Global Corporate Venturing

The World of Corporate Venturing 2018

THE DEFINITIVE GUIDE TO THE INDUSTRY

- CORPORATE VENTURING DEAL VALUES CONTINUE TO GROW
- THE GLOBAL CORPORATE VENTURING SURVEY 2018
- GLOBAL UNIVERSITY VENTURING'S YEAR IN REVIEW
- GLOBAL GOVERNMENT VENTURING'S YEAR IN REVIEW

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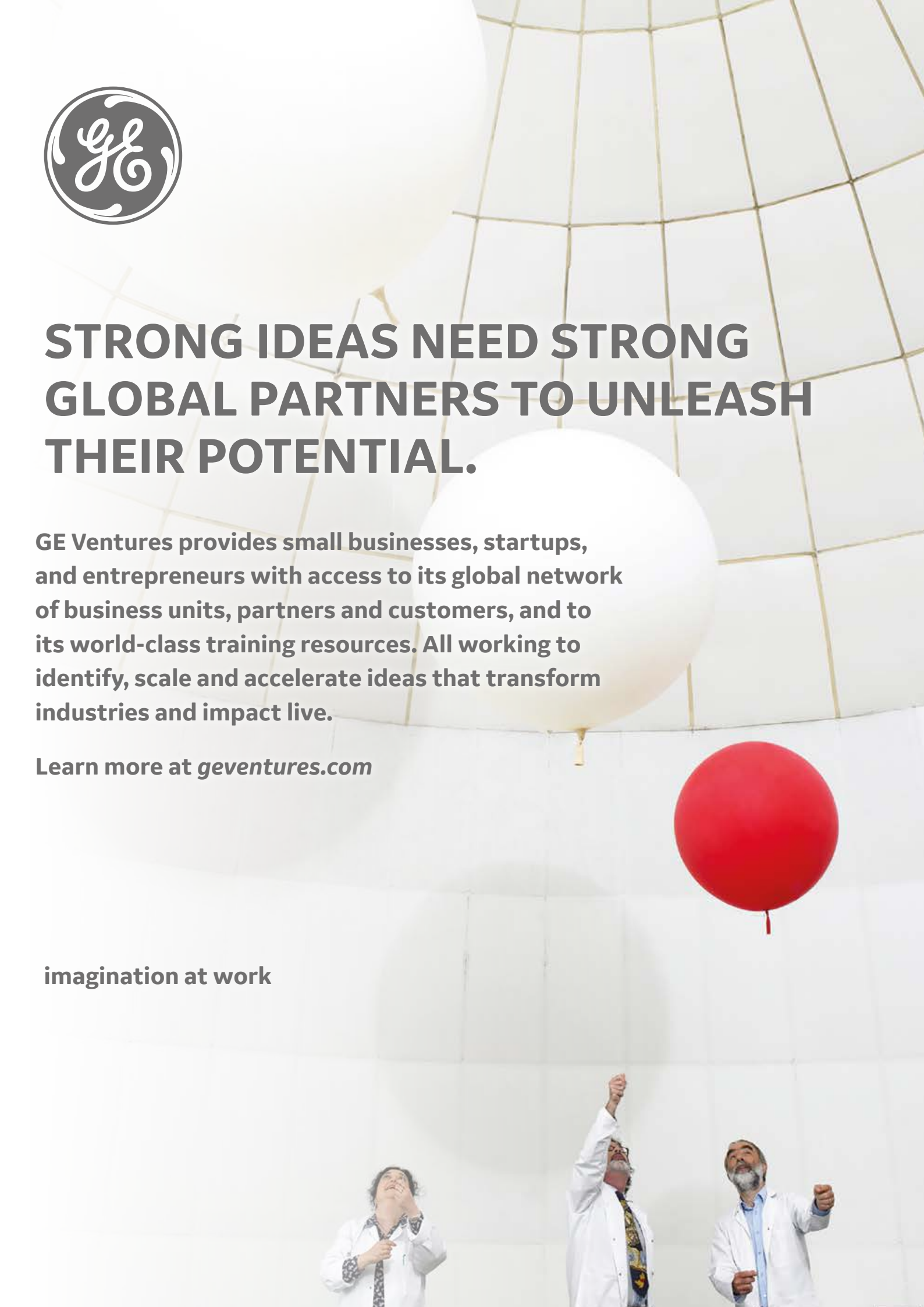

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Global Corporate Venturing

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FOREWORD

Claudia Fan Munce, chairman, GCV Leadership Society advisory board, venture adviser, New Enterprise Associates and founder, IBM Venture Capital

Dear colleagues,

It continues to be my honour to be part of this vibrant corporate venture community and support Global Corporate Venturing's advisory board as chairman, in addition to my now three public board seats and serving as a venture adviser at NEA.

It is clear from where I now sit that corporate venture capital is more relevant than ever as the world turned increasingly towards innovation and entrepreneurs in 2017.

As competition continues to heat up for the best entrepreneurs driving the future at a faster pace than ever, so does the demand for support from corporate venturing leaders as the advantages of that support become more evident to entrepreneurs as well as institutional venture investors. As is always the case, entrepreneurs seek capital, but also in-kind support, such as customer introductions, staff hires, product development and, eventually, help with an exit.

Historically, corporate venturing's advantages have leaned more strongly towards in-kind supports and less as sources of capital. In today's world, however, with nearly $100bn raised by just one corporate vehicle – the SoftBank Vision Fund – this has changed. Even before this fund had its first close at $93bn in May, CVCs last year were involved in more deals by value and by volume. Partnership with corporate

venturers now offers a blend of all benefits that can help build successful companies.

In this light, understanding who CVCs are and how to work inside or with them becomes increasingly important, even if attention is focused in general on the largest deals and funds. In partnership with Ilya Strebulaev, a professor at Stanford University,who teaches the most popular venture capital class at its Graduate School of Business, we introduced to that curriculum, for the first time in the history of that course, a segment on CVC informed by fantastic leaders, such as Sue Siegel at GE Ventures, Nagraj Kashyap at Microsoft Ventures and George Hoyem at In-Q-Tel.

The feedback from the students was positive. What followed was the creation of a new corporate venture capital case sudy, paid for by Stanford and written by a professional Graduate School of Business case writer, in collaboration with Global Corporate Venturing. Another first, and it will be taught as part of the entrepreneur class this year.

But if this industry is to continue to flourish, there will need to be some significant cultural changes to make it inclusive of diversity. I know it is a hot topic and you may be tired of hearing it from all fronts, but it is indicative to note that the majority of CVC units are still run by and employ mainly men, according to GCV's annual survey. It is, however, an important topic and, while there are relatively higher proportions of women in CVC compared with the greater venture industry, there is a lot more to be done.

Certainly, my decision to choose NEA had a lot to do with managing partner Scott Sandell's championship of diversity at US trade body the National Venture Capital Association, and NEA has proven to be a great platform for me to engage in many initiatives that can help drive changes. I recently contributed to a great book – Power Up: How Smart Women Win in the New Economy – with other contributions from many legendary women investors and entrepreneurs, which made me realise how much more there is still to be done.

CVCs have a richer diversity than the overall venture community and we as a community of corporate venture leaders can help drive the incredible momentum of awareness on the hidden issues that women, in particular, face within the community, and improve the opportunities for them to succeed so we can attract more talented young women.

Over 20% of CVC leaders – more than 20 in the GCV Powerlist 100 – as well as over 40% of GCV Rising Stars are women, and by looking at diversity across ethnicity, it is a majority. This movement has been rapid among such leaders as GE, Microsoft, Tencent and In-Q-Tel – unsurprisingly, perhaps, but these are also the names first called on by burgeoning entrepreneurs who recognise those on the right side of history, and they can help these tellers of future truths achieve their, and society's, dreams in 2018 and beyond.

In closing, please accept my sincere appreciation for all you do and for supporting the CVC community as leaders. The passionate entrepreneurs and the growth of our parent corporations would not be as prominent without the hard work and intellectual calibre of your contributions.

INTRODUCTION

James Mawson, editor-in-chief

Last year, the introduction to the World of Corporate Venturing 2017 started:

> *It is hard not to look at commitments made to a near-$100bn venture fund organised by a Japan-based conglomerate SoftBank with an expectation that last year [2016] was a high point in private capital markets and innovation capital.*
>
> *But SoftBank's fund might not be the signal of peak venture that it first appears for two reasons that became clearer over the past year – supply of capital is changing from purely financially-focused principals to those with often more strategic reasons, and opportunities to invest are broadening.*

That SoftBank alone was involved in about a fifth of US venture deals by value in the third quarter indicates the impact it has had. Entrepreneurs are asking for 10 times what they might have sought earlier, and using the money to develop their own corporate venturing strategies by investing in and acquiring peers in other sectors and geographies.

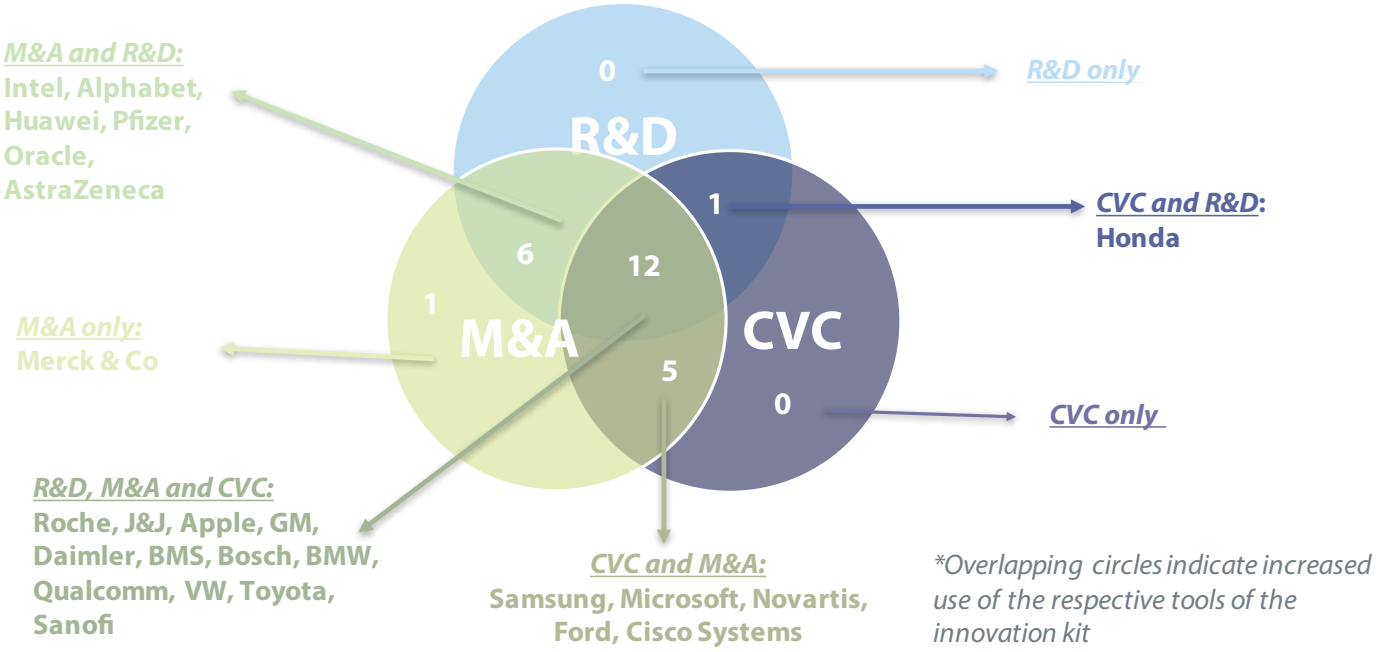
Media group Tencent and SoftBank's funding of China-based ride-hailing company Didi Chuxing will be perhaps a defining case study of this new world order. It has effectively defeated US peer Uber in China and turned the tables on its erstwhile partner outside North America to be valued more highly and have a more effective partnership model. This has put the group at the head of the GCV Rising Stars 2018 in the persons of strategy chief Stephen Zhu and his boss Jean Liu – both in the top 25 of last year's GCV Powerlist. *(see Zhu's profile in the separate GCV Rising Stars 2108 supplement).*

What Didi, Tencent and the others realise is that, as Arjun Sethi puts it, "a moat [a durable competitive advantage] today is simply a temporary buffer that helps a company get ahead of the next innovation cycle".

That is why Tencent effectively reinvests all its profits in corporate venturing, as Jeffrey Li, managing partner at Tencent Investment, said at the inaugural GCV Asia Congress in October.

The growth in the importance of intangibles upends economic theory. Arnold King in his blog said: "Business competition does not consist of building bigger production facilities. It consists of trying to come up with the best strategies for capturing the value of ideas, including the value of spillovers and synergies that come from other people's ideas.

Increased use of innovation tools among the top 25 corporations



Source: GCV Analytics

"Economic textbooks continue to treat incomes as returns to factors of production, notably labour and capital. Meanwhile, in the real world, incomes at the highest levels are the outcome of management strategy, in mobilising internal talent and in exploiting the opportunities to use synergy, spillovers, and scalability in the external environment.

"As intangible factors increase in importance, strategy matters more and resource endowments matter less."

As presented in our GCV Symposium keynote in London last May, the leading corporations are joining up their innovation toolsets, with venturing an increasing proportion of the capital allocation and, more importantly, top talent.

Corporations are increasingly shaping and driving the venture ecosystem. As my colleague, Kaloyan Andonov, found, "in 2017, GCV Analytics tracked 2,320 deals worth an estimated $109.23bn of total capital raised.

"While the deal count registered a somewhat minor increase on a year-to-year basis (6%) versus the 2,173 transactions of 2016, the total value of corporate-backed VC rounds reached a new all-time high, surpassing the $100bn mark.

"What also grew was the number of active corporate venturers. Since 2011, when our publication started, we have tracked more than 2,234 distinct corporate investors, according to our definition – any corporate investor, with or without a specialised CVC unit, which has participated in at least one venturing round for a given period of time.

"We also observed that the number of active corporate venturers grew drastically by 70%, particularly over the past four years, from 678 in 2014 to 1,153 in 2017."

The new large CVC-backed funds are primarily set up in Asia and will shape the opportunities backed and what new champions emerge. The role of innovation in driving relative outperformance is indicated by this third consecutive year of more than $100bn invested in venture-backed companies. This is both because financial returns for investors seem to be better in this part of the economic cycle but also because the opportunities to impact the world through technology seems only to be growing and creating commensurate political reactions.

High valuations and a change in the global economy from up to down will put the unprepared at risk if capital is uncommitted by corporate parents, but will offer better-priced assets for the brave. David Swensen, chief investment officer at Yale endowment, recently said he was holding more assets (32.5%) in zero beta – non-market-correlated assets – more than in the days before the global financial crisis.

In partnership with Stanford and Insead business schools, the annual GCV Leadership Society survey of industry leaders identified the main concerns and opportunities they

> Going round the corner of the village to Stanford or Berkeley and hiring your roommate and investing in your friends will only get you so far

have as well as the structural and organisation make-up of the community.

Artificial intelligence (AI), genomics, communications, energy, blockchain, robots, sensors, and a host of other transformative changes are under way.

Now we appear to be, relative to previous generations' expectations, on the cusp of singularity, and with technology impacting three big drivers of human evolution – health, living longer and better; transport and communications, with each other as well as computers and robots; and energy, with solar pricing below coal and other fossil fuels without subsidies.

The January issue of Global Corporate Venturing this month looks at the business model changes affecting corporate venturing through AI impacting deal sourcing and monitoring to partnerships with universities and governments and professionalisation of personnel.

The venture industry is democratising with the rise of angels and initial coin offerings (ICOs), and the formation of cheaper startups changes dynamics for what types of business need venture capital. Gust has 500,000 funders and 70,000 investors. AngelList has a jobs board, Republic for crowdfunding, partnership with CoinList for ICOs and Producthunt for customers and development.

Last month, SingularityNet, a US-based decentralised marketplace for AI, said its ICO raised $36m in just 60 seconds. AI is hot because of the promise of general AI as well as deep or machine learning based on datasets.

As Brian Arthur, an external professor at the Santa Fe Institute and a visiting researcher at the System Sciences Lab at Xerox's Palo Alto Research Centre, wrote for management consultant McKinsey: "The virtual economy is not just an internet of things, it is a source of intelligent action – intelligence external to human workers.

"This shift from internal to external intelligence is important. When the printing revolution arrived in the 15th and 16th centuries it took information housed internally in manuscripts in monasteries and made it available publicly. Information suddenly became external. It ceased to be the property of the church and now could be accessed, pondered, shared and built upon by lay readers, singly or in unison. The result was an explosion of knowledge, of past texts, theological ideas and astronomical theories. Scholars agree these greatly accelerated the Renaissance, the Reformation, and the coming of science. Printing, argues commentator Douglas Robertson, created our modern world.

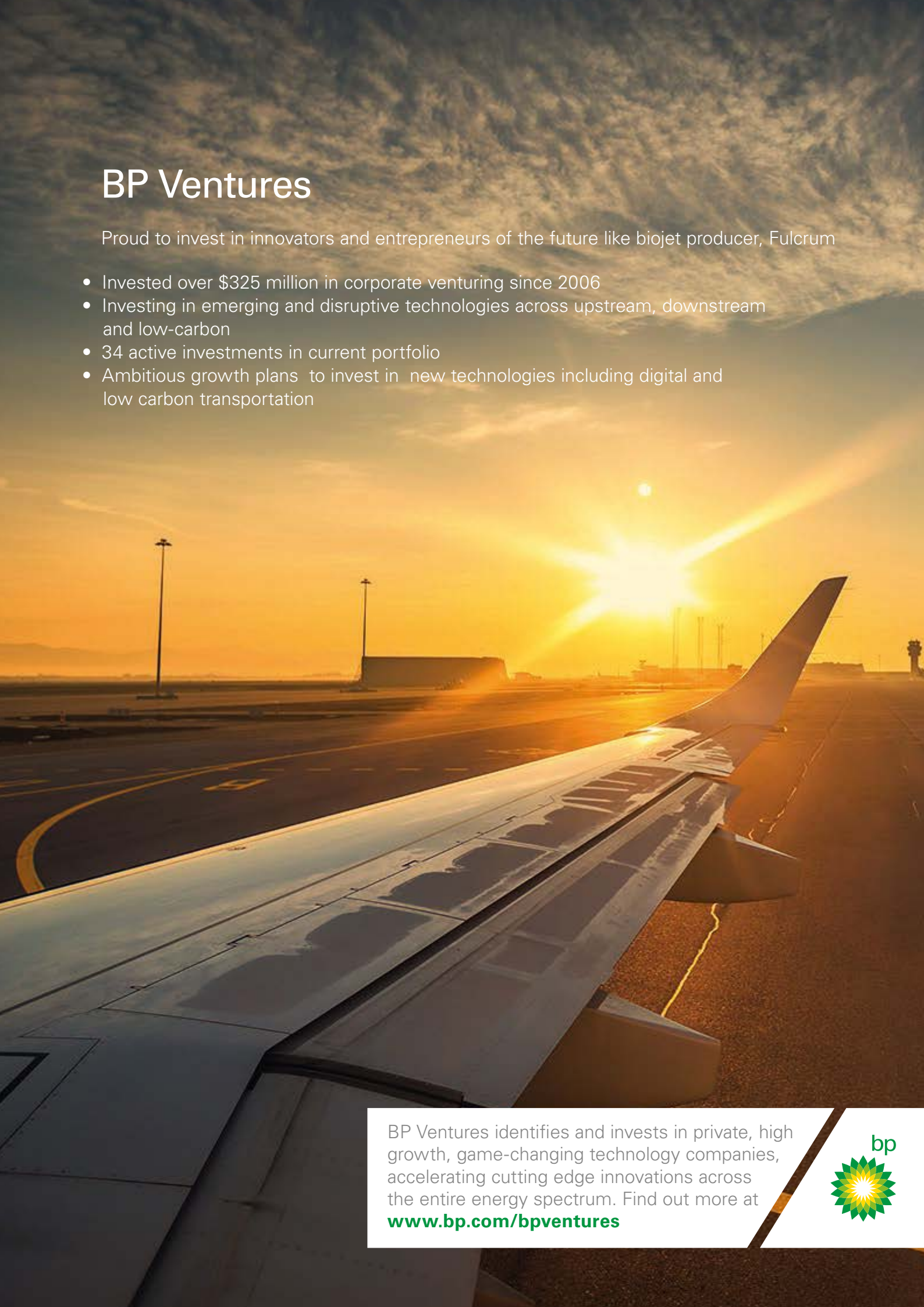
"Now we have a second shift from internal to external, that of intelligence, and because intelligence is not just information but something more powerful – the use of information – there is no reason to think this shift will be less powerful than the first one. We do not yet know its consequences, but there is no upper limit to intelligence and thus to the new structures it will bring in the future."

However, the way we have worked in the innovation ecosystem is perfectly suited to a world that no longer exists. Going round the corner of the village to Stanford or Berkeley and hiring your roommate and investing in your friends will only get you so far.

The entrepreneurs' customers and products and capital and staff and even the buyers of her whole startup can come from anywhere and the diversity is important to that success. And what we realised from the annual GCV survey and inviting portfolio companies to events was that you – the corporate venturers – are the so-far hidden wiring that connects it all.

There is a shift from innovation village capital (IVC), with local investors, small deals, VCs always in the lead, just offering capital and maybe some advice and terms skewed against founders and employees. Fewer than three out of every 10 VC firm are international in scope, according to PitchBook data.

And if their selection is weak, given 75% of venture-backed startups fail, according to a Harvard Business School study by Shikhar Ghosh, then the occasional home-run exits allied with downside protection through liquidation preferences, with double-dipping into option pools and retained shares, and minimum valuations, all mean VCs do better on average than founders and employees.



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So if villages are not the answer, what is? Perhaps city-scale venture capital, where international, mixed syndicates can meet the entrepreneur's needs of capital, customers, talent, product development and, eventually, an exit on aligned terms.

The last part might be the hardest given the current downside protection in seemingly all unicorns – companies worth at least $1bn. But the enormous bonuses and options given to CEOs of the average incumbent listed company means the penny will drop for entrepreneurs, too.

And diversity will matter. Sir Ronald Cohen, founder of UK trade body the British Private Equity and Venture Capital Association and Apax Partners, Bridges Ventures, Social Finance, Big Society Capital and chairman of the Global Steering Group for Impact Investment and the Portland Trust, said, in advising on our next theme – Standing on the shoulders of giants: going beyond capital – for the GCV Symposium in London on May 22-23, the 21st century shift in mindset is one from looking simply at risk and reward to finding the appropriate blend of risk, return and impact.

If investing is intentionality with measurement of impact, then the slightly disparate worlds of traditional venture investing and impact investing will start to combine. This creates opportunities for new regions and investment models.

About half of corporate venturers are already doing deals outside their home countries, and a look at the exciting technology being spun out of academia through our Global University Venturing title indicates that the triple helix of government, corporation and university is present in many of the syndicates formed in the past few years.

As our sister publication Global Government Venturing has reported, countries are "stepping into venture", to repeat a phrase by Peter Diamandis at Abundance Insider. The SoftBank Vision Fund, after all, is backed by Saudi Arabia and the United Arab Emirates.

But finding these parties and building trust to share deals is a challenge. The GCV Leadership Society has been working towards a world of, in angel investor Gil Dibner's words, systems of network intelligence – in which a system of intelligence creates incremental value by sharing intelligence across customers.

Perhaps one example from last year indicates the potential. The moon landings have been called the greatest technological feat of the 20th century, with 4.4% of US gross domestic product spent annually at its peak in the mid-1960s on developing the technology and capability to land someone on the moon as part of a political rivalry between the US and the Russian-led Union of Soviet Socialist Republics.

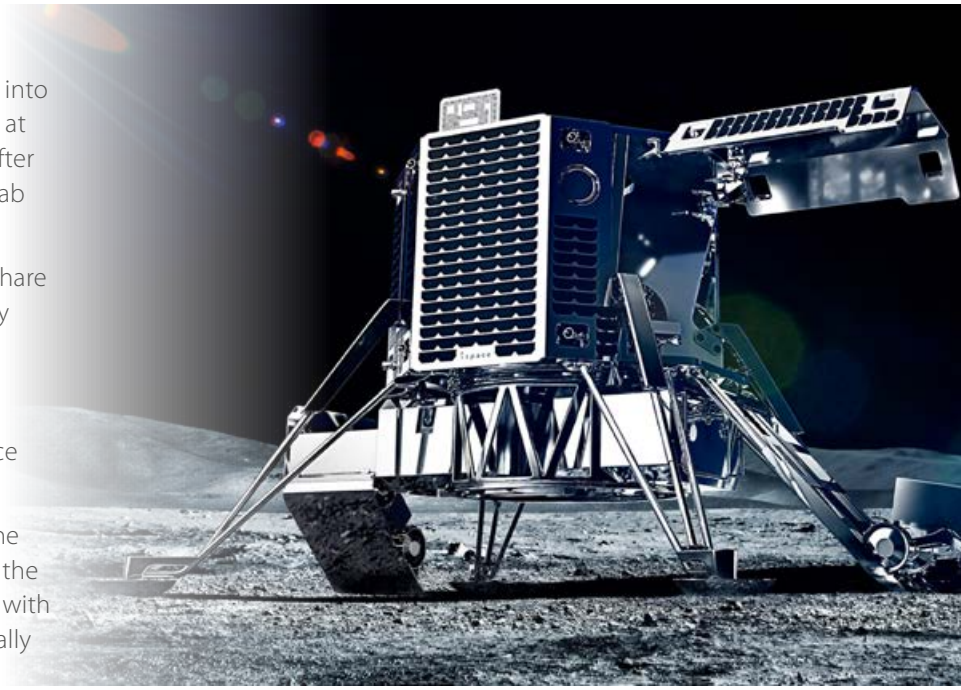
Fifty years on and it can seem the rivalry is more Elon Musk versus Jeff Bezos, which perhaps reflects more on the changing balance of inequality in the near-50 years since the first lunar landings – they have the money to be as impactful as governments. But it also reflects on the technological impact that allows individuals to be effectively on a par with the military-industrial complexes of previous generations.

And no individual is an island developing his or her idea in a vacuum. Last month, Japan-based iSpace raised $90.2m in its series A round, the largest amount in the global commercial space sector and one of the largest A rounds in the country's history. The money came from some of the country's biggest businesses, including Japan Airlines, KDDI, Konica Minolta, Suzuki Motor, Shimizu, Dentsu and TV network Tokyo Broadcasting System, government-backed Innovation Network Corporation of Japan and Development Bank of Japan, and VC firm Real Tech Fund.

iSpace is planning two missions that involve orbiting and landing on the Moon by 2020 and operates in Japan, Luxembourg and the US. It was the sole Japanese team participating in the Google Lunar XPrize.

This project came out of research by Kazuya Yoshida, professor of aerospace engineering at Tohoku University, who is still chief technology officer and director at iSpace.

This type of deal is perhaps the future of CVC.



A VIEW FROM THE TOP

The corporate investing landscape is rapidly evolving. Companies have gone beyond sourcing innovation from suppliers or customers, or simply investing in startups. The range of options has expanded to include a multitude of approaches,from venture investing to incubators, accelerators, and various open innovation models. Importantly, however, the approach to external innovation must be driven by the strategy, and supported from top management and even the board. Hear the perspective and insights on this from a board member of multiple companies, and hear how those companies are using corporate venturing to fast-track innovation.

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THE WORLD OF CORPORATE VENTURING SURVEY 2018

In our annual survey of corporate venturing industry leaders, we asked what were the most important trends in 2017 and sought their insights into the big opportunities of 2018.

THE MOST IMPORTANT TRENDS OF 2017

Sue Siegel, chief innovation officer, GE, and co-chairman of the GCVI Summit

The rise of diversity as an asset class.

The edge will eat the cloud: The rise of edge computing – pushing applications, data, and services away from centralised nodes to the logical extremes of a network to the source of the data, and the need for corporates to develop an edge computing strategy is really good news for the edge computing economy.

Deep learning will eat software, aka software 2.0: Deep learning – that special flavour of machine learning – is changing the way software is developed and the way it responds. Software is turning into dataware, where the functionality and responses are determined and learned via lots of data representing previous examples of inputs and outputs. Almost any data processing system with non-trivial logic can be improved significantly by applying modern machine learning.

Decentralised artificial intelligence (AI) may eat both edge and software 2.0: Centralised AI solutions provided as application programming interfaces and cloud-based services are common, but they have certain bottlenecks. Since users access AI features via the network and because machine learning algorithms involve heavy computations, high latency is often an issue. Also, if you train AI models in a centralised way, it may take more time to improve them. In contrast, decentralised AI can function locally on edge computing devices, have direct, fast access to more raw data and have no dependence on a network connection, which means less power consumption and minimal latency. Recent advances in decentralised AI have been made thanks to on-device optimisation and production of custom chips for AI and machine learning.

Machine learning and AI – moving beyond collection of data to insights.

Collaborative and sharing economy penetrates industrial, for example Xometry, Sonnen, RigUp.

Tech moving from consumer, financial to broader economy, for example blockchain moving beyond cryptocurrency, and autonomy, AI and machine learning from advertising and media to the physical world, particularly in automotive but broadly across industrial.

> Almost any data processing system with non-trivial logic can be improved significantly by applying modern machine learning

Massive convergence where vertical lines use to be much brighter – convergence of all parts of healthcare with each other, of tech and health, of fintech and other industries.

Voice integration for consumer and business apps.

Record stock markets, few real exits. Post-IPO stock performance seems to have been modest, which is a reflection of companies going public when growth is slowing.

SaeMin Ahn, managing partner, Rakuten Ventures

In Southeast Asia, corporate strategic interest driving most if not all of venture capital asset growth and proliferation.

India has seen its first iteration of large-scale startup wind-ups and mergers, and with this secondary liquidation mid-stream has become a valid and trusted exit path for larger investors.

Further intensifying of mobile and online ad dollars concentrating into Google and Facebook, amplified further by Twitter's inability to upgrade its adtech infrastructure to support performance marketing and next-gen programmatic, and Snap's inability to understand that in 2017 the expectation of a closed ecosystem for metrics, viewability and return on ad spend is draconian and unforgiving.

The adtech ecosystem has started to take itself apart to realign with business models previously built overtly on opaque metrics.

Public markets are even more contextual and up to the times as they punish commerce platforms that have pushed the tech company premium for some time for better market cap multiples.

Seeing the beginnings of the next BAT (Baidu, Alibaba, Tencent) arise from the soils from Meituan, Toutiao as the old guards start to dig deeper into the ecosystem with very smart and committed value transfer strategies.

Public markets have done more damage from fear than Amazon could have ever done in the US.

Biplab Adhya and Venu Pemmaraju, co-heads, Wipro Ventures

Accelerated movement of enterprise workload to hybrid cloud, deep learning being used to create sophisticated user experience across verticals, blockchain-driven applications and initial coin offerings.

Grant Allen, head of ABB Technology Ventures

The explosion in interest in cryptocurrency and its increasing mainstream acceptance. This has the effect of implicitly legitimising Bitcoin in the public sphere as a longer-term value store and even a gold alternative, which in turn solidifies blockchain as a very real foundation on which to build many applications over the coming years.

Riyadh AlRuwais, partner, STC Ventures

Fintech.

Amartino

Mariano Amartino, Latin American startups director, Microsoft

Crispr and blockchain.

Ron Arnold, managing general partner, IAG Firemark Ventures

The rapid rise of VC and CVC out of Asia and particularly China. This has the potential to be game changing, with large volumes of additional money coming into the space – and specifically into Asian markets. Couple that with the growing penetration in smart mobiles and I anticipate some exciting and game-changing ventures out of these markets in the coming years.


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Tony Askew, founder partner, REV Venture Partners, and co-chairman, GCV Symposium 2018

Machine learning and AI appeared on every investment pitch – if they had it they were looking to leverage it, if they did not it was becoming part of their plans. We are still at the early stages of really defining scalable, useful AI and machine learning became mainstream.

Cybersecurity has become a design principle and a must-have for every corporation, particularly around early threat detection and intervention.

Augmented interfaces began to show their early promise and will be the natural next extension point of the Human-machine interface, pushing the boundaries of what humans are capable of on their own, and potentially heralding an age of ubiquitous expertise.

Always-on sensors and networks, combined with advanced analytics, continued to challenge the data game. Data companies are now leveraging massive volumes of real-time data to drive unique insights and decision points as they happen, eclipsing legacy and often human intensive data gathering, curation and analysis.

The data giants – Amazon, Facebook, Google, Apple – extended their grip on permissioned first-party data, raising the bar but lighting the way across industries.

Amit Aysola, managing director, Wanxiang Healthcare Investments

Machine learning.

Aysola

John Banta, managing director, Blue Cross Blue Shield Venture Partners

US federal health policy instability.

Banta

Miroslav Boublik, group head of special projects, Home Credit Venture Capital

Continuing rise of AI.

Louis-Philippe Boucher, venture analyst, Randstad Innovation Fund

AI, specifically chatbots.

Wendell Brooks, president, Intel Capital

We put more than $550m to work in 2017, saw 10 portfolio companies go public around the world and continued to develop new value-added programs for our startups. I also am very proud that 20% of our investments in 2017 were in companies led by diverse teams – 10% of our entire portfolio now is led by women, African Americans, Latinos, entrepreneurs and others from underrepresented groups.

Scott Brun, vice-president of scientific affairs and head, AbbVie Ventures

In biopharma venture investing, early-stage and series A deals and company creation are taking on greater overall prominence. Corporate venture groups are heavily engaged in these early-stage deals with CVCs involved in 31% of series A in the first half. Rounds are getting larger to reduce fundraising pressure and allow companies to reach meaningful and robust milestones and inflection points.

Novel therapeutic modalities such as cellular therapeutics and gene therapies received significant validation with regulatory approvals and positive late-stage results.

Laurel Buckner, senior vice-president and managing director, ATN Ventures

Buckner

The biggest trend was investments in artificial intelligence, not only by amount of investment but how folks are understanding the power of AI beyond that of big data a few years ago.

Roel Bulthuis, managing director, Merck Ventures

Convergence of life sciences, tech and digital.

Tony Cannestra, head of Denso Corporate Ventures

AI and automotive.


Cannestra

Leo Castellanos, investment director, Saatchinvest

Wider use of AI, including bots. This plays on both sides of the spectrum. On the negative side, the role of social media to undermine democracy and western society.

Oscar Chamberlain, general manager, Petrobras/Cenpes

Bitcoins and AI.

Tony Chao, head of Applied Ventures

AI and deep learning.


Chao

Piyush Chaplot, partner, Innosight Ventures

AI and machine learning.

Scarlett Chen, director of strategic investments, Prudential

Big data, AI and blockchain-related solutions


Danusaputro

Eddi Danusaputro, CEO, Mandiri Capital Indonesia

Fintech in developing countries.

Kai Engelhardt, head of corporate strategy, Mahle International

Within companies, smart industries, for example connected supply chains, efficient digitised processes. Electrification – efficient powertrains and CO2 reduction. Digitisation of cars – driving assistants for security and comfort reasons, autonomous driving.


Engelhardt

Jay Eum, co-founder and managing director, TransLink Capital

Emergence of blockchain technology, cryptocurrencies, and initial coin offerings (ICOs) as an alternative to traditional fundraising.

Aurora Fagerhus, executive assistant, Marsec

The internet of things, smart home tech and improved healthcare.


Eum

Ernest Fung, senior director, head of international corporate development, JD

Increasing adoption of deep tech – datamining, AI, augmented reality, autonomous vehicles – across different business functions, such as customer relationship management, marketing, user interface and experience.

Focus on customer intelligence technologies.

Uncertainty in global markets – the EU, Brexit, US politics.

Increased global consolidation in e-commerce and retail, with focus on omni-channel expansion, for example Amazon, Whole Foods, unmanned stores.

William Germain, director of M&A and strategic development, Inmarsat, and venture capital adviser, Techstars

Everything as a digital service, such as application platforms; machine intelligence, automation, AI; trust economy. for example blockchain.


Gilmour

David Gilmour, head of BP Ventures

AI and blockchain.

Larry Harper, vice-president, Stanley Ventures, Stanley Black & Decker

The most important trend for us are investments around AI and machine learning. It is moving fast into all our businesses. We are also having a lot of discussions on how we get exponential growth from our investment portfolio.

George Hoyem, managing partner, In-Q-Tel

In-Q-Tel observed two large megatrends deepen.

Computing at the edge: The continuing evolution and accelerated funding in the general area we call computing at the edge, which is best exemplified by edge compute devices and solutions that leverage AI and training models in the cloud, and push identifying features to the edge device. These products will show up in areas called hearables and seeables which will, for example, provide highly accurate voice command identification in low-powered devices with feature markers trained in cloud-based neural networks. These signatures or features will be pushed to smart edge devices which may be based on specialised processors. Another example may be the same construct acting on edge video or camera recording devices – seeables – that have impeded feature selectors to identify items or objects at the edge in video or images trained from cloud-based neural networks.

Synthetic biology: Synthetic biology-based companies are taking advantage of the convergence of several megatrends including high-speed gene sequencing that can do in hours what used to take years and the gene editing breakthroughs with Crispr. Synthetic biology companies are simply the practice of engineering gene sequences to create new biological systems and devices. In a commercial application, it often involves altering biological products for the purpose of health or materials replication at lower costs. Examples include biofuels, lab-grown meat, produce preservation, and perfume or mint oils made without plants. This is a big wave which may have a 10-year run of new companies and products.

Bevin Jacob, partner and co-founder, Automobility

Facial recognition.

Benjamin Joffe, partner, Hax

Our focus is hardware investment. Despite media stories about the failure of companies like Jawbone and Juicero, the investment amount and number of rounds in the sector has gone up. What we saw is also a growing interest from corporates – including non-tech multinational companies – in connected devices, service robots and healthtech devices. The hype around virtual and augmented reality and wearables has calmed down, and it is all about solving real problems with real value now. AI has also spread to more and more devices, from robots to healthtech and consumer things. Voice agents was also a new trend, but the killer app is still playing music and asking for the weather or the time. Not quite the revolution yet.

Alexander Kalinnikov, investment manager, VTB Capital Investment Management

Increase of blockchain applications, and AI and machine learning.


Kapeskas

Rimas Kapeskas, managing director, UPS Strategic Enterprise Fund

AI, machine learning and cognitive computing.

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Brendon Kim, managing director, Samsung Next Ventures

Proliferation of AI.

Imran Kizilbash, vice-president and head of Schlumberger Venture Fund

Continued developments and evolution of products in the mobility and transport sector.


Kizilbash

Shashi Kumar, director, SK Telecom

Blockchain and AI

Nityen Ranjan Lal, managing director, Icos Capital Management

Trump election and US climate policy changes, solar hitting price parity with coal, and recovery of economy and back to business.

Jacqueline LeSage Krause, managing director, Munich Re/HSB Ventures, and co-chairman, GCV Symposium 2018

The internet of things, AI, and transportation.

Jon Lauckner, president, GM Ventures

Autonomous technology, augmented reality, 3D printing, AI and fintech.


Lauckner

Crispin Leick, managing director, EnBW New Ventures

Blockchain goes nuts.

Fernand Lendoye, managing director, Aviva Ventures

AI, machine learning, blockchain, cryptocurrencies, ICOs.


Leick

Victoria Lietha, market development partner, ABB Technology Ventures

Applied AI, advanced machine learning.

Wayne MacGregor, strategic business development, Naspers

Blockchain.


MacGregor

Ashish Mahashabde, principal, IBM Ventures

Face recognition tech becoming mainstream.

Brad McManus, managing director, Motorola Solutions Venture Capital

AI as applied to our specific vertical. Cybersecurity, especially securing mobile access to proprietary cloud-based platforms.

Dominique Mégret, head of Swisscom Ventures

The rapid development of AI technologies in all types of vertical, the emergence of gigantic Asian VC funds backed by corporates.

Tom Montgomery, senior vice-president, De Beers Ventures

Blockchain and AI.

Keith Muhart, senior director, Qualcomm Ventures

AI was by far the most important tech trend in 2017.


Muhart

Koji Murota, head of KU-iCap

Gene editing and AI.

Girish Nadkarni, president, Total Energy Ventures

AI, machine learning and blockchain.


Nadkarni

Janis Naeve, managing director, Amgen Ventures

Focus on next-generation technologies to improve immuno-oncology and cell-based therapies.

Jay Onda, startup investments, Orange Silicon Valley

AI, 5G and the internet of things, fintech and blockchain.


Naeve

Tony Palcheck, managing director, Zebra Ventures

AI, analytics and automation.

Amish Parashar, partner and director of strategic business development, Yamaha Motor Ventures

Convergence of advances in robotics hardware systems with advancing vision systems, more robust AI, and connectivity."


Palcheck

Charles Paul, vice-president, Henkel Ventures

Wireless everything. Gene editing.

Ulrich Quay, managing partner, BMW i Ventures

Blockchain and AI.


Quay

Susana Quintana-Plaza, partner, Siemens Next47

Autonomous driving.

Mayuresh Raut, managing partner, Salamander Excubator Angel Fund

AI going mainstream, blockchain getting more entrenched, cryptocurrency making rapid strides and ICOs.


Quintana-Plaza

Erik Ross, head of Nationwide Ventures, Nationwide Insurance

Machine learning and artificial neuron networks, autonomous vehicle advances, liquid biopsies and biomarkers, quantum computing.

Marek Rubasinski, director of startup investments and partnerships, Sky Ventures

Start of the process of maturing AI and machine learning technology to specific enterprise applications.


Rubasinski

Gaurav Sachdeva, partner, JSW Ventures

We are an India-focused fund. We saw AI and machine learning adoption across the board. I would rate it the most important technology trend from an adoption point of view.

Seiji "Eric" Sato, unit general manager, Sumitomo Corporation Europe

Mobility services.


Schroeder

Reese Schroeder, managing director, Tyson Ventures

AI, cybersecurity and foodtech.

Jean-Pierre Sedaghat, managing partner, Vantage Capital Partners

Fintech and AI.


Simi

Clara Shen, catalyst director, Mars

Non-tech CVC. China.

Bonny Simi, president, JetBlue Technology Ventures

We see the emergence of AI and blockchain as an early trend that CVCs are starting to pay attention to, as these technologies will transform entire industries.


Solibieda

Markus Solibieda, managing director, BASF Venture Capital

Digitisation.

Sam Tanskul, managing director, Krungsri Finnovate

Blockchain and AI.

William Taranto, president, Merck Global Health Innovation Fund

As it relates to digital healthcare, we have seen growth and investment appetite in a number of areas. On-body sensor monitoring continues to grow and has become more relevant as the technology gets better, faster and produces more data for clinical outcomes. The other big growth area in healthcare has been the use of AI and health analytics, which is being supported by health middleware and data liberation. This will continue to dominate in 2018.

Philipp Thurn und Taxis, managing director, Constantia New Business

Blockchain, AI, automation and robotics.

Frank Tong, global head of innovation and strategic investments, HSBC

The continuing fast-paced adoption of digital technology in banking continued as a key theme in 2017. Customers expect to be able to carry out their banking when they want, in the way they want. This is seen in the tremendous global growth across technologies that includes mobile payments, biometrics – voice, digital fingerprint and facial recognition – data analytics and AI – improving risk management, financial crime resilience and marketing to customers.


Tong

Nobuyuki Toyoda, manager, office of the president, JSR

AI.

Jonathan Tudor, technology and strategy director, Centrica Innovations

AI, machine learning, blockchain.


Tudor

Masatoshi Ueno, senior manager, AGC Asahi Glass

Software powered by AI.

Thomas Van Halewyck, founding partner, Bundl

Blockchain and virtual reality.


Ueno

Rita Waite, manager, Juniper Networks Ventures

AI and machine Learning, cybersecurity, edge computing.


Waite

Paul Wallace, managing director, Heritage Group

Security, migration to the cloud, blockchain.

Robert Wetzel, vice-president of corporate development, Enterprise Holdings

Acceleration in advances in autonomous technology, AI and machine learning, and augmented and virtual reality. The pace of advances is increasing.


Wallace

Thomas Whiteaker, partner, Propel Venture Partners

AI: although not a new topic, it is well positioned to become much more mainstream based on recent technical advancements. In the world of financial services, AI is just beginning to scratch the surface in terms of possibilities. Early AI customer support solutions are already demonstrating meaningful return on investment by deflecting calls that would normally go to human agents while at the same time providing a better consumer experience.

Blockchain: This trend continues to emerge and is not going away. While we are likely to be on the cusp of a bubble in terms of Bitcoin prices, a solid foundation is being put in place for innovation over the coming decades. Feels like 1998 all over again.

Robin Wye, research commercialisation manager, BP

Rise of AI, fall of lithium ion battery costs, and the light popping sound of quantum devices in the background.

Shintaro Yamakami, CEO, Colopl Next

Launch of ARkit and ARcore by Apple and Google, the ICO boom, and the $100bn SoftBank Vision Fund


Yamakami

Jimmy Zhu, vice-president, Citi Ventures

The rise of AI and the application of machine learning."


Zhu

THE BIG OPPORTUNITIES IN 2018

Sue Siegel, chief innovation officer, GE

Megafunds through microfunds – blurring and mixing of strategic and financial funds. For example, SoftBank Vision Fund is highly strategic for SoftBank and its assets.

SoftBank is rewriting the rules of investing. Call it disruptive investing – venture, private equity, hedge – all in one fund. It has to deploy $5bn every quarter to stay on its proposed investment track. It is raising a $200bn fund right now, which would require a quarterly commitment larger than a considerable segment of the venture industry.

We are also seeing a pendulum swing back to independent venture from corporate venture capital, given the huge amounts of money pouring into groups like KKR, SoftBank and others. This may make it harder for CVC to compete though clearly CVC is here to stay. We will need to be even more assertive about how we add value.

Venture capital is becoming more of a reality for women.

Returns from the top quartile in private equity are greater than the top quartile in venture, again, due to unprecedented levels of realisation opportunities for private equity firms. As a result, larger private equity firms are reaching further down the risk spectrum for opportunity.

Bubbles may be a problem. The world is awash in cash, with pension and sovereign wealth funds taking on much greater operating roles in portfolio companies No company is off limits, such as the Chinese proposing to invest $100bn in Aramco. Chinese investors, particularly sovereign investors, want to pursue artificial intelligence (AI) and machine learning in the same swarm fashion as they did solar.

Every major and minor industry is addressing transformation, mostly still from a defensive position – for example, cost out versus yield-enhancing perspective.

Data is now readily accessible and knowledge is far more valuable.

Other trends include blockchain moving to the supply chain, and, in a continuation of 2017, overvalued companies will have to right-size, signalling a return to investment basics.

SaeMin Ahn, managing partner, Rakuten Ventures

We have another generation of richly-funded and valued AI companies readying to create value. Are we in for another flattening and acquihiring market?

How much of the barrel can you scrape until there is a critical lack of human resources for engineering and overall computer science? Where does capital go to for safe harbour?

How does increasing scrutiny on General Data Protection Regulation affect business models once thought to be durable?

Where do the 30 other unacquired non-backed autonomous driving startups place themselves in market driving – forgive the pun – towards vertical integration.

Mirroring the bike-sharing model of China without context of backers and intention will lead to a rude awakening.

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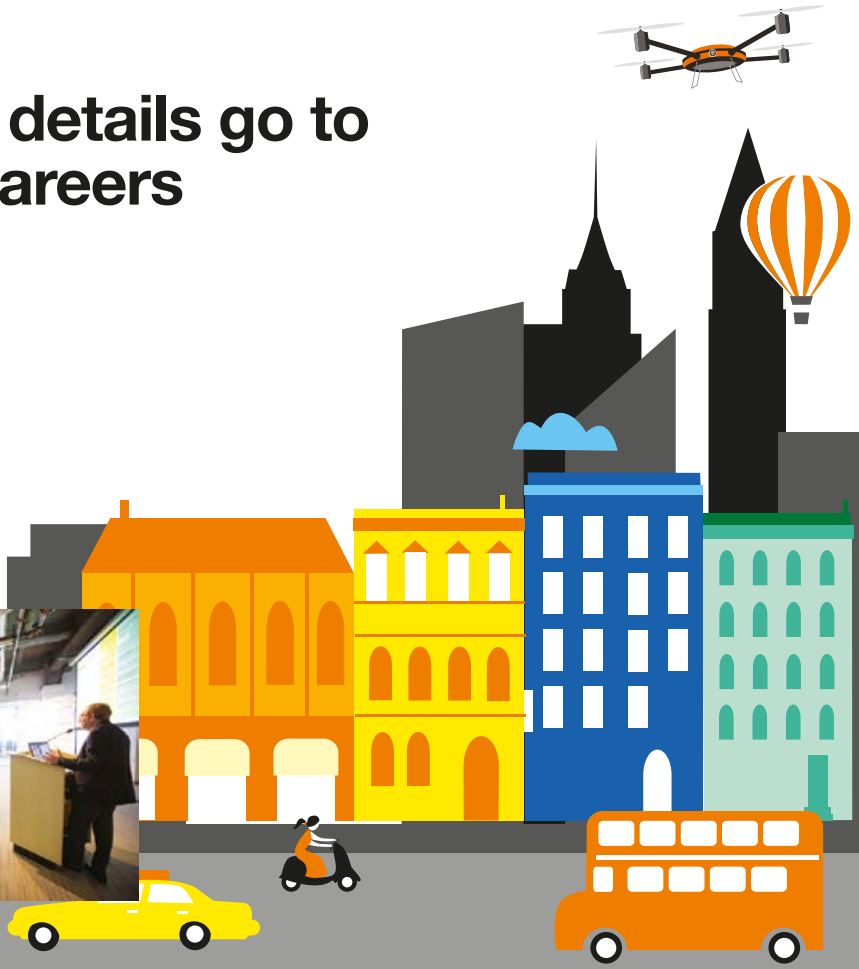

Biplab Adhya and Venu Pemmaraju, co-heads, Wipro Ventures

Serverless computing, industrial cybersecurity, augmented reality applications in enterprise use cases, AI and machine learning-driven diagnostics.

Grant Allen, head of ABB Technology Ventures

Automating automation. Over the past two years, we have seen countless startups go after automation itself, for instance software to make robots smarter or more adaptable. But we expect there will be enormous value created by stipulating to the automation hardware and robotics we have today and thinking about how to automate the installation, calibrating and fine-tuning of that machinery.

Riyadh AlRuwais, partner, STC Ventures

Cryptocurrency – initial coin offerings versus venture capital.

Amartino

Mariano Amartino, Latin American startups director, Microsoft

In Latin America – fintech and edtech.

Ron Arnold, managing general partner, IAG Firemark Ventures

Valuations and particularly early-stage valuations. Some of these just looked to be way over-cooked. At some point, this will come back to earth and this has the potential to harm the industry.

Askew

Tony Askew, founder partner, REV Venture Partners, and co-chairman, GCV Symposium 2018

The single biggest factor propelling the investment landscape is the volume of capital now being deployed – $240bn in the past three years, of which more than a third came from non-traditional VC sources – sovereign wealth, mutual and pension funds and an expansion of corporate investment activity. This has led to expanded valuation expectations, particularly at early rounds from more intensive competition for deals.

Aysola

Amit Aysola, managing director, Wanxiang Healthcare Investments

Blockchain in healthcare.

John Banta, managing director, Blue Cross Blue Shield Venture Partners

Banta

The continued quest for value-based – or at least more effective and efficient – clinical approaches.

Miroslav Boublik, group head of special projects, Home Credit Venture Capital

Alternative payment mechanisms.

Louis-Philippe Boucher, venture analyst, Randstad Innovation Fund

Data collection, storage and analytics.

Wendell Brooks, president of Intel Capital

I would like to see us work together more often with our peers in the CVC community. In the current landscape there is too much money chasing too few deals. I believe CVCs acting together provide substantial benefit to entrepreneurs and can accelerate the routes to market for startup companies. Working together, CVCs bring the resources of our collective parent corporations and deliver value beyond dollars.

Scott Brun, vice-president of scientific affairs, and head of AbbVie Ventures

Areas of portfolio focus by technical area or platform will become important. As new funds begin investing, how many more bets on immuno-oncology will VCs be willing to make? Will VCs be willing to invest in immunoscience and neurodegenerative disease even though translational uncertainty exists in these areas?

Laurel Buckner, senior vice-president and managing director, ATN Ventures

We will continue to see investment in AI grow, but now it will be in even more bespoke solutions for verticals. There will be more investment in this area. The tough decision for investors will be what exactly is the value of AI in this instance and how is this AI company or technology doing something different from others. The trick is, as always, separating the wheat from the chaff.

Roel Bulthuis, managing director, Merck Ventures

Still cancer immunotherapy, but away from cell therapy.

Bulthuis

Tony Cannestra, head of Denso Corporate Ventures

Advanced robotics, mobility, manufacturing, internet of things.

Leo Castellanos, investment director, Saatchinvest

Brexit [Britain leaving the EU].

Castellanos

Oscar Chamberlain, general manager, Petrobras/Cenpes

The internet of things and the software industry.

Tony Chao, head of Applied Ventures

Artificial intelligence and deep learning.

Chao

Piyush Chaplot, partner, Innosight Ventures

The bitcoin and initial coin offerings bubble might burst.

Scarlett Chen, director of strategic investments, Prudential

Will fintech investments eventually cool down?

Danusaputro

Eddi Danusaputro, CEO, Mandiri Capital Indonesia

Unbanked and underbanked market.

Kai Engelhardt, head of corporate strategy, Mahle International

Software topics in general – navigation material, in-car security, over-the-air, services). Digital sources – more and more applications to approach end-customers in cars. Operating systems in cars – more data and faster processing as a prerequisite for autonomous driving.

Jay Eum, co-founder and managing director, TransLink Capital

Continuation of blockchain technology, cryptocurrencies, and initial coin offerings as an alternative to traditional fundraising.

Aurora Fagerhus, executive assistant, Marsec

Internet of things, transportation technology and shipping.


Fung

Ernest Fung, senior director, head of international corporate development, JD

The Committee on Foreign Investment in the US, an interagency committee of the US government that reviews the national security implications of foreign investments in US companies or operations, and cross-border acquisition approvals. Initial coin offerings and cryptocurrency impact on capital raising and strategic investments. Rising private market valuations in emerging markets.


Gilmour

William Germain, director of mergers and acquisitions and strategic development, Inmarsat, and venture capital adviser, Techstars

Internet of things, artificial Intelligence and digital service platforms.

David Gilmour, head of BP Ventures

Connected cars, battery management.

Larry Harper, vice-president, Stanley Ventures, Stanley Black & Decker

My biggest issue is manpower – having enough people to close the deals that we have on the table. We have no issues with dealflow, quality companies or leaders, and we definitely do not have any issues internally with support for getting deals closed. My problem is strictly manpower.

George Hoyem, managing partner, In-Q-Tel

Scarcity of human resources – it will become harder and more expensive to hire and pay for human resources in tech focused markets. This will drive startups to second-tier markets.

Rising cost of building a startup – bases on full employment and real estate costs, the cost to build startups will continue to rise precipitously.

When will the music stop? VCs will continue to worry about valuations and the simple fact that we are at the top of the business cycle, which could continue for a few years or just as easily correct.


Hoyem

Bevin Jacob, partner and co-founder, Automobility

Real-time sensing and sensor fusion.


Joffe

Benjamin Joffe, partner, Hax

AI and machine learning are definitely here to stay. Healthtech is likely to see more products come to market, but in niche categories and medical applications. We are also excited about robotics.

Alexander Kalinnikov, investment manager, VTB Capital Investment Management

Machine learning for medicine, pharma and biotechnology.

Rimas Kapeskas, managing director, UPS Strategic Enterprise Fund

AI, robotics, automation, lack of team resources. Keeping leadership focused on our CVC thesis – getting pressure to seek greater financial returns, and get closer to M&A, as opposed to an extension of R&D, piloting and learning about new models and technologies.


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Brendon Kim, managing director, Samsung Next Ventures

Artificial intelligence and edge computing.

Imran Kizilbash, vice-president and head of Schlumberger Venture Fund

Automation, analytics and machine learning has been a trend for the past few years. However, the application of these technologies in the energy space is still embryonic and a great deal of potential is currently untapped.


Kizilbash

Shashi Kumar, director, SK Telecom

Artificial intelligence, machine learning and deep learning.


LeSage Krause

Nityen Ranjan Lal, managing director, Icos Capital Management

Hype is coming back it seems, thus higher valuations, more bad propositions (initial coin offerings?) getting funded.

Jacqueline LeSage Krause, managing director, Munich Re/HSB Ventures, and co-chairman, GCV Symposium 2018

AI applications, new materials, bio and robotics intersecting.

Jon Lauckner, president, GM Ventures

Autonomous technology, quantum computing and wireless communications standard 5G.

Crispin Leick, managing director, EnBW New Ventures

Augmented reality.

Fernand Lendoye, managing director, Aviva Ventures

Autonomous vehicle, smart mobility, blockchain, healthtech, insurtech.


Lietha

Victoria Lietha, ABB Technology Ventures

Augmented reality, virtual reality, drones and autonomous cars.

Wayne MacGregor, strategic business development, Naspers

Online-to-offline.


MacGregor

Ashish Mahashabde, principal, IBM Ventures

Agriculture tech, augmented reality, cybersecurity, deep learning.

Brad McManus, managing director, Motorola Solutions Venture Capital

The biggest investment issues for 2018 will be legacy issues in CVC – how to optimise inorganic innovation into proprietary platforms and then how to monetise for business outcomes. We have monetised our capital investment well, but producing strategic outcomes that can be measured in terms of incremental revenues and profits remains a challenge that we will be working to solve in the coming year.


McManus

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Dominique Mégret, head of Swisscom Ventures

How will the blockchain-related applications develop if and when the cryptocurrencies crash?

How fast will voice and gesture-based recognition become the interface of choice to command mobile and TV screens?


Muhart

Tom Montgomery, senior vice-president, De Beers Ventures

Blockchain, AI.

Keith Muhart, senior director, Qualcomm Ventures

Consumer and industrial internate of things are gaining some good momentum and this should translate into some great investment opportunities in 2018.


Murota

Koji Murota, head of KU-iCap

Artificial intelligence, the next generation's battery, antigen-specific T-cells.

Girish Nadkarni, president, Total Energy Ventures

Smart grid and machine learning.

Janis Naeve, managing director, Amgen Ventures

The crossover between tech and biotech to address real-world evidence and delivery of value-based healthcare.

Jay Onda, startup investments, Orange Silicon Valley

Artificial intelligence, initial coin offerings, services for underserved markets.

Tony Palcheck, managing director, Zebra Ventures

AI, automation, analytics and blockchain.

Amish Parashar, partner and director of strategic business development, Yamaha Motor Ventures

Specific, narrow applications of automation and autonomous systems.


Parashar

Charles Paul, vice-president, Henkel Ventures

Sensors, energy capture and storage.

Ulrich Quay, managing partner, BMW i Ventures

Artificial intelligence.


Quay

Susana Quintana-Plaza, partner, Siemens Next47

Autonomous driving.

Mayuresh Raut, managing partner, Salamander Excubator Angel Fund

AI, blockchain, cryptocurrency hedge funds.


Quintana-Plaza

Erik Ross, head of Nationwide Ventures, Nationwide Insurance

Cybersecurity, autonomous tech, machine learning and artificial intelligence.

Marek Rubasinski, former director of startup investments and partnerships, Sky Ventures

In Europe, getting in early on new businesses leveraging PSD2 (Europe's Second Payment Services Directive) personal banking regulation changes.


Rubasinski

Gaurav Sachdeva, JSW Ventures

Robotics, big data, cleantech.

Seiji "Eric" Sato, unit general manager, Sumitomo Corporation Europe

The electrification of the automotive industry.


Schroeder

Reese Schroeder, managing director, Tyson Ventures

Agri and foodtech, artificial Intelligence, autonomous vehicles, factory automation, internet of things.

Jean-Pierre Sedaghat, managing partner, Vantage Capital Partners

Artificial intelligence.


Shen

Clara Shen, catalyst director, Mars

Non-tech CVC, China, multinational corporations in China.

Bonny Simi, president, JetBlue Technology Ventures

The biggest investment opportunities in air transport and travel will be in AI and machine learning, blockchain, mobility and the industrial internet of things.

Markus Solibieda, managing director, BASF Venture Capital

Platform business models.

Sam Tanskul, managing director, Krungsri Finnovate

Artificial intelligence.

William Taranto, president, Merck Global Health Innovation Fund

In digital healthcare, it remains to be seen if the IPO and M&A market will open up. My guess is more M&A than IPO. We have seen some inflated values for healthcare IT companies which I think will fail and come down rapidly.


Thurn und Taxis

Philipp Thurn und Taxis, managing director, Constantia New Business

Dry powder if the public markets come down, consolidation in a number of areas.

Frank Tong, global head of innovation and strategic investments, HSBC

Emerging markets in Asia and China have proved to be avid adopters of new financial technologies thanks to young and increasingly affluent digital natives with more sophisticated requirements from their financial services providers. This is turning China, Southeast Asia and India into leaders in the fintech space.

Continuing to meet these growing needs involves spotting global technology trends – artificial intelligence, blockchain, distributed ledger technology, biometrics and digital identity – and identifying the innovations that will most benefit customers. We will also continue to explore the potential of blockchain and distributed ledger technology to make trade easier.


Tong

Nobuyuki Toyoda, manager, office of the president, JSR

Artificial intelligence.

Jonathan Tudor, technology and strategy director, Centrica Innovations at Centrica

Valuation hypes, CEOs who choose to have only VC or only corporate investors. Another variation of the financial versus strategic question.


Tudor

Masatoshi Ueno, senior manager, AGC Asahi Glass

Open and crowd collaboration for innovation.

Thomas Van Halewyck, founding partner, Bundl

Location-based entertainment.


Ueno

Rita Waite, manager, Juniper Networks Ventures

Artificial intelligence, machine learning and blockchain.

Paul Wallace, managing director, Heritage Group

Healthcare technology.


Waite

Robert Wetzel, vice-president of corporate development, Enterprise Holdings

How to respond to the continued acceleration of advances in autonomous technology, AI, machine learning, and augmented and virtual reality, and the implementation into products. Accelerated M&A. More and broader CVC investments. Legislative responses to autonomous technology and AI.


Wallace

Thomas Whiteaker, partner, Propel Venture Partners

Regulation of initial coin offerings. These will continue to be closely scrutinised by the regulators. Unfortunately, there will be bad players that screw it up and force regulators to get more involved. Lack of IPOs and exits – companies are staying private and not going public. Over time, this negatively impacts the venture industry. DPI (distributed to paid in, or the ratio of money distributed to limited partners by the fund, relative to contributions) matters.


Wye

Robin Wye, research commercialisation manager, BP

AI will have the hype for a while, but not all things branded AI are AI – even if they are, they are not useful. Old tech – tech for the aged. Plus a developing market in aid tech – investment in stuff for developing countries, but still with an eye to profit, not charity-driven.

Shintaro Yamakami, CEO, Colopl Next

Affluent money in the market equals increasing investment size and valuation.


Yamakami

Jimmy Zhu, vice-president, Citi Ventures

Operationalising the promises made from AI and machine learning.

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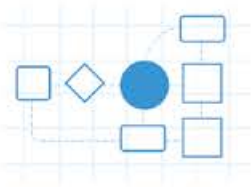

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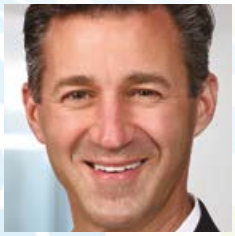


Ian Goldstein
Fenwick & West

The main theme of October's GCV Synergize conference in New York City was VC and CVC investment collaborations, with the objective of maximising return on investment and internal innovation and, of course, building great companies. At the conference, I had the opportunity to interview Duncan McCall, co-founder and CEO of PlaceIQ, a company sitting at the intersection of geolocation, insights and commerce, to get his perspective on effective investment partnerships.

It was an incredibly informative and engaging conversation that offered a glimpse at how top founders and executives look at partnering different types of investors at different stages of a company's life, the challenges of doing so, and how to optimise the relationships between investors and CEOs or founders.

The challenge of getting CEOs and investors on the same page is a common one. But that process had unique attributes in the case of PlaceIQ. Not only was it a new company, it was a new company attempting to do something that had not been done, or even thought of, before.

McCall pointed out: "PlaceIQ builds a gigantic relational database of people, place and things. We see how consumers interact with the real world because they are sharing opted-in and anonymised locations with mobile applications through their smartphones. It is giving us a persistent and sophisticated way to understand the real-world customer journey for more than 165 million consumers."

The foundation of the PlaceIQ idea is the universal use and presence of the mobile device – a foundational idea that is obvious today but was not so a decade ago when McCall and his co-founders first conceived of the PlaceIQ business. It was a concept not that easily grasped in those early days by anyone, and that included potential investors.

However, a small group of early investors understood the PlaceIQ potential and were excited by the opportunity. PlaceIQ can connect the data it collects to such items as credit cards, cookies, televisions, auto ownership and many other things. It is possible to understand where people go, what brands they like. And it is possible to look at businesses and understand why people patronise certain locations, or pass them by to go somewhere else.

Essentially, it is a gigantic queryable database of behaviours that are connected through location.

It is a service that can be monetised directly to clients, through agencies, through marketing, through advertising – through a whole series of data products. Today, these data, insights and analytics offerings are used to inform a host of business decisions for well-known brands in retail, automotive, dining, consumer packaged goods and more. To me, the biggest question was how McCall had been able to develop his very raw idea into something that investors could understand and buy into.

"We were ridiculously early – mobile had not really taken off yet," he

Partners have changed over eight years, but in general, we have been able to configure and manage that board in a way that has added value

said. "I was literally cold-emailing people, and a number of our seed investors were just cold emails."

Even though his idea was a good bit ahead of the market, Duncan said it was important for the infant company to find investors who understood the concept of big data and geo-specific location awareness. Some potential investors expressed interest, but thought a later round would work better for them.

"Our seed stage was kind of strange," McCall said. "We raised money in a very quiet time. We raised $1m. I signed every single check, and we hit our budget within about $6,000. We had no idea about monetisation. We spent probably six months building a technology that had real promise, and then we spent some time talking to customers."

Just as things were coming together, perhaps nine months into the process, someone offered to buy the fledgling company. It was a very tempting offer.

Ultimately, however, an investor showed up who was able to see and understand the vision of what PlaceIQ could be. He not only furnished capital, he also provided much-needed advice and direction. That allowed Duncan and his team to reject the purchase offer, stay the course, raise the capital they needed, and get PlaceIQ up, running and profitable.

Now that PlaceIQ has moved from an idea to a profitable company, McCall said he had learned some valuable lessons about investors – what they were looking for, what they worried about, and how to create alignment with them in a productive manner to support the long-term growth of the company.

"Not all of our investors could see the full potential of mobile," he said. "[Some of them] did not have a thesis at that point that mobile was going to be big, and it was a big learning moment for me. Here are a bunch of smart people who had seen a ton of businesses and still, still they do not really understand the pulse of where things are going."

Duncan stressed the importance of ensuring that investors, once on board, understood that it was the CEO and his or her team, and not the investors or board members, who must ultimately make the management calls and set the company's course.

"I think it has taken me quite a few years to get even moderately good at managing a board and investors properly," McCall said. "Initially we had all institutional investors, who had great general business acumen but did not understand technology products and did not really understand our market particularly well. They were good guys with perspective on a number of different industries, but I realised we had to even the board out. We brought in a couple of pretty seasoned, well-known operators who understood the product market, and at that point I started to really be able to manage the board. It took a long time to get this right. To get that balance, where they are not saying 'You should do this,' is hard."

Companies in the high-tech arena can create special challenges for, on the one hand, entrepreneurs who are trying to bring complex and sometimes abstract ideas to market and, on the other, investors who may understand capitalisation and business financing. For McCall, it was a crucible with a happy ending.

"We are lucky with the people who are on the core board," he said. "I think we all found a way to work together. We respect each other's company. We have been on this journey together, so I think by building this approach, whereby we are all in this boat together rowing, and occasionally someone gets thrown off, or throws himself off. And that is fine, but the core group members have this shared experience of PlaceIQ. They have understood it. They feel part of it. We have all matured as individuals."

"People do come and go. Partners have changed over eight years," he said, "but in general, we have been able to configure and manage that board in a way that has added value."

Ian Goldstein is a business lawyer with more than 20 years of experience advising emerging growth companies in the technology and life sciences industries as well as the venture capital firms and strategic investors that finance, partner with and acquire these companies. He also advises companies and institutions that are adapting to a technology-driven world on complex financial and strategic transactions and other initiatives designed to accelerate innovation and growth. Ian's practice is based in the growing and dynamic technology and venture market of the greater New York City region and leverages the knowledge, insights and connections of the firm's deep roots in Silicon Valley.

DRIVING DISRUPTION

Jim Adler
managing director, Toyota AI Ventures

"Upward, not northward" –
Edwin Abbott, Flatland: A Romance of Many Dimensions

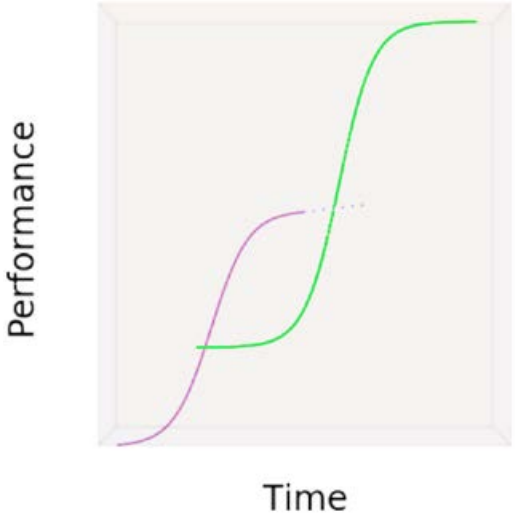
The current fitful disruptive artificial intelligence era is a case study in Clayton Christensen's business theory of innovation which is unfolding as we watch. Christensen's Innovator's Dilemma helps explain why incumbent market leaders cannot seem to jump on the new disruptive innovation, but instead continue with sustaining innovations that ultimately lose to new market insurgents.

A great example is Kodak missing the gigantic digital photography market, even though they invented the technology way back in 1975. Apple, Google and Facebook clearly won the digital photography market by making it a killer feature in their products, fuelling nearly $2 trillion in market value between them.

So what are the mechanics of all this? Stay with me, it might get a little nerdy.

Typically, a new product *(green curve in the graph below)* enters a market with poorer performance than the incumbent product *(purple curve)*. But, the insurgent gets better over time and fuels its growth by finding a new market that the incumbent is underserving, or that is enabled by some new technology.

For example, in the 1960s, the thrifty Corona and Corolla made car ownership possible for those who could not afford a car, and generated huge market growth for Toyota in the process. My first car was a slightly-used Corona, paid solely by my wages as a Miami busboy. It was silver, and it was awesome. By 1975, Toyota had surpassed Volkswagen to become the number one import brand in the US.



Once the incumbent realises the insurgent is progressing, it reacts by continuing its habit of incremental sustaining innovations *(the dotted purple line)*. This may be necessary to maintain its current market position for a while, but is insufficient to catch the insurgent. In Toyota's case, the successful Corona and Corolla insurgency laid the foundation for the company's growth to become the world's largest automaker.

The problem, which is difficult for the incumbent to see, is that the insurgent is innovating in dimensions that may be completely orthogonal – that is, unrelated – to the incumbent *(see graph below)*. These new dimensions could be new technologies, business models or regulatory regimes. Insurgents are also culturally adept at operationalising these new

dimensional advantages because they are smaller, faster and have a lot less to lose.

If the incumbents were Abbott's protagonists in Flatland, they would go inwards to catch the green S-curve in the second graph, not upwards on the same purple S-curve. They may be more comfortable on the purple S-curve, but they cannot win by staying on it.

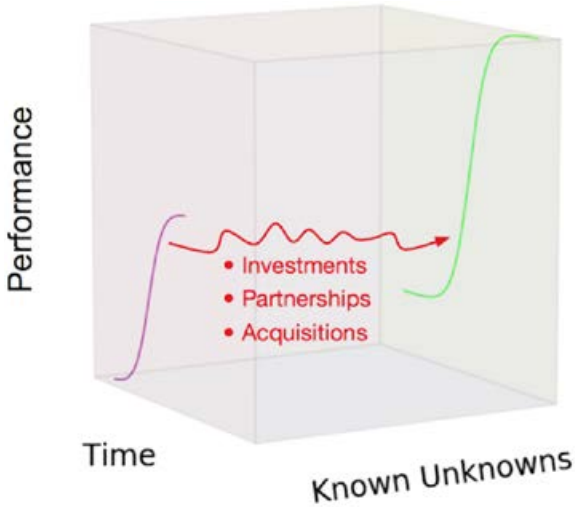
One way to make the jump to a new S-curve is by being humble enough to align with the insurgents through partnerships, investments and acquisitions. These strategies, while far from easy, are critical to making the jump. High-tech companies, like Cisco and Intel, have been running parallel experiments through their startup investments for decades, acquiring the winners and jumping to the next disruptive S-curve. Now automotive leaders, like Toyota, are recognising that they may need to do the same to compete against new high-tech insurgents.

A good example of tapping into disruptive innovation can be found in the original content-streaming market. About 10 years ago, it was becoming clear that video and music content would be delivered by streaming media, rather than static storage like DVD or MP3. Content distribution services, like Netflix, realised it would be much easier for original content producers, like HBO and Disney, to stream their own content and fatally disrupt Netflix's business. When asked what justified Netflix spending billions on original content production, they famously replied that "the goal is to become HBO faster than HBO can become us".

This disruption of original content delivery was not lost on Amazon, which realised quite early that, in order to cement its competitive position, it needed to jump on this new S-curve through more than a dozen partnerships, investments and acquisitions. Amazon's larger acquisitions included the 2014 acquisition of Twitch, a live video-streaming platform for $1.1bn, about 0.7% of its market value at the time, and the 2011 acquisition of LoveFilm, a UK film download service, for $315m, about 0.4% of its market value at the time. Clearly, Amazon needed to become Netflix and HBO faster than either could become Amazon.

Integrating acquisitions is not easy, often messy, but they can work. The biggest failure modes I have seen are misaligned incentives and incompatible cultures. Incentives are easier. Cultures are harder. Sure, the acquired team must have financial upside, but what is harder is ensuring the acquired team has the agency, shared mission and social connection to the acquirer. That is a lot of risk for the acquirer, especially at high acquisition prices.

One way to mitigate acquisition-integration risk is through startup investments that help the incumbent learn how these disruptive teams are incentivised and operate. For example, the automotive industry is not data-native like many high-technology companies, for example Google, Netflix, Facebook and Amazon. Traditionally, cars have thrown off data exhaust for, say, vehicle testing. Only recently has data fuelled the creation of automotive systems, like automated driver assistance and fully autonomous vehicles. In the graph on the right, data nativity is a "known unknown" that is critical to the automotive industry jumping to the next innovation S-curve. Startup insurgents, not automotive incumbents, are driving this data disruption.



High-technology companies have learned to disrupt themselves into the next discontinuous S-curve of innovation. The automotive industry is now learning to do the same. Toyota's president recently said: "The automotive industry is currently facing a big change, what we thought was the future may just happen tomorrow. We need to be attacking and defending at the same time."

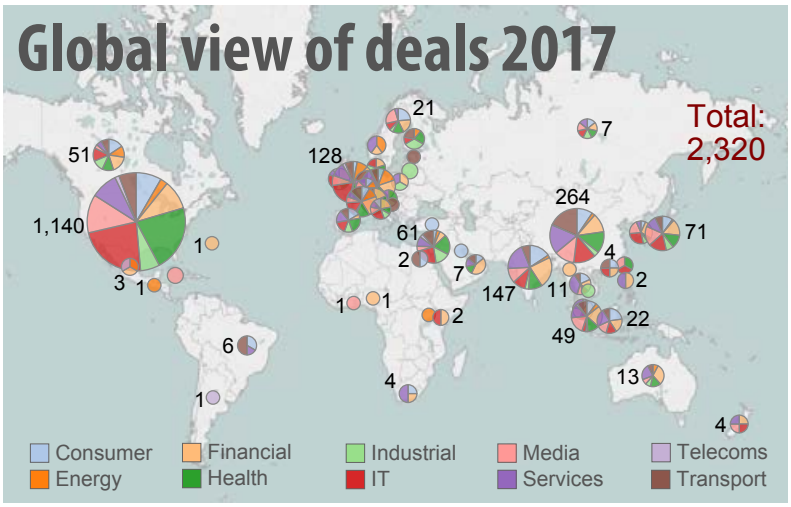
The era of disrupting while sustaining has begun. Can automotive become high tech faster than high tech can become automotive?

This is an edited version of an article first published on LinkedIn

The acquired team must have financial upside, but what is harder is ensuring the acquired team has the agency, shared mission and social connection to the acquirer

CORPORATE VENTURING GROWTH CONTINUED THROUGH 2017

Kaloyan Andonov, reporter and data analyst



In 2017, GCV Analytics tracked 2,320 deals worth an estimated $109.23bn of total capital. While the deal count registered a minor increase year-to-year (6%) compared with the 2,173 transactions of 2016, the total value of corporate-backed VC rounds reached a new all-time high, surpassing $100bn.

The number of active corporate venturers also grew. Since 2011, when our publication was launched, GCV Analytics has tracked more than 2,234 distinct corporate investors, according to our definition – any corporate investor, with or without a specialised CVC unit, which has participated in at least one venturing round over a given period of time. The number of active corporate venturers has risen considerably, particularly over the past four years, by 70% from 678 in 2014 to 1,153 last year.

According to data from our partner PitchBook, overall venture capital activity has been decreasing in terms of deal count over the past three years – dropping from 19,288 deals in 2015 to 12,929 in 2017. Deals in

Active corporate investors

the CVC realm, by comparison, appear to have remained relatively stable at above 2,000 transactions for that same period. Moreover, corporate venturing's overall share of all VC activity has increased from 11% in 2015 to 18% in 2017.

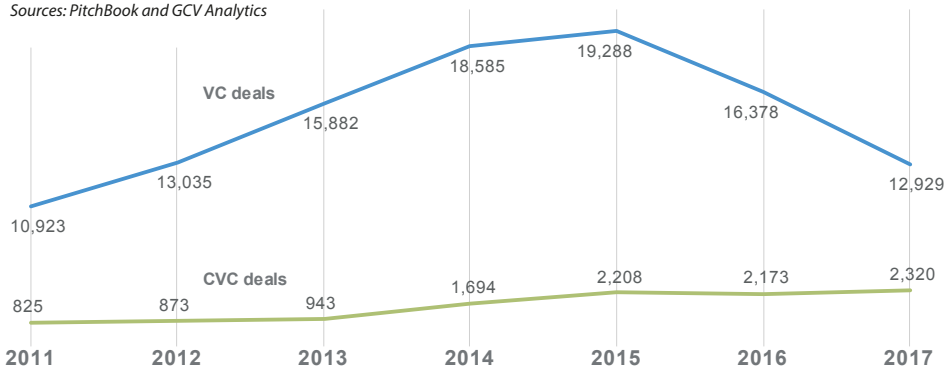
This may be attributed to the fact that corporate venturers are more strategically oriented, providing optionality for corporate parents in emerging technologies, irrespective of developments in the overall VC space. Furthermore, portfolios of corporate venturers tend to be concentrated in technologies and areas where they usually have significant expertise, which makes them more likely to pick promising investments.

Nearly half of all tracked corporate-backed transactions in 2017 took place in the US (1,140). Other notable innovation geographies on a global scale were China (264), India (147), the UK (128), Japan (71) and Israel (61). East Asia still accounts for almost half of the disclosed US dealflow but its often behemoth multibillion-dollar investment rounds actually account for good portion of the estimated total value of the entire corporate venturing world.

Emerging businesses from five sectors raised the largest number of corporate-backed rounds – health with 420 deals, IT with 411, financial services with 313, media with 266 and services with 263. These figures do not necessarily always coincide with the sectors that have drawn most attention in the media or raised most capital.

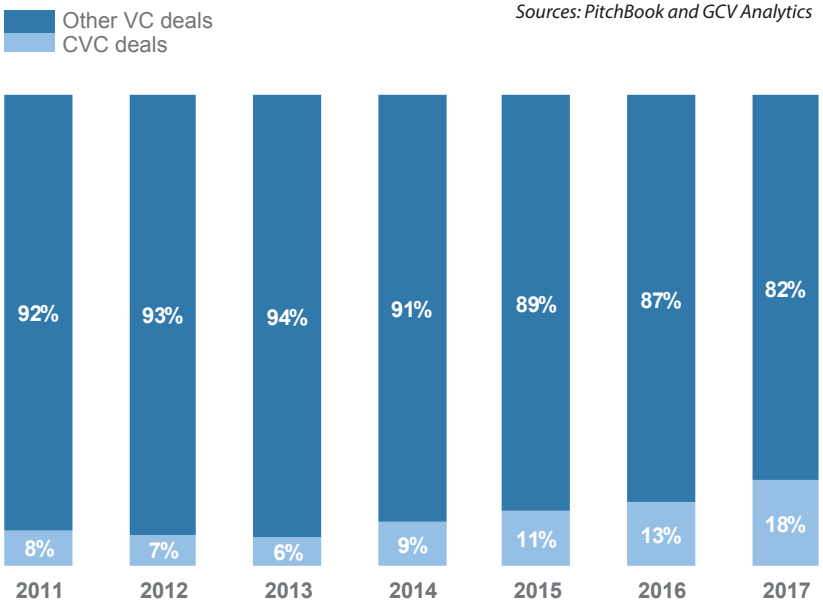
Number of CVC deals and total VC rounds 2011-17

Sources: PitchBook and GCV Analytics

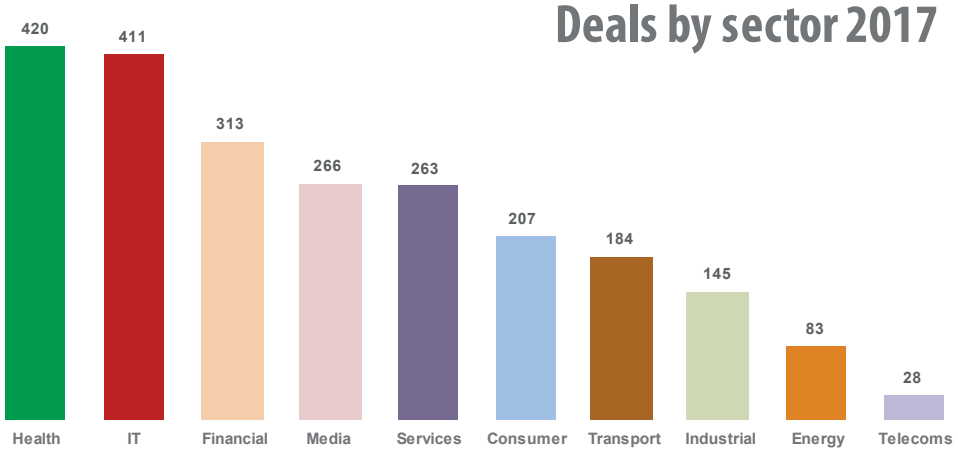


Share of CVC deals among total VC deals 2011-17

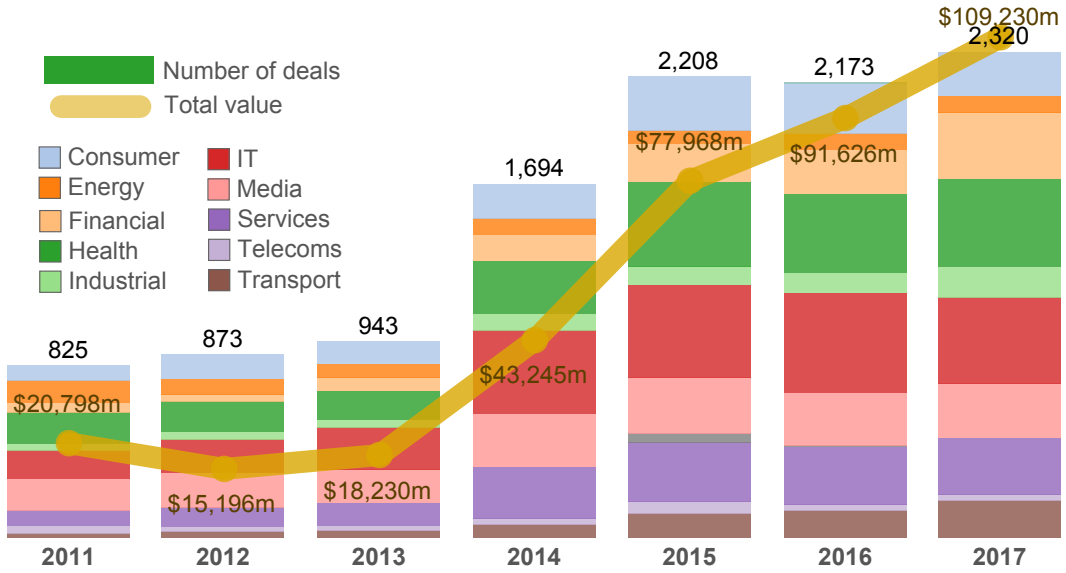
Sources: PitchBook and GCV Analytics



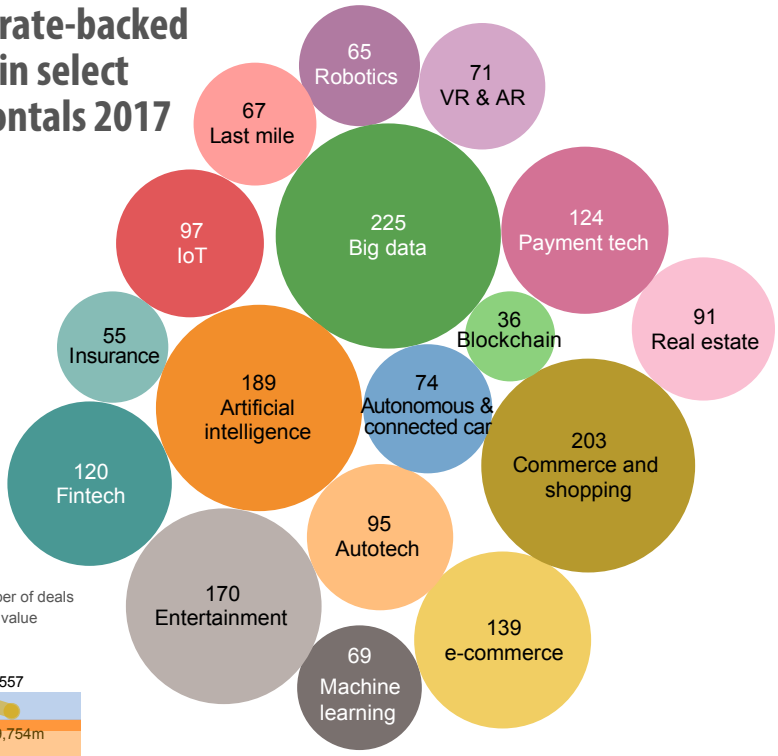
Deals by sector 2017



Deals by year 2011-17

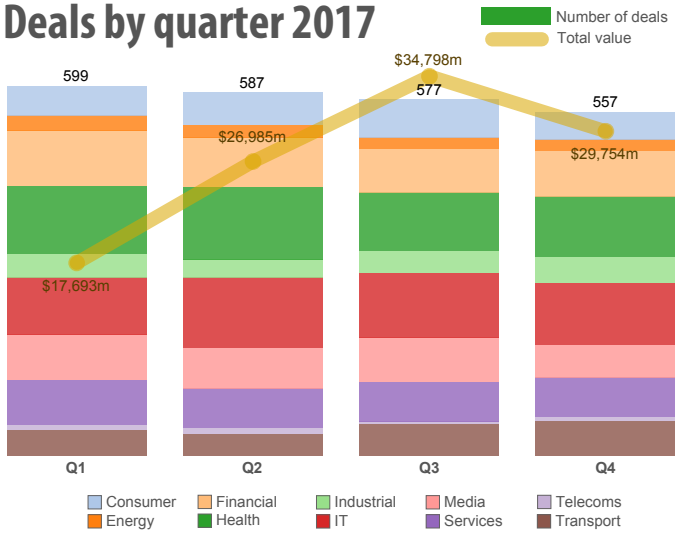


Corporate-backed deals in select horizontals 2017



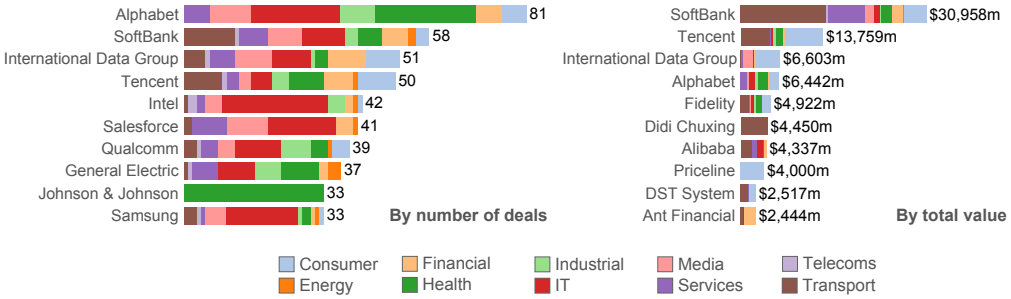
In terms of horizontals and technologies spanning sectors, artificial intelligence, big data, machine learning, autotech, e-commerce, fintech and payment tech, commerce and shopping as well as entertainment, among others, drew the most attention and interest from corporate venturers.

Deals by quarter 2017



Looking at 2017 on a quarterly basis, there was a gradual decrease in total deal count from the first quarter, when GCV Analytics tracked 599 transactions, to the fourth, when 557 transactions were recorded. In terms of total value, there was an upward trend until the third quarter, which registered the highest estimated total capital involved in corporate-backed rounds at $34.8bn. This figure, however, went down by 14% to $29.75bn in the last quarter.

Top investors 2017



US and Asia-based investors vied to be the top corporate investors in 2017 – diversified internet conglomerate Alphabet (Google) with 81 deals, telecoms company SoftBank with 58 investments, media and research firm International Data Group (IDG) with 51, internet company Tencent (50), semiconductor manufacturer Intel (42) and cloud service provide Salesforce (41), among others. The three investors involved in the largest rounds were SoftBank, Tencent and IDG.

Deals

GCV Analytics tracked many large deals through 2017. The top 10 were well above the $1bn mark. These sizeable rounds were raised mostly by emerging businesses in the ride-hailing, e-commerce and media spaces. The most often frequent corporate backer of these top rounds was SoftBank and the $97bn Softbank Vision Fund.

China-based ride-hailing service Didi Chuxing raised $5.5bn from investors including SoftBank. The round included Silver Lake Kraftwerk, part of private equity group Silver Lake, and financial services firms China Merchants Bank and Bank of Communications. Didi Chuxing runs a Chinese ride-hailing platform with 450 million registered users. In addition to taxis, it also offers car rental, carpooling, luxury and business transport, designated driver and urban bus services. The company revealed its "active internationalisation plans" and is working on intelligent driving and smart transportation projects.

Later, Didi Chuxing closed a $4bn round that featured SoftBank and Abu Dhabi's Mubadala Investment Company. The company said part of the funding would be used for international expansion starting with Taiwan, where it has licensed its brand to local operator Ledi Technology. Additional capital will go to the development of Didi Chuxing's artificial intelligence technology and the exploration of new business directions, including charging and service networks for electric vehicles.

SoftBank and its Vision Fund agreed to invest a total of $4.4bn in US-based working space operator WeWork. The two paid $3bn to acquire a mixture of primary and secondary shares, and committed to providing $1.4bn for three new regional WeWork subsidiaries in Asia. Founded in 2010, WeWork oversees a network of 160 co-working spaces, stretching across 50

Top 10 corporate venturing investments 2017

Portfolio company	Location	Sector	Round	Round size	Investors
Didi Chuxing	China	Transport	–	$5.5bn	China Merchants Bank | Silver Lake | SoftBank
WeWork	US	Services	Stake purchase	$4.4bn	SoftBank
Didi Chuxing	China	Transport	E and beyond	$4bn	Mubadala Investment Company | SoftBank
Meituan-Dianping	China	Consumer	–	$4bn	Canada Pension Plan Investment Board | China-UAE Investment Cooperation Fund | Coatue | GIC | International Data Group | Priceline | Sequoia Capital | Tencent | Tiger Global Management | TrustBridge Partners
FlipKart	India	Consumer	E and beyond	$2.5bn	SoftBank
Grab	Singapore	Transport	E and beyond	$2bn	Didi Chuxing | SoftBank
BamTech	US	Media	Stake purchase	$1.58bn	Walt Disney
iQiyi	China	Media	–	$1.53bn	Baidu | Boyu Capital | Hillhouse Capital Management | International Data Group | Run Liang Tai Fund | Sequoia Capital
Lyft	US	Transport	E and beyond	$1.5bn	AllianceBernstein | Baillie Gifford | CapitalG | Fidelity | Janus Henderson Investors | KKR | Ontario Teachers' Pension Plan Board | Rakuten
FlipKart	India	Consumer	E and beyond	$1.4bn	Alphabet | eBay | Microsoft | PayPal | Tencent

cities in 16 countries. Customers can rent desks or full offices and have access to high-speed internet, office supplies and equipment, and other perks such as free coffee. WeWork plans to move into Asia through its new subsidiaries WeWork China, WeWork Japan and WeWork Pacific.

Tencent led a $4bn round for China-based online services provider Meituan-Dianping, which reportedly valued the company at $30bn. Travel services provider Priceline Group also participated in the round, among a host of other institutional and traditional venture investors. Meituan-Dianping runs a local services and e-commerce platform that processes about 21 million orders a day, for items such as food, event tickets and flights, connecting 280 million customers annually with a network of some 5 million local businesses.

The SoftBank Vision Fund invested an amount reported to be "at least" $2.5bn in India-based e-commerce company Flipkart. Sources said the transaction involved the purchase of primary and secondary shares. Founded in 2007, Flipkart has built the largest e-commerce marketplace in India by estimated market share. It currently lists about 80 million products across more than 80 consumer categories including electronics, fashion, appliances and furniture.

Earlier, Flipkart had raised $1.4bn from Tencent, online marketplace operator eBay and software provider Microsoft at a post-money valuation of $11.6bn. The funding was announced by the company alongside news that it had acquired eBay India, the local branch of eBay, which is to continue to run as an independent Flipkart subsidiary.

Singapore-based on-demand ride service Grab secured $2bn from its China-based counterpart, Didi Chuxing and SoftBank. The funding was raised at a reported post-money valuation of $6bn. Grab runs an app-based service spanning 65 cities in seven Southeast Asian countries that enables users to order lifts through private cars, motorcycles, taxis or carpooling, equating to an average of almost 3 million rides a day. The company claims to have a 95% share of the third-party taxi-hailing market in the region and a 71% market share for private vehicle hailing.

Entertainment and media group Walt Disney agreed to invest a further $1.58bn in its portfolio company BamTech to take a majority stake in the US-based online video streaming technology provider. Disney paid $1bn for a 33% stake in BamTech in August 2016 as part of a deal that granted it an option to acquire a majority stake. This latest investment raised its share of the company to 75%. BamTech was originally created by MLB Advanced Media, the interactive media arm of sporting league Major League Baseball (MLB). It powers the online video offerings of MLB and several other major sporting organisations that together have attracted about 7.5 million paid subscribers. The deal will give Disney the means to put together its own streaming sports service, as it plans to launch an offering focused on its ESPN sports media subsidiary.

China-based video-streaming platform iQiyi raised $1.53bn from investors including internet group Baidu and IDG Capital, the local venture capital affiliate of IDG. Baidu contributed $300m to the round, which also featured venture capital firm Sequoia Capital, among others. Launched as Qiyi in 2010, iQiyi operates an online video platform that offers both a free and a premium subscription-based streaming service. It had about 480 million monthly users at the end of 2016. The financing, which was provided in the form of convertible debt, is expected to support the strengthening of iQiyi's original output.

US-based ride-hailing platform Lyft expanded a funding round led by CapitalG, the growth equity arm of Alphabet, from $500m to $1.5bn. E-commerce firm Rakuten also took part in the round, as did Fidelity Investments, among others. The round valued the company at $11.5bn post-money. Lyft's on-demand ride service is the second most popular in the US, behind Uber, and the company recently started an international expansion with selected cities in Canada.

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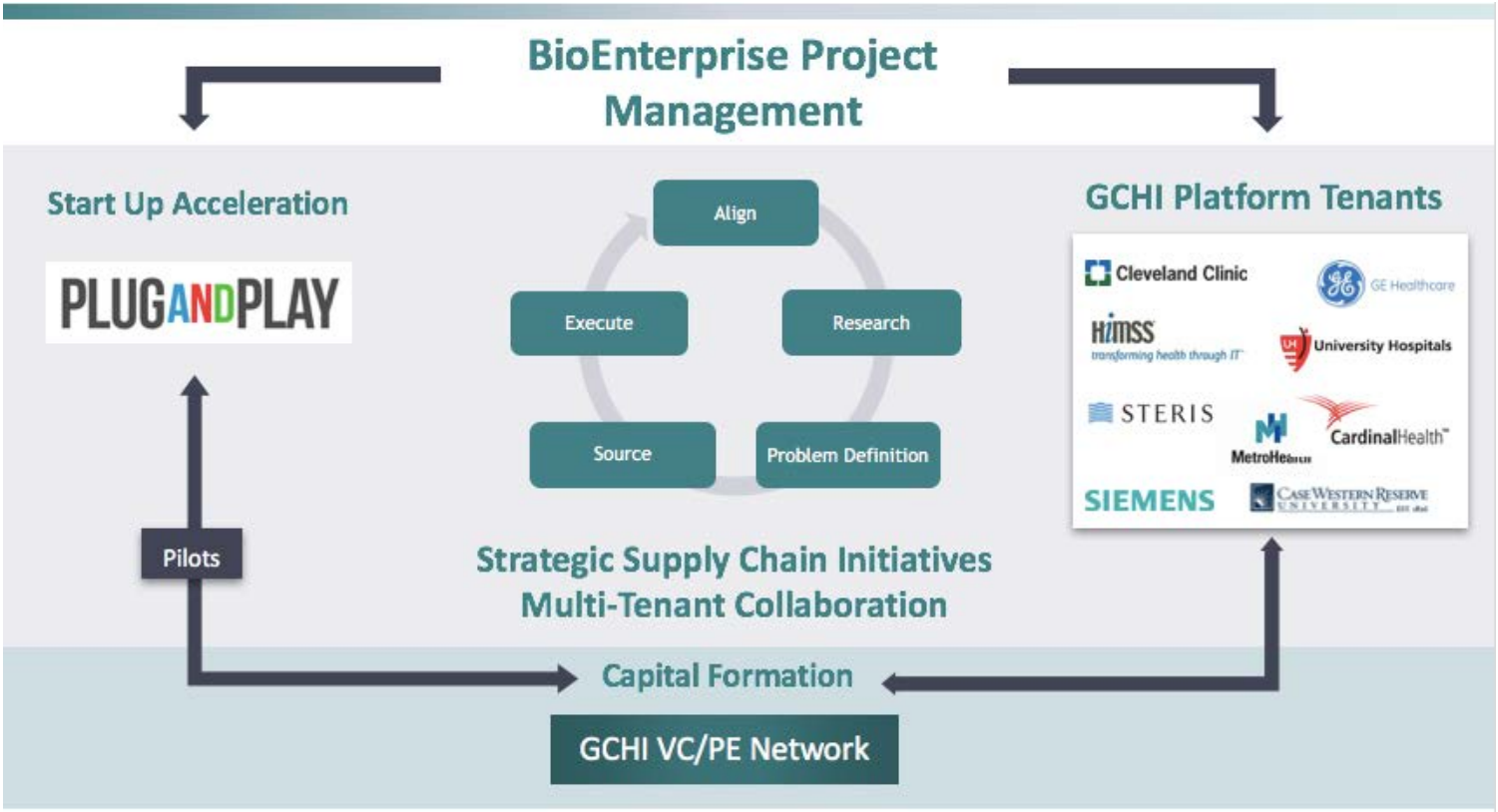
The Global Center for Health Innovation leverages a network of health care thought leaders from industry, venture capital/private equity, and start ups, to address strategic data supply chain problems too big for any one organization to solve on its own. By giving our tenants and clients access to new approaches, technologies, testbeds, and relationships, we guide them toward solutions that will drive innovation and deliver quantifiable economic value.



Convene Catalyst Resource Execute

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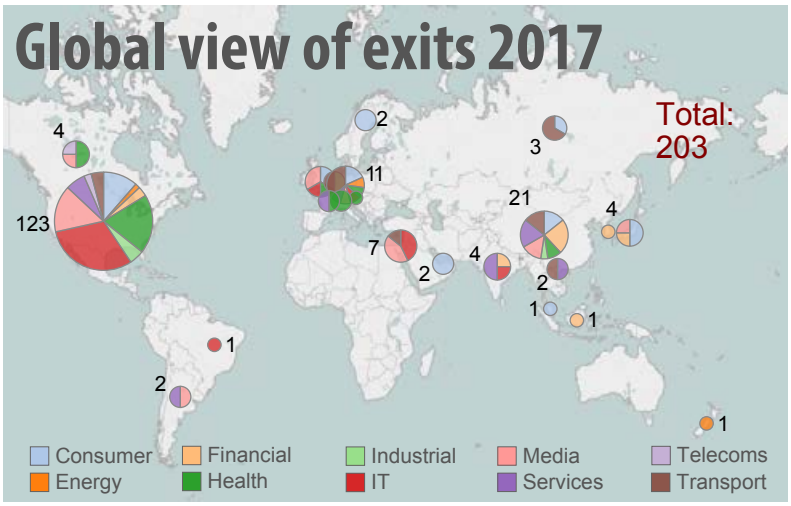
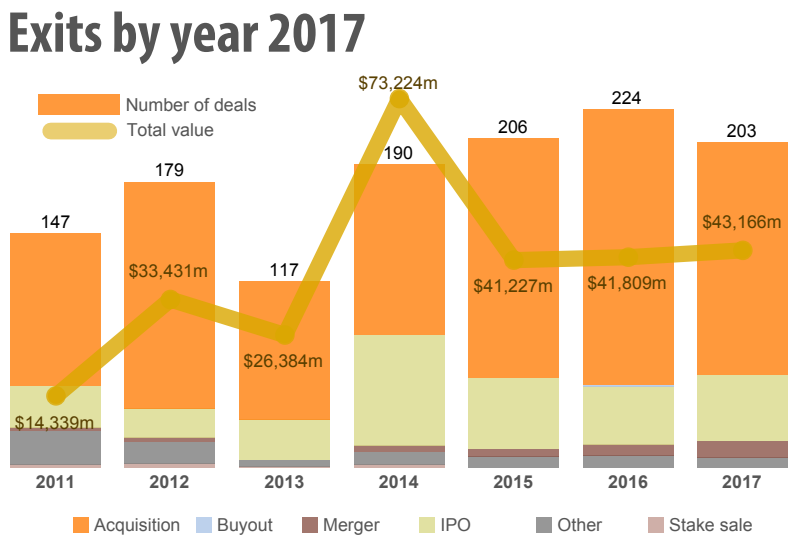
Exits

GCV Analytics tracked 203 exits involving corporate venturers. This is a 10% drop from the previous year's 224. The US hosted more than half of these transactions (123), followed by China (21). The estimated capital involved in these exits totalled $43.16bn, a modest 8% increase over the $41.81bn in 2016. Most of the top exits last year were initial public offerings (IPOs), though the overall share of IPOs remained stable compared with previous years. In 2017, we also witnessed the largest acquisition of a tech company that had previously received corporate backing.

This record-breaking transaction involved Intel acquiring Israel and US-based developer of vision driver assistance systems Mobileye for $15.3bn by purchasing 84% of the company's outstanding ordinary shares. Mobileye had previously received backing from financial firms Goldman Sachs and Morgan Stanley in the 2000s as well as car rental services Enterprise Rent-a-Car and financial firm Fidelity in 2013, before it floated on the New York Stock Exchange in 2014. Founded in 1999, Mobileye develops a collision avoidance system designed to reduce vehicle injuries and fatalities, offering computer vision and machine learning, data analysis, localisation and mapping for advanced driver assistance systems and autonomous driving.





US-based visual media platform Snap closed its IPO at $3.91bn, after its underwriters took up the option to buy an extra 30 million shares. Snap issued 145 million shares at $17 each, which were joined by 55 million shares divested by existing backers to raise an initial $3.4bn. Exiting investors included e-commerce firm Alibaba, Tencent and Yahoo. NBCUniversal subsequently revealed it had invested $500m in Snap through the offering, giving it a stake of approximately 2.1%. Snap is best known for the Snapchat platform but its IPO filing indicates its long-term plans involve expanding into an all-purpose visual media company that will also delve into hardware.

SoftBank invested $500m in China-based online insurance platform ZhongAn Online Property and Casualty Insurance as part of the latter's $1.5bn IPO. ZhongAn issued approximately 199 million new shares on the Hong Kong Stock Exchange at HK$59.70 ($7.64) each, at the top of the HK$53.70 to HK$59.70 range it had set. SoftBank acquired a stake of just under 5%. ZhongAn's online platform provides about 300 specialised insurance packages, with its most popular option being to append insurance to e-commerce purchases to cover the cost of returning the goods.

Germany-based online food ordering platform Delivery Hero went public in a €996m ($1.13bn) IPO that gave a partial exit to e-commerce holding company Rocket Internet. The IPO consisted of 18.95 million new shares, 15 million shares held by existing investors and 5.09 million shares held by the Rocket Internet-founded Global Online Takeaway Group, all at €25.50 each, at the top of the €22.00 to €25.50 range set earlier. The shares, issued in Germany and Luxembourg, equated to 18.8% of Delivery Hero's overall share capital, giving it a valuation of $5.3bn. Delivery Hero has built an online food ordering and delivery platform that serves customers in more than 40 countries across Europe, Latin America, the Middle East, North Africa and Asia-Pacific.

NeoTract, a US-based medical device manufacturer backed by pharmaceutical firm Johnson & Johnson, agreed to an acquisition by medical device maker Teleflex for a total consideration of $1.1bn. Teleflex paid $725m in cash on closing the deal. The remaining $375m are payments contingent on certain commercial milestones related to sales up to the end of 2020. Founded in 2004, NeoTract has developed a minimally invasive device, UroLift, to treat lower urinary tract symptoms caused by an enlarged prostate gland, a condition known as benign prostatic hyperplasia.

Qudian, a China-based online consumer lending service backed by financial services provider Ant Financial and game producer Kunlun Tech, raised $900m from its US flotation. The company priced 37.5 million American depositary shares at $24 each on the New York Stock Exchange, above the $19 to $22 range it had set, giving it a market value of about $7.9bn. Founded in 2014 and formerly known as Qufenqi, Qudian runs an online platform that provides credit to mostly younger customers who are underserved by traditional banks due to their lack of credit history. The company utilises big data and artificial intelligence technology to assess the creditworthiness of borrowers.

Yixin Group, a China-based e-commerce marketplace operator spun out of automotive transaction services provider BitAuto, raised HK$6.77bn in its IPO. The company issued almost 879 million shares on the Hong Kong Stock Exchange at the top of its HK$6.60 to HK$7.70 range. Its stock opened at HK$10 and briefly reached HK$10.18 before closing at HK$8.12, giving it a market cap of about $6.54bn. Yixin runs an online marketplace for vehicles, and a financial services operation that provides leasing as well as financing for car purchases.

Enterprise software provider Sage Group agreed to acquire US-based financial management software provider Intacct in an $850m deal, giving exits to payment services provider American Express and professional services firm Deloitte. Founded in 1999, Intacct has built a cloud-based platform for enterprises that incorporates cash, inventory, contract and vendor management as well as accounting, purchasing, financial consolidation, revenue recognition, subscription billing, financial reporting and project and fund accounting.

Biotechnology producer Bioverativ agreed to acquire True North Therapeutics, a US-based rare disease therapy developer backed by pharmaceutical firms GlaxoSmithKline, Biogen Idec, Baxter and Baxalta, in a deal that could reach $825m. Bioverativ paid $400m up front with the potential to pay $425m more in milestone payments to True North's shareholders

Top 10 corporate venturing exits 2017

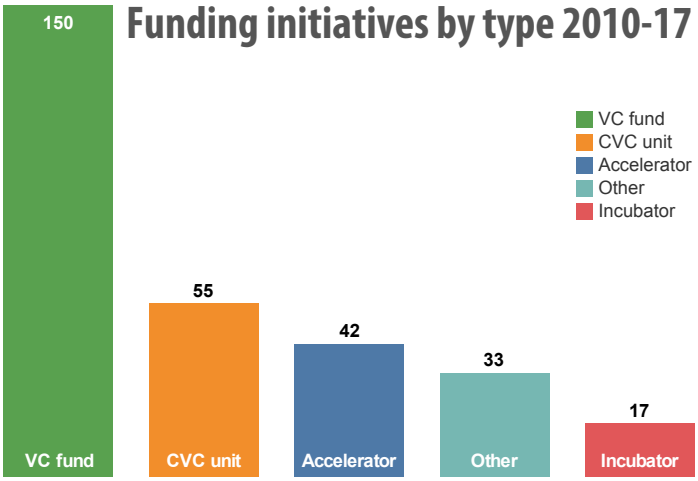
Portfolio company	Location	Sector	Exit type	Acquirer	Exit size	Investors
Mobileye	Israel	Transport	Acquisition	Intel	$15.3bn	Undisclosed strategic investors
Snapchat	US	Media	IPO	–	$3.9bn	Alibaba | Benchmark | Coatue | Fidelity | General Atlantic | General Catalyst | Geodesic Capital | GIC | GSV Capital | Institutional Venture Partners | Kleiner Perkins Caufield & Byers | Lightspeed Venture Partners | Meritech Capital | NBC Universal | Sequoia Capital | SV Angel | T Rowe Price
ZhongAn Online Property and Casualty Insurance	China	Financial Services	IPO	–	$1.5bn	Ant Financial | CDH Investments | China International Capital Corporation | Keywise Capital Management | Morgan Stanley | Ping An Insurance | SoftBank | Tencent
Delivery Hero	Germany	Consumer	IPO	Rocket Internet	$1.13bn	Global Online Takeaway Group | Naspers | Rocket Internet
NeoTract	US	Health	Acquisition	Teleflex	$1.1bn	Johnson & Johnson | New Enterprise Associates | Quilvest
Qudian	China	Financial Services	IPO	–	$900m	Ant Financial | BlueRun Ventures | Hangzhou Liaison Interactive Information Technology | Kunlun | Phoenix Fortune | Source Code Capital
Yixin Group	China	Transport	IPO	–	$867m	Baidu | Bitauto | China Orient AMC International | JD.com | private investors | Tencent
Intacct	US	Financial Services	Acquisition	Sage Group	$850m	American Express | Battery Ventures | Bessemer | Costanoa Venture Capital | Deloitte | Emergence Capital Partners | Goldman Sachs | Hummer Winblad Venture Partners | JK&B Capital | Morgan Creek Capital Management | Sigma Partners | Split Rock Partners
True North Therapeutics	US	Health	Acquisition	Bioverativ	$825m	Baxalta | Baxter International | Biogen Idec | Cowen | Franklin Templeton Investments | GSK | HBM Healthcare Investments | iPierian | Kleiner Perkins Caufield & Byers | MPM Capital | New Leaf Venture Partners | OrbiMed | Perceptive Advisors | Redmile Group | undisclosed strategic investors
Musical.ly	China	Media	Acquisition	Bytedance	$800m	Cheetah Mobile | DCM | GGV Capital | Greylock Partners | Qiming Venture Partners

depending on development, regulatory and sales achievements. True North was spun out of pharmaceutical company iPierian in 2013. Its lead drug candidate is a monoclonal antibody, TNT009, which is being developed to combat the rare condition cold agglutinin disease.

Bytedance, owner of news app Toutiao, acquired China-based social video app developer Musical.ly, giving an exit to mobile app developer Cheetah Mobile. Bytedance reportedly agreed to pay between $800m and $1bn. Musical.ly has created a short-form music-based social video app aimed at a millennial user base. It enables users to upload a 15-second clip of themselves lip-synching or engaging in some other activity accompanied by a popular song. The platform, which includes a livestreaming feature, has accumulated more than 60 million registered users, many of whom are in the US, and will continue to operate independently following the acquisition.

Funding initiatives

GCV Analytics recorded 297 new funding initiatives with corporate backing last year, including 150 venture funds, 55 new units, 42 corporate-backed accelerators, 17 incubators and 33 other initiatives. Most of these were set up in Asia (105), North America (101) and Europe (63). The countries that hosted the most were the US (92), China (45), India (20) and France (19).



The number of new initiatives were 10% fewer compared with the 332 in 2017. The total estimated size of the initiatives ($43.34bn) was significantly lower than the 2016 figure of $137.44bn but this was largely due to the outsized $97bn SoftBank Vision Fund, which was announced in 2016. If we discount the size of that fund, the 2016 figure would have been $40.44bn. However, Asia accounted for $31.55bn or about 73% of the total capital raised in new initiatives in 2017, which points to the leading role of the region now and in the future. Most of the top funding initiatives were raised in Asia, often with government participation. In September last year, Global Corporate Venturing organised its first GCV Asia Congress in Hong Kong, which received great interest from the local investment community.

The largest fundraising initiative reported in 2017 featured the government of China. Premier Li Keqiang attended the fifth meeting of the heads of government of Central and Eastern European countries in Riga, Latvia, and launched Sino-CEE

Top 10 funding initiatives 2017

	Location	Sector	Type	Funds raised	Investors
Sino-CEE Financial Holdings	China	IT, industrial, consumer	VC fund	$11bn	Fosun Group | China Life Insurance
China Internet Investment Fund	China	IT, media, consumer	VC fund	$4.5bn	China Mobile | China Unicom | China Post Insurance | Citic Guoan | Agricultural Bank of China | Cyberspace Administration of China | China Ministry of Finance | China Development Bank
Xiaomi Yangtze Industry Fund	China	IT	VC fund	$1.7bn	Xiaomi | Wuhan City Government | Hubei Government
Apollo Fund	China	Transport	VC fund	$1.5bn	Baidu
Foxconn-IDG transport fund	China	Transport	VC fund	$1.5bn	International Data Group | Hon Hai
Unnamed UCar unit	China	Transport	CVC unit	$1.47bn	Ucar
Apple advanced manufacturing fund	US	Industrial	VC fund	$1bn	Apple
Baidu Fund Partnership	China	IT, telecoms, financial services	VC fund	$1bn	Baidu | China Life Insurance
Ping An Global Voyager Fund	China	Health, financial	VC fund	$1bn	Ping An Insurance
Unnamed Xiaomi India Fund	India	Services, telecoms, IT, financial services	VC fund	$1bn	Shunwei Capital | Xiaomi

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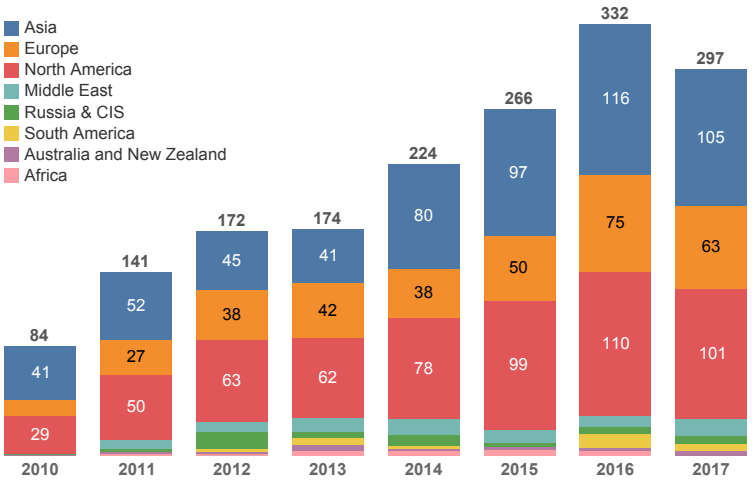
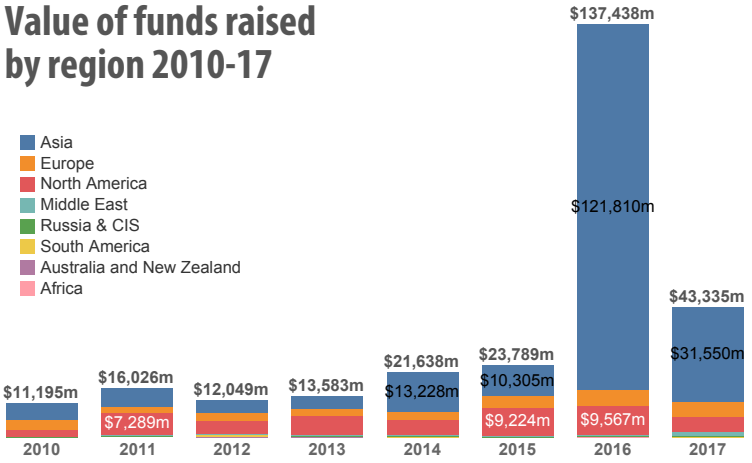
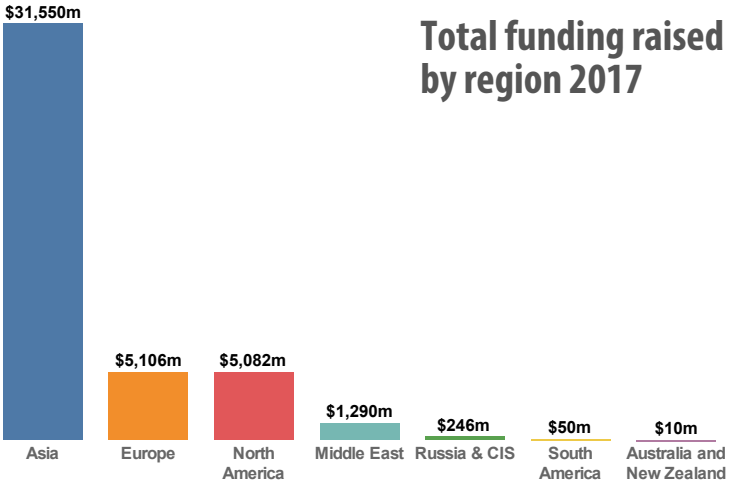
Corporate-backed funding initiatives 2010-17



Value of funds raised by region 2010-17



Total funding raised by region 2017



Financial Holdings, which was set to manage a €10bn investment fund that will focus initially on businesses in Central and Eastern Europe. The fund was also supported by two China-based corporate investors – insurance provider China Life Insurance and conglomerate Fosun. The targeted sectors include high-tech manufacturing, consumer goods and infrastructure projects. Sino-CEE Financial Holdings was actually set up earlier by state-owned financial institution Industrial and Commercial Bank of China – by some accounts the largest financial services firm in the world by total assets and market capitalisation.

The Chinese government also set up a fund backed by several state-owned firms that will invest in the country's internet sector. The targeted size of the fund was RMB100bn ($14.5bn), though by the time it was announced the fund had raised $4.35bn in capital. The China Internet Investment Fund will be overseen by state agencies the Cyberspace Administration of China and the Ministry of Finance. It forms part of the Chinese government's Internet Plus initiative, which aims to strengthen traditional industries through the introduction of internet technology. Financial services firm Industrial and Commercial Bank of China, its largest limited partner (LP), supplied $1.45bn. Other LPs include telecoms companies China Mobile and China Unicom, insurance provider China Post Insurance and Citic Guoan Group, part of investment firm Citic Group Corporation.

China-based smartphone manufacturer Xiaomi agreed to form a RMB12bn strategic investment fund in partnership with the government of the Chinese province of Hubei. Xiaomi, Hubei's guidance fund Yangzte River Industry Fund, and the government of Hubei's largest city, Wuhan, each agreed to provide 33% of the capital for Xiaomi Yangtze Industry Fund. The fund will invest in companies able to expand the Mi ecosystem Xiaomi is building around its connected devices. The ecosystem would include a wide variety of connected hardware products ranging from appliances and TVs to robots and component makers.

China-based internet company Baidu announced the RMB10bn Apollo Fund, which will focus on the autonomous driving sector. The fund was established to back 100 self-driving car projects over the next three years, seeking opportunities across the globe in the areas of software, hardware, vertical services and data providers. It drew its name from Baidu's open-source autonomous driving platform Apollo, which has attracted 70 industry partners so far, including car manufacturers like Hyundai. Baidu announced the latest iteration of the platform, Apollo 1.5, in conjunction with the Apollo Fund. Portfolio startups will gain access to the Apollo platform, which enables features such as high-definition maps, day and night obstacle detection and end-to-end deep learning.

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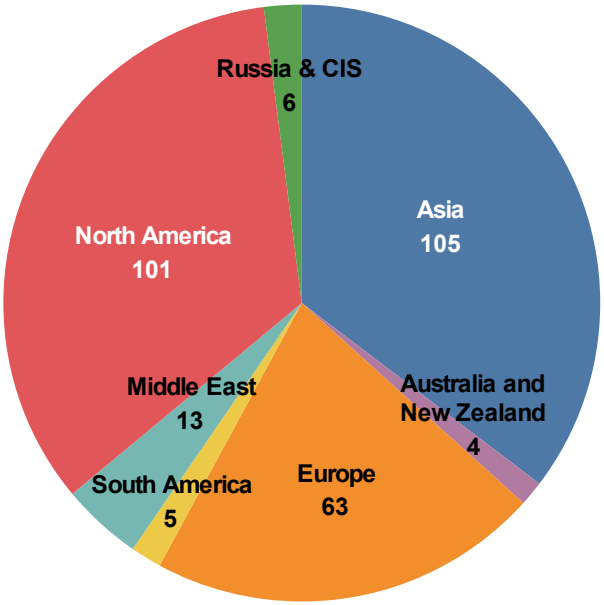
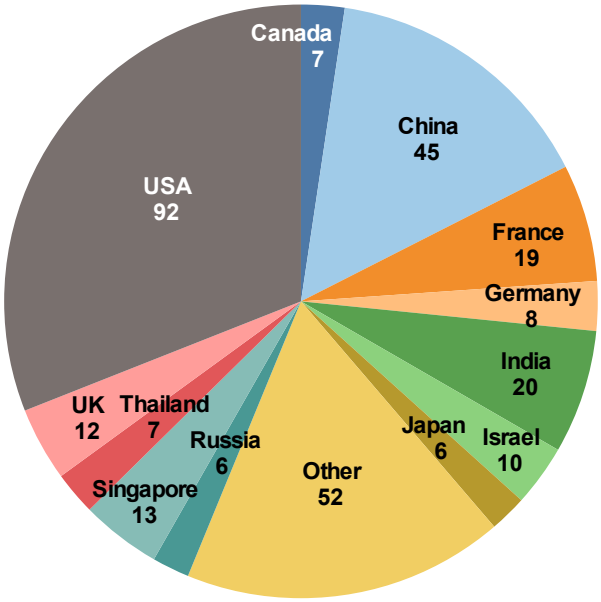
Funding intiatives by region 2017



Funding intiatives by country 2017



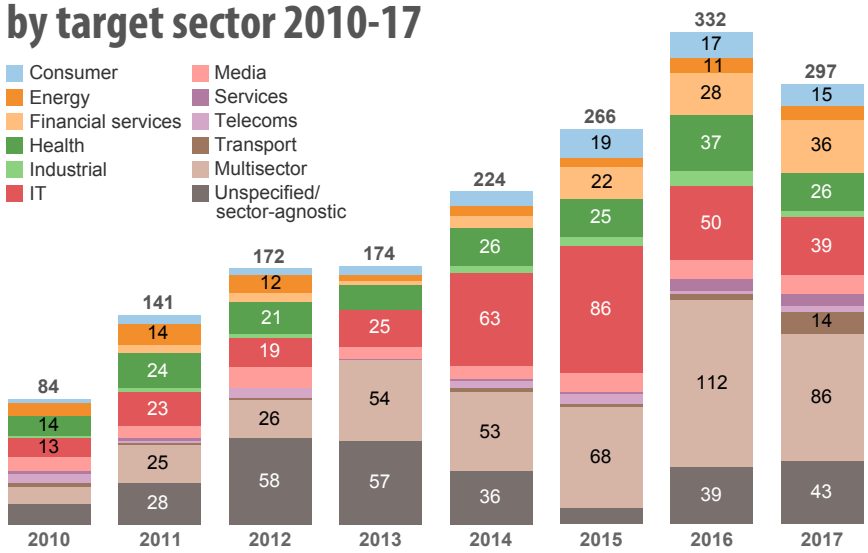
China-based manufacturing services provider Foxconn partnered venture capital group IDG Capital to form a RMB10bn investment fund focused on transport technology. Foxconn and IDG supplied 10% of the capital as well as experts to run the fund. The unnamed fund will target a range of technologies including autonomous driving software and advanced batteries, and will invest in companies based in China, Japan and the US. The fund is expected to be active for seven years, and to "encompass early and mature-stage financing, combining VC and private equity models".

On-demand chauffeured travel platform UCar formed a $1.47bn investment subsidiary. The strategic investment fund is to cover the entirety of the automotive value chain. Ucar's chairman and CEO Lu Zhengyao said: "We are already the single largest vehicle buyer in the country and we have a strong sales network and rich service offerings for people to ride in cars." The fund's first commitment as a lead investor was in China-based electric vehicle developer Xiaopeng Motors, which raised RMB2.2bn in a series B round. Founded in 2014, Xiaopeng is working on an all-electric sports utility vehicle called Xpeng that could be mass-produced relatively quickly.

US-based hardware producer Apple announced that it was setting up a $1bn investment fund that will focus on the advanced manufacturing space. Few details were disclosed about the structure, strategy or staffing of the fund. It also remained unclear how much of it would be dedicated to venture investments. The initiative followed Apple's $1bn commitment to the SoftBank Vision Fund.

China Life and Baidu announced a RMB7bn private equity fund partnership. The fund followed a government statement that state-owned companies, which include insurers like China Life, would be allowed to set up venture funds and "insurance companies will be encouraged to invest in startups". China Life will put up as much as RMB5.6bn of the capital for the fund – the Baidu Fund

Corporate-backed funding initiatives by target sector 2010-17

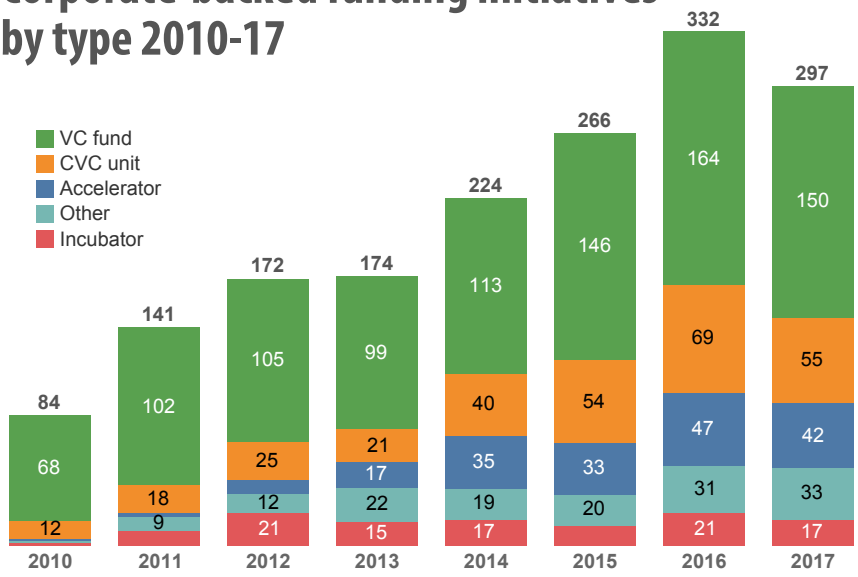


Partnership – while Baidu will provide up to RMB1.4bn. The two China-based corporates have each invested an initial 30%. The fund will target mid and late-stage investments in internet-focused companies, including mobile internet, artificial intelligence and online finance technology companies, with a "significant association" with China.

China-based insurance group Ping An launched the $1bn Ping An Global Voyager Fund to invest in financial and healthcare technology startups. The $1bn figure represents Global Voyager Fund's initial size, and Ping An, which has a customer base of more than 138 million people, said in a statement it intended to become an "internationally leading technology investment pioneer". The fund is Ping An's second dedicated corporate venturing unit, following the establishment of its Ping An Ventures subsidiary in 2012, and the company has been an active venture capital investor ever since.

Xiaomi has set up a fund to invest up to $1bn in 100 India-based startups over the next five years. Xiaomi joined forces with its venture capital affiliate Shunwei Capital as it sought to build an ecosystem of mobile apps around its smartphones. The investments will focus on manufacturing, entertainment content, fintech and hyperlocal services such as phone repairs. The corporate, which entered India in 2014, hopes the investments will help create more loyalty among Indian users driven by a desire to own the most up-to-date popular devices, regardless of brand.

Corporate-backed funding initiatives by type 2010-17

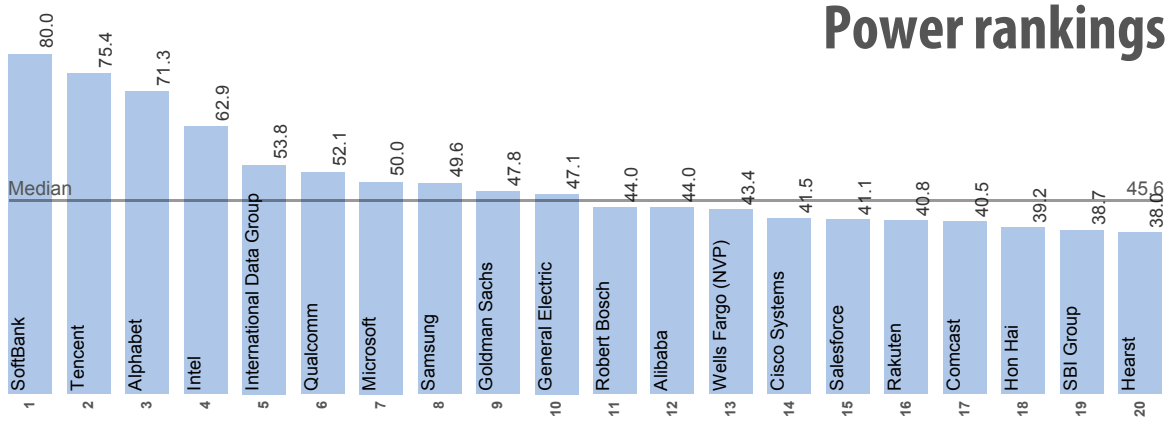


Co-investor analysis 2017

Columns include non-CVC investors

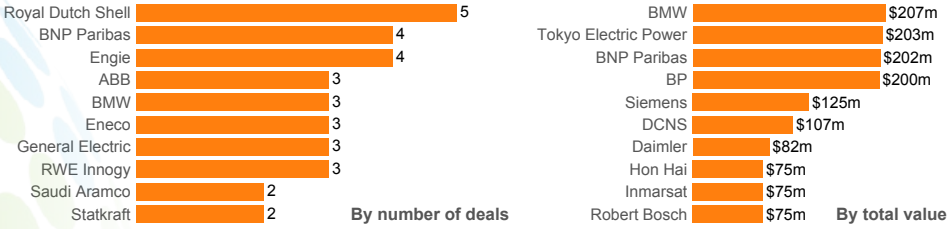
	Intel	Alphabet	International Data Group	Qualcomm	SoftBank	Tencent	General Electric	Johnson & Johnson	Angel investors	Sequoia Capital	Kleiner Perkins Caufield & Byers	New Enterprise Associates
Intel		10	3	9		1	8		17	9	17	8
Alphabet	10		5	10	8	6	10	2	52	29	63	18
International Data Group	3	5		5		6			16	18		4
Qualcomm	9	10	5		9	1	5		14	17	4	13
SoftBank		8		9		6	1		4	11		5
Tencent	1	6	6	1	6			1	5	23	1	
General Electric	8	10		5	1				4	5	10	3
Johnson & Johnson		2				1			2		7	7
Goldman Sachs	8	8	1	6	3	1	4		3	5	5	8
Fidelity	5	9	2	5	1	2	3		5	6	2	11
Salesforce	3	7					1		8	6	8	7

Power rankings

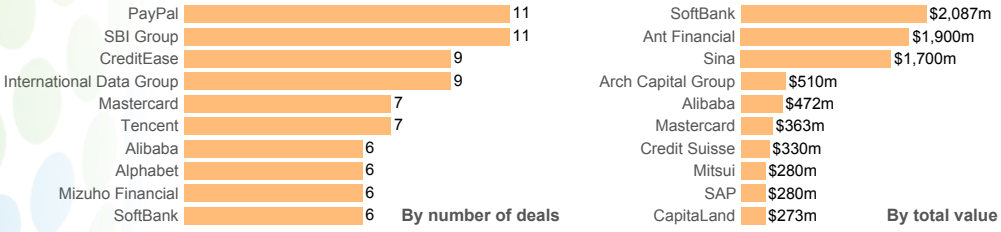


Top investors in consumer enterprises

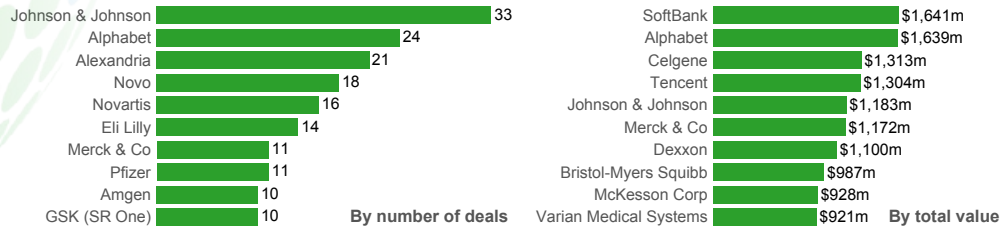
Top investors in energy enterprises



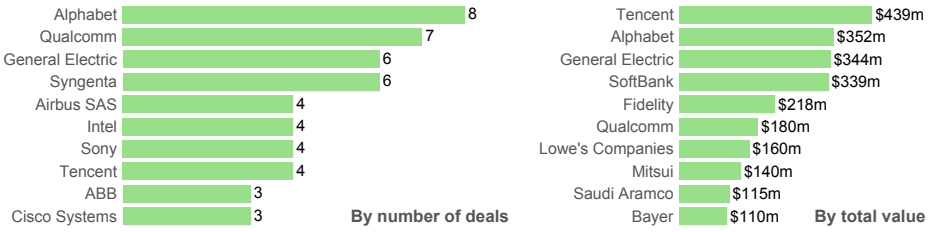
Top investors in financial services enterprises



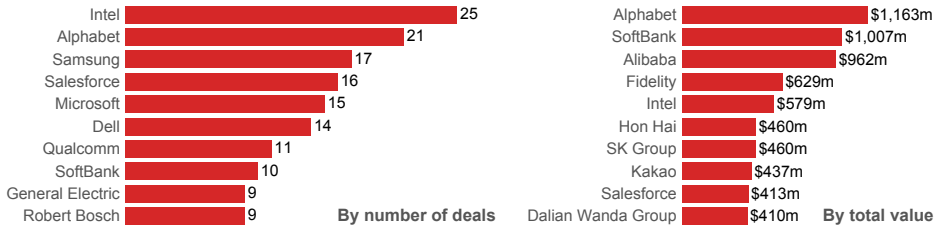
Top investors in healthcare enterprises



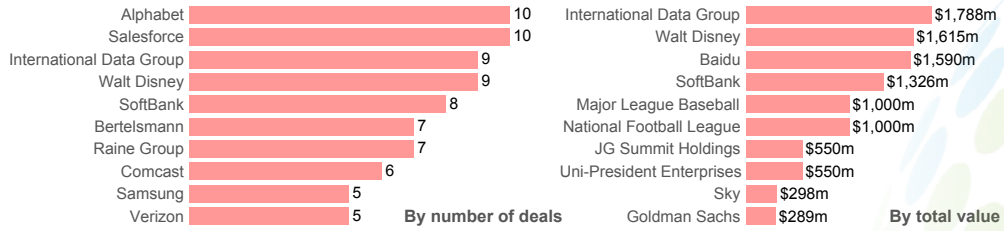
Top investors in industrial enterprises



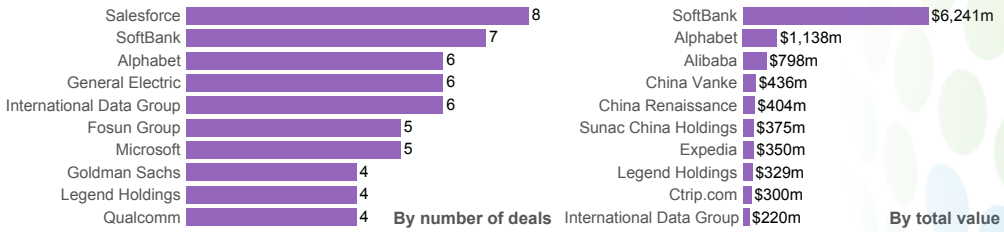
Top investors in IT enterprises



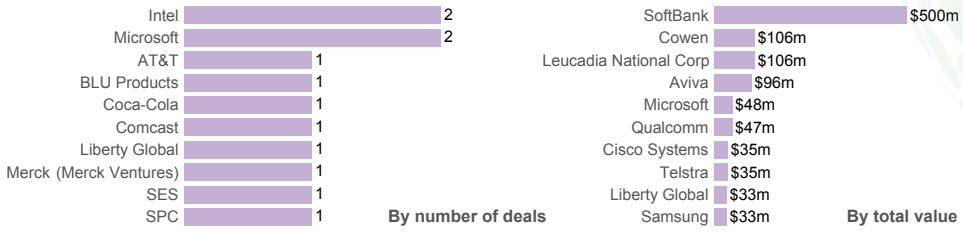
Top investors in media enterprises



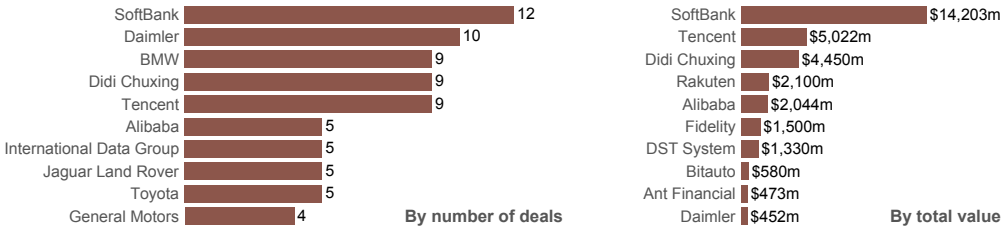
Top investors in services enterprises



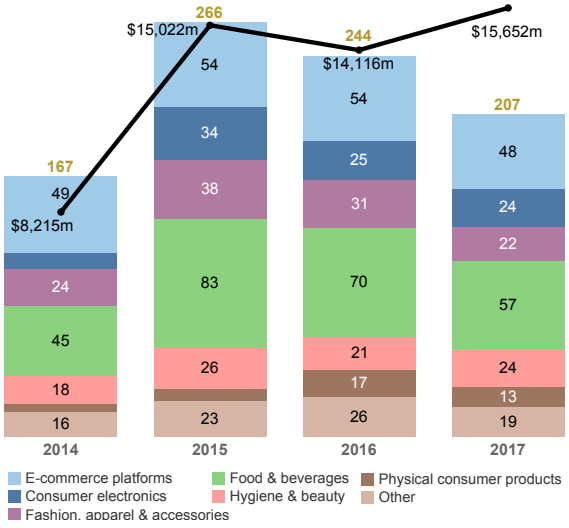
Top investors in telecoms enterprises



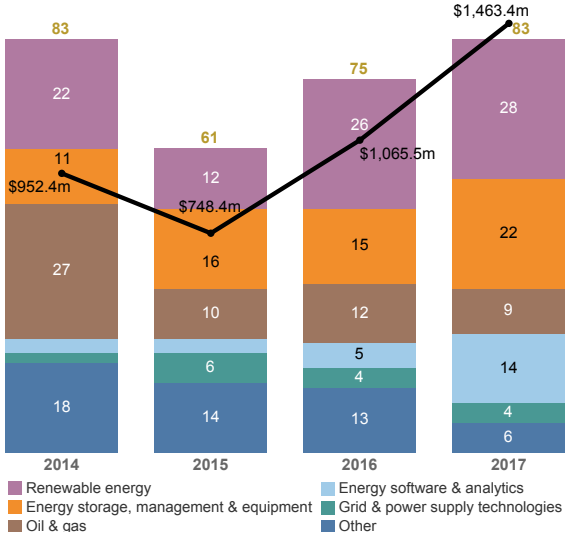
Top investors in transport enterprises



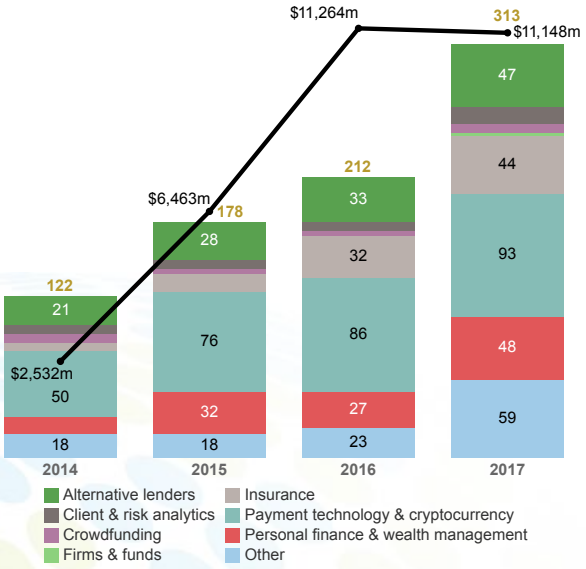
Consumer deals by subsector 2014-17



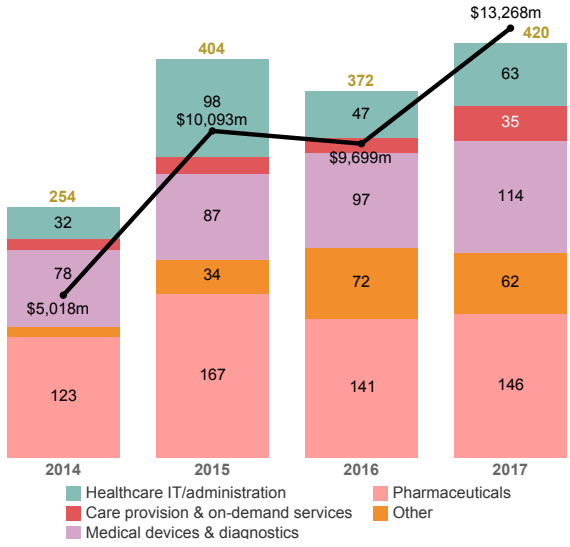
Energy deals by subsector 2014-17



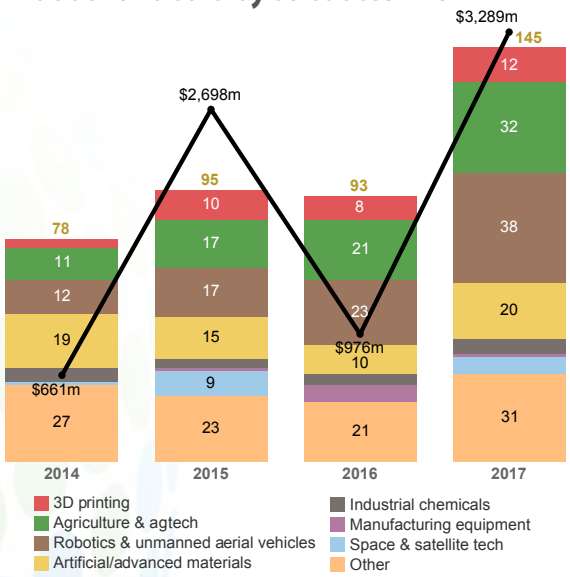
Financial services deals by subsector 2014-17



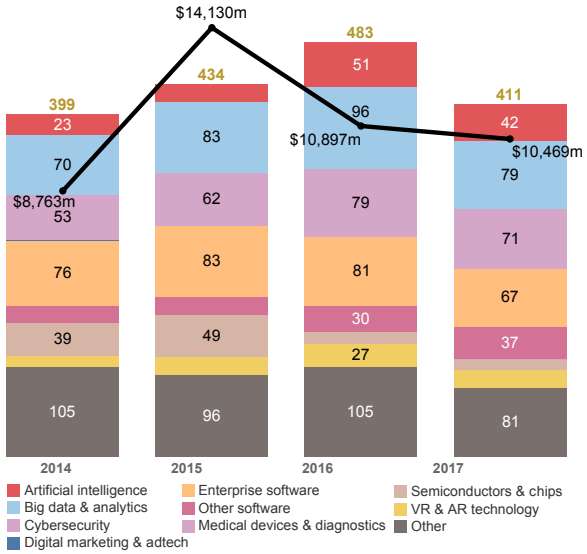
Healthcare deals by subsector 2014-17



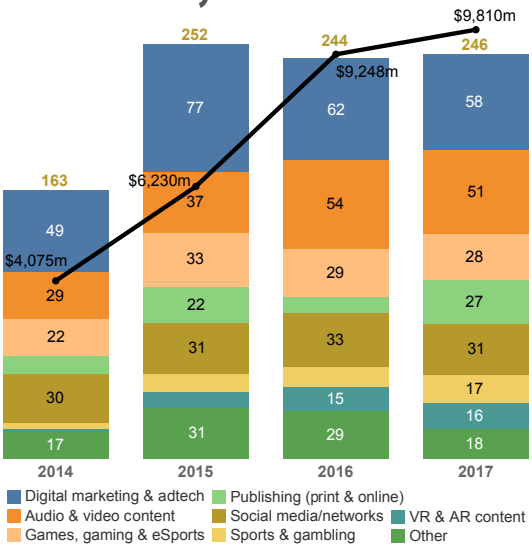
Industrial deals by subsector 2014-17



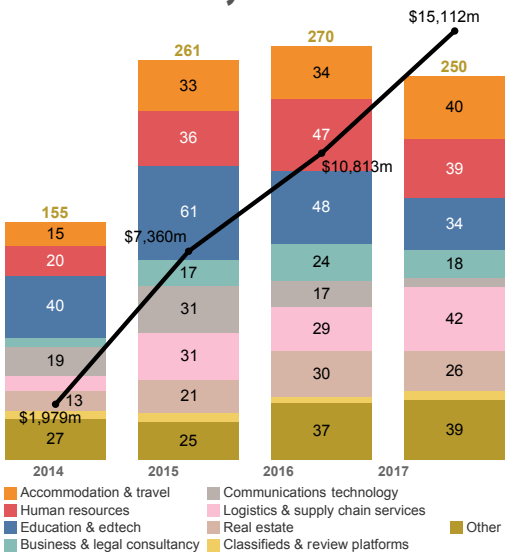
IT deals by subsector 2014-17



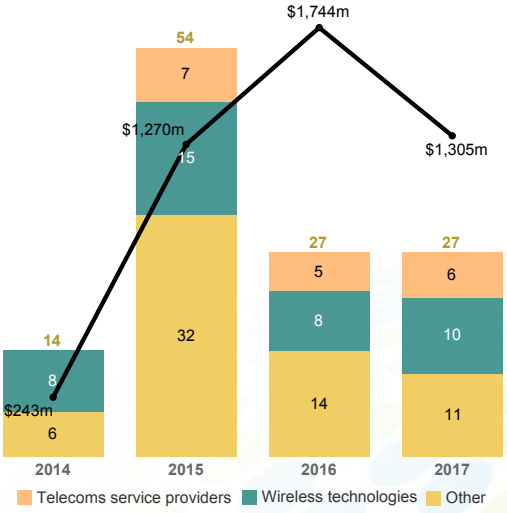
Media deals by subsector 2014-17



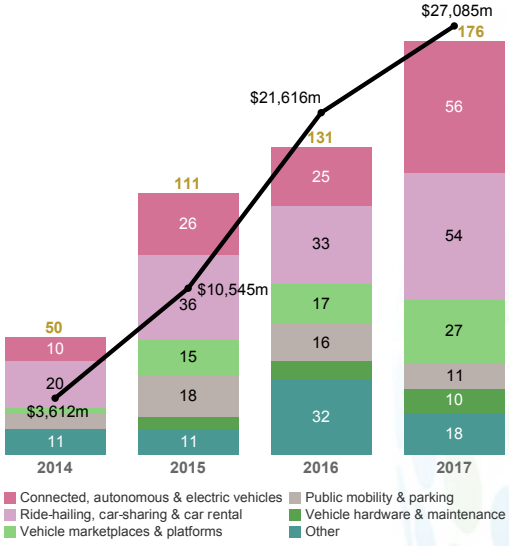
Services deals by subsector 2014-17



Telecoms deals by subsector 2014-17



Transport deals by subsector 2014-17



THE GLOBAL CORPORATE VENTURING SURVEY 2018

Kaloyan Andonov
reporter, GCV Analytics

Throughout October and November 2017, GCV Analytics conducted its annual survey on the state of corporate venturing. The study was conducted in cooperation with Stanford University and Insead Business School. Faculty members and students of these academic institutions will have access to the results of the survey and publish academic papers based on them. Our joint effort was generously sponsored and supported by General Electric and Fenwick & West.

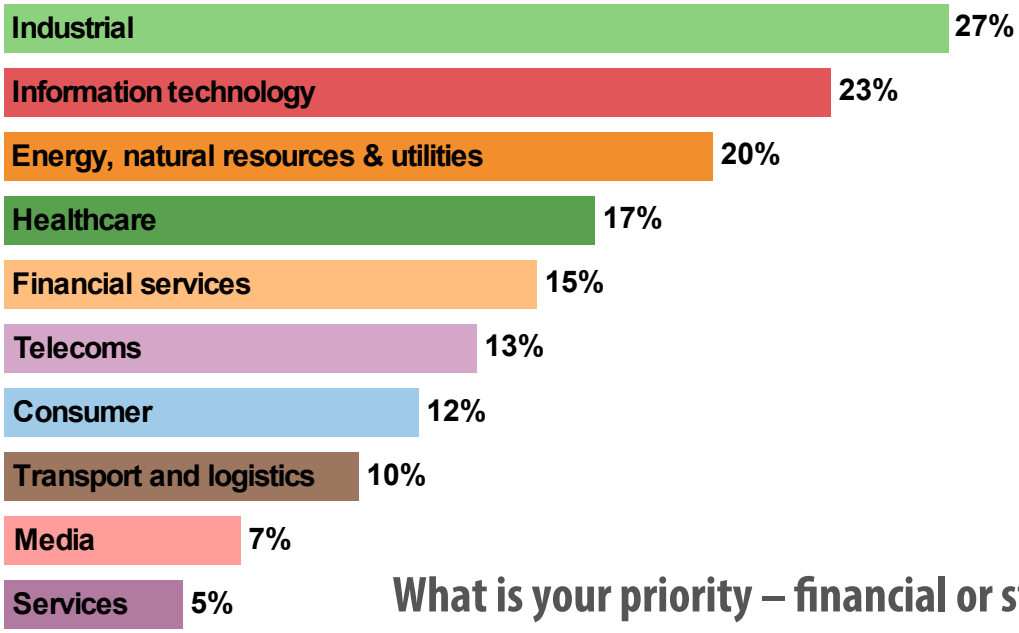
A total of 60 respondents took part in the survey this year. The response rate was slightly lower than in previous years due to the considerable additional length of the survey. However, we received contributions from corporate venturers in each of the 10 sectors we track, thus maintaining the overall representative nature of the data.

The survey questionnaire consisted of 44 questions encompassing various aspects of corporate venturing. The response rate per question depended on participants' willingness to disclose information about their unit and investments.

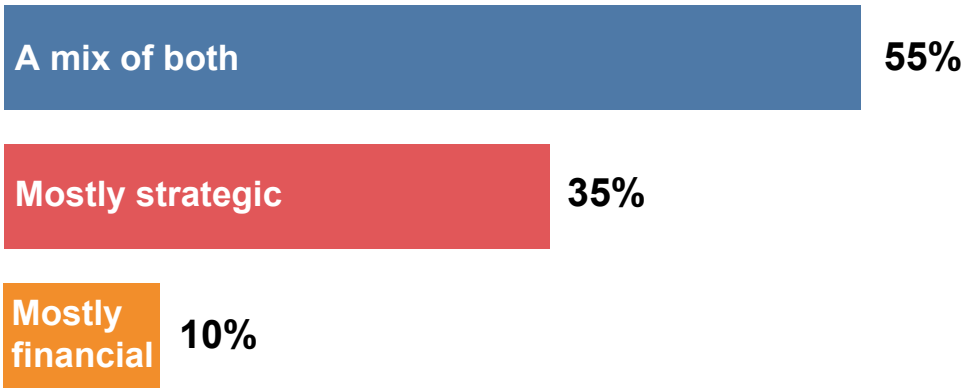
Survey respondents and the venturing units they represent are kept strictly anonymous in this graphical summary of survey results, which are illustrated here only in a statistically aggregated fashion.

More than half the respondents – 55% – say their investment priorities consist of a mix of financial and strategic return considerations. Slightly more than a third (35%) say they focus mainly on strategic returns, and only 10% say they prioritise financial returns. These results are in line with the nature of corporate venturing and consistent with results from previous surveys.

Which sectors would you use to describe your parent company?

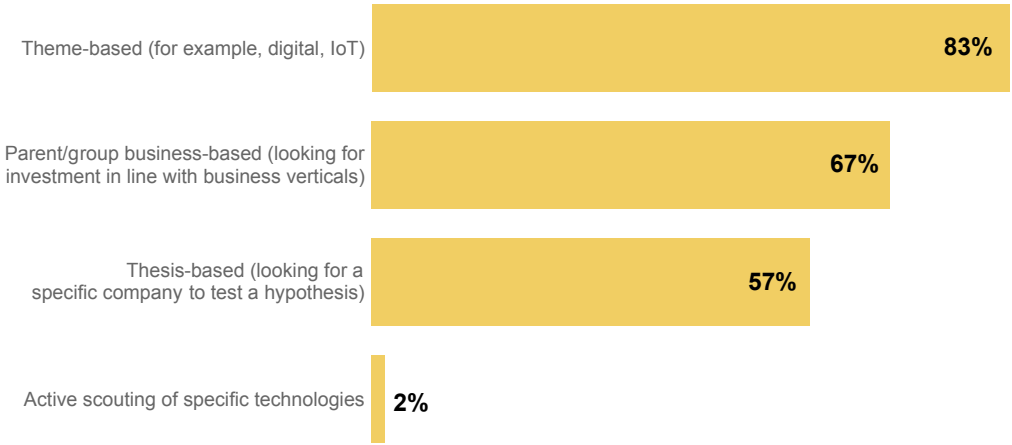


What is your priority – financial or strategic returns?



Strategically-oriented venturing units seek to invest in promising emerging businesses based on a mix of criteria, whether theme-based (83%), looking for investees in line with business verticals (67%) or investing in a specific company to test a hypothesis (57%).

How do you search for investments?



Structure

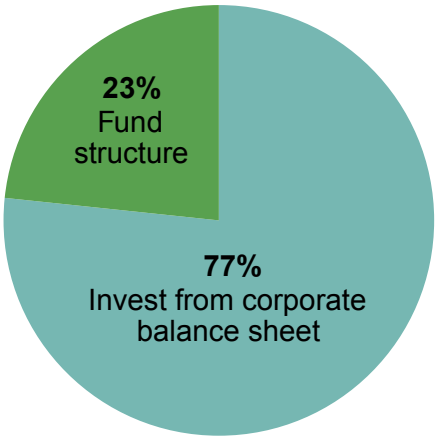
Most corporate venturers (77%) say they invest money in emerging businesses from the corporate balance sheet. Only 23% say they have a separate legal structure, akin to a traditional venture capital firm, with general and limited partners. Indeed, it is a fact that many corporations participate in venture capital rounds through their corporate development, strategy or mergers and acquisitions (M&A) departments.

Only a fifth of corporates (26%) say they have a capital pool fully committed by their parent and significant autonomy at the same time, while 74% say they have a separate fund but the capital is wholly-owned by the corporate parent.

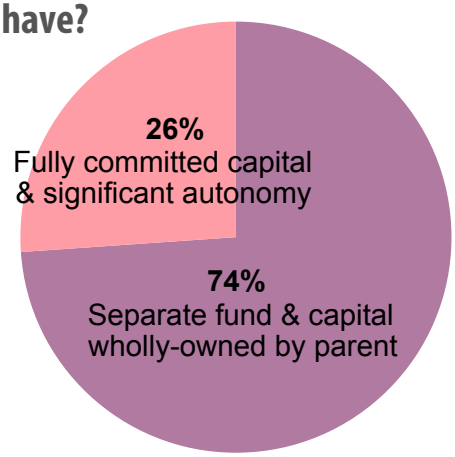
These structures are reflected in the investment decision-making process. In 57% of cases, strategic and financial priorities are set jointly by the venturing unit and corporate C-level executives. In 21% of cases, only corporate executives make those decisions.

This is also evident in the reporting structure. Heads of venturing units most often report to the chief technology officer (23%), the chief executive officer (19%), the head of strategy (19%) or the chief innovation officer (18%), among others.

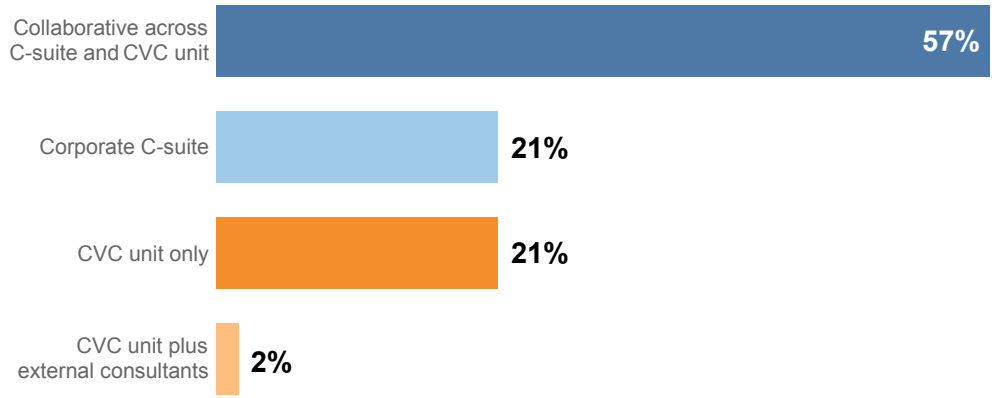
How are you structured?



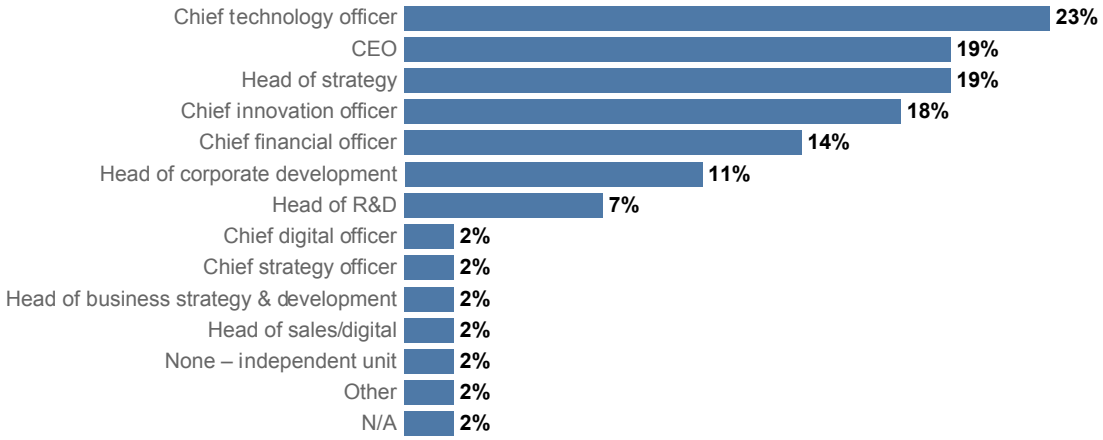
What type of fund structure do you have?



Who in your unit establishes your strategic or financial priorities?



To which C-level executive does you unit head report?



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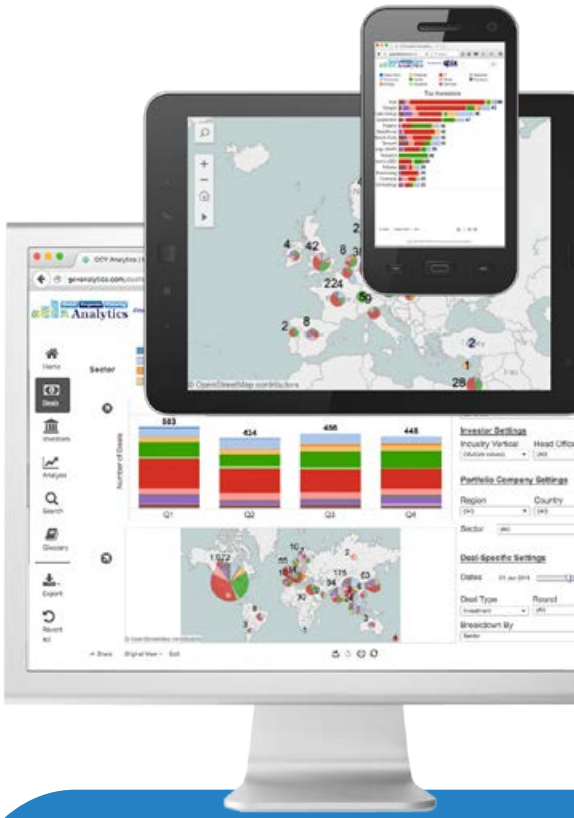
Arnaud's CEO asked him how many deals their closest five competitors had done that year. Minutes later he pinged her the answer – and all the detail plus some cool looking charts.

Marie urgently needed to create a graph showing the number of CVC investments, and their dollar value, in healthcare in Asia over the past two years. Three minutes later the graph was in her presentation.

Zhang is a consultant and had a meeting scheduled with a CVC. Needing to do a quick bit of background research he popped into GCV Analytics. He walked into the meeting knowing what deals they had done and who they had co-invested with and was also able to tell them what the competition had been doing.

Anika works for a government and needed to benchmark inward venture investment from corporates, compared to other similar countries. She used the information to get an increased marketing budget.



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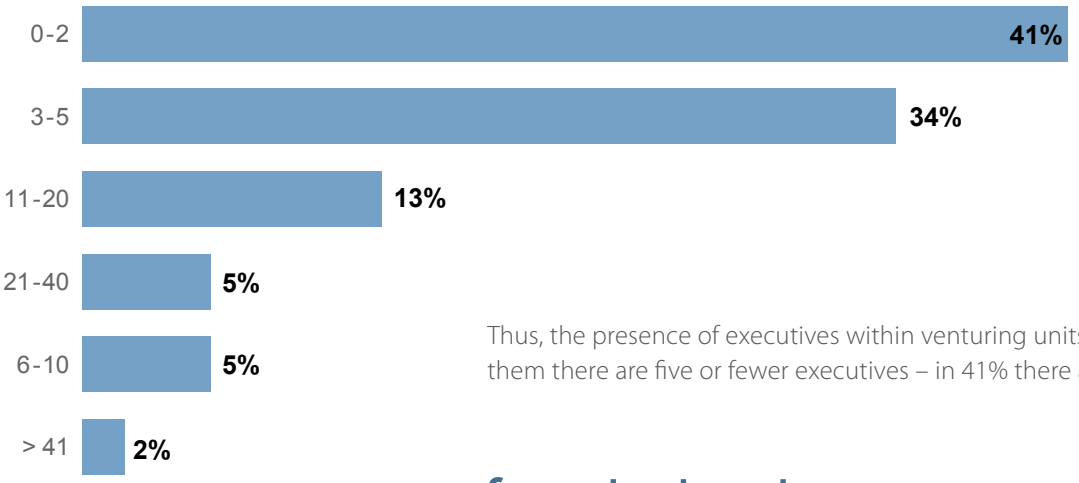
How many executives does your unit have?



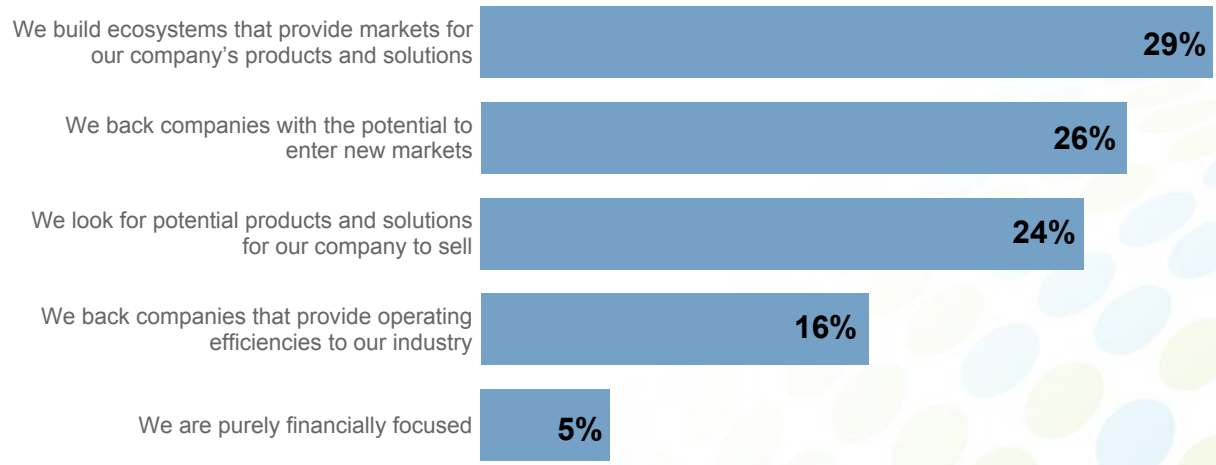
Thus, the presence of executives within venturing units is limited – in 75% of them there are five or fewer executives – in 41% there are two at most.

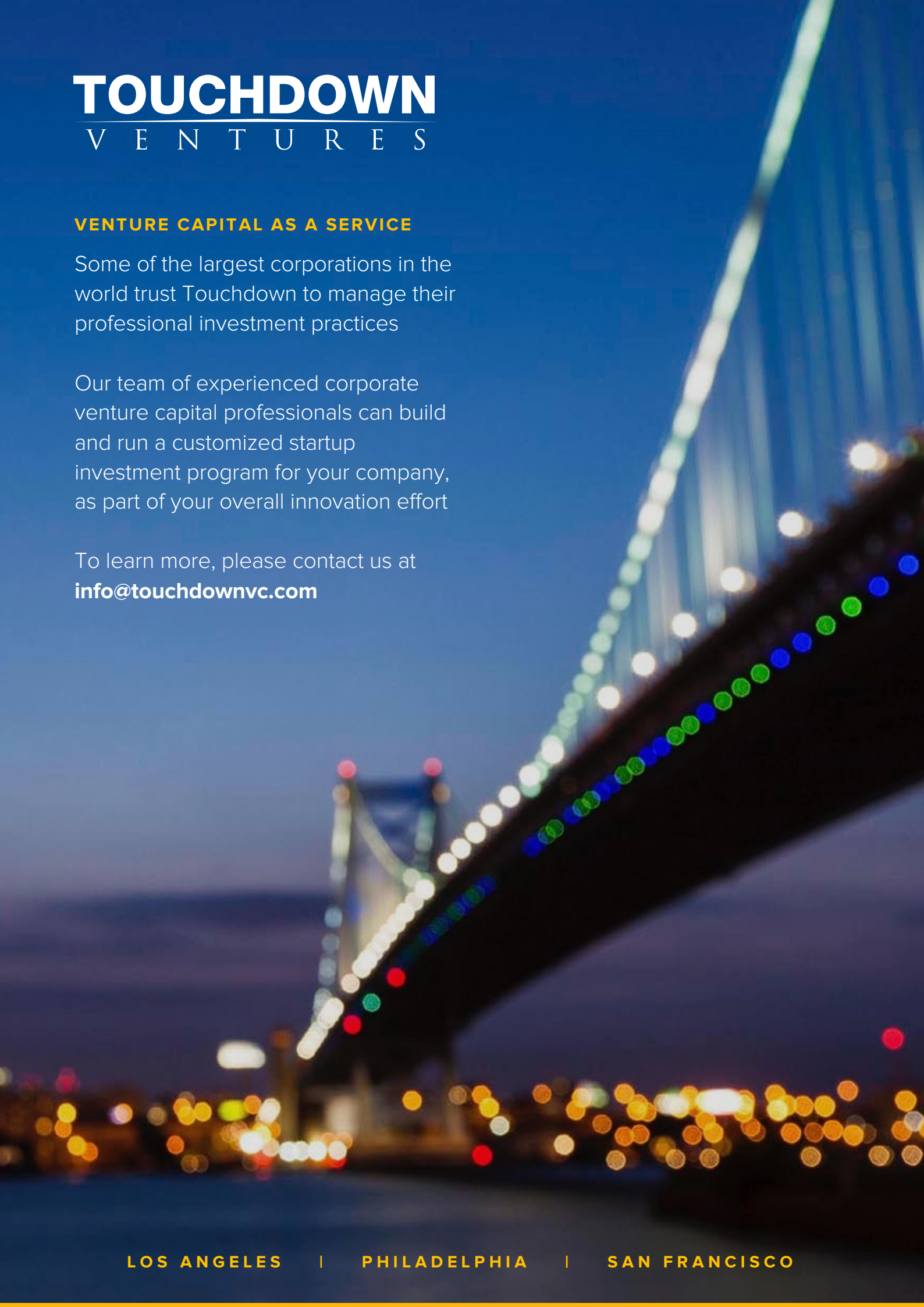
Strategic orientation

Given the clear presence of strategic considerations in the majority of corporate venturing units, it is important to shed light on what those considerations are.

When asked to select a statement best describing their investment focus, 29% of corporate venturers claim to be building an ecosystem for the parent company's products and services, 26% say they back companies that can help the corporate parent enter new markets, 24% claim to be seeking new products and services for their parents. Only 16% say they are scouting for companies to add value to the corporate by increasing operating efficiencies, and just 5% claim to be purely financially oriented.

Which of these would best describe you as a corporate investor?





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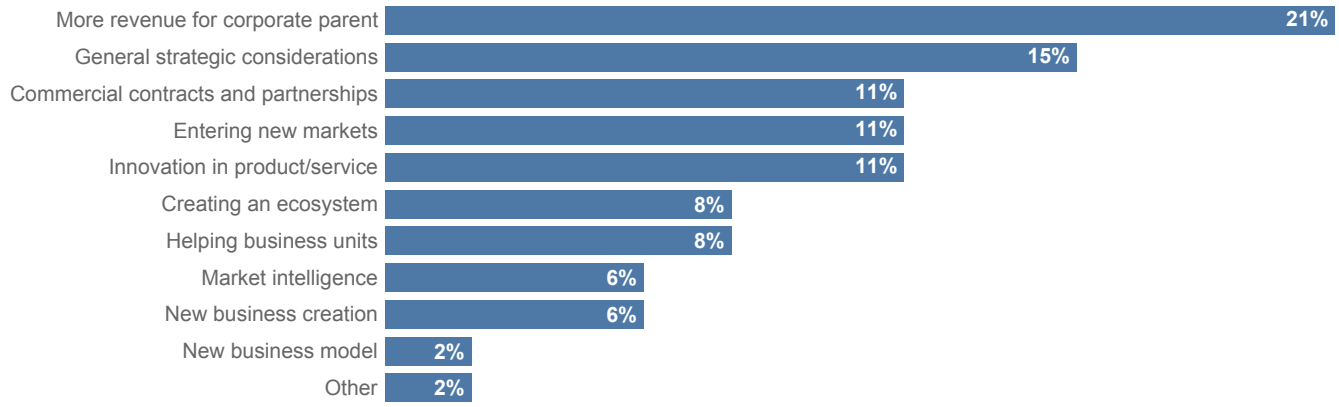
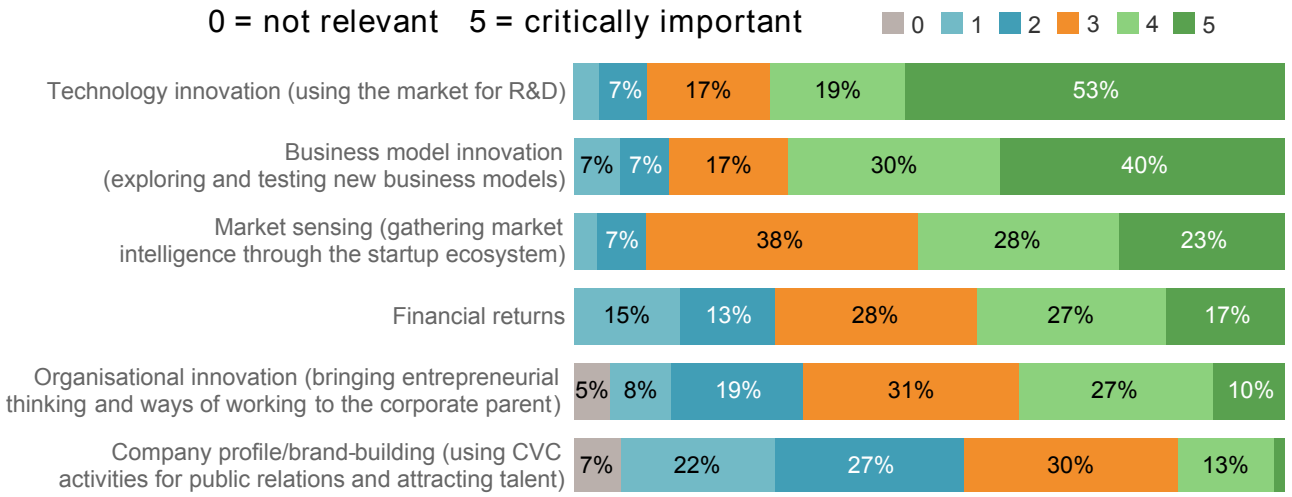
What would you define as an important strategic return?



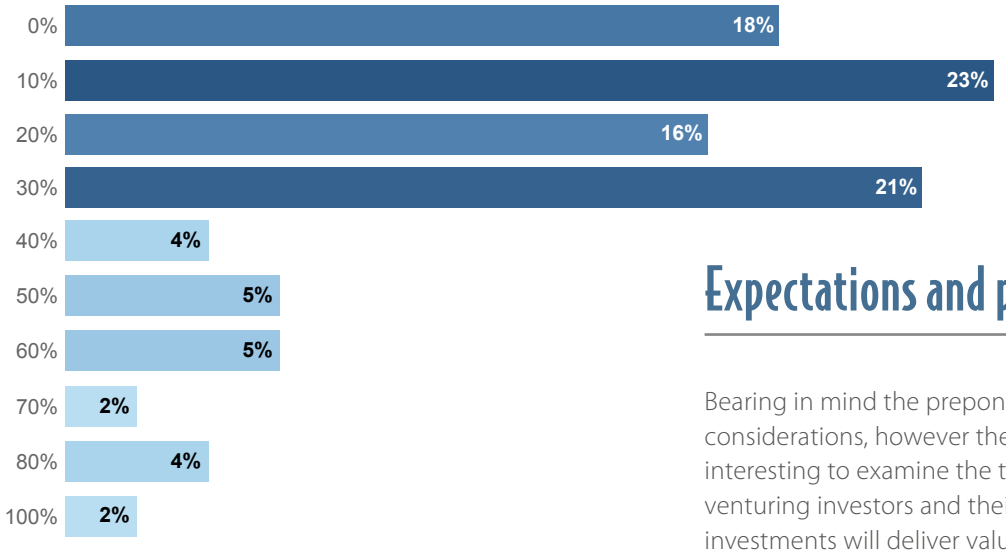
However, when asked to define "important strategic return" in an open-ended question, respondents give answers that are more nuanced. While striking partnerships with new businesses, entering new markets and innovating products or services are often mentioned – by 11% of respondents in each case – the most frequent answers concerned general strategic considerations (15%) – growth, industry disruption and so on – and ultimately generating more revenue for the corporate parent (21%).

When respondents rate the importance of a set of value drivers to their venturing unit, they give the highest scores on the scale – 4 and 5 – to technology innovation, defined as using the market for research and development (R&D), business model innovation (exploring and testing new business models) and market sensing (gathering intelligence through the startup ecosystem). Other value drivers such as bringing entrepreneurial thinking into the corporate parent, immediate financial returns from the startups and using venturing unit activities for public relations and attracting talent are given much lower scores.

What is the importance of these value drivers to your unit?



What percentage of investments are expected to deliver value within 2 years?

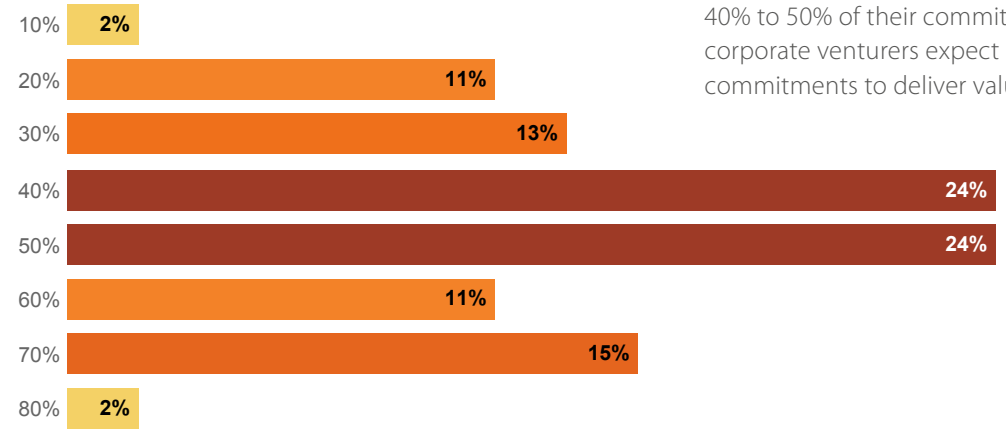


Expectations and portfolio structure

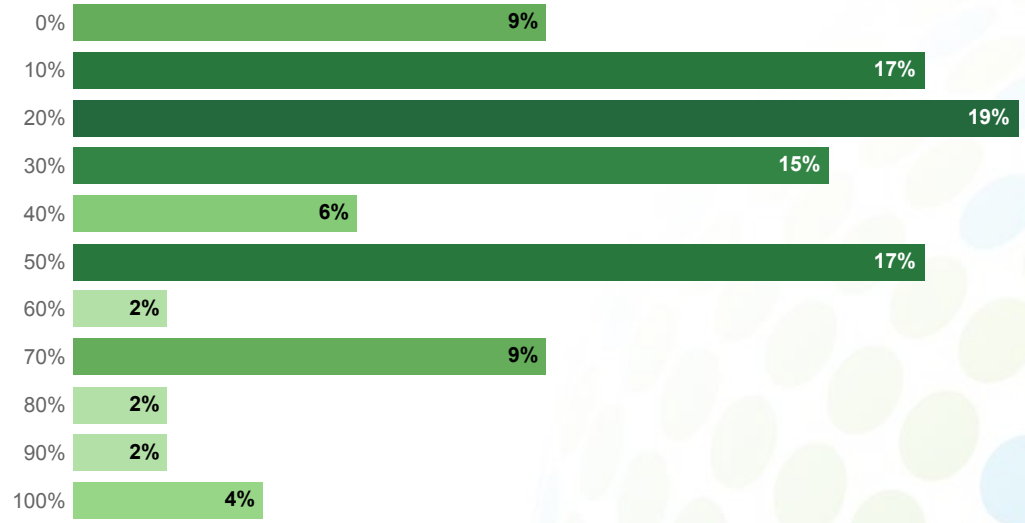
Bearing in mind the preponderance of strategic considerations, however they may be defined, it is interesting to examine the time horizon of corporate venturing investors and their expectations concerning when investments will deliver value.

In the short run – up to two years – most investors (78%) expect up to 30% of their investments to deliver value. For the medium term – three to five years – about half expect 40% to 50% of their commitments to deliver value. Most corporate venturers expect between 20% and 50% of commitments to deliver value within six to 10 years by.

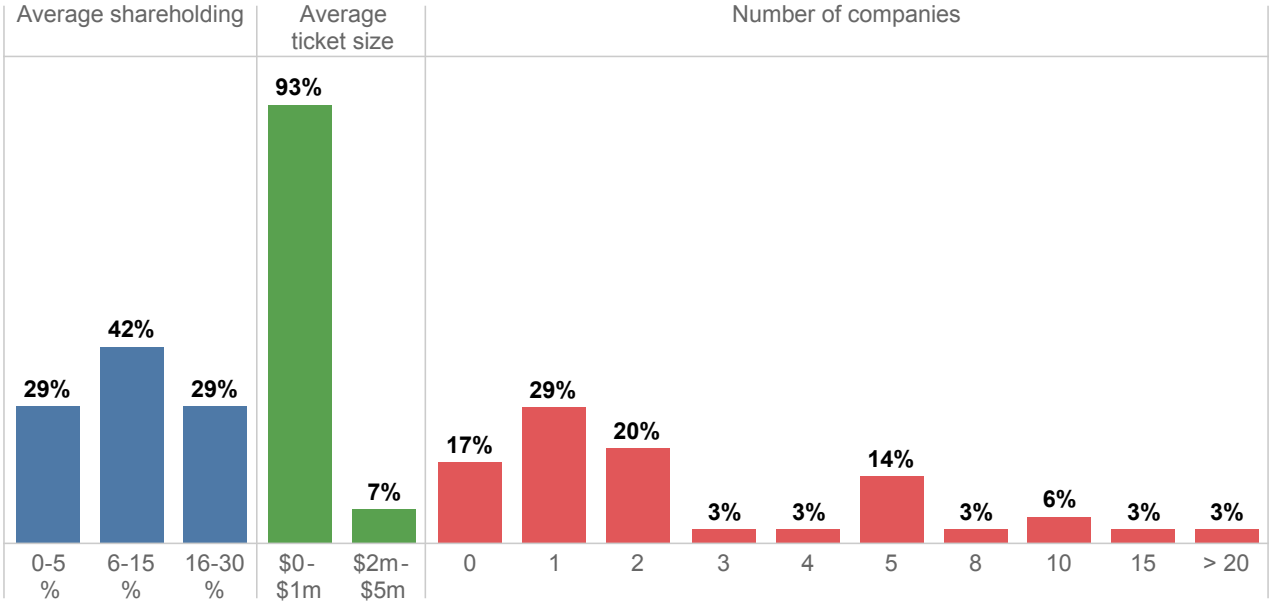
What percentage of investments are expected to deliver value within 3-5 years?



What percentage of investments are expected to deliver value within 6-10 years?



Seed stage: How many such companies are in your portfolio, and what is their average ticket size and your targeted shareholding?

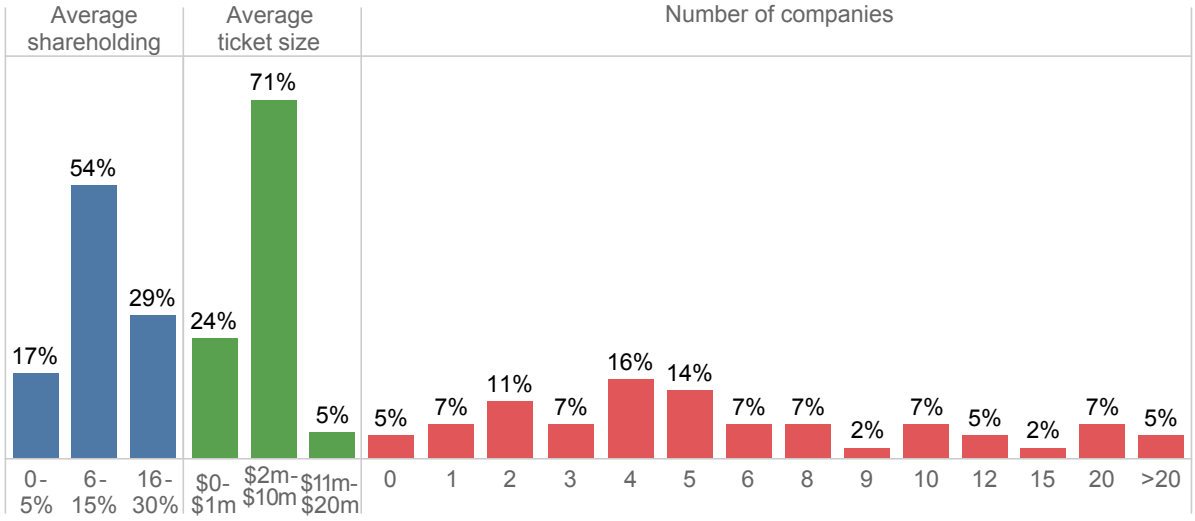


Such expectations, weighted heavily on the medium and long term, are corollary to the typical portfolio structures of corporate venturers broken down by stages.

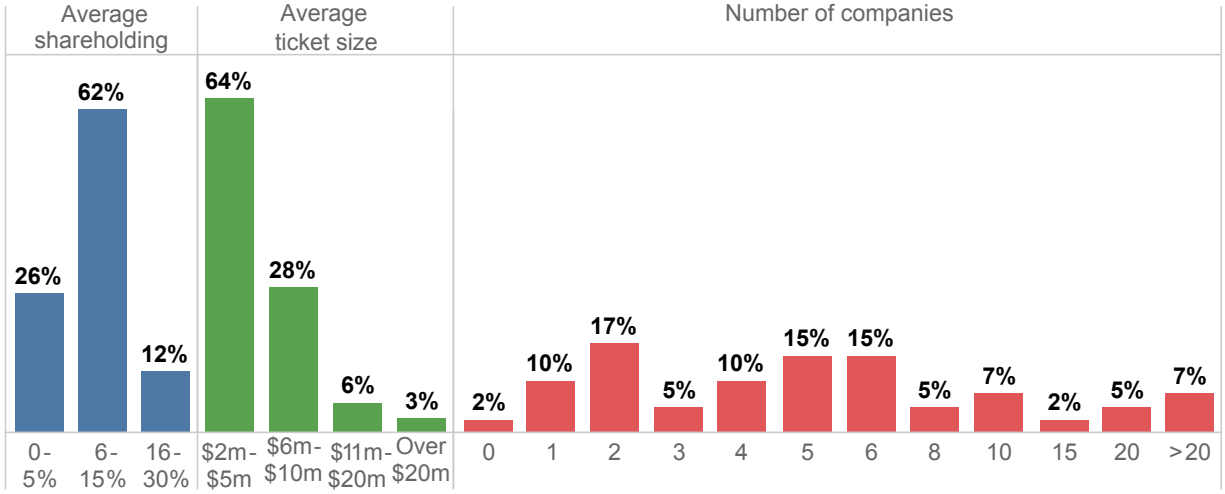
Most surveyed investors claim to hold one or two seed-stage companies in their portfolio, where the average ticket size tends to be up to $1m for 93% of investors and the targeted shareholding for many is between 6% and 15%.

In the case of businesses at series A stage, we see greater exposure by corporate investors, which tend to hold anything up to 20 such companies in their portfolio. In 71% of cases, the average ticket size ranges between $2m and $5m. More than half of corporate venturers (54%) seek to hold stakes of 6% to 15% stakes in such enterprises, and 29% aim for an even larger stake.

Series A: How many such companies are in your portfolio, and what is their average ticket size and your targeted shareholding?



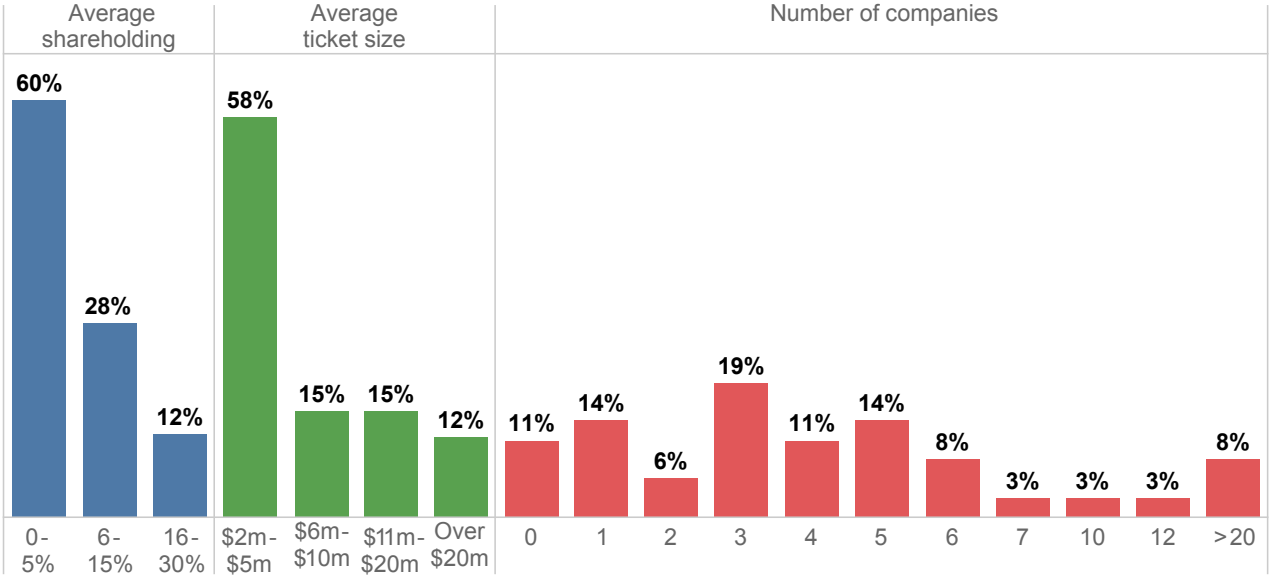
Series B: How many such companies are in your portfolio, and what is their average ticket size and your targeted shareholding?



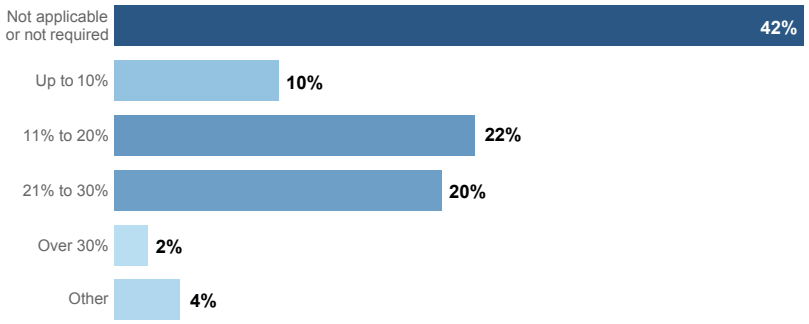
For enterprises at series B stage, the situation is similar. Most corporates claim to hold up to 10 such companies in their portfolio, where the average ticket size in 64% of cases is between $2m and $5m, and in 28% of cases between $6m and $10m. Almost two-thirds of respondents (62%) say they aim to hold a stake of between 6% and 15% in such enterprises.

For later-stage enterprises – series C and beyond – most corporates tend to hold fewer than 10 in their portfolio. The average ticket size of enterprises, however, at this level of fundraising is not necessarily higher – 58% claim to write cheques of between $2m and $5m, while 30% have committed anywhere between $6m and $20m. Targeted stakes are fairly similar to those of enterprises at series B stage.

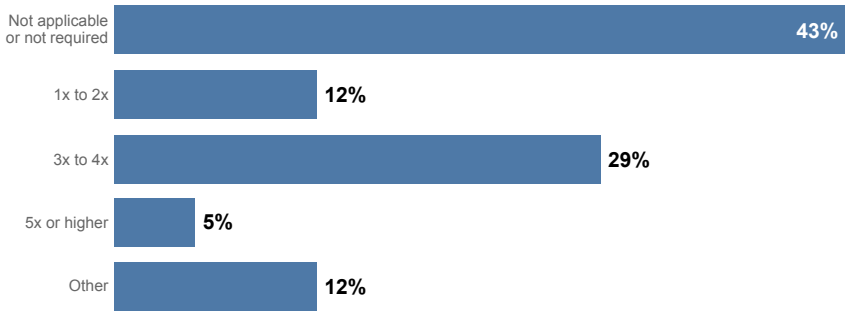
Series C and beyond: How many such companies are in your portfolio, and what is their average ticket size and your targeted shareholding?



What is your required internal rate of return from an investment?



What is your required gross or cash-on-cash multiple/return for an investment?



Expectations about the actual returns, as stated in open-ended questions, enable us to make interesting and consistent observations. When asked about their required internal rate of return (IRR – a measure of performance), 42% of corporates claim not to have any requirement, 22% say they require from 11% to 20% and another 20% or respondents say they need 21% to 30%.

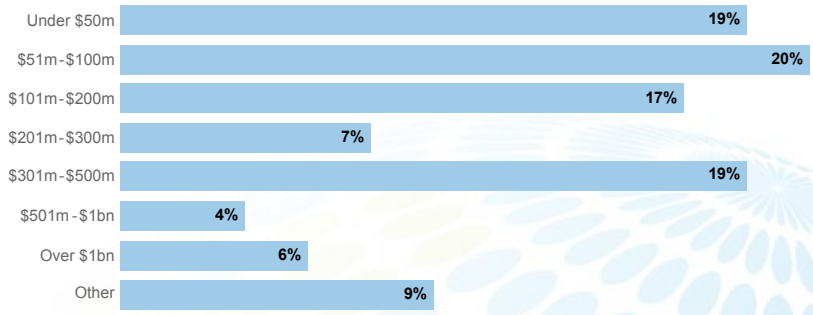
The large number of corporates that do not formally require or expect a return may be attributed to the heavier weight they give to other strategic considerations – those of a more qualitative nature. Responses regarding required cash-on-cash multiple or gross multiple, also collected through an open-ended question, are consistent with stated IRR expectations.

Capital deployment

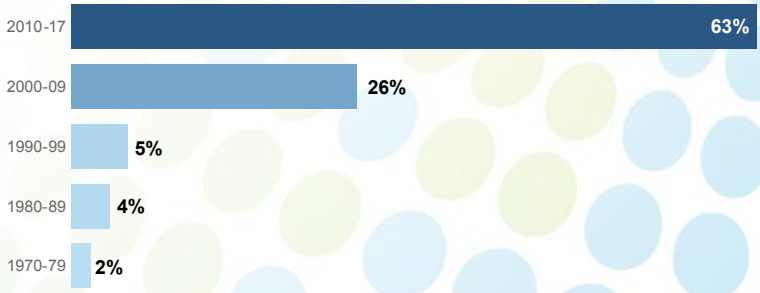
Among the most interesting facets of any investment business is how much capital it has at its disposal and how that capital is being deployed. The fund size of most corporate venturing arms (63%) tends to range from under $50 to $300m, while nearly a fifth claim to have between $301m and $500m in their coffers. A relatively small number of venturing arms have more than $500m.

The key to understanding patterns of capital deployment among corporates is that most of their investment vehicles are relatively new. Almost two-thirds of our respondents (63%) manage venturing arms that have been founded in this decade, while 26% of units were started in the 2000s.

What is your overall corporate venturing fund size?



When was your unit established?



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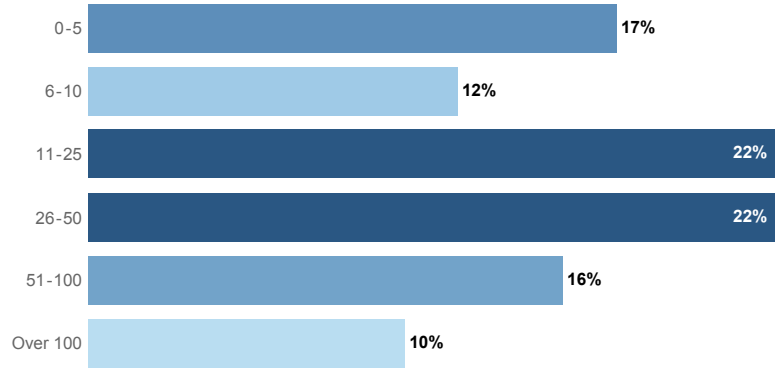
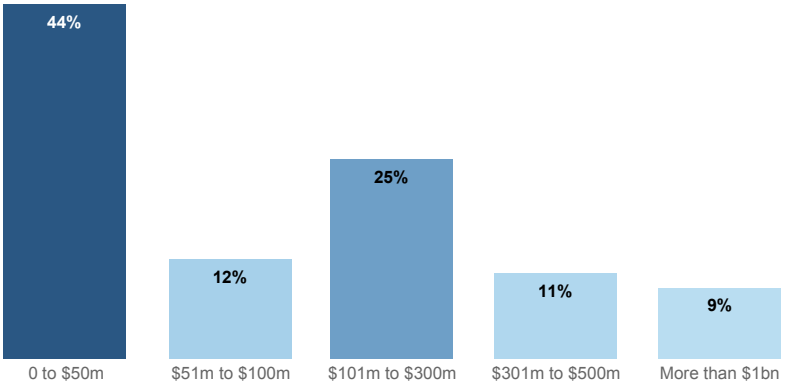
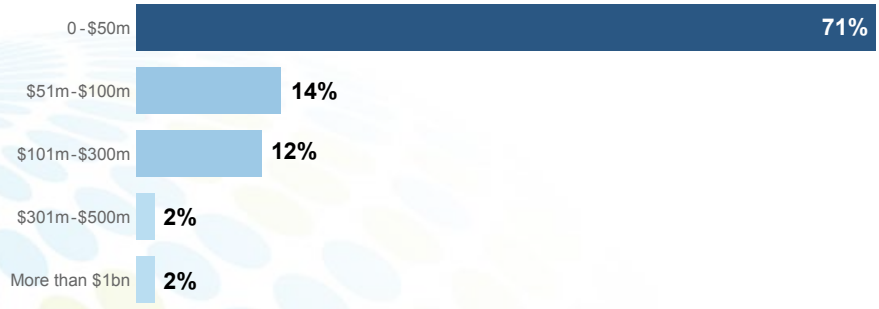
How many deals has your unit backed over its history?



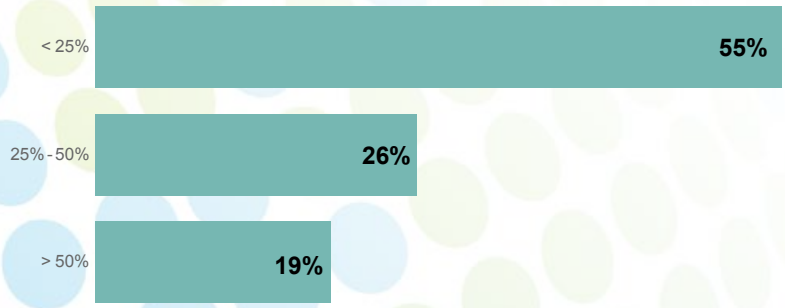
How much has your unit invested over its history?



How much does your unit normally aim to invest in a year?



In what percentage of deals was your unit lead investor?



Save for some old and well-established units, corporate venturing is still a young investment phenomenon. This is why most respondents claim to have backed anywhere from zero to 50 rounds but rarely above 50.

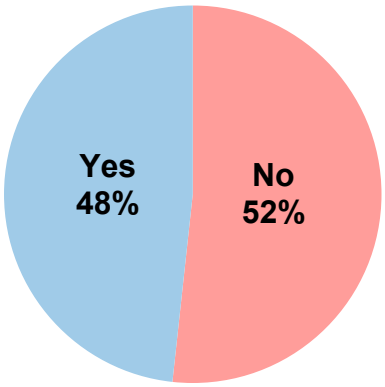
Most corporates have invested somewhat modest amounts of capital through their history – 44% claim to have deployed only up to $50m, while 25% - between $100 and $300m.

However, there are exceptions or outliers in the data, particularly China-based units that deploy billions of dollars of capital on an annual basis, despite being relatively young.

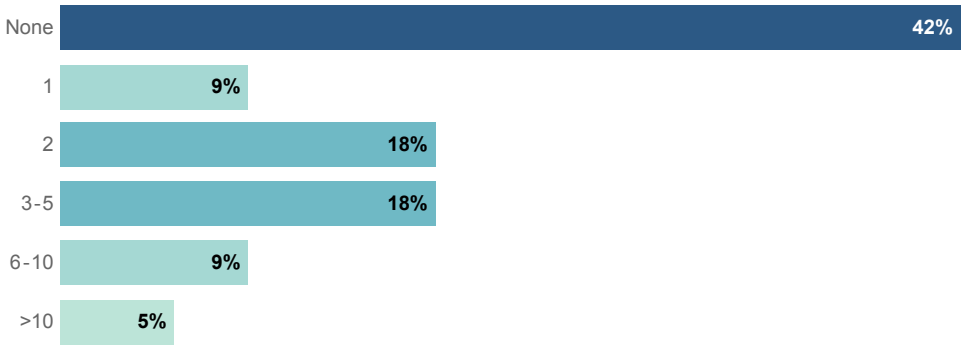
Given these patterns and capital availability, it is no surprise that most corporate units (71%) aim to invest only $50m a year at most.

These realities may also help explain why corporates are not often the lead investors in rounds raised by their portfolio companies. More than half (55%) say they have acted as lead investor in fewer than a quarter of the rounds they have backed, 26% of units have led about half of their rounds, and only about a fifth have led in more than half their rounds.

Do you take LP stakes in other VC funds?

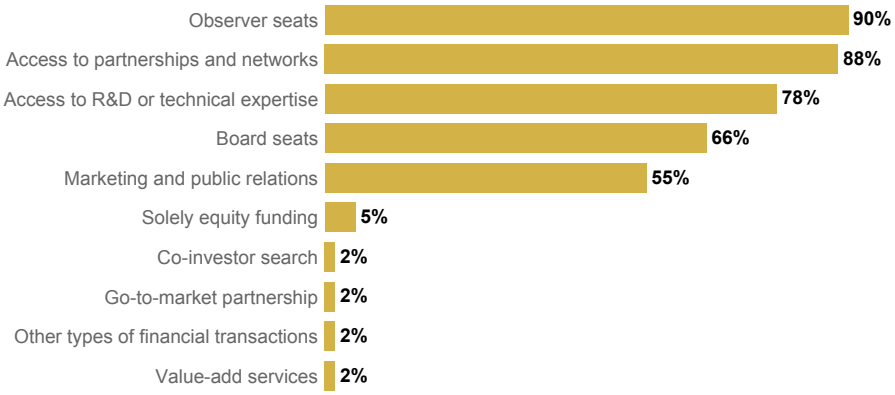


How many LP stakes do you hold?

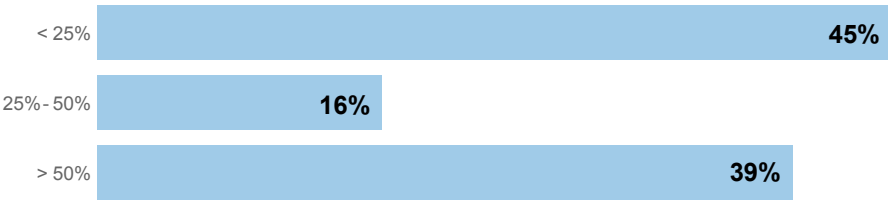


For corporate venturers, an alternative to direct investment is taking limited partnership (LP) stakes in established venture capital funds. According to our survey, nearly half of corporates with a venturing strategy take such stakes (48%). Most corporates with such stakes will typically hold no more than 10, while 42% say they have none. Many heads of corporate venturing units interviewed by Global Corporate Venturing over the years have said they use LP stakes for a variety of reasons – as a way to diversity the overall portfolio, as a way to invest in verticals they do not know well, or simply as a tool for learning about venturing.

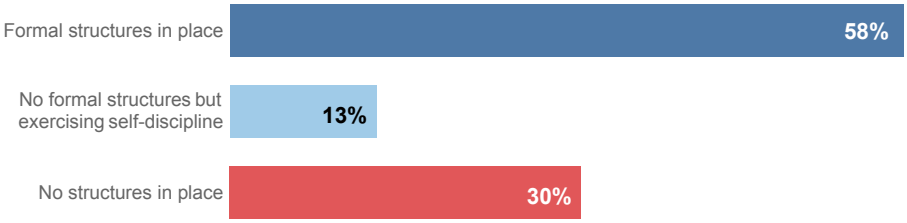
By what means do you support portfolio companies?



In what percentage of deals do you take a board seat?



Where you have a portfolio company board or observer seat, are there any special structures to address issues of conflict or confidentiality?



Relations with portfolio companies

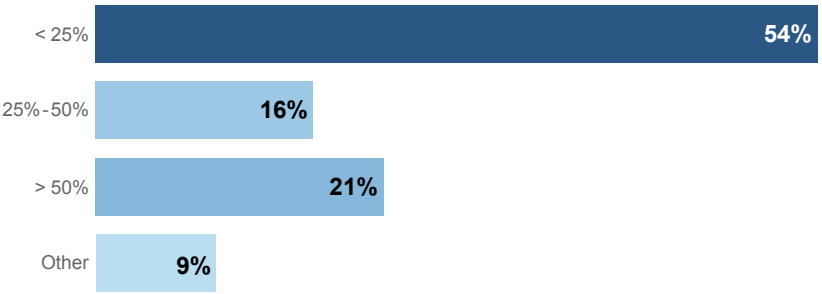
Unlike other venture capitalists, corporate venturers are in a unique position to help investees in a range of ways. The most common, according to our survey, involve taking observer seats (90%), providing access to partnerships and supplier or consumer networks (88%), offering access to R&D or technical expertise (78%), taking board seats (66%) and helping with marketing and public relations (55%). There appears to be a preference for observer seats over boards seats. Nearly half (45%) claim to take a board seat in fewer than a quarter of their portfolio companies, 39% say they have taken such seats in more than half the startups in their portfolio.

Issues of information sharing and confidentiality that emerge in such situations are also dealt with differently from firm to firm. Most have some formal structure in place (58%).

What percentage of deals are completed to coincide with some form of commercial partnering or collaboration agreement?

What percentage of deals subsequently result in some form of commercial partnering of collaboration agreement?

In what percentage of deals have you negotiated some form of first notice, right of first refusal or similar rights with regard to exit?



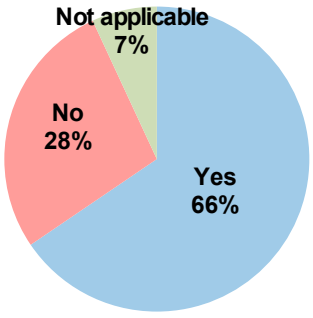
More than half of corporates (51%) claim some form of partnering is an integral part of the decision to invest in fewer than 25% of cases, while 37% say this is the case in over half their deals.

Collaboration deals often follow later in a portfolio company's association with an investing parent, though survey responses suggest that venturing units have differing strategies in this regard, some more than others seeing portfolio company partnerships as a means of deriving value from their investments.

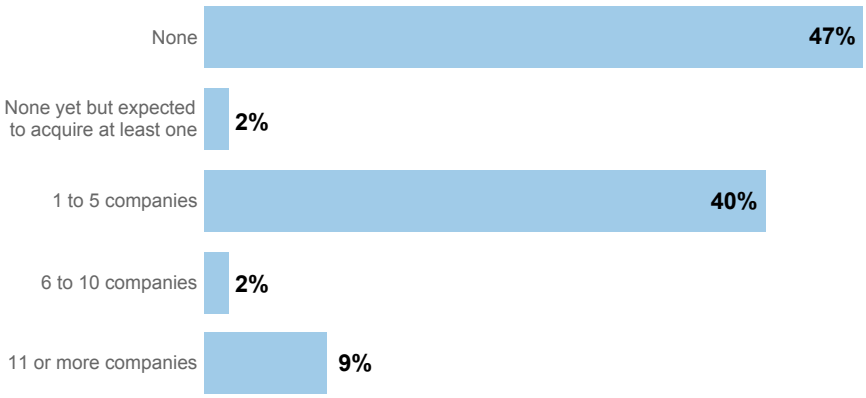
But acquisition is often seen as a natural process in securing value from a portfolio company. Two-thirds of venturing units also function as acquisition scouts for their parent and many investments involve conditions seeking to give the parent preference in portfolio company sales.

However, in 47% of cases the corporate parent has never acquired a portfolio company, and in another 40% it has bought only between one and five such companies. Venturing arms, therefore, do not necessarily act as extensions of corporate M&A divisions.

Do you help your parent's M&A team identify and buy your or other venture-backed portfolio companies?



How many of your portfolio companies has your parent bought?



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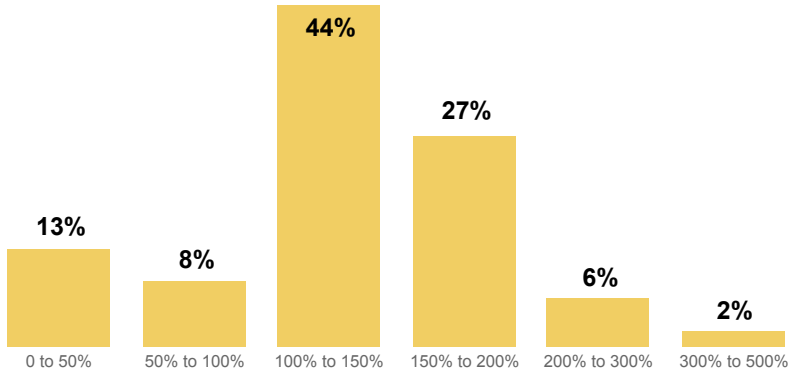
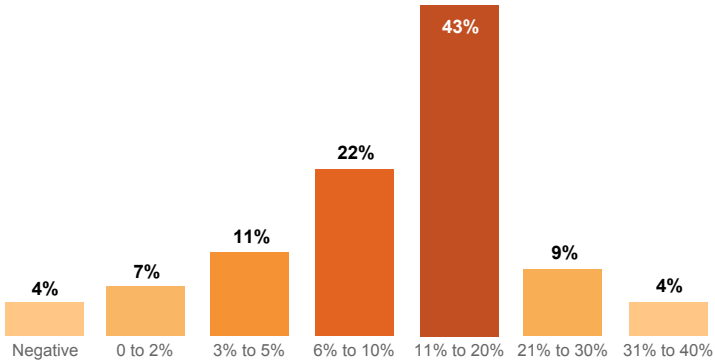
**Total commitment amounts pertaining to the limited partnerships mentioned above includes the sum of capital commitments to the main fund and those of its affiliates/parallel funds.*

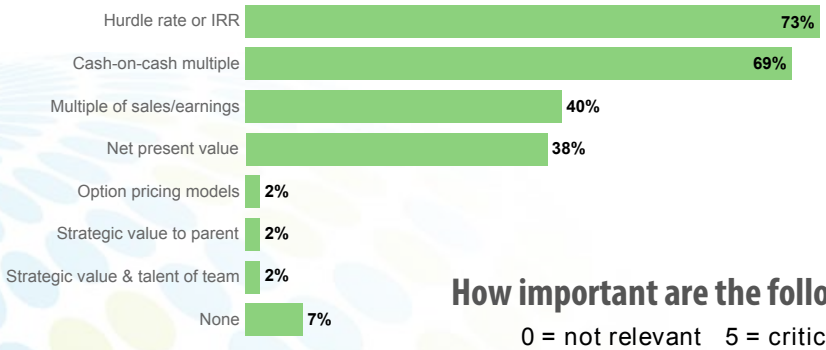
What is your portfolio worth compared with net asset value by multiple?



What is the internal rate of return on your portfolio?



Which of these metrics do you use to assess investments?



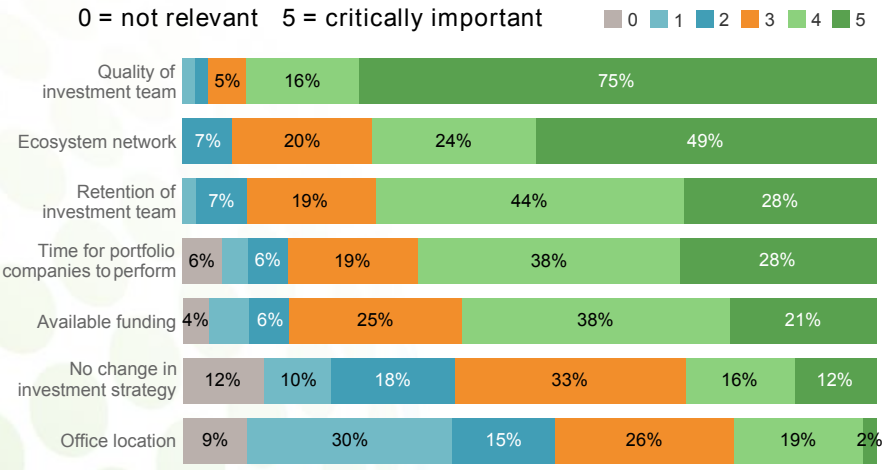
Metrics, performance and investment teams

investment funds are judged on their performance, and this naturally applies to corporate venturing funds. When comparing a portfolio's worth with net asset value by multiple, most corporate investors (71%) claim to stand between 100% and 200%, while 65% of IRRs range between 6% and 20% .

A variety of metrics are used by corporate venturers to monitor their own performance. The most common are hurdle rate or IRR (73%), cash-on-cash multiple (69%), multiple of sales or earnings (40%) and net present value (38%).

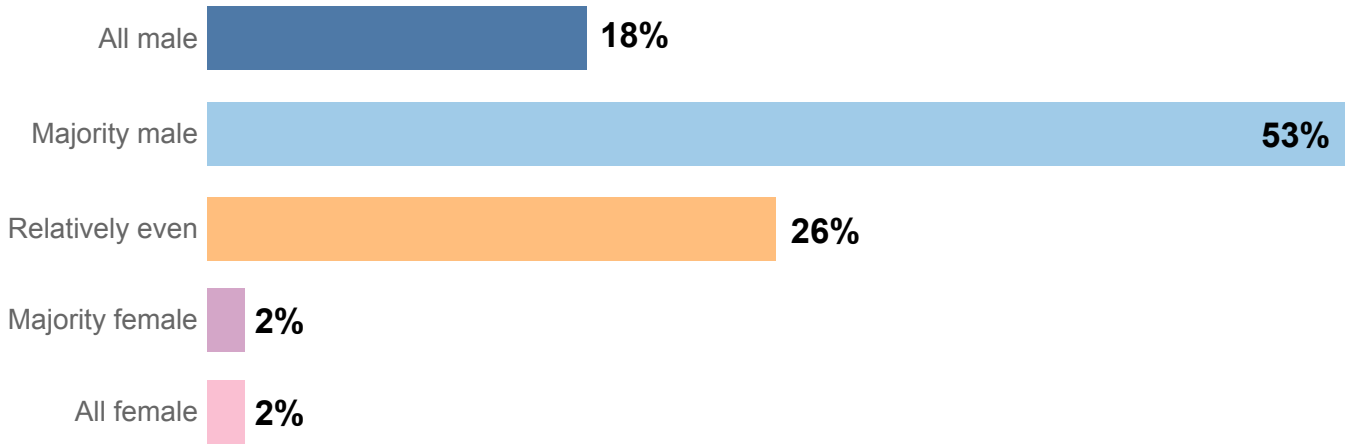
The critical factors that determine the success of a corporate venturing unit, according to respondents, extend beyond the performance of investments. The most highly rated factors had more to do with people than with financial results – the quality of the investment team, followed by the ecosystem network and the retention of investment team members. These factors were given higher priority than the time for companies to perform. It is, thus, no exaggeration to claim that corporate venturing is widely perceived by its practioners as, first and foremost, a people-driven and people-centred business.

How important are the following factors to the success of your unit?



What is the average age of your team members?

What are the gender characteristics of your team?



In nearly half of corporate venture capital firms (49%), teams tend to have an average age of between 40 and 50, and in nearly half (47%) an average age of between 30 and 40. Corporate venturing seems to be a place for more experienced professionals.

The overwhelming majority of units (71%) are populated either exclusively or mainly by men. Only 26% have a fairly even gender split. This disparity is one of the challenges the corporate venturing community has yet to address effectively.

Open-ended responses on measuring value drivers

The following tables include anonymised verbatim answers from survey respondents.

How do you measure the performance of business model innovation?	What KPIs do you use to measure business model innovation?
Innovative, releastic and business growth	Number of customers, number of competitors, market share
Traction with termsheets, even if does not get executed	
Adoption, utilisation and/or commercial collaboration	
Model assessment, adoption	Speed to market success
Scalability	
Partnership contracts / collaborations with businesses	Number of commercial contracts with business
Ability to execute an innovative business model at scale	Scale
	New value chains
New business created	Dollars
Not evaluated	
Development of new markets or customer acquisitions	
Qualitative	
Degree of disruption	Long-term upside
Number of partnership contracts and its contribution to revenue and profit	Number of partnership contracts
Did we implement the startup's solution?	Did we implement the startup's solution?
Don't really	
Not measurable	
Exploration of and exposure to new business models	
Dealflow, new business creation	Dealflow, new business creation
Strategy development	
	Percentage revenue growth
New offerings	
Number of investments in companies with new business models	
Use of new technology	
Revenue stream	
Using some of the startups business model in one of our product lines	Number of business models implemented
Identifying transformational concepts and business model extensions that will transform our industry. Several have been identified already	TBD
Market success	
Magnitude of impact and disruption on existing value chain	
Acceptance and utilisation	
New to market	Customer adopt
Collaboration with business units	Number of collaborations
New sales channels or product influencers	Partnership with a new sales channel
Number of new external technologies/startups introduced to corporate R&D and business units	
Onboarding	
Commercial agreements implementing new business models	Commercial agreements implementing new business models
New business lines or partnerships	Revenue growth
New offering / market positioning	
Learnings	
Addressable market	Market size
Not quantifiably measured	
Level of difference compared with existing business	Qualitative
As nearly every industry is being digitised, we can evaluate startups that deliver new efficiency and disruption and engage early in the transformations. Data is transforming business like never before and we are at the heart of how data is collected, analysed, secured, stored and used across industries beyond our own. Measures include market TAM and share in new and adjacent verticals. For example, recent reports about the computer power in autonomous driving show how data is transforming transportation.	Executive grade

How do you measure financial returns?	What KPIs do you use to measure financial returns?
Business growth	Revenue growth MOM and YOY
Multiples and IRR	
IRR & MOIC	IRR & MOIC
Individual exit focused	IRR
Return on invested capital	
Hurdle rate, cash on cash	Cash on cash return
IRR	IRR
IRR	IRR
ROCE	ROCE
IRR	IRR
IRR	IRR
IRR, cash return	IRR
ROI	ROI
Valuation growth	
ROI on invested capital	ROI
ROI	ROI
ROI	ROI
MOIC, IRR, other financial metrics of the performance of the fund	
IRR and exit multiple	IRR and exit multiple
ROI	
CoC	CoC
Cash returns	Value
Revenue, profit	Revenue and Opex
TPVI, IRR, traditional metrics	
IRR and DPI	
Dollars returned to the company	Cash-on-cash, IRR
Returns in 3-5 years	Benchmark versus other Corporate VCs
ROI	
IRR	IRR a few % points above our long term WACC.
Cost savings or revenue generators to corporate parent, and financial return on exits of portfolio companies – which has not happened yet	P&L impact
Cash-on-cash returns, IRR,	Distributions to paid-in capital (DPI), total value to paid-in capital (TVPI)
Cash on cash multiple, IRR	Cash on cash multiple
IRR	
Substantial return	Return XX ROI in each stage
IRR, absolute returns (cash on cash)	IRR, cash on cash returns
ROI for the fund itself	ROI
Immaterial to us, so not measured	
Cash on cash returns	Cash on cash
Cash on cash returns	Cash on cash returns
Internal business impact plus exit cash on cash	NPV
CF / IRR / NPV	
ROI	Revenue
IRR	IRR
ROI, IRR, cash on cash	
IRR and multiple	IRR and multiple
Cash on cash	Cash on cash

How do you measure technology innovation?	What KPIs do you use to measure technology innovation?
Value proposation, new or clone	Number of customers, number of competitors, market share
Interest from internal scientists in R&D to support investment	
Adoption, utilisation and/or commercial collaboration	
Tech assessment, adoption	Speed to market success
Drive new technologies entrepreneurially	
Joint development agreements	Number of joint development agreements / platform integrations
Technical milestones	
Global customer adoption	Global MRR/ ARR
Feedback from business units	
Number of deals, deployments	No of deals
Patents applications	
Disruptive core technologies	
Exposing the business unit to new technologies	Changes to company strategy, and technology investments
New products, services	
Qualitative	
Disintermediation	Degree of disruption
the number of partnership contracts and its contribution to revenue and profit	Number of partnership contracts
Did we implement the startup's solution	Did we implement the startup's solution
Don', really	
Not measurable	
IP opportunities	
Dealflow, new business creation	Dealflow, new business creation
POCs and trials	Volume
process kpis	Efficiency
Specific KPIs around R&D spend, build vs buy	
New areas of competency building	
Number of investments that are launched in the product lineup	
Patent, paper, collaborator	
Result of joint development agreement. Using the startup's technology.	Number of successful joint technology development and numbr of technologies being successfully used in our product lines
Bringing new technologies to corporate parent, measured by number of POCs and number of implementations	Number of POCs and implementations
Impact on revenue	
Magnitude of impact on existing value chain and high multiplier effect on output/ return/reach	
Collaboration with portfolio	
Technology that interest to parent companies	Banks accept the technology
Collaboration with business units	Number of collaborations
Influencing our product for the next 5-10 years	Partnership or acquisition of startup
Number of startups that R&D or business units decided to partner, or collaborate, with in that year	
onboarding of opportunity/fill pipeline	ENPV of onboarded assets
Commercial and collaboration agreements	Commercial and collaboration agreements
Level of internal technology implementation and impact	Number & scale of deployments
New technology / product portfolio	
Learnings	
Disruptive	Joint development agreements
Not quantifiably measurable	
Feedback from technological experts	Qualitative
Potential for disruption is hard to measure, but we can't afford to miss out.	Executive grade

How do you measure market sensing?	What KPIs do you use to measure market sensing?
Size and quality of data	Growth of mother company business in startup segement
Adoption, utilisation and/or commercial collaboration	
Research verification	Prediction timing, success
Relevant dealflow	
Feedback businesses	
Market maps	Market sizing
No evaluated	
new market development growth rate	
Providing a sense for disruptive technologies to the exec staff	Changes to company strategy, and technology investments
Key influence in driving long term strategy	
Qualitative	
Discovery of trending apps	ROI
Did it inform us of change in our industry?	Did we bring learnings back to the business?
What our BUs actually do with the startups	
Not measurable	
Exploration of and exposure to	
Dealflow, new business creation	Dealflow, new business creation
Strategy development	
Exposure to opportunities	
Number of deals analysed per year	
Identification of new trends	
TAM	
Identifying key trends to better position the corporate or one of our product line	Number of market trends identified
Quarterly reports to corporate parent	Number of internal presentations
Dealflow, number of investments, referrals of startups to business units	Dealflow
Internal reporting	
Mass market adoption	
Insight and guidance reporting	
Changes that influence product direction or discovering relevant technologies	Reviews of technology areas
Sharing of gathered knowledge within the corporation	
We don't	
Internal white paper and workshops	Internal white paper and workshops
Usefulness of intelligence vs other methods	Difficult to measure
Market penetration	
TAM, SAM, SOM validated	Potential market size
Network	Potential deals from network
Impact on strategic direction of business units	
Feedback from market experts	Qualitative
We gain insights based on sector/industry growth across verticals. For example, innovations in AR/VR are transforming sports by providing new immersive experiences.	Executive feedback on scorecare

How do you measure internal organisational innovation?	What KPIs do you use to measure internal organisational innovation?
Ability to access new technology or introduce new service	Number of new services, Capex and Opex reduction
Adoption, utilisation and/or commercial collaboration	
Projects testing innovative approaches	Projects, allocation of resources
Cooperaton startup w corporate	
Number of people exposed	
Internal survey	
E?ngagement with portfolio companies	
Qualitative	
None	None
Our responsiveness to the startup's timeline	Did we close the investment or commercial deal?
We have an incubation team that drives internal innovation	
Not measurable	
Senior management feedback	Volume
Subjective	
Adoption of innovation	New products/initiatives/pilot projects
Improved entrepreneurship in the company and product lines.	Number of new ideas, projects started in our product lines due to impact of startups
Number of internal events at corporate parent, number of internal mentions in company-wide newsletters, number of presentations to officer level, number of engagements with department leaders	Number of engagements with department leaders
Talent acquisition, secondment of employees into startups and accelerators	
Organisational structure fit to modern company	Less turnover
Openness to new technologies and working with startups	
New processes or innovative techniquest that are documented and have influenced the different departments within the corporation	
We don't	
Pipeline of opportunities with each business unit	Pipeline of opportunities with each business unit
Speed of new product/service development	Shortening of timecycles
Qualitative	
People engaged with the program	Number of people engaged
Management attention	Time with top management
Impact on strategic direction of business units	
Number of joined development agreements	Number of joined development agreements
Working with technology startups is a constant reminder of the fragility and promise of new businesses. It keeps us humble when we see what it takes to help a startup accelerate their progress. And it takes a lot more than money to win in business, whether it is the startup or the parent company	

How do you measure company profile/brand building (external)?	What KPIs do you use to measure company profile/brand building (external)?
PR related to innovation and starups ecosystem	Customers base growth
Subjective	
PR, media coverage	Media impressions
Reputation at startups	
Publications / recall	Count
Share of voice	
External survey	
Speaking engagements, publications and inbound investment opportunities	
Qualitative	
Brand value	Brand value
Improved dealflow and recognition of brand in investment ecosystem	Dealflow count
Logos, newsletters	
Marketing exposure	
Senior management feedback	Volume
Peers	
Trusted adviser to customers	
Major media mentions, awards, speaking engagements	Major media mentions and speaking engagements
CB Insights and other tech media references, invitations to major tech events of senior execs, articles on media outlets	
PR and speaking opportunities	
Founder branding	Media exposure
Percentage of deals we see that others have done	
View of the parent company as a creative and entrepreneurial organisation	
Number of press releases and positive news articles	
We don't	
	External recognition
PR impact – articles , press reception etc.	Number of positive articles
PR impact	
People attracted by the program	
Media recognition (international)	Number of interviews, articles
Social media hits, quality of recruiting, press mentions	
Dealflow (quantative)	Number of deals received / seen
We measure our share of voice relative to a peer group of VCs, and ad value delivered and share of voice for portfolio companies. Our belief is that greater visibility and brand association helps them win customers and attract and retain talent.	

Do you measure any other value drivers?	What KPIs do you use to measure other value drivers?
No	
We track the number of commercial contracts and relationships which originate through our structure	Number and value of commercial contracting
Internal acceptance of CVC activity	Company leadership publicly talking about CVC link to innovation
We have a strategic value framework that we map to	We have a strategic value framework that we map to
Growth rates, achieved turnover/margin per capital invested	Turnover/margin per capital invested
Spinouts – IRR	
Revenues to startups and to parent company	
Revenue generation in a new white space	Value or dollar revenue generation in new areas

UNIVERSITY AND GOVERNMENT VENTURING IN 2017

Thierry Heles, editor of Global University Venturing and Global Government Venturing

Global University Venturing's year in review

2017 has been a year of change – of positive change, for the most part, but also some shocking developments that took the technology transfer world by surprise.

Chief among the latter was the hostile takeover of Touchstone Innovations, the commercialisation firm spun out of Imperial College London, by its peer IP Group. The story began in May and came to a conclusion only in November after months of back and forth between Touchstone's board – which opposed the deal – and IP Group – which managed slowly but surely to convince enough shareholders until it could force a delisting.

More things are expected to change still. The UK government published its patient capital review consultation in August, calling for a bigger emphasis on generating unicorn companies – those worth at least $1bn – and businesses that grow into large corporates. Global University Venturing took an in-depth look at the government's startling figures at the time and, while several parts of the consultation were pointing in the right direction, some of the government's figures did not chime with data collected by GUV – in fact, the discrepancies were significant.

When the government subsequently released its Industrial Strategy document in November, reactions were mixed. For example, John Spindler, chief executive of Capital Enterprise – the umbrella group for universities, incubators and accelerators, non-profits and enterprise agencies in London – presented five points on how the plan could be improved in a guest comment on our sister site, Global Government Venturing.

Others were more upbeat. Tony Raven, chief executive of University of Cambridge's tech transfer office Cambridge Enterprise, told GUV that "it was not just a good year for Cambridge Enterprise, it was also a good year for UK university commercialisation overall", adding: "In October, the government announced its plan to put science, innovation and its translation at the heart of its industrial strategy. Increased funding for university-based R&D will mean greater opportunities for successful commercialisation. This is good news for us all."

Indeed, he said: "The 2017 financial year was an excellent year for Cambridge Enterprise. We raised £16.9m ($23m) in operating income from licensing and consultancy, signed 126 commercial and research licences and helped win £13m in translational funding for researchers.

"All told, we supported 1,714 researchers from across University of Cambridge. Our seed funds team made 17 investments totalling £5.2m. Our sister organisation, Cambridge Innovation Capital, committed £41m to investments in University of

Cambridge and Cambridge cluster companies."

The Industrial Strategy document also came as calls for regional university venture funds continued to grow louder – a topic debated at conferences such as UK-based professional association for public sector tech transfer staff PraxisUnico's annual gathering in June and in a September guest comment from Gregg Bayes-Brown, marketing and communications manager of University of Oxford's tech transfer arm Oxford University Innovation (OUI) and a former editor of GUV.

And in December, the first steps towards just such a vehicle were revealed when the universities of Aston, Birmingham, Cranfield, Keele, Leicester, Loughborough, Nottingham and Warwick joined forces for a unified intellectual property office – Midlands Innovation – with a view of bolstering the local ecosystem to the point where they can establish a $400m fund.

Midlands Innovation follows existing examples in mainland Europe, where Ghent University, research organisation Vito and the universities of Antwerp and Brussels collaborated in January to establish Qbic II, a $45m multi-university venture fund.

PraxisUnico, incidentally, also experienced a significant change. The association completed its merger with Auril, a professional association of tech transfer staff in the UK and Ireland, in October to form PraxisAuril. It was not the only one to rebrand. Edinburgh Research & Innovation, the tech transfer arm of University of Edinburgh, changed its name to Edinburgh Innovations in August.

Change abounded at the aforementioned OUI, too. Managing director Linda Naylor retired after 15 years of helping the tech transfer arm evolve as one of the true powerhouses in the university venturing ecosystem, growing from some 20 staff to nearly 100.

Naylor was replaced by Adam Stoten, in April, who accepted a promotion from head of technology transfer, life sciences, to the new position of chief operating officer. And in August, Paul Ashley and Brendan Ludden were named new heads of tech transfer at OUI, completing the process of putting a new management in place that began with the recruitment of Matt Perkins as chief executive in October 2016.

The rest of the world did not stand still, of course, and countless tech transfer offices gained new management – here is a selection of some of the most notable changes.

In April, Jay Schrankler was promoted to associate vice-president of technology commercialisation and new ventures at University of Minnesota. Working in its office for technology commercialisation, Schrankler was appointed executive director in 2007, having joined from industrials product manufacturer Honeywell.

Also in April, Jim O'Connell replaced David Day, outgoing director of technology transfer at University of Florida's office of technology licensing, who stood down after 16 years in the role. O'Connell, formerly the director of tech transfer at University of Miami, was hired as associate vice-president for commercialisation.

In May, Belgium-based life sciences research institute VIB promoted Els Beirnaert to head of new ventures. Beirnaert was previously senior manager of new ventures at the institute, a position she held for more than four years since joining in early 2013.

Yissum, the tech transfer office of Hebrew University, appointed Yaron Daniely as chief executive in June. Daniely had stepped down as CEO at cognitive therapeutics developer Alcobra the previous month before becoming company chairman.

Also in June, the technology development office of Boston University confirmed Mike Pratt as its managing director. Pratt had held the position in an interim capacity since August 2015. His appointment was partly recognition of his instrumental work in refocusing the office's goals as part of a critical review by the university's executive.

Jeremy Clay was appointed director of Mississippi State University's tech transfer office in July. Earlier that same month, Zachary Ellis, formerly manager for external innovation at beverage producer Pepsi, joined Ohio State University as director of new ventures.

Jason Salstrom, who previously led technology commercialisation efforts at University of Southern Indiana, joined Purdue@WestGate, Purdue University's outlet at WestGate Technology Park in August. Salstrom is in charge of all programs and activities conducted by the university's entrepreneurship hub Purdue Foundry and the Purdue office of technology commercialisation.

In September, Geisenheim University named Annette Reineke as its new vice-president of research, putting her in charge of tech transfer, research promotion and junior scientific staff with leadership of the PhD board. She replaced Manfred Großmann, who chose to step down from the position after three and a half years.

University venture funds, commercialisation firms and others were also busy hiring new staff.

StartX, the accelerator affiliated with Stanford University, promoted Joseph Huang to chief executive, replacing Cameron Teitelman, in March. Teitelman moved on to

chairman of the board, continuing his role on the StartX Fund and initiatives, including founder sourcing and admissions.

In May, US-based commercialisation firm Allied Minds confirmed Jill Smith as chief executive and president, following her appointment in an interim capacity in March when she replaced co-founder and CEO Chris Silva. Smith had been a non-executive director of Allied Minds since January 2016.

Two months later, Smith was joined by Simon Davidson as executive vice-president of technology investments. Davidson was previously a managing director responsible for east coast investments at In-Q-Tel, the investment affiliate of the US intelligence community. He had held that position for more than 10 years.

Uniseed, an Australia-based multi-university venturing fund, appointed tech entrepreneur Natasha Rawlings as an investment manager based in Sydney in October. Rawlings is now responsible for liaising with commercialisation staff at Australian-government owned research agency Commonwealth Scientific and Industrial Research Organisation (Csiro), University of Sydney and University of New South Wales, among other local institutions.

Also in October, University of Texas (UT) System's commercialisation vehicle Horizon Fund appointed Julie Goonewardene as chief innovation officer. Goonewardene took on the role while continuing as UT System's associate vice-chancellor for innovation and strategic investment, a position she has held since 2014, as well as chairman of UK-based diagnostics provider Diaceutics.

University System of Maryland (USM) named David Wise as director of its Maryland Momentum Fund, the $25m initiative that supports companies launched from USM's 12 institutions and its incubators. Wise joined USM at the end of July, having previously been chief executive of vaccine and vaccine delivery technology developer Pharos Biologicals.

And in November, IP Group named several members of its senior executive team to lead operations in Australia, where the firm established a subsidiary in May with a $200m commitment and signed agreements with nine universities across Australia and New Zealand. Mike Molinari was named managing director, working closely with Alistair McCreadie, appointed chief investment officer, Asia Pacific. The team also consists of Peter Grant, managing director for new business and partnerships for IP Group, who was previously appointed chairman of the Australian subsidiary.

Beyond the personnel changes, it was also a good year for university venture funds.

Jim Wilkinson, chief financial officer of Oxford Sciences Innovation, the university venture fund of University of Oxford, said: "Oxford Sciences Innovation has continued to attract investment and now has funds in excess of £600m.

"2017 saw the first series A investments, with Diffblue and Vaccitech the two most significant. The number of investments in the portfolio has continued to expand from 28 to 46. It is expected that 2018 will continue to see an increase in the portfolio and the further development of existing companies primarily through series A investments."

Change was a theme in some parts of Asia, too. One country that is likely to feature much more prominently in the university venturing world is South Korea, where the government has taken steps towards a range of initiatives and relaxed regulations it hopes will raise the local entrepreneurial spirit.

Hicheon Kim, professor of strategy and organisation and director of the Korea University Business School Startup Institute, took a closer look at these moves for GUV in a guest comment last month and was cautiously optimistic, noting that "it remains to be seen how the university innovation ecosystem will evolve and interact with the existing startup ecosystem".

One factor that will help South Korea in strengthening its ecosystem will undoubtedly be the partnership between Canada-based commercialisation firm Mars Innovation and South Korea government-affiliated institution Korean Health Industry Development Institute. Despite the early stages of this cooperation, Rafi Hofstein, president and chief

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Delivering on the promise of a digital world

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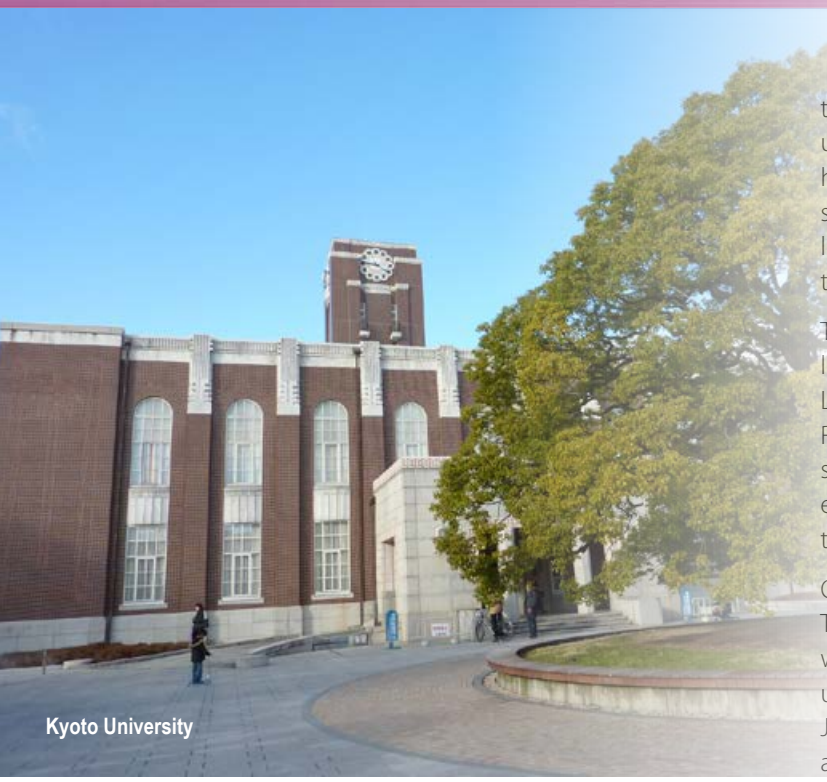
Kyoto University

executive of Mars Innovation, revealed in a guest comment in June that his organisation had already "been approached by several similar organisations in other countries interested to learn about our business model and possible cooperation".

This was not the only partnership agreement Mars Innovation signed in 2017. In September, it joined forces with drug discovery company Evotec to establish Lab150, an initiative to drive research translation for projects emerging from Mars's member institutions. The initiative was modelled on another partnership Evotec entered in 2016 – Lab282, which involves University of Oxford.

Elsewhere in Asia, Kyoto University continued to go from strength to strength. Koji Murota, president and chief executive of Kyoto University Innovation Capital (KU-iCap), the investment firm of Kyoto University, told Global University Venturing that KU-iCap dealt with the largest number of investments by a university VC in Japan in 2017. Looking ahead, he said: "In 2018, we plan to invest in about 10 deals. Our main targets are biotech ventures and materials."

Kyoto's successes do not mean others are far behind. UTokyo Innovation Platform, the venture capital arm of University of Tokyo, for example, backed a ¥1bn ($8.9m) first close for the seed stage-focused 360IP Japan Fund 1, which will support technology spinouts from domestic universities and research institutes, in October.

In China, spinouts from Tsinghua University's incubator X-Lab are set to gain access to $40m in funding from Future Planet Capital, a UK-based innovation platform that aims to secure tie-ups with what it regards as top-tier university programs across Asia, Europe and the US. X-Lab has generated 480 spinouts and supported 1,190 projects since it was launched in 2013. The partnership, signed late last month, will focus on the education, health and security technology sectors.

This was not the only UK-China tie-up last year, or indeed last month: Tsinghua also inked a deal with Imperial College London to seed a $300,000 vehicle – Tsinghua-Imperial Research and Innovation Fund – to back early-stage scientific research. The two institutions have pledged to expand the initiative "significantly" if it proves successful, though a hard cap was not disclosed.

On the other side of Asia, Technion–Israel Institute of Technology unveiled a $200m venture capital fund that will support spinouts and startups emerging from the university, as well as businesses launched by alumni, in June. The fund, whose management will be based in Israel and Hong Kong, is a joint venture between the university's non-profit subsidiary Technion Research and Development Foundation and UG Capital Management, the venture capital arm of fund management company UGI.

Change, big sums and intriguing initiatives also made headlines in the US. A prime example is the Engine, a program created by Massachusetts Institute of Technology (MIT) in October 2016 to drive commercialisation efforts of research-intensive innovations that have to date been unable to secure the necessary support and resources. The Engine raised a $150m fund in April – with MIT putting in $25m – before growing to $200m in September.

And Leslie Millar-Nicholson, director of MIT's technology licensing office (TLO), knows a thing or two about change. Giving the opening keynote speech at our GUV:Fusion conference last year, she faced an audience eager to learn what her vision was – she had taken over proceedings at the tech transfer office less than year earlier.

Having had some time to settle into her new job since her appointment and since GUV:Fusion, she said: "The 18 months since my arrival at the helm of MIT technology licensing office has gone like a whirlwind. From the initial six months of listening, observing and gathering data, to the subsequent 12 months of launching new initiatives, refining practices, hiring new staff and actively engaging with our stakeholders we are full steam ahead into 2018.

"Through the collective efforts of a talented and dedicated TLO staff, who were asked to participate in a myriad of change activities, we have managed to achieve so much to date. The following is a sampling – a revamped website, hired for the first time a communications officer who will

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KU Leuven

lead in the development of a TLO communications strategy, we launched our ready-to-sign licences, we have fully adopted an e-disclosure process, we hired a seasoned intellectual property (IP) attorney to lead a revamped patent management team to improve efficiency in our patent filing strategies, we made significant improvements to the professional development support for all staff, and we are in the early planning stages to replace our IP database.

"These and many other activities have occurred while the staff manage the constant stream of new technologies being disclosed by faculty and researchers, just under 800 in 2017, accompanied by the inevitable patent issuances (approximately 300), and licences and options (137), plus endless other tech transfer activities. And all of this alongside our support for the increasingly entrepreneurial research engagements our faculty undertake, such as through the MIT-IBM Watson AI Lab adding to the over $128m of industry funding received by MIT in 2017.

"Lastly, with MIT showing such leadership from the top on initiatives such as the Engine, our 2020 vision for technology transfer is very bright."

Countless other institutions across the US have also established new funds – ranging from smaller vehicles, such as University of California Riverside's $10m Highlander Venture Fund, launched in partnership with VC firm Vertical Venture Partners in July, and medium-sized initiatives such as Johns Hopkins University's and healthcare investment firm Deerfield Management's $65m commercialisation fund, Bluefield Innovations, established in November and aimed at the university's therapeutic research, to large programs such as the Pittsburgh Revolution Fund, which is targeting a $200m close to support drug research teams that will form spinouts from University of Pittsburgh, created in June.

What about European universities, often seen as being in desperate need of catching up to their peers in the US? Change is afoot here, too.

Mars Innovation was not the only one to see the Lab282 model and be inspired – in Italy, investment firm Aurora-TT was launched with plans in May to boost the transfer of biotechnology research at universities in the country. To achieve this, the firm is raising a $55m fund from backers such as the European Investment Fund, an EU-owned agency responsible for providing funding to small and medium-sized enterprises. Aurora-TT and its fund marks the first time such an effort is being made in Italy, where technology transfer remains in its infancy. The firm said it had been met with enthusiasm by universities and their tech transfer offices.

It was in Belgium – where nanoelectronics research institute Imec launched early-stage venture capital fund Imec.xpand with a target size of 114m to $136m in June – where news agency Reuters found the most innovative university in Europe in a ranking published in October – KU Leuven.

Paul Van Dun, general manager of KU Leuven's tech transfer office, said: "We were happy to be ranked, for the second year in a row, as the number-one university in Europe

on the Reuters ranking, and number five worldwide. This ranking of the most innovative universities gives an indication of those universities that succeed best in bringing the research results to the market."

Even beyond this recognition, it was a great year for KU Leuven. Van Dun added: "In 2017 we concluded more than 2,000 new agreements, we were involved in a wide variety of societal relevant issues, from the development of sustainable materials, the reduction of poverty, to a new drug for difficult-to-treat epilepsies that will be launched shortly. Many dozens of millions of euro capital were raised by spinouts from our university."

The rest of Europe has been busy as well. The government of Austria launched Spin-Off Austria, an $18m initiative that will initially function as a fellowship program to support academics looking to set up spinouts, in September.

Germany's Federal Ministry of Education and Research's Innovative Hochschule initiative announced the first batch of universities to receive funding that will support technology transfer efforts in July. A total of 48 institutions out of 118 applicants have been allocated cash and will receive the money over the course of five years beginning this year.

In France, University of Paris-Saclay launched a $53m seed fund in January. The institution remains a project unique in scope and scale both in France and internationally. It unites 18 institutions comprising two universities, nine grandes écoles and seven research organisations, many of which have a long history as autonomous entities.

In Ireland, the Technology Transfer Strengthening Initiative, a program introduced by government-owned export credit agency Enterprise Ireland and managed by Knowledge Transfer Ireland (KTI), received a $37m boost from Enterprise Ireland in January. If figures released by KTI in June are anything to go by, that decision was more than justified – Irish institutions generated 28 new spinouts in 2016.

Finally, down-under also made great strides. Apart from IP Group launching its aforementioned subsidiary in Australia, other projects included University of Melbourne and RMIT University joining a consortium of backers of an incubator and accelerator in the city of Melbourne with $64m in funding in September.

Uniseed, the venture fund backed by four Australian universities and research institute Csiro, announced a $15m fund in March aimed at existing portfolio companies. Melbourne, Sydney, New South Wales and Queensland universities are each set to provide $3.75m to the fund over the next 10 years.

The university venturing ecosystem continues to be largely unaffected by the geopolitical realities of the late 2010s. And the majority of changes that are coming will largely revolve around staying competitive – or marching to the top of the table. But with 2018 being the last year that UK universities are guaranteed to have full access to their European counterparts for research collaboration, it will be interesting to see what, if any, other changes will occur over the coming 12 months.

Global Government Venturing

Global Government Venturing's year in review

For all the geopolitical upset in the world, countless governments found a lot of time to double down on – or get involved in – the venturing space in 2017.

The timing was right, therefore, for Global Government Venturing to launch its Leadership Society at the annual Global Corporate Venturing & Innovation Summit in January, with delegates from countries such as Austria, Australia, Belgium, Brazil, Canada, China, Finland, Germany, Ghana, the Netherlands, Russia, the UK and the US, states such as California and institutions including the UN.

Indeed, Global Government Venturing tracked more than 265 funds last year – many of them new vehicles, though some existing initiatives also boosted their capital. If that seems like a lot of funds, it is – in fact, it is approximately a 33% rise on 2016, when this publication tracked just over 200 funds.

There were the usual actors, of course, such as Canada, where BDC Capital, the investment arm of state-owned financial institution Business Development Bank of Canada, confirmed a budget of $55m for investments in women-led technology companies in November – extending a program first launched the previous year.

Alberta Enterprise, the investment arm of the provincial government of Alberta, committed $10m to the first close of the $135m Yaletown Innovation Growth Fund, managed by Canada-based investment firm Yaletown Partners, also in November, while the province of Ontario committed $42m to be managed by venture capital funds for the clean technology sector in February.

VC firm ScaleUp Ventures, meanwhile, achieved the final close of its inaugural fund at $82m with the backing of the British Columbia government-owned BC Tech Fund in September.

In May, BDC Capital also turned its attention to Canada's four Atlantic provinces, Nova Scotia, New Brunswick, Quebec, and Newfoundland and Labrador, announcing a $200m fund aimed at businesses in that region to be committed over two years.

Another province that gained more of a focus this past year was Prince Edward Island, where in August the local government committed $2m to a $4m investment fund being raised by Island Capital Partners to support the local ecosystem.

The strength of Canada's ecosystem did not pass by Temasek, the investment firm owned by the government of Singapore, which was one of more than 60 limited partners backing a $140m fundraising effort by venture capital firm Real Ventures. BDC Capital and internet company Tencent also put their weight behind that vehicle, raised a month ago.

Temasek was busy closer to home, too. When VC firm Wavemaker Partners closed its $66m Southeast Asia-focused fund in October, Temasek was one of the limited partners, alongside the International Finance Corporation, the private sector-focused arm of multilateral financial institution World Bank.

In August, Vertex Ventures, Temasek's VC arm, raised more than $150m for its third fund aimed at Southeast Asia and India. The firm had already announced in June it was planning two new funds focused on Israel and US-based companies.

Heliconia Capital Management, a wholly-owned investment subsidiary of Temasek, unveiled a $422m vehicle that will co-invest with corporates in February, followed by the government of Singapore announcing in May that it was launching a $718m fund to assist businesses with development and overseas expansion as part of an effort to drive economic growth.

And Spring Singapore, a government agency responsible for assisting domestic small and medium-sized enterprises, launched a $72.8m fund aimed at technology startups in July.

China continued to claim big numbers in 2017 – so much so that even focusing on the $1bn-plus funds would justify a separate article.

Tianjin's municipal government launched the Tianjin Haihe Industry Fund, a $17.4bn government guidance fund, in April. The cash will be deployed in various subsidiary funds targeting several sectors, with the subsidiary funds expected to leverage a total of $77bn in private sector capital.

Sovereign wealth fund China Investment Corporation (CIC) and US-based investment bank Goldman Sachs revealed plans in November for a $5bn private equity fund aimed at promoting US-based exporters to China.

Russian sovereign wealth vehicle the Russian Direct Investment Fund (RDIF), and CIC agreed in July to invest an additional $1bn in their joint venture the Russia-China Investment Fund.

Russia upped its game elsewhere, too. Regional investment arm Far East Development Fund, fund of funds RVC and nanotech commercialisation fund Rusnano agreed to launch the $175m Far East High Tech Development and Implementation Fund to back technology businesses in the Russian Far East in November.

Government-owned development bank Vnesheconombank signed a memorandum of understanding with India-based infrastructure finance provider Srei Infrastructure Finance to create a $200m IT and innovation fund in June, while the RDIF and Japanese government-owned export credit agency Japan Bank for International Cooperation joined forces for a $900m fund in May.

The St Petersburg city government established a $4m venture fund aimed at local IT and light industry startups. And Russia was one of several countries to reach for the stars – in September, space agency Roscosmos established a venture capital fund to commercialise inventions from the space ecosystem.

Another country hoping to get in on the space action was the UK, whose British Business Bank backed a $95m space technology fund in September along with the European Space Agency. And Saudi Arabian state-owned Public Investment Fund (PIF) put a total of $1bn into Virgin Galactic, Spaceship Company and Virgin Orbit in October.

In November, the government of South Korea unveiled plans for a $9bn investment fund to join investors backing South Korea-based startups over the next three years, adding to an initiative by Korea Venture Investment Corp (KVIC), a state-backed fund-of-funds management firm, which committed $8m to a $20m fund run by Mexico-based VC firm Angel Ventures that same month.

KVIC also launched an investment fund with Applied Ventures, the corporate venturing unit formed by materials engineering technology provider Applied Materials, in June. A regulatory filing indicated the partners were looking to raise $40m.

In April, South Korea's Ministry of Science, ICT and Future Planning said it would set up a $102m fund for startups and VC firms in the biotechnology sector.

India, too, remained a strong player in government venturing. The government of the Indian state of Karnataka said in October it would invest $6.1bn in a new hub designed to support India-based artificial intelligence and data science startups.

The Indian state of Kerala launched a fundraising effort to secure $78m for early-stage investment, while a range of state-owned institutions – including Small Industries Development Bank of India and National Bank for Agriculture and Rural Development as well as UK development institution CDC – backed a $95m first close for the sixth fund of Aavishkaar Venture Management Services, the impact venture arm of investment firm Aavishkaar-Intellecap in November.

The state of Tamil Nadu, meanwhile, said it would establish a $78m venture capital fund in April. And the government of Karnataka launched a $1.5m proof-of-concept fund aimed at women entrepreneurs in March, an idea replicated by the states of Telangana and Rajasthan in December.

Elsewhere in Asia, the government of Hong Kong launched its $256m Innovation and Technology Venture Fund in September, inviting venture capital firms to become co-investors. The fund's launch had been awaited since July, when Anne Choi, commissioner of information and technology, said at the Hong Kong Venture Capital Association's VC Forum that it was due to go live "in a matter of weeks" after several years of development.

Arab countries, which in 2016 made headlines when the PIF committed $45bn to the SoftBank Vision Fund, made new commitments to funds. One of these was the Oman Investment Fund, the venturing arm of the Omani government, which became an anchor investor in a $15m fund established by VC firm 500 Startups in May. The fund will invest exclusively in startups based in the Middle East and North Africa.

Bahrain's sovereign wealth fund, Mumtalakat, meanwhile showed an interest in investing in the aforementioned SoftBank Vision Fund in October. The vehicle, which is targeting a $100bn close, had secured $97.7bn by the end of the third quarter.

A range of countries that rarely appear on GGV's radar gave a boost to their local ecosystems, too, such as Thailand, which announced a $147m fund aimed at the domestic digital economy sector in June.

In November, several Iranian ministries and councils prepared to launch separate VC funds as part of the country's bid to build a knowledge-based economy. Each fund will be supported by government-backed investment arm the Innovation and Prosperity Fund.

There were other, more unusual funds. Mossad, the intelligence agency of Israel, created an investment fund aimed at domestic startups in June, with France's Ministry of the Armed Forces and public investment bank BPIFrance following with a $59m fund, Definvest, in November.

Ras Al Khaimah Police, the police force of the emirate, launched an investment fund targeting the policing and technological security industries in June.

The government of Nigeria launched a $1m venture capital fund aimed at startups in the creative economy in July, while the government of Ghana relaunched its scandal-hit Venture Capital Trust Fund with $50m in capital and a new management board charged with driving the country's ecosystem for small and medium-sized enterprises.

And things ticked along smoothly in Australia. The state government of New South Wales, for example, partnered non-profit pension fund First State Super and private equity firm ROC Partners to launch a $118m investment vehicle in

October, while Queensland decided to put another $8.3m into its Business Development Fund in June.

In neighbouring New Zealand, government-owned investment firm New Zealand Venture Investment Fund received permission to invest up to $1.1m in startups through its Seed Co-Investment Fund – double the previous limit – in August.

On the other side of the Pacific in July, Chile, Colombia, Mexico and Peru revealed plans to secure a $120m fund to invest in entrepreneurial projects across the four countries. The four nations have been partners since 2011, when they formed the Pacific Alliance with the aim of creating deeply integrated economies that provide free movement of goods, capital, people and economy.

In December, Chile's economic development agency Corfo also injected $6m into the $8m Chile Outlier Seed Fund I, aimed at software companies in the south of the country, while the government of Mexico invested $4.1m in three agtech-focused venture capital funds to help grow Mexico's agricultural technology ecosystem in September.

Other parts of the continent were not far behind. BNDES, Brazil's economic development bank, said it was going to launch two funds aimed at growing the internet of things ecosystem in November.

The Multilateral Investment Fund, an investment arm of development finance institution Inter-American Development Bank, committed $5m to Argentina-based accelerator NXTP Labs' $120m impact fund in November – other limited partners have yet to be named.

Argentina also launched three venture funds with $12m in state funding in December to be managed by Mexico-based Jaguar Ventures and Drayper Cygnus, and NXTP Labs – all three funds are set to gain an additional $18m each from private investors.

And the Bahamas government-backed Bahamas Entrepreneurial Venture Fund received a $5m one-off capital injection from the public purse to help meet its backlog of funding applications in June.

In the US, new funds were few and far between, belying a flurry of investment activity, as the country remains one of the strongest players thanks to organisations such as In-Q-Tel, the investment firm affiliated with the intelligence community.

Nevertheless, some new vehicles did appear. Fintech-focused venture capital firm TTV Capital, for example, closed a $93m fund backed by Invest Georgia, a long-term investment program supported by the US state of Georgia, in March, while the US city of Pittsburgh in September began looking into establishing its own fund to support startups, revitalise deprived districts and prepare Pittsburgh to churn out autonomous vehicles.

Across Europe, funds were raised at a much more prolific rate. Portuguese government-owned financial company Instituição Financeira de Desenvolvimento and Vesalius Biocapital agreed to a $77.4m partnership targeting Portugal-based life sciences companies in September.

The UK-focused $132m Nobel Sustainability Growth Fund was launched in November with support from state-owned Constitutional Reserve Fund of Monaco and investment syndicate Set3 via the Nobel Sustainability Fund.

And France made headlines with president Emmanuel Macron outlining his vision for the future of Europe and ambitious plans for a $12bn innovation fund – though the figure was slightly less impressive when the plans were picked apart in a Global Government Venturing editorial in September.

The following month, EU-owned financial institution

European Investment Bank (EIB) backed a close of $103m for Italia Venture I Fund, an Italy-based public-private partnership managed by Italian government-owned firm Invitalia Ventures, while its European Investment Fund (EIF) put its weight behind a wide range of funds, such as one created in May in partnership with Tekes, the Finnish state-owned innovation funding agency, to bolster angel investors in Finland with $33m.

The EIF's commitments across Europe came as the fund decided in May to halt investments in the UK following the country's decision to leave the EU. In January, the EIB itself had already informed the government of Northern Ireland it would not be backing its investment fund. That meant the UK government had to step up its own efforts, and in December the British Business Bank invested in the $81m Enterprise Capital Fund raised by VC firm Episode 1.

Scotland on the other hand still managed to get the EIF's cash for a $250m fund in June – only a couple of months before the EIF retreated from other opportunities the UK. And the Welsh government finally launched its Development Bank of Wales in October with a $580m budget.

Things were rosier in the Republic of Ireland. Between a flurry of vehicles launched and backed by export credit agency Enterprise Ireland and sovereign wealth fund Ireland Strategic Investment Fund, the country's startups should face little to no funding worries this year.

In Sweden, SamInvest, a VC arm of Sweden state-owned investment fund Almi Företagspartner, contributed to the $119m first fund for Norway-based life sciences-focused venture capital firm Hadean Ventures.

In the Netherlands, the ministries for Foreign Affairs, Finance, and Foreign Trade and Development Cooperation jointly announced $2.1bn government venturing fund Invest-NL in February, adding to the city of Rotterdam investiment a month earlier in Icos Capital Fund III, a $52m cleantech and sustainability-focused vehicle created by domestic venture capital firm Icos Capital.

In September, the Netherlands government-owned Dutch Investment Agency and the EIF committed $117.7m to the Dutch Growth Co-Investment Program, a fund targeting growth-stage startups.

In neighbouring Belgium, investment firm Fortino Capital Partners achieved a $150m first close of its $240m Fortino Capital II Growth fund in December with Flemish government-owned investment firm PMV as a cornerstone investor. Insurance provider AG Insurance also signed up as a cornerstone investor, as did financial services firms BNP Paribas Fortis and Belfius.

Germany, where public-private partnership High-Tech Gründerfonds (HTGF) celebrated a $275m first close of its third fund in May, also marched on, as HTGF III added a seven-figure commitment from RWE Generation, the power production arm of energy firm RWE, in October, and another seven-figure sum from Ewe, a local government-run energy and telecoms utility, in November.

Other areas of Europe also received cash. Western NIS Enterprise Fund, an investment vehicle backed by the government-owned foreign aid agency US Agency for International Development, in December launched U.Ventures, a fund focused on early-stage technology businesses based in Ukraine and Moldova – two countries that have seldom appeared on GGV's radar.

The government of Hungary supplied an additional $31m to its Széchenyi Venture Capital Fund and extended the fund's lifetime to the end of 2025, with the deadline for exits extended to 2030.

Greece launched a call for financial institutions and private investors to participate in its VC fund Equifund in February. The fund has received $214m in public funding through the EU initiative Competitiveness, Entrepreneurship and Innovation, a part of the National Strategic Reference Framework 2014-20 program, having been established at the very end of 2016. The vehicle is expected to leverage more than $1.2bn in total funding – a substantial figure for an economy that continues to suffer from the aftershocks of the 2008 global recession.

The question now, of course, is whether governments will be able to keep up this momentum heading into 2018. The odds, it would seem, are in startups' favour everywhere – and Global Government Venturing will be here to keep track of it.

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