

Unicorns: Capital vs Innovation

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Executive summary

In early February 2022, the world had 1000 unicorns, with a combined market value of USD3.3 trillion, nearly 3% of the market capitalization of global stock markets. A decade ago, an unlisted firm with a market value above USD1 billion was a rarity, hence the name ‘unicorn’. We see three key reasons for the exponential growth of the unicorn club.

The first and most important factor is the surge in venture capital (VC) and growth investing. Among various forms of capital, debt has been around for thousands of years, and equity capital for at least a few hundred years (joint-stock companies already existed in the 15th century), but formal VC is just decades old. In its early days in the 1960s, the industry managed a few hundred million dollars in assets, nearly all of it in the US, making small investments in early-stage companies. Since then, the VC industry has expanded in size and across geographies. In 2010, it made investments worth around USD50 billion, and in 2021, the amount invested was 12 times larger – nearly USD600 billion. This has allowed firms to stay private longer.

Changing demographics, as well as growing inequality of wealth and income have contributed to a global surge in private equity (PE) investments in the last two decades. As these trends (among others like growing global trade) push down inflation and interest rates, large institutional asset managers like pension, insurance and sovereign wealth funds have been pushed to take more risks, creating large pools of capital that are chasing growth, even at higher risk. For VC funds, very few investments drive the bulk of returns – often, 5% of investments drive 60% to 80% of returns. This is inherently risky, and is unlikely to be the core method of savings for most households. On the other hand, large pools like institutional funds and family offices can allocate some percentage of their capital to VC/PE strategies.

The second factor is that as much as the supply of savings increases, there is also growing demand. Investments in building intangible assets are increasing, as value-add shifts to software, brands and supply-chain complexity from just ownership of physical assets. Intangible investments began to exceed tangible

investments in the US more than 15 years ago. These investments are high-risk-high-reward – when they work, they can scale almost infinitely (like a piece of software), and benefit from large-network effects (like social media platforms or ride-sharing platforms), but when they fail, there is no salvage value. Traditional sources of capital like banks would be unwilling to fund them, while the leader out on top industry structure they engender fits the expected return profile of VC/PE funds.

The third factor is that new technology firms are also growing larger at a much faster rate than they used to, and the rapid growth in market capitalization of new firms is not just due to a surge in capital chasing of a few investments. In the listed space as well, the leadership in market capitalization had shifted from energy and financial firms two decades back to technology firms. Not only is the latter seeing unprecedented levels of profitability and market capitalization, but they are also achieving these much faster.

Across the world, the combination of cheaper computing with surging internet penetration (even to rural areas, which are still large in Asia) is enabling new business models and removing inefficiencies from value chains. Going forward, several promising innovations like rapid gains in energy storage transforming mobility and artificial intelligence (AI) applications that can bring down costs substantially and thus improve penetration of hitherto expensive goods and services, the internet of things (IoT) and new standards like 5G, are likely to continue to provide entrepreneurs with opportunities to disrupt existing businesses and build new ones.

It is natural to find periods of excess, as different factors drive the demand and supply of VC/PE capital. For starters, the pace of innovation is unlikely to stay uniform. More importantly, attractive returns in the space have brought in non-traditional funds like public-market investors and hedge funds, and capital has flowed in faster than the absorptive capacity. This may be reversing as interest rates rise, and the market capitalization of several technology stocks corrects. Activity may slow down in the coming year or two.

However, the establishment of this pipeline, which routes risk capital from the rich toward new technologies and new business models, is an integral part of boosting total factor productivity globally over the coming decades, particularly as population growth slows. The VC industry in the US was integral to the development of the West Coast as an innovation hub; the spread of this industry to Asia has already catalyzed much creative destruction and can continue doing so going forward.

This channel has other benefits too. Economies globally (including in the

developed world) have struggled to supply growth capital to smaller firms, particularly as banks' business models are not attuned to smaller loan ticket-sizes, and these firms own few, if any, assets. Such businesses may also be better off with equity rather than debt capital. VC/PE funds, steeped in the philosophy of high-risk investments, are likely to be much better equipped to provide capital to smaller businesses.

While much of VC/PE capital flowing to Asia was foreign in the early years, local pools of capital are also emerging, not only created by the success of the early entrepreneurs themselves, but also with the help of some regulatory support, as governments realize the economic value of such capital.

1. China unicorns: saddling up

Over the past decades, China's remarkable economic growth, rapid modernization and constant demand for consumption upgrades have helped it become the world's second-largest source of unicorns at a phenomenal speed. When Credit Suisse first published our China Unicorns report in 2018, there were 79 unicorns from China (including Hong Kong), worth USD285 billion in total valuation. Three years later, the number of unicorns from China (including Hong Kong) more than doubled to 165, valuing at USD566 billion in total. This impressive growth rate has given China's unicorns increasing influence in shaping, or in many cases disrupting, the way many sectors and businesses operate. They have changed the way people eat, work and shop through technological innovation and mastery of data-based insights, attracting talent and investments.

1.1.Characteristics and trends

According to CB Insights, of the global total of 805 unicorn companies in 2021, 405 originate from the US, with a total valuation of USD1,348 billion. The number and aggregate valuation of US unicorns account for 50% of the global total. The US is still leading in the number of unicorns.

China/Hong Kong have 165 of these unicorns, with a total valuation of USD566 billion, accounting for 22% of the global total. China/Hong Kong continue to be the second-largest breeding ground for unicorns. Compared to early August 2020, the number of China/Hong Kong unicorns increased by 40, from the following sectors – internet/e-commerce/online-to-offline (O2O) (8), AI/big data/robotics/software (11), auto (4), fintech (6), healthcare (3), tech hardware (4) and old economy (4).

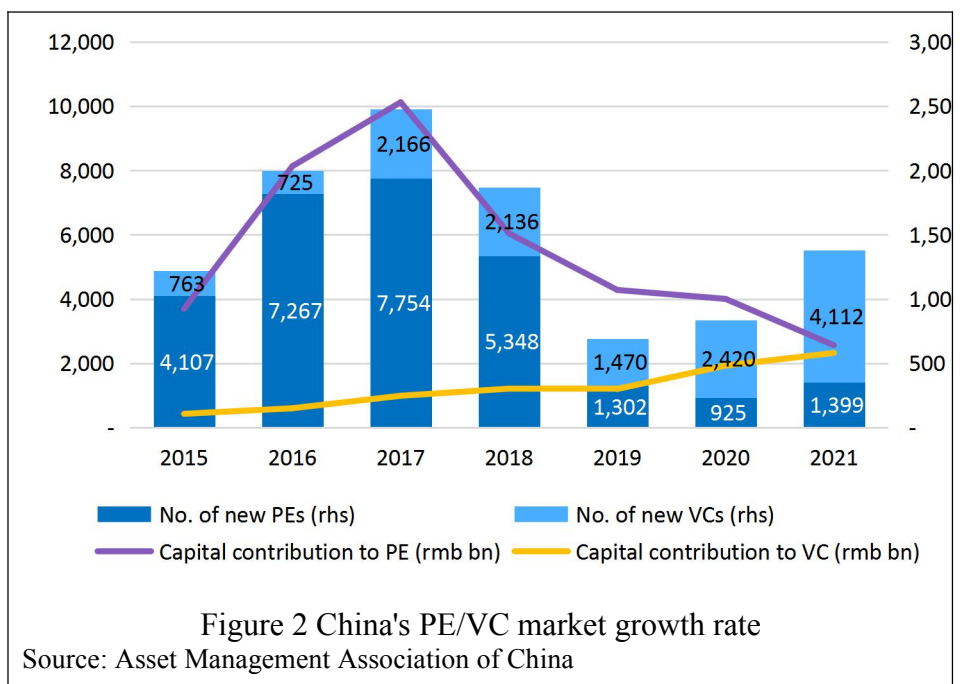
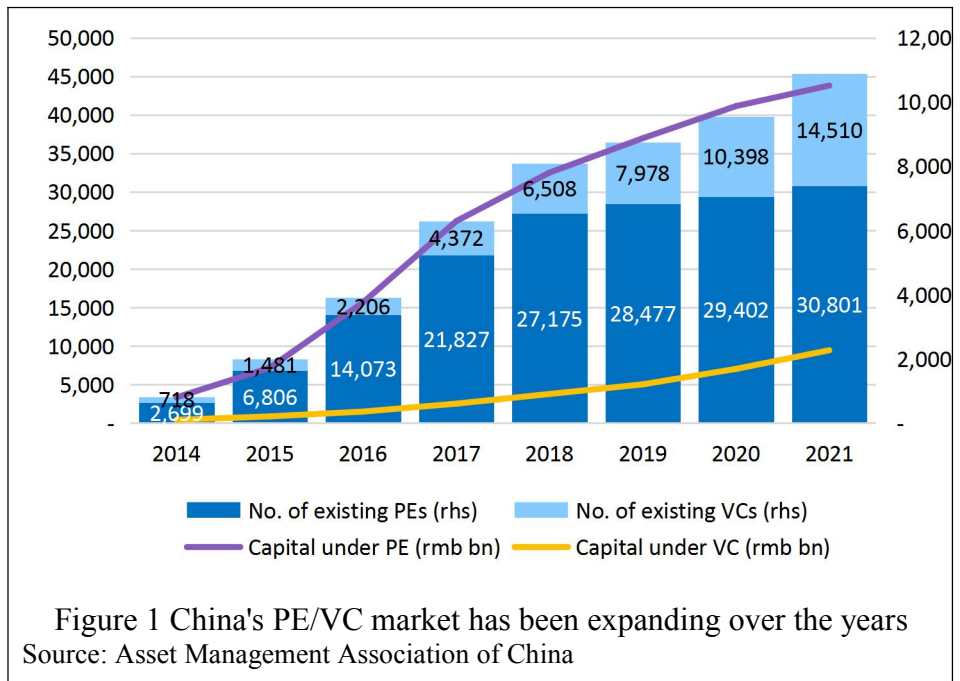
China's unicorns are well-known for being mainly driven by business model innovation, as they have the advantage of gaining access to China's large and vital but fragmented consumer market. In contrast, the US has a higher percentage of high-tech unicorns. However, under China's recent transition to utilize a technology-independent strategy since the US-Sino trade tensions in 2018, we noticed great changes in their unicorn composition with an increasing proportion of unicorns focusing on technological innovation. According to CB Insights, the share of China's internet unicorns dropped to 45% in 2021, a decrease of ~8 percentage points year-on-year (YoY), despite the fact that internet companies still made up the largest part of China's unicorn universe in 2021. Since last year, China has tightened regulations on anti-unfair competition and antitrust rules for the Internet/e-commerce/O2O/game sectors, which has put pressure on their valuations.

In contrast, we noticed a continuous increase from 22% to 25% in the hardware/semi and AI/big data/robotics/software sectors, which have been labelled as hard-core technological innovation sectors, making it easier for them to win the favor of venture funds and government support.

1.2.Capital plays a pivotal role in breeding unicorns

Behind the sharp growth rate of unicorns in China, capital, especially the VC sector, has played a pivotal role in creating financing channels for early-stage technology business growth. Over the past two decades, VC/PE funds have been one of the major driving forces for the rise of Chinese internet giants, scaling their business in the era of web 1.0 and the mobile internet. They are the first generation of unicorns themselves, later providing financing channels to other start-ups, linking companies in their various industries and forming their own ecosystem. Apart from investor funding, unicorn enterprises can also gain brand value, business traffic, valuation and other forms of support such as guidance and access to social networks from investors.

In a virtuous cycle, China's VC sector also registered impressive growth, benefiting from the investment opportunities and the boom of private enterprises overseas listings. In terms of growth rate, we notice a slowdown in capital contribution to PE since the peak in 2017, which in our view, is mainly attributed to the implementation of new asset management regulations. By comparison, the capital contribution to VC has been consistently stable in an upward trend.



VC funding in Asia rebounded after decelerating in 2019 where a 22% drop was

seen. In 2020, VC funding in Asia surged 38% to USD87 billion, outpacing North America's 18% growth rate, according to data from PwC/CB Insights' 4Q20 MoneyTree Report.

In China, a recent trend we have seen is that PE/VC activities in the primary market have mainly concentrated on unicorns that seek Series C or later stages of private financing. In contrast, young start-ups that seek Series A or B financing are still facing difficulties in attracting investments. This suggests that financial institutions are favoring mature unicorns. This also shows that it is becoming increasingly difficult for early-stage companies to stand out, if they just focus on business model innovation.

1.3. Innovation and the government's unswerving commitment to moving up the technological ladder

As mentioned above, relying solely on business model innovation, driven by optimizing user experiences, makes it relatively harder for a company to stand out and keep a leading position. Thus, we observe that unicorns are increasingly seeking to distinguish themselves through technological innovation, in areas such as big data, AI, etc., for business development and product innovation.

At the same time, the government's strategy to achieve technological self-reliance also encourages more companies to focus on hard-core technology and innovation. The number of unicorns in China's technology space, which includes AI, big data, robotics, software, hardware and semiconductors, has steadily risen over the years and reached 42 in 2021 with total valuation reaching USD96 billion, according to CB Insights. Although the number and valuation still lag behind the US, we have observed an encouraging sign that the percentage of tech unicorns among the total number of unicorns in China is gradually edging up. In our view, this is supported by the country's strong desire to pursue technology advancement despite geopolitical tensions. Despite the stepped-up regulations in the internet sector last year, policy makers remain committed to making technology breakthroughs, encouraging import substitution and moving up the value chain.

China's integration into the global economy has been one of the main drivers of its remarkable economic development, underpinned by an export-oriented growth strategy over the past four decades. This was underpinned by the expansion of global trade until the Global Financial Crisis (GFC). Post-GFC, however, global trade posted no meaningful growth in proportion to world gross domestic product (GDP). Rising tensions between China and the US further challenged globalization's status quo and China's export-orientated development model, while emerging nationalism and protectionism around the world made the

situation worse. These conflicts have not only been limited to the political arena but have also flowed over to the trade, tech and finance sectors. Such a backdrop, together with the Covid-19 pandemic, has sped up the dynamics of decoupling.

China's manufacturing sector relies on foreign technology and key components. Our study on tech independence shows that in many industries, China's manufacturing sector faces the risk of supply disruption, as certain parts/components rely heavily on a country/region. Chinese industries may have traditional advantages given that there is more focused production supported by sophisticated logistics and infrastructure. However, they could be vulnerable if access to cutting-edge technology or key components is restricted. Given the potential heightened geopolitical risks in the future, China may seek production independence and fill the gaps along the supply chain and is likely to have a backup plan.

On the back of its scalable domestic market, China could explore domestic substitutes and self-reliance on key technologies by nurturing domestic suppliers. If successful, it could maintain its competitiveness in the manufacturing sector.

China is also transforming its traditional export-oriented growth model into a consumption-oriented one. The contribution of net exports to the Chinese economy is less significant than before, registering close to 3% growth in 2020 from its 8.7% peak in 2007. China's exports demonstrated resilience during the Covid-19 outbreak as the global supply chain was disrupted. However, the challenge of supply chain relocation may once again come back to China once Covid-19 is over and the world's manufacturing processes normalize. The unfavorable demographic development with a rapidly ageing population also naturally calls for a change in the cheap labor strategy. China has to move along the global food chain by offering higher value-added products and services, instead of simply competing on scale and cost.

The stability and security of the supply chain appear to have become a top priority. China's disadvantaged position in key technological areas started to show from 2018, especially in areas such as semiconductors that are heavily reliant on Western countries. China has planned to mobilize more resources, especially for R&D, and invest in those weak links in order to make breakthroughs as soon as possible. It has identified quite a few of them, such as high-end integrated circuits, aero-engines, key robotic components and industrial software.

In our view, the introduction of the "Dual Circulation" high-level development model in late 2019 implies that China's future endeavors in technological self-reliance, import/supply-chain substitution and domestic demand expansion, will ultimately help to safeguard the economy from overreliance on external demand, kindle investment toward domestic consumption and enable China to attain more

sustainable development. This development philosophy has been included in China's 14th Five-Year Plan and the semiconductor and software industries are benefitting from import substitution, as laid out in the Five-Year Plan.

We expect China to step up fiscal and financial support in order to achieve this technological self-reliance. Industries including integrated circuits, electronic components, industrial software, biotech, and major equipment will likely be the focus. It means startups in these areas should have bigger opportunities to develop.

Investments in basic research have also been stepping up. China intends to increase support for and incentives in basic research. In 2019, a mere 5.8% of total R&D expenditure went into basic research, far below the 15-25% often observed in developed countries, such as the US, Israel, Korea and Japan. In 2020, China's basic research as a percentage of total R&D expenditure increased 20 basis points to 6%. We expect basic research expenditure to rise to 15-20% of total general R&D expenditure during the 14th Five-Year Plan period from 2021 to 2025.

1.4.Capital market development for the growth of unicorns

1.4.1. US listings halted amid tightening regulations

Internet and media companies have sought to list in the US market to tap a broader investor base, capture better liquidity and see higher valuation, commonly via the VIE (variable interest entity) structure over the past two decades. In return, foreign investors enjoyed the fast growth of China's technology, media and telecom (TMT) sector by investing in Chinese American Depositary Receipts (ADRs). Over the past few years, the strong momentum in the US market prompted many Chinese companies to list overseas. In the first seven months of 2021, a total of 38 Chinese companies were listed in the US.

However, the outlook for listing in the US has dimmed amid tightening regulations, triggering unicorns to consider listing in markets closer to home. Amid escalating US-Sino tensions, we see tightening regulations both at home and abroad. On one hand, the Holding Foreign Companies Accountable Act was signed in the US at the end of 2020, which requires foreign companies publicly listed on the stock exchanges of the US to delist if they refuse inspections of their audits from the Public Company Accounting Oversight Board (PCAOB) for three consecutive years. On the other hand, China's regulators have pledged to strengthen regulations on Chinese companies' listings in foreign markets at the end of June 2021. China's cyberspace regulator – the Cyberspace Administration

of China (CAC) – has implemented a rule that requires any platform operator that has over one million users worth of data and that wishes to list in a foreign market to undergo a cybersecurity review before the proposed listing. Since then, US listings by Chinese companies have halted, with several Chinese companies reported to have pulled out of planned US initial public offerings (IPOs). This tightening of regulatory policy generated an overhang for unicorns and may trigger them to consider Hong Kong or the mainland A-share market as listing venues.

The sentiment for Chinese ADRs has been hurt due to the overhang of the audit requirement and the potential forced de-listings. At the end of last year, the China Securities Regulatory commission (CSRC) drafted new rules for overseas listings, but the market remains downbeat and expects no compromise from both the US and China regulators in the near term. We believe the meaningful resumption of Chinese companies' listings in the US could significantly lift sentiment and become a driver for the re-rating of Chinese ADRs.

There have been news reports recently that at least six Chinese companies have filed for US listings; however, the IPO size does not look big enough to move the needle. A larger scale of resumption or a bigger listing would be needed to significantly boost market sentiment and foreign investors' confidence, in our view, given a healthy overseas ADR market will be one of the important components for China's successful capital market development.

1.4.2. Beijing Exchange and China's "little giants"

In September 2021, Chinese President Xi Jinping announced a plan to set up the Beijing Stock Exchange (BSE) to better serve high-growth and innovative small-and medium-sized enterprises (SMEs), labelled "little giants". The enterprises represent the novel elites of China's SMEs that are engaged in manufacturing, specialize in a niche market and boast cutting-edge technologies.

BSE was established to replace the Select Tier of the National Equities Exchange and Quotations, (NEEQ, known as the "new third board"), providing a direct fundraising channel for the "little giants".

China is cultivating these "little giants" as the government desires to strengthen its advanced manufacturing capabilities with the proliferation of innovative SMEs that have technological specialties. Xu Xiaolan, the Vice-Minister of Industry and Information Technology recently said China's industrial chain had withstood the impact of the pandemic largely due to the depth and breadth of the industrial layout of SMEs. China aims to incubate 10,000 such companies by 2025.

Among all 4,922 national “little giants”, 294 companies are listed on the A-share market (42% on ChiNext, 30% on the Main Board and STAR Board), according to data from Wind. Among the first batch of 81 firms listed on the BSE, 16 are “little giant” firms, taking c.15% of total market value of the bourse. The government will improve listing services for these companies and provide favorable financial policies for them.

1.5.Key trends in China’s big tech sectors—internet & technology

1.5.1. Internet

China’s digital economy has reached a tipping point after total internet users exceeded one billion as of June 2021. While the overall Chinese internet user base has maintained its 7.5% compound annual growth rate (CAGR) from 2010 to 2021, the number of mobile users has grown even faster at 11.5% CAGR during the same period. The penetration intensified in 2020 as the Covid-19 pandemic boosted rapid digital adoption. The enormous internet user base lays a solid foundation for the next stage of economic development and despite the slower growth ahead, we continue to see key drivers for further acceleration of the digitalization of the economy.

The key drivers include the following – (1) The construction of digital infrastructure: 5G network construction has been accelerating across the nation, and now covers all major cities in China and is connected to 365 million users. (2) Deeper penetration in lower-tier cities and wider user age groups: as most e-commerce platforms seek incremental user growth in lower-tier cities, logistics and digital service facilities have greatly improved in rural areas, driving an uplift in internet penetration in rural areas to 59% in June 2021. Also, internet adoption among wider age groups (elderly and younger generation) is boosting emerging fields, like internet healthcare, animation, comics and games (ACG), e-sports, etc. With average internet user penetration hitting over 70%, the competition for user engagement and user time spent will fuel the growth in content-related e-commerce, local services, and video streaming. (3) Increased market appetite for deep tech and renewable companies which are well aligned with China’s sustainable development plan.

1.5.2. Technology

AI has come to play an important role in China’s national development blueprint. China aims to become a global leader in smart manufacturing by 2030 and AI is a key enabler. China aims to pursue leadership in the AI field through three steps: first, it

must be able to keep pace with all leading AI technology, and its application in general, by 2020. Second, China has to make major breakthroughs by 2025, which are intended to lead to the third and last part of the plan: the establishment of China as the world leader in the AI field by 2030. China targets the core industry scale of AI to exceed RMB400 billion and the scale of related industries to exceed RMB5 trillion in 2025. By 2030, the core industry scale of AI is expected to exceed RMB1 trillion, and the scale of related industries to exceed RMB10 trillion. We believe China becoming an AI leader by 2030 is achievable due to three factors: (1) strong VC investment totalling USD2.6 billion annually; (2) largest smartphone user base of 730 million; and (3) strong domestic and overseas returning talent pool.

AI has four major development areas: (1) Machine learning: enables machines to “learn” from data, especially leveraging neural networks and structures; it is applied in major areas of AI technology, especially voice and image recognition. (2) Compute hardware and cloud platforms: stronger computing power from three types of mainstream AI chips, GPU (graphics processing unit), ASIC (application-specific integrated circuits), & FPGA (field-programmable gate arrays, and cloud resources facilitate faster algorithm iteration and testing. Infrastructure-as-a-Service (IaaS), Platform-as-a-Service (PaaS), and Software-as-a-Service (SaaS) allow different industries to customize their own AI solutions. (3) Availability of data: the International Data Corporation predicts that the collective sum of the world’s data will grow from 33 zettabytes (ZB) in 2018 to 175ZB by 2025, with a 61% CAGR, enabling AI algorithms to learn and improve their performance. (4) Internet of Things: Allows data collection and AI applications in diverse scenarios to drive smart decision-making and provide more accurate predictions.

We see AI applied in several instances such as in healthcare, driverless vehicles, computer chips, financial, facial recognition, retail, robots, etc. Due to the broad applications of AI, different industries can be enhanced with different forms of AI, especially sensing intelligence and cognitive intelligence. Sensing intelligence tech has made significant progress and incubated representative products such as smart speakers utilizing voice and speech recognition and smart cameras/servers that can identify and match human faces from images and videos. Cognitive intelligence still remains a challenging area.

In the AI value chain, there are three major layers: the foundation layer, the machine learning engine, and the technology layer. The *foundation layer* provides infrastructure such as servers, chipsets, sensors, data resources and cloud computing resources, etc. The *machine learning engine* is the platform that provides the deep learning process and makes computers learn from the data. The *technology layer* includes algorithm providers, products and solution providers,

etc. We expect some common operators' across different applications in the AI ecosystem to leverage their technological capability.

AI chips: AI is a system with the ability to think for itself and embrace different types of machine learning which requires minimal human intervention to learn from data to make accurate predictions. Deep learning is a type of machine learning that can adapt itself to new data and train its systems to learn on its own and recognize patterns. The AI chip is designed to do particular AI tasks more efficiently to perform training and inference-making in the deep learning process. An AI chip also uses “neurons” as a fundamental computing unit, unlike logic gates. The “neurons” in neural networks are simple computer processes. In other words, the AI chip is actually an accelerator to efficiently execute tasks at low power.

AI algorithm: Visual information takes up 70% of all the information human beings process every day. Visual intelligence, with more dimensions of information to analyze, requires more complex analysis and computing power to identify objects and “make sense” of the images and videos. Visual intelligence includes visual perception, visual cognition and image and video understanding. Visual intelligence is one of the applications that AI could be effectively applied to.

Facial recognition is only one part of visual intelligence, but it is the biggest part as it is the most mature, and can be quickly applied to different industries to meet rigid demands, such as public surveillance. Based on iResearch's analysis, the market size of AI-enabled surveillance for To Government (ToG) and To Business (ToB) markets (excluding storage, switch, network, and implementation/maintenance, etc.) in China is expected to grow from RMB4 billion in 2017 to RMB71 billion in 2022, with a CAGR of over 78% (2017-22). Visual intelligence, especially facial recognition, is applied across broad industries, including, video surveillance analysis, advertising, smartphone and mobile internet, financial services and other new areas. Video surveillance takes 68% (the largest) of the market share. Due to the high technological barrier to entry and levels of R&D investment needed, this market is dominated by a few internet giants, major AI companies, and companies developing AI capabilities.

An AI-enabled video surveillance solution consists of front-end and back-end products. The smart cameras in the front-end and smart servers/storage in the back-end can be used independently. Smart cameras are network cameras with chipsets added and AI solutions loaded. Smart servers are built from servers and storage items, paired together with AI solutions to extract facial features,

recognize and match faces in the databases, and conduct image-searching services across multiple channels. The differences between single-server solutions and platforms or supercomputing centers are mainly in: (1) image/video processing speed; (2) number of facial features recognized; (3) number of video channels that can be processed simultaneously; (4) ability to trace targets for real-time video-streaming; and (5) number of targets that can be focused on at the same time.

AI hardware devices: AI is moving toward edge devices from the cloud/server. We see that increased computing power and sensor data along with improved AI algorithms are driving the trend toward machine learning to be run on terminal devices, such as smartphones and automotives, rather than in the cloud.

AI robotics: AI is possibly the most exciting field in robotics. We see the increasing integration and connection between robotics and AI. Robots are programmable machines which are used to carry out a series of actions autonomously, or semi-autonomously. With embedded machine learning capabilities, robots can perform complex tasks and interact with human beings.

We think the next generation of robots may use AI to develop independence and perform a variety of tasks without human supervision. The market is still in an early stage, and we believe today's AI robots are not "real" enough yet. AI robot development is led by American and Japanese makers, but China aims to catch up.

Artificial Intelligence of Things (AIoT): AI is moving toward edge devices from the cloud/server. When things such as smart devices, home appliance, sensors and other equipment are connected to the internet, they are called IoT. When AI is added to the IoT, it means that these devices can analyze data and make decisions and act on the data without human involvement.

In China, the development of the 5G network and the adoption of big data and smart-city solutions enabled the broad adoption of IoT. IDC estimates that there were 4.5 billion IoT units connected in Asia ex-Japan at the end of 2019, and forecasts it will grow at an 18% 2019-25E CAGR to reach 12.3 billion connected units in 2025. China will continue to lead and account for 84% of the Asia ex-Japan's connections. The strong adoption growth will be primarily driven by the continuous capacity expansion of 4G LTE networks in China, as well as the introduction of 5G New Radio. 5G's ultra-low latency and enhanced mobile broadband capabilities will be a key enabler for enterprise/industrial and public sector applications, which IDC expects to grow fastest at 25% 2018-23E CAGR. We see significant potential for AIoT – first, connecting the IoT together and creating business opportunities by leveraging the data, and then also offering smarter solutions.

2. Learning from other Asian countries

2.1. ASEAN Unicorns – Scaling new heights

2.1.1. Reaching take-off speed

The growth of ASEAN's digital economy is rapidly accelerating – ASEAN stock indices are starting to shift toward the new economy, with significant changes already afoot in Indonesia and Singapore. Meanwhile, private money is also filling the gap left by public markets, with public markets already starting to reflect the changes that PE has made to the ASEAN start-up scene. These factors have resulted in key business lines like e-commerce growing and reaching take-off speed.

The number of unicorns in ASEAN has continued to increase over the last two to three years to reach 35 (as of September 2021). While the sectoral split of the ASEAN unicorns is more diversified, the country mix is unsurprisingly skewed toward Singapore and Indonesia, which account for ~74% of the companies. By sector, Fintech leads the pack, accounting for 26% of the companies followed by e-commerce (20%), logistics (11%), and diversified internet (8%). Most of the unicorns in ASEAN have consumer-led business models (B2C) with very few companies in the business to business (B2B) space.

Many unicorns have been launched over the last decade: 77% of unicorns were formed after 2010 with ~60% of the companies being formed during 2011-15, highlighting the accelerated pace of new company formation.

2.1.2. Key enablers: PE/VC funding, strong demographics, and supportive regulations

Several factors have acted as structural supports that enabled the healthy growth in high value companies in the region. A young population with high smartphone penetration rates, a fifth of the population entering the workforce in the next 25 years accompanied by a rising middle class, as well as robust PE and VC activity, have all been catalysts for the growth in the ASEAN start-up ecosystem.

ASEAN's public markets have yet to provide as much support for start-ups as seen in other regions, but for several years, private money, has taken note of the underlying opportunities in ASEAN's large, underpenetrated total addressable market (TAM). We believe public markets will soon be following the lead of private markets and that Tech+ start-ups can realize the potential of an integrated ASEAN market in ways other sectors have not.

2.1.3. A virtuous cycle spawning entrepreneurship and successful start-ups

It has historically been a challenge to foster integration across ASEAN-6's large

and ethnically diverse population, thus making it difficult to cultivate regional competitors. However, companies are now capitalizing on these differences to succeed through “hyperlocalization” strategies.

Many of the region’s start-up founders/co-founders are alumni of other successful start-ups/tech companies. The ecosystem will continually expand as second-generation entrepreneurs increasingly launch their own companies, which in turn attracts more first-generation entrepreneurs who are inspired by the former’s success. Furthermore, Southeast Asia is still armed with significant dry powder sitting uninvested, while the exit momentum is picking up.

2.2. Indian Unicorns: Changing the corporate landscape

India’s corporate landscape is undergoing a radical change due to the remarkable confluence of changes in the funding, regulatory and business environment in the country over the past two decades. An unprecedented pace of new-company formations and innovation in a variety of sectors has meant a surge in the number of highly valued, as-yet unlisted companies.

2.2.1. Transformation in the corporate landscape

While India ranks third behind the US and China in the number of unicorns, the combined market capitalization value of its 100+ unicorns is disproportionately higher than the size of the listed universe. In addition, three-fourths of these firms started after 2005, whereas only 60 of the top 500 listed firms started this century. The sectoral split is highly diversified – in addition to the largely expected e-commerce, FinTech, education technology, food delivery and mobility companies, there is a rapidly growing number of such firms in SaaS, gaming, new-age distribution and logistics, modern trade, bio-tech, pharmaceuticals, and even fast-growing consumer brands that are benefitting from accelerating penetration, formalization, and most importantly, the availability of growth capital.

2.2.2. The Enablers: Funding, infrastructure, regulation

A number of factors are driving this growth in highly valued companies. A surge in (mostly foreign) PE has addressed the natural shortage of risk capital in an economy with low per capita wealth: these flows have exceeded public market transactions in each year of the last decade. Teledensity and internet penetration have accelerated – until 2005 less than 15% of Indians had a phone, versus 85% end of 2021; approximately 700 million people, representing 45% internet penetration, have internet access now due to cheap data and falling smartphone prices. There have also been deep-rooted physical infrastructure changes – nearly all habitations now have all-weather roads compared to only half in 2000, and

household electrification is at 100% now versus just 54% in 2001. Financial innovation is accelerating, courtesy of the world-leading “India stack”.¹

2.2.3. The beginning, not the end of unicorn seeding

In addition to generic drivers, the development of ecosystems in several sectors is also providing India with a competitive advantage compared to its global peers, for example in technology, with its five million IT professionals, and in pharma/biotech. Furthermore, several sectors also have many idiosyncratic catalysts, like the changing nature of software and software development that is driving an impressive surge in the number of SaaS unicorns. Similarly, e-commerce, modern-trade and regulatory tightening by the government are driving the formalization of mature but extremely fragmented businesses including jewelry, as well as driving the creation of new consumer brands in novel and fast-growing categories supported by new advertising channels and the consolidation of distributors.

2.2.4. A virtuous cycle?

In a country not known for its entrepreneurship, new company formation was quite strong even in the 1980s, though lack of access to capital was a challenge. This changed as economic reforms freed up capital access, but sizeable investments were still limited to a handful of family-owned dynastic businesses. The surge in unicorns creates numerous large pools of risk capital: ~USD50 billion of wealth even at an average of 15-20% residual ownership across these businesses. This has contributed to the growth in the number of millionaires in India, triggering a wave of angel investments of the type seen in the US post-1990s. Unlike for family-owned, generational businesses, this capital is likely to be deployed in new ventures once monetized. Record exits for PE investors should also trigger more interest in Indian businesses.

After a record number of new unicorns formed within 18 months, the pace may begin to slow, given that US rates are climbing higher, and listed tech stocks are seeing a correction globally. However, over the medium-term, momentum should sustain, providing an impetus to the economy as well.

2.3. Korean unicorns: the Korea experience

Korea is home to the third-largest number of unicorns in Asia, after China and India. Local investments by VCs had been very strong in 2021 after a stagnant

¹ ‘India Stack’ refers to the trinity of higher banking penetration through Jan Dhan accounts, Aadhaar-based unique identification and authentication, and increased internet (mobile) penetration. These three together create public infrastructure, which enables paperless, instantaneous, and cost-effective customer authentication and on-boarding.

2020, and the strong local investment appetite should continue to support the growth of start-ups in Korea.

New investments in start-ups reached KRW4.3 trillion in 2020 and went up to KRW7.7 trillion in 2021. Investments in start-ups have been steadily increasing over the past decade, with a very strong 44% YoY growth in 2018, while 2021 turned out to be an even stronger year with investments up 78% YoY, a continued increase for the eighth successive year according to KVCA. The annual new investment amount has also more than doubled in the past four years. The big growth seems to be due to the proliferation of mobile handset usage which led to a big jump in the establishment of innovative new businesses.

Regulatory support and tax deductions also played an important role in the rapid growth. In 2017, the minimum required equity for establishing a VC company was reduced to KRW2 billion from KRW5 billion. In addition, institutions investing in venture funds were given a 5% discount on corporate taxes and individuals received a 10% income deduction. Angel investors were given up to a 100% income deduction to incentivize them to invest, and the government formed an KRW800 billion start-up fund to directly support the sector's growth.

As for sectors that are seeing strong investment growth, biotech/medical sector start-ups have been a popular investment target for VC companies in Korea, which we believe is because of the higher success rate of biotech/medical companies, as such start-ups are based on studies that have already been completed and recognized, giving investors a higher chance to exit their investments profitably.

IT and retail service start-ups are two other sectors that attract large VC investments. Despite the risk of failure, new mobile IT and retail services are drawing in the most interest from investors. New investments in IT and retail service start-ups were KRW402 billion and KRW304 billion respectively in 2015, and reached KRW2,428 billion and KRW1,455 billion in 2021, increasing more than five times over the six-year time span.

3. In conclusion

While the US continues to account for more than half the unicorns globally, other geographies have caught on over the past decade. The early lead and access to government-funded fundamental research has helped US firms stretch the frontiers of technological innovation, but firms that use the business model innovation, benefiting from formalization and consolidation of sectors, dominate lists in Asia, which has seen a leap forward in terms of both the number and size of unicorns. China has become and remains the world's second largest breeding

ground for unicorns, ASEAN's digital economy is in the driver's seat, leading the rapid acceleration of unicorn growth, while India's changing corporate landscape is spurring highly valued, as-yet unlisted companies and South Korea's strong local investment appetite should continue to support the growth of start-ups in the country. In terms of unicorns' business nature, we have noticed a change at the margins in recent years, as AI and robotics firms in China, as well as SaaS firms in India are now developing solutions for the global market.

The growth in unicorns and of VC/PE in general also poses new challenges for regulators. Firstly, disclosure norms for listed firms are more stringent, but only to protect minority shareholders. However, as private firms rapidly become an integral part of the economy, the economic risks from their potential failure or missteps can still be significant. Secondly, several of these sectors are prone to a winner-takes-all industry structure, creating new regulatory challenges. Routing investments to areas of strategic importance for a country, even if only to "crowd in", may also need regulatory intervention, given that capital markets are susceptible to herd behavior, starving some sectors of capital, even as they over-fund others.