



Vertex Holdings

Investing in the Digital Economy: Connecting Countries, Industries & Firms

October 2018





01 | Overview of Vertex

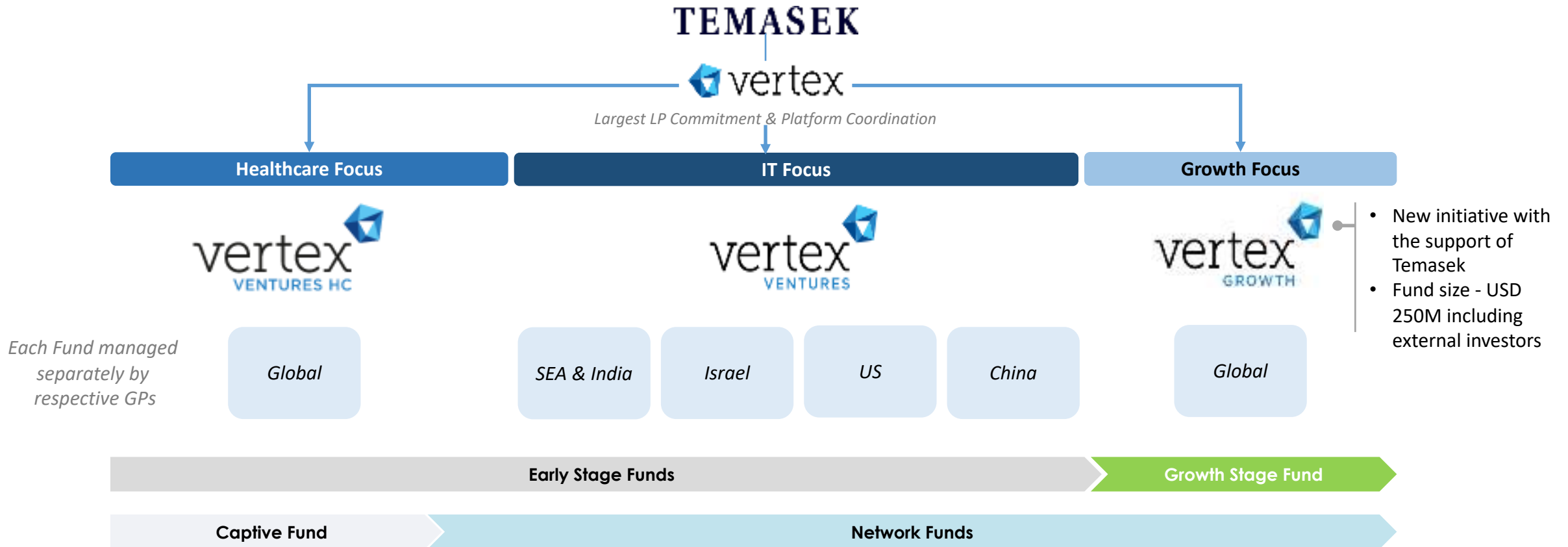
02 | Key Trends

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01 | Overview of Vertex

Organization Structure

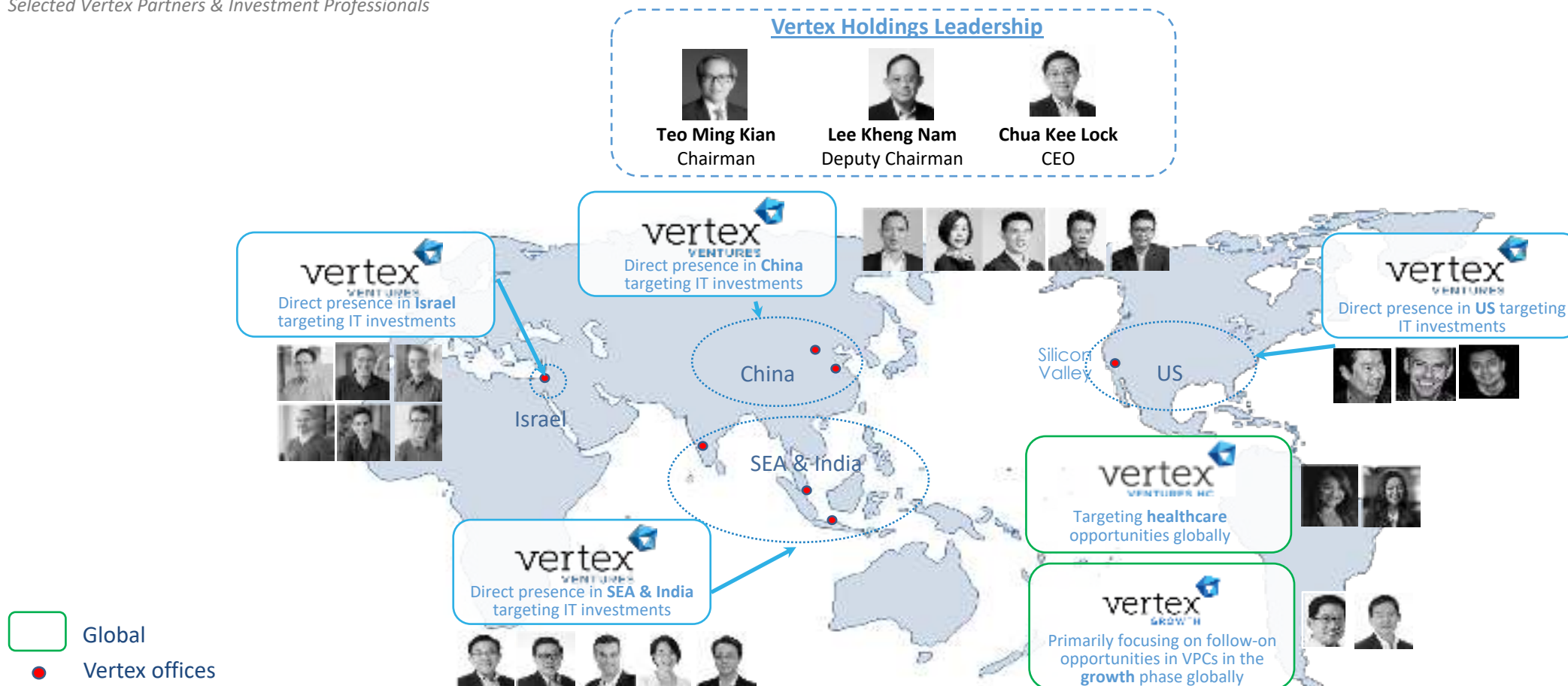


01 | Overview of Vertex

Global platform with strategic presence

- Global VC franchise comprising **5 early-stage** focused funds and **1 growth-stage** focused fund
- Investing in **technology** and **healthcare** opportunities in the most important innovation hubs globally
- **43 VC professionals** with in-depth local knowledge and relationship networks

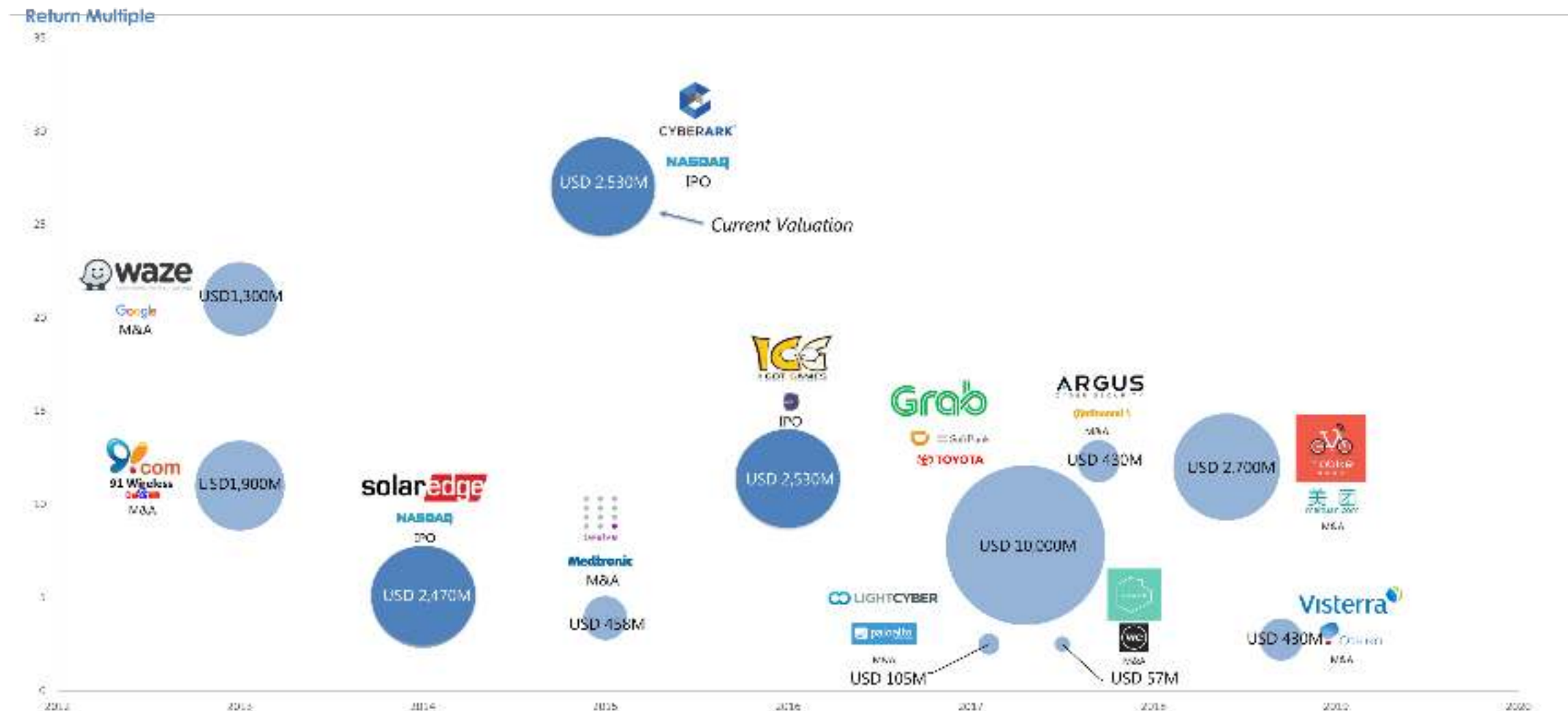
Selected Vertex Partners & Investment Professionals



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Investment highlights – outsized exits

Outsized exits: Demonstrated track record of investing into disruptive startups and delivering substantial returns



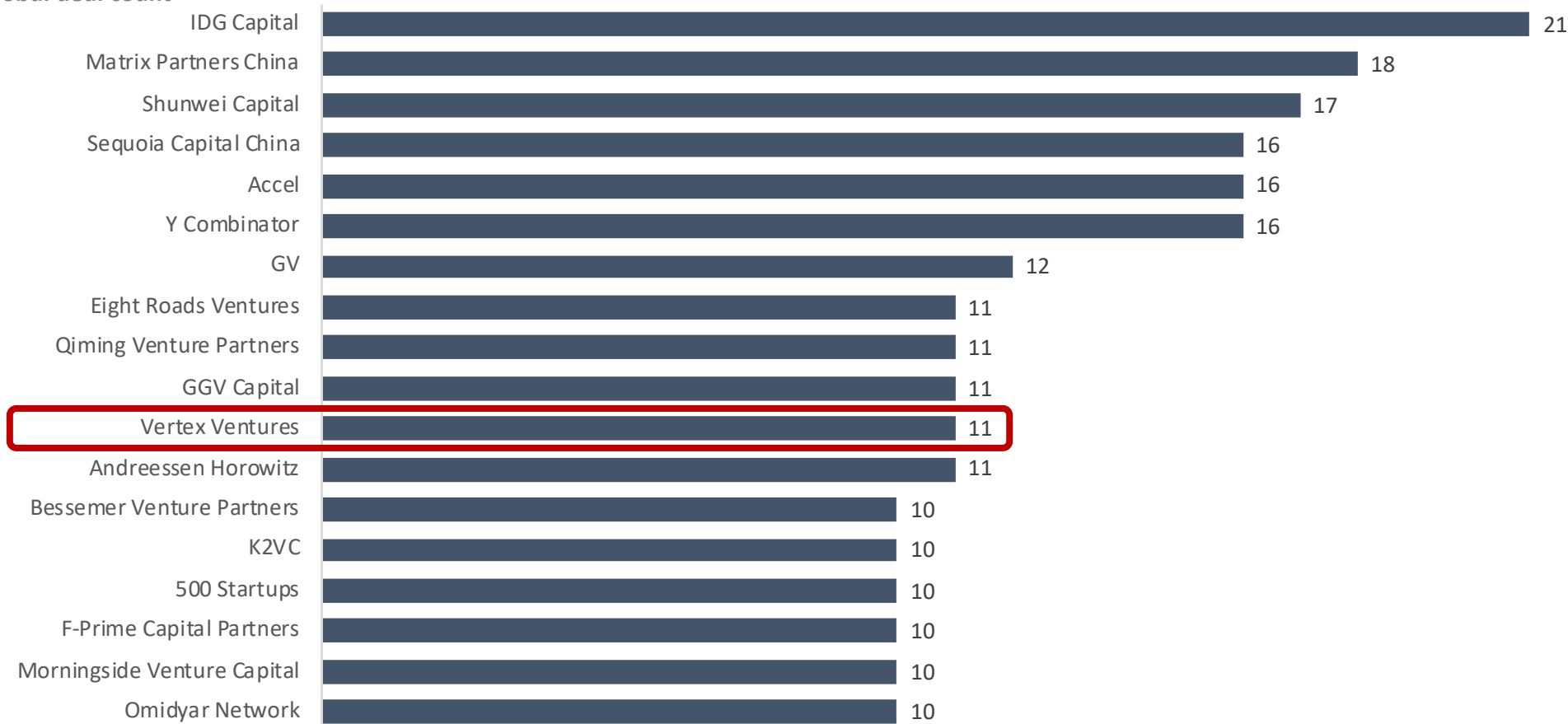
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Investment highlights – one of the global lead VCs

Recognized as one of the most active global VC lead investors

Active lead investors in Q3 2018

Global deal count





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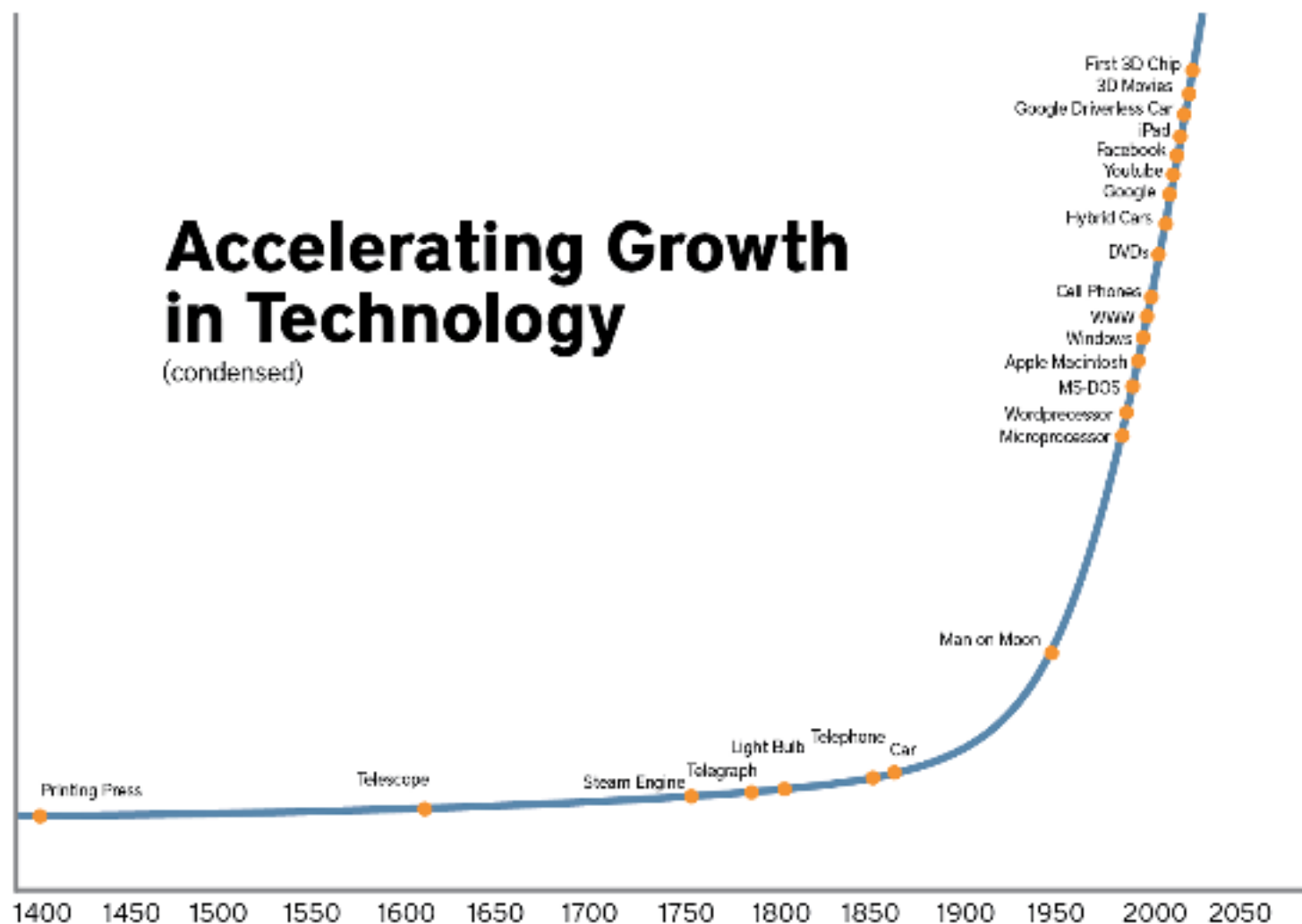
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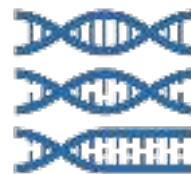
02 | Key Trends

The pace of technological change is accelerating with new technologies introduced in shorter time(s)



02 | Key Trends

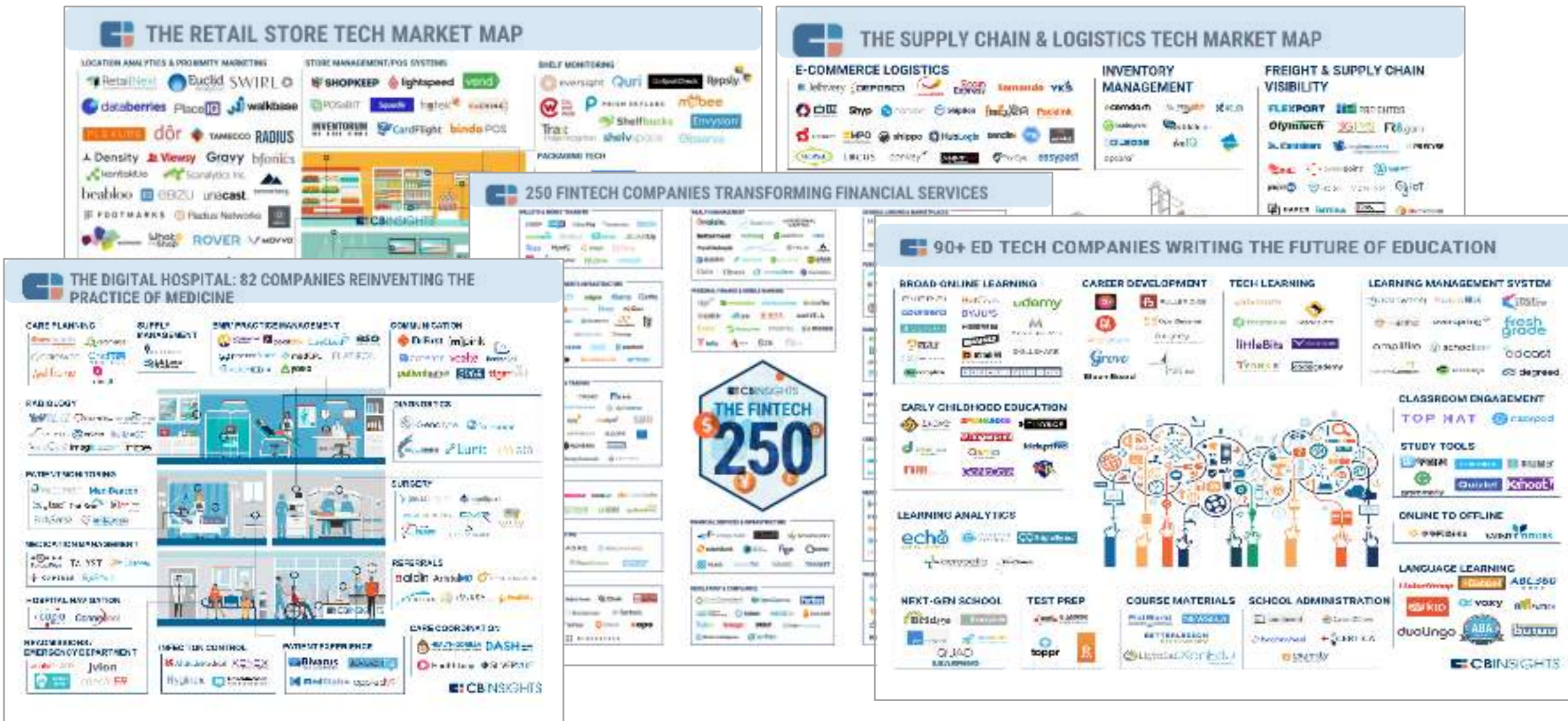
This is driving the rapid cost decline for various emerging technologies



Drones (Cost per Unit)	3D Printing (Average Cost)	Industrial Robots	DNA Sequencing	Solar Power (Cost per kWh)	Sensors (3D LiDAR)	Smartphones
2007: USD 100K	2007: USD 40K	2007: USD 550K	1984: USD 10M	2009: USD 30	2009: USD 30K	2007: USD 499
2013: USD 700	2014: USD 100	2014: USD 20K	2014: USD 1K	2014: USD 0.16	2014: USD 80	2015: USD 100

02 | Key Trends

Pointing to industry convergence as the world becomes increasingly digitized and connected



02 | Key Trends

Reshaping conventional notions about how businesses are structured

The Uber logo, consisting of the word "Uber" in a bold, black, sans-serif font.

the world's largest ride hailing company, **owns no vehicles**



the world's most popular media owner, **creates no content**



the most valuable retailer, **has no inventory**

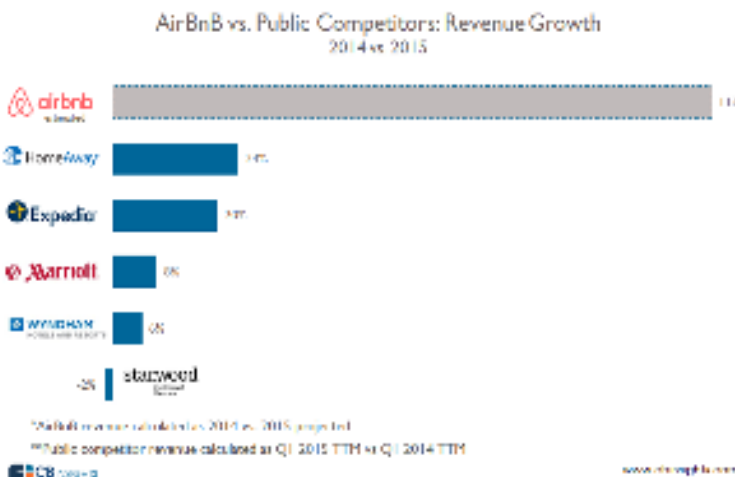


the world's largest accommodation provider, **owns no real estate**

02 | Key Trends

Spawning new startups with business models that avail faster growth, greater scale and higher valuations

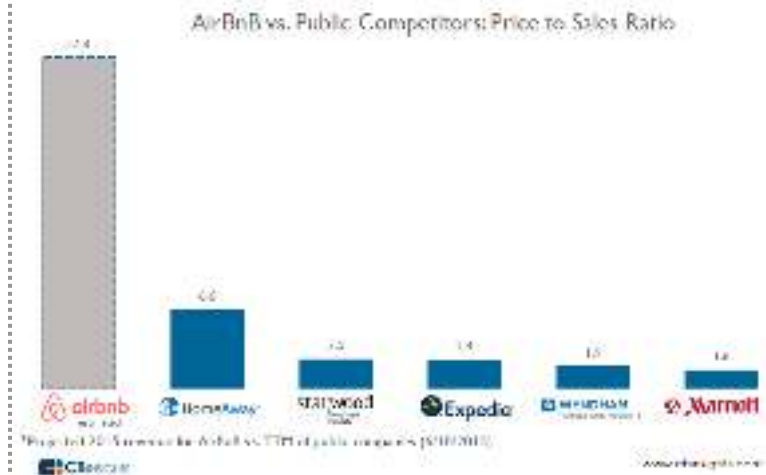
For instance, AirBnB has a **higher revenue growth rate** than its publicly listed peers



It is the **largest lodging company** by rooms, with more rooms than Marriott, Starwood and Hilton Worldwide *combined*.

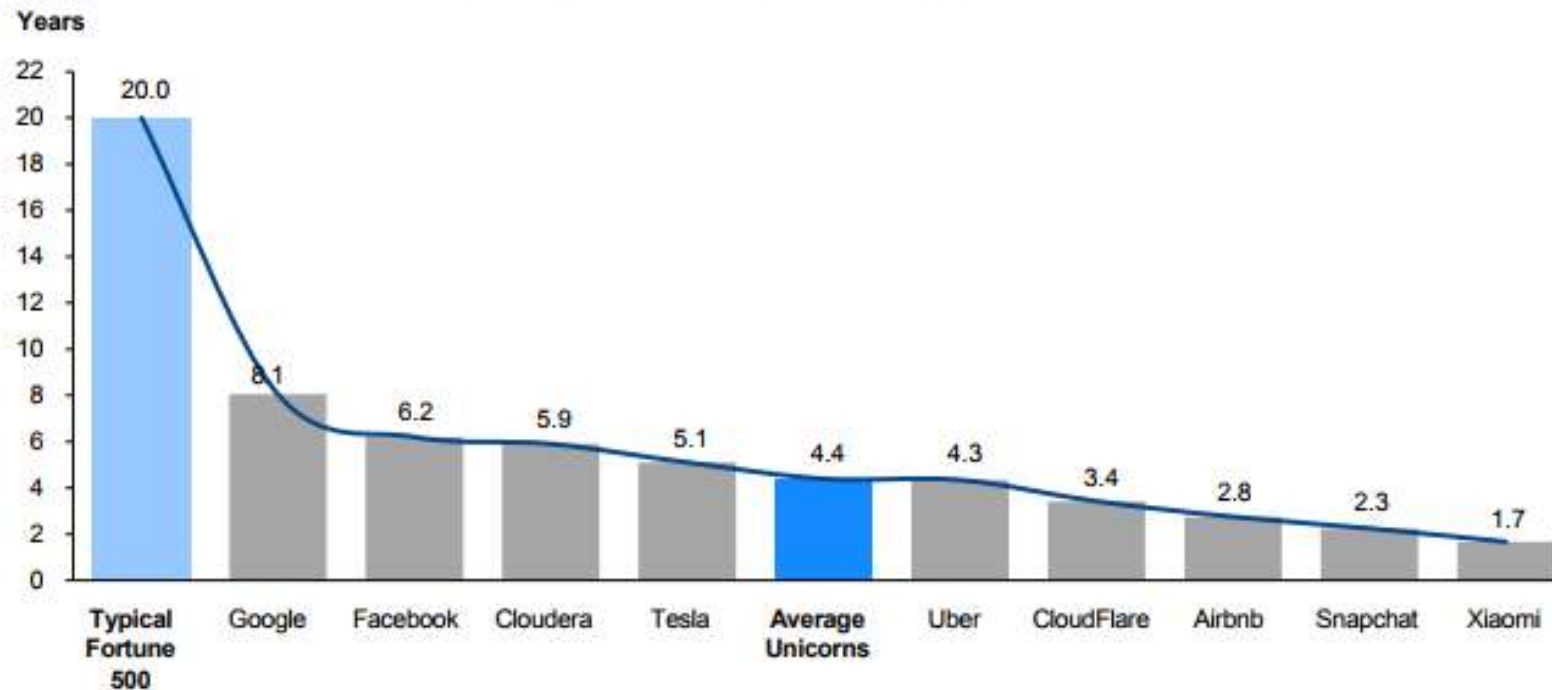


Sporting **higher valuations** than its public competitors



02 | Key Trends

....and becoming unicorns faster than the typical Fortune 500 company. An investment opportunity?





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03 | Investment Approach










An Overview

We seek to invest in **disruptive, transformational enterprises** with potential to become **global leaders**

Stage Focus	<i>Series</i>	<ul style="list-style-type: none">Primarily Series A, typically with follow-on and some capital deployed at Series B
	<i>Size</i>	<ul style="list-style-type: none">USD 1M – USD 8M
Value Creation	<ul style="list-style-type: none">Active investor with board representationProvide operational support in talent recruitment & business developmentSupport fundraising for Vertex portfolio companies via follow-on investments from our network of co-investorsLeverage Vertex & Temasek network to drive global expansion, partnerships & exits	



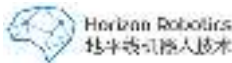
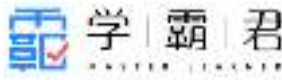


03 | Investment Approach

SEA & India - IT

Sector Focus	Consumer Internet	Fintech	Enterprise
Trends	<ul style="list-style-type: none"> SEA: ~300M monthly active users with the economy expected to exceed USD 200B by 2025 India: ~450M internet users with the economy expected to reach USD 250B by 2020 	<ul style="list-style-type: none"> SEA: Rising need to serve the underbanked, 73% of 650M total population India: digital payment transactions grew to INR 2,295T in 2017 with encouragement from government initiatives 	<ul style="list-style-type: none"> SEA: Enterprise tech spending is expected to total ~USD 62B in 2018 India: Enterprise deep tech was the only theme that saw increase in investment activity from 12 in 2016 to 23 in 2017
Selected Portfolio Companies	<div>  <p>India's largest mother and child omni-channel commerce company</p> </div> <div>  <p>Mobile app that offers a wide range of transport, logistics and payment solutions</p> </div> <div>  <p>Social and community platform for events ticketing and merchandise</p> </div>	<div>  <p>Provides lower cost remittance services than traditional banks</p> </div> <div>  <p>Online financing marketplace to help SMEs to secure financing from accredited investors</p> </div> <div>  <p>Leverages proprietary credit scoring to provide consumer loans to university students</p> </div>	<div>  <p>Provides customer experience management, creates customizable omni-channel surveys in time</p> </div> <div>  <p>Leading data platform for intellectual property analysis & management</p> </div> <div>  <p>AI platform for conversational banking and virtual personal assistants</p> </div>







03 | Investment Approach

China - IT

Sector Focus	Consumption Upgrade	Artificial Intelligence	Deep Tech
Trends	<ul style="list-style-type: none"> Household consumption is estimated to reach RMB 56T within the decade, powered by a growing middle class that will represent ~65% of households 	<ul style="list-style-type: none"> AI positioned as a strategic priority and the Chinese government plans to create a USD 150B AI industry by 2030 	<ul style="list-style-type: none"> Shenzhen is electronics manufacturing hub of the world, making 90% of world's electronics
Selected Portfolio Companies	<div>  <p><i>O2O spectacles brand owner & distributor</i></p> </div> <div>  <p><i>Designs and sells entry level high heels</i></p> </div>	<div>  <p><i>Integrated and open embedded AI solutions</i></p> </div> <div>  <p><i>Online solution to assist K12 students in their work using deep learning technologies</i></p> </div>	<div>  <p><i>Design & manufacture next gen lithium batteries</i></p> </div> <div>  <p><i>Designs & manufactures robots or logistics automation</i></p> </div>






03 | Investment Approach

Israel - IT

Sector Focus	Cybersecurity	Automotive	Enterprise
Trends	<ul style="list-style-type: none"> Created 300+ cybersecurity startups Exported USD 6.5B in cybersecurity products in 2017 	<ul style="list-style-type: none"> With more than 500 startups working in the automotive industry, Israel is at the forefront of driverless vehicle innovation 	<ul style="list-style-type: none"> Continued development of the cloud ecosystem with emergence of new approaches and services has seen a wave of Israeli companies tackling issues in this space
Selected Portfolio Companies	<div>  <p><i>Railway cybersecurity solutions to protect critical infrastructure</i></p> </div> <div>  <p><i>Industrial cybersecurity company which helps companies protect their SCADA networks</i></p> </div>	<div>  <p><i>Cutting edge LiDAR remote sensing solution</i></p> </div> <div>  <p><i>AI-based solutions to plan, manage and optimize smart mobility services and autonomous vehicles</i></p> </div>	<div>  <p><i>SaaS company delivering end-to-end platform for personalization</i></p> </div> <div>  <p><i>Cloud workload management software</i></p> </div>





03 | Investment Approach

United States - IT

Sector Focus	Intelligent Applications	Enterprise	Industry 4.0
Trends	<ul style="list-style-type: none"> This market is predicted to reach USD 123B by 2023, with North America leading the way By 2030, up to 73M jobs in US could be automated 	<ul style="list-style-type: none"> North America is expected to lead the world in the growth of digital assets and enterprise data management markets in next 5years 	<ul style="list-style-type: none"> Seen as the way to revitalize the US manufacturing sector, which is the second largest in the world
Selected Portfolio Companies	<div>  <div>Offline traffic retail analytics solution</div> </div> <div>  <div>Feature management platform to help software teams build better software, faster</div> </div>	<div>  <div>Prevents automated attacks by detecting and protecting against malicious web behavior</div> </div> <div>  <div>Customize data storage in the cloud</div> </div>	<div>  <div>3D metal printing systems which cover the full product life cycle</div> </div>

03 | Investment Approach

Global - Healthcare

Sector Focus	Biotech	Medical Devices
Trends	<ul style="list-style-type: none"> Median deal size from new investment round from active investors has increased 40% over 2015 Immuno-oncology investing comprises 1/3 of series A funding 	<ul style="list-style-type: none"> Cardiovascular was ranked the top indication for device exits 19 M&As and 1 IPO between 2013 and 2017
Selected Portfolio Companies	<div>  <p><i>Development of first-in-class medicines to treat cancer and other debilitating diseases</i></p> </div> <div>  <p><i>Development of first-in-class antibodies targeting the innate immune system</i></p> </div>	<div>  <p><i>Development of new and innovative solutions for glaucoma</i></p> </div> <div>  <p><i>Development of novel catheter-based system for COPD</i></p> </div>



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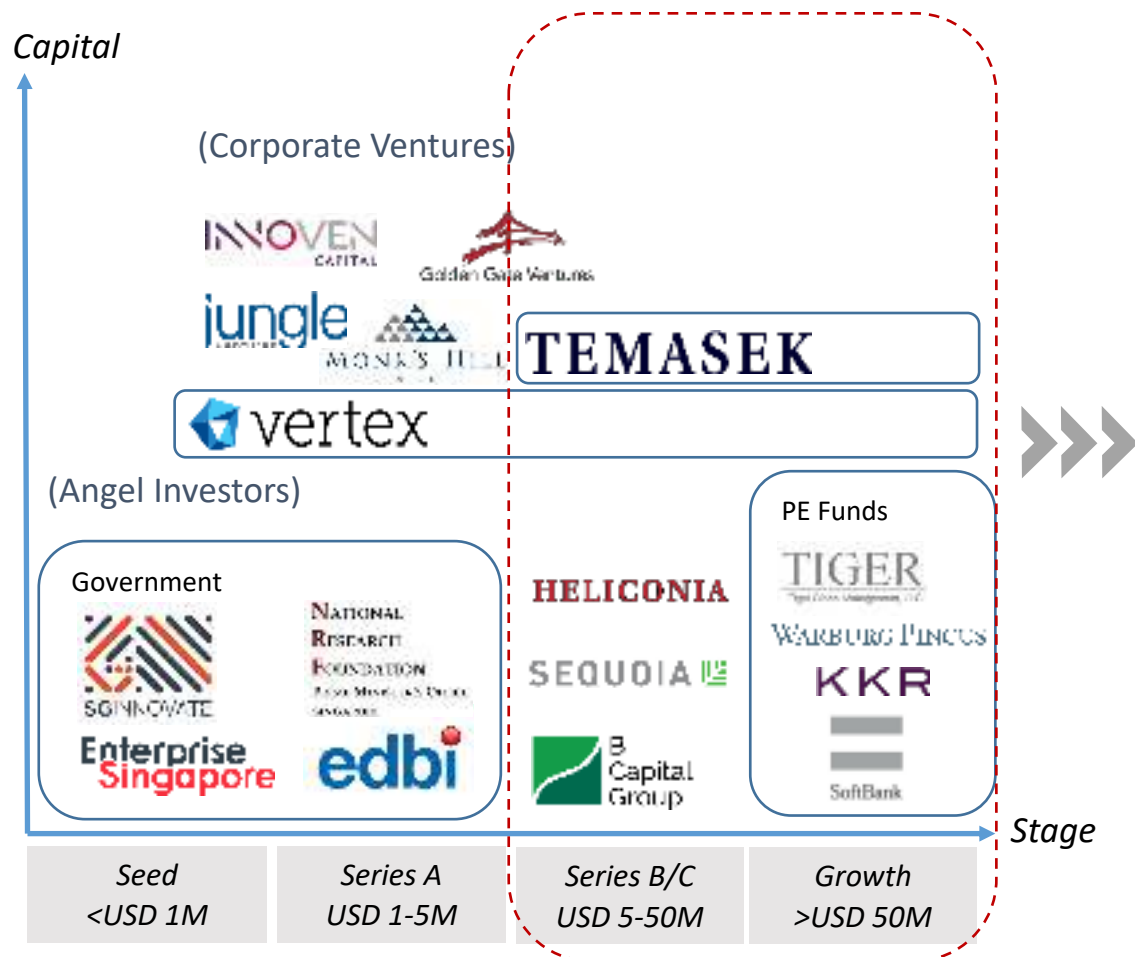
04 | Policy Considerations

Encourage committed, long-term investors

Encourage institutional investors to invest in VC funds

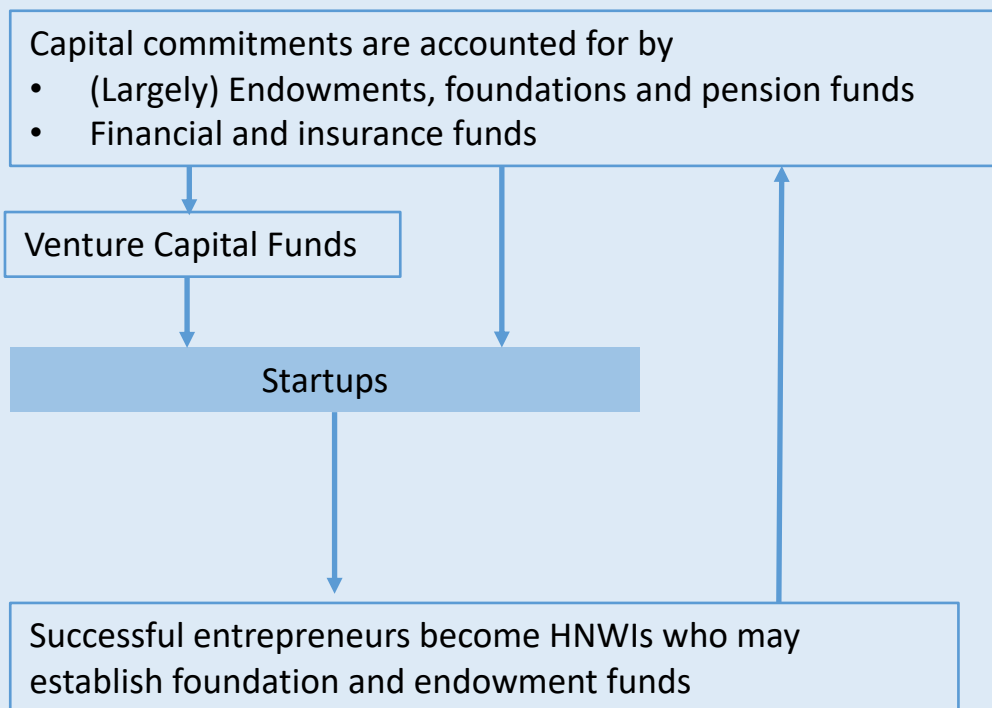
- Consider matching investments with private money into VCs to plug the growth stage funding gap

Case study: Funding Gap (Singapore)



Case study: Successful Enterprise Ecosystem (US)

With each cycle, the industry shows greater strengthening with this interconnectivity



04 | Policy Considerations

Open new markets and facilitate business development opportunities for innovative startups

Adopt a pro-innovation regulatory stance to develop a market for solutions from innovative startups

Government Tenders

Governments should be prepared to **boldly consider innovative ideas or products on their merits** when offered for procurement or identify several strategic areas to provide more opportunities for promising startups to build competencies.

The *US public sector* purchases approximately *half a trillion dollar's* worth of products and services annually.

Procurement by the US Government drove new developments in technology that became innovative products of many entrepreneurial growth companies.



Public sector procurement examples to consider include:

- ***Program in Thailand*** where 2-3% of public sector procurement is made from local technology startup/ SMEs
- ***Scheme in Korea*** to award good design products with a Good Design mark. Since 2002, Korean Government's procurement policy has been revised to offer preferential treatment to such products

Examples of the roles that VCs adopt in assisting startups in their growth journey

New market entry



- Aid in Singapore re-incorporation & operations setup.
- Facilitate connection to Government agencies, taxi operators & mobile operators
- Introduced to other investors for follow-on funding

"Door Opening" Connections



- Introduced to several Temasek Portfolio Companies including Keppel, ST Marine, ST Aerospace & Sembcorp, PSA Singapore, Singapore Power
- Flutura chosen as ST Marine's vendor for the implementation of "Diagnostics and Prognostics for Propulsion systems".

04 | Policy Considerations

Providing IP funding support

Funding support for startups in IP strategy implementation via various mechanisms like IP defence funding, IP prosecution funding, sovereign patent funds, and legislative support.

Funding Support

IP Prosecution Funding

Australia's Accelerating Commercialisation programme provides grants of up to AUD 1M that can be put towards "IP protection expenditure - reasonable costs that protect IP".

These costs include fees to a patent office for the cost of filing a patent application, patent search and examination fees, freedom to operate review costs, and annual patent maintenance fees.

IP Defence Funding

Japanese Patent Office (JPO) has announced a program whereby half of the premiums for IP infringement insurance will be covered.

The program is a partnership between the JPO, the Japan Chamber of Commerce and Industry, The National Federation of Small Business Associations, and three insurance companies.

Specifically, the subsidy is directed at making affordable IP infringement litigation insurance for SMEs that are operating in countries outside of Japan. The program covers both the need for the SME to fund IP infringement litigation against alleged infringers and to defend litigation.

Sovereign Patent Funds (SPFs)

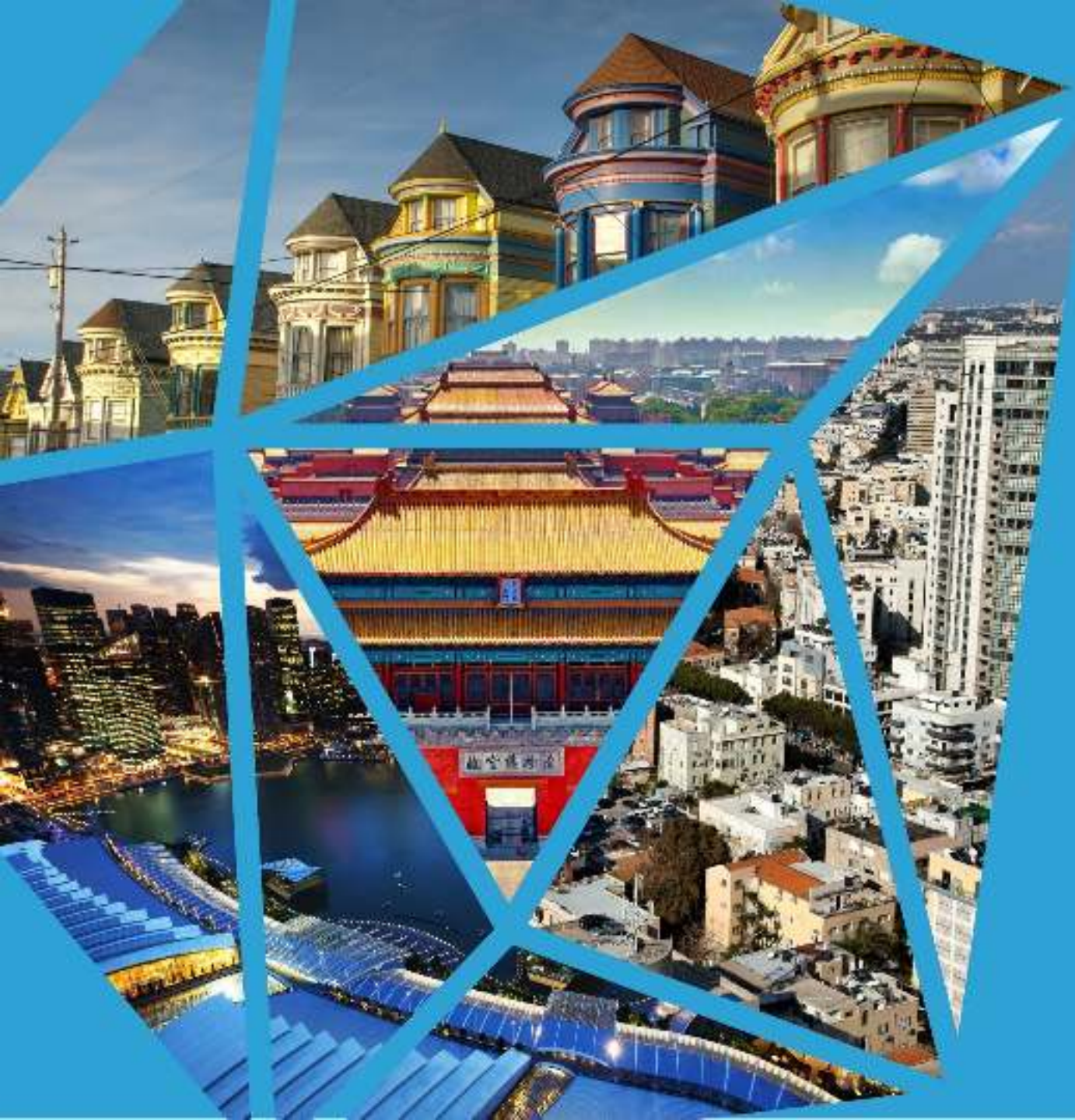
Emerging in the last five years in a small handful of countries like Japan, South Korea, and France.

SPFs can be broadly defined as state-backed investment vehicles that acquire intellectual property right (IPR) assets from third parties in service of national economic objectives which include:

- Defensive objectives
- Commercialization objectives
- The provision of high-quality IP expertise to high-potential startup and scale-up firms that might not otherwise be able to access it.
- International trade objectives

Legislative Support

The Scottish Government published its Legislative Programme for 2016-17 which includes the Expenses and Funding of Civil Litigation Bill. If the Bill delivers improved access to litigation in Scotland as intended, this may help reassure SMEs and startups that they can take on large corporations should their IP rights in Scotland be infringed.



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