

# UK FinTech

## On the cutting edge

An evaluation of the international  
FinTech sector

Commissioned by:



HM Treasury



**EY**

The EY logo consists of the letters 'EY' in a bold, white, sans-serif font, with a yellow chevron shape pointing upwards and to the right above the 'Y'.

Building a better  
working world

## Foreword



Financial Technology - or FinTech - is fundamentally changing the way financial services firms operate and transforming the way we transfer, borrow, protect and manage our money.

Just as the UK is the financial capital of the world, so we are also a leading FinTech capital, with increasing FinTech activity taking place across the financial sector. Small start-ups and innovation within existing large financial services firms is creating jobs and attracting investment. The sector has now grown from its disruptive roots into an industry in its own right - generating £6.6b in revenue in 2015.

The UK Government is committed to supporting the development of the UK's FinTech sector. We have already taken a number of measures to further this aim, including measures to support alternative lenders and the digital currency sector as well as an industry-led initiative to give consumers better access to their bank data.

However, we know that if we are to remain a leading global FinTech hub we will need to go further. In order to inform our FinTech strategy going forward, HM Treasury commissioned EY to produce a report to consider the UK environment for FinTech compared to that in other leading FinTech hubs and highlight areas where the UK needs to improve, drawing on best practice from other leading FinTech hubs which we may wish to emulate.

We have published this report as we believe those in the FinTech economy, including FinTechs, investors, regulators and traditional financial services firms will benefit from increased research and transparency on this innovative and fast-growing sector.

I welcome this report and its recommendations to ensure the UK's continued strength as the leading global FinTech hub.

**Harriett Baldwin**

Economic Secretary to the Treasury



## About this report



In August 2014, the Chancellor of the Exchequer, George Osborne, announced the UK Government's ambition to make the UK the "global capital of FinTech". As part of Government's work to realise this aim, Harriett Baldwin, Economic Secretary to the Treasury, commissioned EY to produce this benchmarking study of the UK and selected international FinTech ecosystems.

The purpose of the study is to assess how the UK FinTech ecosystem compares to that of California, New York, Germany, Singapore, Hong Kong and Australia. These regions were selected by HM Treasury based on their status as notable FinTech hubs. Across the seven in-scope regions, the report considers four Attributes essential to a FinTech ecosystem, namely Talent, Capital, Policy and Demand. We use this framework to assess international best practices and propose a series of recommendations to maintain the UK's position as a leading FinTech centre.

The analysis, views and recommendations expressed in this report were produced by EY and informed by over 65 stakeholder interviews held with FinTech firms, investors, trade associations and policy makers across the in-scope jurisdictions. We are very thankful to all those who contributed their time and insights, and made the production of this report possible.

We hope this report will be used by the UK Government to inform policy and further support this vibrant and dynamic sector. We also hope the analysis and insights offered in this report will be helpful to all stakeholders across the FinTech ecosystem.

**Imran Gulamhuseinwala**  
EY FinTech Leader

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# 1. Executive summary

## A world-class FinTech ecosystem

Since 2008, the UK has grown in stature to be the global FinTech capital. We estimate that the UK FinTech sector represented c.£6.6b in revenue in 2015 and attracted c.£524m in investment.<sup>1</sup> With c.61,000 people employed in the sector (c.5% of the total financial services (FS) workforce), more people work in UK FinTech than in New York FinTech, or in the combined FinTech workforce of Singapore, Hong Kong and Australia.<sup>2</sup> The UK has always benefitted from a large FS industry. However, much of the recent success of the UK's FinTech sector should be attributed to a well-served and well-functioning ecosystem.

### Introduction

The sector is growing globally in terms of investment, employment and the number of FinTechs, but it is far from mature. The UK has an enviable lead today in FinTech. However, it is vital that the UK keeps its pace, particularly as the sector approaches critical mass and starts to deliver a meaningful payback in jobs, innovation and growth. Strong competition from other regions is emerging: some are actively competing to create best-in-class FinTech ecosystems and are increasingly progressive in their use of government and regulatory policy to support FinTechs. Others are beginning to specialise in promising disruptive technologies, and China is scaling up quickly across the sector. Our research suggests that in order to maintain its world-leading position, the UK will need to continue to work hard to deliver.

This report proposes a framework for benchmarking the FinTech sector and makes a set of recommendations to enable the UK to retain its market-leading position as a global FinTech capital.

1. The £6.6b of revenues relates to high growth FinTech. Including traditional FinTech, the combined size is in excess of £20b. Please see UKTI's "Landscaping UK FinTech" for further details  
2. In this report, Hong Kong (HK) refers to Hong Kong Special Administrative Region (HKSAR)

## Approach

In this report, we compare the FinTech ecosystems of seven regions: the UK, California, New York, Germany, Singapore, Hong Kong and Australia. These in-scope regions were selected at the outset of the exercise by HM Treasury on the basis of the reputation and size of their FinTech sectors. California and New York were considered separately as their ecosystems operate relatively independently, despite being part of one large national market, and we were keen to understand best practices at the local level. In addition to these regions, mainland China and Israel were considered based on the recent growth of their respective FinTech sectors, but have not been formally benchmarked in this report.

Data on the FinTech sector is limited. As such, all references to the market size and employment in this report are estimates. These estimates were based on triangulating top-down and bottom-up quantitative models and market assumptions. These assumptions were informed by over 65 external stakeholder interviews and more than 30 internal EY interviews.

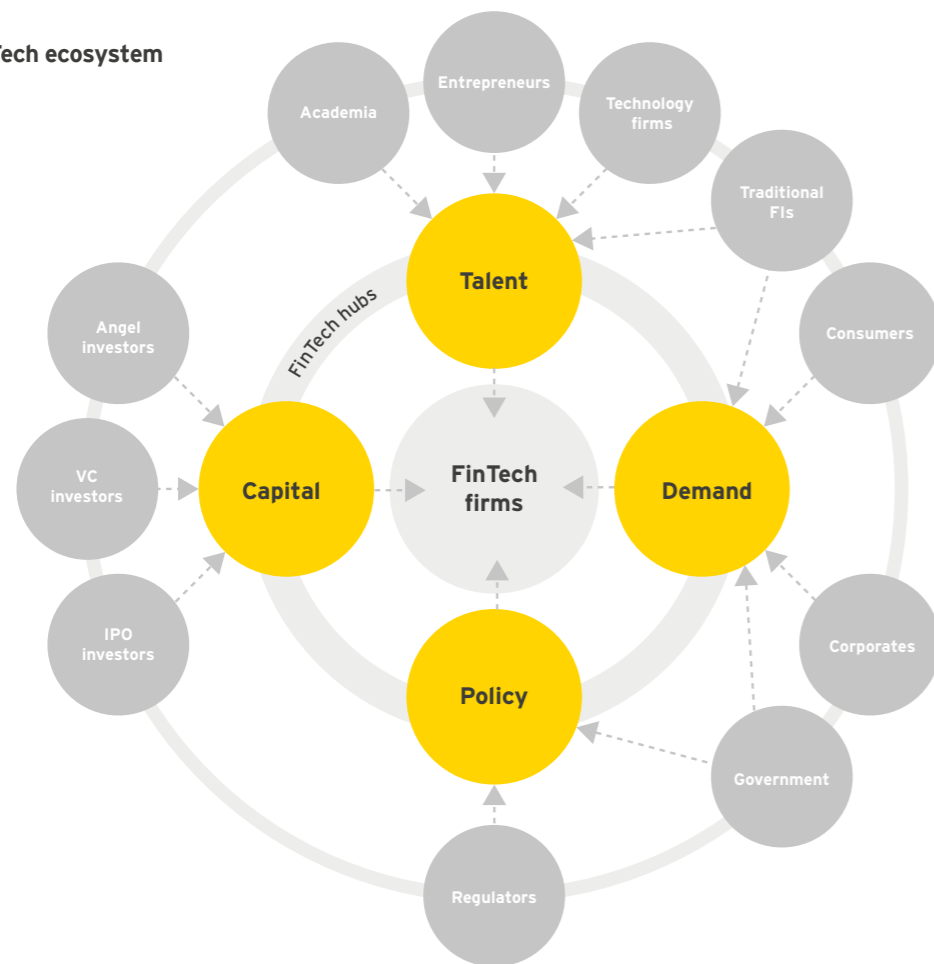
The focus of this report is on benchmarking the FinTech ecosystems, as we believe the strength of the ecosystem provides the strongest indication of the future health of this nascent sector.

Our view is that a well-functioning FinTech ecosystem is built on four core ecosystem attributes (“Attributes”):

- 1. Talent:** the availability of technical, FS and entrepreneurial talent
- 2. Capital:** the availability of financial resources for start-ups and scale-ups
- 3. Policy:** government policy across regulation, tax and sector growth initiatives
- 4. Demand:** end-client demand across consumers, corporates and financial institutions (FIs)

Figure 1 below highlights how these four Attributes interconnect to support the ecosystem and identifies the network of stakeholders.

Figure 1: The FinTech ecosystem



### Key

- Attributes
- Stakeholders

In order to assess the quality of the FinTech ecosystem in each region, the Attributes of Talent, Capital, Policy and Demand were benchmarked against the following benchmark factors (“Factors”) shown in figure 2.

Figure 2: Ecosystem Attributes and benchmark Factors

Attributes	Factors	Description
Talent	Talent availability	Current availability of technical, FS and entrepreneurial talent
	Talent pipeline	Availability of future talent, both domestic and foreign
Capital	Seed capital	Access to start-up capital (£0m-£5m)
	Growth capital	Access to growth capital (£5m-£100m)
	Listed capital	Access to the public markets
Policy	Regulatory regimes	Regulator support for new entrants and innovative business models
	Government programmes	Government support for programmes to open up the sector, increase competition, attract foreign FinTechs and improve cybersecurity
	Taxation policy	Availability of tax support for investors and corporates
Demand	Consumer demand	Adoption by local market consumers (B2C)
	Corporate demand	Adoption by corporates, particularly SMEs (B2B)
	FI demand	Adoption by FIs (enterprise)

The following section provides a summary assessment of the seven FinTech regions across each of the four Attributes. Full details can be found in section 3 of this report.

## Talent

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**The UK currently has a very good pool of talent, with exceptional access to financial expertise, although there are concerns about the future tech talent pipeline; California leads for the depth of talent overall.**

The availability of talent in the UK (particularly London) is currently stronger than in most other FinTech regions. This applies broadly across the three key skill sets required to establish and grow a FinTech business successfully: technical talent, FS expertise, and entrepreneurial and leadership know-how.

**“The level of expertise in London is higher than in New York and Hong Kong, and we have presence in all three markets.”**

FinTech, UK

While the current availability of tech talent in the UK is sufficient, stakeholder interviews highlighted the need to develop a healthier pipeline of tech employees. This pipeline is stronger in California which benefits from numerous tech companies headquartered in the region and considerable focus on Science, Technology, Engineering and Mathematics (STEM) education.

“In the UK, we need to find a way to develop more home-grown tech talent: coders, developers and engineers – that starts with better training in high school. Otherwise, you’ll see more FinTechs outsourcing their needs for tech talent to Poland and Germany” FinTech, UK

The availability of FS and entrepreneurial talent in the UK is currently strong and expected to remain so. With respect to financial expertise, the UK has an unrivalled lead, employing 1.2m people in FS.<sup>3</sup> Entrepreneurial and leadership skills are also readily available in the UK, second only to the US. Entrepreneurship is particularly strong in California, where the established network of investors, tech companies and academia has contributed to a vibrant entrepreneurial community.

## Capital

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**The availability of capital in the UK is good for early-stage investment; California is dominant in FinTech investment overall.**

The UK generated c.£524m of FinTech investment in 2015. While the UK is the third-largest region by capital invested, this is a fraction of the c.£3.6b raised in California and the c.£1.4b raised in New York in 2015. The higher level of FinTech investment in the US stems partly from the presence of a well-established venture capital (VC) sector, which invests in FinTechs of all sizes, and the strength of the US listed markets.

The UK appears to have robust access to capital at the early stage, although growth capital appears constrained. According to stakeholder interviews, seed financing benefits from the effectiveness of UK tax initiatives. Interviewees also reported that weaker growth financing is partly due to the lower risk appetite exhibited by the UK venture funds (relative to the US), which tend to represent institutional money rather than the reinvested proceeds of successful entrepreneurs.

“When a US entrepreneur exits or sells, he’ll just go again and reinvest in another business. In the UK, he’ll buy a house” – FinTech, UK

Despite this, FinTechs in the UK are still achieving scale: nearly a quarter of global FinTech unicorns are UK-based, albeit these businesses are mostly funded by overseas investors.

**“There is a lot going on in the early stage, thanks to the Enterprise Investment Scheme (EIS), Seed Enterprise Investment Scheme (SEIS) and the like. But as you go along, at later stages with the bigger tickets, it tends to come from the US.”**

FinTech, UK

## Policy

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**The UK has the strongest FinTech policy environment, with the most supportive regulatory regime; policy initiatives in Singapore and Australia are increasingly progressive.**

The strength of the UK policy environment is due to the supportiveness and accessibility of the Financial Conduct Authority (FCA), effective tax incentives and numerous government programmes designed to promote competition and innovation which indirectly support FinTechs (e.g., Open API and Mandatory Referrals).

**“The FCA’s Innovation Hub was outstanding and made the authorisation process so much more manageable.”**

FinTech, UK

Second to the UK, Singapore is increasingly active in FinTech policy and benefits from initiatives to make it an attractive place to set up a business. While gaining traction, Singapore’s FinTech initiatives (like those in Australia) are relatively new and need time to reach the UK’s level of maturity.

Policy landscapes in the US, Hong Kong and Germany are viewed as more complex, conservative and, in some respects, opaque. In the US, the Government has historically played only a limited role in supporting the industry.

## Demand

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**FinTech demand is robust in the UK, driven by London’s strength as the global financial capital; New York also benefits from its position as a global financial centre and currently has the highest rate of consumer adoption.**

London ranks first in terms of the scale and competitiveness of its financial centre, with the world’s highest concentration of global institutions across banking, asset management, insurance and trading sectors. This concentration of FS activity represents an exceptional platform for FinTech solutions, particularly in the trading, regulatory, data and compliance space, that is only comparable with New York.

The UK SME market also represents an attractive opportunity, given the size of the sector compared to other regions, and the willingness of SMEs to embrace FinTech solutions, notably in the alternative finance and payments subsectors.

Consumer adoption of FinTech is becoming increasingly mainstream in the UK with c.14% of digitally active consumers identifying themselves as FinTech users according to the EY FinTech Adoption Index. This rises to c.25% in London but lags in the US-based regions (with New York at c.33% and California at c.32%) and Hong Kong (at c.29%).

3. Office of National Statistics



Based on the analysis contained in this report, we have ranked in-scope regions across the four Attributes of a successful ecosystem (figure 3). We have used a simple, non-weighted addition of rankings in each Attribute, and have found that the UK ranks first marginally, as the leading global FinTech ecosystem. This analysis recognises that the UK has a well-rounded FinTech ecosystem with particular competitive advantage in its government and regulatory policy.








**“I can’t think of another FinTech market that combines expertise, a captive market of consumers and a facilitating regulatory framework better.”**

FinTech, UK

**“The UK is what you get if you take the best of other regions like Silicon Valley and New York.”**

FinTech hub, International

Figure 3: **Benchmarked ranking of FinTech ecosystems**

Region	2015 rank by ecosystem Attribute					Total points
	Talent ▸ Talent availability ▸ Talent pipeline	Capital ▸ Seed ▸ Growth ▸ Listed	Policy ▸ Regulatory regimes ▸ Government programmes ▸ Taxation policy	Demand ▸ Consumers ▸ Corporates ▸ FIs		
UK 	2	3	1	3	9	
California (CA) 	1	1	6	2	10	
New York (NY) 	3	2	7	1	13	
Singapore (SG) 	4	7	2	6	19	
Germany (DE) 	6	4	5	5	20	
Australia (AU) 	5	5	3	7	20	
Hong Kong (HK) 	7	6	4	4	21	

Source: EY analysis

Note: Please see section 3 for a detailed breakdown of each Attribute by region

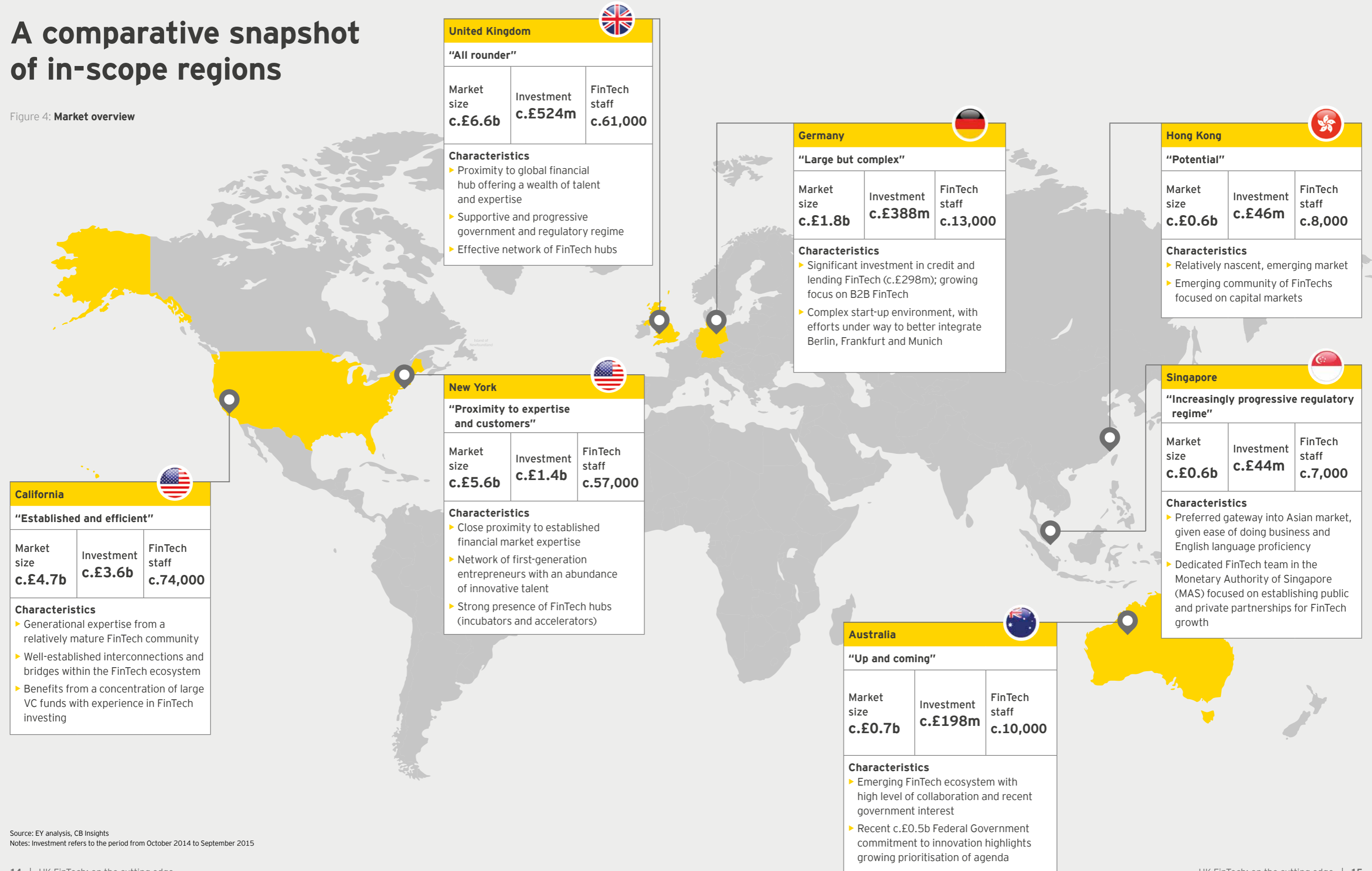
Relative rank: 1 = highest, 7 = lowest

Our interviews suggest that New York and California operate as distinct FinTech hubs, with little collaboration between them. However, if the US were assessed on a consolidated basis, the strength of New York and California combined would see the US lead the table by a considerable margin.

The analysis highlights the significant gap between the top three regions and the remainder of the group which, outside of the policy Attributes in Singapore and Australia, does not challenge the top three across the breadth of Attributes tested. This analysis also highlights the importance of supportive government and regulatory policy to the UK’s position.

# A comparative snapshot of in-scope regions

Figure 4: Market overview



Source: EY analysis, CB Insights  
Notes: Investment refers to the period from October 2014 to September 2015



# The UK's leading position will increasingly be under pressure

Despite the UK's leading position as a global capital for FinTech, its long-term position is not assured, as other regions accelerate policy initiatives, specialist regions emerge, and China emerges as a FinTech juggernaut. The trends below highlight each of these three challenges and help inform our subsequent recommendations for the UK.

Policy is widely recognised as a key lever in supporting the FinTech sector and a major differentiator between regions. While the UK was a first mover in implementing policy initiatives, other regions are looking to close the gap with the UK. Examples of progressive policy initiatives include Singapore's launch of a c.£100m Financial Sector Technology and Innovation Scheme and the Australian Government's announcement of a c.£500m National Innovation and Science Agenda.

As policy becomes more progressive in some geographies, we also see the emergence of specialisation, as a number of emerging technologies gain traction in smaller, focused regional centres. Examples include Israel's focus on cybersecurity (see section 5.2, Israel case study), Benelux's focus on payments, Dublin's focus on fund administration, Malta and the Isle of Man's focus on cryptocurrencies and Estonia's focus on financial identity. This specialisation could place London's position as a diversified FinTech sector at a disadvantage.

From a standing start, the Chinese FinTech sector, which is largely concentrated in Beijing, has outgrown almost all other regions (see section 5.1, China case study). Beijing's VC market has increased from £1.0b of VC investment in 2012 to £8.6b in 2015, and is now second only to San Francisco.<sup>4</sup> Currently, seven of the world's 31 FinTech unicorns are based in China. The Chinese regulator appears to have taken an arm's length approach to FinTechs and allowed them to achieve tremendous scale. For example, Alibaba now processes more than 80m transactions per day, and operates a c.£65b online money market fund.<sup>5</sup> While there are clear risks to this approach, the fundamental scale of China's FinTech market threatens to dominate established centres and close neighbours.

**"We're perpetually in China's shadow, where we'll continue to see much more innovation, investment and FinTech unicorns in China than in Singapore."**

FinTech, Singapore

The evolving international landscape could challenge the UK's leading position. In order to better understand the implications of this challenge, we have run a very simple and subjective scenario analysis:

## Scenario A: "Policy Momentum Lost"

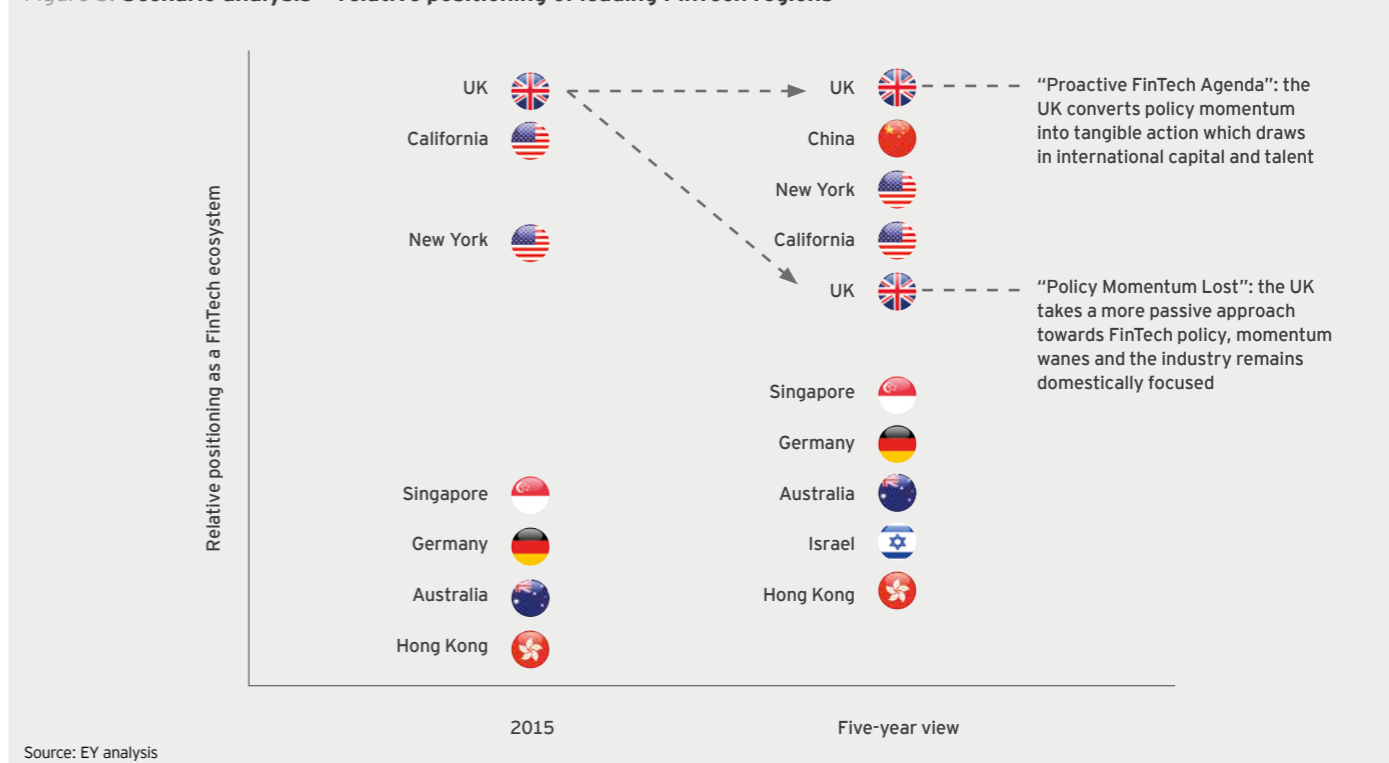
In this scenario, the UK does not proactively respond to the challenges posed by other FinTech regions, its current momentum wanes and leading position diminishes relative to other regions.

This simple scenario exercise illustrates that the UK is at risk of losing its global lead to China, New York and California (figure 5). The following section proposes a long list of recommendations that the UK Government should consider to adopt a proactive FinTech agenda and safeguard the UK's longer-term opportunity.

## Scenario B: "Proactive FinTech Agenda"

In this scenario, the UK converts policy momentum into tangible action which boosts the market and draws in international capital and talent, enabling the UK to become a global expert hub for FinTech.

Figure 5: Scenario analysis – relative positioning of leading FinTech regions



4. EY Capital Insights, Q3 2015; San Francisco refers to San Francisco Bay area (see appendix B, figure B.5)  
5. Tech Asia, CNBC

# Summary recommendations

Based on interviews and our analysis of best practices, we have drawn up a long list of recommendations to enable the UK to remain the global capital of FinTech. These recommendations address each of the four Attributes and are included here in summary form. For a detailed description, please refer to section four of this report – EY recommendations.

## 1. Create a FinTech “delivery body” to drive high impact policy initiatives to implementation as quickly as possible

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The UK Government has already identified a number of bold initiatives designed to encourage competition and innovation across the FS sector and thereby indirectly support the FinTech sector. We recommend the Government accelerate the time to market of these pipeline initiatives. In order to do this, the Government should consider creating and funding a FinTech “delivery body” to lead and manage the implementation of these pipeline initiatives.

## 2. Build on the FCA’s position as the most progressive regulatory body globally

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The FCA is highly regarded and should now consider scaling-up Project Innovate to strengthen support for a larger number of domestic and foreign FinTechs and, increasingly, established tech businesses. The FinTech sector would also benefit from the FCA forming a clear strategy on high-impact initiatives such as RegTech and the Regulatory Sandbox platform.

## 3. Deliver practical business support to FinTechs

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The Government should consider making available Government office space to FinTechs, encouraging FinTech hubs to create a national database of experienced, freelance professional services providers, and working with the FCA to review Know Your Customer (KYC) procedures to ease the challenges of opening business banking accounts.

## 4. Build FinTech “bridges” to support UK FinTechs expand internationally

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The Government should identify and invest in a small number of regions to build two-way collaborative “bridges” that would deliver a well-invested network of local talent, professional services, regulatory contacts and investors.

## 5. Strengthen the UK’s talent pipeline, particularly for tech talent

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The Government should consider broadening the Tier 2 Visa with respect to foreign tech talent, supporting foreign tech graduates to stay in the UK, and promoting FinTech and STEM in universities and schools with specialist modules, apprenticeships and sponsored work placements.

## 6. Establish regional Centres of Excellence in the UK

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The Government should consider undertaking a capability review across the UK to create Centres of Excellence. These centres should be seeded with dedicated physical space and aim to establish an active collaboration network with academia and other FinTech centres to create globally recognised FinTech capabilities.

## 7. Initiate investor-focused programmes to improve access to growth capital

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The Government should consider sponsoring events for VCs to meet early-stage FinTechs and creating a growth capital fund such as the Business Growth Fund to finance FinTechs. We think the Government can improve the visibility of the sector by encouraging an industry body to collate and report on sector growth metrics and by commissioning dedicated equity analyst coverage of the listed market sector.

## 8. Broaden tax initiatives to drive greater investment in UK FinTech

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The Government should consider widening the application of seed-based funding initiatives and expanding the investment thresholds of early-stage initiatives such as the EIS and VCT Scheme.

## 9. Promote government, consumer and FI adoption of FinTech services

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The Government should consider working with local government to adopt FinTech propositions such as payment and supply chain solutions. The Government should also consider involving FinTechs to support the financial inclusion agenda. Lastly, the Government should consider promoting greater collaboration between FinTechs and FIs by encouraging professional services firms to act as intermediaries and multi-corporate accelerators to set up in the UK.

A nighttime photograph of a city street. In the foreground, a curved walkway with a metal railing is visible, with red and yellow light trails from moving vehicles. In the background, a large, modern glass-fronted building is brightly lit from within, and other city buildings are visible under a dark sky.

# 2. Introduction to the UK FinTech sector

## Defining the FinTech sector

In this section of the report, we set out a working definition of the term FinTech and provide an introduction to the UK FinTech sector.

### A working definition for FinTech

In its broadest sense, we define FinTechs as high-growth organisations combining innovative business models and technology to enable, enhance and disrupt FS. This definition is not restricted to start-ups or new entrants, but includes scale-ups, maturing companies and even non-FS companies, such as telecommunication providers and e-retailers.

We also associate FinTechs with several common characteristics. For example, FinTech companies tend to have a laser-like focus on specific customer propositions (often one that is poorly served, if at all, by traditional FS companies) and offer seamless and intuitive user experience. FinTechs are able to scale, typically balance sheet light, and free from the burdens of legacy systems and platforms. FinTechs also tend to have smart, unbundled business models often designed to avoid the need for authorisation.

In order to put some rigour around these common characteristics, we use the CLASSIC Framework, which builds on the work of Professors Chuen and Teo, and provides a working definition of the types of firms that we look to cover in our analysis of the FinTech sector (figure 6). Of particular note is that the framework excludes Traditional FinTechs (such as mature processors and FS software providers). It is intended that the analysis in this report only reflects FinTechs that qualify according to this framework.

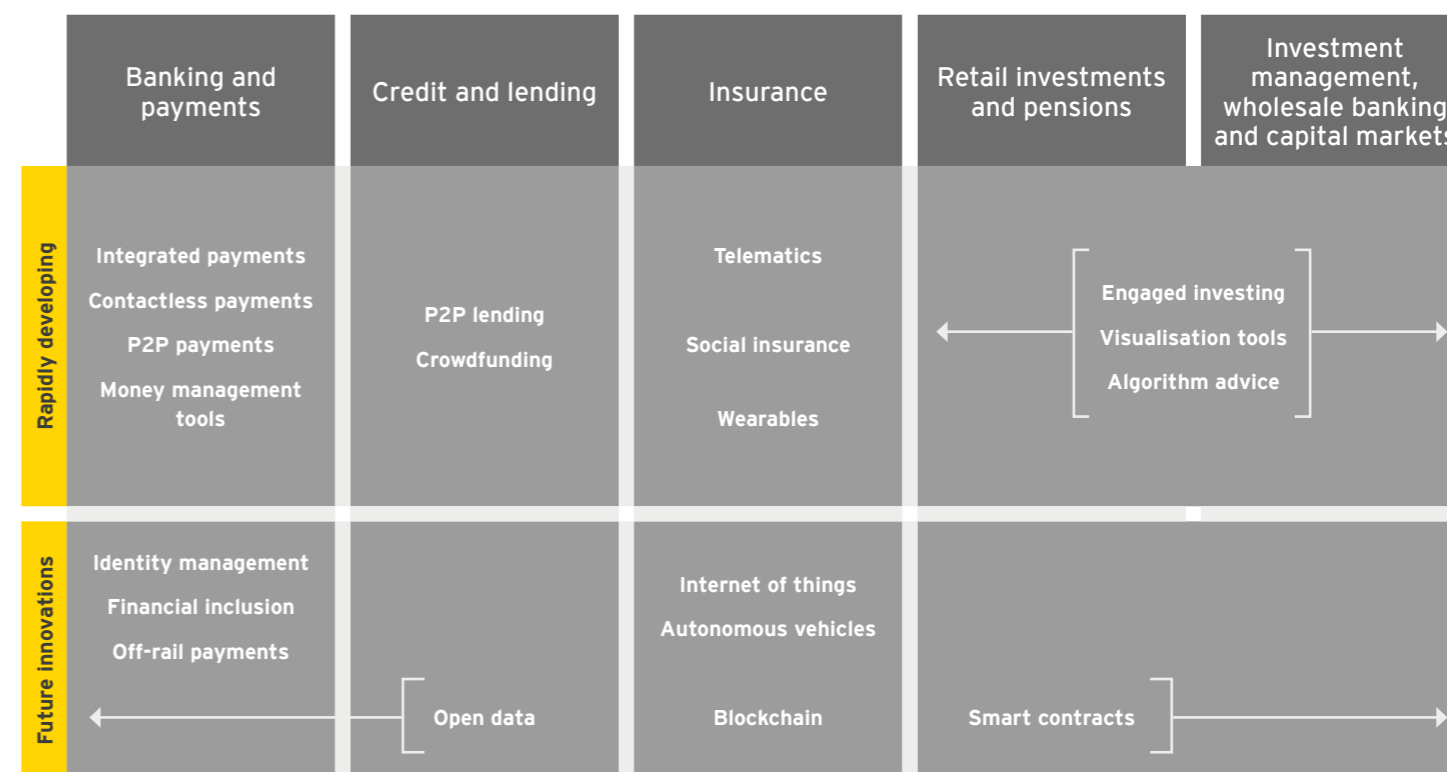
Figure 6: Characteristics of FinTechs

	Common characteristics	Description
C	Customer-centric	<ul style="list-style-type: none"> <li>Simple, easy-to-use, high-convenience products and services</li> <li>"Needs-focused" propositions designed around particular consumer use cases and pain points</li> <li>High degree of customer engagement</li> </ul>
I	Legacy-free	<ul style="list-style-type: none"> <li>Purpose-built systems designed around digital channels and fulfilment</li> <li>Little drag from discontinued products, prior acquisitions or regulatory liabilities</li> </ul>
a	Asset light	<ul style="list-style-type: none"> <li>Low fixed-asset base creating significant operating leverage</li> <li>Balance sheet frequently rented or outsourced to other parties</li> </ul>
S	Scalable	<ul style="list-style-type: none"> <li>Scalability built into the business model by leveraging partnerships, distribution and simplicity</li> <li>Low capital requirements</li> </ul>
S	Simple	<ul style="list-style-type: none"> <li>Fundamentally simple customer proposition</li> <li>Highly focused and transparent business processes</li> </ul>
i	Innovative	<ul style="list-style-type: none"> <li>Innovation across the spectrum, e.g., new business models, products and services and delivery models</li> </ul>
C	Compliance light	<ul style="list-style-type: none"> <li>Simple and unbundled models that are often designed so as to avoid the need for authorisation</li> </ul>

Source: Chuen and Teo, EY analysis

To identify innovation characteristics and emerging areas of innovation, we have developed the following framework (figure 7).

Figure 7: Areas of innovation by subsector



Source: EY analysis

To date, most FinTech activity has been concentrated in the payments space, where mobile and e-commerce has led to real demand from consumers and merchants who were poorly served by traditional products and providers. Other innovations that are entering the mainstream include alternative finance platforms, including crowdfunding and P2P lending which have more than doubled in volume year-on-year in Europe.<sup>6</sup> Future innovations that have been attracting the interest of FinTechs include opportunities enabled by the "internet of things" and Blockchain technologies.

6. EY and University of Cambridge, *Moving Mainstream*

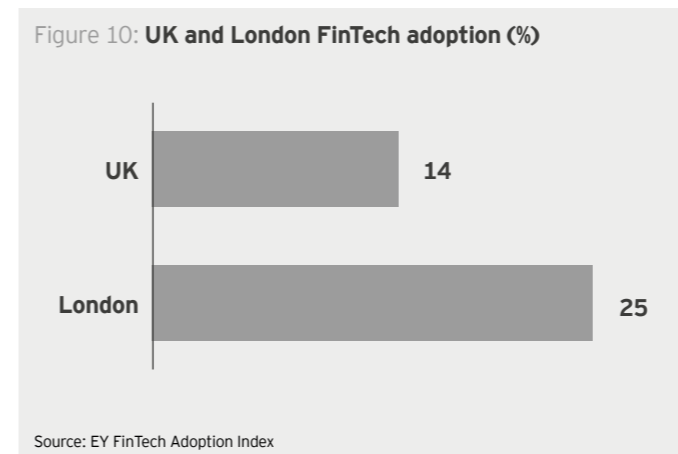
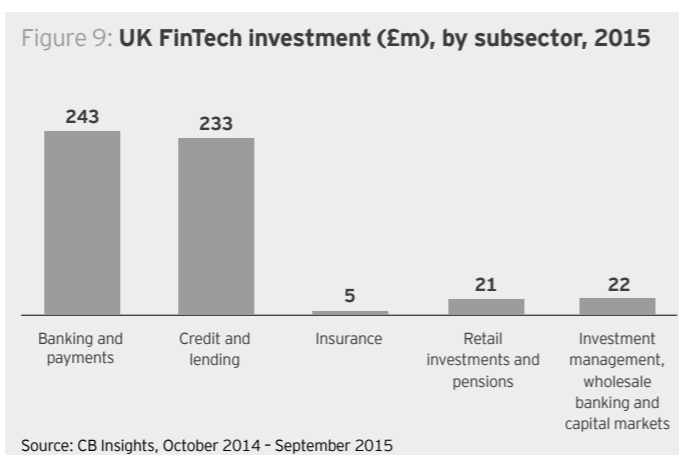
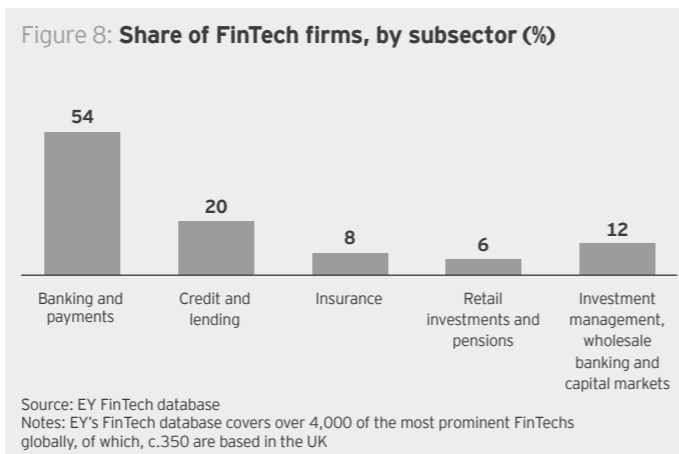
# Introducing the UK FinTech sector

Before benchmarking the FinTech ecosystems across in-scope regions, we provide a brief introduction to the UK FinTech sector.

The UK FinTech sector is highly fragmented and growing quickly, which makes it challenging to measure. Using our definition of high growth FinTechs, we have sized the UK FinTech sector at c.£6.6b in 2015 revenues, comprising a workforce of c.61,000 employees. In 2015, the UK FinTech sector attracted c.£524m in investment.

Activity in the UK FinTech sector is skewed towards banking and payments. Based on the EY FinTech database, we find that more than half of FinTechs are banking- and payments-focused, with a further c.20% focused on the credit and lending sectors (figure 8). Investment is skewed towards the latter, which partly reflects the UK's position in peer-to-peer (P2P) lending, where it accounted for c.75% of European volumes in 2014.<sup>7</sup> Investment was also focused on the banking and payments sector, which accounted for 46% of total UK investment, reflecting the overall level of activity in that sector (figure 9). Despite the UK's strong position in the insurance sector, both activity and investment have been relatively subdued; however, indications are that activity is beginning to emerge.

In terms of consumer adoption, FinTech firms are beginning to get real traction. Based on the results of the EY FinTech Adoption Index, published in December 2015, c.14% of digitally active consumers in the UK are customers of FinTech (figure 10). We define FinTech users as survey respondents who claimed to have used at least two FinTech products in the last six months.



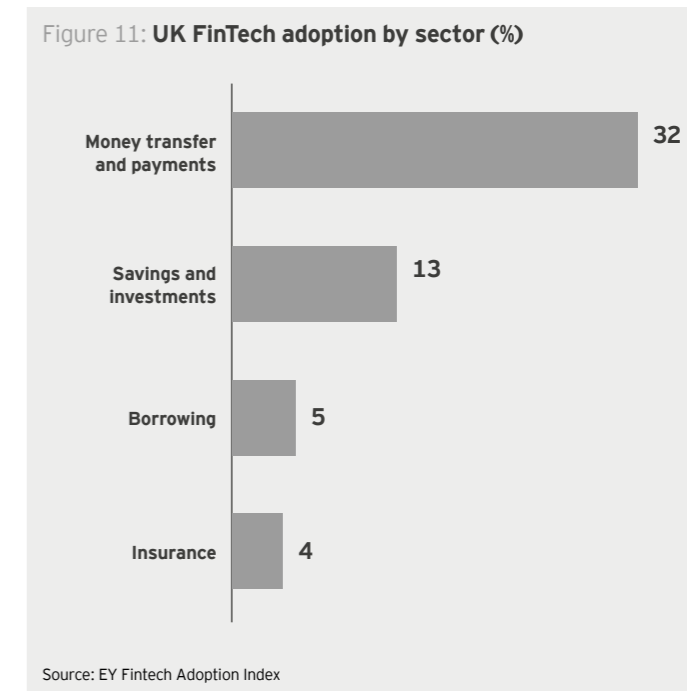
We find that the adoption rate in London is significantly higher at c.25%, which reflects the younger and wealthier demographics that have universally been the early adopters of FinTech propositions.

On a sector basis, money transfers and payments have the highest adoption rates in the UK (figure 11). This reflects the high uptake of e-commerce and the use of integrated payment providers such as PayPal.

Following payments, the most widely used FinTech products are online services related to foreign exchange (FX) and investment. This reflects the level of investment into FinTechs in these areas, combined with the high price and poor service offerings of traditional providers. Areas such as P2P investment and lending remain niche products in terms of adoption, but are growing most quickly. Convenience and simplicity appear to be the biggest drivers of adoption for FinTech products.

When non-users were asked about their future intentions, c.13% of respondents expressed a desire to use FinTech products in the near future, which gives the sense of a broad and growing consumer market.

With this introduction to UK FinTech, we now benchmark the UK's FinTech ecosystem against the other in-scope regions.



7. EY and University of Cambridge, *Moving Mainstream*

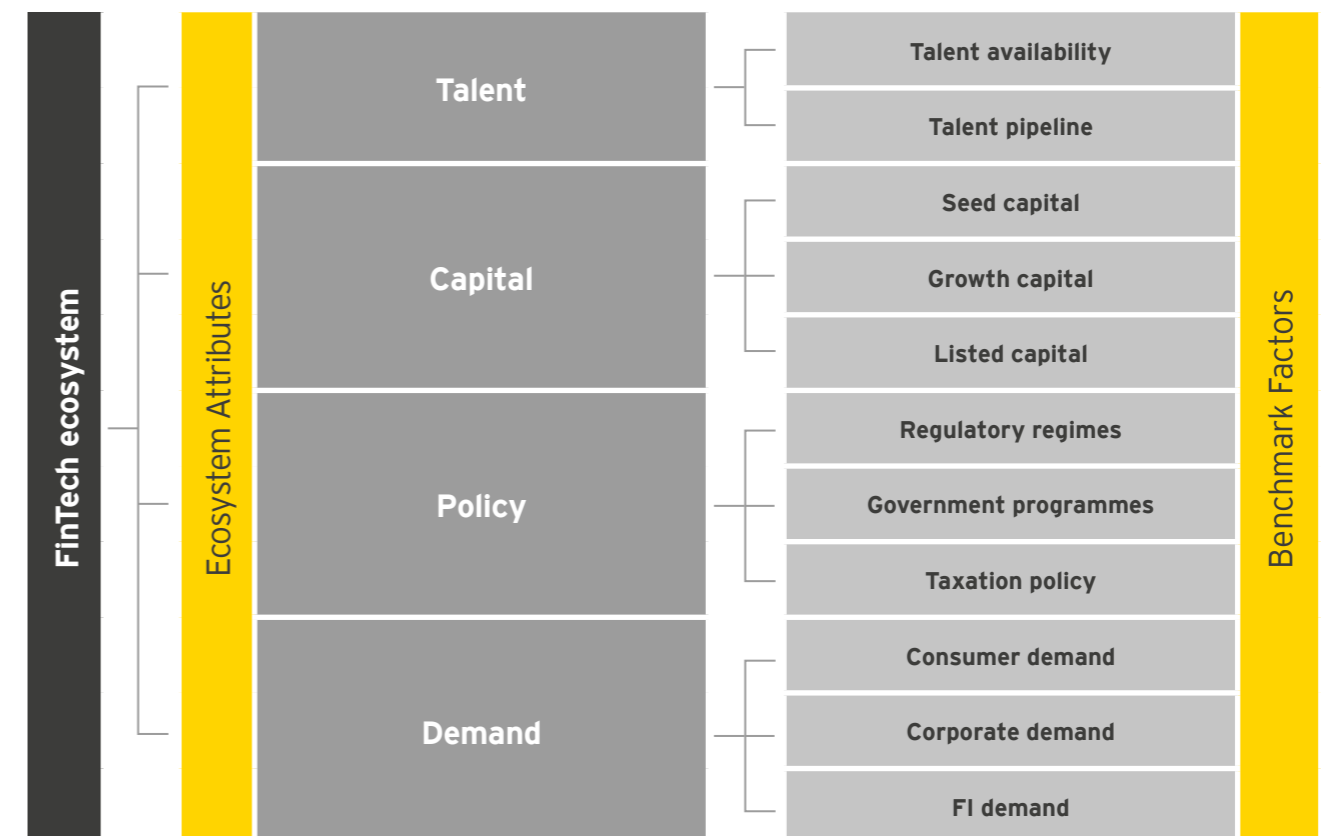
# 3. Analysis of core ecosystem Attributes

## Our framework for benchmarking ecosystem Attributes

In order to benchmark the FinTech ecosystems of in-scope regions, we assess each Attribute by analysing a number of supporting Factors. We identified these Attributes and their supporting Factors through our stakeholder interviews and in discussion with HM Treasury.

We step through each Factor and Attribute. Figure 12 is used below to help the reader navigate this section of the report.

Figure 12: Benchmarking the FinTech ecosystem



## 3.1 Talent

### The UK FinTech workforce is large but lacks the depth of talent found in California

#### Assessment summary of the Talent Attribute

The FinTech ecosystem requires access to a deep pool of expert talent in order to support growth. Entrepreneurial talent in particular is frequently the catalyst for activity and fundamental to draw capital.

In this section, we discuss the two Factors that influence talent:

**1. Talent availability:** the availability of talent to meet current requirements, including the overall size of the FinTech workforce and coverage across key FinTech skill sets.

**2. Talent pipeline:** the health of the talent pipeline to meet future demand with an infrastructure in place to maintain it.

We consider talent to cover three main types of skills that are critical to the success of a FinTech: technical, FS and entrepreneurial talent. We assess domestic talent against these three skill sets and recognise the importance of accessing foreign talent to augment domestic skill shortages.

Regarding current talent availability, our findings suggest that California ranks highest, due to the size of its overall FinTech workforce and its strength in technical and entrepreneurial talent. It is closely followed by the UK and New York, which both benefit from their high concentration of FS expertise in these regions. Singapore and Hong Kong rank the lowest, as their FinTech workforce is currently relatively small and has not attracted as much entrepreneurial talent.

In terms of the talent pipeline, California again ranks the highest. This is particularly the case for technical and entrepreneurial talent, due to the numerous STEM education initiatives, a well-established and integrated network of academia and entrepreneurs, and a culture of mentorship. Singapore ranks second, partly due to its world-leading access to foreign talent and supportive skilled immigration regime.

Attribute: Talent

	Factors		
	1. Talent availability	2. Talent pipeline	Talent ranking
UK			2
CA			1
NY			3
DE			6
AU			5
HK			7
SG			4

Less supportive  More supportive

## 3.1.1 Talent availability

### Talent availability is currently strongest in California, followed closely by the UK

A well-functioning ecosystem requires a large workforce of skilled talent. In this section, we assess the current availability of FinTech talent, both overall and in terms of the three main types that are critical to the success of a FinTech.

To benchmark the current availability of talent across in-scope regions, we firstly estimate the size of the current FinTech workforce and then assess the availability of technical, FS and entrepreneurial talent. To estimate the size of the FinTech workforce, we use a bottom-up approach which we extrapolate using publicly available employment information for larger FinTechs. To assess the availability of talent, we consider the size of the local tech and FS institution sectors, local entrepreneurship and stakeholder interviews.

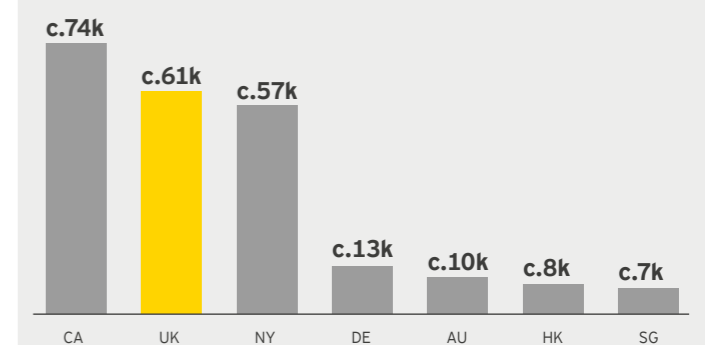
In using this approach, we note that talent across the three skill sets does not exist in industry silos. Global banks are a major source of FS expertise, but also a key source of tech talent.<sup>8</sup> Likewise, tech companies have a large cohort of business and finance professionals as well as entrepreneurs.

### The size of the current FinTech workforce

Our estimates indicate that California has the largest pool of FinTech workers (c.74,000), closely followed by the UK (c.61,000) and New York (c.57,000) (figure 13). In each of these regions, FinTech employment is higher than all other in-scope regions combined.

In the UK, FinTech employment is concentrated in London, although there are other growing hubs, including Edinburgh and Manchester. By function, UK interviewees suggest that tech workers (focused on product delivery) account for the largest share of UK FinTech workers (c.40%), followed by FS experts (c.30%), business development and corporate support staff (c.20%), and executive and leadership (c.10%).

Figure 13: Number of people employed in FinTech



Source: EY analysis

### The current FinTech workforce by skill set

When assessing the availability of technical, FS and entrepreneurial talent, we find that California, the UK and New York have strong coverage across all three skill sets. In addition, the current availability of tech talent is high in Singapore and Hong Kong, although entrepreneurial talent is comparatively limited in these regions.

8. Over a quarter of Goldman Sachs staff are engineers and programmers, *Business Insider*

### Technical talent

Technical talent consists of the engineers, software developers and coders required to build and implement FinTech solutions.

A driver of the availability of technical talent is proximity to tech giants. This is instrumental in California, which is home to four of the top 14 global tech companies, and is increasingly important in the UK, as the favoured location for European headquarters of international tech firms (see appendix A, figure A.1). In line with this, California and London have world-leading concentrations of professional developers as evidenced by Stack Overflow data (see appendix A, figure A.2). Notably, this data shows that London currently has more developers in absolute terms than San Francisco and Silicon Valley, as well as New York City or other European cities.<sup>9</sup>

However, in both California and London, the proximity to tech giants is also creating wage inflation as FinTechs are crowded out. As one UK FinTech stated: “We can find engineers locally but it is cheaper and easier to hire from Poland.”

### FS talent

FS expertise includes the skills required to understand FS markets, business models and regulations.

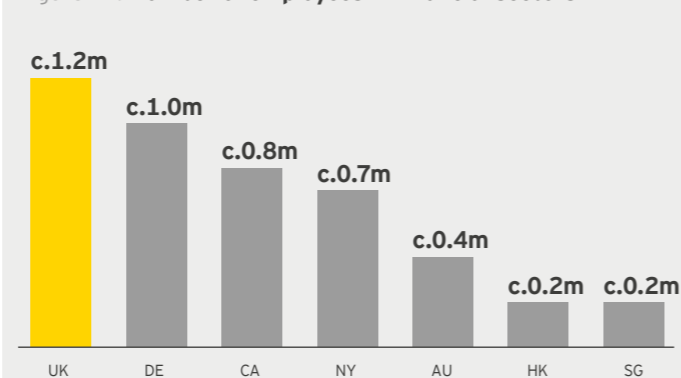
We find that the UK has an unrivalled lead for financial expertise, followed by New York and Hong Kong. As one FinTech stated:

**“With FinTech start-ups, financial expertise is a must. London and then New York have the strongest pools of this talent.”**

FinTech, UK

A key factor is London’s position as a global financial hub. According to the Global Financial Centres Index (GCFI, 2015), London ranks highest as the world’s financial capital – in terms of both the overall competitiveness of its financial sector and the strength of its FS human capital (see appendix A, figure A.3). As such, the UK has a leading concentration of global FIs and the largest pool of FS workers (figure 14). Global FIs, such as multinational banks, have historically been a key source of FS as well as technical talent for FinTech.

Figure 14: Number of employees in financial sectors



Source: ONS, EDD, NYDoL, Censtatd, Singstate, ABS  
Notes: Uses the latest available data for finance and insurance activities for each region

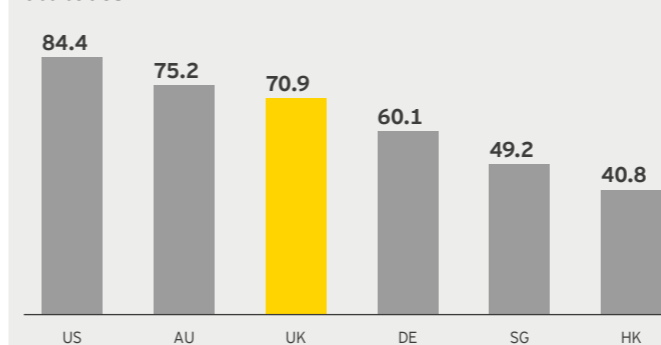
### Entrepreneurial talent

Entrepreneurship is the ability to generate new ideas, build businesses from scratch, identify and acquire customers and deliver scale. It requires creativity, self-belief, leadership and risk-taking.

We find that the availability of entrepreneurial talent is strongest in California, where the established network of successful entrepreneurs, mentors, investors, tech companies and academia has created a vibrant entrepreneurial community. Following California, the highest-ranking regions are New York, the UK and Australia.

The Global Entrepreneurship Index (GEI, 2016) benchmarks regions on the strength of attitudes to entrepreneurship. The data shows that the US has a clear lead (figure 15). This is consistent with our interview research, with California particularly praised for its vibrant entrepreneurial community and culture of successful entrepreneurs going on to act as mentors.

Figure 15: Global Entrepreneurship Index – entrepreneurial attitudes



Source: Global Entrepreneurship and Development Institute  
Notes: This includes opportunity perception (pillar one), start-up skills (pillar two), risk acceptance (pillar three), networking (pillar four), cultural support (pillar five), the US ranks the highest globally

**“California is a hotbed for entrepreneurial talent, due to an innate culture where it is okay to try and fail and try again. This encourages individuals to take up the higher-risk career path.”**

FinTech, California

Entrepreneurial talent is also strong in Australia and the UK. However, in the UK, finding entrepreneurs who have the requisite mix of leadership and technical skills is currently a challenge. Meanwhile, Australia has a healthy culture of entrepreneurship, but entrepreneurs often relocate overseas or choose to operate in non-FS sectors.

**“It is tough to find leaders with the tech skills to scale teams and lead whole product lines, like senior product managers.”**

FinTech, UK

**“There are not enough leaders coming in at the top; entrepreneurs don’t want to give up salary or take a large risk, despite being talented.”**

FinTech, Australia

Entrepreneurial talent is weakest in Hong Kong and Singapore. The reasons for this appear to be largely cultural, with their cultures characterised by risk aversion, limited networking and poor perceptions of entrepreneurs in terms of status and career choice. In fact, in Singapore, leadership in FinTech and entrepreneurship tends to be imported, with one interviewee reporting that “70% of FinTechs’ founders are expats.”

**“There is a lack of appetite, mindset and culture to build or work for start-ups.”**

FinTech, Hong Kong

<sup>9</sup>. Estimate for Silicon Valley excludes the wider California Bay area. Including this area, California currently has more developers in absolute terms than London





### Talent availability: conclusion

Regions with strong availability of talent not only have a large FinTech workforce, but also solid coverage across technical, FS and entrepreneurial skill sets. This is facilitated by close proximity to global tech giants, as evidenced in California, as well as proximity to a concentration of global FIs, as seen in London and New York. With respect to entrepreneurial talent, cultural factors are more at play, with California's established network of investors, tech companies, mentors and academia creating a vibrant entrepreneurial culture.

As such, we find that California leads the market in the current availability of talent, driven by the size of its overall FinTech workforce and particular strength in tech and entrepreneurial talent. It is closely followed by the UK and New York, which rank the highest for the availability of FS expertise.

Attribute: Talent

Factor: Talent availability

UK

CA

NY

DE

AU

HK

SG



Talent availability



Less supportive



More supportive

## 3.1.2 Talent pipeline

### The UK's talent pipeline trails that in California

In this section, we benchmark the health of the talent pipeline and initiatives in place to improve access to talent in the future. This pipeline can be built domestically, largely through academic pathways and education initiatives. It also needs to be built internationally through frictionless access to foreign talent. Even in the US, where there is a vast domestic labour market, this is critical; over 40% of Silicon Valley's IT workers are born overseas, compared to a national average of around 10% (see appendix A, figure A.4).

To benchmark the talent pipeline, we consider the outlook for talent across the three key skill sets drawing on interview research. We then assess the strength of academic networks and education initiatives to build the pipeline of domestic FinTech talent. And lastly, we assess the strength of current immigration regimes to provide FinTechs with easy access to foreign talent. We do this with respect to the overall immigration regime (applicable to all sectors) and the prevalence of entrepreneur-specific visa initiatives.

#### The outlook for talent across key skill sets

Across in-scope regions, the talent pipeline appears weakest for technical talent. Concerns about future technical talent shortages are most pronounced in the UK, New York and Australia, which have considerably lower shares of science and technology graduates (see appendix A, figure A.5).

**“One of our biggest challenges for tomorrow is our tech skills agenda, and ensuring we have sufficient technical skills.”**

FinTech hub, UK

**“There needs to be a bottom-up push for tech talent and STEM training to grow and keep talent in Australia.”**

FinTech, Australia

By comparison, the pipeline of FS and entrepreneurial talent is stronger for most in-scope regions. A major source of FS skills in FinTech is global banks, which are cutting costs and downsizing their workforce. We estimate that the UK's big four banks intend to reduce headcount by more than 15,000 over the next few years.<sup>10</sup>

10. EY analysis based on publicly available research

11. In the UK, it is reported that women occupied only 9% of board seats for FinTech City's 50 firms (of which 35 are UK-based) and 69% of their boards were entirely comprised of men, Management Today

### The strength of education initiatives and academic networks

Building a sustainable talent pipeline requires strong education systems at all levels of schooling. Most in-scope regions perform favourably with respect to the strength of education initiatives and academic networks, with the US and UK leading (figure 16).

With respect to the tech talent pipeline, a number of regions are actively pursuing STEM education in schools as part of national innovation agendas. This includes efforts targeted at females, as seen in California, to combat the existing gender disparity in tech and FinTech globally.<sup>11</sup> A number of STEM initiatives are in train in the UK, including the introduction of coding in schools, with early evidence of their impact. According to our interviews, there is scope to further expand and promote UK initiatives, for example, by encouraging industry participation in order to keep tech skills and teaching up-to-date.

**“In the UK, we need to find a way to develop more homegrown tech talent – coders, developers and engineers – that starts with better training and awareness in high school. Otherwise, you'll see more FinTechs outsourcing their needs for technical talent to Poland and Germany.”**

FinTech, UK

Universities can play a key role in providing graduate pathways to FinTechs, promoting the sector and, in the longer term, adapting curriculums (e.g., towards entrepreneurship) and spearheading research (e.g., into data analytics). The US and UK lead for the strength of academic networks and research facilities, overall university-industry collaboration (see appendix A, figure A.6) and genuine engagement with FinTech (see appendix A, figure A.8).

Figure 16: **Best practice – tech education and academic initiatives (in-scope regions and select European initiatives)**

Region	Initiative	Region	Initiative	
UK	<b>Government STEM policy paper “2010 to 2015”:</b> actions to encourage STEM in schools. Includes STEMNET (which covers ambassadors to assist teaching, after-school clubs, and STEM education advice to schools).	CA	<b>StartX Accelerator (2014):</b> non-profit programme accelerating the development of Stanford University’s top entrepreneurs through experiential education and access to an uncapped fund.	
	<b>The ICT Curriculum Review (2013):</b> replaced previous ICT curriculum with computer science and coding course in school.		<b>Draper University – Hero city and FinTech Incubator programme (2015):</b> co-working space, run privately to promote FinTech innovation and an invite-only incubator which provides access to funds.	
	<b>ProgeTiger (2012):</b> Estonian Government programme to teach programming and robotics in schools.		<b>NY</b>	<b>START-UP NY (2013):</b> State Government initiative offering 10 years of tax-free operation for new or expanding businesses on or near eligible universities or colleges.
	<b>STEM in secondary schools:</b> applied learning programme to be rolled out in schools.		<b>Cornell Tech Runway Startup Postdocs (2014):</b> a university-run package, for recent PhDs in digital technology looking to start a company in New York, that includes a salary, research budget, housing allowance and work space.	
	<b>Women Who Code:</b> US not-for-profit; meetups for women in tech careers.		<b>AU</b>	<b>Incubate (2012):</b> developed by the University of Sydney and principally sponsored by industry, the programme offers funding, mentoring and work space.
	<b>Coding in Schools:</b> Opposition Government pledge to introduce coding into all schools.		<b>UK</b>	<b>Tech City UK’s Digital Business Academy (2014):</b> provides 11 free, online courses on business acumen; course content delivered by Cambridge Judge Business School and University College London, amongst others.
EE	<b>Clearing debt for STEM graduates:</b> Opposition Government pledge to write-off higher education debts for 100,000 STEM graduates.	UK	<b>ELITE programme (2014):</b> a 24-month programme run by the London Stock Exchange Group (LSEG) in collaboration with Imperial College Business School which provides high growth companies with education, mentorship and increased funding.	
	<b>FR</b>		<b>FinTech 101 (2015):</b> e-learning course offered by The Open University in collaboration with Innovate Finance.	
	<b>École 42:</b> privately-run computer programming school, available to adults regardless of further education.		<b>London Business School FinTech Hackathon (Nov 2015):</b> three-day event, organised by the university’s Entrepreneurship Club and supported by industry, which brings together individuals to create FinTech products.	
SG	<b>CA</b>	<b>Shadbolt Review (2015):</b> Government-commissioned review to understand how the current accreditation system for computer science degrees can be reformed to improve employability of ICT graduates.		
	<b>Women and girls in STEM week:</b> state initiative to urge educators, business and community leaders to increase the level of women in STEM.			

See appendix A, figure A.7 for further tech education examples; appendix A, figure A.8 for further academic network examples

### Access to foreign talent

We find that Singapore and Hong Kong have the most accommodating skilled immigration regimes, based on the speed, simplicity and flexibility of visa programmes. Although the UK’s overall regime is more restrictive, it benefits from labour mobility policies within the European Union and a number of entrepreneur-specific immigration initiatives.

### The overall immigration regime

Singapore and Hong Kong have the most supportive regimes of in-scope regions, driven by:

- ▶ Less time (and steps) required to process visas for skilled workers (figure 17)
- ▶ The lack of quotas that control the inflow of skilled workers
- ▶ The availability of longer-term residency options

Despite overall supportive immigration regimes in Singapore and Hong Kong, interviewees commented that the high cost of living in these regions can make it difficult to incentivise foreigners to relocate there.

While UK and German regimes are generally more restrictive than those in Asia-Pacific countries, they benefit from flexible labour mobility policies within the European Union.

Figure 17: **Factors influencing degree of restrictiveness**

	UK	US*	DE	AU	HK	SG
Quota system	✓	✓	✗	✗	✗	✗
Path to long-term options	✓	✓	✓	✓	✓	✓
Spousal visa	✓	✗	✗	✓	✓	✗
Average weeks to obtain a temporary work permit	20	12	9	8	5	2

Source: Employing Skilled Expatriates Index, 2013

\*In the US, while the path to longer term citizenship and residency options exists, it tends to be more complex and uncertain




### Entrepreneur-specific immigration initiatives

Outside of their overall skilled immigration programmes, most countries have adopted immigration initiatives which specifically target entrepreneurship or technical skill shortages.

The UK and Australia have several initiatives to support foreign business entrepreneurs and technical talent, although the most notable initiatives are relatively new (figure 18).

In particular, the UK's new Tech Nation Visa Scheme was revised in late 2015 to replace a previous scheme which was seen by many to have overly strict criteria, red tape and a limited profile (resulting in very low take-up). While the new visa is progressive, it only applies to Tier 1 "Exceptional Talent" applicants and the bulk of non-EU tech workers reside on a Tier 2 visa, for which conditions are generally tightening.<sup>12</sup>

Figure 18: Best practice – entrepreneur-specific immigration initiatives

Attracting tech talent and entrepreneurs		
UK 	<b>Tech Nation Visa Scheme (Tier 1 Exceptional Talent) (2015)</b>	Available for tech experts, entrepreneurs, academics or start-up employees. This includes fast-track application procedures for northern digital businesses in the seven cities under the Tech North remit and the recruitment of overseas tech teams (groups of up to five individuals).  While the recent initiative (implemented Nov 2015) has been welcomed by industry, concerns have been raised that it only applies to a limited number of Tier 1 visa applicants.
	<b>Graduate Entrepreneur visa (2012)</b>	Endorsed by UKTI, the visa enables graduates identified by a UK university as possessing world-class entrepreneurial skills or having a credible, genuine business idea to apply to stay in the UK after graduation.
Attracting tech talent		
AU 	<b>Enhanced residence pathways for STEM and ICT graduates (Dec 2016)</b>	Graduates of Australian universities with qualifications in STEM and ICT will receive extra points under the points-tested Skilled Migration programme to qualify for a permanent work visa. This will be implemented in December 2016.  This programme specifically looks to target and retain tech talent and has been announced as part of Australian Prime Minister Turnbull's National Innovation and Science Agenda.
Encouraging investors		
AU 	<b>Significant and Premium Investor Visa Programmes (2012)</b>	Part of the Government's Industry Innovation and Competitiveness Agenda. The programme selects applicants with business and entrepreneurial skills and the capital to invest into innovative Australian businesses and ideas. Refinements to the programme have been under consideration since May 2015.  This initiative shows the Australian Government's desire to engage participants from all stages of the value chain.
Entrepreneur visas		
All of the in-scope regions, with the exception of the US, have visa schemes targeted at individuals looking to set up or run a business (the US has a proposed start-up visa but this is currently awaiting Congress approval).  These all have either compulsory or suggested minimum investment criteria.		

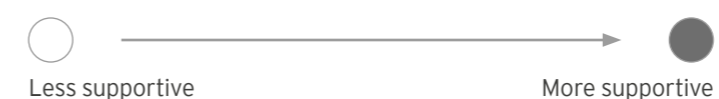
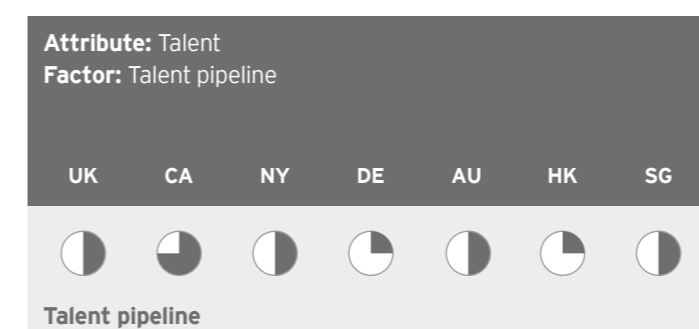
Notes: See appendix A, figure A.9 for further examples

12. A report from the UK Migration Advisory Committee suggested that the UK Government should introduce an annual 'Migration Skills Charge' of £1,000 to incentivise employers to reduce reliance on foreign workers, BBC News

### Talent pipeline: conclusion

With the pipeline of technical talent proving the most challenging globally, highest-scoring regions have an active focus on STEM education. This includes initiatives targeted at females to combat the gender disparity in tech and FinTech. Academia plays a key role in the ecosystem, strengthening graduate pathways (a relatively near-term source of talent) and developing FinTech-relevant curriculums and research (building the pipeline further out). Best-in-class practices to strengthen access to foreign talent include adopting an accommodative stance to skilled migration overall and well-targeted visa initiatives to help FinTechs address local talent shortages flexibly.

We find that California ranks highest overall, owing to strength in its tech and entrepreneurial skills pipeline and the impact of established academic networks to build the future FinTech workforce. This is followed by Singapore, which leads for access to foreign talent and broad-based strength in the UK.



## 3.2 Capital

### The US has vastly superior access to scale-up capital for FinTechs

#### Assessment summary of the Capital Attribute

Within the FinTech ecosystem, access to funding at all stages of a FinTech's development is critical to help them grow. Investment activity can also help to increase the profile of the sector as a whole, thereby attracting further investment, and spurring sector growth.

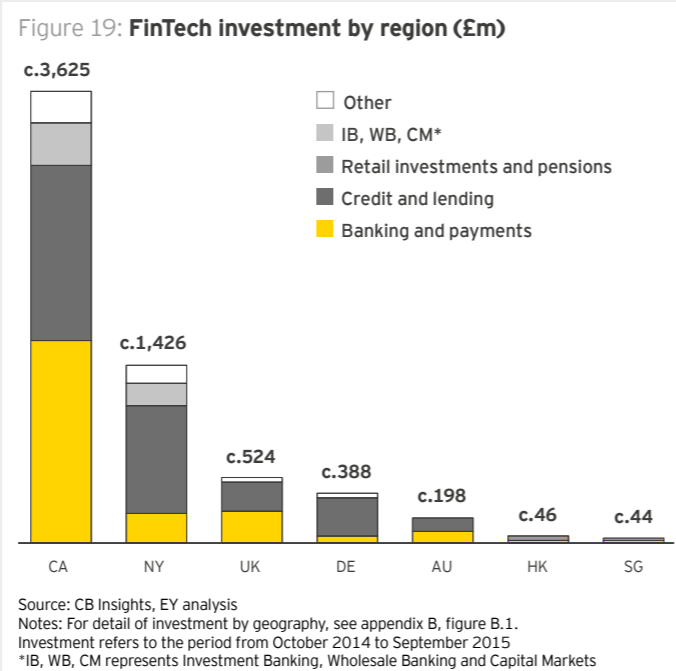
In this section, we discuss the three Factors that influence the Capital Attribute:

**1. Seed capital:** the availability of capital to finance initial start-up activities for FinTechs, typically provided by angel investors, as well as through accelerator and incubator programmes.

**2. Growth capital:** the availability of funding from early-stage development into the growth phase, typically provided by VC funds and corporate venture vehicles.

**3. Listed capital:** access for mature FinTechs to public market investors.

In terms of availability of capital and access to investors, the US is the most advanced country across in-scope countries, with California and New York ranking first and second respectively, and generating the most investment in the FinTech sector (figure 19).



The strength of the US regions applies across all stages of development, from seed to initial public offering (IPO). By funding type, particular highlights include:

- **Seed:** The availability of seed funding is strongest in California and New York, where FinTechs benefit from an established investor culture of investing in start-ups and engaged angel networks. In the UK, FinTechs benefit from successful initiatives, including SEIS. However, their applicability of SEIS to FinTech is on a case-by-case basis with a range of FS-related activity (such as banking, lending and insurance) falling outside the initiatives' scope.
- **Growth:** The US regions excel in growth capital, with growth investment in FinTech more than six times that in the UK. Investor culture, particularly, re-investment behaviour, further supports growth funding in these regions.
- **Listed:** The US dominates the global IPO market, with the New York Stock Exchange (NYSE) and NASDAQ together accounting for nearly £300b in IPO proceeds in the last 10 years. Meanwhile the LSEG provides UK FinTechs with access to the largest investor base in Europe.

Attribute: Capital<sup>13</sup>

	Factors			Capital ranking
	1. Seed	2. Growth	3. Listed	
UK	◐	◐	◑	3
CA	●	●	◐	1
NY	◑	◑	●	2
DE	◐	◐	◐	4
AU	◐	◐	◐	5
HK	◐	◐	◑	6
SG	◐	◐	◐	7

○ → ●  
Less supportive → More supportive

## 3.2.1 Seed capital

### Availability of seed funding is highest in US regions; the UK is well supported through effective tax initiatives and FinTech hubs

In this section, we analyse the availability of seed funding across in-scope regions. Seed funding is a critical factor, as without seed investment, start-ups would not be able to access basic infrastructure and recruit talent.

To compare the availability of seed funding across regions, we consider a number of drivers, including the presence of angel investor networks, FinTech accelerators and incubators, and supportive tax initiatives designed to encourage early-stage investment (see appendix B, figure B.2-B4).

13. In calculating regional rankings, higher weighting is given to seed and growth capital

Our analysis of the availability of seed funding across the regions takes into account the prevalence and availability of angel investment (figure 20). As shown, the availability of seed funding is strongest in California and New York where FinTechs benefit from an established investor culture of investing in start-ups. In the UK, FinTechs benefit from successful policy initiatives, including SEIS.

Figure 20: Comparative snapshot of seed funding, by region

<p><b>UK</b></p> 	<p>Wide-ranging government-supported seed ecosystem, with FinTech specific initiatives that have been developed over several years</p> <p>A variety of schemes such as start-up loans, UK Angel CoFund and EIS to help start-ups gain access to and, in the case of the BBB, receive business loans and encourage a seed investment market</p> <p>“The seed funding environment is strong, but not as good as California. The capital is certainly readily available, but just not at the same volumes as California and the US in general.” FinTech, UK</p>
<p><b>SG</b></p> 	<p>Despite a supportive government and relatively high concentration of investors, seed financing is limited by the nascency of FinTech and scarcity of attractive investment targets</p> <p>A highly active and FinTech-focussed regulator (MAS) supporting start-ups; a c.£100m dedicated fund and initiatives, including incubators and funding schemes, such as SPRING SEEDS Capital</p> <p>“Access to capital at the early stage was an issue two to three years ago, but now it’s a case of the money is there, but there is a lack of good targets for investors.” Investor, Singapore</p>
<p><b>HK</b></p> 	<p>Small and nascent seed funding market, but with increased focus from government; compared with Singapore, represents a smaller market with lower availability of seed funding</p> <p>A number of recent government initiatives, including a FinTech Steering Group and an Innovation and Technology Venture Fund (of c.£175m), to co-invest in local innovation and tech start-ups with private VC firms on a matching basis.</p> <p>“There is not much of a fund-raising problem in HK. There is a sizeable amount of money available and willingness to invest, however, the FinTechs in HK don’t appear to be very profitable and hence attract low levels of investment.” Investor, Hong Kong</p>
<p><b>US National</b></p> 	<p>The strongest seed funding environment with an established network of angel investors with decades of experience of investing in emerging sectors</p> <p>Historic non-FinTech national initiatives support access to capital and help to meet start-up business costs; such as regional SBDCs and Start-up America</p>
<p><b>NY</b></p> 	<p>Limited state-focused initiatives, other than New York State Consolidated Funding Application (CFA)</p> <p>“New York has a healthy supply of capital for seed funding, from a range of sources, but the risk appetite is probably a little lower than California.” FinTech, New York</p>
<p><b>CA</b></p> 	<p>Limited regional investment incentive policies</p> <p>“Silicon Valley and San Francisco are definitely advantageous locations to start up a firm of any type, due to the entrepreneurial culture attracting a lot of seed capital.” FinTech, California</p>
<p><b>DE</b></p> 	<p>Underperforming access to seed funding given the size of the market, with regulatory complexity a potential disincentive to investors</p> <p>Numerous financing schemes in the form of loans, capital and grants, such as High-Tech Gründerfonds</p> <p>“Early-stage investment is a challenge, with investors being highly selective and performing very detailed and structured analysis - they don’t give money away easily!” Investor, Germany</p>
<p><b>AU</b></p> 	<p>Currently a small market, but a number of tax initiatives were recently announced as part of the National Innovation and Science Agenda (NISA)</p> <p>Recent NISA announcement includes tax initiatives, R&amp;D credits and creation of a crowdfunding platform to raise funding</p> <p>“Start-up capital is still somewhat scarce, so it’s important for entrepreneurs to sell a strong story.” FinTech, Australia</p>

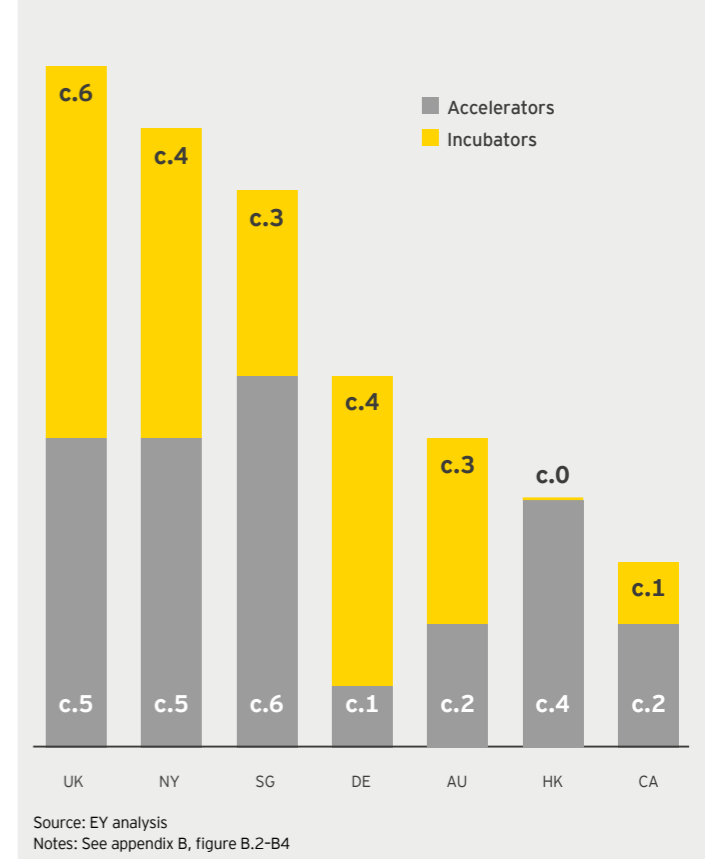
Notes: See appendix C, figure C.1 for specific government programmes for the FinTech sector

Key ■ Summary ■ Policy ■ Interview quote

Accelerators and incubators (referred to collectively as ‘FinTech hubs’) are critical to the success of the FinTech ecosystem, in particular for seed stage development. FinTech hubs provide direct funding and access to funding networks (e.g., business angels and high net worth individuals). An ‘incubator’ typically provides long-term office space, basic business infrastructure, and networking opportunities, whereas an “accelerator” provides an intensive short-term programme culminating in an “investor day”.

In this capacity, the UK is market-leading with several FinTech hubs headquartered in London providing a range of services to start-up FinTechs including office space, mentoring and networking events to connect with prospective talent and investors (figure 21, and see appendix B, figure B.2-B.4). New York, as a well-developed FS centre, has a number of mature incumbent and VC-backed FinTech initiatives. In California, there are fewer FinTech-specific hubs and the region is dominated by tech-focused initiatives. Corporates and incumbents in Singapore, and to a lesser extent Hong Kong, have recently invested in several accelerator and incubator programmes, with these regions viewed as a strategic gateway to the Far Eastern markets.

Figure 21: Current number of FinTech hubs, by type



To progress through the seed stage, FinTechs (and start-ups in general) must have access to a number of basic business infrastructures, many of which are supported by FinTech hubs. However, of these basic infrastructures, access to affordable office space and flexible lease terms can still be a challenge, particularly in locations such as London (figure 22).

Figure 22: The cost and availability of office space

#### Cost of office space

Renting commercial property is relatively expensive in London (£84 per sq ft), second only to Hong Kong (figure 23). The affordability of office space in Germany was duly noted in stakeholder interviews.

However, once outside of London, rents in other UK cities are considerably lower with cities such as Manchester, Leeds and Cardiff comparable to Germany (figure 24).

“Office space in Berlin is pretty easy to come by, and considerably cheaper than in London – it has to be one of the appeals of being based in Berlin” – FinTech, Germany

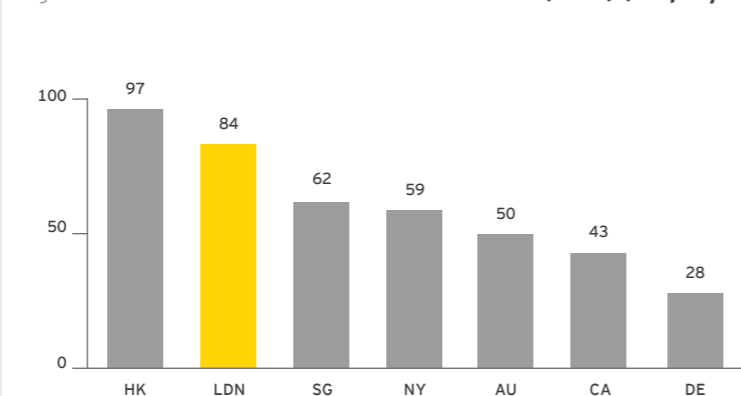
#### Lease length

Beside rental price, another challenge in the UK can be the longer lease length required for commercial property. Longer lease length in the UK (twice that of most other in-scope regions) can place strain on a start-up's balance sheet and limit their ability to scale (figure 25).

Recently, however, the increased prevalence of property management companies in the UK, which sub-lease office space on shorter terms, has helped to mitigate this challenge.

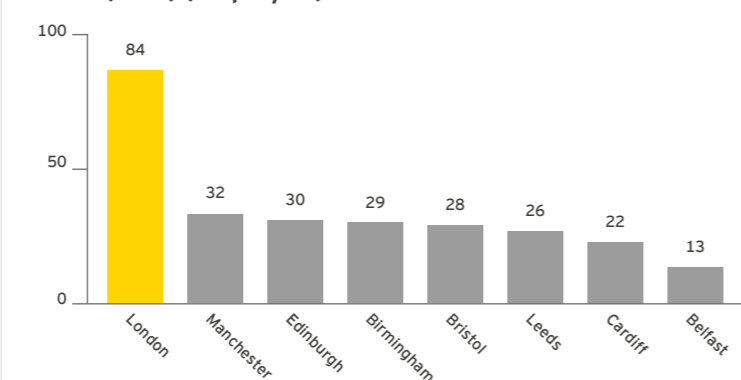
“Compared to the US, London is not as flexible, particularly in regard of length of lease – often 10 years with a five year break clause. It's not just a problem for new FinTechs, but any that are growing and may need to upsize” – FinTech, UK

Figure 23: Rental cost of commercial real estate (2014) (£ sq ft year)



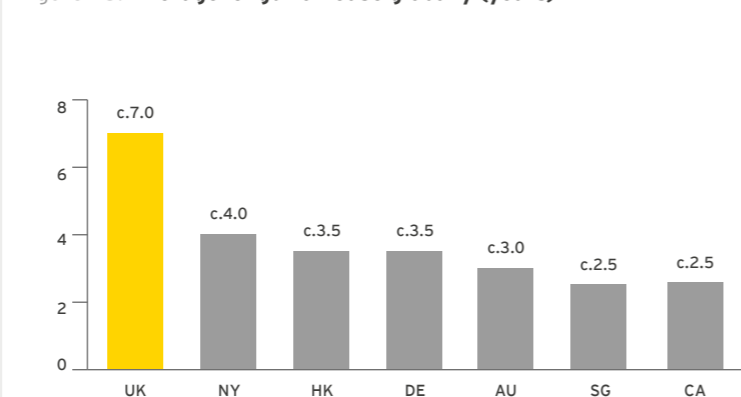
Source: Cushman and Wakefield  
Notes: Rental cost calculated as average of large cities

Figure 24: Prime rental cost of office space in regions outside of London (2014) (£ sq ft year)



Source: JLL, Cushman and Wakefield

Figure 25: Average length of lease globally (years)



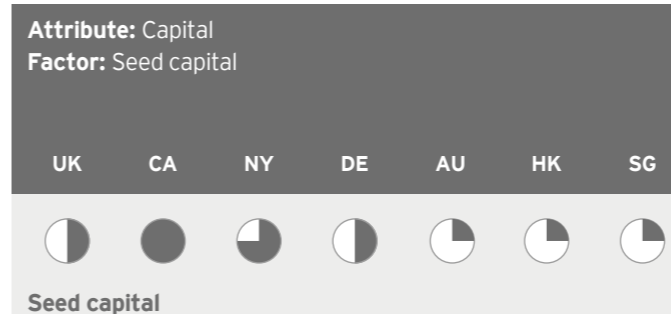
Source: EY analysis

#### Seed capital: conclusion

In summary, it appears that California and New York are the respective market leaders in terms of seed funding availability. Both markets benefit from a high investor risk appetite, and particularly in the case of California, an established network of angel investors with decades of experience in investment in emerging sectors.

Following the US markets, the UK has a strong seed funding landscape, by way of a supportive and sizeable angel investor network and tax initiatives such as SEIS and EIS. While these tax initiatives appear to have been effective in encouraging early-stage investment, we note that their applicability to FinTechs varies.

Availability of seed funding in the UK is also bolstered by the largest network of FinTech hubs across in-scope regions. UK-based FinTech hubs appear to be having a significant impact. In particular, one UK incubator highlighted that 90% of FinTech participants successfully piloted with a major bank.



## 3.2.2 Growth capital

### California benefits from decades of experience in growth investment in the broader tech space

In this section, we assess the availability of growth capital, primarily by assessing VC funding for FinTechs across in-scope regions. VC funding remains the primary source of capital for FinTechs from early-stage through to growth stages. As a result, a strong VC network can be a defining factor for scaling innovative start-ups.

To compare the availability of, and access to, growth funding across in-scope regions, we have analysed the quantum of VC investment in the regions, investor attitudes towards investing in emerging sectors and the degree of specialism in FinTech.

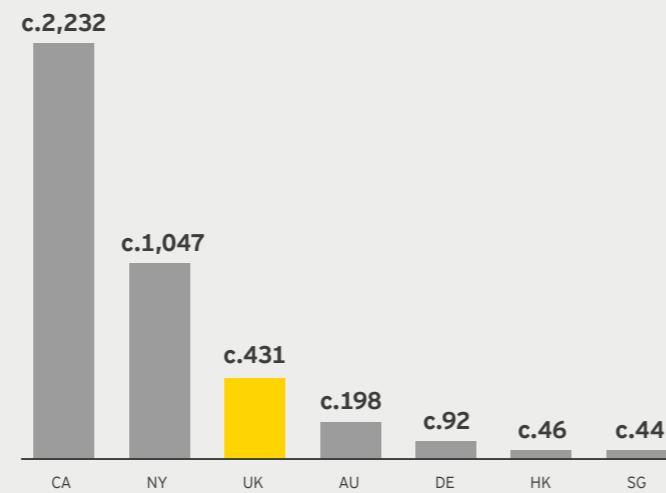
We analysed total investment into FinTech and excluded fundraises of more than US\$100m to better understand the growth segment specifically (figure 26). Despite making this adjustment, we find that California continues to dominate, with the level of overall FinTech investment more than six times that in the UK. As VC models are less mature in Europe than in the US, this finding is not surprising and is consistent with stakeholder interviews. The gap between California and other regions is largely explained by its significant investor experience, high risk tolerance and a willingness to re-invest in FinTechs: "It's almost unfair to compare others with the West Coast. How do you accelerate 40 years of VC and experience" - Trade Association, UK.

Nonetheless, growth investment in FinTech is not a specialism in California. Countries such as Australia and the UK show a higher specialism in FinTech with approximately 30% of total tech VC investing channelled towards FinTech, compared with c.12% for California (figure 27). This focus is often associated with longer-term support for the sector.

In the UK, growth investment is also supported by tax incentives, such as the VCT Scheme where this is applicable. The average investment received by a company through the VCT Scheme is £2.3m. The Scheme was also recently reviewed to lift the company lifetime investment limit for 'knowledge-intensive' companies (from £12m to £20m).

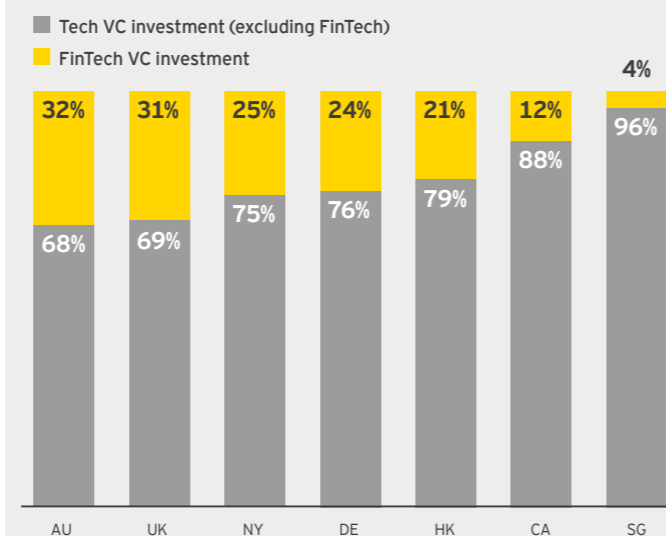
Globally, the emergence of CVVs is also providing support to growth funding. Activity is currently a fraction of that of VCs, however, it is beginning to grow (see appendix B, figure B.6).

Figure 26: FinTech investment by region (excluding raises >US\$100m), (£m)



Source: CB Insights, EY analysis  
Notes: Investment refers to the period from October 2014 to September 2015

Figure 27: Proportion of tech vs. FinTech investment by region

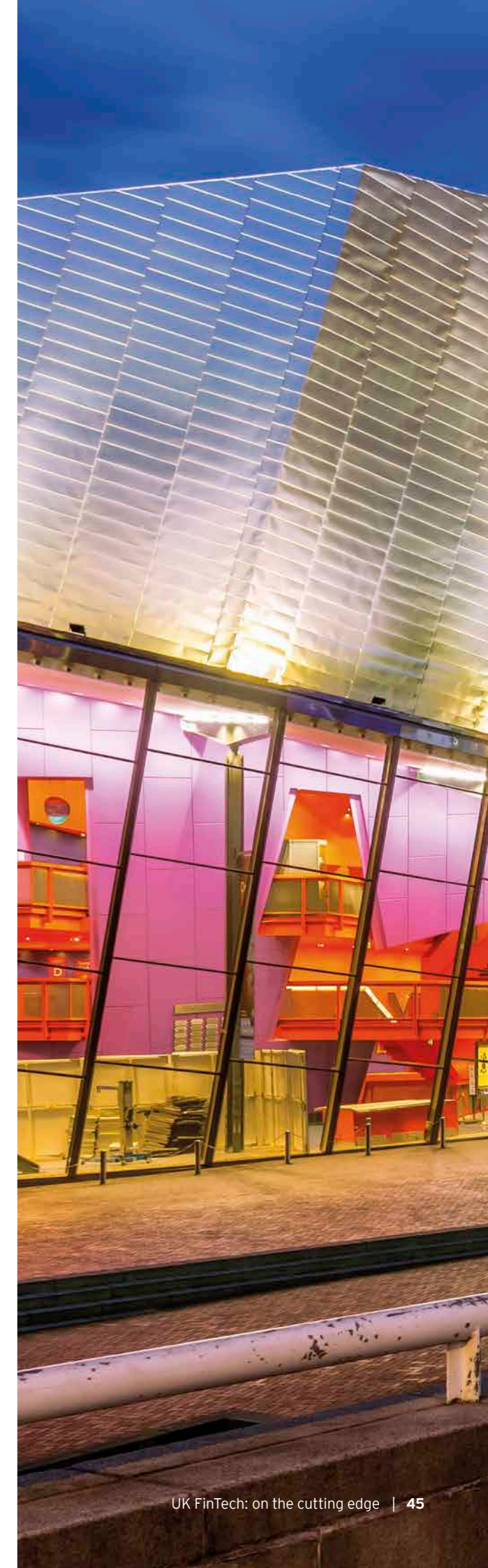
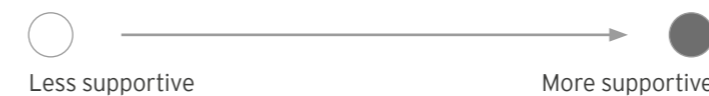
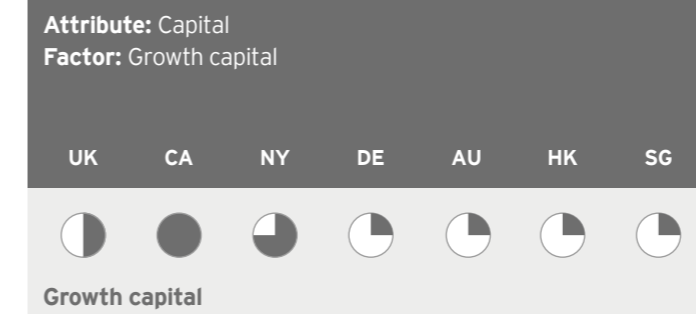


Source: EY VC Report 2015, Preqin, Wilmer Hale  
Notes: See appendix B, figure B.5 for total VC investment in the top six regions (VC hotbeds)

### Growth capital: conclusion

Measured against these criteria, California is the highest ranked region for VC funding with over c.£17.5b in overall tech investment in 2014 (see appendix B, figure B.7) compared to c.£3.5b for New York and c.£1b for the UK. Like seed funding, what separates California from the other regions is the presence of an established and experienced VC community. Of perhaps greater relevance are investor attitudes in the US, where investors are more likely to be serial investors (frequently re-cycling proceeds from exits) than their UK counterparts.

The consensus in the UK, which ranks third for availability of growth funding, is that compared to seed financing (which is a strength of UK market) growth capital appears limited. While tax initiatives such as VCT and EIS are in place to promote growth investment, interviewees noted that the UK lacks the depth and scale of funding available in the US.



### 3.2.3 Listed capital

In this section, we assess mature FinTechs' access to public market investors with reference to the strength of the local stock exchange in our regions. Strong local exchanges are important to give mature FinTechs access to longer term and more cost-effective funding as well as provide an exit for growth investors.

Across the in-scope regions, we benchmarked the size and scale of regional exchanges - in terms of the number of IPOs and proceeds generated over the past 10 years. As secondary factors, we consider the impact that market research coverage and IPO fees may have on the attractiveness of local exchanges (see appendix B, figure B.8).

Analysis of the IPO activity of the world's largest exchanges highlights the scale of US-based exchanges. The NYSE and NASDAQ together generated total proceeds of nearly £300b from 1,594 IPOs in the last ten years, with the tech sector accounting for c.20% of total proceeds and number of IPOs (figure 28).

Following the NYSE, the HKSE is the second largest exchange globally, although its share of tech IPOs (c.7% by number and c.2% by proceeds) is low relative to other large exchanges. The LSEG is the third largest exchange globally, and the largest in Europe. However, it is still only roughly a third of the size of the US exchanges combined. Moreover, the LSEG's share of IPOs accounted for by tech firms is less than half that for the NASDAQ (c.11% versus c.23%, by number of IPOs). In comparison to other large global exchanges, Germany's DBAG is significantly smaller by total proceeds, however, it has a relatively high share of tech IPOs. Lastly, even though China is not in scope, it is important to acknowledge the importance of the SSE and SZSE, due to the scale of its recent IPO activity (see section 5.1 China case study).

Our analysis and stakeholder interviews suggest that access to capital and premium valuations are the most significant factors which determine tech firms' decision of where to IPO. Our analysis of the level of exchange fees and analyst coverage suggests these factors are of secondary importance.

Figure 28: Total IPOs over the last ten years (by proceeds and number)

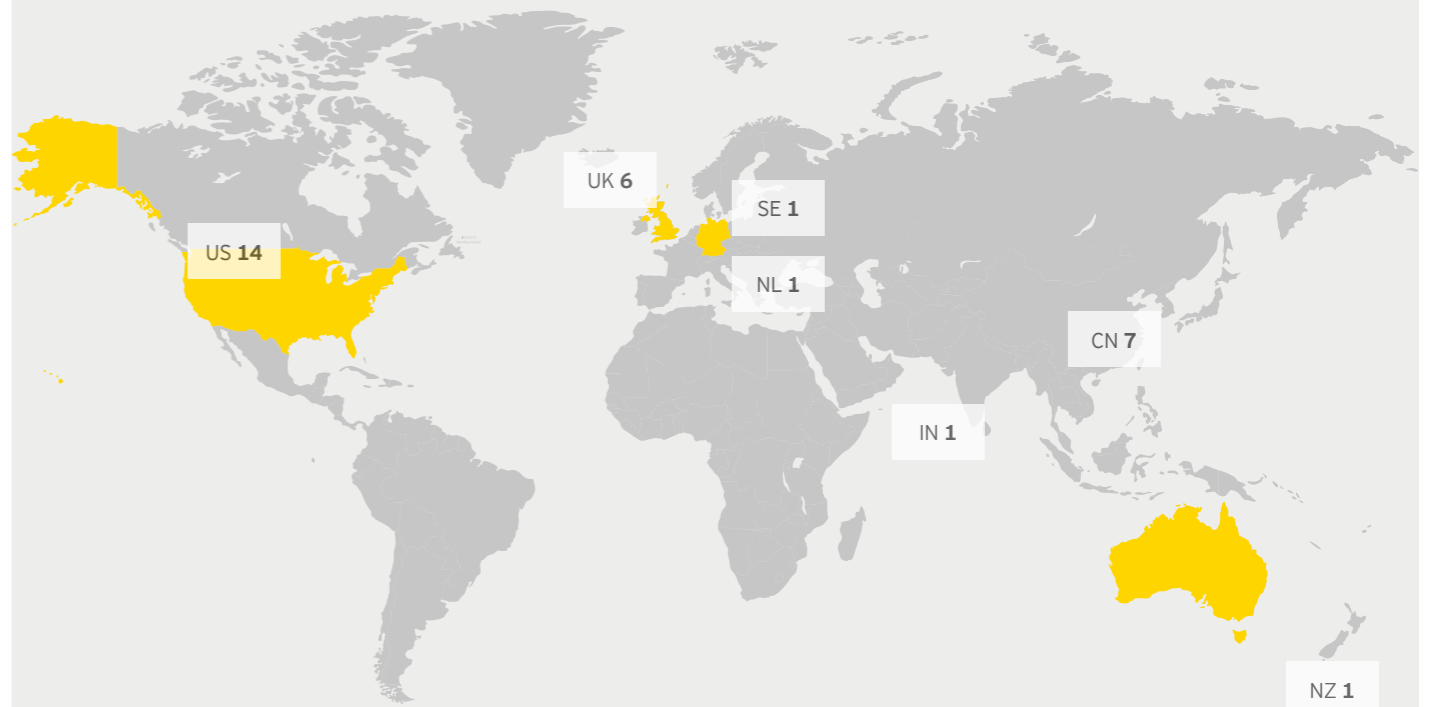
Geography	Exchange name	Total proceeds at IPO (£b)	% of total proceeds accounted for by technical	Total number of IPOs	% of total number accounted for by technical
US	NYSE (including NYSE and NY AMEX)	211.3	17	721	16
	NASDAQ	86.8	34	873	23
HK	HKEX	191.3	2	635	7
UK	LSEG (including LSE and AIM)	113.3	5	863	11
CH	SSE	105.2	2	258	6
	SZSE (including SZSE and ChiNext)	12.2	15	1202	17
AU	ASX	33.0	4	916	5
DE	DBAG	26.9	11	196	14
SG	SGX	22.5	1	201	5

Source: Dealogic  
Notes: Technology is categorised according to Thomson Reuters Industry classification: "High Technology"; figures for 2015 are as of the 30 September 2015

Figure 29: The prevalence of scaled FinTechs in the largest IPO markets

There is a simple correlation between the prevalence of large and successful FinTechs or "unicorns" (companies valued at greater than US\$1b), and the scale of an exchange. The US is home to 14 of the 31 global FinTech unicorns, eight of which are based in California and primarily financed in the US.

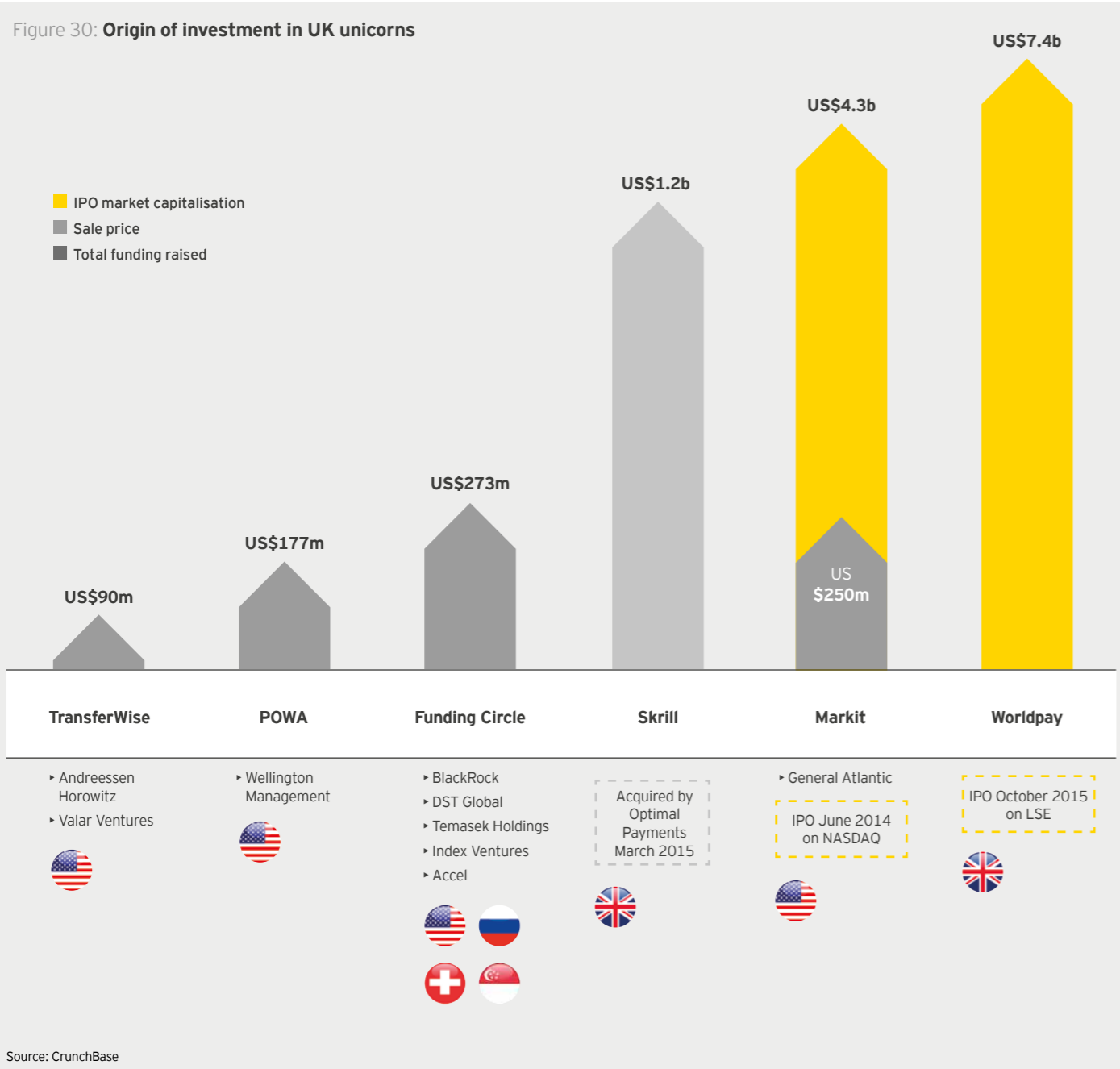
Six of the 31 unicorns are based in the UK, more than anywhere else in Europe. However, UK unicorns attracted capital primarily from foreign investors (figure 30).



Source: CB Insights, EY analysis  
Notes: Logos for each region are not exhaustive



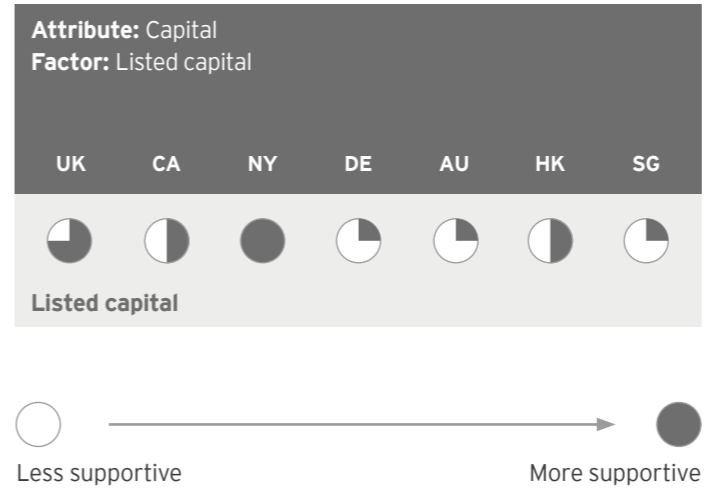
Figure 30: Origin of investment in UK unicorns



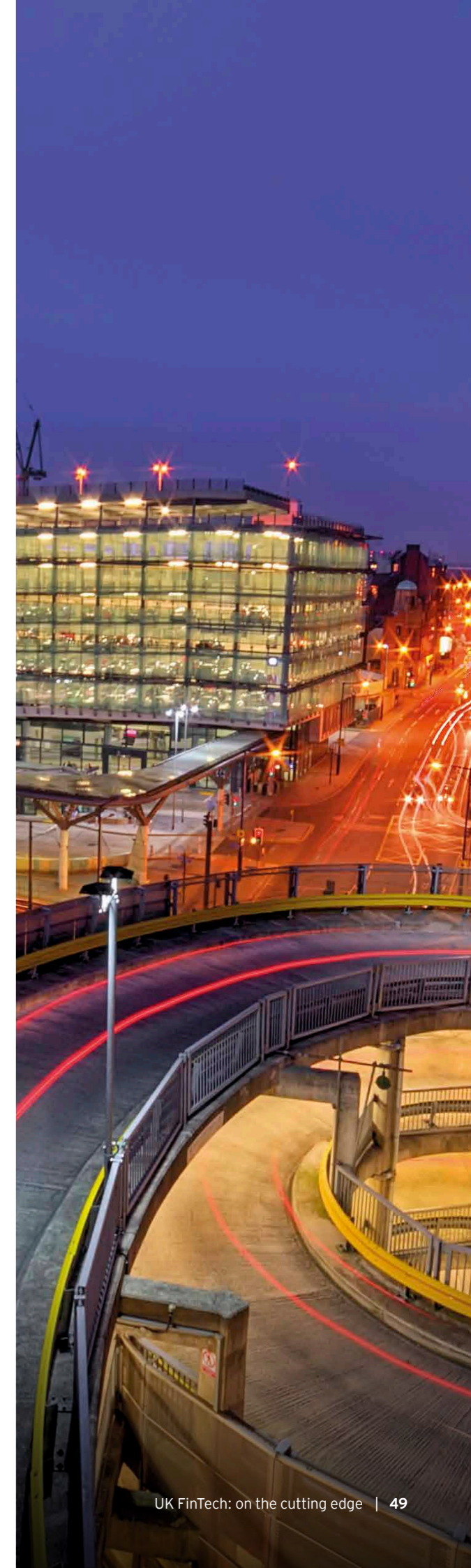
### Listed capital: conclusion

The US dominates the global IPO market, with the NYSE and NASDAQ together accounting for 1,594 IPOs and total proceeds of nearly £300b in the last ten years.<sup>14</sup> With a globally recognised brand and a reputation for delivering high valuations, the US exchanges are the most sought after destination for global FinTechs. The NASDAQ also benefits from high levels of analyst coverage.

The LSEG is Europe's leading exchange and the third-largest exchange globally, behind the NYSE and HKEX. Despite being roughly half the size of the NYSE in terms of IPO proceeds raised, its profile has continued to rise within the FS sector with notable FS listings over the past two years.



14. Dealogic.



# 3.3 Policy

## Policy is a key differentiator across regions and the primary strength of the UK

### Assessment summary of the Policy Attribute

A progressive FinTech policy regime can be instrumental in fostering innovation and supporting entrepreneurs. Conversely, a closed and complex policy regime can result in barriers to innovation and overly burdensome compliance costs.

In this section, we consider three Factors that influence the Policy Attribute:

- 1. Regulatory regimes:** support from regulators for new entrants and business models.

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- 2. Government programmes:** programmes to reduce barriers to entry, encourage competition and innovation and assist FinTechs in the local market.

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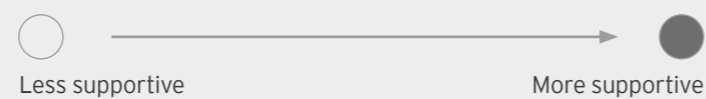
- 3. Taxation policy:** support through taxation for investors and corporates.

We assess regulatory regimes from the perspective of navigating regulatory complexity. Government programmes are more varied and we assess them across four Factors relating to: opening up the sector, attracting foreign FinTechs, ease of setting up businesses and cybersecurity. We assess taxation policies from the perspective of promoting investment (across all stages of funding), and promoting innovation (e.g., through R&D tax credits).

Across in-scope regions, the UK has the strongest FinTech policy environment, with a supportive regulatory regime and market-leading government and tax-related programmes. Second to the UK, Singapore is increasingly active in FinTech policy, though initiatives are relatively new and need time to reach the UK’s level of maturity. The policy landscape in the US and Hong Kong is viewed as more complex, conservative and, in some regards, simply opaque. The US Government stands out as only playing a limited role in supporting the industry.

Attribute: Policy

	Factors			Capital ranking
	1. Regulatory regimes	2. Government programmes	3. Taxation policy	
UK	●	◐	◐	1
CA	◑	◑	◑	6
NY	◑	◑	◑	7
DE	◐	◑	◑	5
AU	◐	◐	◐	3
HK	◑	◐	◑	4
SG	◐	◐	◐	2



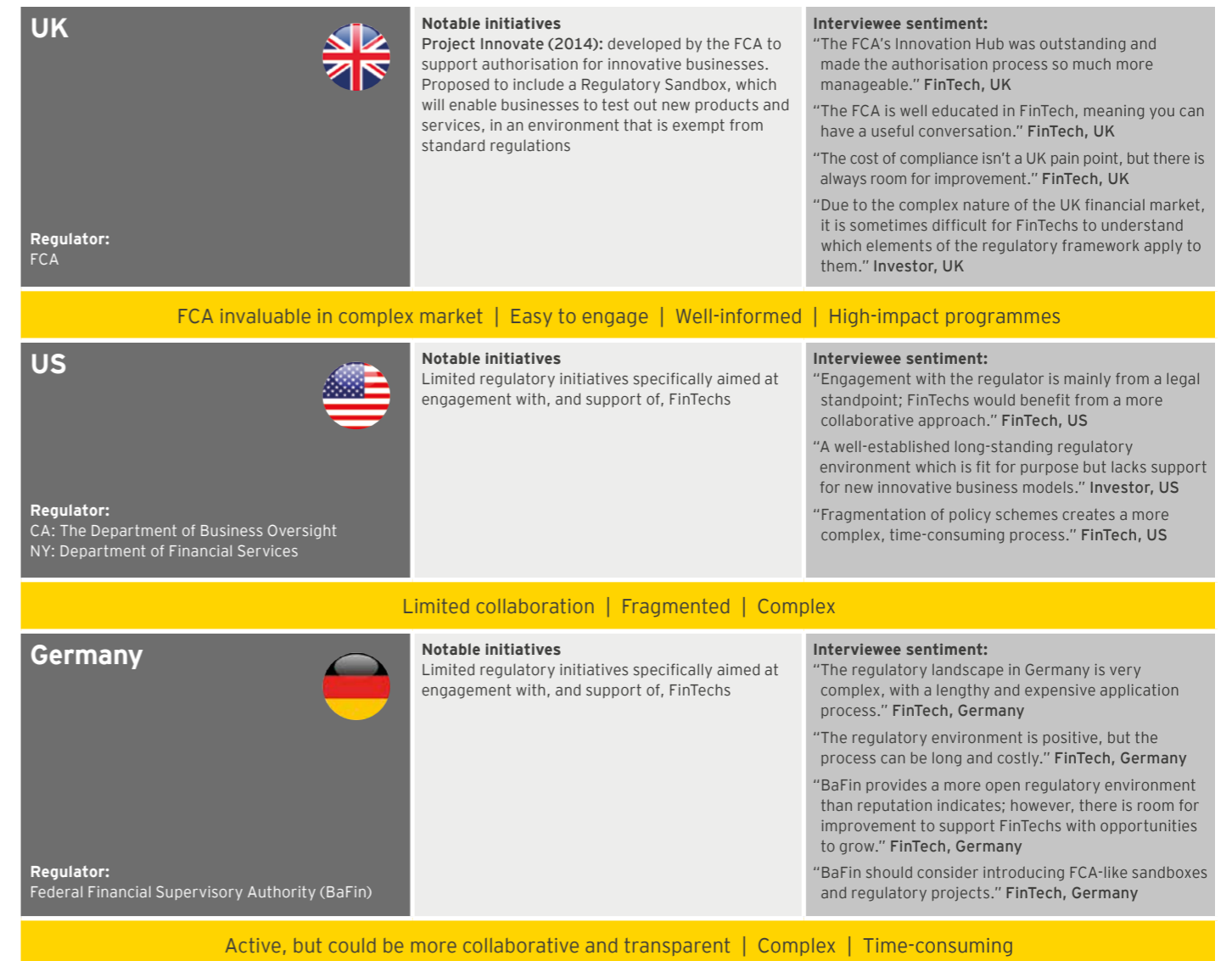
# 3.3.1 Regulatory regimes

## The UK’s regulatory regime leads for its simplicity, transparency and industry-led approach.

To benchmark regulatory regimes across in-scope regions, we assess the range of regulatory initiatives which support FinTech and broader entrepreneurship. We draw on stakeholder interviews with Fintechs, investors and regulators themselves to understand the effectiveness of current initiatives, existing challenges and potential areas for improvement.


Across in-scope regions, the UK’s regulatory regime leads for its simplicity, transparency and industry-led approach. UK FinTechs we interviewed noted the role of the FCA in helping them to navigate regulatory complexity with best-in-class programmes such as Project Innovate (figure 31). Following the UK, the regulator in Singapore (and similarly Australia) has recently taken a more active interest in the FinTech sector, establishing a FinTech steering group and replicating the UK model of an Innovation Hub. At the other end of the spectrum, regulators in the US, Germany and Hong Kong are seen as complex, conservative, and in some respects opaque with limited regulatory initiatives directed towards FinTech.

Figure 31: Best practice – regulatory regimes and initiatives



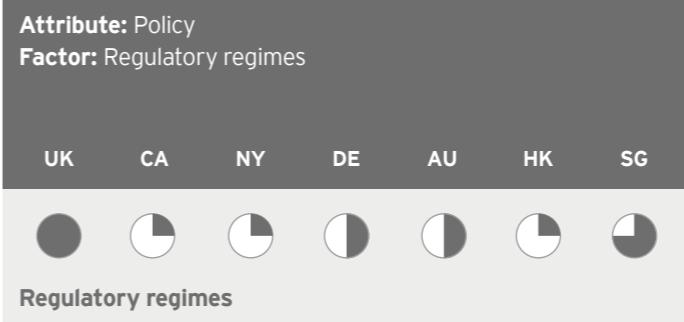
<b>Australia</b>   <b>Regulator:</b> Australian Prudential Regulation Authority (APRA) Australian Securities and Investments Commission (ASIC)	<b>Notable initiatives</b> APRA was recommended by the Australian Financial System Inquiry (FSI) to establish a permanent public-private collaborative committee to facilitate financial system innovation. This has been accepted by APRA and is proposed to be set up mid-2016.  <b>Innovation Hub (2015):</b> developed to help new FinTechs navigate the ASIC's regulatory system. This includes making senior staff available at open events and industry hubs to respond to questions.  <b>Digital Finance Advisory Committee:</b> includes members from FinTechs, industry and academia to advise ASIC on the hub and its engagement with innovative businesses more broadly.	<b>Interviewee sentiment:</b> "APRA is certainly very conservative; in particular, Authorised Deposit-taking Institutions (ADI) are under a lot of scrutiny." <b>Investor, Australia</b>  "ASIC is starting to make an attempt at engaging with the FinTech community, with good intention, but they are still not quite there yet." <b>Investor, Australia</b>
	Nascent FinTech dialogue   Conservative	

<b>Singapore</b>   <b>Regulator:</b> Monetary Authority of Singapore (MAS)	<b>Notable initiatives</b> <b>FinTech and Innovation Group (FTIG) (2015):</b> responsible for creating strategies and regulatory policies regarding technology innovation. A technology innovation lab will work with industry and FinTechs to test innovative new solutions.  <b>Financial Sector Technology and Innovation (FSTI) scheme (2015):</b> a commitment of c.£100m over the next five years to fund innovation labs, institutional-level projects and industry-wide initiatives.	<b>Interviewee sentiment:</b> "The regulators are extremely responsive - I contacted MAS on a Friday evening and received a response from a minister on the Saturday arranging a Monday morning meeting." <b>FinTech, Singapore</b>  "Singapore's innovation hub looks promising, but it is still relatively early days." <b>FinTech, Singapore</b>  "The Singaporean regulator understands FinTech." <b>FinTech, Singapore</b>  "MAS has created a supportive environment for innovation." <b>FinTech, Singapore</b>
	Highly responsive and active   Nascent efforts and initiatives	

<b>Hong Kong</b>   <b>Regulator:</b> Hong Kong Monetary Authority (HKMA)	<b>Notable initiatives</b> Initiatives are more government-led than regulatory-led, and specifically aimed at engagement with and support of FinTechs.	<b>Interviewee sentiment:</b> "Hong Kong does not have a clear regulatory framework, creating a high barrier to entry for new FinTechs." <b>Accelerator, Hong Kong</b>  "The government needs to clarify the regulatory framework, while improving effective communication channels to improve FinTech engagement with the regulator." <b>FinTech, Hong Kong</b>  "Hong Kong has a "regulate first" culture, setting up an environment of high regulatory pressure before accommodating businesses." <b>Accelerator, Hong Kong</b>
	Lacks clarity, transparency and innovative engagement   Barrier to sector growth	

### Regulatory regimes: conclusion

The UK is a global gold standard for the progressiveness of its regulatory regime. Through Project Innovate, a dedicated programme to assist FinTechs to navigate the regulatory authorisation process, the FCA has established a programme that FinTechs describe as supportive and collaborative, and significantly simplifying regulatory complexities. More recently, this approach has also been employed in Singapore, where MAS has created a FinTech-focused strategy group. MAS has quickly developed a reputation for being a responsive regulator that has been instrumental in supporting innovation in the sector.



## 3.3.2 Government programmes

### The UK is market leading for the strength of its government FinTech programmes

In this section, we assess the strength of government programmes across in-scope regions. Government programmes are a key facilitator of a strong FinTech ecosystem; these programmes bring ecosystem stakeholders together, create opportunities for innovation and competition, and therefore help FinTechs scale and internationalise.

We have identified four primary groupings of government programmes:

- ▶ Opening up the FS sector to competition and new entrants
- ▶ Helping to attract foreign FinTechs to the region
- ▶ Assisting FinTechs to set up
- ▶ Improving cybersecurity



#### Opening up the sector to competition and new entrants

Across the range of government programmes to support local FinTech ecosystems, our research finds that those related to opening up the sector - that is, initiatives to remove barriers to competition - are the most important.

In this regard, the UK is market-leading for the prevalence and impact of initiatives across a number of agencies, including HM Treasury, British Business Bank (BBB), UK Trade and Investments (UKTI), Department of Business, Innovation and Skills (BIS), Innovate UK and Tech City UK (see appendix C, figure C.1 for further government programmes to open up the local FinTech sector). Across these agencies, FinTech-focused initiatives range from requiring banks to refer SMEs that are rejected from bank credit to alternative finance platforms, to enabling consumers to have seamless access to their bank data. We also note the role of trade associations in promoting these initiatives through to implementation (see appendix C, figure C.2).

The governments in Singapore, Hong Kong and Australia are increasingly active with the creation of FinTech steering groups, some with dedicated budget (figure 32). For example, Australia's National Innovation and Science Agenda is committing c.£500m to support innovation. Nonetheless, these efforts are relatively nascent and their effectiveness is still to be determined.

Figure 32: Illustrative examples – government programmes to open up the sector

	<p><b>National Innovation and Science Agenda (2015):</b> committing c.£500m over the next four years to promote business-based research, development, innovation and entrepreneurship. Including: tax incentives, talent initiatives, access to crowdsourced equity funding and an incubator support programmes.</p> <p><b>FinTech Committee (2015):</b> acting on the Financial System Inquiry (2014), the government-backed group will spur collaboration between public and private sectors and ensure the Australian Government responds to innovation in FS.</p>
	<p><b>The FinTech and Innovation Group (FIG) (2015):</b> responsible for regulatory policies and development of strategies to facilitate the use of technology and innovation, and bring together stakeholders from government and industry.</p> <p><b>Financial Sector Technology and Innovation (FSTI) Scheme (2015):</b> committing c.£100m over the next five years to fund the establishment of innovation labs, institutional-level projects and industry-wide initiatives.</p>
	<p><b>FinTech Steering Group (2015):</b> a government-sponsored steering group, with representatives from government, regulators, industry and research institutions, to identify how Hong Kong can become a FinTech hub.</p> <p><b>Injection into Innovation and Technology Fund (2015):</b> c.£450m was injected into the existing fund in February 2015 to support projects which contribute to innovation and upgrading technology in industry.</p> <p><b>Innovation and Technology Venture Fund (2016):</b> government to set up a c.£175m fund to co-invest in local innovation and tech start-ups with private VC funds on a matching basis.</p>

Policy initiatives in the UK are not limited to London, with increasing levels of FinTech activity in other UK cities such as Edinburgh, Manchester and Leeds (figure 33).

Figure 33: Regional FinTech hubs in the UK

- ▶ FinTech activity in the UK is concentrated in London. However, many of the factors which have helped to cement London's place at the forefront of FinTech (such as progressive regulatory and government policy and well-established academic networks) are not specific to London. Regions outside London also benefit from lower cost of living, more affordable office space, less competition for talent (e.g., tech talent) and, in some regions, stronger academic networks.
- ▶ In regards to northern cities, the Chancellor's Northern Powerhouse strategy and Tech North have delivered a number of initiatives to promote the local economy, strengthen ties between the UK's North and South and accelerate development in the North's digital economy.
- ▶ Relative to other regions in the UK, Edinburgh, Manchester and Leeds (profiled below) have local FinTech ecosystems which are growing in prominence.

#### Edinburgh

- ▶ Edinburgh currently has an active FinTech hub, with Innovate Finance, the City of Edinburgh and the Scottish Financial Enterprise collaborating to grow the sector.
- ▶ Edinburgh benefits from strong academic institutions (particularly the University of Edinburgh), the historic success of large tech companies (such as IBM and Microsoft), low cost of business set-up and a high quality of life which encourages talented individuals to stay post-university.
- ▶ Edinburgh-based companies also benefit from funding schemes including the Small Business Loan Fund and Archangel, the largest angel syndicate in Scotland. Moreover, Edinburgh has a growing presence of incubator programmes such as CodeBase (the UK's largest technology incubator) and Scottish Enterprise (which provides training and support to high growth Scottish companies).

#### Manchester

- ▶ Manchester, the latest city to join Innovate Finance's regional programme, benefits from a strong academic network and growing tech industry.
- ▶ Manchester has the largest student population in Europe (more than 100,000 students) and initiatives such as "Shed" and "Innospace" (a start-up incubator) offer graduates a space to test new technologies and ideas.
- ▶ Manchester is Europe's second largest business cluster focused on the creative and digital industries, with £3.5b already invested to support digital and technology infrastructure (e.g., Salford's £950m MediaCityUK).
- ▶ A growing tech sector is well-supported by an increasing number of co-working spaces (e.g., The Sharp Project and SpacePortX).

#### Leeds

- ▶ Leeds has a well-established digital technology sector, specialising in data analytics and management, and benefits from initiatives such as the National Consumer Data Research Centre at Leeds University and Leeds' open data platform (Leeds Data Mill).
- ▶ The city has c.45,000 people employed in digital (fifth highest in the UK) and has one of the highest concentrations of health informatics professionals globally.
- ▶ Leeds has a growing supportive and collaborative network for start-ups. The recently announced pre-seed Tech accelerator, "Dotforge", offers funding, office space and networking opportunities for entrepreneurs and investors.

Source: Tech Nation















Across in-scope regions, governments have become increasingly active in opening up the FinTech sector by improving access to privately-owned common infrastructure.

There are three types of privately-owned common resources that have been flagged as most relevant to FinTechs:

1. Payments infrastructure or systems (such as BACS and FPS in the UK) typically owned and operated by large banks
2. Government data, including Public Sector Information (PSI) such as geo-spatial, environment, transport, health and economic data
3. Customer data, in particular customer banking data stored in FIs which enables customers to access new and better services

A range of government initiatives are underway across in-scope regions to improve access to privately-owned common resources (figure 34). The UK is the clear leader with pioneering initiatives across all three types of infrastructure, followed by the US (strong with respect to access to government data) and Singapore (noted for the proactive and innovative approach shown by MAS and the Infocomm Development Authority (IDA)).

Figure 34: Best practice – accessing core infrastructure

Payments infrastructure	Government data	Customer data
<b>UK</b> 	<b>UK</b> 	<b>UK</b> 
Payment Systems Regulator (2015)	data.gov.uk (2009)	Open API and Open Banking Working Group (in progress)
Launched to ensure that payment systems promote the interests of businesses and consumers through effective competition and innovation in payments. Access to payments systems is currently being considered as part of a market review by the Payment Systems Regulator.	Publicly available datasets from all central government departments, a number of public sector bodies and local authorities.	Initiative to enable customers and SMEs to access bank data via APIs. A detailed framework for APIs is being explored via the Open Banking Working Group.
<b>US</b> 	<b>New York</b> 	<b>GOV.UK Verify</b>
Strategies for Improving the US Payment System (2015)	data.ny.gov (2009)	Creates an official online identification for consumers, which over time may have an application to FinTech products and services.
Federal Reserve strategy to enhance the speed, safety and efficiency of the US payment system through collaboration with payments stakeholders, including emerging payments firms, card networks, payment processors and FIs.	A portal providing access to information generated by Federal Government departments and agencies. Initiatives that seek to increase access to voluntarily contributed corporate data are also being pursued.	
<b>Australia</b> 	<b>Singapore</b> 	<b>Germany</b> 
Reserve Bank of Australia (RBA) Payments System Board (1998)	Smart Nation Platform (in progress)	FinTS formerly known as HBCI protocol (1995)
Developing a new payments platform to facilitate real-time and out-of-hours payments and the sending of payments without full bank account details. Access regimes have recently been deregulated, providing greater flexibility to MasterCard and Visa systems.	A platform and infrastructure to provide greater connectivity through facilitating more agile data collection and sharing between businesses, public agencies and citizens.	A publicly available open protocol managed by the Association of German Banks, enabling FIs to provide uniform, secure services for online banking and electronic payments.
<b>Singapore</b> 	<b>California</b> 	<b>US</b> 
MAS (1971)	ByTheNumbers (2014)	Open data bill (not passed)
Oversees the payments system and has been proactive in enhancing systems in the past, specifically through immediate payments.	California's open data portal, specifically hosting government financial reports by California's 58 counties.	Under the bill, each state agency would designate a data coordinator who would establish a series of annual benchmarks for the amount and type of data published on the state-wide portal.
		<b>SME lending</b>
		<b>UK</b> 
		SME mandatory referrals and BBB investment programme
		Mandatory referrals: legislation to refer rejected SMEs to alternative finance providers. BBB investment programme: £100m allocation to SME lenders.

Notes: See appendix C, figure C.3 for more examples

**Attracting foreign FinTechs**

The UK (led by the UKTI) is particularly active in pursuing foreign FinTechs, with roadshows and promotions in markets such as Singapore, Hong Kong and Australia. Second to the UK, Hong Kong and Singapore (and increasingly Australia) also have initiatives to attract foreign FinTechs and build bridges with overseas FinTech hubs (see appendix C, figure C.4).

In all regions, cross-border initiatives focus on attracting foreign FinTechs to the region, with limited evidence of support for local FinTechs to expand overseas. This is despite the majority of UK FinTechs aspiring to internationalise (based on survey data from Singapore's IDA and the UK's YouGov).

**Ease of setting up a business**

A region's ease of setting up a new business and lack of red-tape bureaucracy can be a key attraction (see appendix C, figure C.6 for examples of government initiatives to cut red tape).

In this regard, we find that Hong Kong and Singapore rank highest, followed by Australia and the UK. Hong Kong, Singapore and Australia are the easiest regions in which to set up a new business, with the least number of days and procedures required to do so (see appendix C, figures C.7 and C.8). This is partly due to business regulatory reform in Asia-Pacific, which has simplified and streamlined registration systems and counterparties in order to attract foreign investment. Interviewees in Singapore and Hong Kong cite this as a key success factor for FinTech in these regions:

**“FinTechs in Singapore have nothing but good things to say about getting started.”**

FinTech, Singapore

**“InvestHK has been critical in speeding up set-up processes for FinTechs.”**

FinTech, Hong Kong

Across in-scope regions, setting up a business bank account (in terms of time and complexity) can be a particular challenge for FinTechs in certain subsectors (e.g., online lending and cryptocurrency), based on high Know Your Customer (KYC) and Anti-Money Laundering (AML) requirements (see appendix C, figure C.9). In stakeholder interviews, a payment-focused UK FinTech highlighted the extent of this challenge:

**“The UK Government should think about what it wants to do with Bitcoin, because right now, it can be really challenging for any of those players to even get a bank account, let alone a bank relationship.”**

FinTech, UK

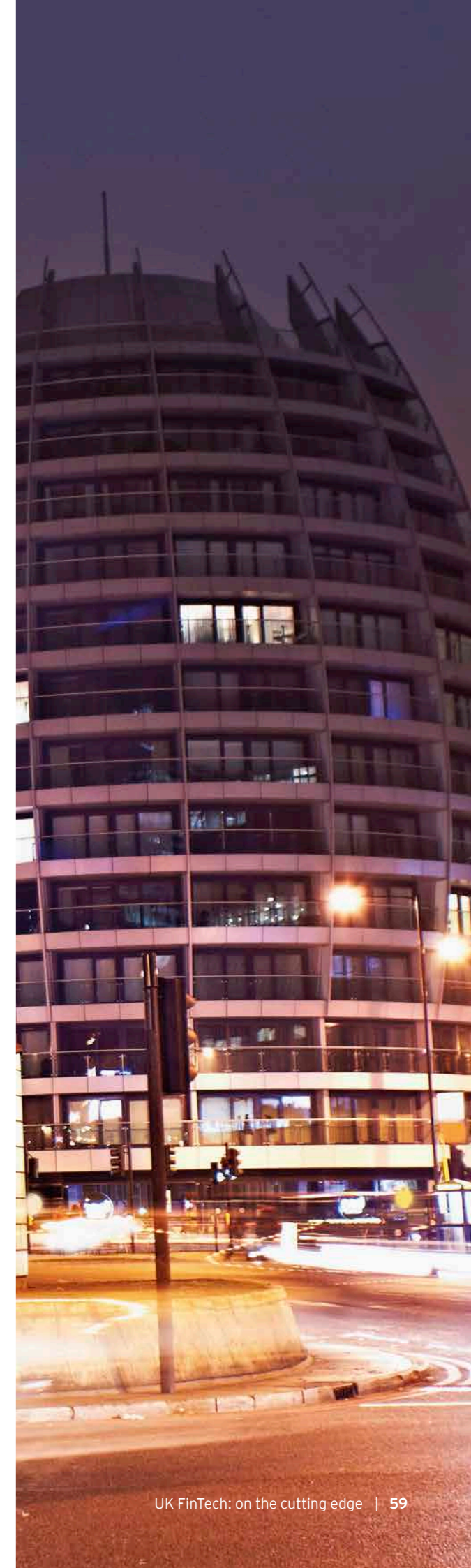
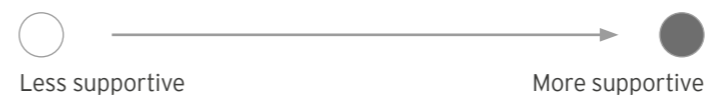
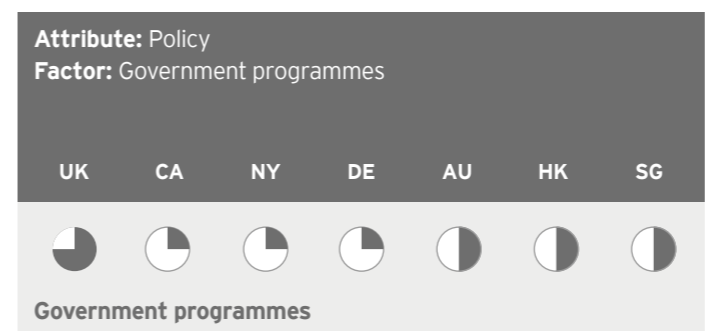
**Cybersecurity initiatives**

As a final consideration, some interviewees flagged the importance of a comprehensive government strategy around cybersecurity to ensure adequate support for the safe operation of their business.

The US, UK and Australia lead with respect to cybersecurity policy. The US has best-in-class technical measures for cybersecurity, including emergency response and education (see appendix C, figure C.10). At federal and state levels, there are well-recognised standards, government groups and strategies with a global focus, including the California Cybersecurity Taskforce and New York Cyber Security Examination Process. Similarly, Australia has best-in-class legal measures for investigating and enforcing cyber crime. Australia has recently launched The Cyber Security Growth Centre - an innovation network bringing together industry, academia and government experts to inform the national cybersecurity agenda. The UK has invested significantly in cybersecurity in recent years, including a national strategy, a dedicated cybersecurity centre and incentives for businesses.

**Government programmes: conclusion**

The UK leads the market for its government programmes, owing to the prevalence and impact of local initiatives and agencies actively engaged in supporting the FinTech sector nationwide. Singapore, Hong Kong and Australian Governments are generally conducive to setting up a business and increasingly active in FinTech. However, government programmes in these regions are nascent, and their impact is yet to materialise.



## 3.3.3 Taxation policy

### With programmes such as SEIS and EIS, the UK leads the market in terms of the quality of its tax initiatives




In this section, we assess the strength of taxation initiatives across in-scope regions. Like regulatory initiatives and government programmes, tax policy can be a highly effective mechanism for government to promote investment within a market and incentivise entrepreneurship, innovation, and research and development (R&D).

In order to compare the tax landscape across regions, we assess the range and effectiveness of initiatives to promote business set-up, investment (across all stages of funding), and entrepreneurship and innovation (e.g., through R&D tax credits). These are often not limited to FinTechs but apply broadly to start-ups and innovation.

Across in-scope regions, the UK's three tax-based financing incentives – the SEIS, EIS and the VCT Scheme (recently revised) – are best-in-class (figure 35). With strong take-up, these schemes have been successful in promoting seed and growth funding. For the SEIS, provisional figures from HMRC show that almost 2,000 companies received investment through the scheme in 2013-14 (of which 1,700 firms raised under SEIS for the first time), with an average investment per company of £82,000. With respect to the VCT Scheme, in 2013-14, a total of 13,420 VCT investors claimed income tax relief of £408m and the average amount raised per company was £2.3m. Nevertheless, the applicability of these incentives to FinTech is somewhat unclear as FS is typically considered to be a non-qualifying activity.

Elsewhere, Singapore and Australia have also recently launched innovation-focused tax initiatives. In Australia, the proposed tax scheme closely references the UK EIS model.

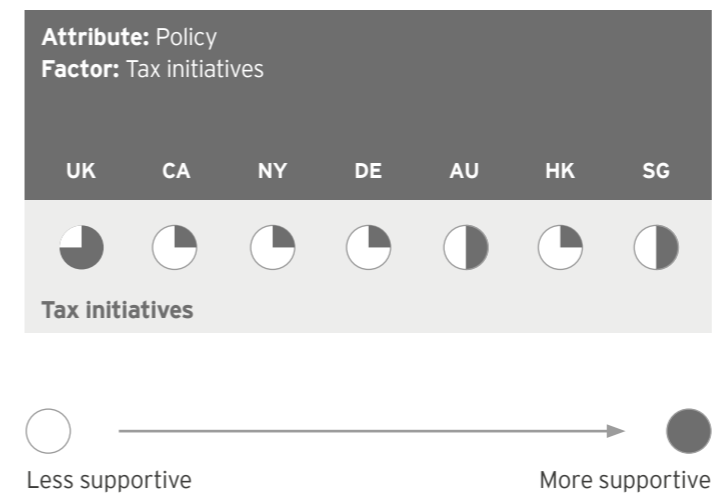
Figure 35: Best practice – tax initiatives

<b>UK</b> 	<p><b>EIS (1994):</b> tax relief for investors in smaller high-risk trading companies</p> <p><b>SEIS (2012):</b> tax relief for investors in high-risk start-up projects</p> <p><b>VCT Scheme (1995):</b> tax relief for investors in VCTs. VCTs subscribe to shares in, or lend money to, small unquoted companies</p> <p><b>Entrepreneurs Relief (2008):</b> capital gains tax relief for entrepreneurs when they sell business assets</p> <p><b>R&amp;D tax credits (2002):</b> R&amp;D expenditure tax relief</p> <p><b>Innovate Finance ISA (IFISA) (2016):</b> ISA investment eligibility for P2P loans</p>
<b>AU</b> 	<p><b>National Innovation and Science Agenda (2016):</b> contains a number of tax incentives to encourage investment – modelled on the UK's EIS</p>
<b>HK</b> 	<p><b>Extension of profit tax exemptions to offshore private equity (PE) funds (2015):</b> innovative investment tax relief to offshore PE funds to attract foreign investment</p>
<b>SG</b> 	<p><b>Productivity and Innovation Credit (PIC) Scheme (2010):</b> tax benefits for companies engaging in innovation activities (e.g., R&amp;D and software and design)</p> <p><b>Tax exemption for start-ups:</b> tax relief on income for start-ups in their first three years</p>
<b>US</b> 	<p><b>California Competes Tax Credit (2014):</b> tax relief for businesses that want to come to, or remain in, California; criteria based on strategic and economic importance</p> <p><b>Qualified Emerging Technology Company incentives (2005):</b> tax credits for qualifying emergent tech companies, targeting employment, training and investment</p> <p><b>START-UP NY (2013):</b> broad tax exclusion programme for start-ups that locate to New York City</p>

Notes: See appendix, figure C.12 for more examples

### Taxation policy: conclusion

The UK appears market-leading for the strength of tax-related initiatives, with the EIS, SEIS and VCT schemes particularly key to encouraging seed and growth financing. FinTechs in Singapore also benefit from a supportive tax environment, with start-up tax exemptions and innovation tax credits supported by an overall lower rate of corporate taxation (see appendix C, figure C.13 for corporate tax rate of in-scope regions). Germany lags behind other regions notably in this area with limited tax initiatives applicable to FinTech.



# 3.4 Demand

## Consumer FinTech adoption is increasingly mainstream and expected to grow

### Assessment summary of the demand Attribute

Demand is critical to the health of any sector, even more so for the nascent FinTech sector. Currently, demand is predominantly domestic, but expected to become increasingly global.

We assessed the three Factors that influence domestic demand:

**1. Consumers:** appetite of consumers to use FinTechs.

**2. Corporates:** appetite of companies, particularly SMEs, to use FinTechs.

**3. FIs:** appetite of FIs to use or partner with FinTechs.

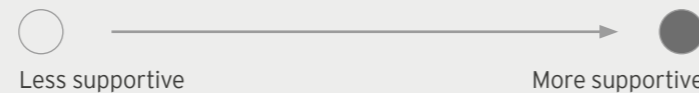
The EY FinTech Adoption Index is the first international exercise to attempt to analyse the adoption of FinTechs by consumers. Consumer demand for FinTechs is already significant for such a new industry, with c.18% of digitally active consumers identifying themselves as FinTech customers.<sup>15</sup> Adoption is highest in New York, California and Hong Kong, followed by the UK.

Our research suggests SMEs also present a considerable market opportunity, particularly in the alternative finance and payments subsectors. We find that SME demand for FinTechs is strongest in the UK, Germany and California. These regions have the largest SME markets as well as the greatest business appetite to adopt digital and tech innovation.

With respect to FIs, the UK and US (specifically London and New York) demonstrate the greatest opportunity. This reflects the scale of the institutional FS sectors across banking, capital markets, asset management and insurance.

Attribute: Demand

	Factors			Demand ranking
	1. Consumers	2. Corporates	3. FIs	
UK				3
CA				2
NY				1
DE				5
AU				7
HK				4
SG				6



15. Based on a weighted average of the seven in-scope regions

# 3.4.1 Consumer demand

## The US regions and Hong Kong are currently the highest adopters of FinTech products

Many FinTechs are focused on consumer propositions (traditionally referred to as B2C offerings). The consumer market is predominantly local, due in part to the disparities in national and international regulatory frameworks. Therefore, local market traction is a critical factor for the health of the ecosystem. In the longer term, we would expect FinTechs to internationalise and leverage the increasingly digital global population, particularly in key markets such as China (see appendix D, figure D.1).

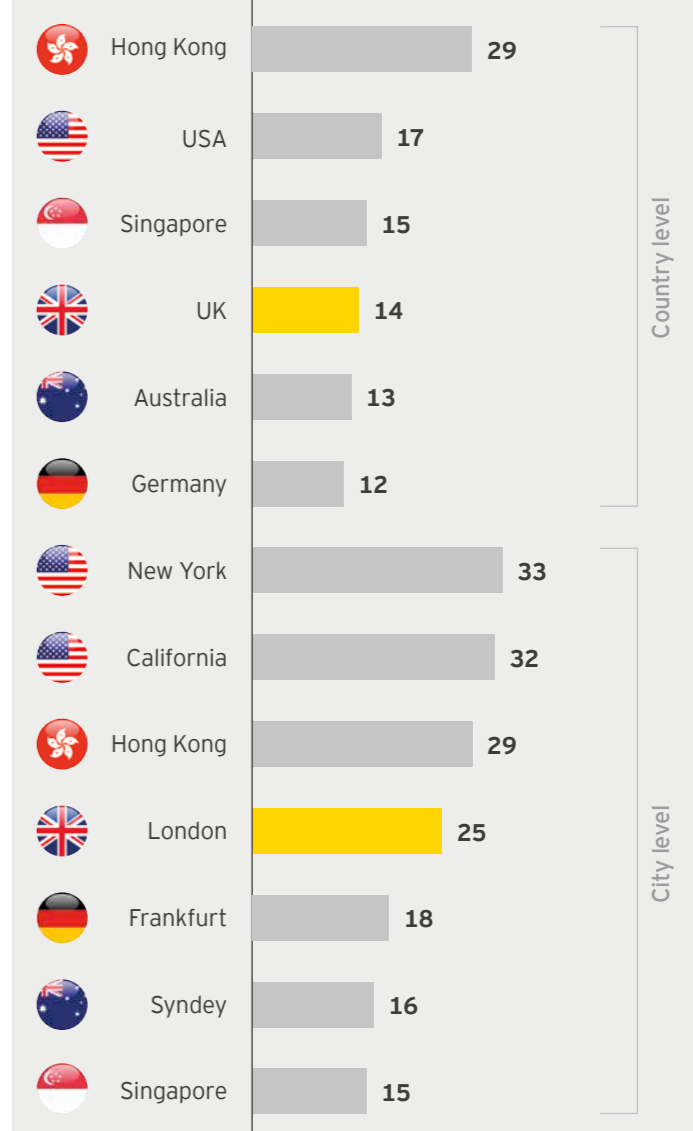
We use the EY FinTech Adoption Index to assess the traction that FinTechs have with consumers and to develop a picture of the typical FinTech customer. This Index surveyed over 10,000 digitally active consumers across in-scope regions.<sup>16</sup>

On the basis of the EY FinTech Adoption Index, c.18% of digitally active consumers (weighted average across our seven in-scope regions) claim to use FinTech propositions. At the country-level, adoption is highest in Hong Kong (29%), followed by the US (17%) and the UK (14%) (figure 36). At city or state level, adoption is highest in New York (33%) and California (32%), and moderate in London (25%).

Across all regions, adoption is skewed towards younger, high-income groups. Ease of use is a key driver of adoption (nearly half of respondents cited this as the number one reason for adoption), with access to more attractive rates or fees and new products and services being secondary drivers.

The survey suggests significant growth in consumer adoption is likely, with the number of FinTech users projected to double in the next 12 months across our seven in-scope regions. The share is expected to more than double in Singapore (where the current adoption rate is lower) and increase by somewhat less in New York and California (where adoption is already high).

Figure 36: Current consumer adoption of FinTech (% of digitally active consumers that use FinTech)



Source: EY FinTech Adoption Index  
 Note: 'FinTech adopter' - when a consumer has used two or more FinTechs in the past six months

16. The survey was conducted in September - December 2015. In each of these regions, EY identified 10 FinTech services which fall into four broad categories: savings and investments, money transfers and payments, borrowing and insurance. A FinTech 'user' is defined as having used two or more FinTech products in the past six months



### Consumer demand: conclusion

We find that consumer traction is relatively strong for a nascent industry, with c.18% of digitally active consumers using FinTech products in our regions. Currently, adoption is highest in New York and California (albeit lower when assessed for the US as a whole) and Hong Kong. The UK ranks moderately across in-scope countries, as does London when compared with other cities or states.



## 3.4.2 Corporate demand

### The SME market is the largest in the UK, Germany and California, and businesses are relatively open to innovative solutions

Corporates (excluding FIs) are an increasingly important source of FinTech demand. In particular, the SME segment has been relatively underserved by traditional FIs. This view was expressed by the World Economic Forum (WEF) report on “The Future of FinTech”, which identified FinTech as a potential game-changer for small businesses particularly those in the credit, lending and payments subsectors.

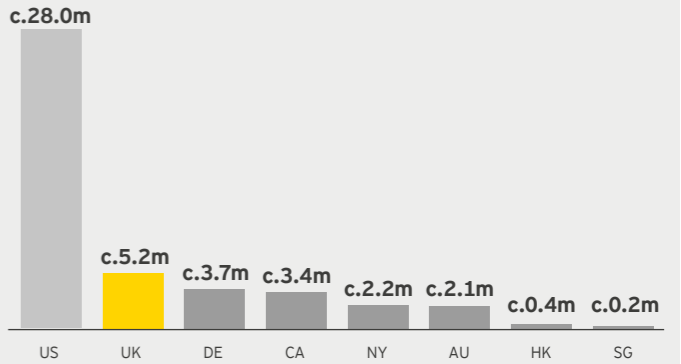
Across in-scope regions, we benchmark corporate demand for FinTech by considering the size of the SME sector in each region and the propensity of SMEs to embrace FinTech solutions. We use proxies to determine the willingness of SMEs to use digital and tech solutions more broadly.

#### The size of the SME sector in each region

The UK has the largest number of SMEs in Europe (5.2m), followed by Germany (figure 37). On a national basis, the US dominates with c.28m SMEs (which compares to c.20m SMEs across Europe). Individually, the California and New York markets are also sizeable, together representing one-fifth of the total US market.

The SME market is considerably smaller in Hong Kong and Singapore; however, these regions operate as a strategic gateway to China, where the SME market is larger than all in-scope regions combined (estimated by some sources at c.42m) and growing rapidly.<sup>17</sup>

Figure 37: Number of SMEs per region (2014)



Source: Government national statistics authorities  
Note: The definitions of SME vary marginally across regions

#### The propensity of SMEs to embrace FinTech solutions

While the SME market may be large in some regions, appetite to adopt varies significantly. We proxy the propensity to adopt FinTech using SME’s adoption of generic tech and digital innovation across their business.

Our stakeholder interviews and research indicate that the US and Germany, followed by the UK, lead in corporate willingness to explore B2B FinTech solutions and adopt digital innovation more broadly (figure 38).

“The companies we work with have gained traction with corporates, not just in our city, but other US cities and states.”













FinTech Hub, US

“The future of German FinTech will be B2B, driven by the mid-sized corporate market. They tend to be more innovative, more so than consumers. They have a large appetite for engineering-type solutions, like analytics.”

Industry expert, Germany

17. B2B International

Figure 38: Propensity of SMEs to adopt tech and digital solutions

Region	Findings	Assessment
UK 	UK SMEs are willing to adopt digital methods with 27% having made tech infrastructure improvements in the last 12 months and 26% with improvement plans for the next 12 months. <sup>18</sup> Notably, growth in the SME lending market is nearly exclusively captured by challenger banks and alternative finance providers, with their combined market share increasing from 4% to 12% 2012-14. <sup>19</sup> Initiatives such as mandatory referrals of rejected SME loan applicants by banks will drive greater access to alternative finance providers.	
US 	US-based small businesses were found to be the greatest users of online business software in 2015, with 51% using cloud software (closely followed by the UK at 47%). <sup>20</sup> The top reasons for leveraging the cloud were security and lower IT costs. There are numerous government and industry initiatives to increase SME adoption of technology such as the Manufacturing Extension Partnership (MEP) which connects SMEs with developed technologies and technical capabilities.	
DE 	German SMEs lead Europe for their use of business technology, ahead of the UK. <sup>21</sup> German FinTech is B2B-focused, with particular strength in business payments solutions.	
AU 	Many Australian SMEs appear to be adopting a 'wait and see' approach, deliberately choosing to be late adopters and preferring to see proven success of solutions before expending resources and money. <sup>22</sup>	
SG 	Most SMEs tend to be cautious of new technology, although a small proportion are enthusiastic early adopters. In-house investment in technology and innovation capabilities is increasing, incentivised by government initiatives to increase SME access to technology. <sup>23</sup>	
HK 	Hong Kong SMEs are typically late adopters of innovative technology solutions. However, recent government initiatives and increased marketing are raising awareness.	

**Examples**

<p><b>Payment solutions</b></p> <ul style="list-style-type: none"> <li>Payment software companies (such as Stripe, Paypal) are enabling SMEs to expand globally and navigate complex banking systems. Always Riding, a small UK-based cycling apparel retailer is using payments FinTech software to sell its products globally, with its biggest export market in Japan.<sup>24</sup></li> </ul>	<p><b>Business management</b></p> <ul style="list-style-type: none"> <li>Xero, a cloud-based SME accounting software provider, allows alternative finance providers and other FinTechs to connect seamlessly to SME accounts via APIs.<sup>25</sup></li> <li>Viewpost offers a B2B electronic invoicing, payments and cash flow management tool to small businesses. This allows clients to see the real-time status of outstanding payments.<sup>26</sup></li> </ul>	<p><b>Alternative finance</b></p> <ul style="list-style-type: none"> <li>A number of FinTechs now provide SME financing solutions, which are built on fast, flexible and easy-to-use platforms</li> <li>Examples include Singapore Capital Match, which offers P2P lending via crowdfunding for SMEs or Funding Circle, which has lent over £1b to SMEs.<sup>27</sup></li> </ul>
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18. The Manufacturer  
19. EY analysis  
20. Exact's Small Business Cloud Barometer 2015  
21. Virgin Media Business  
22. ZDNet  
23. DP Group, Service and productivity improvements top SME priorities for the next 12 months  
24. Business Insider  
25. Company website  
26. Company website  
27. FinTech ranking

Government can play a role in supporting FinTech adoption through its own use of FinTech solutions and by promoting usage among its corporate supplier base (figure 39).

**Figure 39: Government as consumers and ambassadors of FinTech**

- As governments increasingly focus on cutting costs and streamlining processes, there is considerable scope for government use of FinTech solutions. This includes products associated with mobile and digital payments, biometric authentication, distributed ledger technologies and investment management.
- Through its own adoption, government can promote FinTech to corporates (such as its corporate supplier base) and consumers.
- E-government refers to government's use of IT to transform its engagement with citizens, corporates and within government and streamline workflows, processes and data management. As with corporates and consumers, a government's "e-readiness" or adoption of tech solutions may be a proxy for its openness to adopt FinTech. By this metric, Australia and Singapore rank the highest of in-scope regions, followed by the US and UK (figure 40).
- Generally, government use of FinTech is currently low, including in the UK, although some interesting use-cases are found.

**Figure 40: E-government ranking for in-scope regions (Rank 1-6)**

Source: United Nations e-government survey, 2014  
Notes: 6 = highest, 1 = lowest

<p><b>Philippines</b></p> <ul style="list-style-type: none"> <li>The Government, USAID and private banks have launched an initiative to create a single electronic payments platform for all transactions in the country. This is part of a bilateral agreement with the US Government and is envisaged to be a B2B, B2C and C2C system for e-payments.</li> </ul>	<p><b>Estonia</b></p> <ul style="list-style-type: none"> <li>Estonia e-government approach represents an international best benchmark. The E-ID allows digital access to a full range of government services (e.g., voting, taxes, health care, and business registration).</li> </ul>
<p><b>Australia</b></p> <ul style="list-style-type: none"> <li>The Department of Community Services' "Express Plus" mobile apps allow access to Medicare, Centrelink and Child support via your phone. It also features a digital wallet which allows real time access to concession cards (e.g., health care and pensioner cards).</li> </ul>	<p><b>Idaho</b></p> <ul style="list-style-type: none"> <li>The "Idaho on the Go" app, created for the Government, allows Government entities to take card payments on any smartphone without phone coverage.</li> </ul>
<p><b>Honduras</b></p> <ul style="list-style-type: none"> <li>The Government has announced a deal with Blockchain company Factom Inc. to utilise a land registry tool to track land titles to address the country's historic challenge with land title fraud.</li> </ul>	<p><b>United Kingdom</b></p> <ul style="list-style-type: none"> <li>Funding Circle's P2P lending platform has been used as a channel for local business lending by a number of local councils (e.g., Lambeth Council).</li> <li>HMRC is working on digital taxation, including an API strategy, which would see business accounting software interfacing data directly with digital tax accounts.</li> </ul>

### Corporate demand: conclusion

We find that corporate demand for FinTech is strongest in the UK, Germany and California. These regions have the largest SME markets, as well as the greatest propensity for businesses to harness broad digital and tech innovation.

Attribute: Demand  
Factor: Corporate

UK

CA

NY

DE

AU

HK

SG



Corporate



Less supportive



More supportive



## 3.4.3 FI demand

### London and New York are the world's financial capitals

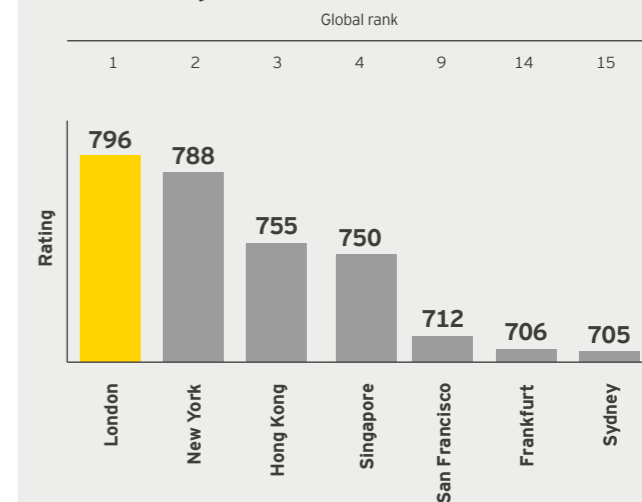
In this section, we assess the demand opportunity for FinTech from traditional FIs. Increasingly, traditional FIs want to work alongside FinTechs, as they tackle the changing digital landscape and continue to cut costs. This applies across a range of FS subsectors, particularly in the areas of retail banking, trading, and regulatory and data compliance.

We benchmark the demand opportunity for FinTech by assessing the size and competitiveness of the financial centre across in-scope regions, and the propensity of FIs to adopt FinTech solutions. We base the latter on the intended focus of FIs on digital transformation, and their openness to partner with FinTechs.

According to the GFCI, London ranks first as a global financial centre (figure 41). New York ranks second to London, followed by Hong Kong and Singapore. Asian centres are expected to become increasingly important in the next few years, with the rapid rise of Chinese centres in Shanghai, Beijing and Shenzhen.

One area of opportunity is the retail banking subsector, where leading FIs are investing heavily in digital transformation. We estimate that planned annual digital spend of US and UK retail banks is in the £10b- £15b range, representing a significant opportunity for enterprise and white-label FinTechs.

Figure 41: Global Financial Centres Index (GFCI) rating and rank



Source: Z/Yen

The scale of involvement, however, will depend on the openness to partner with FinTechs. The US and UK banks are market-leading in this regard, showing the greatest appetite to work with FinTechs to re-engineer infrastructure and processes and to expand client offerings (figure 42). The opportunity for FinTechs in these regions is rapidly growing, as stated by one UK FinTech: "Banks are getting better and better at understanding the value of partnering with us - not seeing us just as a source of disruption but working with us to realise change."

**"More established FS firms are now collaborating. They are asking two questions: Can FinTechs change my business model? Can Fintechs improve my revenue?"**






FinTech hub, US

In Singapore, Hong Kong and Australia, at this stage, incumbent engagement with FinTech is primarily through support for FinTech hubs (incubators and accelerators) rather than through explicit use of FinTech services.

**"There are barriers to selling our products to FIs. Most of the big banks' decision makers are in the US or Europe, that's where master agreements and contracts are negotiated. Our FinTechs don't have the branding and connectivity to engage with large FS incumbents."**

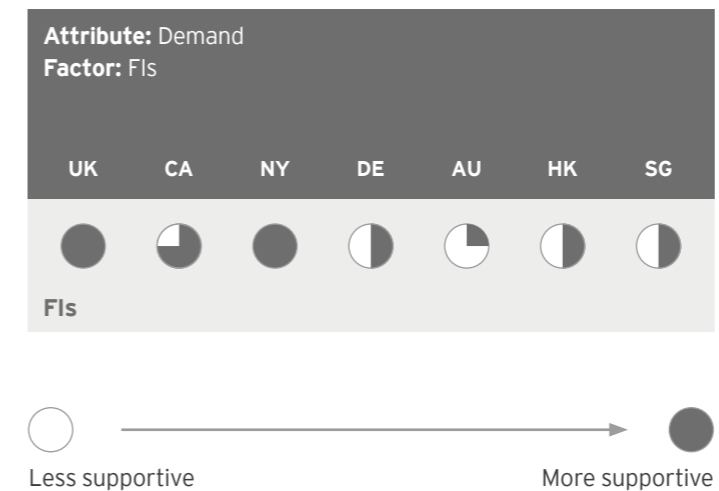
FinTech, Hong Kong

Figure 42: Illustrative examples – partnerships and joint ventures between incumbents and FinTechs

CA 	A partnership between Citi, Lending Club and Varadero Capital L.P. offers affordable credit to underserved borrowers and communities.
NY 	J.P. Morgan and Motif Investing are working together to allow individuals to invest as little as US\$250 in IPOs.
DE 	Bank partnership between Verlagsgruppe Handelsblatt and the German social trading platform Moneymeets.
SG 	Fastacash has worked with DBS Singapore to incorporate a social payment function into the DBS Paylah! App.
UK 	Aberdeen Asset Management has acquired Parmenion Capital, who offer risk graded portfolios (via a digital platform) to financial advisors. This is a strategic acquisition to grow Aberdeen's investment solutions.

## FI demand: conclusion

Measured against these factors, we find that the UK and US (specifically London and New York) demonstrate the greatest source of demand from FIs. These regions rank highest for the strength and depth of their financial sectors. Within the retail space, they appear to be more advanced than other regions in terms of digital investment and demonstrated willingness to work with FinTechs.



# 4. EY recommendations

## Recommendations

On the basis of interviews and our analysis of best practices, we have proposed a long list of recommendations to enable the UK to remain the global capital of FinTech. These recommendations address each of the four Attributes of a well-functioning ecosystem. These recommendations have not undergone an impact or business case assessment and should therefore be considered as a basis for further analysis.

### Policy

#### 1. Create a FinTech “delivery body” to drive high impact policy initiatives to implementation as quickly as possible

The UK Government has already identified a number of bold policy initiatives designed to encourage competition and innovation across the FS sector. These initiatives will benefit the end users of FS and indirectly create material opportunities for the FinTech sector.

Many of these pipeline initiatives are at the consultation or working group stage, and there is a perception that more needs to be done to ensure that these initiatives do actually get implemented in the marketplace and that the timelines set are ambitious and adhered to. Regions such as Singapore and Australia are becoming increasingly active in promoting FinTech and there is a risk the UK loses its first-mover advantage.

We make the following recommendations with regards to pipeline initiatives and then address how these may best be brought to market using a dedicated FinTech “delivery body”:

► **Prioritise and accelerate the time to market of pipeline initiatives:** the Government should consider setting ambitious time frames around the following high-impact pipeline initiatives:

#### ► *Government-led initiatives*

- **Mandatory Referrals:** This initiative mandates that banks pass on rejected SME loan applications to alternative finance providers to improve access to credit for SMEs. This initiative was announced in the Budget in March 2014 and is due to go live in 2016.
- **Open Bank API Framework:** This initiative allows consumers and SMEs to access their bank data via APIs and supports a host of lower cost and innovative services. This initiative will need to be completed ahead of the revised Payments Services Directive (PSD2) in 2018–19.
- **IFISA:** This initiative allows consumers to invest in the P2P alternative finance sector in a tax-efficient way. This initiative is targeted to go live in April 2016.

#### ► *Regulator-led initiatives*

- **Access to payments infrastructure:** The PSR is undertaking a market study to consider access to payment systems. The review is due to be completed by the second half of 2016.

#### ► *Industry-led initiatives*

- **Digital Savings Passports:** This initiative enables consumers to digitally open and switch savings accounts by leveraging the Government’s online digital identity service, GOV.UK Verify. This initiative is in its proof of concept stage.

#### ► **Consider launching additional initiatives to support the FinTech agenda.** Specific examples include:

- **Broader reliance on e-identities:** The Government should consider evolving the GOV.UK Verify initiative into a commonly accepted and relied upon identity standard for the FS sector.
- **Access to public data via open APIs:** The Government should consider broadening out the Open Data Initiative to also address the requirements of FinTechs and the FS sector. Access to public data could lead to new products and more competition, particularly in the insurance sector where, for example, access to Driver Vehicle and Licensing Agency (DVLA) data and real-time flood data were mentioned in our stakeholder interviews.
- **Encourage experimentation with Blockchain:** The Government should consider trialling Blockchain use cases utilising open industry initiatives, such as the Blockchain Laboratory joint venture between Innovate Finance and the Hartree Centre.

► **Create and fund a FinTech “delivery body” to lead the implementation of pipeline initiatives:** it will be incredibly challenging to deliver this many, complex initiatives, not least of which because of the number of Government entities involved, and that incumbent industry institutions may not always be forthcoming with support and/or funding in some instances. The Government should consider creating a dedicated “delivery body” that is independently funded to provide the leadership and accountability required to deliver this challenging agenda.

- We propose that the Government consider creating a FinTech delivery body which would have responsibility of shaping and driving the implementation of the pipeline initiatives and be accountable to Government and the public. The delivery body would coordinate and manage the pipeline initiatives, track progress against clear milestones and coordinate communications with the various stakeholders. We envisage this body would employ a small number of dedicated, full-time staff made up of experienced programme delivery and FS specialists. This body would be most effective if incorporated independently with a governance structure drawn from senior members of Government and industry.
- We propose that the Government also consider providing the delivery body with a discretionary, independently-sourced budget. We believe the effectiveness of the delivery body will be materially enhanced if it were able to manage its own budget rather than be reliant on discretionary funding from industry (which can be slow to source and potentially conflicted). Access to discretionary funding would allow the group to be more effective by sourcing specialist skills directly (e.g., to inform technical decisions quickly), managing resourcing (e.g., to meet delivery deadlines and respond to bottlenecks) and providing process logistics (e.g., venue hire, secretariat, communications). Currently, these resources tend to be provided on a voluntary and ad hoc basis by industry incumbents, trade bodies and professional services firms.

Across benchmarked regions, we note that Hong Kong, Singapore and Australia have set up, or are proposing to set up, dedicated FinTech bodies with meaningful budgets to drive Government policy forward.

## 2. Build on the FCA’s position as the most progressive regulatory body globally

The FCA, in particular Project Innovate, is considered to be world-leading in its approach to innovation, collaboration and interaction with FinTechs. As regulatory policy becomes more progressive in other regions, the FCA should aspire to build on this position under new leadership and move forward with high impact but early-stage initiatives such as the Regulatory Sandbox and the framework on guidance vs. advice.

In order to enhance the effectiveness of its programmes, the FCA could consider the following actions:

- **Add resource to Project Innovate:** While Project Innovate has supported c.175 innovative FinTechs to date, additional resource would enable it to potentially support a greater number of firms and provide longer term supervisory support to those firms. It could also enable greater international engagement with FinTechs and greater dialogue with large incumbent institutions.
- **Simplify the authorisation process and hand over from the Project Innovate team to the traditional supervisory process:** The FCA should build on ‘next step’ initiatives, such as the initiative to provide a year of dedicated supervisory support for newly-authorised firms, to streamline and reduce complexity of the authorisation process. As one UK FinTech remarked: “Even though the Innovation Hub significantly helped us navigate the process, the application was still over 300 pages long, and we still had to hire a dedicated consultant to prepare the documentation.”
- **Broaden support and dialogue with technology firms and foreign FinTechs:** Financial regulations can be equally complex for telecommunications, e-commerce, social media and software firms looking to offer innovative FS products. Project Innovate should continue to build engagement with technology firms by being present at tech industry events and forums with a view to directly serving them through Project Innovate. The FCA should also consider hiring specialist resource to support foreign FinTechs seeking to enter the UK market (in line with recommendation four on ‘FinTech bridges’).

## ► Form a clear strategy on high-impact initiatives such as RegTech and the Regulatory Sandbox platform:

- **RegTech:** There are an increasing number of FinTechs applying technology to the regulatory process. These firms aim to take the cost out of regulatory processes and deliver valuable real-time risk information. As part of the FCA and Project Innovate’s initiative to better support RegTech firms, they should be clear on their interpretation of forthcoming regulation, so that both RegTech firms and their prospective clients have the confidence to invest in the technology. Specific examples, given in interviews, of affected regulations were Markets in Financial Instruments Directive (MiFID) II, Senior Managers Regime (SMR) and cyber threat assessment.
- **Regulatory Sandbox:** The FCA should trial the sandbox concept in several different forms, recognising that there is no best-in-class model to emulate. The FCA should consider using a sandbox as a tool to determine priority policy initiatives, including, for example, technological initiatives such as cloud computing, and conduct initiatives such as the guidance or advice framework, which could be an important catalyst to the robo-advice sector.

## 3. Deliver practical business support to FinTechs

FinTechs struggle with the same basic business challenges faced by start-ups in other high-growth sectors. The FinTechs we interviewed voiced three particular challenges: access to office space, professional services and bank accounts.

### ► Office space

The cost of office space, predominantly in London, is constraining growth. Government support for co-work spaces and FinTech hubs can be an effective solution for early-stage FinTechs. However, they are less practical for scaling FinTechs that require larger, more flexible accommodation.

To improve access to affordable and flexible office space for FinTechs, the Government should consider the following:

- **Promote council-owned commercial property:** A number of councils offer commercial property, which may be particularly helpful to very early-stage FinTechs. Examples include Coventry City Council’s Small Space initiative, which targets small businesses in the local area, and Camden Council’s ‘Pop-Up/Meanwhile’, which offers leases of less than three months. The Government should consider partnering with local councils to generate greater awareness of council-owned properties and develop a real estate database to help start-ups find and enquire about these properties.

### ► Make efficient use of unused government buildings:

Empty government buildings can be utilised by both start-ups and scale-ups. The Government should consider identifying additional locations that are poorly used and can be opened up to SMEs (noting that the UK Government identified 18 locations in 2012). In addition, the Government should consider upgrading the existing platform to match SMEs with government-owned property, Government Property Finder, to a full-service and easy-to-use website.

- **Establish regional Centres of Excellence in the UK:** This corresponds to recommendation nine below. The cost of office space in regional areas is significantly lower than in London. Promoting these regions as FinTech hubs will help to alleviate cost pressures for FinTechs of all sizes.

### ► Professional services

FinTechs of all sizes often find it hard to find basic legal, accounting, human resources and regulatory compliance support at low cost. To improve access to professional services, the Government should consider the following:

- **Create a live database of professional services providers:** Freelancers and small boutiques are often the most cost-effective service providers for small FinTechs, but introductions are primarily via word of mouth. A curated database would help FinTechs navigate this market and increase competition in services. There may be a role for industry to play in managing this database on an ongoing basis.
- **Launch a professional services scheme:** The Government should consider inviting large firms (e.g., law firms and consultancies) to provide basic business services to FinTechs on a low-cost or pro-bono basis. For instance, participating firms may operate walk-in clinics or specialist workshops in designated spaces in FinTech hubs such as Level 39. The Government should initially endorse the scheme and encourage industry participation, recognising industry ought to manage this scheme thereafter.

#### ► **Business bank accounts**

Many FinTechs complain about the difficulty they experience opening a bank account when launching, particularly in the online lending, FX and cryptocurrency sectors or where company directors are foreign nationals.

To improve the speed of opening bank accounts, the Government should consider the following:

#### ► **Work with the FCA to review bank KYC procedures:**

The Government and the FCA should consider working together to ensure that clearing banks are employing KYC procedures appropriately. There may be an opportunity to use a materiality threshold to assist small start-ups with low turnover (for example, similar to minimum value thresholds for applying customer due diligence on occasional financial transactions). The Government should also consider whether the entities that spearhead government programmes, such as the BBB, could offer a form of endorsement to FinTechs involved in their programme, helping to validate and demonstrate a FinTech's legitimacy.

#### **4. Build FinTech “bridges” to support UK FinTechs expand internationally**

International expansion is a strategic ambition for most FinTechs; however, it remains highly challenging to execute. Well-invested FinTech bridges to a small number of priority geographies could provide UK FinTechs looking to expand with valuable contacts at a point in time when it suits them. Several regions are exploring this concept, with Australia proposing to establish five “landing pads” to provide qualifying start-ups with a short-term operational base in global hotspots (including Tel Aviv and Silicon Valley).

To deliver meaningful FinTech bridges, the UK Government should consider taking the following steps:

- **Identify a small number of priority geographies:** The Government should focus its resources on only a small number of attractive markets where there is a natural affinity or strategic value. Potential candidates include Silicon Valley, Singapore, China and Tel Aviv (see section 5, Case studies).
- **Build networks and an operational base:** The focus on priority geographies should allow the UK to develop deep and ongoing connections with high-quality, local contacts from regulatory agencies, industry, academia and the professional services sector. A dedicated physical base in the region (which may leverage existing UKTI real estate) may be used temporarily by FinTechs, and to host network events and provide training.
- **Convert bridges into collaborative two-way relationships:** Over time, these bridges should mature into collaborative, formalised, two-way relationships.

## Talent

#### **5. Strengthen the UK's talent pipeline, particularly for tech talent**

The UK's current talent pool benchmarks well, but there are concerns that the tech talent pipeline cannot support future growth. The UK Government recently revised the Tier 1 Exceptional Talent Visa for tech talent (Tech Nation Visa Scheme). However, it remains fairly narrow in scope: the Exceptional Talent Visa allows c.1,000 approvals per year, of which Tech City UK has an allocation of c.200 places.

The UK Government should consider the following actions to strengthen the talent pipeline for FinTech. This includes actions to deliver greater access to foreign tech workers in the near term, and, in the longer term, actions to nurture the domestic talent pipeline.

- **Broaden the Tier 2 (general) visa with respect to foreign tech talent:** The majority of non-EU tech workers reside on a Tier 2 (general) visa, for which conditions are generally tightening. The Government should consider reviewing the Shortage Occupation List for Tier 2 visas for programmers and software developers, particularly for roles requiring under five years' experience.<sup>28</sup>
- **Support foreign tech students to stay in the UK:** The UK has a deep pool of international students studying tech-based degrees. The Government should consider a foreign tech students' visa scheme to incentivise UK-qualified students to stay and work in the UK. This is similar to the new Australian initiative, “Pathways to Permanent Residence for STEM and ICT students”, which gives foreign tech students additional points in the skilled migration test.
- **Strengthen existing STEM-in-school initiatives:** The UK has introduced initiatives to encourage STEM (including coding) in schools, with early evidence of their impact. The Government should consider strengthening these initiatives by encouraging greater industry involvement to keep curriculums and teacher training up-to-date and ensuring suitable access to foreign STEM teachers (to address any domestic teacher shortages).

- **Deliver FinTech apprenticeships programme:** Innovate Finance is mobilising the FinTech community to deliver an apprenticeship programme, exploring how to best leverage existing initiatives such as the Open University's FinTech 101 Course. While industry interest is high, current challenges include designing courses which meet qualification credit frameworks and reflect the skills required for FinTech (as a broad and rapidly changing sector). The Government should consider working with Innovate Finance to deliver this initiative and potentially incorporate FinTech into existing apprenticeship initiatives, such as Trailblazers, to establish a common set of learning standards for FinTech apprenticeships.
- **Action reviews of STEM university courses:** Certain STEM subjects have a poor rate of graduate employment in the UK and many graduates do not meet industry needs. In response, the Government-commissioned Shadbolt Review is underway to help reform the accreditation of computer science courses. If possible, the Government should consider including the views of FinTechs in this review to maximise talent employability.
- **Leverage local MBA programmes:** FinTech is growing in profile among business schools. In the UK, both the London Business School and the London campus of The University of Chicago's MBA programme held FinTech-related events in recent months. To enhance the role of academia in the ecosystem, the Government should consider working with universities to co-host events and develop courses (e.g., business and innovation-based courses) and promote FinTech work-study placement programmes.
- **Work with successful FinTech entrepreneurs to promote talent initiatives and the broader FinTech sector:** The Government should consider a programme that invites FinTech entrepreneurs to visit schools, technical colleges and universities to promote talent initiatives and FinTech as a career. This should also focus on the STEM agenda and encourage women into the FinTech sector.

28. Currently, the shortage as listed only applies to senior programmers and software developer roles requiring at least five years' experience

## 6. Establish regional Centres of Excellence in the UK

The UK has a rich pool of talent outside of London and in areas where niche capabilities exist and can be nurtured into world-class Centres of Excellence. This will help the UK keep pace with a global trend towards specialisation, and is consistent with the UK Government's regional development strategies, such as the Northern Powerhouse. In order to create regional Centres of Excellence, the UK Government should consider taking the following steps:

- ▶ **Conduct capability assessments and select potential regions:** The UK appears well positioned to build globally recognised FinTech capabilities in established areas such as payments, P2P funding and credit analytics, as well as emerging areas such as open banking, Blockchain and RegTech. A capability assessment will help to identify regions with existing capabilities and ecosystem Attributes. Potential candidates include Manchester, Bristol, Leeds, Edinburgh and Nottingham (see figure 33 for profiles of Manchester, Leeds and Edinburgh).
- ▶ **Co-ordinate a network of regional stakeholders:** The Government should consider playing an active role in bringing together key stakeholders. This includes representatives from the local research and academic community, industry or large business, local council and successful FinTechs. Existing Local Enterprise Partnerships (LEPs) may be leveraged but will likely require additional resource support.
- ▶ **Assign physical centres:** Like the Digital Catapult Centres launched in three UK regions by the BIS, regional FinTech hubs require a dedicated space to allow entrepreneurs to “cluster”, build momentum and anchor initiatives.
- ▶ **Strengthen academic and research expertise:** Centres of Excellence typically require strong technical capabilities. Well-established local universities should be encouraged to play a central role, producing world-leading research and developing local FinTech expertise. This will also help to strengthen the UK's talent pipeline (see recommendation five).
- ▶ **Instil collaboration between regional centres:** Once established, the Centres of Excellence should build a collaborative network to tap into common sources of capital and talent, and share knowledge. There is a role for a central trade association or industry body to coordinate and represent the network.

## Capital

### 7. Initiate investor-focused programmes to improve access to growth capital

While access to capital is relatively robust in the UK (particularly for early-stage funding), there is a gap in growth capital. The Government could introduce new initiatives to make the FinTech sector more accessible to growth investors. As such, the Government should consider the following:

- ▶ **Organise investor conferences to meet the FinTechs:** A big challenge to international capital is investing in the travel time to meet FinTechs. The Government could sponsor an event for UK FinTechs that are considering fundraising and invite the international VC community en masse to meet and greet them. The Government should consider leveraging UKTI's established network of foreign VC firms and could broaden the scope to include other sectors.
- ▶ **Collate and publicise headline metrics on the growth of the FinTech sector:** The Government could work with an independent body to collate and publish sector data (e.g., revenue, headcount, funding) to attract the attention of the investor community. For example, France Digitale and EY publish a survey of French digital start-ups in order to report on sector revenue, fundraising, employment and innovation. These surveys are repeated on a quarterly basis, thus providing an indexed growth metric for an emerging sector.
- ▶ **Establish a Government growth fund for finance FinTech:** The Government could help fill the UK's growth capital funding gap by targeting the £5m–£25m stage of investment. The Government should consider whether the mandate of the Business Growth Fund could be flexed to include some, if not all, FinTech categories.
- ▶ **Fund equity analyst coverage of the UK FinTech sector:** In order to attract the attention of institutional investors and build an IPO pipeline, the Government could encourage industry to fund coverage of the listed and potentially non-listed FinTech sectors. By way of example, Enternext, a subsidiary of the European stock exchange Euronext, commissioned Morningstar to provide focused research analysis on the SME tech space.

### 8. Broaden tax initiatives to drive greater investment in UK FinTech

The UK is market-leading in promoting tax initiatives for start-ups and entrepreneurs (including initiatives such as SEIS, EIS, VCT Scheme, and Entrepreneur's roundtable (ER)). There may, however, be value in broadening the appeal of existing tax-related initiatives. The Government should consider the following:

- ▶ **Review the list of excluded activities for SEIS and EIS:** Currently, a number of FS-related activities are classified as non-qualifying activities for SEIS and EIS. The Government could consider providing greater specificity on FS-related activities to enable greater qualification of legitimate businesses for SEIS and EIS. As part of this initiative, the Government should also consider relaxing the connected persons restrictions to allow entrepreneurs to participate in follow-on funding rounds on the same terms as their investors.
- ▶ **Expand the investment thresholds currently applicable on initiatives such as EIS and VCT Scheme:** Currently, investments eligible for EIS are capped at £1m, and VCT investments are subject to a £5m annual cap. To encourage big-ticket investment, the Government could look to expand these thresholds to enhance support for scaling, high-growth FinTechs.
- ▶ **Encourage risk-taking among entrepreneurs:** The Government could explore mechanisms to allow individuals to carry forward income tax personal allowances to remove some of the friction that stops individuals moving from corporate or traditional employment and into entrepreneurial ventures.

## Demand

### 9. Promote Government, consumer and FI adoption of FinTech services

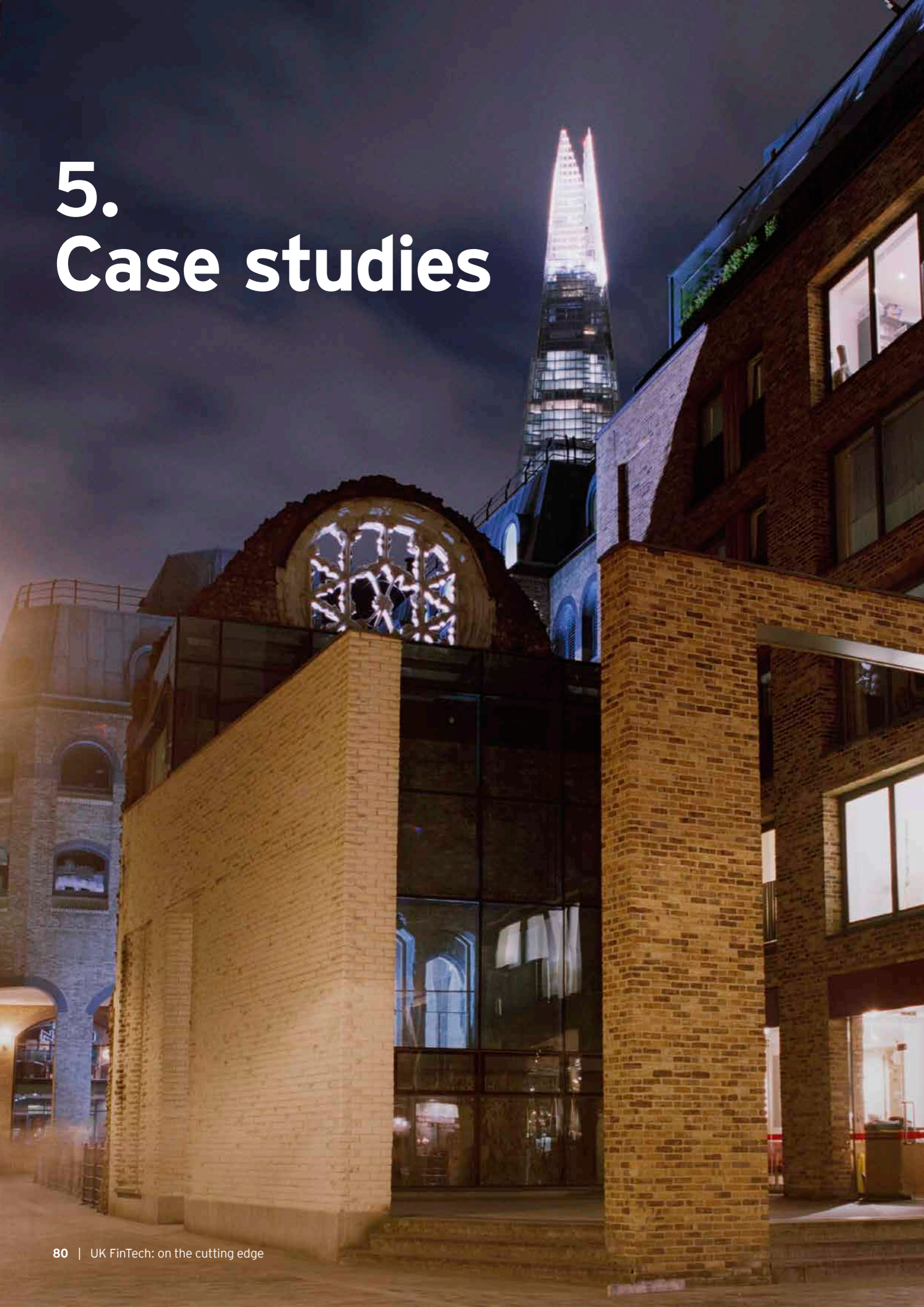
The Government is in a strong position to promote FinTech adoption and should consider the following:

- ▶ **Adopt payments and supply chain finance FinTech solutions:** The Government can promote payments and supply chain finance solutions, while also benefiting its SME supplier base. For example, Birmingham City Council, the largest local authority in Europe, has recently invested directly into a supply chain FinTech. The Government should consider how other councils could adopt similar approaches.
- ▶ **Support a financial inclusion agenda to grow consumer demand:** FinTechs should be well-suited to supporting a financial inclusion agenda with their emphasis on low cost and simplicity. Relevant Government departments, such as the Department of Work and Pensions (DWP), should consider working with FinTech trade associations and not-for-profit bodies to identify challenges and spur development.
- ▶ **Promote FI and FinTech collaborations:** FIs and FinTechs are increasingly looking to work together, but frequently struggle to engage. The Government should consider encouraging professional services firms to take a more active role as intermediaries and multi-corporate accelerators (e.g., Plug and Play)<sup>29</sup> to establish themselves in the UK.

29. Plug and Play helps corporate partners to license, pilot and co-invest in start-ups



# 5. Case studies



## China

Dominance in capital markets and access to the world's largest consumer base provides the foundation for an increasingly active FinTech market.

### FinTech landscape

“High investor interest, vast digitally active consumer base”

FinTech investment (Oct 2014–Sept 2015): c. £2b<sup>30</sup>

Seven Chinese firms feature in the leading 50 of the FinTech100 2015 (up from one in 2014)<sup>31</sup>

**FinTech clusters:** Shanghai, Beijing, Shenzhen

Seven of the 31 FinTech unicorns were founded in China.

Four were set up in the last five years.<sup>32</sup>

### Characteristics

Large, highly digital consumer base, open to trying online and innovative solutions

Rapid growth in the number of FinTech players; many FinTechs established in the last few years

Dominant tech players, such as Alibaba, launching FinTech products (on a tremendous scale)

Strong FinTech focus on the lending and payments subsectors

### Capital

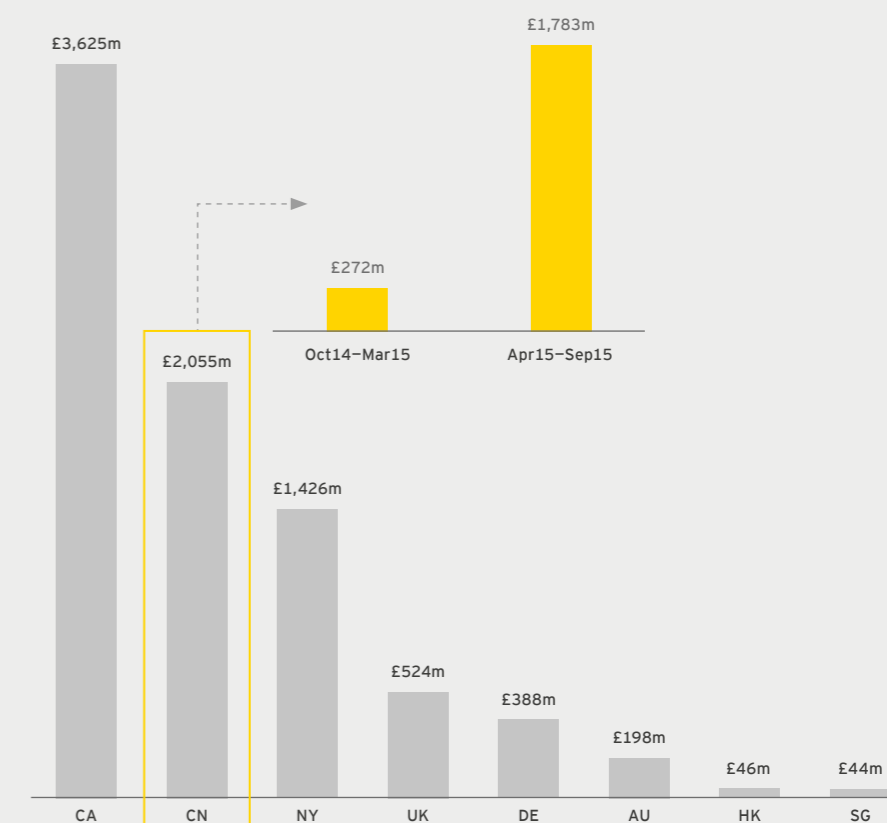
Investment in FinTech in mainland China is second only to California, with over c.£2b of investment in the year to September 2015 (the bulk of this occurred in the last six months of this period). Increasing FinTech investment parallels the significant rise in the number of Chinese FinTechs that look to follow the success of major players such as Alibaba and Tencent.<sup>33</sup>

China's FinTech investment mirrors the broader investment landscape where China is increasingly dominant in VC and IPO markets.

Both Beijing and Shanghai have emerged in the top five hotbeds for VC investment in 2015 (see appendix B, figure B.5).<sup>34</sup>

As leading financial centres, Shanghai and Shenzhen Exchanges listed a total of 1,460 companies in the last decade, second only to the NYSE and NASDAQ combined (1,594).<sup>35</sup>

Figure 43: FinTech investment, by region (£m)



Source: CB insights

30. CB Insights  
 31. FinTech Innovators  
 32. EY Analysis  
 33. Economist Insights  
 34. EY Venture Capital Insights  
 35. Dealogic

# Israel

Strong talent, policy initiatives and global connections support a culture of innovation.

## Demand

- ▶ China has the world's largest population, accounting for c.20% of the total world population.<sup>36</sup>
- ▶ The consumer base is not only large, but increasingly digitally active, with strong potential to adopt innovative FinTech products. Almost 15% of Chinese retail purchases are online, greater than the share in the US or UK (see appendix D, figure D.1). Consumer mobile-payment readiness is amongst the highest globally.<sup>37</sup>
- ▶ Almost 40% of the population are unbanked, with no credit history and limited access to traditional banking. FinTechs may provide this cohort with alternative FS solutions and thereby help to drive financial inclusion.<sup>38</sup>
- ▶ Potential corporate demand for FinTech is also strong, with China home to the world's largest pool of SMEs (c.42m in 2015).<sup>39</sup> Chinese SMEs have historically been underserved by the traditional banking system. This presents a significant opportunity for FinTechs in the alternative finance market.

## Policy

- ▶ China's regulatory regime for FinTech appears relatively supportive of new entrants and sector growth. It ranks highly for ease of entry and business models are easily replicated, which results in strong competition.
- ▶ Regulators have recently passed a series of measures to enable the setup of "private banks", which allows tech firms to bring FinTech offerings to market.
- ▶ The Chinese Government is driving investment in innovation and R&D, with particular focus on enabling the development of new technology solutions, such as the third computing platform (which is based on online cloud computing and wireless connectivity), as outlined in the 13th Five-Year Plan.
- ▶ State-owned institutions also play a role in providing capital (e.g., the state-owned Guangdong Technology Financial Group directly invested in WeLab, a mobile lending platform).

## FinTech landscape

**"Well linked to US markets, strong talent base"**

FinTech Investment, Tel Aviv (Oct 14-Mar 15) £23m<sup>40</sup>

Number of FinTech companies<sup>41</sup>  
c.430 (2015)  
c. 90 (2011)

Employees in High Tech  
c.283,000 (2014)<sup>42</sup>

Eight Israeli FinTechs feature in the FinTech100 2015<sup>43</sup>

FinTech cluster: **Tel Aviv**

## Characteristics

High technology is the leading export (roughly half of all Israel's exports)

Highest density for start-ups per capita in the world (Israel)

World-leading tech talent and entrepreneurial can-do attitude; tech skills bolstered by compulsory military training

Well-connected diaspora supporting investment and talent corridors (particularly with the US)

Strong focus on cyber and information security, and mobile innovation

Ranked fifth globally for Bitcoin adoption

## Industry involvement

Industry players are actively involving themselves in the FinTech scene. For example, Bank Hapoalim is openly inviting developers to access their API and developers portal to learn about and experiment with the bank's API.

## Capital

- ▶ Investment in Tel Aviv FinTech appears slightly larger than, if not comparable to, Hong Kong and Singapore (with c.£23m of investment in the six months to March 2015).<sup>44</sup>
- ▶ Israel benefits from a thriving expat community and diaspora. This supports strong global connections, particularly with the US, resulting in an established corridor for investment and skills transfer (13 of the 18 Israeli start-ups that went public in 2014 did so on US-based exchanges, while the other five listed in London).<sup>45</sup>
- ▶ Initiatives such as Israeli Start-ups NYC look to nurture relationships between Israel and US start-up communities. A large proportion of the c.300 VC funds active in Israel are international. Foreign direct investment is boosted by initiatives, such as the Yozma Fund, which offers highly attractive funding benefits by global standards.

## Talent

- ▶ Israel's skill base is characterised by strong technical talent nurtured through STEM-focused education and compulsory two-to-three year military service for the Israeli Defence Force (IDF).
- ▶ Following service, many young Israelis utilise their skills to develop new technologies and found start-up companies.
- ▶ Additionally, Israeli universities are highly regarded with strong R&D capabilities and courses.
- ▶ Share of employment in R&D in Israel is almost double that in the US, partly owing to the intensive R&D efforts of the IDF (particularly in the field of network and data security).

## Policy

- ▶ The Israeli government has created a highly supportive policy environment for start-ups and tech companies.
- ▶ In Tel Aviv, a number of public facilities, such as libraries have been converted into shared or co-working spaces, which start-ups can access at subsidised rates.
- ▶ The Israeli Government offers several funding initiatives to attract foreign investment, most notably the Yozma Fund, which offers foreign investors two dollars on every dollar committed to an Israeli entrepreneur. In addition to the option of buying out the Government's stake after five years.
- ▶ There are also Government start-up grants and programmes for seed capital (e.g., Tnufa programme, offering pre-seed capital for early-stage activities).
- ▶ Tax breaks are available for R&D, VC accelerators and angel investors. The Government also sponsors events to promote entrepreneurial networks and bridges with global FinTech hubs.

36. Worldometers

37. MasterCard mobile payments readiness index

38. Traxpay

39. B2B International

40. CB Insights

41. TechCrunch

42. CBS

43. Crowdfunder

44. CB Insights

45. Forbes

# 6. Appendices



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# A. Talent

Figure A.1: Headquarters of top 14 tech companies

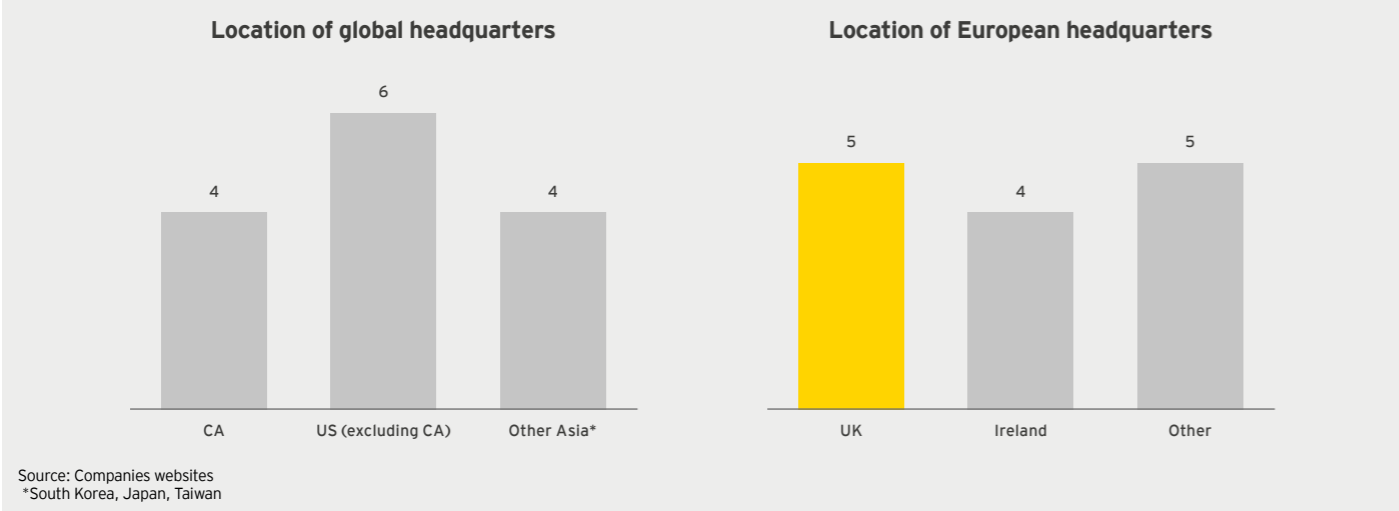


Figure A.4: The proportion of foreign born individuals in the US (2009-13)

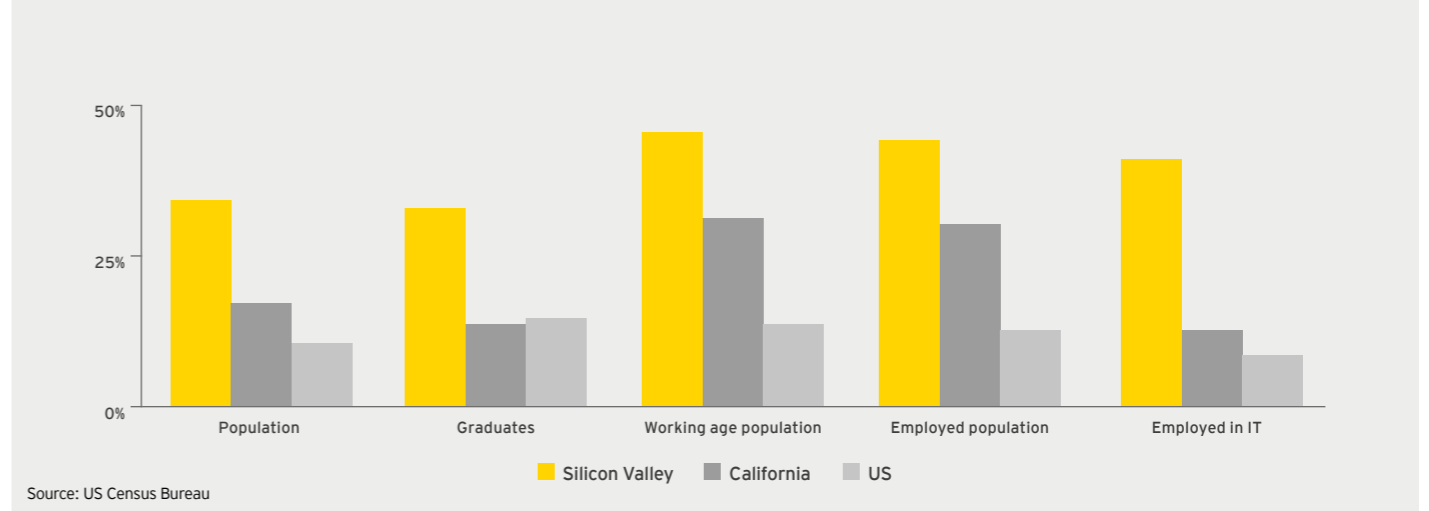


Figure A.2: Developer population by city (thousands)

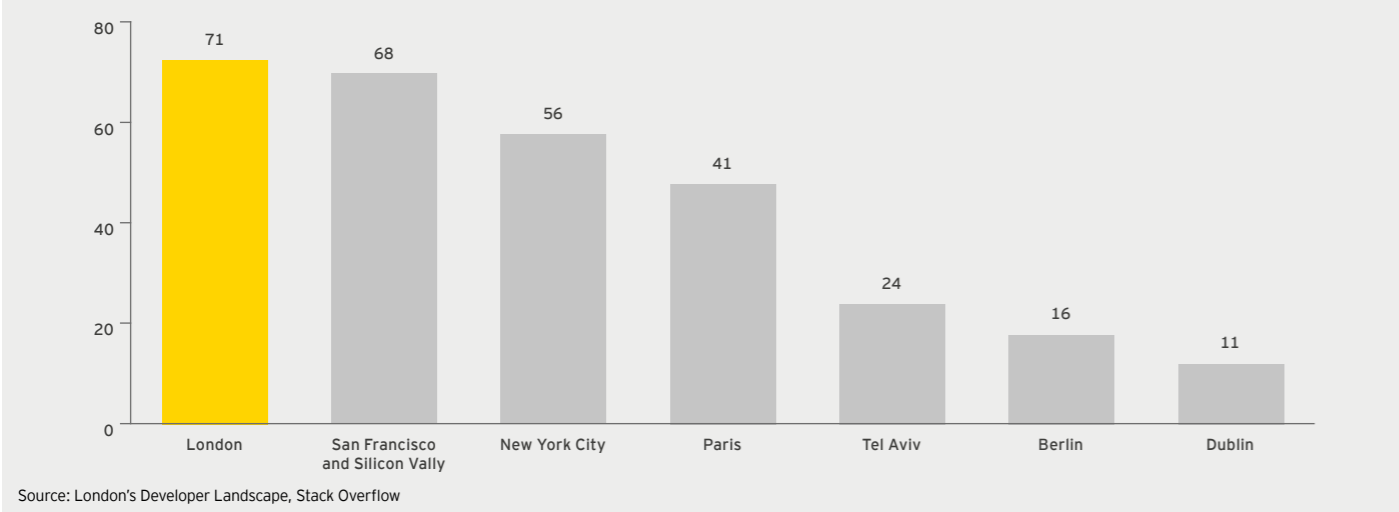


Figure A.5: Graduates in science and technology (share of total university graduates)

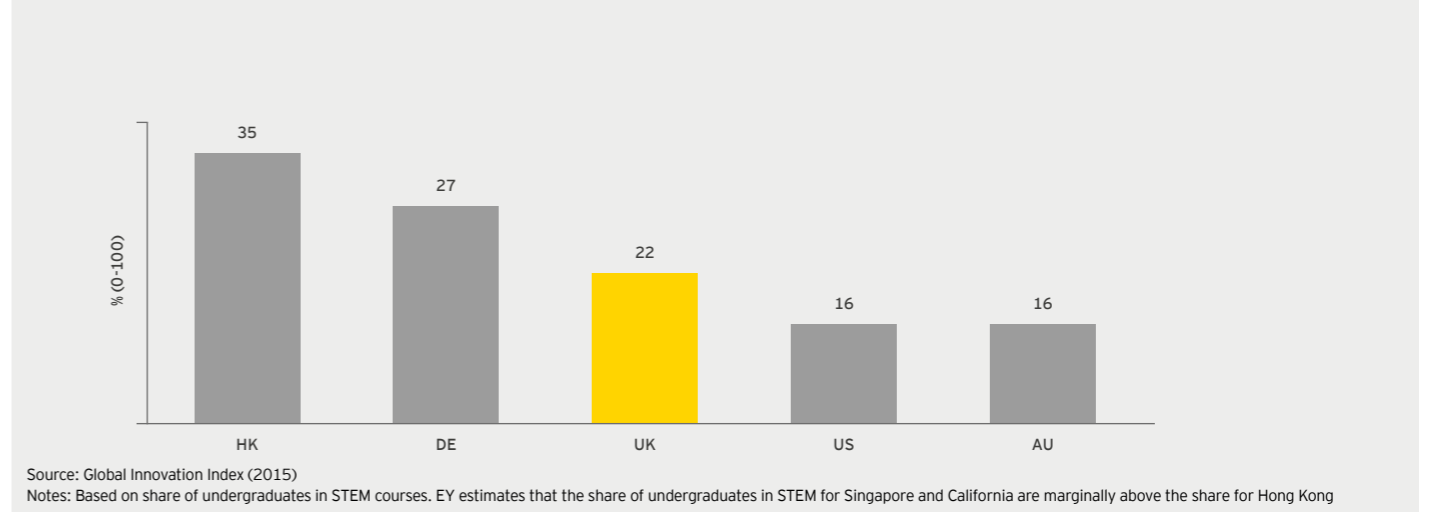


Figure A.3: Global Financial Centre Index (GFCI) – human capital, ranking of in-scope regions (2015, rank 1-7)



Figure A.6: University-industry collaboration in R&D, ranking for in-scope regions (rank 1-6)

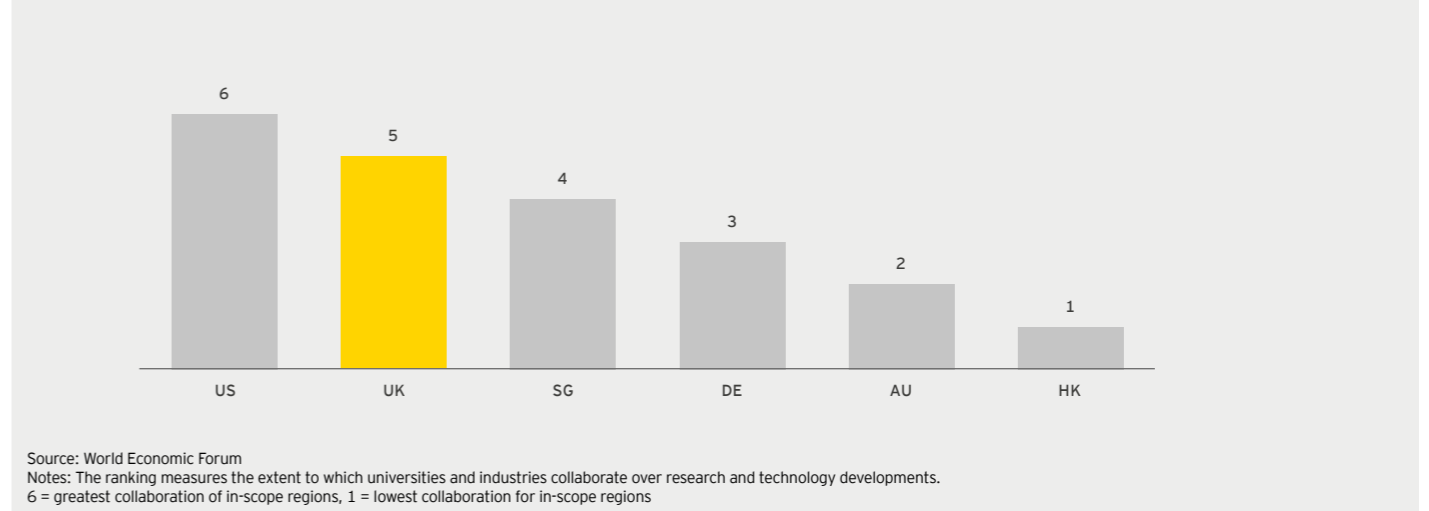






Figure A.7: Further examples of best practice initiatives to develop tech talent

UK	
<p><b>STEM in schools</b></p> <ul style="list-style-type: none"> <li>Government policy "2010 to 2015, Public Understanding of Science and Engineering", contains measures to encourage STEM in schools. This includes STEMNET – which covers an ambassador initiative to assist STEM teaching, after-school clubs and a network to advise schools on how they can improve STEM education and employment.</li> <li>The ICT Curriculum Review (2013): Previous ICT curriculum replaced in favour of new courses in computer science. Coding introduced in schools in September 2014</li> </ul>	
<b>Industry</b>	<ul style="list-style-type: none"> <li>Strong industry engagement (e.g., by tech firms) in computing education and teacher training</li> </ul> <p><b>Barclays Code Playground</b></p> <ul style="list-style-type: none"> <li>The bank has launched a coding app aimed at children and offers weekly classes (run by the Barclays "Digital Eagles") to introduce children and parents to the basics of coding.</li> </ul>
Estonia	Australia
<p><b>ProgeTiger</b></p> <ul style="list-style-type: none"> <li>Launched by the Estonian Ministry of Education and Research in 2012 to teach programming and robotics in schools.</li> <li>This programme is aimed at preschool, primary and vocational education and has developed over time to cover engineering, design and technology, and ICT.</li> </ul>	<p><b>Coding in schools</b></p> <ul style="list-style-type: none"> <li>An Opposition Government proposal to introduce coding to primary and secondary education. Digital proficiency proposed to become a foundation skill alongside reading and numeracy.</li> </ul> <p><b>Clearing higher education debt for STEM graduates</b></p> <ul style="list-style-type: none"> <li>An Opposition Government pledge to write off the debts of 100,000 STEM graduates.</li> </ul> <p><b>Resident visa programme for STEM graduates</b></p> <ul style="list-style-type: none"> <li>Additional points to be given to foreign STEM and ICT graduates in skilled migration tests.</li> </ul>
France	California
<p><b>École 42</b></p> <ul style="list-style-type: none"> <li>A private computer programming school in Paris, created and funded by Xavier Niel and Partners.</li> <li>The school is free for 18 to 30 year olds regardless of whether they possess an academic degree.</li> <li>Training occurs over a period of three to five years; up to 1,000 enrolments annually.</li> </ul>	<p><b>STEM Office</b></p> <ul style="list-style-type: none"> <li>A task force, driven by the California Department of Education, focused on enhancing STEM education and professional learning so that California retains its lead in STEM education.</li> </ul> <p><b>Women and girls in STEM week</b></p> <ul style="list-style-type: none"> <li>A week-long initiative, announced by the State Schools Chief, to urge educators, business and community leaders to increase the percentage of women, girls and underrepresented youth in STEM.</li> </ul>
Singapore	New York
<p><b>STEM in secondary schools</b></p> <ul style="list-style-type: none"> <li>STEM applied learning programme to be rolled out to mainstream secondary schools with opportunities to apply knowledge to real-world problems.</li> </ul> <p><b>Women Who Code</b></p> <ul style="list-style-type: none"> <li>A US-based not-for-profit dedicated to inspiring women to excel in tech careers; includes organised meetups in Singapore.</li> </ul>	<p><b>Girls Who Code</b></p> <ul style="list-style-type: none"> <li>A not-for-profit organisation founded by the former Deputy Public Advocate for NYC and supported by public and private partners.</li> <li>Includes a seven-week summer programme placing high school students in tech companies or universities to complete a hands-on computer science course.</li> </ul>

Figure A.8: Academic networks and university initiatives – illustrative examples

	Initiative	Description
<b>UK</b> 	<b>Cambridge 50 (2012)</b>	Developed by Cambridge businesses and the academic community to support economic growth in the Cambridge cluster. The Cambridge 50 tracks the fastest-growing companies in the area and makes it easy to identify, invest, work and partner with them.
	<b>BCS, The Chartered Institute for IT (2012)</b>	This professional body supports the development of IT professionals and tech start-ups by ensuring skills align to market needs, providing training and sharing best practice.
	<b>Tech City UK's Digital Business Academy (2014)</b>	Created by Tech City UK (a UK Government-funded not-for-profit organisation) in partnership with leading educational institutions. The academy offers 11 free online courses covering a range of business skills to help individuals start, grow or join a digital business. The content is designed for anyone over the age of 18 and delivered by University College London, Cambridge Judge Business School, Founder Centric and Valuable Content.
	<b>ELITE programme (2014)</b>	A 24-month programme run and delivered by the London Stock Exchange in collaboration with Imperial College Business School which provides high growth companies with education, business support, mentorship and increased funding access. Major trade body supporters include the CBI, BBAA, BVCA and Tech City.
	<b>FinTech 101 (2015)</b>	A FinTech e-learning course offered at The Open University in collaboration with Innovate Finance. The course is available for a fixed fee; contributions towards the courses' development have been made by Innovate Finance members.
	<b>London Business School FinTech Hackathon (Nov 2015)</b>	Hosted at the London Business School and organised by the school's entrepreneurship club. This is a recently created three-day event bringing together entrepreneurs, business people and the city's top technical talent to create new FinTech solutions or products. The hackathon is supported by a number of industry companies.
	<b>Alan Turing Institute (2015)</b>	The Government has invested £42m to attract leading data scientists and mathematicians globally to help position the UK as a world leader in the analysis and application of big data and algorithm research. The institute is forming partnerships with industry players.
	<b>Shadbolt review (2015)</b>	The Government has commissioned an independent review, led by Sir Nigel Shadbolt (a Professorial Research Fellow at Oxford University), to understand issues around the employability of computer science graduates in the UK. The review will look to understand how current degree accreditation systems could be reformed to keep pace with industry needs and improve graduate employability.

	Initiative	Description
<b>CA</b> 	<b>Caltech's Office of Technology Transfer and Corporate Partnerships (OTTCP) (2012)</b>	The California Institute of Technology (Caltech) provides several resources on the Caltech campus for innovators interested in creating a technology-based start-up. This includes events, forums for entrepreneurs, courses and internal funding programmes to move Caltech-owned technologies from the lab to the marketplace.
	<b>StartX's Accelerator Programme (2011)</b>	An educational not-for-profit programme, associated with Stanford University, that accelerates the development of Stanford's top entrepreneurs through experiential education and collective intelligence. In 2013, StartX, Stanford University and partners co-founded an uncapped fund (Stanford-StartX Fund) open to StartX companies that meet a set of objective criteria.
	<b>Hero City and FinTech Incubator at Draper University (2015)</b>	Hero City is a privately-run co-working space at Draper University that promotes innovation, entrepreneurship and a programme to educate the next generation FinTech entrepreneurs. In addition, Draper has an invite-only FinTech incubator available to early stage start-ups. These start-ups will receive access to the Draper network of funds and receive discounted work space at Hero City.
<b>NY</b> 	<b>START-UP NY (2013)</b>	A State Government initiative which offers new and expanding businesses the opportunity to operate tax-free for 10 years on or near eligible university or college campuses. In order to participate, businesses must partner with a New York State college or university.
	<b>Grand Central Tech (2014)</b>	A group of strategic advisors, mentors, corporate partners, growth partners and educational institutions which provide free office space and support to start-ups for a year. Educational partners include Cornell Tech, Girls Who Code and New York City's premier high schools.
	<b>Cornell's Tech Runway Startup Postdocs (2014)</b>	Based in Jacobs Technion – Cornell Institute, (an academic partnership between Cornell University and Technion – Israel Institute of Technology), provides a package that includes a salary, research budget, housing allowance, space and more for recent PhDs in digital technology fields who are looking to start a company in New York.
<b>DE</b> 	<b>Centre for Entrepreneurship (2010)</b>	The Technology University of Berlin offers courses and events to support tech start-ups. Courses include a double degree masters in "Innovation Management and Entrepreneurship".
	<b>GTEC Berlin (2015)</b>	Established at European School of Management and Technology (ESMT), the open campus unites technology entrepreneurship organisations, resources and expertise. GTEC has a start-up lab and a start-up accelerator.
	<b>Berlin FinTech Day (2015)</b>	A day organised by student associations in which FinTech start-ups present their companies, and both lectures and panel discussions are offered.










	Initiative	Description
<b>AU</b> 	<b>Incubate (2012)</b>	Co-founded by two students and developed by the University of Sydney, the programme offers start-ups non-equity seed funding of AU\$5,000 (c.£2,500), mentoring and co-working space on campus. The principle sponsors are industry players. Incubate has entered a partnership to expand the student entrepreneurship programme across Australia.
	<b>UNSW Centre for Quantum Computation and Communication Technology (2014)</b>	Partnership with the Commonwealth Bank of Australia (CBA) to support innovation and build the world's first silicon-based quantum computer in Sydney at the University of New South Wales Centre of Quantum Computation and Communication Technology. Quantum technology has the potential to be leveraged by FinTechs in areas such as Blockchain and cryptography.
	<b>UNSW Cyber security (2014)</b>	Government-supported cybersecurity research centre, headquartered at UNSW Canberra. Partnership with CBA to develop and boost the nation's reserve of quality security engineering professionals.
<b>SG</b> 	<b>Innovation for Financial Services (2013)</b>	This international conference is hosted by a premier university in Singapore which specialises in business and management studies. It brings together innovation experts, academics and leaders from the FS industry to discuss cutting-edge themes related to innovation in FS. First held in Singapore in 2013.
<b>HK</b> 	<b>Cyberport University Partnership Programme (2015)</b>	Cyberport, in collaboration with Stanford Graduate School of Business, offers a customised boot camp and mentorship to promising FinTech entrepreneurs.

Figure A.9: Entrepreneur-specific immigration initiatives – illustrative examples

	Initiative	Description
<b>UK</b> 	<b>Entrepreneur Visa (2008)</b>	A temporary visa for people looking to set up or run a business in the UK and who have access to at least £50,000 in investment funds from designated sources.
	<b>Graduate Entrepreneur Visa (2012)</b>	A temporary visa endorsed by the UKTI for qualifying graduates to apply or stay in the UK after graduation if they have been identified by a UK university as possessing world-class entrepreneurial skills or having a credible, genuine business idea.
	<b>Global Entrepreneur Programme (2013)</b>	UKTI initiative to encourage an overseas-based entrepreneur or technology business to headquarter their global business in the UK, through the provision of an Entrepreneur Visa and relocation assistance.
	<b>Tech Nation Visa Scheme (Tier 1 Exceptional Talent) (revised 2015)</b>	A temporary visa for individuals who have been endorsed as a recognised or emerging leader in arts or sciences. The visa was revised in 2015 with new qualifying criteria to encompass individuals with expertise in scaling-up companies, fast track applications for northern digital businesses and extends the visa to “exceptional” overseas teams (of up to five).
<b>US</b> 	<b>Start-Up Visa Act (proposed)</b>	Proposed amendment to the US immigration regime to create a visa category for foreign entrepreneurs who have raised capital from qualified US investors. Currently awaiting Congress approval.
<b>DE</b> 	<b>Entrepreneur Visa (2009)</b>	A temporary visa for people looking to set up or run a business in Germany. There is no threshold investment requirement, however, investment of €250,000 (c.£200,000) is recommended.
	<b>EU Blue Card (2012)</b>	A residence permit which allows highly qualified non-EU citizens (from in-demand professions) to be fast-tracked to employment.
<b>AU</b> 	<b>Significant and Premium Investor Visa Programmes (2012)</b>	Part of the Government’s Industry Innovation and Competitiveness Agenda. The programme selects applicants with business and entrepreneurial skills and capital to enhance investment into innovative Australian businesses and ideas. As of July 2015, enhancements to both visas were underway.
	<b>New Entrepreneur Visa (2016)</b>	A new temporary business visa for entrepreneurs with innovative ideas and financial backing. Announced as part of Prime Minister Turnbull’s Innovation and Science Agenda. Will be implemented in November 2016.
	<b>Enhanced residence pathways for graduates with STEM and ICT qualifications (2016)</b>	Graduates of Australian universities with qualifications in STEM and ICT will receive extra points under the points-tested Skilled Migration programme to qualify for a permanent work visa. Announced as part of Prime Minister Turnbull’s Innovation and Science Agenda. Will be implemented in December 2016.
<b>SG</b> 	<b>Entrepreneur Pass (2004)</b>	A visa scheme designed for foreign entrepreneurs looking to set up a business and relocate to Singapore. Minimum capital requirements apply.
<b>HK</b> 	<b>Entrepreneur Visa (2010)</b>	General employment visa available to overseas entrepreneurs who can demonstrate a strong business plan and educational background or proven professional experience. Start-up entrepreneurs attached to a government-backed innovation programme or incubator are favoured considerably.

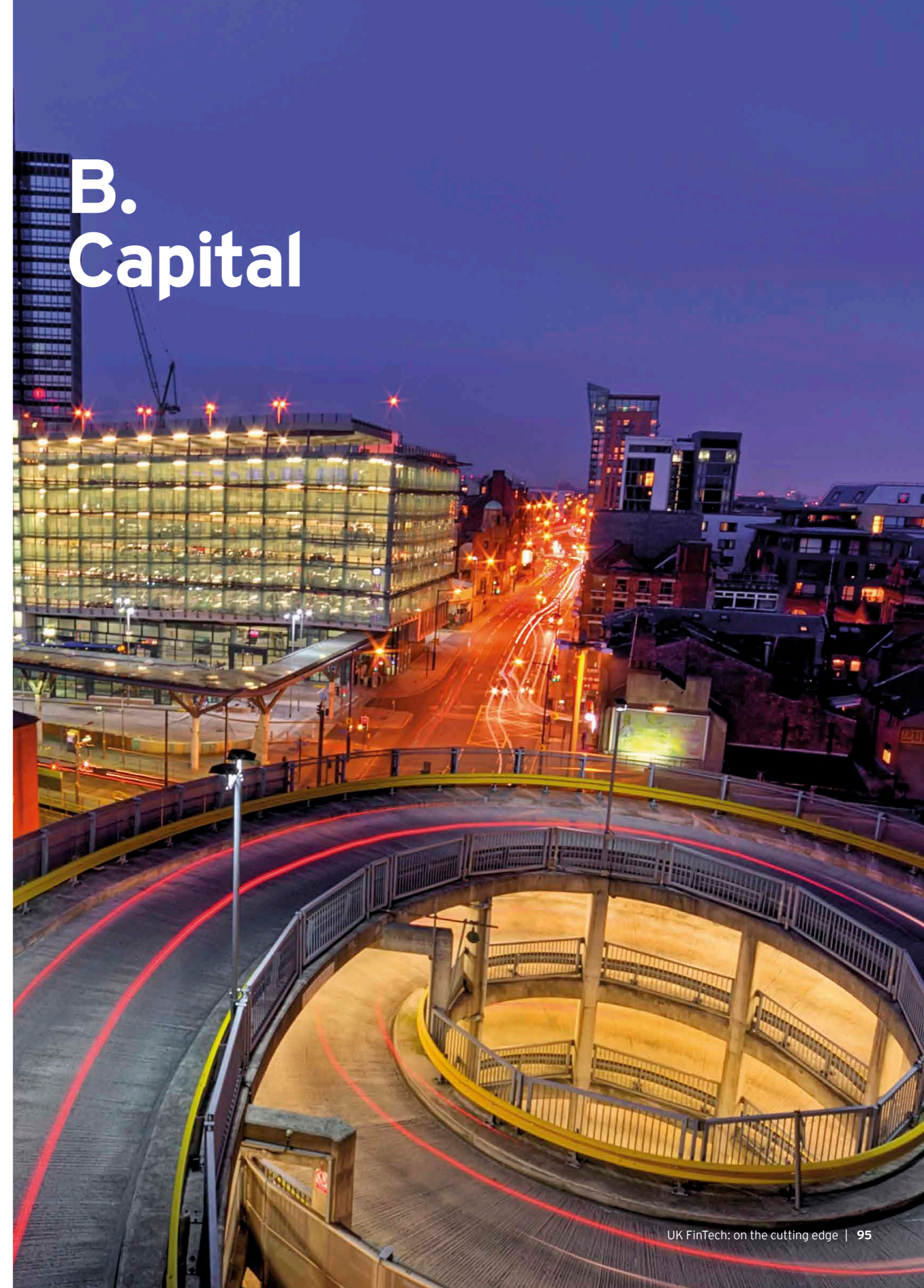
















Figure B.1: Investment into FinTech by geography

 <p><b>CA</b></p>	<ul style="list-style-type: none"> <li>Funding volumes have grown by c.63% compound annual growth rate (CAGR) 2012-15. By FinTech subsector, investment was focused primarily on banking and payments (c.45%), and credit and lending (c.38%).</li> <li>Notable California-based investors include DFJ Growth, Felicis Ventures and Sequoia.</li> </ul>
 <p><b>NY</b></p>	<ul style="list-style-type: none"> <li>Funding volumes have grown by c.120% CAGR 2012-15. By FinTech subsector, investment was focused primarily on credit and lending (c.60%).</li> <li>Notable New York-based investors include Tiger Global Management and RRE Ventures.</li> </ul>
 <p><b>UK</b></p>	<ul style="list-style-type: none"> <li>Funding volumes have grown by c.100% CAGR 2012-15. By FinTech subsector, investment was focused primarily on banking and payments (c.40%), and credit and lending (c.38%) sub-sectors.</li> </ul>
 <p><b>DE</b></p>	<ul style="list-style-type: none"> <li>Funding volumes have grown by c.125% CAGR 2012-15. By FinTech subsector, investment was focused primarily on credit and lending (c.81%).</li> </ul>
 <p><b>AU</b></p>	<ul style="list-style-type: none"> <li>Funding volumes have grown by c.398% CAGR 2012-15. By FinTech subsector, investment was focused primarily on credit and lending (c.51%), and banking and payments (c.46%).</li> </ul>
 <p><b>SG</b></p>	<ul style="list-style-type: none"> <li>Funding volumes have grown by c.586% CAGR 2012-15 with c.57% focused on the banking and payments sector.</li> </ul>
 <p><b>HK</b></p>	<ul style="list-style-type: none"> <li>Funding volumes have grown by c.7% CAGR 2014-15*. The retail investments and pensions sub-sector is a key focus for investment (c.46%).</li> </ul>

Source: CB Insights, EY analysis





\*Data not available for prior years to calculate CAGR 2012-15

Figure B.2: Best practice – incubators and accelerators

Incubators		Accelerators	
 <p><b>UK</b></p>	<p><b>Level 39 (L39, 2013):</b> Europe's largest FinTech-focused incubator, managed by Innovate Finance, providing office space, mentoring, networking and events to start-ups.</p> <p><b>Visa Collabs (2014):</b> a corporate-backed 12-week programme providing support, mentorship and strategic advice.</p>	 <p><b>UK</b></p>	<p><b>Startupbootcamp (2012):</b> privately-run programme which invests €15,000 (c.£12,000) for an equity stake in the start-up and provides office space and mentoring over a three-month period, with an Investor Day to finish.</p> <p><b>Accenture Innovation FinTech Lab (2013):</b> a privately-run 12-week accelerator, housed in L39, providing an angel network and mentoring.</p> <p><b>Barclays Accelerator (2014):</b> powered by Techstars, a 13-week programme where Barclays invests a small minority equity stake in the start-up, providing mentoring and access to their customer data and knowledge. The accelerator is housed at innovative working space Barclays Rise London.</p>
 <p><b>NY</b></p>	<p><b>Wells Fargo Innovation Hub (2014):</b> combines an open-design, collaborative environment to enable start-ups to prototype and bring digital payments products to market quickly and efficiently.</p> <p><b>MasterCard NYC Technology Hub (2014):</b> an open-design, collaborative environment to enable start-ups to prototype and bring digital payments products to market quickly and efficiently.</p>	 <p><b>NY</b></p>	<p><b>Startupbootcamp NYC (2015):</b> an extension of the European accelerator programme, including equity investment and mentoring.</p> <p><b>Citi Plug and Play NYC (2014):</b> a Plug and Play accelerator, sponsored by Citi Ventures, running a 12-week mentoring programme; focused on payments and security.</p>
 <p><b>SG</b></p>	<p><b>WaveMakerlabs (2012):</b> the first government-certified technology incubator approved under the Singaporean Government's National Research Foundation (NRF).</p>		

See figure B.3 and B.4 for further examples

Figure B.3: Incubators – illustrative examples

	Initiative	Description
<b>UK</b> 	<b>Seedcamp (2011)</b>	A tech-focused VC fund, which provides funding and mentoring support for early stage start-ups, focused on proven capital-efficient businesses.
	<b>Wayra (2012)</b>	Telefonica's tech-focused six-month incubator provides office space and mentorship to start-ups with Telefonica taking an equity-stake on a case-by-case basis. Telefonica also have academic involvement through a partnership with the University of Oxford.
	<b>L39 (2013)</b>	Europe's largest FinTech-focused incubator, managed by Innovate Finance, providing office space, mentoring, networking and events to start-ups. It is also home to the Accenture FinTech Innovation Lab.
	<b>Visa Collabs (2014)</b>	A collaborative working space, which includes Aviva partnership advice focused on the insurance sector.
	<b>Aviva Ventures Garage (2014)</b>	A collaborative working space, which includes Aviva partnership advice focused on the insurance sector.
	<b>Deutsche Bank Innovation Lab (2015)</b>	Corporate-sponsored working spaces which aim to cultivate new technology; the programme runs on an indefinite time period, with mentoring, strategic advice and DB customer data access.
<b>CA</b> 	<b>Deutsche Bank Innovation Lab (2015)</b>	The corporate-sponsored working spaces are aiming to cultivate new technology; the programme runs for an indefinite time period, with mentoring, strategic advice and access to Deutsche Bank customer data.
<b>NY</b> 	<b>Wells Fargo Innovation Lab (2014)</b>	Combines a cash investment for a minority stake with six months of coaching and collaboration.
	<b>MasterCard NYC Technology Lab (2014)</b>	An open-design, collaborative environment and workspace for start-ups to prototype and bring digital payments products to market quickly and efficiently.
	<b>ValueStream Labs (2014)</b>	Privately-run six-month programme, including potential investment on a case-by-case basis.
	<b>ICONYC (2015)</b>	Six-month incubator platform for Israeli FinTechs to connect with NY investors and key sector stakeholders.
<b>DE</b> 	<b>Commerzbank Incubator (2014)</b>	Corporate-backed six-month programme which provides mentoring and access to funding on a case-by-case basis.
	<b>SWIFT Innotrife (2014)</b>	The first location of the payment player's innovation programme. The programme provides relevant payment FinTechs with ongoing support, mentoring and potential funding.
	<b>Deutsche Bank Innovation Lab (2015)</b>	The corporate-sponsored working spaces which aim to cultivate new technology. The programme runs for an indefinite time period and provides mentoring, strategic advice and access to Deutsche Bank customer data.







	Initiative	Description
<b>AU</b> 	<b>Tyro FinTech Hub (2015)</b>	A FinTech incubator which looks to support the FinTech network through networking and collaboration.
	<b>Stone and Chalk (2015)</b>	An independent, not-for-profit FinTech hub or working environment with the overarching objective to foster innovation.
	<b>York Butter Factory (2014)</b>	A private, co-working tech entrepreneur space.
<b>SG</b> 	<b>WaveMakerlabs (2012)</b>	A government-certified technology incubator approved under the Singaporean Government's National Research Foundation (NRF).  Under the Technology Incubation Scheme (TIS), WaveMaker leverages its investment capital with the NRF, providing up to c.£240k per start-up in addition to the c.£45k that WaveMaker invests per company during the six-month programme.
	<b>Metlife Innovation Labs (2014)</b>	An ongoing programme which looks to find partnerships with start-ups and co-develop business models.

Figure B.4: Accelerators – illustrative examples

	Initiative	Description
<b>UK</b> 	<b>Startupbootcamp (2012)</b>	The privately-run global accelerator runs a 12-week mentoring programme, with mentoring from key local market incumbent FS players.
	<b>Accenture FinTech Innovation Lab (2013)</b>	The privately-run global accelerator was piloted in London and has now been reproduced in new geographies. A 12-week mentoring programme is housed in L39, with mentoring from key local market incumbent FS players.
	<b>3D FinTech (2013)</b>	A privately-owned seven-week programme, sponsored by Dassault Systems and Deutsche Borse, that is focused on compliance and risk issues.
	<b>Barclays Accelerator (2014)</b>	The corporate-sponsored 13-week programme which is designed by US private accelerator firm TechStars. Barclays invest in the start-up for a small minority equity stake, providing mentoring and access to their customer data or knowledge. Pioneered in London and housed at innovative working space Barclays Rise.
<b>CA</b> 	<b>Y-Combinator (2005)</b>	Arguably the world's first private accelerator. It focuses on tech start-ups and accepts FinTechs into its three-month programme, investing up to c.£75k, as well as providing mentoring and demo days to investors.
	<b>Plug and Play (2015)</b>	The decade-old Silicon Valley private accelerator offers a FinTech-focused 12-week programme, including mentoring and an investor day.
<b>NY</b> 	<b>Accenture FinTech Innovation Lab NYC (2014)</b>	The privately-run global accelerator is a copy of its London counterpart. A 12-week mentoring programme, with mentoring from key local market incumbent FS players.
	<b>Citi Plug and Play NYC (2014)</b>	An accelerator sponsored by Citi Ventures which runs a 12-week mentoring programme focused on payments and security.
	<b>Barclays TechStars NYC (2015)</b>	The corporate-sponsored initiative is a copy of its London-based counterpart. The initiative includes an equity investment and 13-week mentoring programme. The accelerator is housed at innovative working space Barclays Rise New York.
	<b>Startupbootcamp NYC (2015)</b>	An extension of their European accelerator programme, which includes equity investment and mentoring.
<b>DE</b> 	<b>Citi Plug and Play GER (2014)</b>	A Plug and Play accelerator, sponsored by Citi Ventures, run as a 12-week mentoring programme; focused on payments and security.




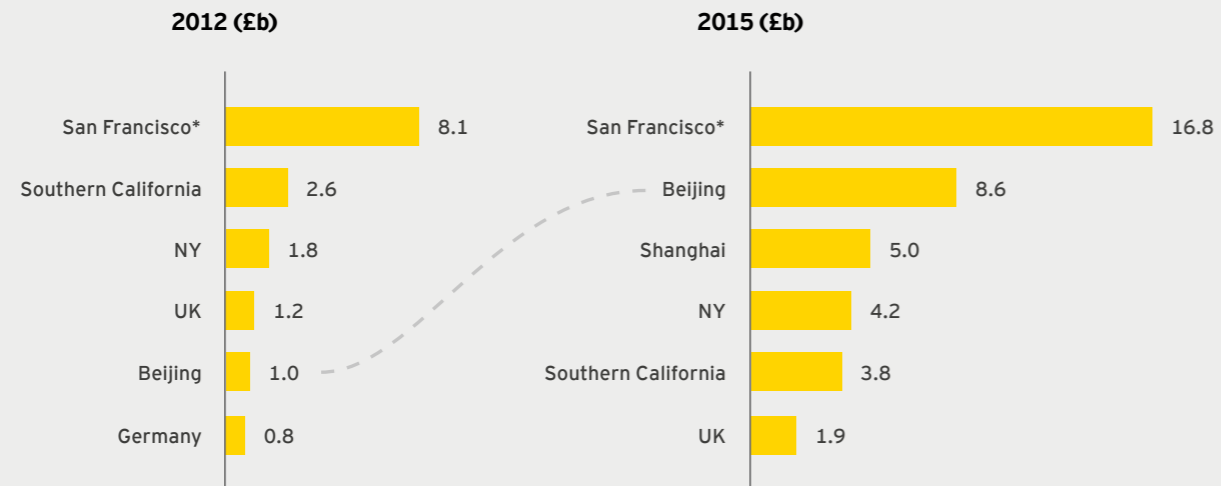
	Initiative	Description
<b>AU</b> 	<b>H2 Ventures (2015)</b>	VC-run six-month accelerator programme, with mentoring and provision of capital on a case-by-case basis.
	<b>Venturetec (2015)</b>	Privately-run six-month programme, focused on enterprise technology solutions, with mentoring and an investor day.
<b>SG</b> 	<b>Accenture FinTech Innovation Lab APAC (2014)</b>	The privately-run global accelerator is a copy of its London counterpart. A 12-week mentoring programme with mentoring from local incumbent FS players.
	<b>InspirAsia (2014)</b>	Privately-run 12-week programme, backed by VC firm Life.SREDA with mentoring and funding opportunities.
	<b>TCF Plug and Play NYC (2014)</b>	A 6-12 month multi-stage acceleration programme jointly offered by The Co-Foundry (TCF) and Plug and Play for start-ups looking to grow in Asia and potentially expand in the US.
	<b>Startupbootcamp Asia (2015)</b>	An extension of their European accelerator programme, including equity investment and mentoring.
	<b>DBS Hot Spot (2015)</b>	A corporate-sponsored three-month programme with mentoring and funding support.
<b>HK</b> 	<b>Accenture FinTech Innovation Lab (2014)</b>	The privately-run global accelerator is a copy of its London counterpart. A 12-week mentoring programme with mentoring from local incumbent FS players.
	<b>Standard Chartered SuperCharger (2015)</b>	12-week industry-supported accelerator offering equity investment and mentoring.
	<b>DBS Accelerator (2015)</b>	NEST-powered accelerator running a three-month mentoring programme.
	<b>Venturetec (2015)</b>	Privately-run six-month programme, focused on enterprise technology solutions, with mentoring and an investor day.

Figure B.5: Value of VC investment (all sectors) for top hotbeds



Source: Venture Capital Insights, EY  
 \*San Francisco refers to the San Francisco Bay area

Figure B.6: Corporate Venture Vehicles (CVVs) - illustrative examples

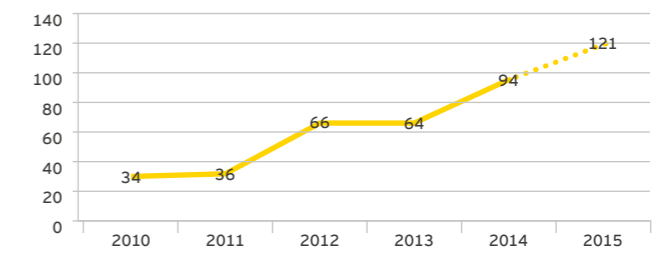
CVVs act as another example of corporations engaging with the FinTech industry, looking to either take a stake or acquire and implement FinTech products and services into their own operations.

FinTech is quickly reaching the top of the agenda for corporates around the globe, both from the FS industry and other industries. In 2014, there were c.94 unique corporations investing into emergent FinTech firms globally, a c.176% increase from 2010.

A number of FIs have set up CVVs over the past few years as an initial step into FinTech. However, few have made investments to date, when compared with other investors in FinTech.

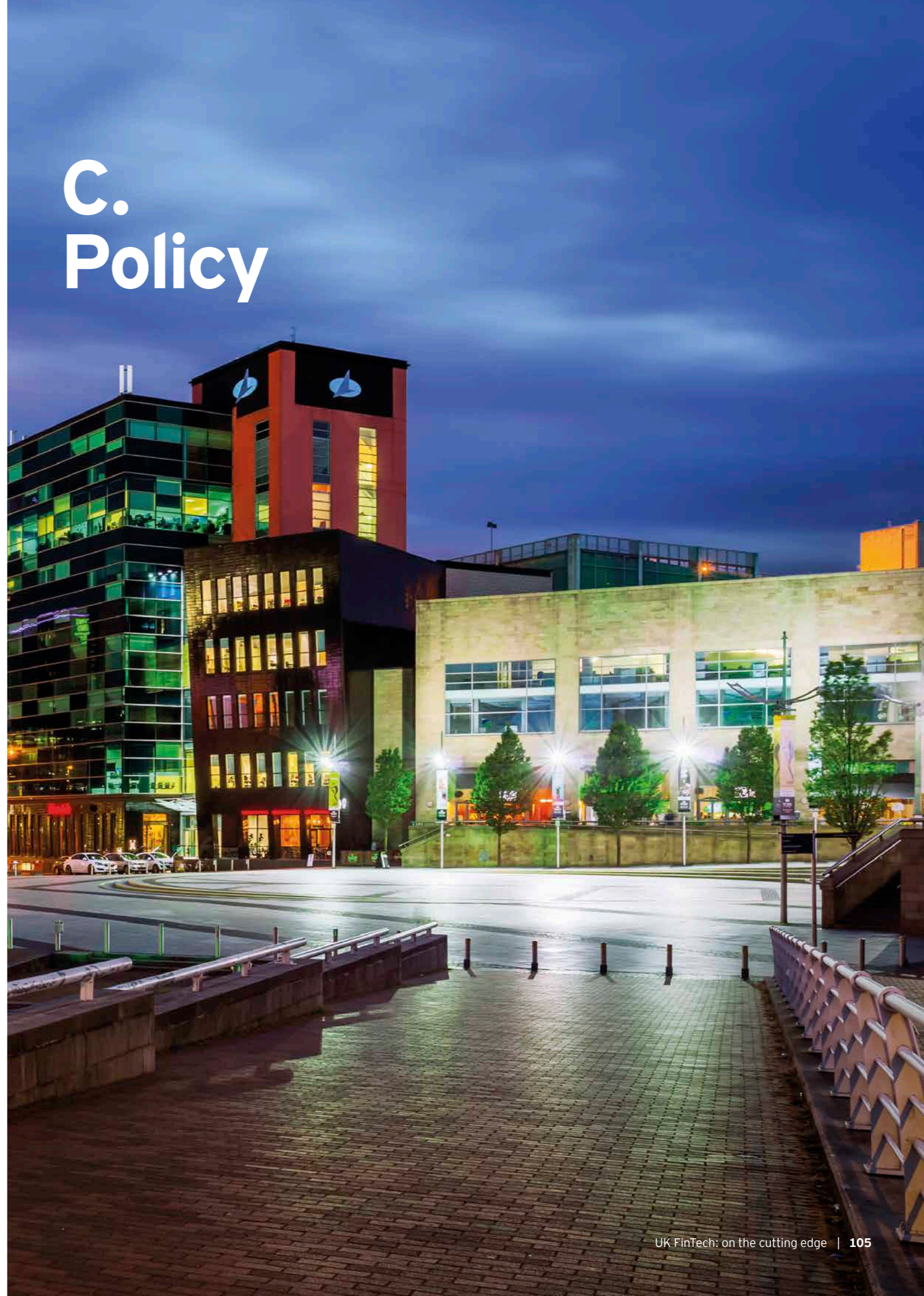
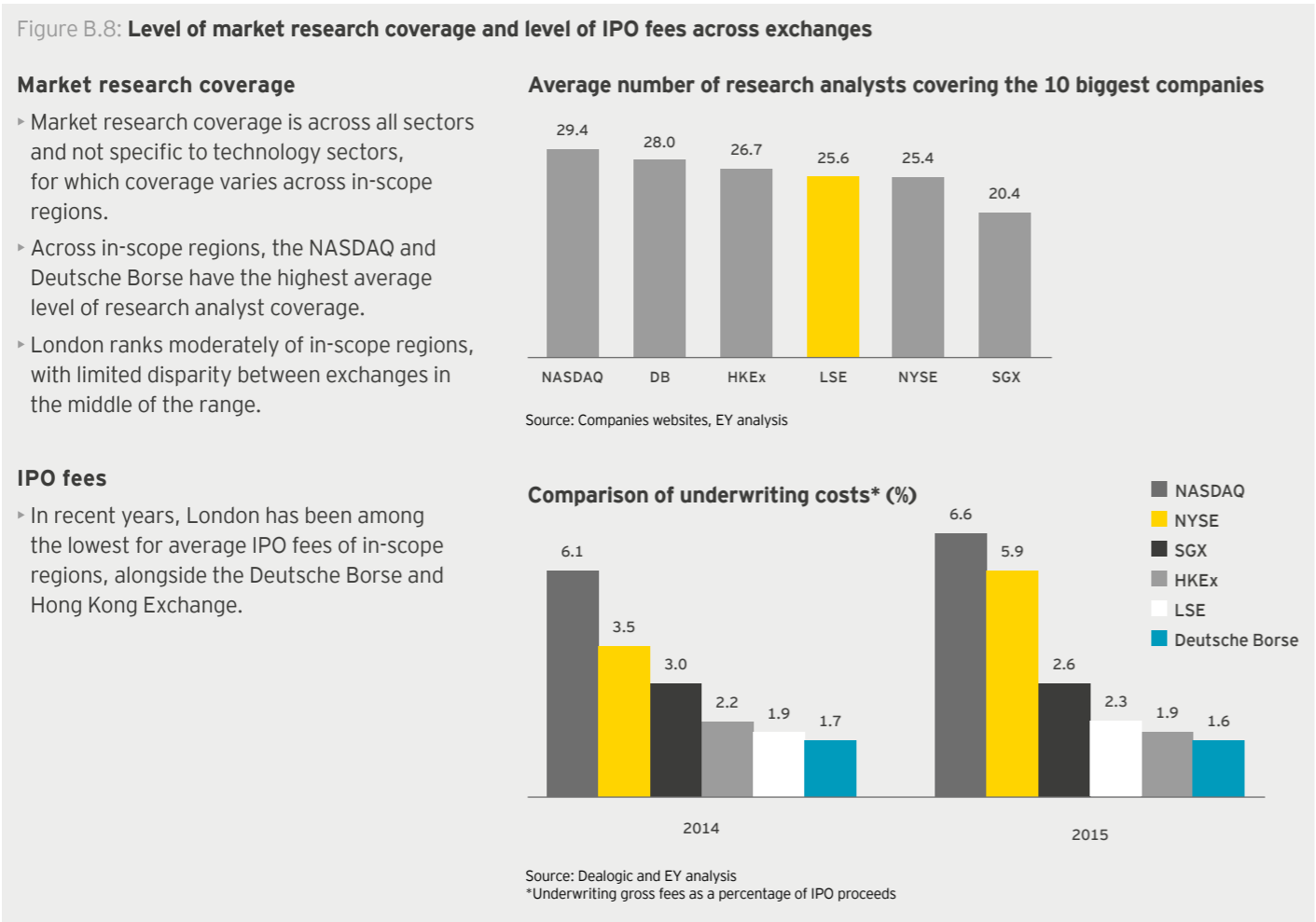
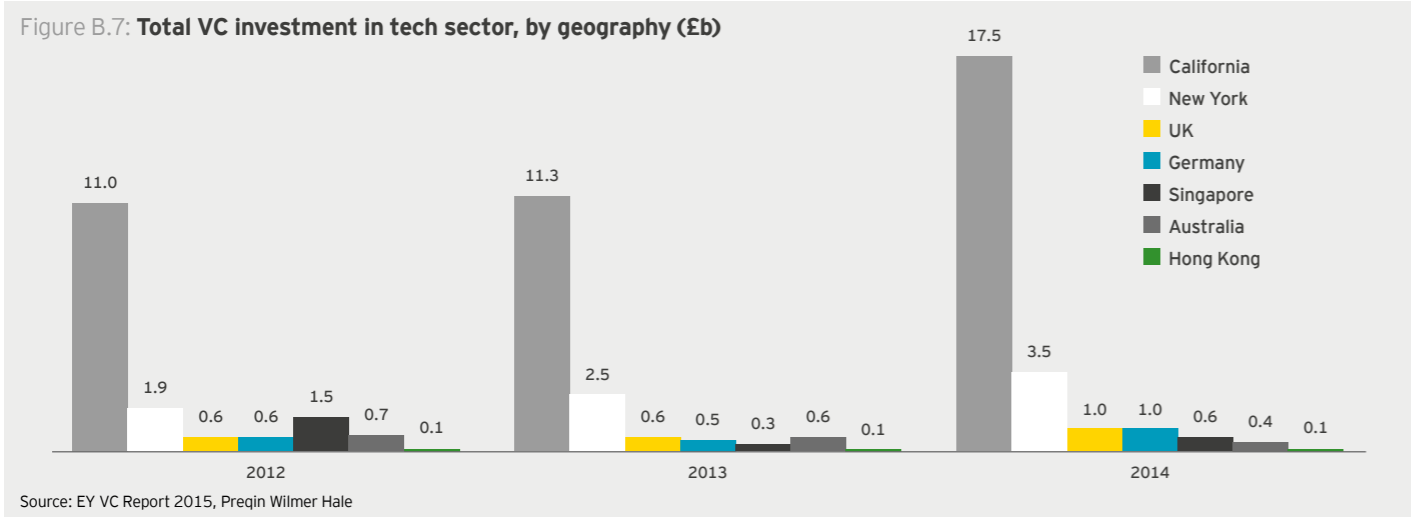
In terms of level of activity, the UK is behind California and New York, both of which have a long history of CVVs, particularly in the technology space. Germany is similar to the UK with large FIs setting up CVVs, but remaining cautious to invest to date. Singapore and Australia have seen very few CVVs set up with an exclusive focus on FinTech.

Number of CVVs globally (2010 - 2015)





Source: CB Insights




- UK**
  - ▶ Santander InnoVentures (£61m)
  - ▶ HSBC (£121m)
  - ▶ Aviva (£61m)
- NY**
  - ▶ American Express Ventures (Undisclosed)
- CA**
  - ▶ Citi Ventures (Undisclosed)
- SG**
  - ▶ DBS (Undisclosed)
- HK**
  - ▶ HK Gov (£4m)
- DE**
  - ▶ Commerz Venturiz (£61m)
  - ▶ Allianz Digital CV Fund (Undisclosed)
- AU**
  - ▶ CBA (Undisclosed)



# C. Policy

Figure C.1: Government programmes to open the local FinTech sector – illustrative examples

	Initiative	Description
 UK	<b>British Business Bank (BBB) and BBB Investments (2013)</b>	State-owned economic development bank supporting SME access to finance. In April 2014, a further £100m was allocated to the BBB to be lent to companies (including FinTechs) focused on SME lending.
	<b>Innovate UK (2007)</b>	The UK innovation agency responsible for driving science and technology innovation by funding projects, determining key focus sectors and connecting innovators with partners and supporting their growth.
	<b>Financial Services Trade and Investment Board (2013)</b>	Government and industry collaboration to identify growth opportunities in the FS industry. The board (chaired by HM Treasury) is currently scoping a project to support trade and investment in the UK FinTech sector.
	<b>UK Angel Co-Fund (2011)</b>	A £100m fund supported by the BBB which aims to back promising UK businesses and develop the business angel investment market.
	<b>Start-up Loans (2013)</b>	Government scheme (supported by the BBB) that provides loans, advice and mentoring to potential or young start-ups.
	<b>Tech City UK (2010)</b>	A non-profit organisation, launched by the Prime Minister, which supports digital technology businesses and entrepreneurs across the UK through programmes and policy work.
	<b>Future Fifty (2013)</b>	Delivered by Tech City for 50 promising high-growth digital companies. The programme provides access to expertise within the UK Government and the private sector, builds links to the UK's institutional investor base and offers tailored support to help companies with IPO, M&A and global expansion.
	<b>SME Mandatory Referrals (2015)</b>	UK legislation that requires banks to refer credit-rejected SMEs to alternative finance providers.
 US National	<b>Small Business Development Centres (1975)</b>	A national programme, run at a regional level (including in New York and California), which provides technical assistance to small businesses and entrepreneurs at low cost. Funded by federal, state and local governments, and industry.
	<b>Start-up America (2011)</b>	A White House initiative to accelerate entrepreneurship in the US through policy in five areas: access to capital, connecting mentors and education, reducing barriers and making government work for entrepreneurs, accelerating innovation from "lab to market" for breakthrough technologies, and unleashing market opportunities in selected industries.
	<b>Consumer Finance Protection Bureau, Project Catalyst (2012)</b>	A national programme to support the creation of innovative consumer financial products provide advice on regulatory impacts and collaborate with the FinTech start-up community.
	<b>Jumpstart Our Business Start-up (JOBS) Act (2012)</b>	National law to support small businesses procedurally and provide exemptions from various securities regulations.

	Initiative	Description
 CA	<b>Innovation Hub (iHub, 2010)</b>	Government programme to stimulate partnerships, economic growth and jobs through specific research clusters. The hubs (16 to date) leverage research parks, technology incubators, universities, and federal laboratories.
	<b>New York State Consolidated Funding Application (CFA, 2011)</b>	A single application point for accessing financing and technical assistance available through multiple programmes.
 DE	<b>BMWi Start-up portal</b>	A Government start-up portal for entrepreneurs providing advice, online tutorials, a "start app", funding and address databases.
	<b>EXIST Start-up programme (1998)</b>	Aimed at improving the entrepreneurial environment at universities and research institutes. The EXIST programme comprises three schemes: the fostering of an entrepreneurial culture; start-up grants; and technology transfer in higher education institutions.
	<b>High-Tech Gründerfonds (2005)</b>	A public-private VC firm focused on high-tech start-ups. The seed financing provided is designed to take an idea from prototyping through to market launch.
	<b>Various funding initiatives</b>	Numerous financing schemes in the form of loans, capital and grants provided by the KfW SME Bank and the German Federal Ministry for Economic Affairs and Energy (BMWi).
 AU	<b>National Innovation and Science Agenda (announced 2015, to be implemented in 2016)</b>	Federal Government's National Innovation and Science Agenda recently which commits AUD\$1.1b (c.£0.5b) over the next four years to promote business-based research, development and innovation, including: <ul style="list-style-type: none"> <li>▶ Global Innovation Strategy: to improve Australia's international innovation and science collaboration with hot spots such as Silicon Valley and Tel Aviv</li> <li>▶ Easier access to crowdsourced equity funding: entrepreneurs can raise up to c.£2.7m per year via an online fundraising platform</li> <li>▶ Tax incentives for investors and entrepreneurs</li> <li>▶ An Incubator Support Programme: to support the development of incubators and accelerators in high-impact regions and sectors, and provide access to research and technical expertise</li> <li>▶ Supporting talent: measures to support talent in innovation including women in STEM</li> </ul>
	<b>FinTech Committee (announced 2015, to be implemented in 2016)</b>	Acting on the Financial Services Inquiry (2014), the government-backed group will spur innovation and collaboration between public and private bodies and ensure that regulations and policy adjust to digital transformation. The committee will also act as a point-of-contact for FinTechs to engage with government.
	<b>Innovate NSW (2013)</b>	Connects technology SMEs and businesses in key sectors of the New South Wales economy to develop globally competitive business-to-business (B2B) solutions.
	<b>The Entrepreneurs' Programme (2014)</b>	Provides practical support for businesses by accelerating product commercialisation, improving business acumen and connecting entrepreneurs with research.







	Initiative	Description
 <b>SG</b>	<b>SPRING Singapore (1996)</b>	Ministry of Trade agency responsible for nurturing start-ups, helping to grow SME business and enhancing innovation. Key initiatives include incubators and funding schemes, such as SPRING SEEDS Capital.
	<b>Infocomm Development Authority of Singapore (IDA, 1999)</b>	Actively supports the growth of innovative technology companies and start-ups to grow the infocomm industry. Includes a VC arm, Infocomm Investments.
	<b>Infocomm Investments (1996)</b>	IDA's VC arm which is responsible for the advancement and growth of the sector. It has a fund of c.£140m for the development of start-ups and further investment in the expansion stage.
	<b>The FinTech and Innovation Group (FIG), Monetary Authority of Singapore (MAS, 2015)</b>	Responsible for regulatory policies and development strategies to facilitate the use of technology and innovation, and bring together stakeholders from government and industry.
	<b>Financial Sector Technology and Innovation (FSTI) Scheme, MAS (2015)</b>	Commits SG\$225m (c.£100m) over the next five years to fund the establishment of innovation labs, institutional-level projects and industry-wide initiatives.
	<b>Various funding initiatives</b>	Numerous initiatives, including government-supported equity financing schemes, cash grants and debt financing schemes.
 <b>HK</b>	<b>FinTech Steering Group (2015)</b>	A government-sponsored steering group, with representatives from government, regulators, industry and research institutions, to identify how Hong Kong can become a FinTech hub.
	<b>Digital 21 Strategy Review (2014)</b>	Government commissioned review of HK's digital strategy to develop a new blueprint for ICT development.
	<b>StartmeupHK (2013)</b>	Government-sponsored one-stop portal for the start-up community, listing the latest events and resources, including government incentive and incubation schemes, accelerators, angels and VCs.
	<b>Injection into Innovation and Technology Fund (2015)</b>	c.£450m was injected into the existing Fund in February 2015 to support projects which contribute to innovation and technology upgrading in industry.

Figure C.2: Trade Associations – illustrative examples

	Initiative	Description
 <b>UK</b>	<b>Innovate Finance (2014)</b>	An independent, not-for-profit membership-based organisation and industry body serving the FinTech community and facilitating ecosystem growth. They charge members an annual fee to be part of the network; connecting start-ups with incumbent players, investors and entrepreneurs alike.
	<b>FinTech Circle (2014)</b>	A privately held firm, acting as a network for start-ups, investors and incumbent players; run a series of education events in the local market.
	<b>UK P2P Finance Association. (2014)</b>	Industry association of P2P lenders which aims to foster healthy growth and competition in the P2P sector through policy and regulation, ensuring members promote high standards of conduct and raise sector awareness.
	<b>R3 (2015)</b>	A Blockchain-focused consortium of thought leaders, academics and over 30 FIs focused on the R&D of the financial technology of distributed ledgers for the FS market.
 <b>CA</b>	<b>California FinTech Network (2015)</b>	A not-for-profit trade organisation for professionals, founders, executives and investors that work and invest in the FinTech sector.
 <b>NY</b>	<b>New York City Economic Development Corporation (1991)</b>	A not-for-profit organisation that provides economic development services, such as access to capital raising, mentoring and networking.
	<b>New York – Worldwide Investor Network (2011)</b>	NY-based post-seed programme, providing strategic access and hands-on support to global entrepreneurs looking to succeed in the US market.
 <b>DE</b>	<b>FinTech Forum (2013)</b>	The first hub for FinTech firms, investors and FIs in Germany, Austria, Switzerland and Central Europe.
	<b>German Start-ups Association (2014)</b>	A not-for-profit organisation designed to bring the different elements of the FinTech ecosystem together by running events, networking and lobbying on behalf of start-ups.
	<b>Berlin Technology Foundation (2014)</b>	A not-for-profit organisation helping to promote technology in Berlin, supporting tech companies to access funding, infrastructure and business networks.
	<b>FinLeap (2015)</b>	Independent forum to support entrepreneurs, by providing seed funding, talent networking and financial expertise.







	Initiative	Description
AU 	<b>FinTech Melbourne (2013)</b>	A not-for-profit FinTech community platform, which fosters connections between industry and start-ups by organising events to build sector awareness.
	<b>Sydney FinTech Meet Ups (2015)</b>	A FinTech community-based series of events and open discussion forums.
SG 	<b>Singapore FinTech Consortium (2014)</b>	A cross-industry initiative, structured as a commercial venture, designed to facilitate collaboration between all market participants and stakeholders in the FinTech eco-system.
	<b>10k (2014)</b>	A VC-backed enterprise acting as a network to connect start-ups to entrepreneurs and investors.
HK 	<b>The Bitcoin Association Hong Kong (2013)</b>	A not-for-profit group of like-minded individuals running thought leadership events and focus groups to develop the Bitcoin technology.
	<b>FinTech HK (2014)</b>	A privately held firm acting as a network for start-ups, investors and incumbent players; run a series of education events in the local market.
	<b>Hong Kong Internet Finance Council (HKIFC) (2014)</b>	A not-for-profit organisation with a mission to foster the growth and development of the internet finance industry in Hong Kong. They provide a forum for businesses to discuss best practices and industry standards.

Figure C.3: Access to privately-owned, common infrastructure – illustrative examples

	Initiative	Description
UK 	<b>Payment Systems Regulator (PSR, 2015)</b>	The PSR, a subsidiary of the FCA, was launched to ensure that payment systems operate and are developed in a way that promotes the interests of businesses and consumers, and promotes effective competition and innovation in payments.
	<b>Data.gov.uk (2009)</b>	Publicly available datasets from all central government departments, a number of public sector bodies and local authorities.
	<b>Midata (launched 2015)</b>	Allows individuals to download their current account transactional data to facilitate account switching.
	<b>Open API and Open Banking Working Group (in progress)</b>	The Government is keen to foster innovation in bank data and launched a Call for Evidence on how to deliver standardised Application Programming Interfaces (APIs) in the banking industry. A detailed framework for the design of an Open Banking Standard is currently being considered by the Open Banking Working Group.
	<b>SME Mandatory Referrals (2015)</b>	UK legislation that requires banks to refer credit-rejected SMEs to alternative finance providers.
	<b>British Business Bank (BBB) and BBB Investments (2013)</b>	State-owned economic development bank supporting SME access to finance. In April 2014, a further £100m was allocated to the BBB to be lent to companies (including FinTechs) focused on SME lending.
	<b>GOV.UK Verify programme (2015)</b>	Creates an official online identification for consumers, which over time may have an application to FinTech products and services.
CA 	<b>Strategies for Improving the US Payment System (2015)</b>	Federal Reserve strategy to enhance the speed, safety and efficiency of the US payment system through collaboration with payment stakeholders, including emerging payments firms, card networks, payment processors and FIs.
	<b>ByTheNumbers (2014)</b>	California's open data portal, specifically hosting government financial reports for California's 58 counties.
	<b>Open Data Bill - Not Passed</b>	Under the Bill, each state agency would designate a data coordinator to report to the chief data officer, who would establish a series of annual benchmarks for the amount and type of data published on the state-wide portal. While the future of the Bill is uncertain, efforts towards Open Data continue.
	<b>Statewide open data portal (pending Bill)</b>	GovOps has circulated a solicitation for small businesses to compete for a contract to develop a state-wide open data portal – pending the Open Data Bill (see above).
NY 	<b>Payments infrastructure</b>	See "Strategies for Improving the US Payment System" above.
	<b>Data.ny.gov (2009)</b>	Makes information generated by Federal Government departments and agencies readily available to the public. Initiatives that seek to liberate government data and voluntarily contributed corporate data are being actively pursued.
	<b>NYC OpenData Portal (2011)</b>	An Open Data portal providing free access to over 1,300 datasets.










	Initiative	Description
<b>DE</b> 	<b>Open Data Access Plan / G8 Open Data Charter (2013)</b>	Publicly available data that follows the open data model in the US and UK. The Government is working to continue to make identified core datasets accessible through the German open data portal by the end of 2015, many of which are only in PDF form. Currently, the site is in Beta format.
	<b>FinTS / HBCI protocol (1995)</b>	A publicly available open protocol managed by the German Bankers Association, enabling FIs and data centres to provide uniform, fast and secure services for online banking and electronic payments; supported by over 2,000 banks.
<b>AU</b> 	<b>RBA Payments System Board (PSB, 1998)</b>	The PSB governs payment systems and has taken an active interest in payment systems' innovation. In the past year, the PSB has signed a contract for the development of a New Payments Platform to facilitate real-time payments and out-of-hours payments, send more explanatory information, and send payments without having to use the full bank state branch and account number details. This is in addition to the formation of the Payments Council and Consultation Group to foster ongoing development in the payments system and facilitate dialogue between the Board and industry.
	<b>Data.gov.au (2010)</b>	Australian Government portal providing a central catalogue to access public data.
	<b>Open Data 500</b>	A government study of Australian companies and non-governmental organisations (NGOs), in collaboration with New York University's GovLab, intended to guide the Government in its effort to add further datasets to its open data portal. The objective is to foster dialogue between the Government and businesses on how government data can be made more useful.
	<b>Digital Transformation Office (2015)</b>	The Office will work with government and the private sector to develop a digital identity framework to support the Government's Digital Transformation Agenda, which looks to boost innovation and government service virtualisation.
<b>SG</b> 	<b>Monetary Authority Singapore (MAS) (1971)</b>	MAS oversees the payments system and has been proactive in enhancing systems in the past, specifically around Immediate Payments. In addition, MAS has recently suggested keeping an open approach to create an open banking platform via APIs to foster FinTech innovation with start-ups.
	<b>Data.gov.sg (2011)</b>	The Singapore Government information portal provides access to more than 8,000 datasets. Since 2011, more than 130 apps have been created with such data.
	<b>OneMap (2010)</b>	The Government's one-stop, geospatial data sharing platform with more than 60 map themes available. Includes a population query service.
	<b>Smart Nation Platform (in progress)</b>	Infocomm Development Authority (IDA)-driven initiatives to enable greater pervasive connectivity, better situational awareness through data collection and efficient sharing of collected sensor data. This will provide businesses with rich and useful datasets to improve their operations and enable innovation.
<b>HK</b> 	<b>Data.gov.hk (2011)</b>	The Government data portal making all PSI available in a digital format to download for free. The portal was revamped in 2015 to provide greater capacity, flexibility and additional functions. The Government encourages the community to use the PSI to develop creative web and mobile apps.

Figure C.4: Best practice – Government programmes to attract foreign FinTechs to the local market

<b>UK</b> 	<b>FinTech initiatives, UKTI (2014):</b> roadshows in numerous countries (including Singapore, Hong Kong and Australia) to attract foreign FinTechs and provide relocation and growth support.	<b>HK</b> 	<b>InvestHK (2000):</b> department of the Hong Kong Special Administrative Region responsible for supporting foreign FinTechs to build their presence in Hong Kong, with FinTech recognised as a target market.
	<b>Global Entrepreneur Programme, UKTI (2014):</b> assists overseas entrepreneurs and early-stage tech businesses or start-ups that want to relocate their business to the UK.		<b>StartmeupHK (2013):</b> initiative to promote Hong Kong to foreign start-ups through events such as FinTech Finals 2016 (a competition for FinTechs throughout Asia).
<b>DE</b> 	<b>BMW Start-up portal:</b> advice and information, including business registration, tax and legal services and a public authority guide for businesses setting up in Germany.		

See figure C.5 for further examples

Figure C.5: Government programmes to attract foreign FinTechs – illustrative examples








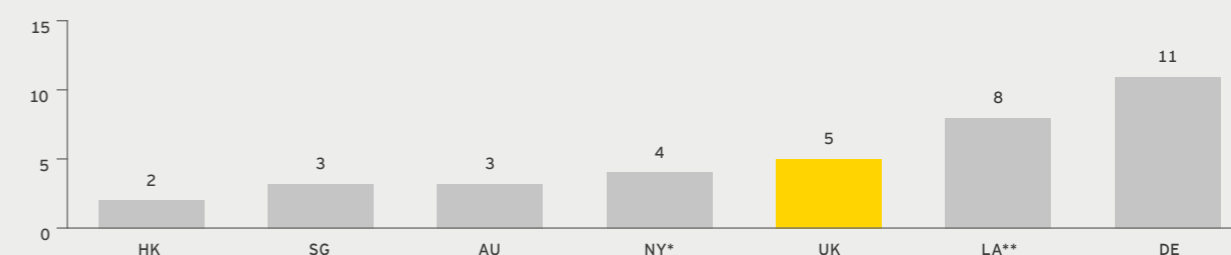
	Initiative	Description
UK 	<b>FinTech initiatives, UKTI (2014)</b>	UKTI roadshows in a number of countries (including Singapore, Hong Kong and Australia) to attract foreign FinTechs to the UK and provide relocation and growth support.
	<b>Global Entrepreneur Programme, UKTI (2014)</b>	Comprehensive assistance to overseas entrepreneurs and early-stage tech businesses or start-ups that want to relocate their business to the UK.
	<b>HQ – UK (2015)</b>	Programme operated by UK Government and Tech City UK to showcase why foreign digital companies should set up their headquarters in the UK.
	<b>Tech Nation (2015)</b>	A report and online interactive tool for businesses wanting to learn more about the UK ecosystem. Analyses the clusters and capabilities empowering the UK digital economy.
CA 		Limited government initiatives aside from tax-related initiatives designed to attract businesses to California.
NY 		Limited government initiatives aside from tax-related initiatives designed to attract businesses to New York.
DE 	<b>BMW Start-up portal</b>	Advice and information, including business registration, tax and legal services and a public authority guide for businesses setting up in Germany.
AU 		Limited government initiatives.
SG 	<b>Infocomm Investments' London launch (2014)</b>	IDA's VC arm launched in London to better access European tech start-ups and strengthen links between both markets. The investment fund is also now open to US and Israeli start-ups.
HK 	<b>InvestHK (2000)</b>	Department of the Hong Kong Special Administrative Region responsible for supporting foreign FinTechs to build their presence in Hong Kong, with FinTech recognised as a target market.
	<b>StartmeupHK (2013)</b>	Initiative to promote Hong Kong to foreign start-ups through events such as FinTech Finals 2016 (a competition for FinTechs throughout Asia).

Figure C.6: International government programmes to cut red tape

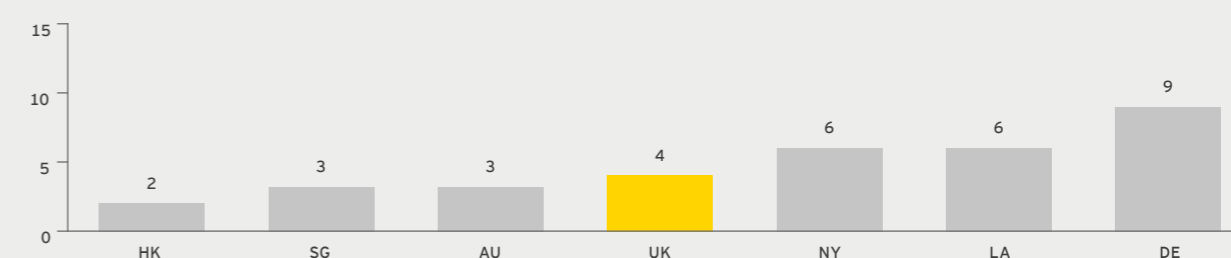
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|--|---|--|
| <p><b>UK</b></p> <ul style="list-style-type: none"> <li>▶ A review of the UK's AML regime started in September 2015 as a part of the "Cutting Red Tape" programme launched by the Better Regulation Executive.</li> <li>▶ The objective is to ensure that regulation does not limit productivity by holding back businesses. This is in response to complaints of the rising costs of AML compliance.</li> </ul> | <p><b>Germany</b></p> <ul style="list-style-type: none"> <li>▶ "Grenzoffensive", an award winning cross border initiative for SMEs (with Austria and Czech Republic, which aims to minimise or remove obstacles faced by businesses looking to expand their activities to neighbouring regions</li> </ul> | <p><b>Estonia</b></p> <ul style="list-style-type: none"> <li>▶ A government drive to become an e-government and reduce red tape including a Digital Signature Act, which allows for a company to be set up online in 15 minutes</li> </ul> |
|--|---|--|

Figure C.7: Days to start a business (Number, 2015)



Source: World Bank Group (2015)  
 \*NY in this instance refers to New York City  
 \*\*LA refers to Los Angeles

Figure C.8: Procedures to start a business (Number, 2015)



Source: World Bank Group (2015)

Figure C.9: Challenges to setting up a business bank account

There are two key business banking challenges faced by FinTechs:

1. The outlook for setting up a bank account
2. The time and complexity in setting up the account (should an account be attainable)

**1. The outlook for setting up a bank account**

Getting access to a business bank account can be a challenge for:

- FinTechs in certain subsectors, particularly online lending and cryptocurrency (e.g., Bitcoin), based on heightened KYC and AML risks attached to these subsectors and their customers.
- FinTechs that have directors who are foreign nationals and whose identity and credit history is harder to verify.

This was cited by interviewees in the UK, although research indicates that difficulties are global (and more pronounced where KYC and AML thresholds are higher).

One payments-focused UK FinTech commented that “the UK Government should think about what it wants to do with Bitcoin, and what role it wants the UK to have in this space – because right now it can be really challenging for any of those players to even get a bank account, let alone a bank relationship” FinTech, UK.

**2. The time and complexity required to set up the account (should an account be attainable)**

In the UK, it can take up to 10 working days to set up a small business bank account with a leading bank. The process is longer and more complex for businesses that require greater KYC and AML checks.

US banks perform similar to the UK with respect to the speed and complexity of processes, with KYC and AML frameworks similar in both countries.




Despite its position as the easiest region in which to set up a business, Hong Kong’s banking KYC and ID requirements have been tightened, making it one of the more difficult environments in which to set up a bank account. In contrast, business banking conditions in Singapore are more favourable.

Figure C.10: Best practice – government programmes to improve cybersecurity

<p><b>UK</b></p> <p></p> <p><b>UK Cyber Security Strategy (2011):</b> Government guidelines and objectives to strengthen business and community cyber defence</p> <p><b>National Cyber Security Programme and Centre (2015):</b> £1.9b of spending by 2020 to create a national cybersecurity centre and recruit additional intelligence staff</p> <p><b>Cyber Security Innovation Vouchers Scheme (2015):</b> offers SMEs £5,000 to boost their security, overseen by Innovate UK</p> <p><b>Cyber Information Sharing Partnership (CiSP) (2013):</b> permits organisations to share threat information which is then analysed and provided, with advice, to the CiSP community</p>	<p><b>US</b></p> <p></p> <p><b>California Cybersecurity Taskforce (2013):</b> an advice bureau comprising government, industry, academia and legal representatives aiming to reduce cyber risk exposure</p> <p><b>US International Strategy for Cyberspace (2011):</b> federal strategy to promote a secure and reliable communications infrastructure internationally</p> <p><b>New York Cybersecurity Examination Process (2015):</b> focused on cyber attack prevention and detection measures at banks</p>
<p><b>AU</b></p> <p></p> <p><b>Cyber Security Strategy (2009):</b> Government policy to ensure secure ICT measures at all businesses to protect operations and customer privacy</p> <p><b>Cyber Security Growth Centre (2016):</b> a national innovation network combining industry, research and government experts, in addition to a hub created to facilitate collaboration and information sharing</p>	<p><b>DE</b></p> <p></p> <p><b>National Cyber Security Council (2011):</b> a public body which facilitates coordination between the public and private sector on preventative cybersecurity tools</p> <p><b>National Cyber Response Centre (2011):</b> established to protect state IT systems and provide assistance to private firms</p>

See figure C.11 for further examples

Figure C.11: Government programmes to improve cybersecurity – illustrative examples

	Initiative	Description
<p><b>UK</b></p> <p></p>	<p><b>UK Cyber Security Strategy (2011)</b></p> <p>Sets out the Government’s vision for cyberspace, including objectives to increase business and community resilience to cyber attacks.</p> <hr/> <p><b>National Cyber Security Programme (2015)</b></p> <p>Government initiative to increase spending on cybersecurity (£1.9b by 2020), recruit additional intelligence staff and establish a National Cyber Centre. The UK Government Communications Headquarters (GCHQ) is investing £3b over the next nine years to develop cyber intelligence.</p> <hr/> <p><b>Cyber Security Innovation Vouchers Scheme (2015)</b></p> <p>Offers SMEs up to £5,000 for specialist advice to boost their cybersecurity, and is overseen by experts and Innovate UK.</p> <hr/> <p><b>CiSP (2013)</b></p> <p>Permits organisations to share threat information which is then analysed and provided, with advice, to the CiSP community.</p> <hr/> <p><b>Cyber Essentials Accreditation Scheme (2014)</b></p> <p>A joint industry government scheme setting out clear, basic standards for cybersecurity to provide defense against the most common forms of attack. It enables organisations to demonstrate their cyber resilience and may encourage consumer confidence in accredited businesses.</p> <hr/> <p><b>Cyber Streetwise (2014)</b></p> <p>A campaign intended to improve cybersecurity among the public and SMEs.</p>	
<p><b>CA</b></p> <p></p>	<p><b>California Information Security Office</b></p> <p>The US has best-in-class technical measures for cyber emergency response and education (ITU Global Cybersecurity Index 2014).</p> <hr/> <p>The state authority responsible for ensuring the integrity of state systems and applications and the protection of state information. Sponsors various cybersecurity awareness and risk management initiatives for industry and communities.</p> <hr/> <p><b>California Cybersecurity Taskforce (2013)</b></p> <p>State-wide government-sponsored partnership comprising representatives from government, industry, academia and law enforcement to advise the state on cybersecurity matters.</p> <hr/> <p><b>California Cyber Strategy (2015, proposed)</b></p> <p>Being drafted by the Taskforce with the aim to create a stronger environment for collaboration and awareness and reduce cyber risk exposure.</p>	
<p><b>NY</b></p> <p></p>	<p><b>Enterprise Information Security Office (EISO)</b></p> <p>The state authority responsible for protecting the State Government’s cybersecurity infrastructure and providing state-wide standards, programmes and education relating to cybersecurity for industry and communities.</p> <hr/> <p><b>US International Strategy for Cyberspace (2011)</b></p> <p>Sets out the Government’s vision to work internationally to promote secure and reliable information and communication infrastructure, that will foster innovation.</p> <hr/> <p><b>Cybersecurity Examination Process (2015)</b></p> <p>The New York Department of FS launched a series of bank inquiries on the safeguards and processes banks have in place to prevent, detect and report cyber attacks.</p>	









	Initiative	Description
DE 	<b>Cyber Security Strategy (2011)</b>	A Federal strategy intended to improve the cybersecurity framework, focusing on civilian approaches and measures.
	<b>National Cyber Response Centre (2011)</b>	A government centre, which reports to the Federal Office of Information Security, established to protect the state IT systems and assist private firms.
	<b>National Cyber Security Council (2011)</b>	A public body established to facilitate cooperation with the private sector, comprising representatives from government, industry and academia, intended to coordinate preventive tools and interdisciplinary cybersecurity.
AU 	<b>Cyber Security Growth Centre (proposed, 2016)</b>	Announced as part of the National Innovation and Science Agenda, the Centre will be led by a board of eminent industry experts and bring together industry, research and government to create a national cybersecurity innovation network.
	<b>Cyber Security Strategy (2009)</b>	Whole-of-government cybersecurity policy, with the objective of ensuring that all businesses operate secure ICT to protect their operations and the privacy of their customers.
	<b>Australian Cyber Security Centre (ACSC, 2014)</b>	Brings together cybersecurity capabilities from various government departments and the University of New South Wales, to create a hub for collaboration and information sharing between government, academia and industry.
	<b>Cyber Security Review (underway)</b>	Government review of national cyber policies and strategies.
SG 	<b>National Cyber Security Masterplan 2018 (2013)</b>	A new five-year plan that aims to enhance security and infrastructure resilience, promote adoption of security measures and grow the pool of infocomm security experts to make Singapore a "Trusted and Robust Hub".
	<b>The Cyber Security Agency of Singapore (2015)</b>	Governmental body overseeing cybersecurity strategy, education and outreach, and industry development including prevention, monitoring and response capability.
	<b>Industry Initiative</b>	FIs have also established Cyber Security Operations Centres to enhance their cyber surveillance and intelligence.
HK 	<b>Cyber Security Information Portal (2015)</b>	Government-supported site providing guidelines and tools for general users, SMEs and schools to guard against cyber attacks.
	<b>Baseline IT Security Policy (2012)</b>	Hong Kong has a general IT Security Policy which includes a section on internet security and internet gateways.

Figure C.12: Tax related initiatives – illustrative examples

	Initiative	Description
UK 	<b>Enterprise Investment Scheme (EIS, 1994)</b>	Supports smaller high-risk trading companies to raise finance by offering a range of tax reliefs to investors who purchase new shares in those companies.
	<b>Seed Enterprise Investment Scheme (SEIS, 2012)</b>	Supports investment in start-up projects by providing tax relief to individuals who invest in these projects that they may otherwise view as too risky.
	<b>Venture Capital Trusts (VCT) Scheme (1995)</b>	Tax relief for investors in VCTs. VCTs subscribe to shares in, or lend money to, small unquoted companies. The initiative was recently reviewed to provide further support to "knowledge-intensive" companies.
	<b>Entrepreneurs Relief (2008)</b>	Capital gains tax relief offered to entrepreneurs when they sell all or part of their business or business assets.
	<b>Research and Development Tax Credits (2002)</b>	Provides company tax relief based on a company's R&D expenditure.
	<b>P2P bad debt relief (proposed)</b>	Government proposal to offset losses on bad P2P loans against total taxable income from P2P lending.
	<b>IFISA (2016)</b>	An initiative to make P2P loans an eligible ISA investment.
CA 	<b>The Research and Development Tax Credit</b>	Provides a credit of up to 13% of eligible spending for new and improved products and processes including those that are technological in nature.
	<b>CA Competes Tax Credit (2014)</b>	An income tax credit available to selected businesses that want to come to, or stay and grow in, California. Selection is based on multiple economic development and strategic importance criteria.
NY 	<b>Qualified Emerging Technology Company Incentives (2005)</b>	Offers three types of tax credits for qualifying emergent tech companies: an employment credit; a credit for certain facilities, operations and employee training; and a capital tax credit for investors in these companies.
	<b>Excelsior Jobs Programme (2010)</b>	Provides tax credits for businesses in targeted industries including FS and software development. Applications can be made through the Consolidated Funding Application (CFA).
	<b>START-UP NY (2013)</b>	A broad tax exclusion programme that allows start-ups planning to relocate to, or expand in, New York to operate tax-free for ten years on or near eligible university campuses.
DE 		Germany offers limited tax incentives, reflecting the constitutional requirement for equal treatment of all taxpayers.
		Tax regimes are complicated by fragmentation between Federal and State powers.

# D. Demand




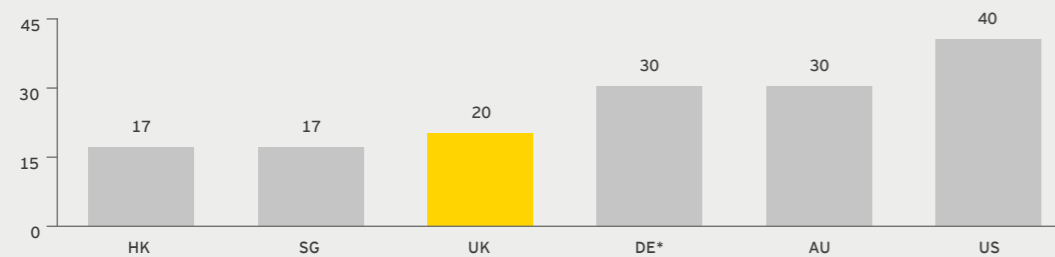
	Initiative	Description
<b>AU</b> 	<b>Tax incentives announced as part of the National Innovation and Science Agenda (proposed for 2016)</b>	<p>A number of tax-related initiatives were announced as part of National Innovation and Science Agenda for 2016, including:</p> <ul style="list-style-type: none"> <li>▶ Tax incentives for investors: a concessional tax treatment for investors who support innovative start-ups including a 20% non-refundable tax offset based on the amount of investment (capped) and a ten-year capital gains tax exemption for investments held for three years.</li> <li>▶ Changes to the tax treatment of Venture Capital Limited Partnerships and Early Stage Venture Capital Limited Partnerships (VCLPs and ESVCLPs): partners will receive a 10% non-refundable tax offset on capital invested in a start-up; relaxed eligibility and investment requirement will allow a broader range of investment activity.</li> <li>▶ Increasing access to company losses: more flexibility for businesses to access prior year losses when they make minor changes to their operations to encourage loss-making companies to seek new opportunities to return to profitability.</li> </ul>
	<b>R&amp;D tax incentive (2011)</b>	Provides a tax offset for eligible R&D activities (45% refundable tax credit for companies with under £11m turnover).
<b>SG</b> 	<b>Productivity and Innovation Credit (PIC) Scheme (2010)</b>	A tax benefit scheme to encourage companies to engage in innovative and productive activities, including R&D, software and design activities.
	<b>Tax Exemption for Start-ups</b>	<p>Start-ups that meet certain qualifying criteria are offered a full tax exemption on a certain amount of their taxable income for the first three years.</p> <p>In addition to these initiatives, there are various industry-specific tax incentives for Singapore-based SMEs.</p>
<b>HK</b> 	<b>Extension of profit tax exemptions to offshore PE funds (2015)</b>	The Government has tabled proposals to extend the exemption previously available to offshore funds to PE funds, with the aim of boosting PE investment in key sectors.

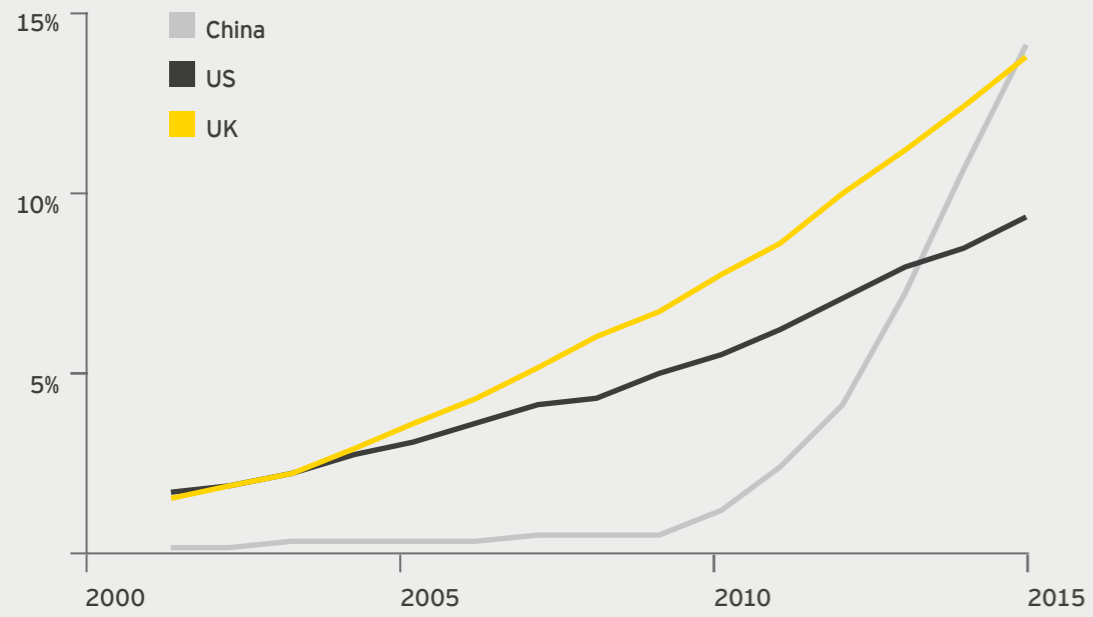
Figure C.13: Corporate taxation rate (Maximum, %)



Source: Worldwide Corporate Tax Guide 2015, EY

\*The overall corporate tax rate for corporations in Germany is just below 30%. This includes the corporate tax rate at 15%, solidarity charge at a rate of 0.825% and the average rate of local trade tax (which generally varies between 7% and 17.15%)

Figure D.1: Proportion of retail sales conducted online



Source: Euromonitor

# E. Interview programme: acknowledgements

# Interview programme: acknowledgments

We would like to offer our sincere thanks to the following interviewed participants for this report:

**United Kingdom** 

- Adyen
- Algomi
- Azimo
- Aviva Ventures
- Barclays Accelerator
- Bought By Many
- Currency Cloud
- DueDil
- Financial Conduct Authority
- Funding Circle
- GoCardless
- Index Ventures
- Innovate Finance
- iwoca
- Lifescale
- London Stock Exchange Group
- Nutmeg
- Passion Capital
- Startupbootcamp
- TransferWise
- Tandem

**Singapore** 

- CoinHako
- fastacash
- MatchMove Pay
- Metsitis
- Next Bank
- Singapore FinTech Consortium

**United States** 

- Bain Capital
- Betterment
- Core Innovation Capital
- Digital Asset
- OnDeck
- Plug and Play
- SigFig
- SixThirty
- Ribbit Capital
- RIMES
- Wells Fargo Digital Innovation Labs

**Hong Kong** 

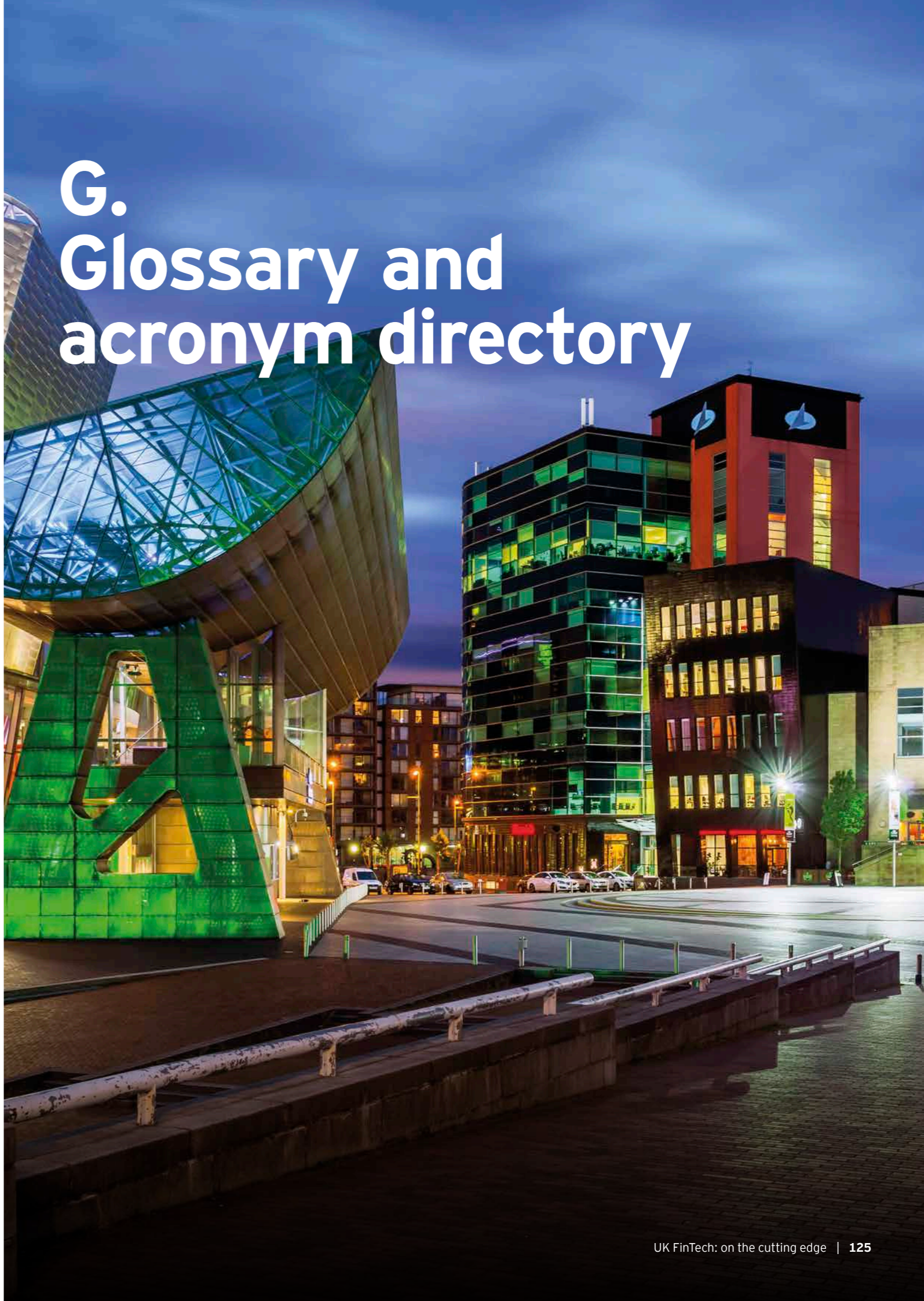
- Advanced Merchant Payments
- Bitquant Research Laboratories
- DBS Accelerator
- FinTech Hong Kong
- Grow Advisors
- Hong Kong Internet Finance Council
- Lattice
- Monexo
- PaynPaid

**Germany** 

- auxmoney
- BANCALIS
- DvH Ventures
- FinLeap
- FinTech Forum
- HV Holtzbrinck Ventures
- Kreditech
- Lendstar
- moneymeets

**Australia** 

- Adventure Capital
- DragonBill
- FinTech Melbourne
- MAP (Melbourne Accelerator Programme)
- MoneyPlace
- Moula
- OzForex
- RateSetter
- SelfWealth
- SocietyOne
- Timelio
- Tyro FinTech Hub
- York Butter Factory



# G. Glossary and acronym directory

# Glossary and acronym directory

Term	Definition
Accelerator	Provides similar services to incubators, however at an accelerated rate pushing quick development. Usually as part of a defined length programme; typically providing an equity stake arrangement
AIM	Alternative Investment Market (UK)
AML	Anti-Money Laundering
API	Application programming interfaces
APRA	Australian Prudential Regulation Authority
ASIC	Australian Securities and Investments Commission
AU	Australia
AUD	Australian Dollar
ASX	Australian Securities Exchange
B2B	Business to business
B2B2C	Business to business to consumer
B2C	Business to consumer
BACS	Bankers Automated Clearing Services (UK)
BaFin	Federal Financial Supervisory Authority, financial regulatory authority of Germany
Barclays Digital Eagles	A coding app launched by Barclays aimed at children to teach them the basics of coding
BIS	UK Department for Business, Innovation and Skills
BBB	British Business Bank (UK)
BBI	Business Banking Index
Blockchain	A public or private (typically permission-less) distributed ledger, built as a collections of "blocks" or nodes, that enables the transfer of information between themselves, via a "transaction"
Business angel	An affluent individual who provides capital for business start-ups
c.	Circa meaning approximately
CA	California
CAGR	Compound annual growth rate
CBA	Commonwealth Bank of Australia
CB Insights	CB Insights is a venture capital database and angel investment database that provides daily real-time information about venture capital and angel investor-backed start-ups
CBRC	China Banking Regulatory Commission
CFA	Consolidated Funding Application (NY)
CISP	Cyber Information Sharing Partnership (UK)
CM	Capital markets
CMU	Capital Markets Union (EU)
CodeBase	Reference to the source code that is used to build software
CREST	Certificate-less Registry for Electronic Share Transfer (UK)
Crowdfunding	A method to raise capital through a large number of investors each investing small amounts of money. Often performed via the internet

Term	Definition
Cryptocurrency	Currency in a digital form that is independent of banks and makes use of encryption to regulate and transfer funds
CVV	Corporate venture vehicle
Cybersecurity	The systems to protect software, hardware and information of IT systems
D2C	Direct to consumer
DBAG	Deutsche Börse AG, the operating company for the German cash and derivatives markets comprising four subsidiaries: Deutsche Börse Clearing AG, Deutsche Börse Systems AG, Frankfurter Wertpapierbörse (FWB), and the derivatives market, EUREX Deutschland (formerly the Deutsche Terminbörse)
DE	Germany
Direct bank	A bank that operates solely online and has no branch network
e-Banking	Banking that is performed by the customer electronically and using the internet
e-government	Electronic government - digital interaction between government and others (e.g., individuals, businesses)
EIS	Enterprise Investment Scheme (UK)
ER	Entrepreneurs Relief
ESMT	European School of Management and Technology
ESVCLP	Early Stage Venture Capital Limited Partnership (AU)
EU	European Union
FCA	Financial Conduct Authority (UK)
FI	Financial institution
FinTech	Financial Technology – organisations combining innovative business models and technology to enable, enhance and disrupt FS
FinTech ecosystem	The overall environment for the FinTech sector within a specific region – the strength of which is highly influenced by four core Attributes including talent, capital, policy, and demand
FinTS	Financial Transaction Services
FS	Financial services
FSI	Financial Systems Inquiry (AU)
FSTI	Financial Sector Technology & Innovation Scheme (SG)
FTIG	FinTech & Innovation Group (SG)
HBCI	Home Banking Computer Interface
HK	Hong Kong, represents Hong Kong Special Administrative Region (HKSAR)
HKD	Hong Kong Dollar
HKEx	Hong Kong Exchanges and Clearing Limited
HMRC	HM Revenue and Customs (UK)
HQ	Headquarters
HS2	High Speed Two – UK's new high speed rail network
ICT	Information Communication Technology



# Glossary and acronym directory

Term	Definition
IDA	Infocomm Development Authority of Singapore
IDF	Israeli Defence Force
IFISA	Innovative Finance ISA (UK)
IM	Investment management sector
Incubator	Provide aid and services to start-up businesses e.g., training and office space
Innovate Finance	UK-based FinTech industry body
IPO	Initial Public Offering
ISA	Individuals savings account (UK)
IT	Information Technology
ITTP	IT training programme
KPI	Key Performance Indicator
KYC	Know Your Customer
Level 39	Based in London, this is the largest technology accelerator in Europe
LSE	London Stock Exchange
LSEG	London Stock Exchange Group
MAS	Monetary Authority of Singapore
m-commerce	Mobile commerce – use of wireless handheld devices to buy or sell goods
Merchant finance	Financial institution that provides companies with capital in shares rather than in loans
MIFID	The “Markets in Financial Instruments Directive” is an EU legislation regulating firms providing services to clients linked to “financial instruments” (shares, bonds, units in collective investment schemes and derivatives) and the venues where those instruments are traded
NASDAQ	National Association of Securities Dealers Automated Quotations (US)
NGO	Non-Government Organisation
Northern Powerhouse	Government initiative to boost economic growth in the north of England
NRF	National Research Foundation (SG)
NY	New York
NY AMEX	American Stock Exchange situated in New York and the former name of the New York Stock Exchange (NYSE)
NYSE	New York Stock Exchange
OGCIO	Office of the Government Chief Information Officer (HK)
P2P	Peer-to-peer
PAYG	Pay As You Go
PE	Private Equity
PIN	Personal Identity Number
Pre-seed capital	Investors who will invest money with a smart individual with an idea before the company has started
PSB	Payment Systems Board (AU)

Term	Definition
PSD II	Revised Payments Services Directive - European legislation to provide the legal foundation for the creation of an EU-wide single market for payments (EU)
PSI	Public Sector Information
PSR	Payment Systems Regulator (UK)
R&D	Research and Development
RegTech	Regulatory technology
Regulatory Sandbox	Allows innovative companies the opportunity to test products without immediately incurring the usual regulatory consequences
SEIS	Seed Enterprise Investment Scheme (UK)
SG	Singapore
SGD	Singapore Dollar
SGX	Singapore Exchange Limited
Silicon roundabout	Area in London where there is a high concentration of technology start-ups
SME	Small and medium-sized enterprises
SSE	Shanghai Stock Exchange
STEM	Science, Technology, Engineering and Mathematics
STEMNET	Science, Technology, Engineering and Mathematics Network
SZSE	Shenzhen Stock Exchange
TIS	Technology Incubation Scheme (SG)
UCL	University College London
UK	United Kingdom
UKTI	United Kingdom Trade and Investments
Unicorn	A very large start-up business that has exceeded a certain valuation (US\$1b)
US	United States
USD	US Dollar
VC	Venture Capital
YouGov UK	International internet-based market research firm, headquartered in the UK

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