



# Small Business Equity Tracker 2023

# Contents

---

Foreword	3
Executive Summary	6
Introduction	11
Chapter 1: Recent Trends in SME Equity Finance	13
Chapter 2: British Business Bank Activity	37
Chapter 3: UK Strengths & Opportunities in Breakthrough Technologies	52
Appendix: Overview of Beauhurst announced deal data	76
Endnotes	79

---

# Foreword

This is the Bank's ninth annual Equity Tracker report, exploring recent trends in equity finance for smaller businesses in the UK.



Our Small Business Equity Tracker, now in its ninth year, provides a comprehensive assessment of the equity finance market for smaller businesses over the last year. This research helps us monitor the latest trends in equity finance and identify areas of the market that could function more effectively. This year's report also provides an analysis of which technology sectors represent key strengths and opportunities for the UK, aligning with the Bank's strategic objective – Backing Innovation – to ensure innovative businesses can access the right capital to start and scale.

There is no doubt that 2022 was a year of two distinct halves for the UK equity finance market. Following record levels of investment during Q1 and Q2, concerns about potential over-valuations and a lack of exit opportunities, as well as rising inflation and interest rates, led to a 47% reduction in equity finance comparing the first and second halves of the year. As fund managers have reduced their activity to compensate for rapid capital deployment over the previous eighteen months, there are signs that businesses are now finding it increasingly difficult to raise the finance they need to fund their growth.

As has been the case in other leading markets across the world, this downturn has continued into the first quarter of 2023. A total of £2.2bn was raised by UK smaller businesses in 2023 Q1, a drop of 28% compared with the last quarter of 2022. The Bank's role in supporting smaller businesses is of particular importance during more challenging market conditions, and we will continue to monitor equity market conditions carefully as they develop.

Despite these overall trends in equity finance, looking ahead there are still positive signs in certain areas of the market. University spinouts raised a record £2bn of investment in 2022, and the deals they secured were a third larger on average than those across the wider market – highlighting the role of universities in creating high growth, innovative companies. Continuing with the technology theme, investment in cleantech companies rose by over 50% to £0.9bn in 2022. Given the Bank’s objective to support the UK’s transition to net zero, it is encouraging to see resilience in such an important long-term industry.

This year’s Small Business Equity Tracker also takes a deeper dive into the UK’s strengths in financing technology sectors through the venture capital ecosystem. Drawing upon its world class research base, life sciences is a leading example of a sector that has reached significant scale in the UK over the past decade. More than £10.5bn was raised by UK life sciences companies during 2020-22, more than Germany, France and Canada combined. However, the UK market also requires more late stage and specialist capital to close

the gap with the global leaders, which the Bank is providing through its commercial subsidiary, British Patent Capital, and its targeted Life Sciences Investment Programme.

As well as building upon existing strengths, to realise the government’s ambition to become a science superpower the UK also needs to invest in companies developing the technologies of the future. For example, the UK is outpacing global growth in nanotechnology, a cross-cutting technology which enables a range of other deeptech sectors. It is also the third largest venture capital market in the world in this technology area, with a market share of 13% of global investment between 2020 and 2022. There is a real opportunity for the UK to capitalise on this position and become a genuine world leader in this breakthrough technology.

Since its inception the Bank has been a key provider and enabler of equity finance as an important means of supporting innovative companies. Through programmes such as Future Fund: Breakthrough, we will continue to support later stage R&D intensive companies across a wide range of deeptech sectors.

As the government’s centre of expertise on smaller business finance, this research helps us to provide policy makers, the finance industry and smaller businesses with a trusted source of information on how the market is performing. I hope you find this year’s Small Business Equity Tracker informative.

**Louis Taylor**  
**CEO, British Business Bank**

# Executive Summary

UK SME equity finance declined in 2022, following a market downturn in the second half of the year which has continued into 2023. Bright spots remain in certain areas of the market, including finance for university spinouts and future technology opportunities.

## Key Findings



### 1. UK SME equity finance declined by 11% to £16.7bn in 2022, driven by a downturn in market conditions in the second half of the year which has continued into 2023

Full year data for 2022 reveals that it was a year of two halves for the UK SME equity finance market. Businesses received a record level of investment over the first two quarters, with company valuations rising sharply particularly in the tech sector. However, concerns about potential over-valuations and a more challenging exit environment, as well as rising inflation and interest rates, led to a 47% decline in equity finance during the second half of the year. This downturn reflects VC fund managers slowing their investment activity and taking more time to focus more on business fundamentals, to compensate for their rapid capital deployment in previous months.

As has been the case in the US and other European countries, this decline in equity finance has been driven by the later stages of the market. Growth stage investment fell by 25% to £8.2bn in 2022, and was 54% lower comparing the first and second halves of the year. A key reason for this has been the lack of exit opportunities via trade sales or public listings, causing investors to avoid larger deals in an attempt to preserve their capital.

The overall market downturn has continued into the first three months of 2023, during which £2.2bn was raised by UK SMEs – a 28% drop in investment compared with the last quarter of 2022. Recent VC fund manager surveys indicate at least a moderate decrease in VC funding in leading markets over the next year, further indicating that the market is returning to levels of equity finance seen in 2020. While it is too early to tell how long the decline in activity will continue, in comparison to previous downturns the UK now has a broader, deeper equity finance market that will support its future recovery.



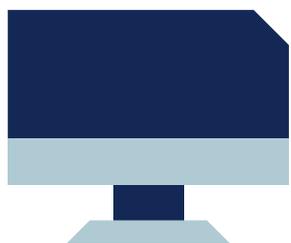
### 2. Looking ahead there are still some bright spots in specific areas of the market, including record investment in university spinouts and the cleantech sector

University spinouts raised £2bn of equity finance in 2022. This was the highest amount on record and accounted for 12% of total UK investment during the year. Deals received by these companies were also 33% larger on average than across the wider market, demonstrating the role of universities in creating high growth, innovative companies in the UK.

Female founded companies continued to receive a higher share of equity deals than in previous years. All female founded companies accounted for 9% of deals in 2022, up from 6% in 2021, while businesses with at least one female founder received 27% of deals – the highest proportion on record. However, female founders continue to receive a relatively small share of total investment.

The 2% share of deal value received by all female founded teams in 2022 represents no improvement over the past decade.

Certain sectors still experienced investment growth during the year, despite the decline in overall SME equity finance. The cleantech sector in particular bucked the trend of the wider market, with equity investment in this area increasing by over 50% to £0.9bn. In chapter three the report takes a more in-depth look at breakthrough technology sectors that could represent future opportunities for the UK VC ecosystem.



### **3. While the Bank's overall share of equity finance has fallen slightly in 2022, it remains more likely to invest in tech companies and university spinouts than the wider market**

The Bank's equity programmes supported around 13% of all equity deals and 15% of total investment between 2020 and 2022. This represented a slight decrease when

compared with the 2019-21 period, during which the Bank's shares were 14% and 19%, respectively. This decline was driven by the growth stage of the market, in which there were some large investments during the first half of 2022 without involvement from the Bank. Over the longer term the Bank's share of equity deals and investment has still increased from 9% and 13% respectively in 2016-18.

Funds supported by the Bank remain more likely to invest in technology/IP-based businesses than the overall equity market. During 2020-22, 48% of Bank-supported equity deals were in this sector, compared to 42% of the wider market. From a regional perspective this focus on tech investment, led by later stage equity programmes such as BPC, is one of the reasons why the Bank has a larger proportion of its deals in London (50%) than the wider equity market (48%).

The activity of the Bank's regional programmes, including the Northern Powerhouse Investment Fund, the Midlands Engine Investment Fund and the Cornwall and Isles of Scilly Investment Fund, is also highlighted through its higher concentration of deals in the North West, the Midlands and the South West, compared to the wider market.

The Bank's equity programmes play an important role in funding academic spinouts. These innovative companies accounted for 12% of Bank-supported equity deals during 2020-22 (compared to 9% across the wider market), with investment mainly coming from British Patient Capital, the Regional Angels Programme and the Managed Funds programme. Finally, an increased proportion of Bank-supported deals are financing diverse teams – over a quarter (26%) of deals between 2020-22 went to a company with at least one female founder.

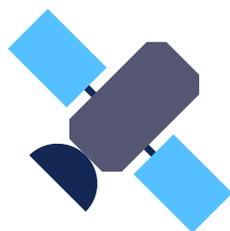


### **4. The UK has scaled a number of technology sectors through its VC ecosystem, with Life Sciences a leading deeptech example**

FinTech, Software, Life Sciences and AI all stand out as areas where the UK specialises and is globally competitive in attracting VC investment. Life Sciences in particular is a sector the UK has scaled through its VC ecosystem, building on a strong R&D base, to become one of the UK's largest deeptech verticals.

The UK has two of the top five universities globally for Life Sciences, and ranks first among leading VC markets for the quality of its research in the field. This R&D capability has flowed through into significant VC finance over the past decade – over £10.5bn was raised by UK Life Sciences companies during 2020-22, more than Germany, France and Canada combined.

The industry also has large and fast growing sub-sectors in Therapeutics and Digital Health. However, a gap remains with the US as the leading global market, and the UK requires late stage and specialist capital in order to address this – which Future Fund: Breakthrough and the Life Sciences Investment Programme aim to provide.



### **5. Looking at future opportunities, the UK can capitalise on its leading position in Nanotechnology**

Nanotechnology is a cross-cutting enabling technology which is finding applications across a range of traditional industries and deeptech sectors – from advanced

materials, to semiconductors, to drug delivery, to renewable energy systems. As a result of this technological development, global VC investment growth in the sector is high, at over 130% comparing 2020-22 with 2017-19, yet the UK is outpacing this growth with an increase in funding of over 220% across the same period.

Although companies in this industry may typically be viewed through their applications (e.g. as healthcare or cleantech businesses), there are around 100 active start-ups in the UK specifically developing nanotechnology propositions. These companies are now receiving record levels of investment, with £0.75bn raised between 2020 and 2022 across 172 deals.

The UK has maintained a high global market share in nanotechnology over the past ten years. The UK is comfortably the third largest market in the world, accounting for 13% of VC investment in 2020-22, and raising more than France, Germany, Canada, Japan, Israel and Sweden combined during this period. There is therefore an opportunity for the UK to capitalise on its current position and become a genuine global leader in this enabling deeptech sector.

The Space Technology industry is entering a new era of commercial innovation. Lower costs and the use of other enabling technologies, such as AI, is facilitating investment in new areas such as space tourism, in-space manufacturing and renewable energy. The global industry is increasingly being disrupted by VC-backed start-ups, with a 223% increase in VC finance when comparing 2020-22 and 2017-19. However, while the UK market is on an upward trajectory it is currently behind global investment growth – attracting an equivalent increase in funding of 23% over the same period.

Globally the UK accounts for a significant share of VC deals (behind only the US and China), however these are smaller than in other leading markets, meaning it receives less than 2% of total investment value. Therefore, while the UK has a foundation of dealmaking activity upon which to scale a more developed VC ecosystem in this sector, it needs to attract larger round sizes to keep pace with international competitors.

## British Business Bank response

The British Business Bank will use the evidence presented in this report to inform our ongoing discussions with Government, businesses, and the finance industry, and to refine our programmes, so they remain focused on parts of the market where smaller businesses can benefit most from the Bank's support. This report highlights several important findings:

**1. Downturn in SME equity finance.** The latter half of 2022 saw a significant decline in equity finance, particularly at later stages of the market. Through its range of equity finance programmes the Bank is committed to supporting business across all stages through these challenging market conditions, and to ensuring that the market has the breadth and depth to best recover from the current downturn. Looking ahead the Bank will continue to monitor UK equity finance conditions very carefully.

## 2. Continued concentration of equity deals in London.

London's proportion of the UK's equity deals increased by one percentage point to 50% in 2020-22. This shows the continued need for the Bank to address geographic disparities in equity finance. The report also shows that, compared to the wider market, the Bank allocates a greater proportion of its deals to areas such as the North West, Yorkshire & The Humber, the Midlands and the South West – highlighting the role of regional programmes such as NPIF, MEIF and CloSF within the Bank's overall equity portfolio.

## 3. Consistent growth in investment in UK Cleantech companies.

In 2022 equity finance in the Cleantech sector rose by 50% to £0.9bn, marking its seventh consecutive year of increased investment. The Bank welcomes the continued growth of the industry given the scale of investment that is needed for the transition to a net zero economy. With our objective to support the UK's transition to net zero, including via enabling SME-led green innovation, the Bank has an important role to play in continuing to unlock greater levels of equity finance for UK cleantech companies.

## 4. Key opportunities for the UK VC market in Life Sciences, Nanotechnology and Space Technology.

To ensure UK Life Sciences companies have the late stage and specialist capital they need to scale up, BPC's Life Sciences Investment Programme (LSIP) will continue to make cornerstone commitments in later stage life sciences venture growth funds with a strong UK focus. In addition, the Future Fund: Breakthrough programme delivered by BPC is currently helping to fund later stage R&D intensive companies across a wider range of deeptech sectors.

# Introduction

This year's report provides an assessment of recent trends in UK SME equity finance and British Business Bank activity using Beauhurst data. It also examines the UK's strengths and opportunities in scaling technology sectors through its VC ecosystem using PitchBook data.

This report provides an in-depth assessment of UK equity finance activity in 2022. It builds on the previous analysis contained in the recently published Small Business Finance Markets Report that covered equity finance trends up to 2022Q3. Our upcoming Nations and Regions Tracker report will provide more detailed analysis of the geographical distribution of equity deals.

Beaurost identifies and records equity deals made by the full range of equity investors, from large growth deals in established businesses by VC funds, to smaller deals in early-stage companies by angel investors and equity crowdfunding platforms. Additional information on Beaurost's methodology and terminology can be found in the report appendix.

This year's report is structured as follows:

- Chapter one provides an overview of equity market activity in 2022, as well as a headline summary of deals and investment in 2023Q1.
- Chapter two provides an overview of equity deals made by British Business Bank supported equity funds between 2020 to 2022, making comparisons to the overall equity market by stage, sector, region and gender of founder teams.
- Chapter three provides an assessment of the UK's strengths in scaling VC-backed technology sectors and, looking ahead, investigates which breakthrough technologies could represent opportunities for the UK VC ecosystem.

For the third chapter, data from PitchBook is used to enable international comparisons between the UK and other leading VC markets. PitchBook's industry verticals also allow for analysis of international VC investment across a wide range of technology sectors.

## Chapter 1:

# Recent Trends in SME Equity Finance

- While £16.7bn of equity finance was raised in 2022 it was a year of two halves, with sharp declines in investment during the second half of the year
- This downward trend continued into 2023Q1, during which equity finance fell by 28% on the quarter to £2.2bn
- Venture and growth stages experienced large declines in investment and valuations, though the seed stage was less impacted
- Most UK nations and regions experienced fewer deals during 2022, except for Wales, Yorkshire & The Humber, and the South West
- University spinouts received 12% of total investment in 2022 and raised 33% larger deals on average
- The tech industry experienced an 11% drop in equity finance during the year, though cleantech bucked this trend with a 50% increase in funding
- All female-founded companies received a record 9% of equity finance deals, but continue to receive a smaller share of total investment

**While £16.7bn of equity finance was raised in 2022 it was a year of two halves, with record investment during the first half and sharp declines in funding in the second**

The Bank’s recent Small Business Finance Markets report found that, while UK SME equity finance had remained exceptionally strong during the first half of 2022, 22Q3 marked a deterioration in market conditions with declining investment and deal activity. The latest full year data now shows that, while 2022 was the second strongest year on record for investment activity, it was a year of two distinct halves for the SME equity finance market.

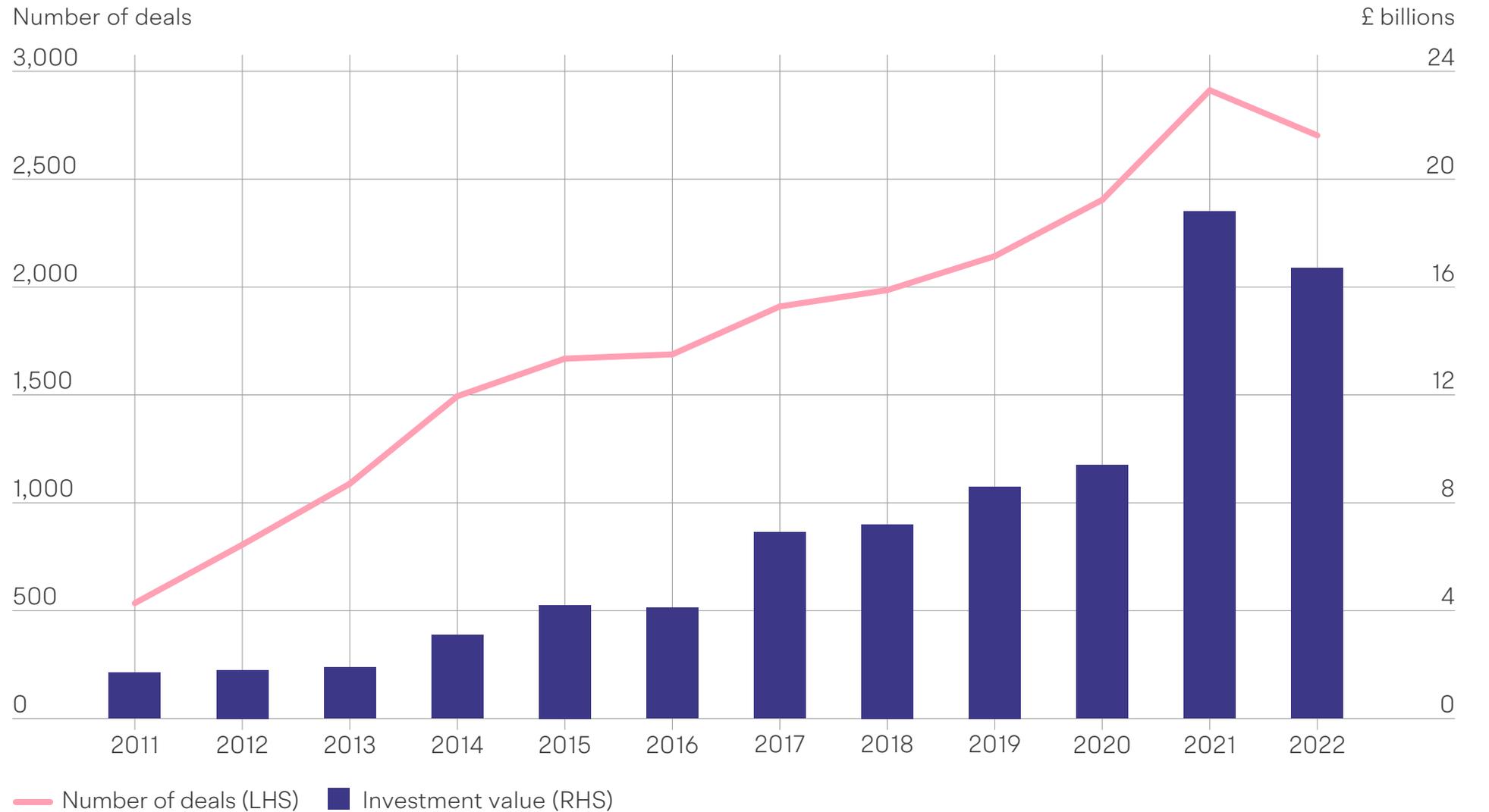
Looking at the full year headline figures, as shown in Figure 1.1 there were 2,702 announced equity deals in total during 2022, a 7% decrease from the 2,912 deals recorded in 2021. While this was a relatively modest decline, it represented the first annual drop in equity deal volumes since Beauhurst began tracking this data in 2011.

Total investment value in 2022 also declined by 11%, from a record £18.8bn in 2021 to £16.7bn in 2022. While these 2022 figures mark an end to the consistent

Figure 1.1

**Number and value of equity deals over time**

Source: British Business Bank analysis of Beauhurst data



year-on-year growth seen over the past decade, the number and value of equity deals still remain significantly higher than in 2020 (by 12% and 77%, respectively).

Looking at the quarterly trends, the start of 2022 saw unprecedented levels of dealmaking activity, with companies receiving excessive valuations particularly in the tech sector. In 22Q3, concerns about potential over-valuations and a lack of exit opportunities, as well as rising inflation and interest rates, led to only 576 deals being invested at a total of £2.8bn. This represented a 53% decrease in investment value and a 31% decrease in the number of deals from 22Q1. Whilst quarterly numbers can be relatively volatile, the investment value in 22Q3 marked an eight-quarter low.

In 22Q4 the SME equity market remained subdued compared to the levels of activity seen during 2021 and early 2022. Compared with 22Q3, total investment in 22Q4 increased by 8% to £3.0bn, while the number of deals grew marginally by 2% to 585. However, these totals represented annual declines of 40% and 22%, respectively, when compared to the same period in 2021. This maintained the trend from the previous quarter of significant annual declines in investment activity.

Figure 1.2

**Number and value of equity deals by quarter**

Source: British Business Bank analysis of Beauhurst data



In this context equity investment during the second half of 2022 can be viewed as returning to lower longer term trend levels seen before the pandemic, following a year and a half of exceptional activity. For instance, the total amount invested during 22H2 (£5.8bn) matched the total investment value deployed during 20H2. VC fund managers slowed their dealmaking activity during this time, partly to compensate for over-deployment of capital during the previous 12 months, and placed a stronger emphasis on due diligence.

The latest quarterly data shows that this downward trend has continued into 2023, with deal numbers and values falling by 11% and 28% compared with 22Q4, respectively. Given that 22Q1 was a record quarter for the UK equity finance market, annual declines were even greater – with a 38% drop in the number of deals and a 63% drop in total investment. On both measures this was the lowest level of Q1 dealmaking activity since 2018.

Comparing this performance internationally, Pitchbook data shows that these 2023 trends were also reflected in Europe and the US. European VC deal value fell by 32% on the quarter to €11.8bn,<sup>1</sup> with the deal count falling more severely than in the UK by 19.2%. Total investment in the US VC market declined more slowly

by 10% to \$37.0bn, though the deal count fell by a substantial 20% on the quarter.

Looking at the reasons for this continued global VC downturn, the low interest rate environment experienced over the past 15 years had encouraged investors to seek assets generating higher returns, increasing the amount of VC funding available to businesses. However, central banks have since raised interest rates to their highest levels since 2008, reducing risk-adjusted returns available to investors in asset classes like VC.

Having invested in huge sums during 2021 and 22H1, fund managers are now demonstrating an increasing reluctance to deploy capital and a greater emphasis on business fundamentals. The aim is for deployment rates to fall to more sustainable levels, and market feedback from fund managers the Bank has engaged with suggests that a significant area of focus now amongst fund managers is extending the runways of their companies. This can be achieved through cost reduction, finding ways to increase revenue, or a combination of both.

Looking ahead inflation remains high across Western economies – particularly in the UK, where the Consumer Price Index (CPI) exceeded 10% in March<sup>2</sup> – which could

continue to put upward pressure on interest rates in the coming months. In PitchBook’s survey of 58 VC investors as part of its H1 2023 VC Tech Survey, 43% expected either a moderate or a strong decrease in VC funding over the next year (due in part to the collapse of Silicon Valley Bank).

---

### **The venture and growth stages experienced large declines in investment in the second half of 2022, though the seed stage was impacted to a lesser degree**

Beauhurst have historically classified equity deals into three stages: seed, venture and growth. These stages are determined by the characteristics of a company’s evolution such as product development, commercialisation, sales and profitability. In 2019 they introduced a new stage called “established”, a subset of the original growth stage designed for more mature, commercially secure companies that have existed for longer timespans. To maintain consistency with past Equity Tracker reports and for simplicity, we have decided to combine growth and established companies within one single “growth” stage in our current analysis. As a result, our analysis of deal stages may differ from Beauhurst’s own reporting.

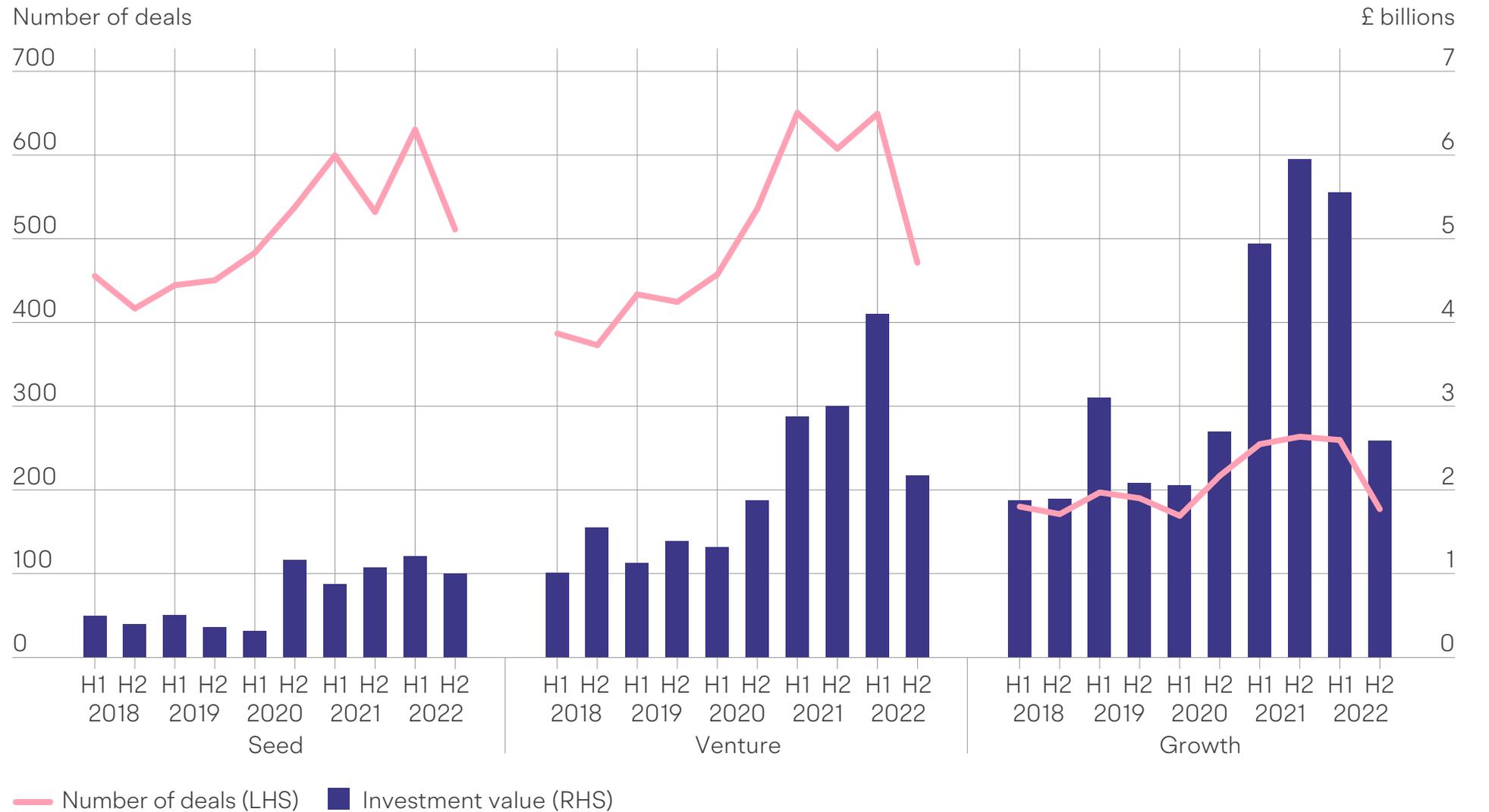
A full list of definitions for each growth stage is provided in the appendix of this report. In summary, the seed stage typically refers to early-stage companies that are either in the process of being set up or have been in operation for a short period of time but have not yet generated any commercial sales. The venture stage covers companies that have existed for a few years and are working towards gaining market traction with rapidly growing sales. Growth stage businesses are likely to have multiple offices or branches and significant revenue streams, some of which may be profitable. This includes later stage VC-backed companies that are seeking to expand their core market, enter new markets, or develop new products/services.

Figure 1.3 breaks down the number and value of deals at each company stage by half year periods. There have been significant increases in funding in recent years, particularly by volume at earlier growth stages and by value at later VC stages. The rapid expansion of overall dealmaking activity over the period had been driven by increasingly large deal sizes in the growth stage. While growth stage companies have benefitted from the attractive market conditions in the last couple of years, they have also been the most impacted by the recent downturn.

Figure 1.3

**Number and value of equity deals over time by stage**

Source: British Business Bank analysis of Beauhurst data



**Seed Stage:**

In 2022 seed stage companies received £2.2bn in investment across 1,144 announced deals, setting a new annual record on both measures. The amount invested in 2022 was 14% higher than in 2021, while the number of deals was marginally higher by 1%.

Looking at the underlying half year data, deal volumes and value did fall in 22H2 when compared with 22H1 – by 19% and 17%, respectively. On an annual basis compared with 21H2, though, these measures were more resilient, decreasing by only 4% and 7%.

Investments in seed stage businesses are generally considered to carry the greatest risk for investors due to uncertainties regarding technology, product development, and the market fit for these early-stage companies. Historically, early-stage businesses are often most affected by any market slowdown, compared to later stage companies. However, seed stage companies can also be seen as a refuge from wider market uncertainty, as they are less exposed to public market and exit conditions compared to later stage companies.

In its 22Q4 US Venture Monitor,<sup>3</sup> PitchBook attributed the relative strength of this part of the US market to “the increasing strength of the pre-seed market, the expansion of seed stage investor participation, and the prolonged time between startup foundings and seed rounds giving rise to more mature startups”. The macroeconomic environment may have also encouraged firms to consider raising more capital to increase runway and avoid raising in a harsher market at a later time.

**Venture Stage:**

Venture stage investment rose by 7% to £6.3bn in 2022, while deal numbers fell by 11% to 1,123 deals. Looking at the half year data, though, the picture is more stark. Comparing 22H2 with 22H1 deal numbers and total investment declined by 27% and 47%, respectively. On both measures the level of venture stage dealmaking activity has returned to levels seen during 2020. Looking at similar recent trends in early-stage VC investment in the US, PitchBook note that “...ongoing economic volatility and a pronounced lack of exits has heightened the importance of liquidity, not only for startups but also for venture funds and their LPs, leading many investors

to slow their deployment of capital into larger rounds as a means of capital preservation.”<sup>4</sup>

**Growth Stage:**

Total growth stage investment in 2022 declined by 25% to £8.2bn in 2022, while the deal count fell by 16% to 435 deals. The growth stage was the main driver of the ‘year of two halves’ for the overall SME equity market – the number of deals in 22H2 was 32% lower than in 22H1, while total investment was 54% lower. In similar fashion to the venture stage, following these significant declines the 22H2 totals at growth stage were the lowest seen since the first half of 2020.

Growth stage investment is strongly linked to the amount of available exit opportunities via trade sales or public listings. While investors in seed stage companies might be willing to wait for ten or more years for a company to exit, the timeframes for growth stage investors are much smaller. Growth stage companies have also recently benefitted from the inflow of crossover and overseas investors, who generally prefer investing in later stage companies. However, sharper investment declines can be expected from these types

of investors, as companies have greater financial measurability and are expected to demonstrate success.

In PitchBook’s 23Q1 Venture Monitor, in the context of the US VC market they note that “as investors grapple with a liquidity crunch due to a frozen exit environment, they have shied away from larger deals in an effort to preserve capital. Just 19 late stage mega-rounds occurred in the first quarter of 2023, compared with 98 in Q1 2022. Not only has this widened the funding gap between startups seeking capital and investors willing to provide it, but it has also put downward pressure on deal pricing”.<sup>5</sup>

Figures 1.4 and 1.5 show the proportion of deals and investment involving companies at each stage. In 2022 the proportion of deals at seed stage increase by three percentage points to 42%, and the proportion of investment value increase by an equal amount to 13%. The proportion of deals at venture stage decreased by one percentage point to 42%, while the proportion of total investment increased by seven percentage points to 38%. The proportion of growth stage deals fell by two percentage points to 16%, while the proportion of investment flowing into the growth stage fell by nine percentage points to 49%.

Figure 1.4

**Proportion of equity deals over time by stage**

Source: British Business Bank analysis of Beauhurst data

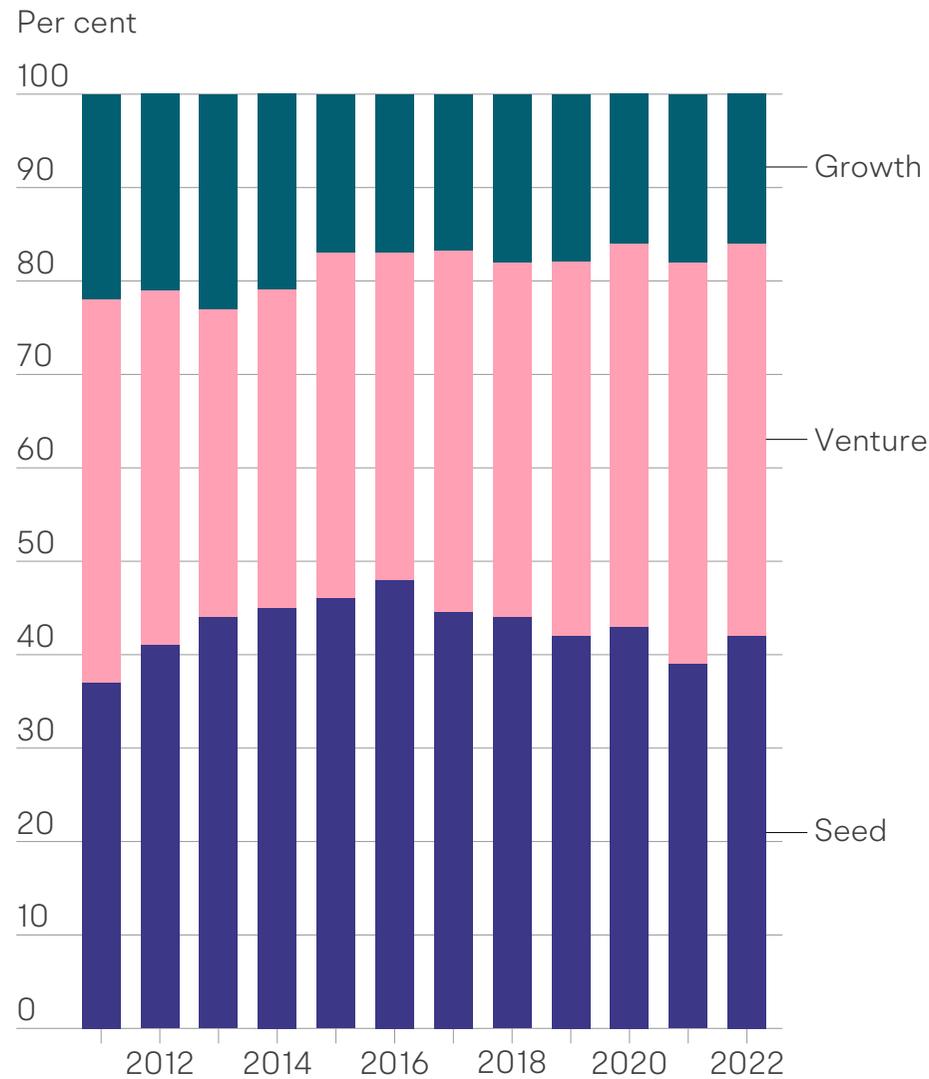
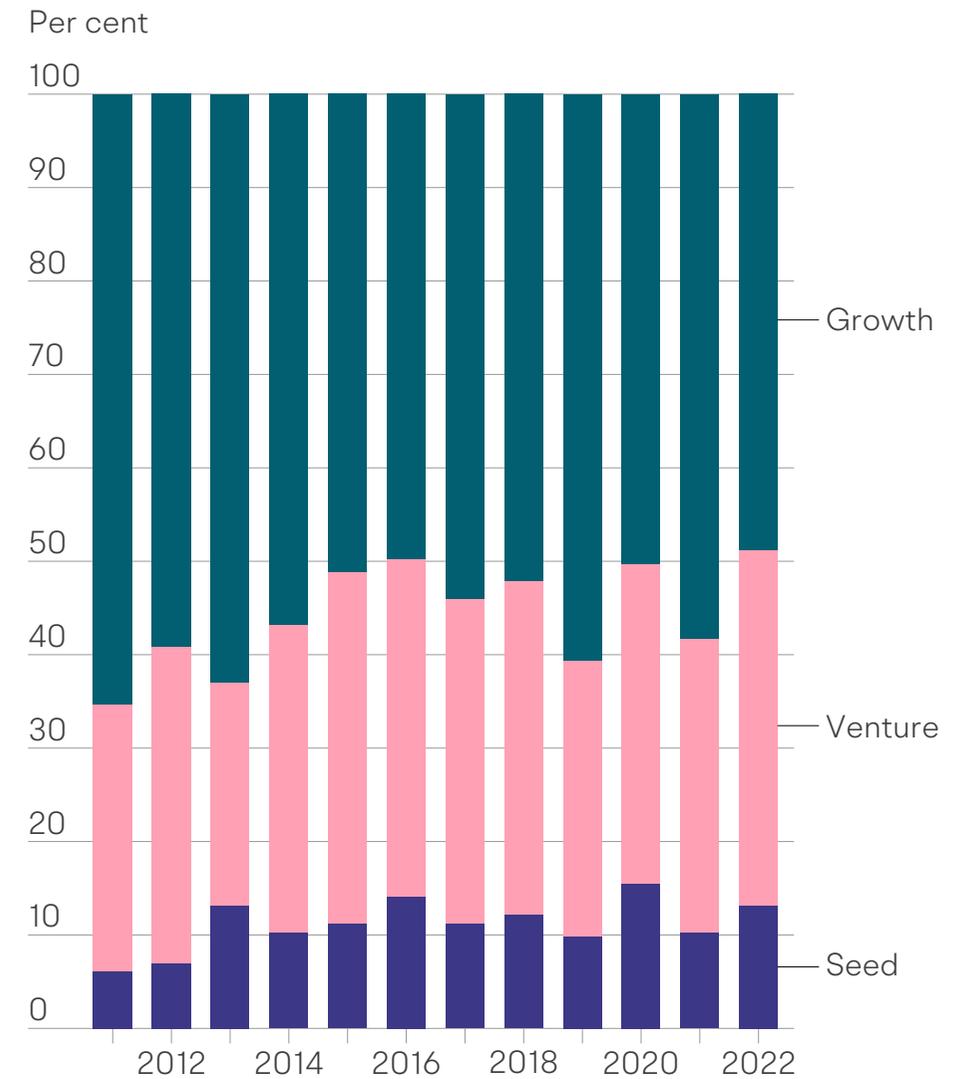


Figure 1.5

**Proportion of equity investment over time by stage**

Source: British Business Bank analysis of Beauhurst data



The share of investment at growth stage (49%) is the lowest since Beauhurst began collecting data in 2011. Last year was therefore the first time where seed and venture stage investment made up a higher proportion of the total deal value than growth stage investment. The share of deals at growth stage (16%) is also the joint lowest since 2011, while venture’s share of deal numbers has been on a steady increase over the last decade.

Tracking the number of follow-on fundraisings gives us an idea of the ecosystem’s ability to successfully scale companies, while tracking the number of first-time fundraisings serves as an indicator for the strength of the “pipeline”. Average deal sizes and valuations are also important measures of a VC ecosystem’s maturity, though these are explored in more detail in the next sub-section.

Figure 1.6 shows that the number of first-time fundraisings had remained relatively flat between 2014 and 2019. The number of follow-on deals rose at a much faster rate and overtook the number of first-time deals in 2019.

More recently, the number of follow-on deals fell by 2% to 1,453 in 2022, while the number of initial equity deals fell by over 12% to 1,250. While initial deals formed 62% of all deals in 2015, they only made up 46% of all deals in 2022 – the lowest share ever and a sign of the UK equity market maturing.<sup>6</sup> The relative resilience of seed stage dealmaking in 2022 is clearly in contrast to the trend here in first-time fundraisings. This may be explained by early-stage investors at this end of the market focusing on more proven companies rather than newly established, riskier businesses. This is also reflected by the larger deal sizes and valuations for seed stage companies in 2022, as explored in the following section.

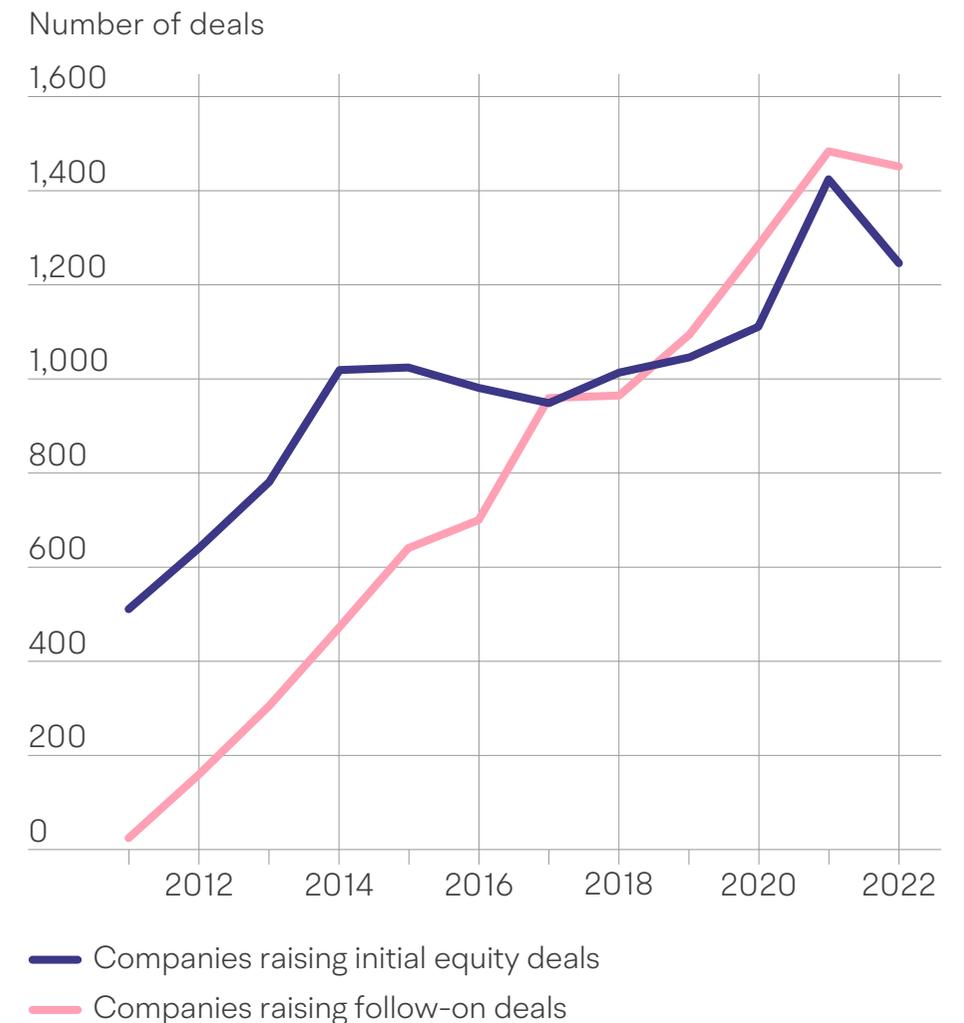
**Deal sizes and valuations at the growth stage fell sharply in 2022, while average valuations at the seed stage reached new highs**

Looking firstly at the overall SME equity finance market, considering that total investment fell twice as quickly as the number of deals in 2022, this has meant a decline in the average deal size.

Figure 1.6

**Number of equity deals over time for companies raising initial equity deals and follow-on deals**

Source: British Business Bank analysis of Beauhurst data



The average amount raised per announced equity deal fell by 3% to £6.7m in 2022 as illustrated in Figure 1.7. This is still by far the second highest annual average on record and 58% higher than in 2020 (£4.3m). However, breaking down both halves of the year the average deal size fell by 28% in 22H2 when compared with 22H1.

Looking at the trends by stage, the average seed stage deal increased by 14% to £2.1m in 2022, reflecting the relative resilience in dealmaking activity in this part of the market. Comparing both halves of the year shows us that the average seed stage deal rose by 6% in 22H2 compared with 22H1 – the only stage to experience an increase over this period. The average venture stage deal increased by 23% to £6.1m in 2022. In similar fashion to the overall market, however, the average venture stage deal fell by 25% in the second half of 2022 compared to the first half.

The growth stage experienced the most significant declines in deal sizes. The average deal size fell by 13% to £22.2m in 2022, though when looking at both halves of the year there was a drop of 31% in 22H2 compared

with 22H1. This was affected by the number of megadeals (deals larger than £100m in size), which contribute strongly to changes in average deal sizes. There were 27 mega deals in 2022 (raising £4bn), which was a decline from the total of 34 recorded in 2021. However, 2022 still had more megadeals than 2020, 2019, and 2018 combined.

Because of their large size megadeals can cause significant skews in average deal sizes. For example, the largest equity deal in 2022 was a £506 million growth stage deal involving a payment processing company called SumUp. The ten largest equity deals in 2022 also made up 12% of the total investment value in the year. To get a more representative picture of the typical funding amount companies receive it is therefore useful to look at trends in median deal sizes as well.

Figure 1.7

**Average deal size over time by stage**

Source: British Business Bank analysis of Beauhurst data

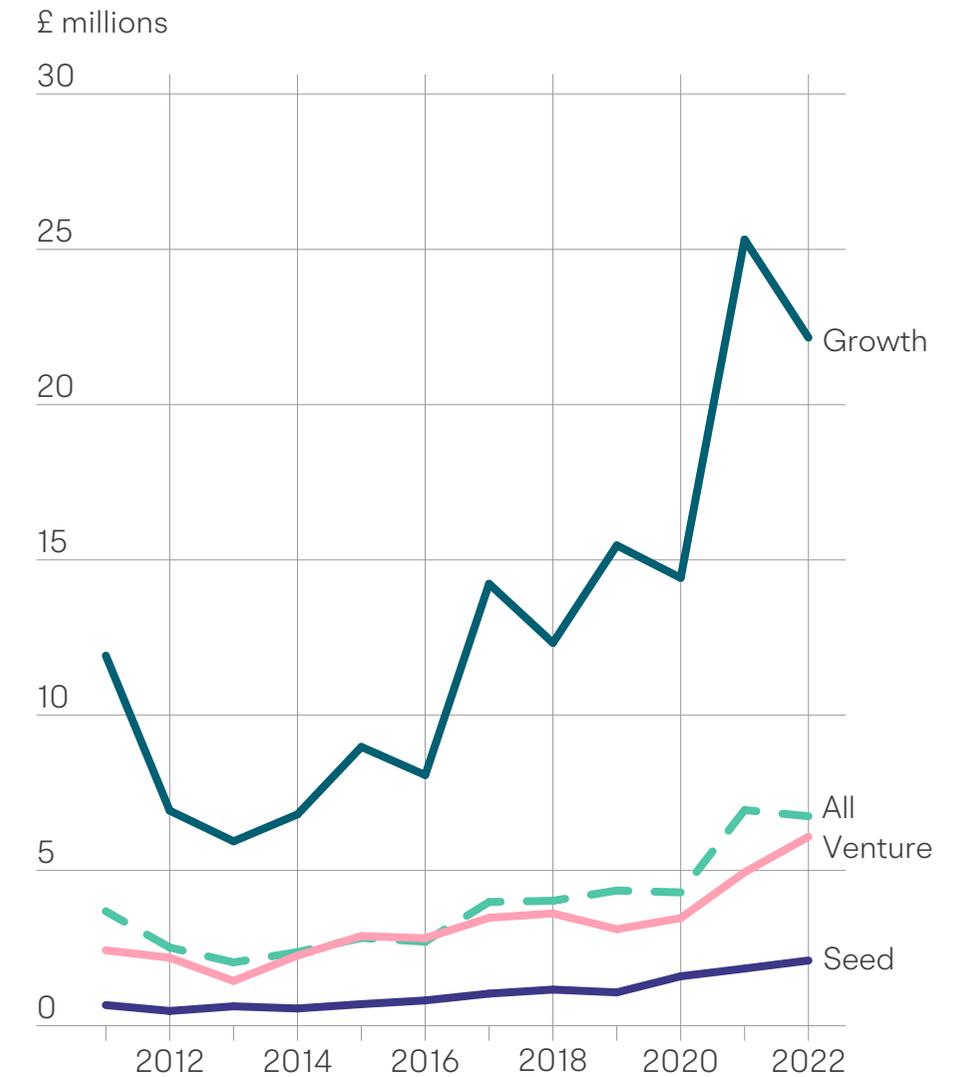


Figure 1.8 shows that the overall median deal size increased by 5% in 2022 to £1.2m. The median seed stage deal increased by 12% to £530k, while the median venture stage deal increased by 21% to £2.0m. The median growth size, on the other hand, fell by 16% to £6.9m in 2022. These changes in median deal sizes at each category are in line with those seen using the mean average. The marked decline at the growth stage shows that there has been a real reduction in investor appetite for more mature companies, and this trend is not simply due to the influence of a few outlier deals.

Beauhurst provides data on pre-money valuations of companies, allowing for the analysis of trends over time. Pre-money valuation refers to a company's value prior to financing. The company's valuation reflects the amount investors must pay for a share of the business. Valuations are based on a company's projected growth and its future prospects, with investors evaluating its value during each funding round, though changes in deal terms can also have a distorting effect. Figure 1.9 shows the mean average pre-money valuation of companies receiving equity finance by stage.

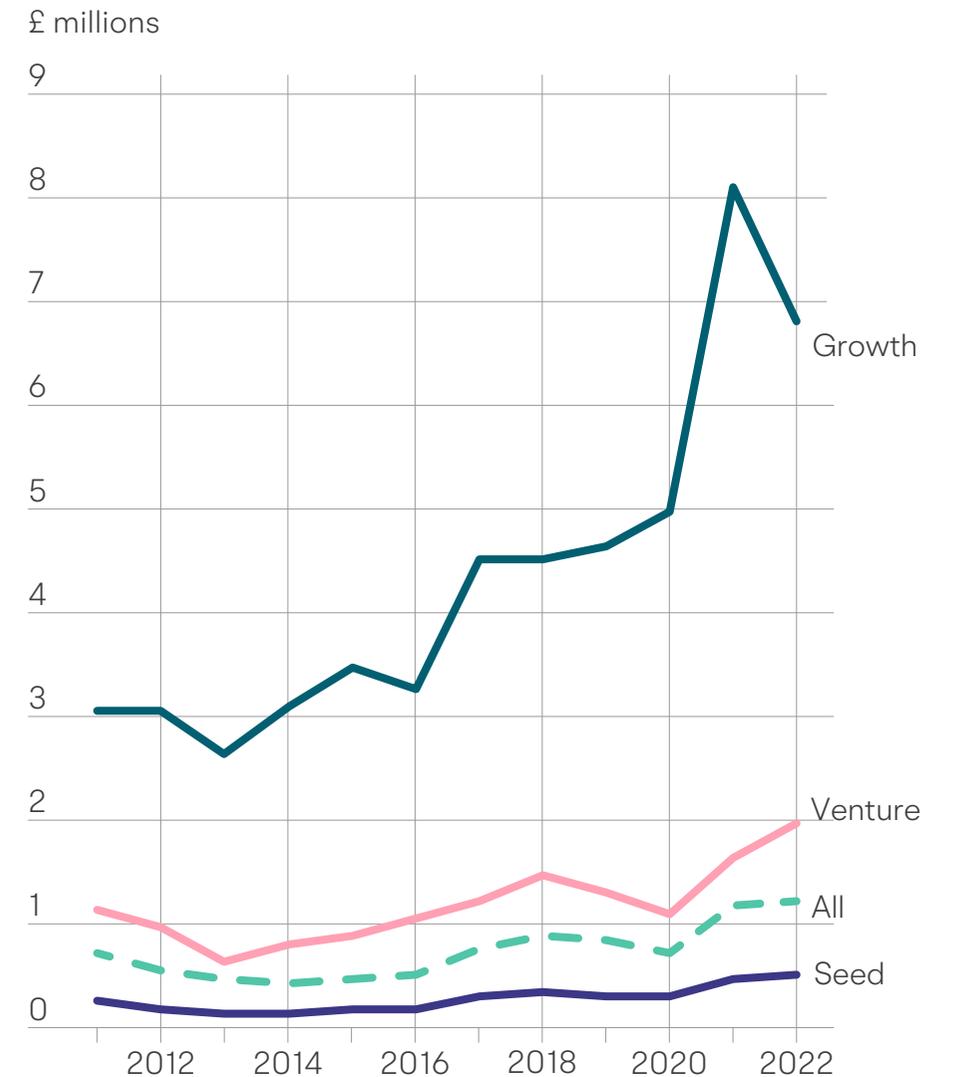
The overall average pre-money valuation fell by 6% in 2022 to £29.6m, from its peak of £31.3m in 2021. With average deal sizes beginning to fall in the second half of 2022, this was also reflected in valuation trends – average pre-money valuations were 22% lower in 22H2 compared with 22H1. However, as with average deal sizes and equity investment activity in general, there were notable differences in these patterns when looking across different business stages.

Average seed stage valuations were not as affected by the wider downturn, increasing by 27% on the whole in 2022 to £5.7m, and by 28% comparing 22H2 with 22H1. Average venture stage valuations increased by 20% in 2022 to £19.3m, but began to decline in the second half of the year – by 7% comparing 22H2 with 22H1. This demonstrates that the valuations of earlier stage businesses are more sheltered from changes in public markets and the wider exit environment.

Figure 1.8

**Median deal size over time by stage**

Source: British Business Bank analysis of Beauhurst data



Growth stage valuations have been impacted the most by the market downturn in 2022. The average growth stage valuation fell to £141m, a 10% drop from its peak in 2021. Comparing both halves of the year there was also a significant 28% decline in average valuations between 22H2 and 22H1. As with the wider market, though, growth stage company valuations still remain high by historical standards and above levels seen before 2021's spike in investment activity.

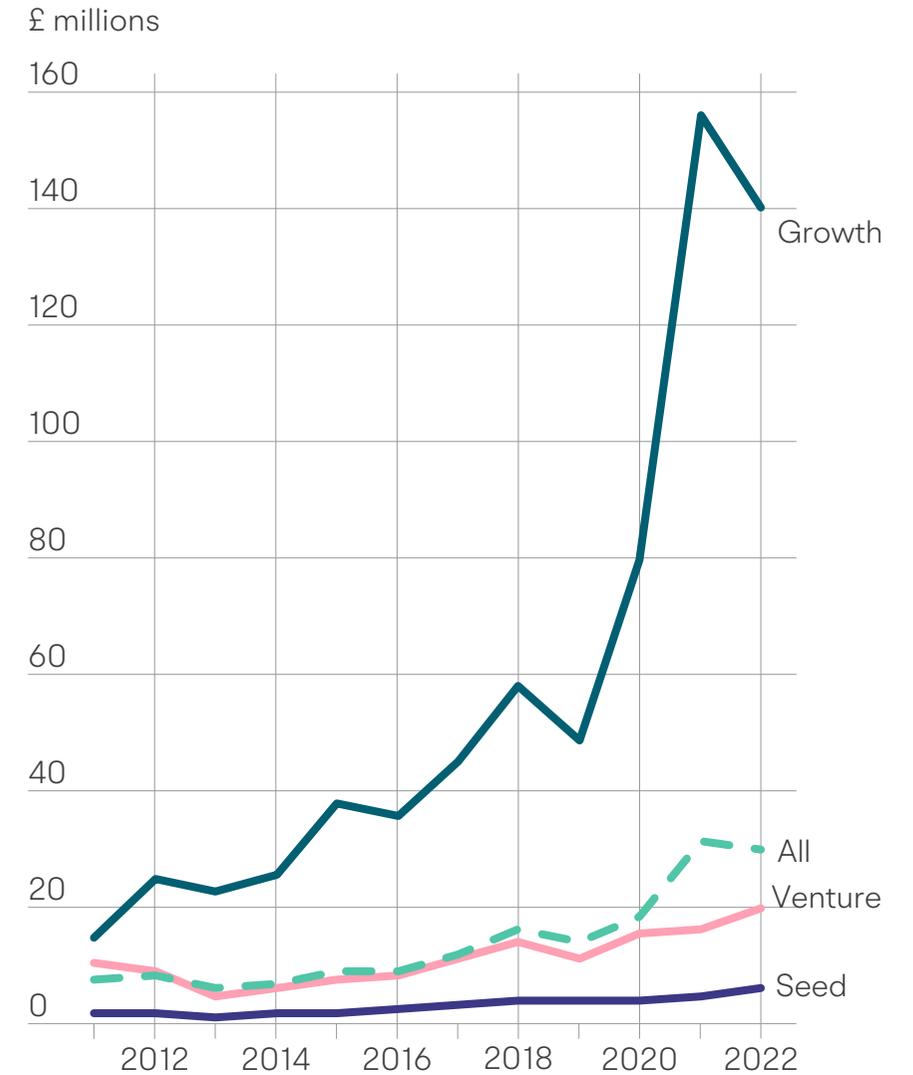
As investors expect growth stage companies to exit the soonest, changes to the exit environment resulting from unfavourable market conditions can have a significant impact on their valuations. Late stage valuations in particular had increased sharply in 2021 due to greater competition for deals, increased trade sales and public market activity leading to a number of high profile IPOs. As these exit opportunities dried up in 2022, the availability of capital has fallen as VC fund managers have returned to placing a stronger emphasis on business fundamentals.

Looking ahead, PitchBook's US Venture Monitor for 2022<sup>7</sup> notes that "...many investors are looking to purchase equity stakes at a discount while many startups are trying to raise capital at the elevated valuations seen in prior years. While many of these founders will try to extend runway for as long as possible to outlast unfavourable deal terms, we expect a plethora of down rounds to occur in 2023 as the lack of liquidity options for many late-stage startups persists, thereby forcing these businesses to return to equity financing for fresh capital."

Figure 1.9

**Average pre-money valuation over time by stage**

Source: British Business Bank analysis of Beauhurst data



As with deal sizes, the mean average valuation can be influenced by distortion from large outliers. It is therefore useful to look at trends in the median, as shown in Figure 1.10. The overall median valuation in 2022 was £6.5m, a 20% increase compared with 2021. The fact that average valuations fell while median valuations increased suggests that the decline in the valuations of a few very large companies has had an impact on the overall average. However, as with the mean averages, median pre-money growth valuations fell in 2022 by 16% to £36.9m, while median venture and seed valuations increased by 23% and 25%, respectively.

These valuation trends are reflected in PitchBook’s VC Dealmaking Indicator,<sup>8</sup> which aims to quantify how startup-friendly or investor-friendly the capital raising environment is on a range from 0-100 (with a higher indicator reflecting a more investor-friendly dealmaking environment). The indicator has risen rapidly since the start of 2022, and for both late-stage and early-stage companies the indicator in 23Q2 was at its highest level since 2010. PitchBook note that for later stage financing, demand for capital outstrips supply offered by VC funds by more than three times.

In this report, companies that are privately held, VC-backed, and have valuations surpassing \$1bn are classified as unicorns. Our definition excludes companies such as Gymshark that have received a \$1bn valuation through private equity rounds alone. Further, we only classify companies as unicorns whose valuations we were able to confirm through a commercial data provider. Companies whose valuations are only reported by the media and lack verification are not included in our list.

Table 1 shows that as at 19<sup>th</sup> May 2023, the UK had 40 equity-backed companies with unicorn status. More than half (55%) of these companies have secured funding through equity programs offered by the British Business Bank. This demonstrates the crucial role played by the Bank's equity programs in supporting the growth of high-potential scale-up companies.

Figure 1.10

**Median pre-money valuation over time by stage**

Source: British Business Bank analysis of Beauhurst data

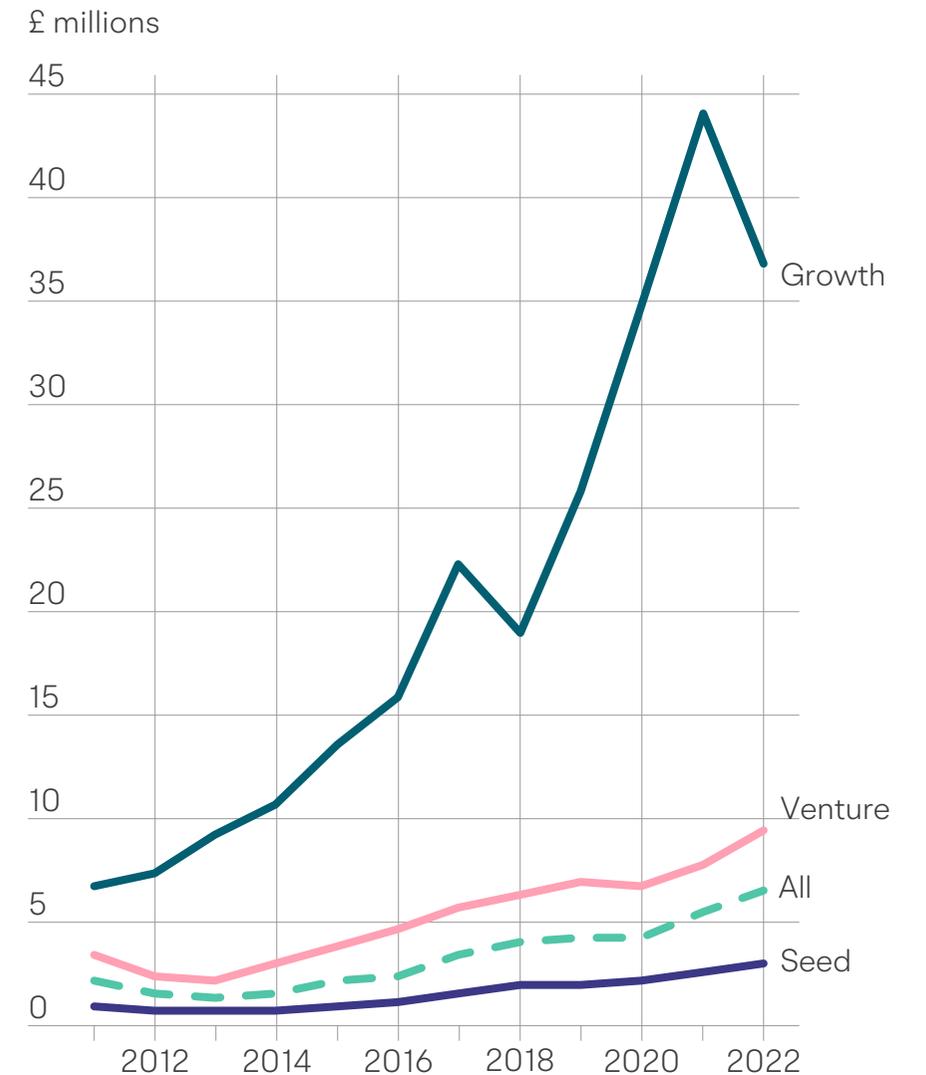


Table 1

**Current UK unicorn status businesses (as at 19<sup>th</sup> May 2023)**

Source: British Business Bank analysis of Beauhurst data

Count	Name	Location	Sector	Date of unicorn status	BBB involvement
1	Brewdog	Ellon	Beverage manufacturing and distribution	Sunday, 9 April 2017	
2	Improbable	London	Gaming	Thursday, 11 May 2017	ECF
3	Oaknorth	London	Challenger bank	Thursday, 12 October 2017	Bank Delivery Partner: Help to Grow and Covid loan schemes
4	Revolut	London	Challenger bank	Wednesday, 25 April 2018	BPC, Managed Funds and UKIIF
5	Monzo	London	Challenger bank	Wednesday, 31 October 2018	Managed Funds
6	Graphcore	Bristol	Semiconductor manufacturing	Tuesday, 18 December 2018	ECF, BPC, and Managed Funds
7	Checkout.com	London	Fintech	Thursday, 2 May 2019	Managed Funds
8	OneTrust	London	Cyber security	Thursday, 11 July 2019	
9	CMR Surgical	Cambridge	Life sciences	Tuesday, 17 September 2019	
10	Rapyd	London	Fintech	Tuesday, 1 October 2019	
11	Snyk	London	Cyber security	Tuesday, 21 January 2020	Managed Funds
12	Gousto	London	Subscription meal service	Monday, 2 November 2020	ACF
13	Hopin	London	Events platform	Tuesday, 10 November 2020	BPC and Managed Funds

Table 1 (continued)

Count	Name	Location	Sector	Date of unicorn status	BBB involvement
14	Zego	London	Fintech	Wednesday, 10 March 2021	BPC and Managed Funds
15	Starling Bank	London	Challenger bank	Monday, 19 April 2021	
16	Blockchain.com	London	Fintech	Wednesday, 24 March 2021	
17	ManyPets	London	Insurtech	Thursday, 27 May 2021	Managed Funds
18	Marshmallow	London	Insurtech	Thursday, 12 August 2021	ECF
19	Tractable	London	Artificial Inteligence	Friday, 13 August 2021	ECF
20	Gelato*	Oslo	Printing	Monday, 16 August 2021	ECF
21	Zepz	London	Fintech	Monday, 23 August 2021	
22	Matillon	Manchester	Data integration	Wednesday, 15 September 2021	
23	TrueLayer	London	Fintech	Tuesday, 21 September 2021	
24	Zopa	London	Peer to peer lending	Monday, 11 October 2021	
25	Zilch	London	Fintech	Wednesday, 10 November 2021	
26	Thought Machine	London	Fintech	Monday, 29 November 2021	ECF, BPC, and Managed Funds
27	SaltPay	London	Fintech	Saturday, 1 January 2022	

\*Gelato is currently headquartered in Norway but was set up in the UK.

Table 1 (continued)

Count	Name	Location	Sector	Date of unicorn status	BBB involvement
28	Wayve	London	Autonomous cars	Tuesday, 1 February 2022	BPC and Managed Funds
29	Tripledote Studios	London	Gaming	Monday, 14 February 2022	
30	PayHawk	London	Fintech	Monday, 7 March 2022	
31	Lendable	London	Fintech	Thursday, 10 March 2022	BPC
32	GoCardless	London	Fintech	Monday, 9 May 2022	ECF, BPC, Managed Funds, and UKIF
33	Paddle	London	SaaS	Tuesday, 10 May 2022	BPC
34	Multiverse	London	Educational services	Wednesday, 8 June 2022	Managed Funds
35	SumUp	London	Fintech	Thursday, 23 June 2022	
36	Spectrum Medical	Gloucester	Life Sciences	Monday, 18 July 2022	
37	Copper	London	Fintech	Monday, 25 July 2022	BPC and Managed Funds
38	Stability.AI	London	Artificial Intelligence	Wednesday, 5 October 2022	
39	Rezolve	London	Software	Wednesday, 16 November 2022	
40	Quantexa	London	Artificial Intelligence	Tuesday, 4 April 2023	BPC and Managed Funds

## Most UK nations and regions experienced lower levels of dealmaking during 2022, with exceptions including Wales, Yorkshire & The Humber and the South West

Table 2 shows the number and value of announced equity deals in 2022 across the nations and regions of the UK. Equity investment has historically been concentrated in London and 2022 saw its significant share of the market maintained. In 2022, a total of 1,357 deals worth £10.8bn took place in London, representing 50% of the UK's overall deal count and 65% of the total investment value. London's share of deals increased by one percentage point while its share of investment remained the same as the year before. This was driven largely by a greater decline in finance in other regions and devolved nations.

Table 2

### Number and value of announced equity deals by nation and English region

Source: British Business Bank analysis of Beauhurst data

Nations and English regions	Number of deals (2022)	% change vs 2021	Investment value (2022)	% change vs 2021
London	1357	-5%	£10.8bn	-12%
South East	238	-20%	£1.7bn	3%
Scotland	190	-22%	£762m	37%
East of England	185	-6%	£1.2bn	-15%
North West	162	-7%	£685m	-22%
South West	155	4%	£540m	-32%
Yorkshire and The Humber	94	4%	£258m	48%
North East	75	-16%	£166m	-60%
West Midlands	76	-10%	£276m	-22%
Wales	70	19%	£82m	-10%
East Midlands	58	-3%	£98m	-37%
Northern Ireland	34	-17%	£94m	39%

In areas outside of London, the number of deals fell by 10% in 2022 to 1,337 deals. The total investment value in these areas also fell by 11% to £5.8bn. The 10% decline in the number of deals is twice as fast as the decline experienced in the London region, while the drop in total investment value is broadly similar.

Only the South West, Yorkshire and The Humber, and Wales saw an increase in deal numbers compared to 2021. Investment value increased in four regions, largely due to a handful of high value deals in each of these regions. Yorkshire and The Humber was the only region that saw an increase in both the number and value of deals in 2022.

Looking at only seed stage deals, London saw an increase of 3% in the number of deals, and a 28% increase in deal value in 2022. Regions and nations outside London experienced a decline in deal numbers of 3% and a decline in value of 9%. London deals captured 60% of the total seed stage deal value in 2022 and 49% of deal volumes.

The number of growth stage deals in 2022 declined by 12% in the London region to 220 deals, and by 20% across the rest of the UK to 215 deals. London captured 70% of the total UK growth stage deal value in 2022, equivalent to £5.7bn. Combined, regions and nations outside of London tend to capture a similar number of deals as London, however the average size of those deals seems to be much smaller than in the capital.

---

### **University spinouts received 12% of total investment in 2022 and raised 33% larger deals on average, highlighting the importance of academic institutions in creating high growth innovative companies**

The creation of spinout companies is an important avenue through which founders and universities can commercialise cutting edge academic research. Beauhurst define an academic spinout as a company that was set up to exploit intellectual property (IP)

developed by a recognised UK university and then either licences the IP from the university, or the university owns or has the option to purchase shares in the company.<sup>9</sup> It is important to note that staff or students can set up start-ups which would not meet this definition.

Figure 1.11 shows how the number and value of equity deals involving these university spinouts has changed over time in the UK. In 2022, 8% of all announced equity deals in the UK were in these companies, with a total of 226 deals.<sup>10</sup>

A total of £2.0bn was also invested in spinouts during 2022, a record annual total and more than double the amount raised in 2020 or 2019. This investment value represented 12% of total UK equity finance (the highest share since 2018), highlighting the importance of spinouts to the UK VC ecosystem. Universities produce high quality spinout companies that are raising large deals; the average deal size for these businesses was

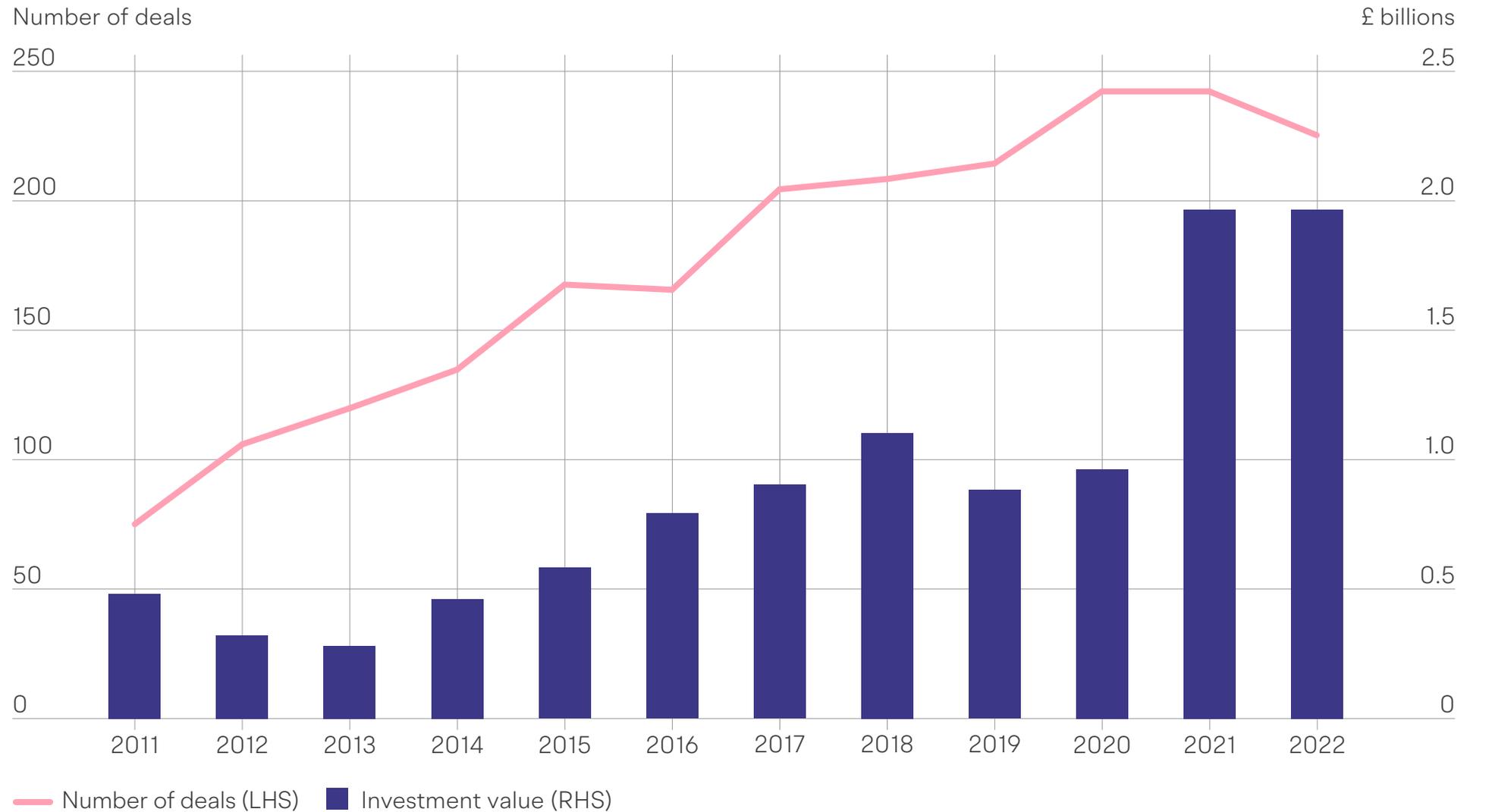
£8.9m in 2022 – 33% larger than the average across the overall UK market. It is also important to note that these businesses are also more likely to be capital intensive, and therefore requiring greater amounts of finance.

Breaking down the data by institution, the highest number of spinout deals in 2022 belonged to the University of Cambridge. The University of Oxford ranked second with 31 spinouts and the University of Edinburgh third with 15. Spinouts from either Cambridge or Oxford raised £12.7 million on average across 192 deals between 2020-2022. Spinouts from the University of Edinburgh, Strathclyde, Bristol, Imperial College London, and University College London (the five universities with the highest number of university spinouts excluding Oxford and Cambridge), on average raised £6.9m across 168 deals during the same period.

Figure 1.11

**Number and value of university spinout deals over time**

Source: British Business Bank analysis of Beauhurst data



---

**The tech industry experienced an 11% drop in equity finance during the year, though the cleantech sub-sector bucked this trend with a 50% increase in funding**

The Technology sector and the Business and Professional Services sector have historically received the largest proportion of total deals and investment but have also seen deals decline by relatively high proportions in 2022. This can be seen in Figure 1.12, which shows the number and value of announced equity deals broken down by sector.<sup>11</sup>

There were 1,014 equity deals in Technology/IP-based businesses in 2022 worth £7.6bn. Compared with the year before this is a 12% decrease in the number of deals and an 11% decrease in investment. Business and Professional Services received 661 deals and £4.8 bn in investment in 2022, a decline of 8% and 10% respectively compared to 2021.

The Retail sector experienced the most significant annual decline in investment value of 58% last year. Total investment fell from £900m in 2021 to £400m in 2022.

The number of deals decreased by 2% during the same period. No sector saw an increase in both deal value and volume in 2022. The media sector was the only sector that saw a rise in investment, from £340m in 2021 to £370m in 2022, an increase of 5%.

Beauhurst further divides the Technology/IP sector into sub-categories which give a more granular indication of the underlying activities of these tech companies. Of these sub-sectors, Software has historically attracted more investment than all the others combined, and this trend has not changed. In 2022, 63% of all deals and 57% of all investment in the Technology-IP sector was raised by Software companies. This sub-sector attracted a total of 627 deals worth £3.9bn. However, this is a decrease of 11% in the number of deals from 2021 and a decrease of 16% in deal value.

Clean tech is a sub-sector that has seen steady and consistent growth over the past few years due to factors such as shifting societal preferences. In 2022 it received £900m of investment across 100 deals, representing annual increases of 53% and 21%, respectively. Clean

tech is also the only tech sub-sector that experienced an increase in both investment and deal numbers in 2022. It has benefitted from annual increases in investment for the last seven consecutive years and now accounts for one in ten UK tech equity finance deals.

---

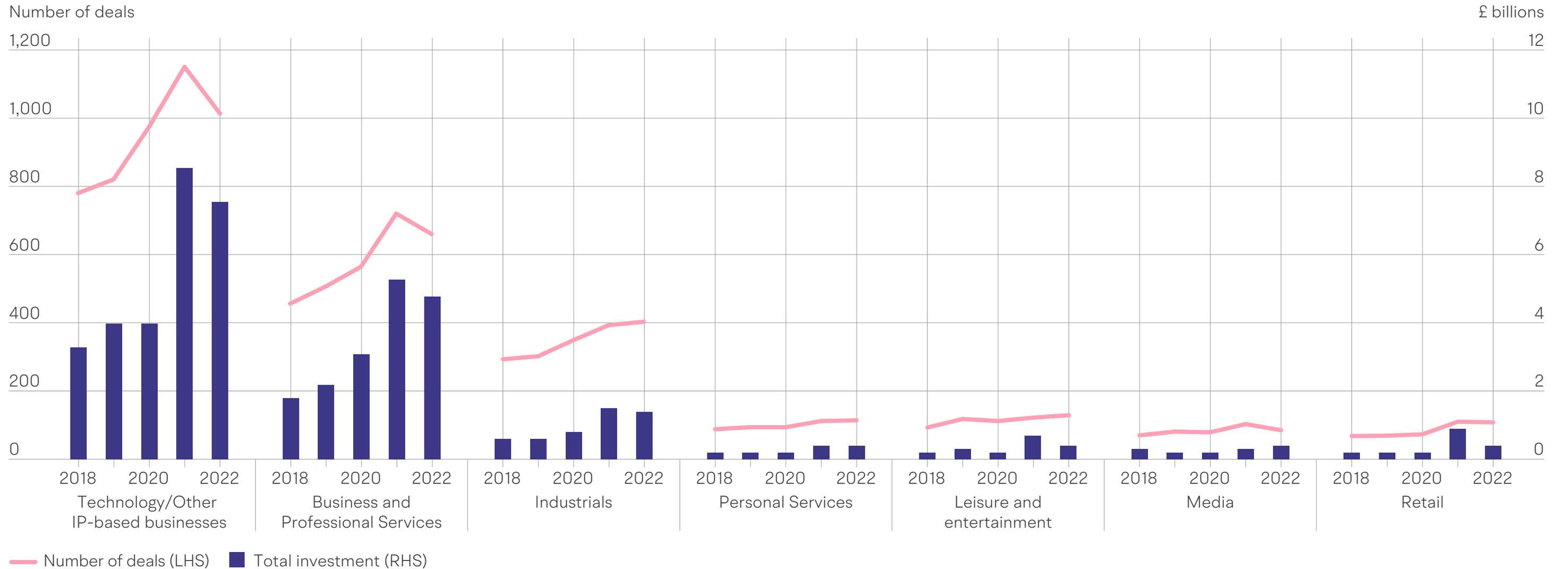
**All female-founded companies received a record 9% of equity finance deals, but continue to receive a relatively small share of total investment (2% in 2022)**

Promoting diversity and making the equity ecosystem more inclusive is important, particularly as women and individuals from ethnic minority groups have historically and persistently been underrepresented in the VC industry. In their tracking of UK companies, Beauhurst provides data on the gender makeup of founding teams and key employees.

Figure 1.12

**Equity deals and investment over time by sector**

Source: British Business Bank analysis of Beauhurst data



As shown in Figure 1.13 all-female founder teams received a record 9% of all deals in 2022, while only receiving 2% of total investment. This represented 218 deals during the year and £304m in equity funding. All-male founder teams, on the other hand, received £2.0bn in deal value across 1,787 deals, accounting for 73% of all deals and 85% of total investment in the market. Compared to the year before, total equity finance in 2022 decreased by 25% for mixed gender teams, 8% for all-male teams, and 4% for all female teams, demonstrating relative resilience among female-founded companies during the wider market downturn.

Figure 1.13 shows that over time, the share of equity investment received by all-female teams has remained relatively flat. The share of deals, on the other hand, has steadily increased from 7% in 2012 to 9% in 2022.<sup>12</sup> Mixed gender teams received 18% of all deals, the same as the year before, and 13% of total investment, a two-percentage point decline from 2021.

Figure 1.13

**Proportion of equity deals and investment received by all-female and mixed gender founder teams**

Source: British Business Bank analysis of Beauhurst data

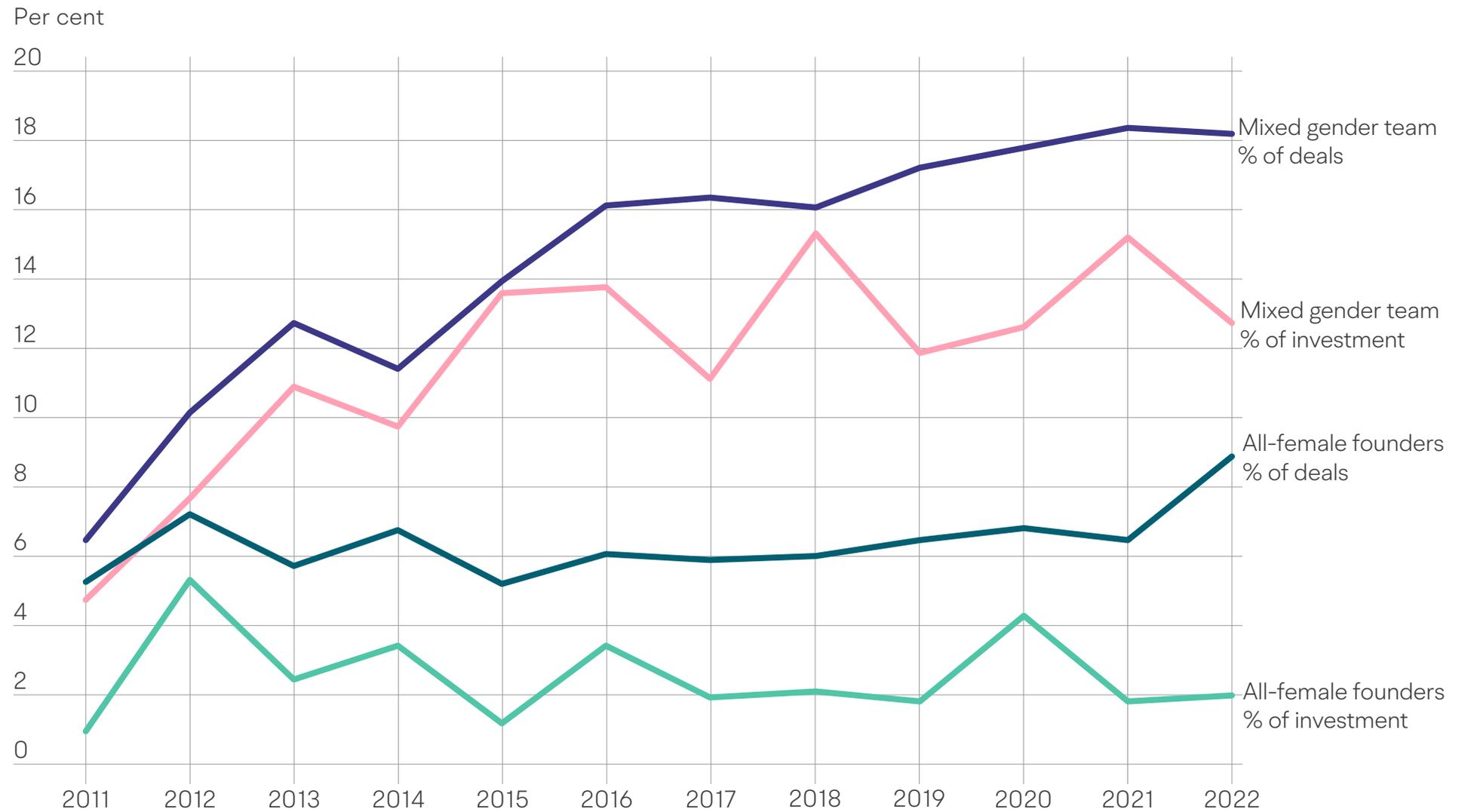


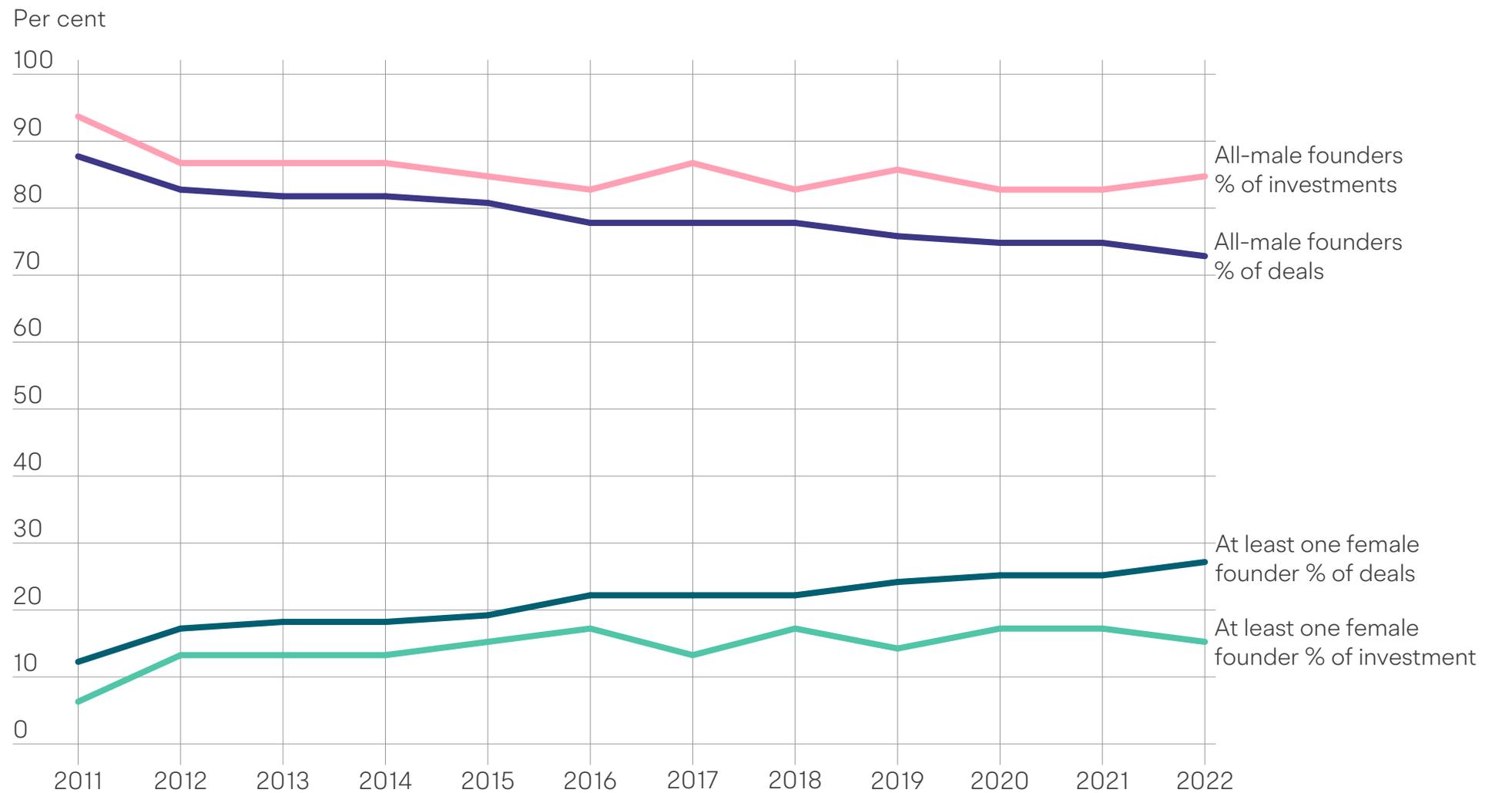
Figure 1.14 breaks down the proportion of deals and investment received by teams with at least one female founder. In 2022, 27% of all deals went to teams with at least one female founder, the highest proportion ever and an increase of ten percentage points since 2012. The share of investment in teams with at least one female founder during the same timeframe however, increased by only 2 percentage points, from 13% to 15%.

All-female founder teams are much more active at the seed stage than all-male or mixed founder teams. Out of 532 all-female founder deals between 2020-2022, 58% were seed stage companies, 37% venture, and 5% growth stage companies. This is compared to 40%, 46%, and 14% of all male teams, respectively. Even at the seed-stage however, all female teams raise significantly less funding than all-male teams. In 2022, all-female teams made up 12% of all seed stage deals, and only 4% of all seed stage funding. All-male teams on the other hand made up 68% of all seed stage deals and raised 79% of the total seed stage funding.

Figure 1.14

**Proportion of equity deals and investment received by all-male and teams with at least one female founder (combining all-female and mixed gender teams)**

Source: British Business Bank analysis of Beauhurst data



Female-founder teams raise smaller average deal sizes at all stages and are also less likely to receive follow-on funding. Follow-on rates are consistently lower for all-female teams compared to all-male or mixed gender ones. These differences do not appear to be driven by sector variations.

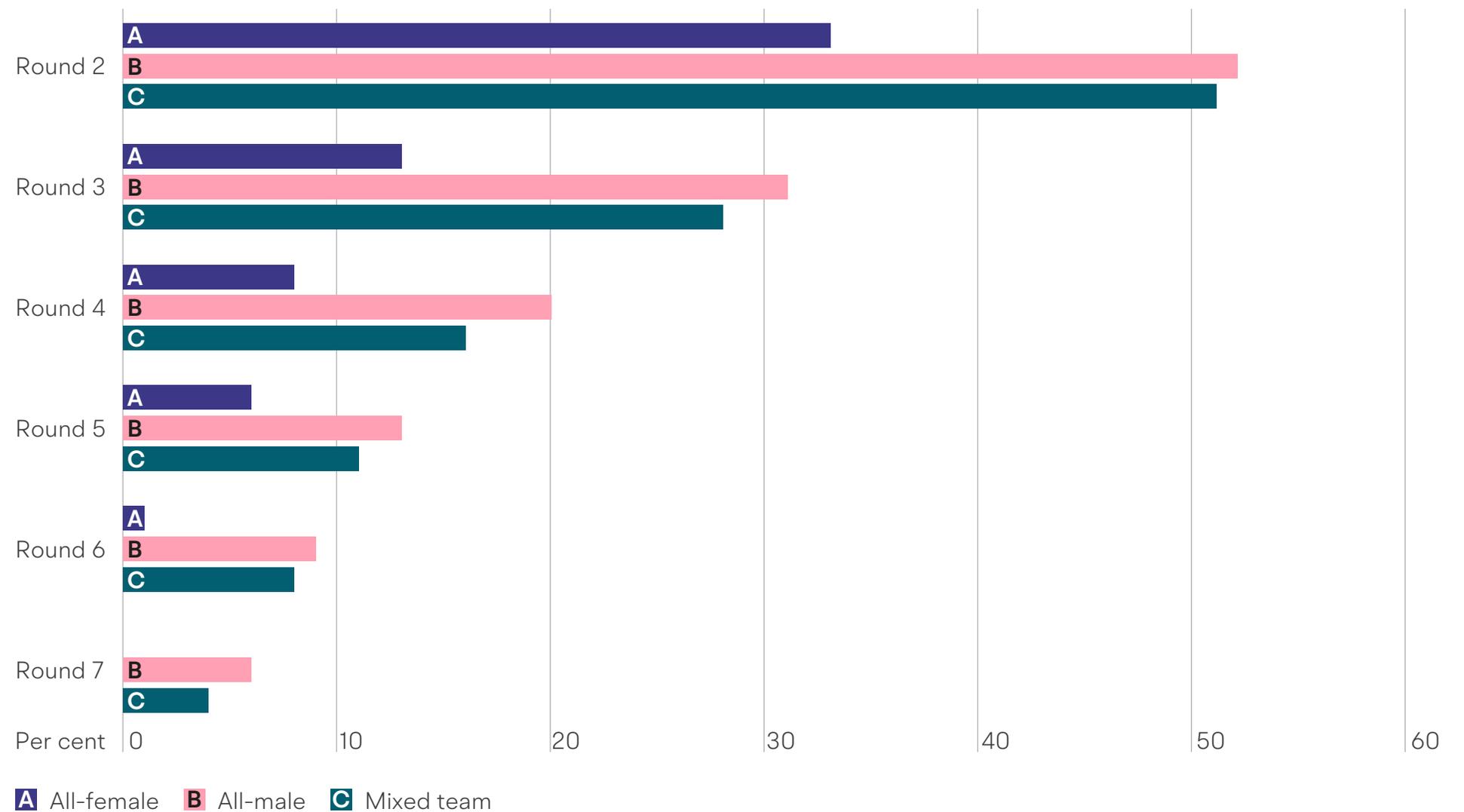
Figure 1.15 shows the proportion of companies, that had their initial funding round between 2012-2014, raising a follow-on round by gender of founder team. The proportion of all-female founded companies who go on to raise the second round is significantly smaller than the proportion for all male founders, a trend that continues every subsequent round. On average all-female teams also raise fewer subsequent rounds – while a small proportion of mixed and all male teams get to a seventh round, this is not the case for all female teams.

The average value of follow-on rounds raised by all female teams is lower than the average value raised by all-male or mixed gender teams. This trend persists when looking at first-time rounds as well. Looking only at first-time seed stage deals, a section where all-female teams tend to perform the best, the average first-time seed-stage amount raised by an all-female team (out of a sample of 232 deals) between 2020 and 2022 was

Figure 1.15

**Proportion of companies raising a follow-on round by gender of founder team**

Source: British Business Bank analysis of Beauhurst data



equal to £0.49 million. The average amount raised by all male teams during the same timeframe was £2m, over four times higher.

As shown in Figure 1.16 deals in the Technology sector made up the highest proportion of all-female founder team deals (30%) between 2020-2022, though this is lower than the corresponding share of around 40% for all-male and mixed gender founded businesses (Figure 1.15). All-female founded company deals are instead overrepresented in the industrials, retail, personal services and media sectors (when comparing to the proportion of all-male and mixed team deals).

In the context of the market trends explored in this chapter, it is evident that the Bank’s programmes will continue to have a key role in increasing the availability of equity finance to SMEs. The turn in market conditions during the latter half of 2022, symbolised by significant declines in growth stage dealmaking activity and a subdued exit environment, suggest that British Patient Capital (BPC) supported funds will be as important as ever in supporting later stages of the VC ecosystem –

including through the Future Fund: Breakthrough programme and the Life Sciences Investment Programme.

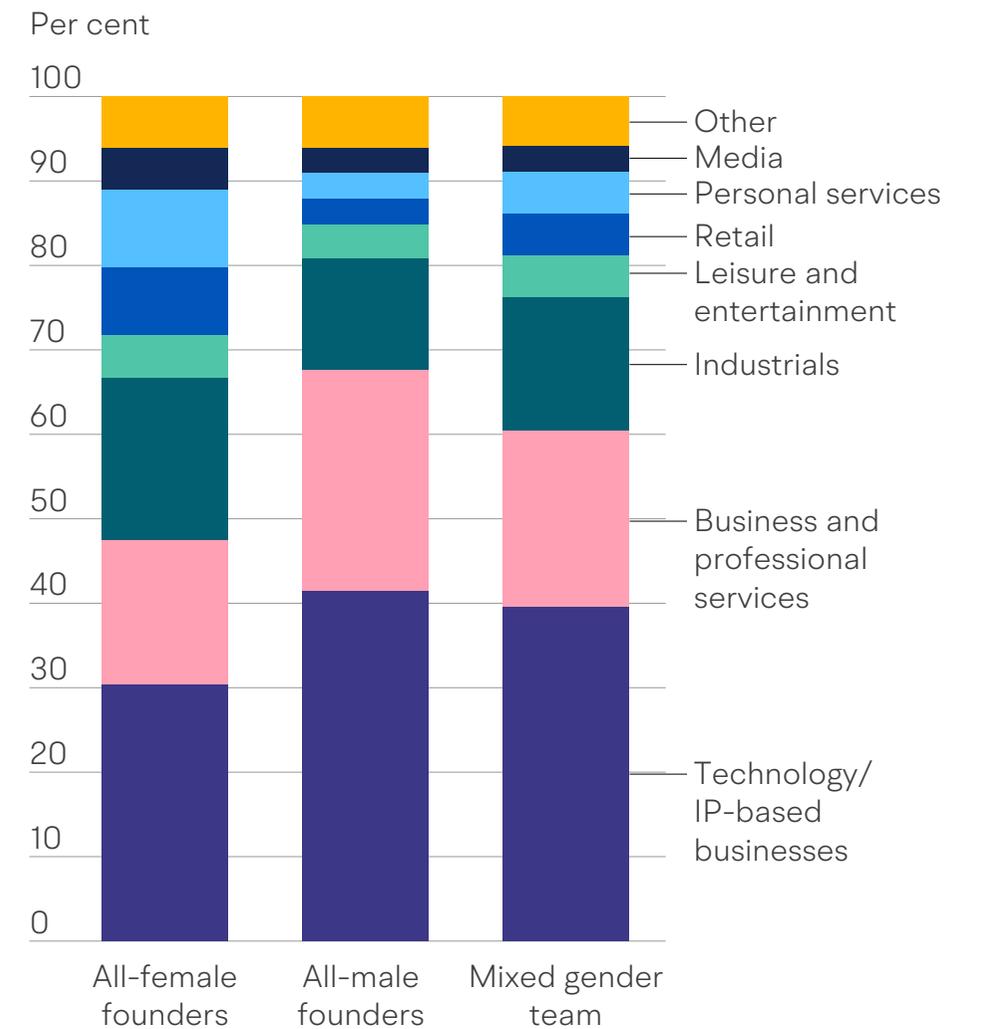
The Enterprise Capital Funds (ECF) programme is also increasing the availability of early-stage equity finance to high potential UK companies, which will be of added importance as the overall market downturn begins to affect early-stage funding as well.

The high concentration of deals and investment in London in 2022 highlights the continued market need of the Bank’s regionally focused programmes including the Regional Angel Programme (RAP), the Northern Powerhouse Investment Fund (NPIF), the Midlands Engine Investment Fund (MEIF) and the Cornwall and Isles of Scilly Investment Fund (CISIF). These programmes play an important role in increasing the supply of finance in all areas of the UK. The Bank will continue to monitor these changing equity finance conditions carefully, and stands ready to adapt its programmes to support the efficient functioning of the market for SMEs.

Figure 1.16

**Proportion of deals by sector and gender of founder team (2020-2022)**

Source: British Business Bank analysis of Beauhurst data



## Chapter 2:

# British Business Bank Activity

- British Business Bank equity programmes supported around 13% of all equity deals between 2020 and 2022
- British Business Bank supported funds were more likely to undertake deals in seed and venture stage companies compared to the overall market
- Funds supported by the British Business Bank were more likely to invest into Technology/IP-based businesses than the overall equity market
- Compared to the overall market, the Bank invested a higher proportion of its equity deals in eight of the twelve UK nations and regions
- British Business Bank programmes are more likely to fund academic spinout companies than the overall equity market
- An increasing proportion of Bank-supported deals are financing diverse founder teams

## Introduction

This chapter analyses the features of equity deals completed by equity funds supported by the British Business Bank. The analysis breaks down the Bank's equity investments by programme, comparing the characteristics of these deals to those completed by other VC investors and to those across the overall UK equity market.

Since its establishment in 2014, the British Business Bank's primary objective has been to reduce market inefficiencies in the area of small business finance and to increase the supply of funding. To reduce market failures in the equity finance market, the Bank mainly invests into VC funds as a Limited Partner,<sup>13</sup> alongside other private sector investors. This is done through the ECF and BPC programmes, for example.

The Bank also has two fund of funds programmes (Managed Funds and UKIIF) that invests in fund of funds that target VC funds that invest into innovative companies. Supplementary to these, the Bank co-invests into companies alongside other equity investors through the Future Fund: Breakthrough and Regional Angels Programme.

In 2018, the British Business Bank adopted an additional objective of aiming to reducing regional imbalances in access to finance. Regional imbalances in access to finance are tackled by geographic-specific programmes<sup>14</sup> that make both equity and debt investments. These include:

- Northern Powerhouse Investment Fund (NPIF)
- Midlands Engine Investment Fund (MEIF)
- Cornwall and Isles of Scilly Investment Fund (CloSIF)

The British Business Bank, together with its subsidiary British Patient Capital (BPC), was the largest UK-based LP investor in UK VC funds between 2017 and 2022 according to PitchBook data. This was based on both the total amount committed and the number of funds the Bank had invested in.<sup>15</sup> Since its creation in 2014, the Bank has committed £2.7bn<sup>16</sup> into 117 equity funds.

Table 3 provides a breakdown and description of the British Business Bank's equity programmes included in the analysis. The Future Fund is excluded from the analysis in this section, which focuses on the Bank's structural equity programmes. While Beauhurst is capturing the subsequent funding rounds where the Future Fund Convertible Loan Agreements convert to equity, the Bank is not providing any additional funding into the funding round. Therefore, these deals are not counted as Bank-supported deals in this section, although they will be captured in the overall market figures presented in Chapter 1.

Table 3

**Description of British Business Bank equity programme activity**

Source: British Business Bank

British Business Bank Programme	Description	Year programme started	Currently investing in SMEs?
ECF (Enterprise Capital Fund)	The Enterprise Funds programme helps fund managers looking to operate in the UK VC market raise venture capital funds ultimately increasing the supply of equity finance within the UK market. The Bank invests in VC funds specifically targeting early-stage businesses with high growth potential alongside private investors.	2006	Yes
UKIIF (UK Innovation Investment Fund)	UKIIF supports the creation of viable investment funds as one of the two fund of funds programmes operated by the British Business Bank. It primarily targets funds investing in strategically important sectors such as digital technologies, life sciences, clean technology, and advanced manufacturing. To date £159 million has been committed into underlying funds.	2009	No
ACF (Angel CoFund)	The Angel CoFund was established with an objective to increase the supply of business angel finance available to small businesses with high growth potential. Since its inception in November 2011, the Angel CoFund has enabled smaller businesses to secure over £280 million in investment. Every £1 invested by the Angel CoFund has leveraged around £5 from business angel syndicates.	2011	Yes
NPIF (Northern Powerhouse Investment Fund)	The NPIF provides commercially focused finance through funds investing in the North of England in collaboration with ten Local Enterprise Partnerships (LEPs). The £500 million programme utilises ERDF and EIB funding to unlock the region's potential for economic growth and transform the finance landscape for smaller businesses.	2017	Yes
Managed Funds Programme	The Managed Funds Programme is part of the Government's response to the Patient Capital Review and helps address the UK's patient capital funding gap. This £500m programme makes cornerstone investments in a number of large-scale, private sector managed fund of funds that invest in venture and growth capital funds backing innovative, high-growth businesses. The programme aims to draw in institutional capital into the UK's venture and growth capital markets.	2018	Yes
CloSIF (Cornwall and Isle of Scilly Investment Fund)	The £40m programme was established in partnership with the Cornwall & Isles of Scilly LEP to support access to debt and equity finance for businesses in the area.	2018	Yes

Table 3 (continued)

British Business Bank Programme	Description	Year programme started	Currently investing in SMEs?
MEIF (Midlands Engine Investment Fund)	MEIF provides over £300m of investment to boost small and medium business (SME) growth in the Midlands and is a collaboration between the British Business Bank and LEPs in the West Midlands and East and South East Midlands utilising ERDF and EIB funding.	2018	Yes
RAP (Regional Angels Programme)	The £100m Regional Angels Programme was established to help reduce regional imbalances in access to early stage equity finance for smaller businesses across the UK. It aims to raise the profile and professionalism of angel investment activity and to attract further third-party capital alongside business angels while generating a market rate of return.	2018	Yes
BPC (British Patient Capital)	British Patient Capital manages a £2.5bn investment programme designed to unlock an additional £5bn of institutional capital to support UK businesses with high growth potential to access the long-term financing they need to scale up. BPC invests on a commercial basis to demonstrate that a long-term patient capital investment strategy can produce commercially attractive returns. BPC was seeded with investments from the VC Catalyst programme which was established in 2013.	2018	Yes
FF:B (Future Fund Breakthrough)	Future Fund: Breakthrough is £375m UK-wide programme which encourages private investors to co-invest in high-growth, innovative firms. The programme makes equity co-investments with private sector investors in growth stage R&D-intensive British companies operating in breakthrough technology sectors. The minimum total investment round size is £30m. The maximum Future Fund: Breakthrough share of an investment round is 30%.	2021	Yes
LSIP (Life Science Investment Programme)	The Life Sciences Investment Programme (LSIP) is a £200m initiative managed by British Patient Capital designed to address the growth equity finance gap faced by high-potential UK life sciences companies. This is expected to attract at least a further £400m of private investment. Through LSIP, we make cornerstone commitments to later stage life sciences venture growth funds with a strong UK focus, typically investing between £50m and £100m in each successful fund.	2021	Yes

Deals completed by the British Business Bank and their supported funds are matched to deals in the Beauhurst dataset using their Company House ID (CHID). Only deals that have the name of the supported fund manager listed in the named investors list are classified as being backed by the Bank.

To avoid capturing deals made by fund managers before they became part of a British Business Bank programme, the Beauhurst investment date must also be within one year of the first recorded deal date on the British Business Bank MI data. Finally, the matching is undertaken at the programme level as one fund manager can be funded across several British Business Bank Programmes.

This approach minimises the chance of wrongfully including a deal that was not supported by the Bank. Because not all deals have complete investor information however, the final figures are likely an underestimation of the actual coverage of deals involving the British Business Bank.

Table 4 tracks the number of unique companies which received at least one equity investment from a fund supported by the Bank's equity programmes. Coverage varies by programme and is mainly dependent on whether the majority of the deals in the programme are announced via the programme or the fund manager's website. Out of 2,962 companies supported by the Bank's equity programmes, 55% of them have a matchable announced deal that meets our criteria described above. In total the analysis identified 1,899 announced equity deals in the Beauhurst dataset that were undertaken by funds supported by the Bank's equity programmes between 2011 and 2022. The total funding value of these deals was equal to £10bn.

Coverage varies by programme with high deal coverage of NPIF and MEIF (above 80%) due to the majority of the deals being announced via the programme or fund managers' websites, but there is lower coverage of deals made by BPC (57%) and ECF programmes (59%). The British Business Bank encourages all fund managers, supported or not, to disclose their equity deals publicly and improve the quality of the data.

Apart from deals supported by the Bank, Beauhurst also tracks deals made by other government funds such as the ERDF-backed JEREMIE funds, funds delivered by the devolved nations like the Development Bank of Wales and Scottish National Investment Bank, and local government funds. British Business Bank funds delivered by private sector fund managers involving private sector sources of capital, such as the ECF and BPC programmes, are not included in Beauhurst's definition of government funds.

In 2022 government funds supported 52% of all announced equity deals in Scotland and 39% of deals in Northern Ireland. In Wales the proportion was lower, and equal to 29% partly because Beauhurst classifies some Development Bank of Wales (DBW) deals as private equity. Reclassifying these deals as government funds increases the percentage to 53%, showcasing the government's significant contributions in making equity finance available to small businesses across devolved nations. Overall, local, and national government funds supported 12% of all announced equity deals across the UK in 2022.

Table 4

**Beauhurst coverage of British Business Bank supported fund equity deals by programme**

Source: British Business Bank analysis of Bank MI data and Beauhurst data

British Business Bank Programme	Number of matched UK companies	UK company population	Relevant coverage
Angel CoFund/Aspire	92	122	75%
BPC	341	569	60%
Future Fund: Breakthrough (FFB)	4	8	50%
Life Science Investment Programme (LSIP)	1	2	50%
Enterprise Capital Fund (ECF)	377	736	51%
UK Innovation Investment Fund	67	142	47%
NPIF	118	147	80%
MEIF	82	100	82%
CIOS	20	28	71%
Regional Angels Programme (RAP)	312	442	71%
Managed Funds (MF)	226	666	34%
<b>Overall</b>	<b>1,640</b>	<b>2,962</b>	<b>55%</b>

### British Business Bank equity programmes supported around 13% of all equity deals between 2020 and 2022

Figure 2.1 shows the number of annual deals supported by the British Business Bank that were successfully identified in the Beauhurst dataset. The number has grown from 28 announced deals in 2011 to 686 in 2021, before declining to 485 in 2022. Because additional deals tend to get identified by Beauhurst over time as companies and funds make more announcements, the 2022 figure should be treated as preliminary.

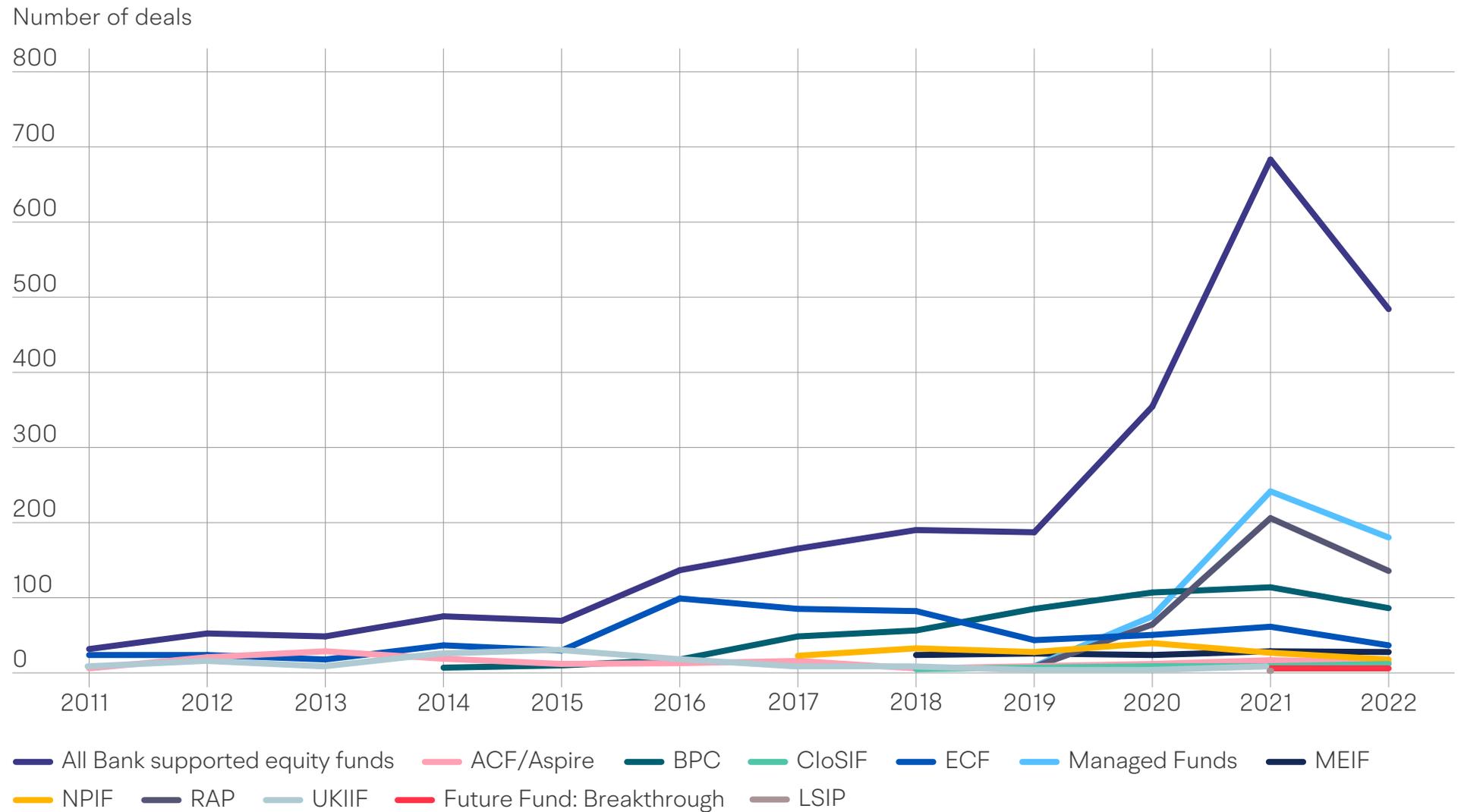
In this year’s edition of the Equity Tracker for example, we were able to identify 180 additional deals in our Managed Funds programme that the Bank supported in 2021. These were not captured by Beauhurst for last year’s edition of the Equity Tracker, due to the MF programme being relatively new with funding not yet deployed, resulting in a large number of deals not yet being announced.

The ECF programme invested in the highest number of annual deals until 2018 while in 2018, 2019, and 2020 BPC supported more announced deals. In 2021 and 2022 the bank supported the highest number of

Figure 2.1

### Number of announced equity deals involving British Business Bank supported funds over time by programme

Source: British Business Bank analysis of Bank MI data and Beauhurst data



announced deals through the Managed Funds programme. We should note that the Managed Funds programme is a fund of funds programme where the bank invests at the fund of fund level. This gives the Bank exposure to a higher number of VC funds because of the design of how the programme is designed. There are 145 unique VC funds in the managed fund portfolio.

It should be noted that figures identified in the Beauhurst dataset only include announced deals, and therefore differ from those on the British Business Bank's Management Information (MI) system which also covers unannounced ones. Follow-on rounds, while tracked through SH01 forms submitted at Companies House by Beauhurst, are largely unannounced and therefore less likely to be reported.

The remaining analysis in this chapter will compare the characteristics of deals supported by the Bank versus those backed by the overall equity market over a three-year period (2020-2022). This allows us to reduce the yearly volatility in the presented numbers and provide a more accurate picture.

British Business Bank equity programmes are estimated to have supported 13% of all UK equity deals between 2020-2022, with these deals making up 15% of the total

UK equity value invested during the period. Between 2019-2021, the Bank supported around 14% of all UK announced deals and 19% of the investment value. One reason for this small decline in the Bank's market share is the fact that the Bank's investments are concentrated in the Technology/IP sector, which experienced large declines in the number and average size of deals in 2022.

The Bank has a greater market share at the venture stage, making up 15% of all announced equity deals in the market, and 19% of the total investment value. Funds supported by the British Business Bank were also involved in 14% of seed stage deals (17% by value), and 9% of growth stage deals (13% by value).

Compared with last year's market share estimates for 2019-21, the Bank now has a marginally greater share of the seed stage market and a similar share of the venture stage market. The decline in overall market share has been driven by the growth stage, in which the Bank's share of investment has fallen from 19% to 13% in 2020-22. This is likely due to some megadeals (over £100m) occurring in the first half of 2022 which the Bank did not invest in. Note that the investment value in this case relates to the total size of the deal, which is not necessarily equal to the size of the Bank's investment.

Table 5

### British Business Bank market share in 2020-2022 by stage

Source: British Business Bank analysis of Bank MI data and Beauhurst data

Stage	By number of deals	By investment value
Seed	14%	17%
Venture	15%	19%
Growth	9%	13%
<b>Total</b>	<b>13%</b>	<b>15%</b>

Other investors are likely to be involved in the funding round as well, and the Bank is also not the sole source of funding for the funds it supports.

**British Business Bank supported funds were more likely to undertake deals in seed and venture stage companies compared to the overall market**

Funds supported by the British Business Bank were most likely to undertake deals in venture stage companies (46%). Figure 2.2 shows that this is 4 percentage points higher than the proportion of deals that went to venture stage companies in the overall equity market, and 10 percentage points higher than the proportion of deals allocated into venture stage companies by the wider PE/VC market. Most of the British Business Bank’s programmes operate through VC funds, making the comparison to the overall equity market as well as the wider PE/VC market very informative. Seed stage companies received 42% of the deals supported by the British Business Bank, while 12% of deals went to growth stage companies.

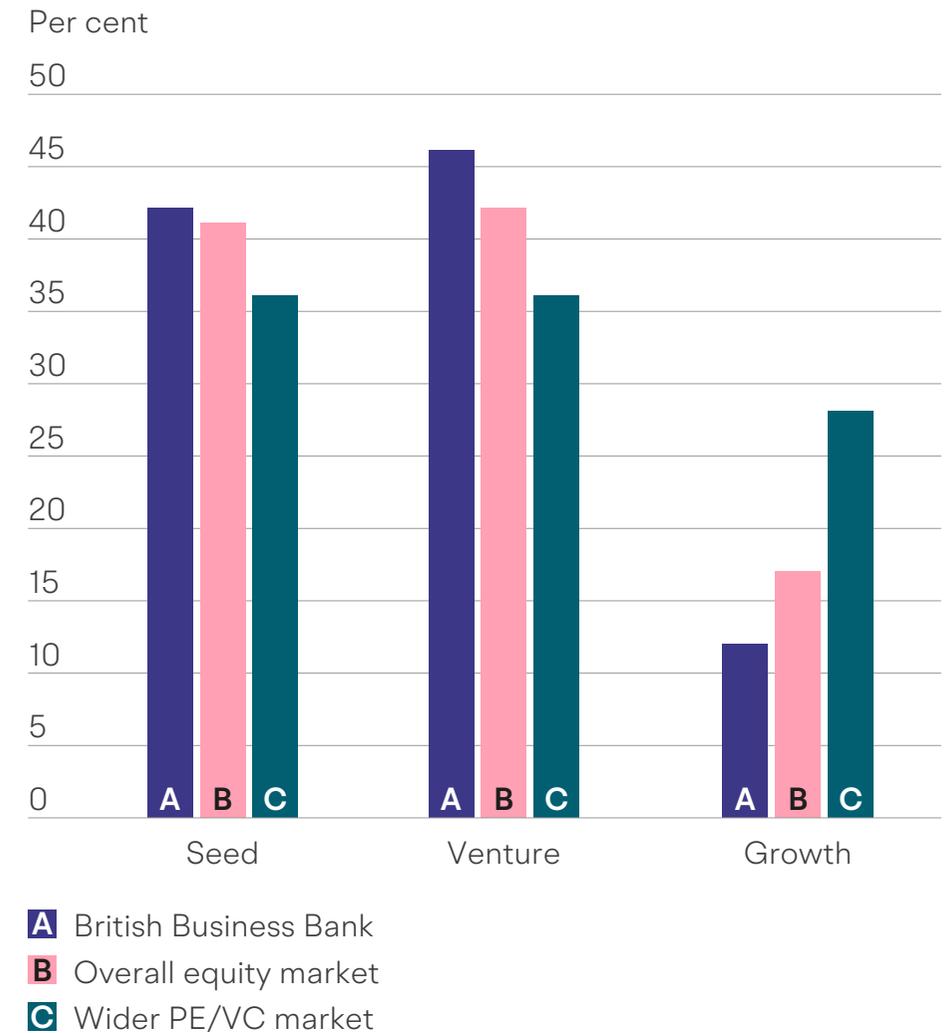
The stage composition of British Business Bank supported deals has been subject to change over time as shown in Figure 2.3. Until 2014, venture stage deals represented the largest proportion of deals supported by the Bank, reaching over 60% that year. Between 2014 and 2016 there was a large shift back towards the seed stage, with the proportion of British Business Bank supported fund deals in seed stage companies increasing from 14% in 2014 to 53% in 2016. This transition was largely due to the ECF programme investing in Entrepreneur First in 2016, an accelerator fund backing a relatively high number of early-stage businesses.

Since 2016 there has been a reduction in the percentage of deals at the seed stage, but this has stabilised to 43% in 2022. The venture stage has received the highest proportion of Bank-supported equity deals since 2019, with its share now at 46% in 2022.

Figure 2.2

**Proportion of equity deals by stage in 2020-2022**

Source: British Business Bank analysis of Bank MI data and Beauhurst data



The average size of deals completed by British Business Bank supported funds varies widely by stage:

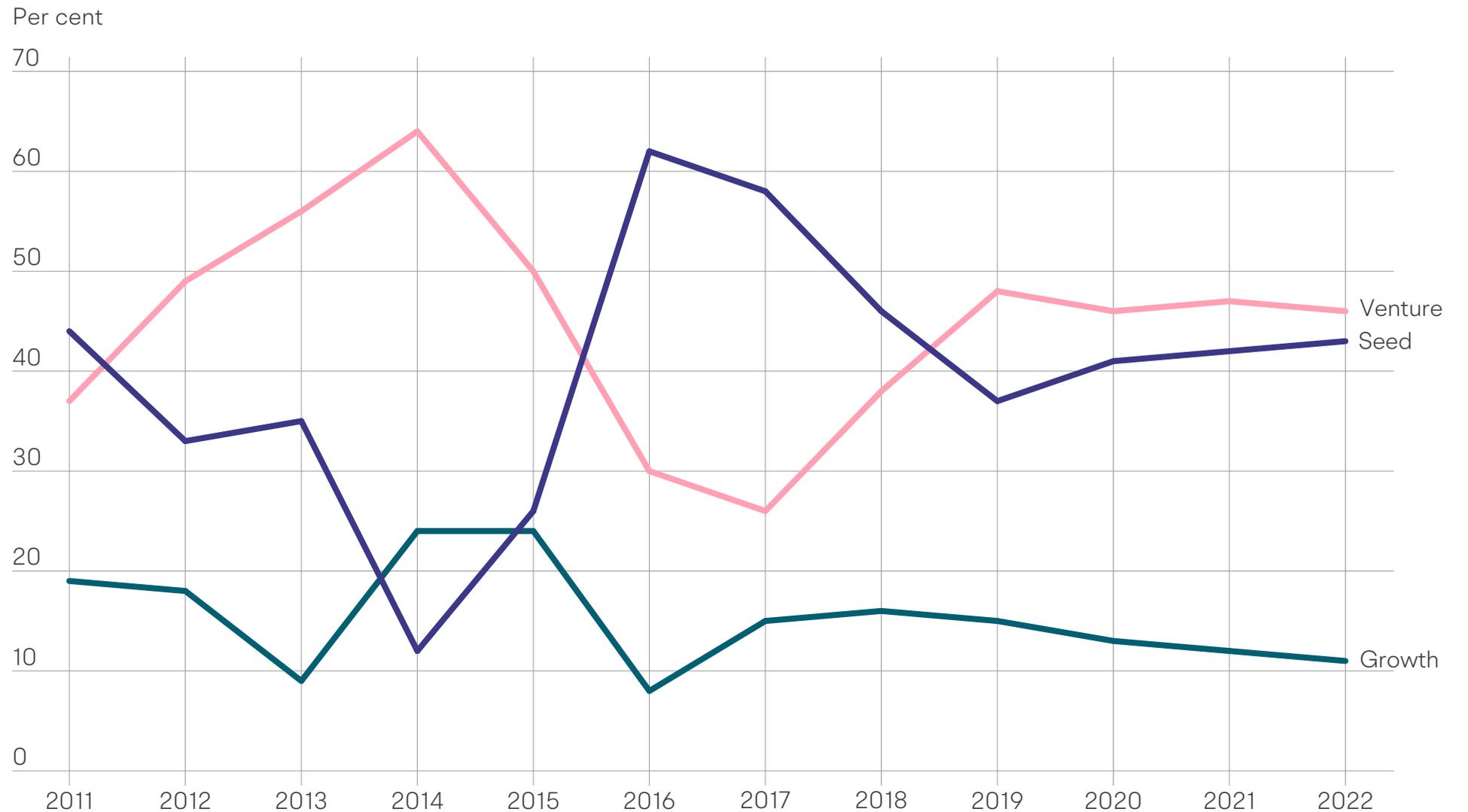
- Seed: The average size of British Business Bank supported fund seed stage deals in 2020-22 was £2.2m compared to £1.8m and £2.9m for the overall equity and PE/VC market, respectively.
- Venture: The average size of British Business Bank supported fund venture stage deals in 2020-22 was £6.0m, compared to £4.9m and £6.9m for overall equity and PE/VC market respectively.
- Growth: The average size of British Business Bank supported fund growth stage deals in 2020-22 was £25.1m, compared to £21.1m and £28.2m for overall equity and PE/VC markets, respectively.

The average size of growth stage deals completed by funds supported by the Bank’s programmes between 2020-22 is significantly larger than the wider equity market, showing the success of the BPC programme in supporting UK scale-ups since 2018. BPC is targeted specifically at later stage growth companies and is a major driver of this increase in deal sizes, helping to ensure companies are now better capitalised.

Figure 2.3

**Proportion of British Business Bank supported equity deals by stage over time**

Source: British Business Bank analysis of Bank MI data and Beauhurst data



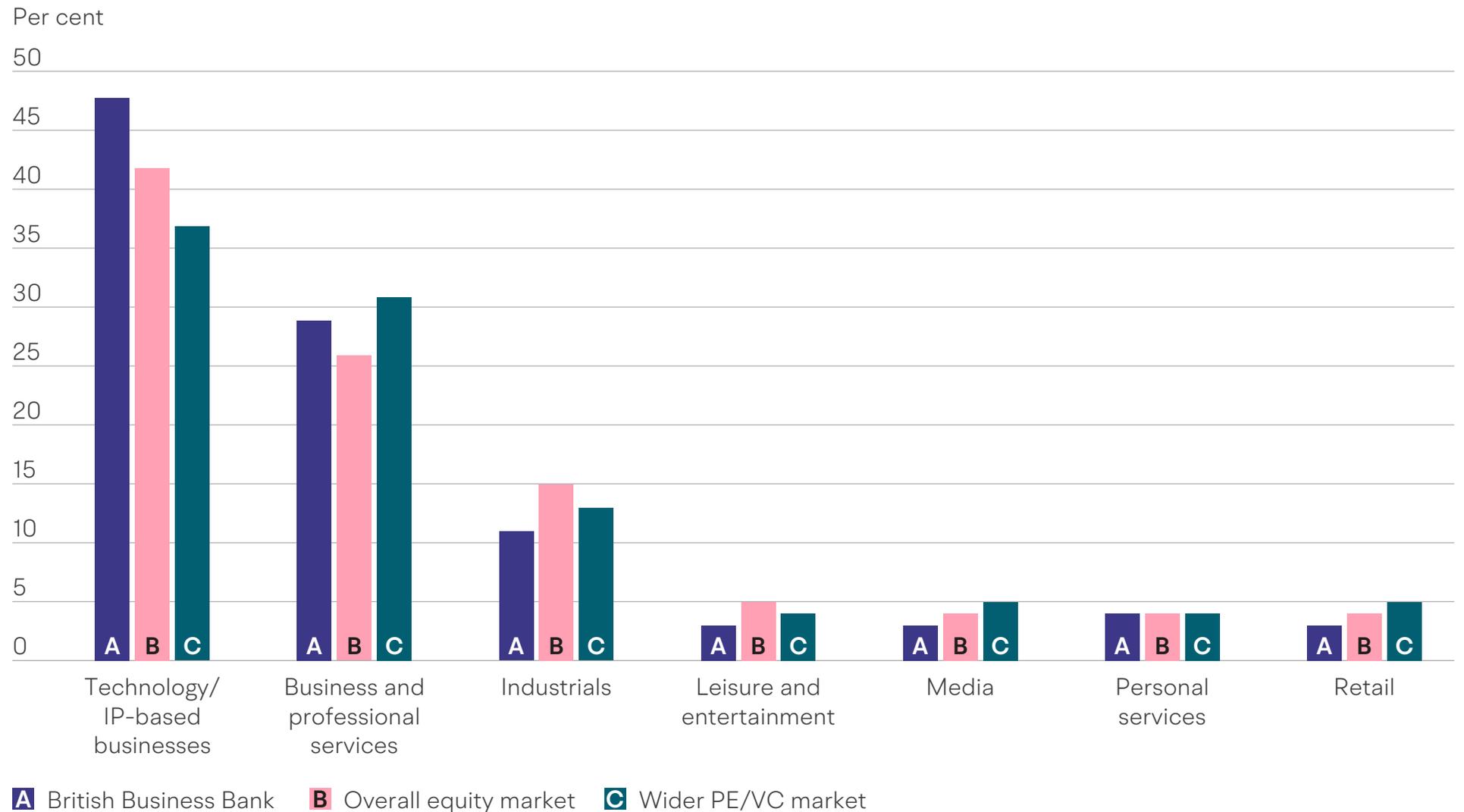
**Funds supported by the British Business Bank were more likely to invest into Technology/IP-based businesses than the overall equity market between 2020-2022**

Funds supported by the British Business Bank were more likely to invest in Technology/IP-based businesses compared to the overall equity market between 2019-2022 as can be seen in Figure 2.4. Nearly 48% of the Bank’s deals were in this sector compared to 42% for the overall equity market. The proportion of deals in the business and professional services sector made by the Bank (29%), was higher than the overall equity market but lower than the wider PE/VC market. 11% of deals supported by the Bank went into the industrials sector, lower than the proportion in the overall equity market (15%), as well as the wider PE/VC market (13%).

Figure 2.4

**Proportion of equity deals by sector in 2020-2022**

Source: British Business Bank analysis of Bank MI data and Beauhurst data



Dividing the Technology/IP-based business sector further into 6 sub-sectors, shows that 30% of all of the Bank's deals fit into the Software subsector category [16]. This is higher than the wider PE/VC market (23%), and the overall equity market (24%). The bank has a smaller share of deals going into Clean Tech (with 2%) than the overall equity market (3%), and a similar proportion as the PE/VC market.

### **British Business Bank programmes are more likely to fund academic spinout companies than the overall equity market**

The UK has some of the best universities in the world. These universities produce valuable research, some of which can be commercialised through the creation of university spinout companies. Between 2020-2022 Bank supported funds made 130 equity investments into such companies. As a proportion of deals undertaken this is equal to 12%. This is higher than the proportion of deals allocated to spinout companies by the wider PE/VC market (6%), and the overall equity market (9%).

BPC, the Regional Angel programme, and Managed Funds were the largest contributors to spinout companies, together making up 71% of the Bank's deals into university spinouts. The two regional programmes, NPIF and MEIF, also made important contributions, together making up 16% of the Bank's deals into spinouts.

As a percentage of all deals made by the programme, 100% of LSIP deals and 75% of all of the Future Fund: Breakthrough deals went to university spinout companies. While this is only based on 1 LSIP and 4 FF:B deals, it still reflects these programmes' objectives of funding R&D intensive companies. The next highest percentages were MEIF at 27%, Regional Angels programmes at 16%, NPIF at 15%, and ECF at 10%. The strength of NPIF and MEIF deals in supporting university spinouts reflects the strength of universities in these regions and the MEIF's proof of concept fund.

In terms of universities from where the spinout companies originated, between 2020-2022 the top four institutions by the number of British Business Bank supported deals were University of Cambridge (21 deals), University of Bristol (15 deals), and University of Oxford (14 deals), and University College London (11 deals).

### Compared to the overall market, the Bank invested a higher proportion of its equity deals in eight of the twelve UK nations and regions

As shown in table 6, between 2020-22 the Bank invested a higher proportion of its equity deals in the following nations and regions compared to the overall equity market: London, East of England, North West, South West, West Midlands, Yorkshire and The Humber, Northern Ireland, and East Midlands.

On the one hand the overrepresentation in London reflects the strategic focus on the technology sector across some of the Bank's key products, particularly BPC. However, the activity of the Bank's regional programmes, including NPIF, MEIF and CloSIF, is also highlighted through its higher concentration of deals in the North West, the Midlands and the South West, compared to the wider market.

Table 6

#### Proportion of equity deals by nation and English region in 2020-22

Source: British Business Bank analysis of Bank MI data and Beauhurst data

Nations and English regions	British Business Bank	Overall Equity Market	Wider PE/VC market
London	50.3%	48.5%	46.8%
East of England	7.5%	6.7%	5.5%
South East	7.2%	9.7%	11.8%
North West	7.0%	6.0%	9.0%
South West	5.5%	5.0%	5.5%
Scotland	5.0%	8.9%	4.8%
West Midlands	4.2%	2.8%	2.5%
Yorkshire and The Humber	4.3%	3.3%	4.6%
Northern Ireland	3.3%	1.3%	1.0%
North East	1.9%	3.3%	3.2%
Wales	1.6%	2.6%	3.0%
East Midlands	2.1%	2.0%	2.3%

The Bank’s NPIF and MEIF programmes began investing in 2017 and 2018 respectively. Beauhurst picked up 28 deals made by these two funds in 2022, contributing 8% and 14% of the total deal number in the Midlands and the North respectively. Both of these proportions are lower than reported previously reflecting fewer programme deals identified, but also higher numbers of overall market deals which is a positive development, as it shows that these local VC ecosystems are becoming more active.

Whilst CloSIF has smaller numbers of deals identified in the Beauhurst dataset (five in 2021 and seven in 2022), the number of wider market deals in the Cornwall and Isles of Scilly Local Enterprise Partnership is lower than in other areas. CloSIF therefore had a significant 33% market share in the number of deals in 2022, following a 42% market share in 2021.<sup>17</sup>

### An increasing proportion of Bank-supported deals are financing diverse founder teams

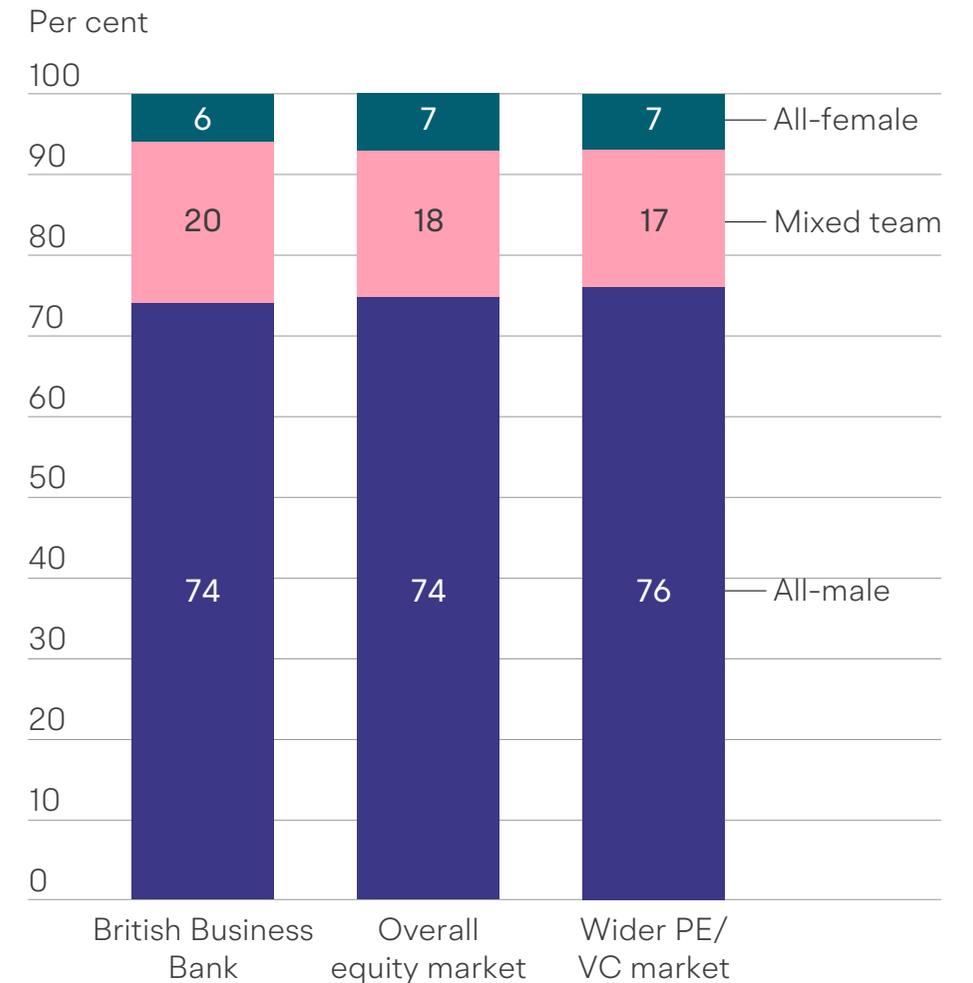
Beauhurst’s coverage of the gender of company founders and key people has increased over time. For instance, Beauhurst records the gender composition of founder teams for 93% of deals in 2020-22 and that of key people in the company for 95% of deals in 2020-22. The percentages mentioned in the following analysis relate to companies with information on founder team gender and key person team gender only, where the gender composition of the team could be determined. Companies with insufficient information are excluded from the denominator to allow robust comparisons.

Figure 2.5 shows that 26% of British Business Bank programmes supported deals between 2020-22 went to a company with at least one female founder (all-female founder teams and mixed gender teams combined). This is the same as the overall equity market (26%), and higher than the Wider PE/VC market (24%).

Figure 2.5

### Gender composition of company founders receiving an equity deal in 2020-2022<sup>18</sup>

Source: British Business Bank analysis of Bank MI data and Beauhurst data



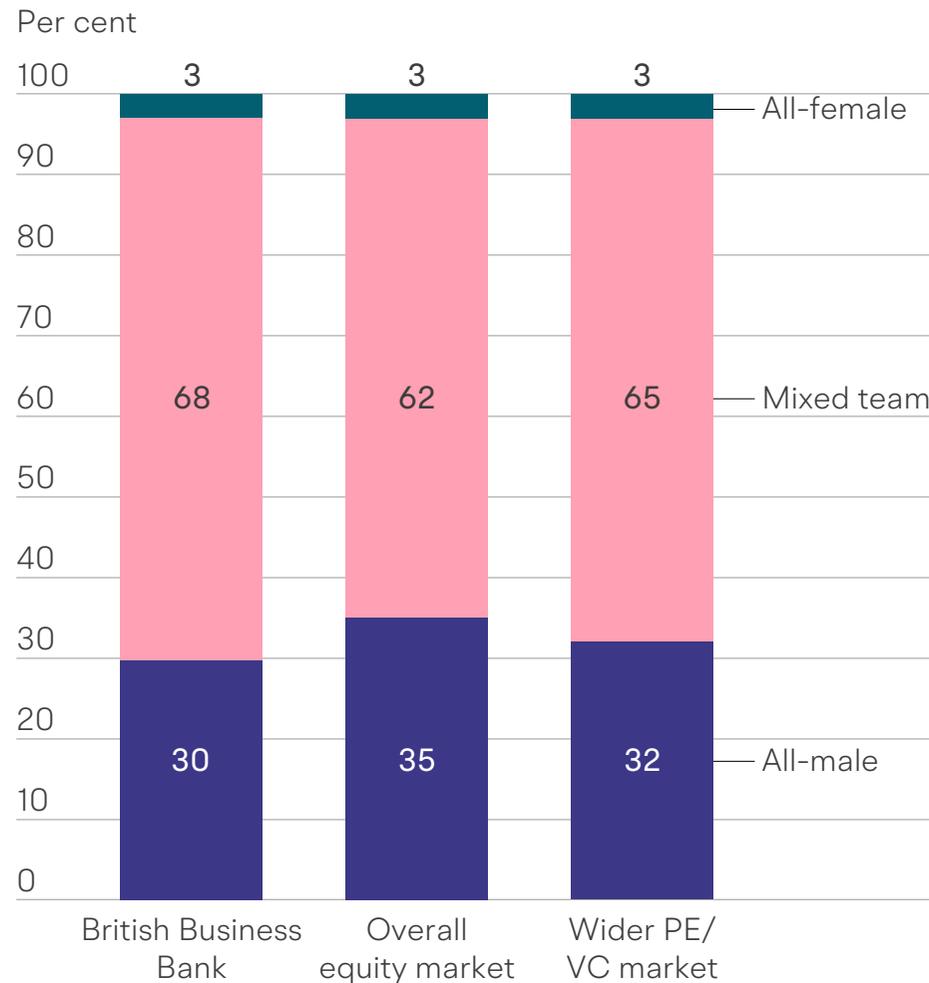
As companies grow and develop, they are likely to take on additional people, so it is also important to assess the current composition of the key people.<sup>19</sup> By its nature, this should lead to the proportion of all-female and all-male companies declining assuming companies are just as likely to employ a male or female within its key functions. Figure 2.6 shows that 71% of British Business Bank supported deals between 2020 and 2022 went to an all-female or mixed gender team compared to 65% for the overall equity market and 68% for PE/VC funds.

The Investing in Women Code helps drive the change necessary to improve venture capital markets for female founders, so they can raise the capital they need for their businesses to reach their full potential. The British Business Bank is a founding signatory of the Code and manages it, on behalf of the Department for Business and Trade (DBT), for venture capital funds. The findings presented here provide valuable market-wide data that complements Code signatories' data on investment in female founders, due to be published in Summer 2023. Both are important for greater transparency across the industry. Such transparency can, in turn, help to identify whether measures are working and where further actions are needed.

Figure 2.6

**Gender composition of key people at companies receiving an equity deal in 2020-2022<sup>20</sup>**

Source: British Business Bank analysis of Bank MI data and Beauhurst data



## Chapter 3:

# UK Strengths & Opportunities in Breakthrough Technologies

- The UK has a track record in scaling technology sectors through its VC ecosystem, including FinTech, Software, Life Sciences & AI
- Over £10.5bn in VC investment was raised by UK Life Sciences companies during 2020-22, more than Germany, France and Canada combined
- The UK still underperforms in Life Sciences VC relative to its research capability, and on a GDP-adjusted basis only receives 60% of US VC
- The UK can capitalise on its current position in Nanotechnology, a cross-cutting technology which enables other Deep Tech sectors
- The UK has a foundation of research excellence, patent activity and over 100 start-ups upon which to scale future nanotech propositions
- There is also a significant future market opportunity in Space Technology, one of the fastest growing global technology areas
- While the UK accounts for a significant share of global Space Technology deals, it needs to attract larger rounds to keep pace with competitors

## 1. Overview of technology strengths and opportunities in UK VC

Over the past decade there has been significant progress in the research, development and scaling of general purpose technologies. These have ranged from R&D intensive technologies such as Robotics and 3D printing, to digitally-led technologies such as Cybersecurity and Software as a Service (SaaS). The intersection of Artificial Intelligence (AI) with these technologies has also facilitated applications across a much wider range of industries, from the use of machine learning in drug discovery (also known as TechBio) to autonomous vehicles in Agriculture.

The UK has been well positioned to capitalise on many of these emerging technology trends, being home to a number of world-class universities and the leading VC market in Europe.

This chapter provides an assessment of the UK's current strengths and potential future opportunities in scaling technology sectors from the VC ecosystem. The first section draws upon VC data across specific technology sectors to identify three types of areas for further investigation: 1) an established technology where the UK is internationally competitive, 2) a breakthrough technology where the UK can capitalise on a globally leading position, and 3) a breakthrough technology where the UK requires greater investment to keep pace with international competitors.

The analysis uses PitchBook's VC data<sup>21</sup> and its industry vertical categories to enable analysis across a wide range of technology sectors at both the UK and global level. For the deep dives into specific verticals, the UK's competitiveness is compared internationally with other leading VC markets. For example, the US provides a useful benchmark for the UK to aspire to as its VC

ecosystem is the largest and most developed globally. The US has notable history of deep tech innovation through the DARPA (Defense Advanced Research Projects Agency) programme, government-supported VCs such as In-Q-Tel, and world leading universities. The analysis also includes some of the more advanced European and Asian VC ecosystems that have developed more recently and that also act as a useful point of reference in comparison to the UK market.

Data on the level of public funding for each sector, as well as data from the OECD on scientific research publications and patent activity, is also analysed to understand the extent to which the UK is successfully commercialising its R&D capability through VC-backed business propositions.

Figure 3.1 provides an overview of the technology areas where the UK has reached significant scale, looking at both its degree of specialisation and international competitiveness. It compares the proportion of the UK’s overall VC invested in a given technology sector, to the UK’s share of the global market in that technology sector. Areas towards the top right demonstrate a high degree of both UK specialisation and global strength, while areas to the top left indicate smaller verticals where the UK already has a significant global position. Technologies towards the bottom left receive a lower share of UK VC and are areas where the UK is yet to capture a notable share of the global VC market.

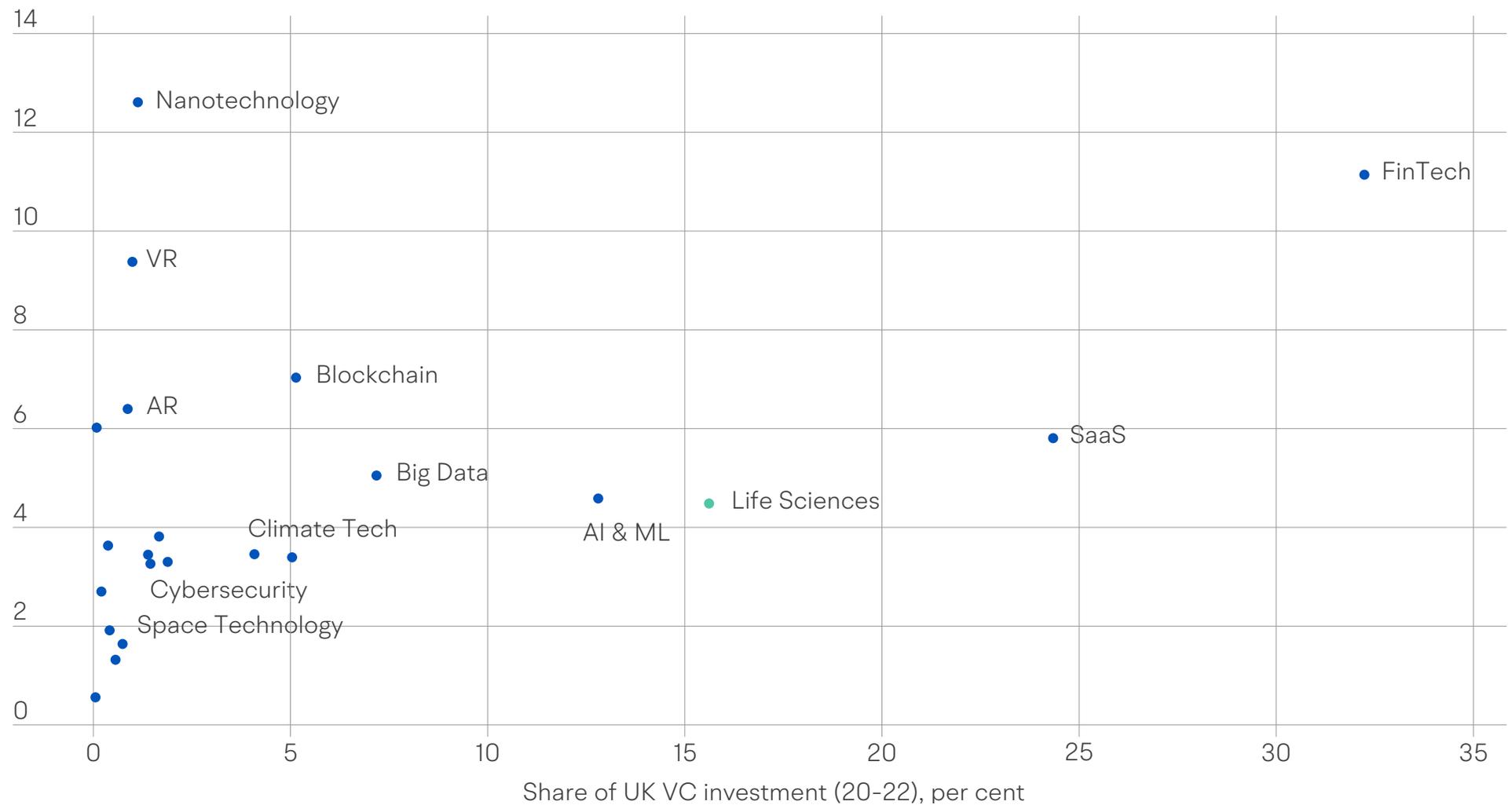
There are four technology areas where the UK performs well on both of these scale measures: FinTech, SaaS, Life Sciences and AI. Life Sciences in particular is one of the UK’s largest sectors within the broader deep tech category, which captures “companies founded on tangible scientific discoveries or meaningful engineering innovation.”

Figure 3.1

**Share of UK VC and UK global VC market share, by technology area (2020-22)**

Source: British Business Bank analysis of user defined PitchBook search. Results may differ from PitchBook's own published figures

UK share of global VC investment (20-22), per cent



Deep tech sectors generate long-term economic benefits in the form of knowledge spillovers and high-skilled employment, but also large face a unique set of challenges because of their complex nature, long development times and the large amounts of financing required to commercialise them.

These characteristics make the Life Sciences sector an interesting candidate for a deeper dive under the first category, focusing on an established technology where the UK is internationally competitive. Section 3i will consider the extent to which the sector has developed over the last ten years, the contributing factors, and the UK’s current global position versus other leading markets.

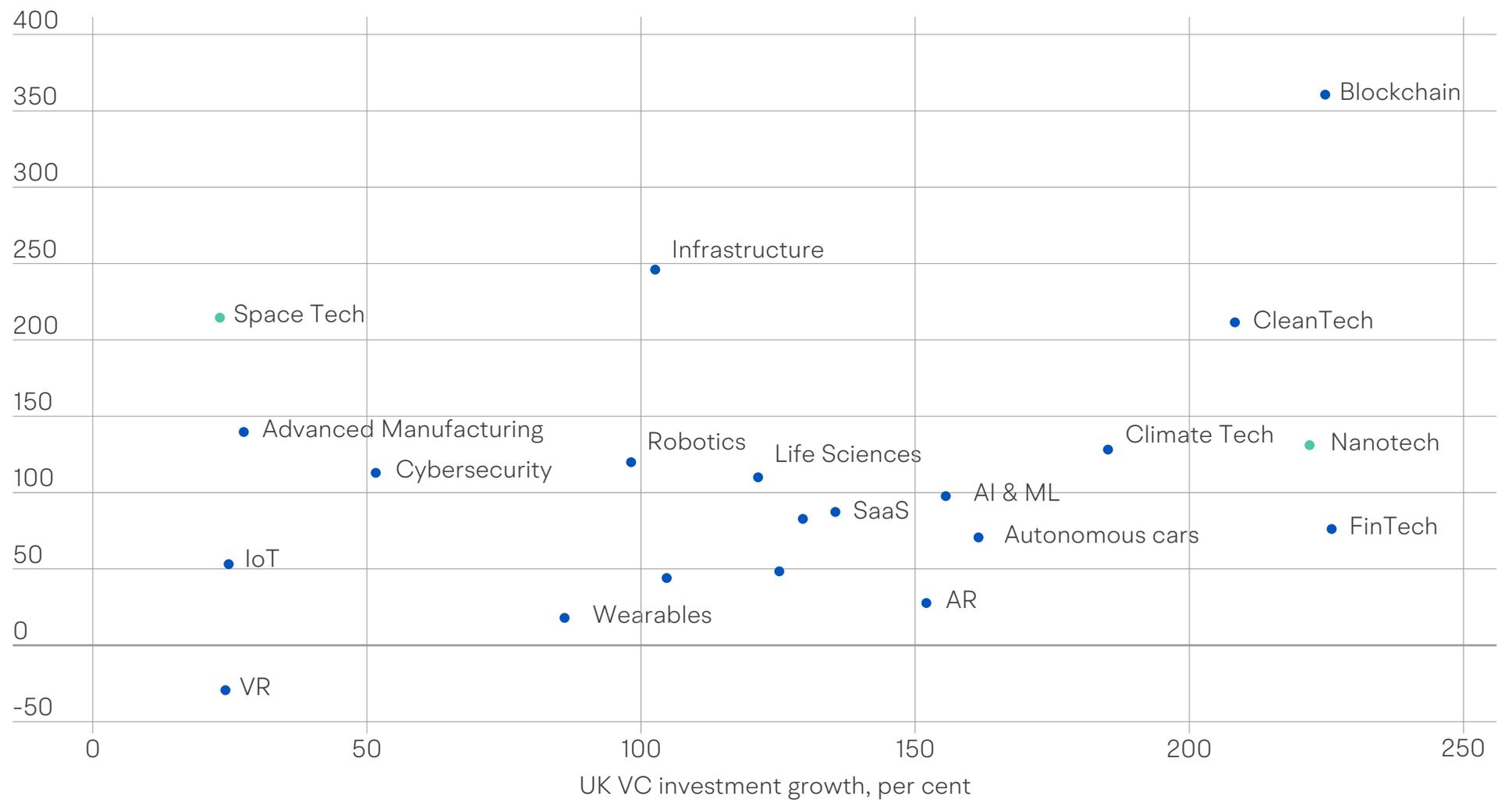
Having taken an overview of UK strengths across different technology areas, this sub-section now looks at where they may be emerging opportunities to scale more nascent technologies from the VC ecosystem. Figure 3.2 plots the growth of both UK and global VC investment by technology area, using the percentage change in finance between 2017-19 and 2020-22 (using three year periods to smooth out annual volatility in investment).

Figure 3.2

**UK and global VC investment growth, by technology area (2020-22 vs 2017-19)**

Source: British Business Bank analysis of user defined PitchBook search. Results may differ from PitchBook's own published figures

Global VC investment growth, per cent



A number of the technologies analysed in Figure 3.2 are clustered around the 100% mark on both measures – i.e., where investment has roughly doubled in value in the UK and across the world. In these instances, such as in the Robotics<sup>22</sup> sector, the UK can be thought of as broadly keeping pace with global progress in these verticals. Towards the top right the UK is also matching the level of investment growth seen internationally, but in more rapidly expanding sectors. The clearest example of this is CleanTech,<sup>23</sup> where the global growth rate of 211% has been matched by the UK's increase of 208%. The UK now has a global market share of 5% in this fast growing sector.

Looking at other areas of the distribution in Figure 3.2, technologies towards the bottom right indicate where the UK has outperformed global growth over the period, while for technologies towards the top left the UK has lagged behind. Two less established technology areas in particular stand out as interesting case studies for further investigation. On the one hand, UK growth in Nanotechnology<sup>24</sup> VC investment is very high (at over 220%), and it is outpacing the already high rate of growth experienced across the global VC market (130%).

Conversely, the Space Technology<sup>25</sup> sector has seen very high global growth over the period (at 223%), while the UK has only achieved an equivalent increase of 23% in VC investment. These verticals therefore represent opportunities for the UK in opposite ways – for the former it is an area for the UK to double down on and potentially become the global leader, while in the latter the UK requires greater VC investment to keep pace with international competitors.

---

## 2. Current UK technology strength: Life Sciences

### 2i) UK capability in Life Sciences

Life Sciences broadly refers to the application of biology and technology to human health improvement. The Life Sciences industry is one of the largest and most strategically important technology sectors in the UK economy. Research from the Office for Life Sciences,<sup>26</sup> for example, finds that over 6,500 business are active in the sector, generating £94bn in turnover and employing 282,000 people – with both of these measures of economic activity on a continuous upward trend since 2013. The UK is home to two of the top

20 pharmaceuticals companies in the world, in AstraZeneca and Glaxo Smith Kline, as well as the European headquarters of both Pfizer and Eli Lilly.

The UK also has a foundation of academic excellence and R&D activity upon which to scale successful commercial propositions. Looking first at publicly funded R&D, in 2020 the government's budget for health R&D amounted to £2.7bn – at 0.12% of GDP, this ranked the UK third globally (of selected comparator countries) behind the US and marginally below Japan.<sup>27</sup> In terms of academic institutions, the UK also has two of the top five global universities for Life Sciences teaching and research (in Oxford and Cambridge).<sup>28</sup>

Figure 3.3 compares the UK’s R&D capability to that of key competitor economies across both research excellence and business innovation indicators from the OECD. The first indicator measures the proportion of the UK’s research publications in Medicine that are among the world’s 10% top-cited, as a measure of the quality of Life Sciences research output. The second indicator measures the UK’s revealed technological advantage (RTA) in Medical Technology. RTA data compares a country’s share of patents in a given sector to its share of patents across all sectors.<sup>29</sup> A figure above one indicates relative specialisation of a given country in a technological domain.

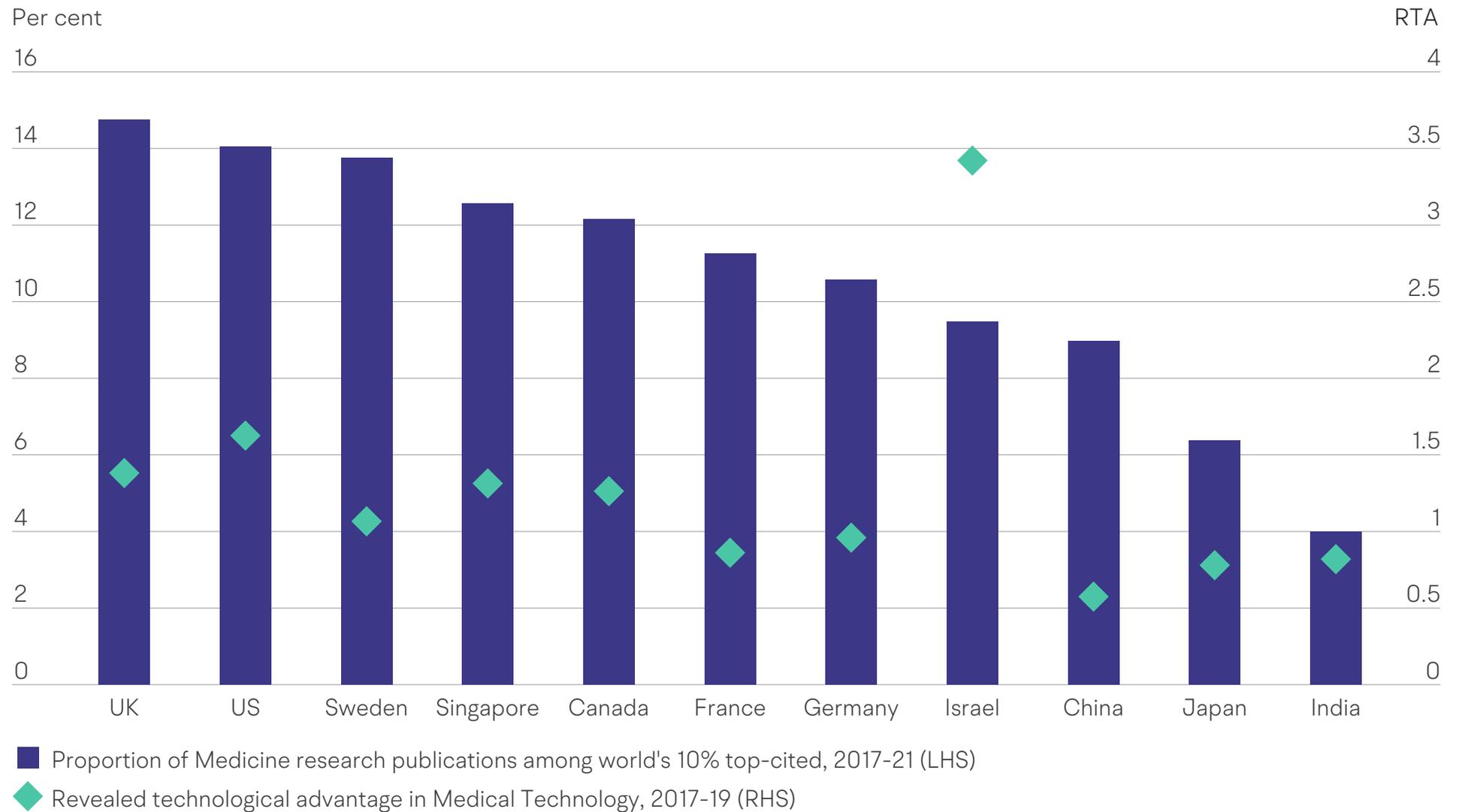
Looking first at the quality of research output, 14.8% of the UK’s research publications in this field are among the top 10% most-cited globally (using the most recent data for 2017-21). This places the UK first out of the selected group of globally leading VC markets, above the US (14.1%), Sweden (13.8%) and Singapore (12.6%). Given the quality of the UK’s academic institutions it is no surprise to see it performing this strongly in research excellence.

Focusing next on patent activity, the UK’s RTA of 1.36 suggests that it has notable degree of specialisation in business innovation in the Life Sciences sector.

Figure 3.3

**UK research excellence and technological advantage in Life Sciences**

Source: British Business Bank analysis of OECD data



While ranking third behind Israel and the US on this measure, this still places the UK as a globally leading economy – ahead of its European counterparts and Asian countries such as China, Japan and India.

Taken together this evidence clearly demonstrates that the UK has world class R&D capability in Life Sciences, and that this is an industry where the UK specialises – demonstrated recently by its development of the Oxford/AstraZeneca vaccine. The next section considers the extent to which this has flowed through into VC investment over the past decade, the contributing factors, as well as how the UK VC ecosystem compares to other leading markets globally and what current challenges it is facing.

**2ii) VC investment trends in Life Sciences**

Figure 3.4 shows the value and volume of VC deals in UK Life Sciences. The sector has demonstrated significant progress over the last ten years, with the growth particularly accelerating over the past five years. The number of deals rose from 270 in 2017 to 505 in 2021, while total investment saw a fivefold increase from £1.0bn to £5.2bn over the same period.

Figure 3.4

**VC investment in UK Life Sciences**

Source: British Business Bank analysis of user defined PitchBook search. Results may differ from PitchBook's own published figures

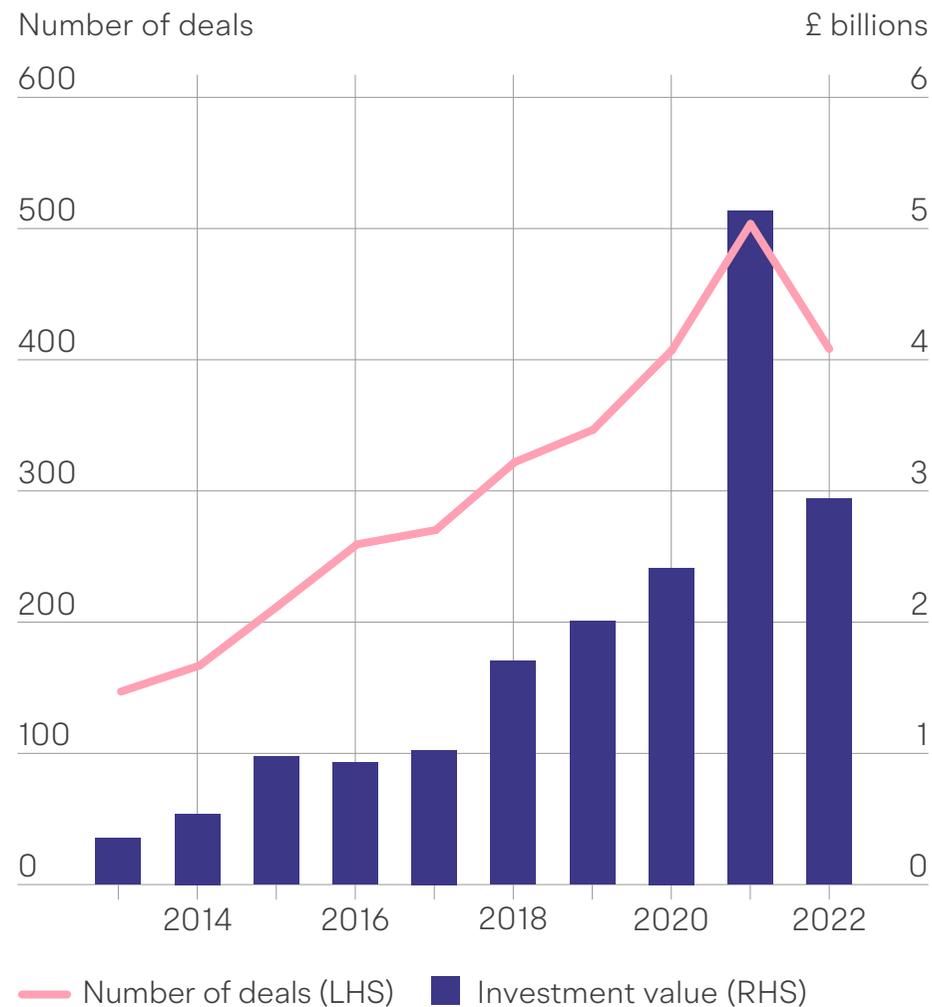
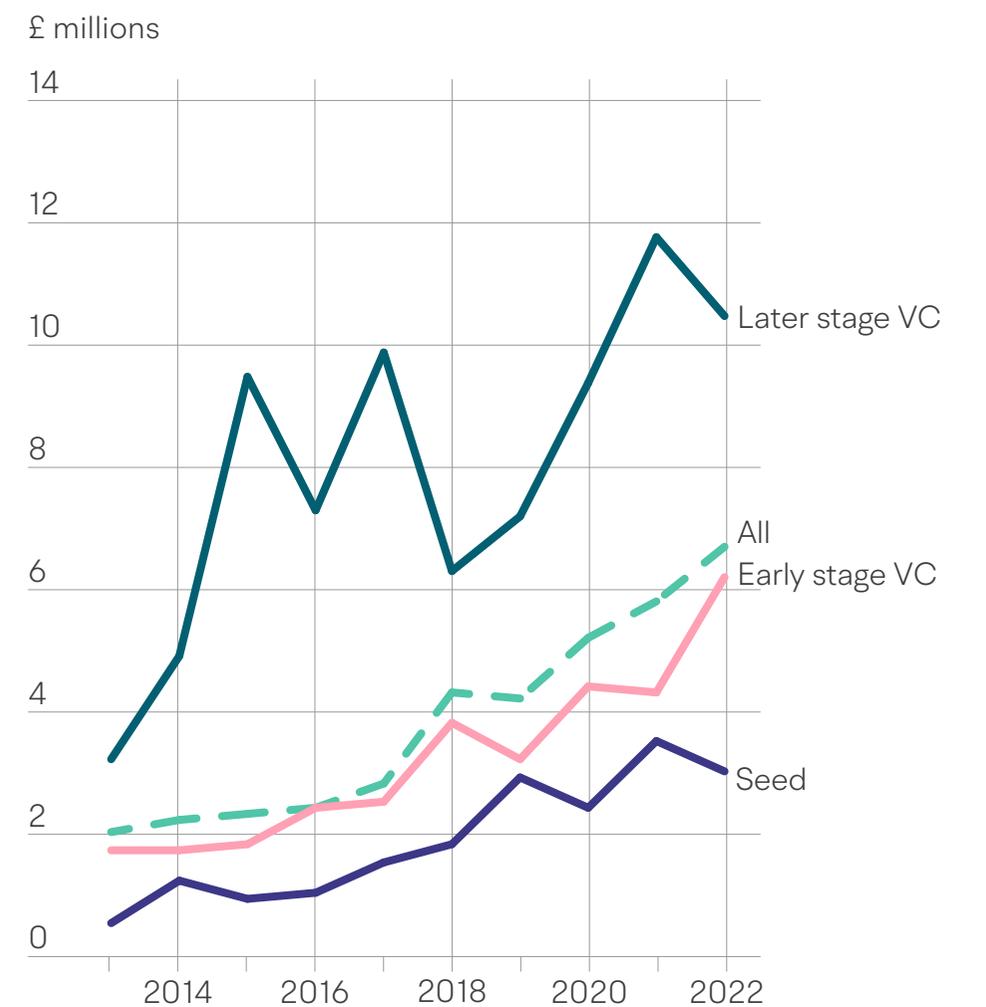


Figure 3.5

**Median pre-money valuations in UK Life Sciences**

Source: British Business Bank analysis of user defined PitchBook search. Results may differ from PitchBook's own published figures



Following this record year, however, in 2022 the value of VC investment declined by 43% to £3.0bn. This was driven mainly by the second half of the year, during which £1.3bn was raised (a 42% decrease on the second half of 2021). Seed stage deals experienced the largest percentage decline in total investment by deal type, with a 51% decrease in 2022H2 versus 2021H2. The Life Sciences sector was more vulnerable to the downturn in VC activity than the wider market in 2022.

Despite the reduction in equity finance in 2022, the sector is now one of the largest VC-backed technology areas in the UK, representing 16% of total UK VC investment between 2020-22. This is despite facing many of the unique financing challenges of a R&D intensive sector, with physical products that require long and costly development processes. The VC-backed technology areas that exceed it in size are less R&D intensive areas such as FinTech and SaaS, which by their digital nature are able to scale more quickly.

The UK life sciences VC ecosystem has also matured over the past ten years, as demonstrated through the increasing valuations of VC-backed companies. The median average pre-money valuation has risen more than threefold from £2.0m in 2013 to £6.7m in 2022

(£0.3m higher than the average across the wider VC market).

Breaking this down by deal type, the largest absolute increase has occurred in later stage VC, from £3.2m in 2013 to £10.5m in 2022. However, median seed stage valuations have demonstrated the strongest percentage growth, increasing by 463% from £0.5m in 2013 to £3.0m in 2022. The deal type in which the life sciences sector outperformed the wider VC market in 2022 was early stage VC – the median valuation of £6.2m in this bracket was £1.2m higher than across all sectors.

Looking at the underlying drivers of the development of the UK Life Sciences industry, four sub-sectors have emerged as key growth areas in recent years.

These include:

Table 7

**Definitions of key life sciences sub-sectors**

Sub-sector	Description
Therapeutics	The development of treatments to prevent or alleviate disease. This sub-sector includes pharmaceuticals, biotechnology and drug discovery.
Diagnostics	The development of techniques to assess and diagnose medical conditions
Medical Devices (or MedTech)	The development of technologies used to prevent or treat medical conditions. This sub-sector includes health monitoring equipment and surgical devices.
Digital Health (or HealthTech)	The development of digital solutions to track individuals' health, enable more effective communication with healthcare providers, and analyse treatment efficacy.

Figure 3.6 shows both the scale and growth of VC investment in the UK across these four sub-sectors. Therapeutics has consistently been the largest sub-sector, receiving £1.9bn in 2022 and a total of £10.1bn across the 2017-22 period. The next largest sub-sector is Digital Health, raising £1.2bn in 2022 and £6.1bn over the period. The remaining Medical Devices and Diagnostics sub-sectors received £3.1bn and £1.7bn, respectively, between 2017 and 2022.

While all of these sub-sectors have been on an overall upward trend over the past decade, it is useful to consider which have grown the fastest over the last few years. While all areas demonstrated an increase in VC investment of over 100% in 2020-22 versus 2017-19, Digital Health experienced the fastest growth (at 157%). Some of the largest deals in this sub-sector included a £260m investment in London-based Cera and a £174m investment in Warwick-based Quanta.

Despite being the largest sub-sector, Therapeutics also raised 125% more VC finance in 2020-22 versus 2017-19. Some of the largest deals included a £195m investment in Oxford Nanopore Technologies, a £183m investment

in Cambridge-based Centessa Pharmaceuticals, and a £161m investment in Oxford-based Exscientia.

So far in this section we have established that Life Sciences is one of the largest and most mature VC-backed sectors in the UK and that, despite the downturn in equity finance during 2022, there are a number of emerging growth areas such as Digital Health.

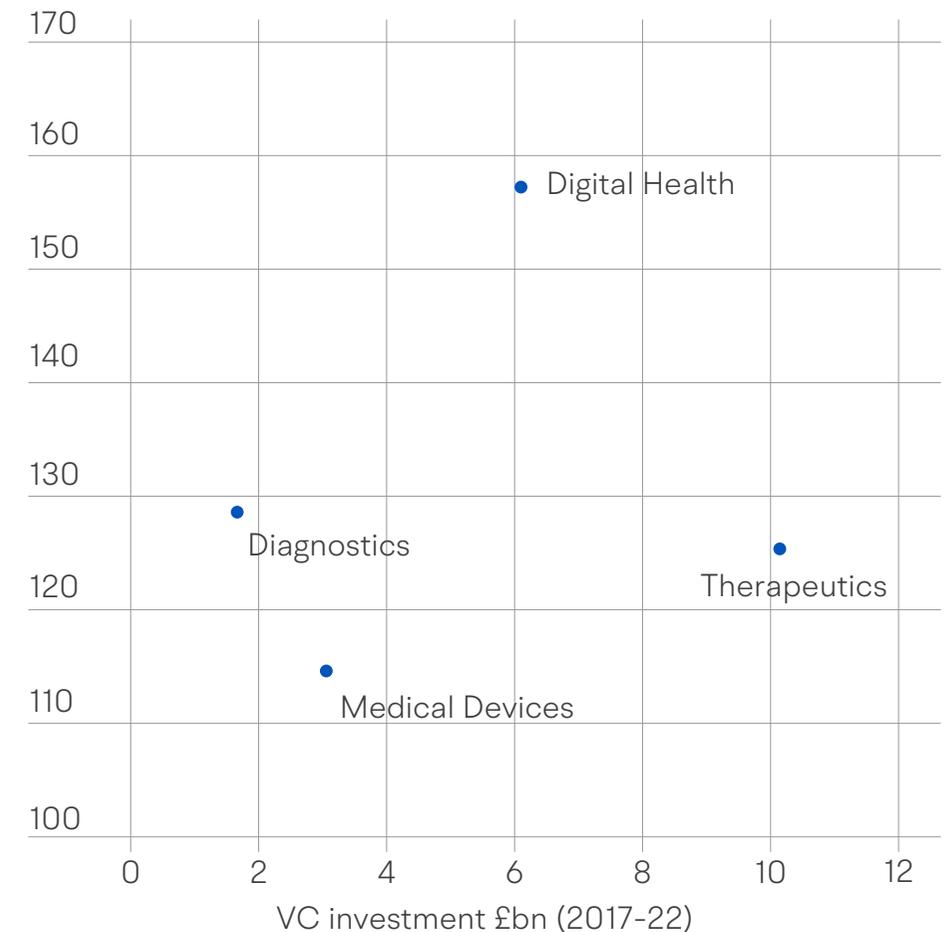
To put these trends in a global context, next we consider the extent to which the UK has been a world leader in scaling the Life Sciences sector through its VC ecosystem. This analysis uses global VC data to provide an indication of the UK's competitiveness against the most developed VC ecosystems globally.

Figure 3.6

**Total VC investment and VC investment growth by Life Sciences sub-sector**

Source: British Business Bank analysis of user defined PitchBook search. Results may differ from PitchBook's own published figures

VC investment growth (20-22 vs 17-19)



Firstly, looking at the total value of VC investment by country in Figure 3.7, the US is by far the largest global market for Life Sciences. It has scaled the amount of VC finance raised from £7.0bn in 2013 to £47.0bn in 2022 (following a peak of £56.0bn in 2021). While China received the third largest investment amount in 2013, it has since established its position behind the US as the second largest market globally, raising £9.0bn in 2022 (after a peak of £20.1bn in 2021).

The UK is comfortably the third largest market in the world, having received a total of £3.0bn in 2022 (down from £5.2bn in 2021). This was more than the total raised by France (£1.9bn) and Germany (£0.9bn) combined in 2022.

As illustrated in Figure 3.8, while the US is the largest global market for Life Sciences VC, its market share has followed a downward trend over the past ten years. Its share of global VC in the sector declined by 19 percentage points from 78% in 2013 to 59% in 2021, before recovering to 67% in 2022. Much of the US' market share has been displaced by China, whose share of global Life Sciences VC has increased from 3% in 2013 to 21% in 2021, before dropping to 13% last year.

Figure 3.7

**VC investment in Life Sciences by country**

Source: British Business Bank analysis of user defined PitchBook search. Results may differ from PitchBook's own published figures

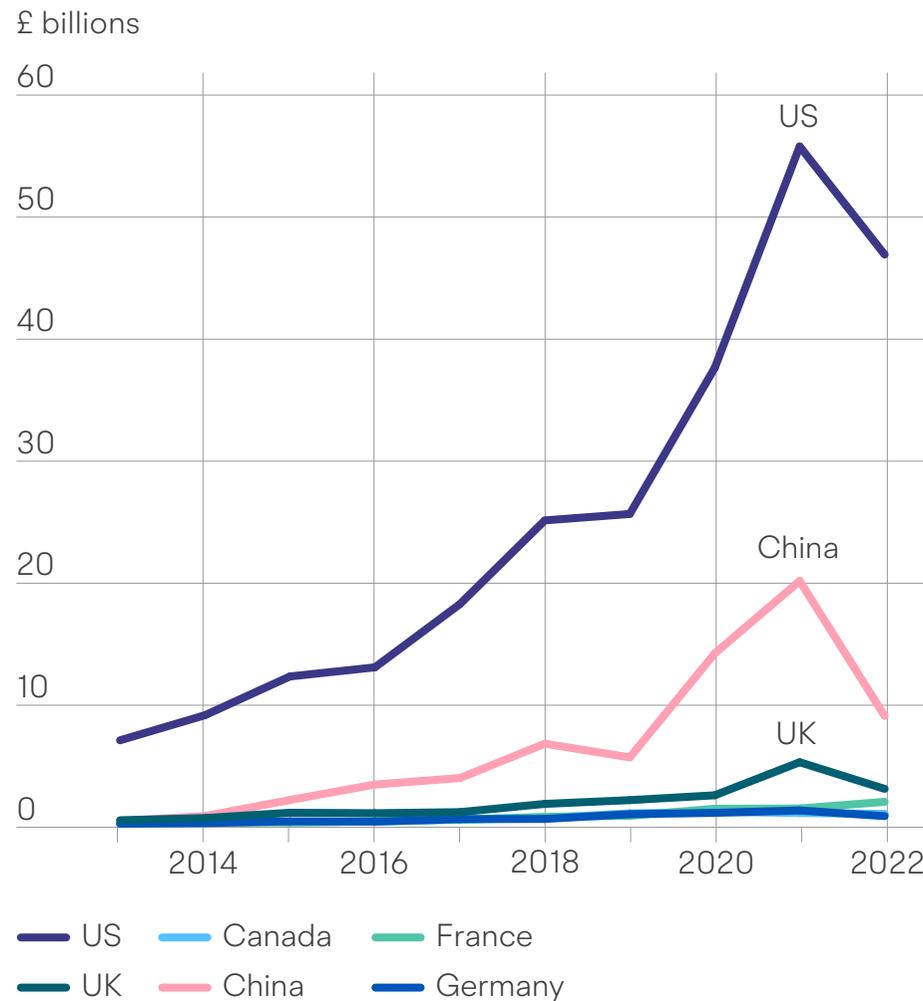
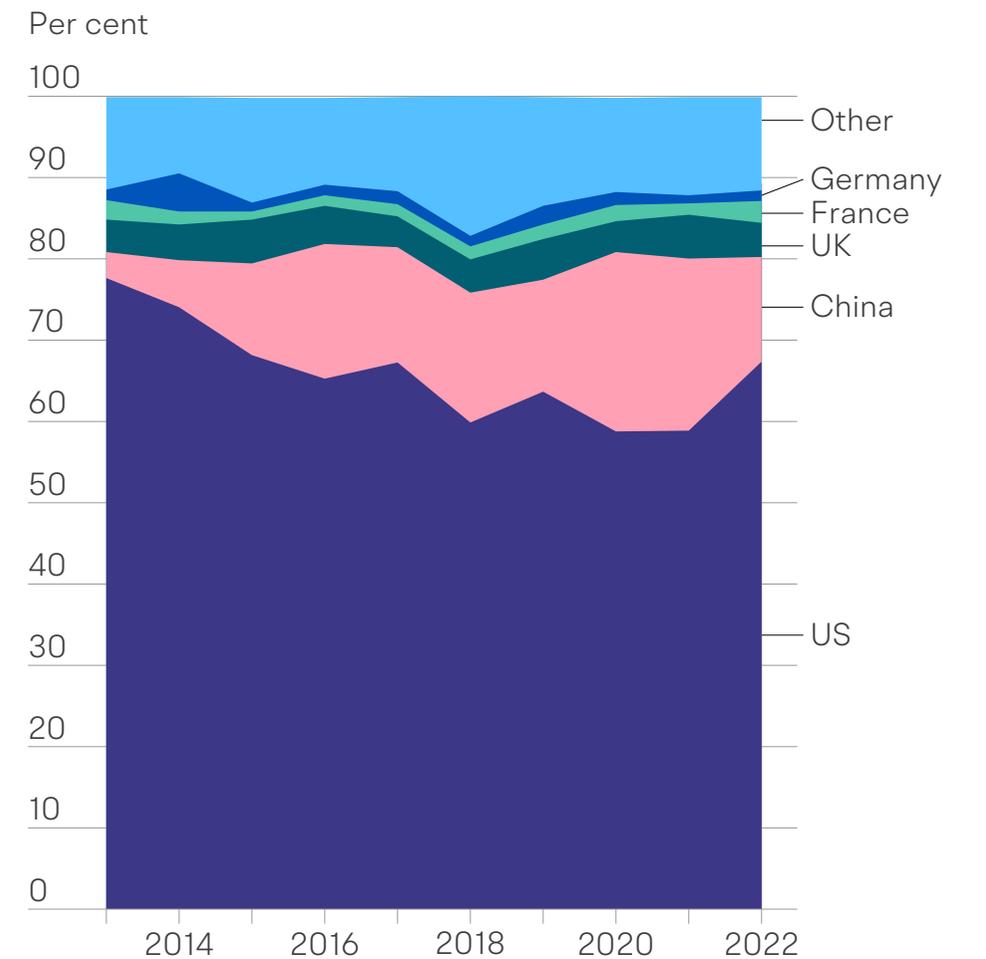


Figure 3.8

**Share of global VC investment in Life Sciences by country**

Source: British Business Bank analysis of user defined PitchBook search. Results may differ from PitchBook's own published figures



The UK’s market share, on the other hand, has remained relatively stable over this period, fluctuating around 5%. Its share of global VC increased from 4.0% in 2013 to 5.4% in 2021, before declining to 4.2% in 2022. The UK’s 2022 position remains stronger than other comparator markets such as France (2.7%), Israel (1.4%) and Germany (1.3%). France was one of only two of these countries to increase its level of VC investment in 2022, reaching its highest market share as a result. Germany, however, reached its highest market share in 2014 (with 4.7%) and has experienced two consecutive years of VC investment decline.

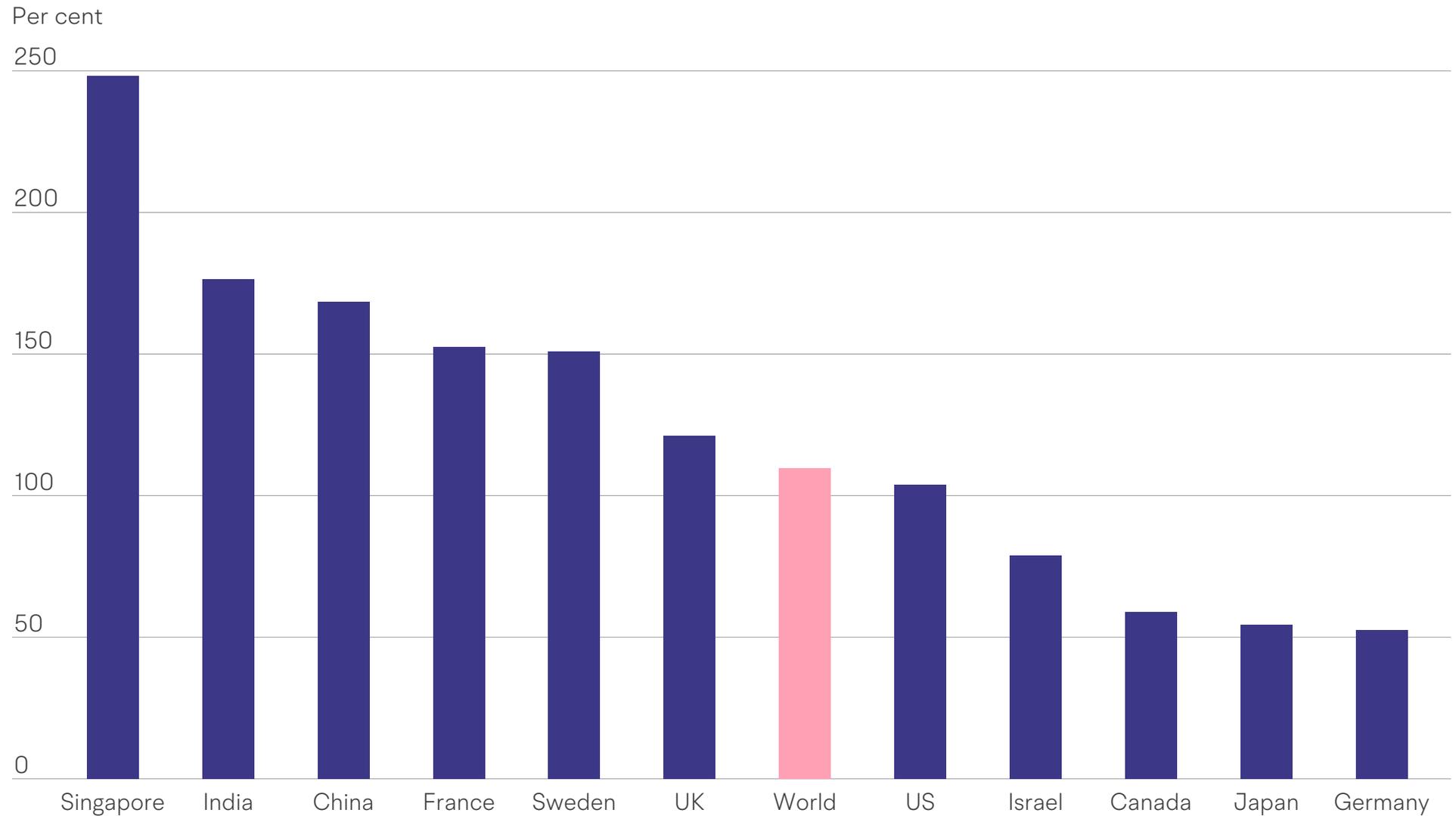
In addition to international trends in total VC investment and overall market share, it is also important to consider which countries are experiencing the fastest growth recently, and therefore may be on a trajectory to become future global leaders in the sector.

Figure 3.9 indicates that a number of Asian economies are top of this list, with Singapore, India and China all seeing an increase in VC investment of over 150% between 2017-19 and 2020-22. Singapore in particular has experienced growth of just under 250% over this period, and in 2021 raised more VC finance than Germany, Israel and Japan (with a total of £1.0bn).

Figure 3.9

**Growth in Life Sciences VC investment by country (2020-22 v 2017-19)**

Source: British Business Bank analysis of user defined PitchBook search. Results may differ from PitchBook's own published figures



Alongside the US and Canada, these three countries are growing at a slower rate than the global Life Sciences VC market (which has increased by 110% during this time).

Looking at the UK specifically, its growth in VC investment of 121% between 2017-19 and 2022-20 is ahead of the global Life Sciences market but behind two other European countries in France and Sweden (as well as the aforementioned Asian economies). This is partly due to a particularly acute slowdown in 2022, where UK VC investment fell by 43%, while other Western countries experienced smaller declines. The extent to which UK investment recovers in 2023 and 2024 will dictate whether the UK retains its current position in the top three VC markets globally or is caught up by some of these faster growing competitors.

Taken together, the analysis in this section demonstrates that the UK is a globally leading destination for Life Sciences VC investment, having maintained a global market share of around 5% over the past decade. However, when considered in the context of its world class R&D capability highlighted in section 2i, it is apparent that there is still potential for the UK to commercialise and capitalise on these strengths more successfully.

Other countries like the US and China, for example, are performing better when comparing their share of total VC investment to their research quality and patent activity in Life Sciences. Both of these economies are successfully translating their excellence in Life Sciences R&D into commercial business propositions that can drive productivity and growth.

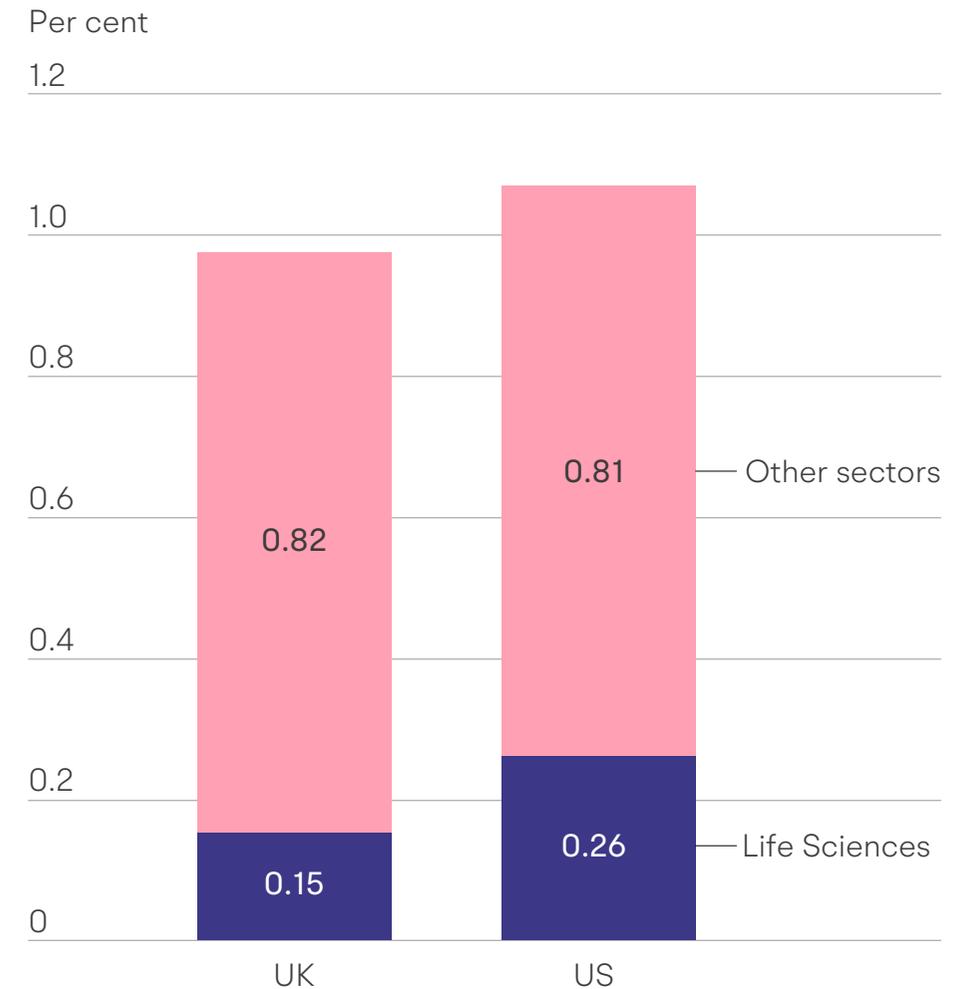
It is also useful to understand the extent to which the UK under or overperforms in Life Sciences VC when adjusting for the size of the economy.<sup>30</sup> Figure 3.10 shows the GDP-weighted levels of VC investment in Life Sciences versus other sectors, comparing the UK to the US as a leading example of a well-functioning VC market. Over the period 2020-22, VC investment in the UK was equivalent to 0.15% of GDP, whereas in the US this figure was 0.26%. Therefore, on a GDP-weighted basis, the UK receives 60% of the Life Sciences VC investment raised by US companies.

This gap also drives the overall difference in VC investment as a proportion of GDP between the two countries – across other sectors UK VC investment equated to 0.82%, in line with the US’ proportion of 0.81%. Overall, looking at total VC across the economy, investment reached 0.98% of UK GDP in 2020-22.

Figure 3.10

**UK and US VC investment in Life Sciences and other sectors, as a proportion of GDP (2020-22)**

Source: British Business Bank analysis of user defined PitchBook search, World Bank data and Bureau of Economic Analysis data



This represented an increase from 0.76% in 2019-21 and not far behind the US' equivalent 1.07% in 2020-22.

The US has scaled the most advanced Life Sciences VC ecosystem globally by bringing together world class research institutes, established industry players and specialist investors with large pools of capital – all centred around specific clusters on the East and West coast. Atlas Venture and Arch Venture Partners, for example, have assets under management in the billions of pounds. This enables US start-ups to access the later stage VC investment they need to reach significant scale.

The UK, on the other hand, has two of the three ingredients needed to produce a world leading ecosystem, with top universities and local industry. However, it lacks the presence of large specialist Life Sciences investors, meaning that many UK start-ups look overseas (particularly in the US) for capital at later stages in their development. This can result in promising companies moving abroad, with a loss of high-skilled employment and intellectual property to the UK economy.

In response to this issue, the Bank has established the Life Sciences Investment Programme, a £200m initiative

managed by BPC designed to address the growth equity finance gap faced by high-potential UK life sciences companies. Through LSIP, BPC makes cornerstone commitments to later stage life sciences venture growth funds with a strong UK focus, typically investing between £50m and £100m in each successful fund. In addition it has established the Future Fund: Breakthrough programme, a £375m UK-wide programme which encourages private investors to co-invest in high-growth, innovative firms. The programme makes equity co-investments with private sector investors in growth stage R&D-intensive British companies operating in breakthrough technology sectors, including Life Sciences, with a minimum total investment round size of £30m.

Having explored an established technology where the UK is internationally competitive, the next sections take a deeper dive into two more emerging technology opportunities. The first, nanotechnology, is a cross-cutting technology where the UK can capitalise on a globally leading position. The second, space technology, is a truly nascent sector with a vast potential market opportunity, but where the UK requires greater investment to keep pace with other major VC markets.

### 3. Future UK opportunity: Nanotechnology

#### 3i) UK R&D capability in Nanotechnology

Nanotechnology or 'Nanotech' is a field of science that broadly involves controlling matter at nanoscale (1-100 nanometres) to produce new structures, materials and devices. While not generally considered as a sector due to its wide range of cross-cutting applications, the technology is now moving from its first to its second generation of evolution. More specifically, it is advancing from the use of "passive nanostructures" (e.g. applying carbon nanotubes to strengthen plastics) to "active nanostructures" which, for example, can actively provide a drug at a specific target cell.

As a result of this progression, Nanotech is now finding use cases across a range of traditional industries. Some of the most impactful now include advanced materials and sensors within construction, semiconductors within ICT, drug delivery and medical diagnostics in healthcare, as well as enhancing the sustainability of energy systems (eg through improving the effectiveness of solar panels and the performance of electric vehicle batteries).

While companies and investors may view Nanotech primarily through this application lens, it is an enabling technology for a range of other deep tech verticals – as AI is for digital verticals. This section applies a sector focus to assesses the UK’s capability in this technology area and to understand what opportunity there is for the VC ecosystem looking ahead.

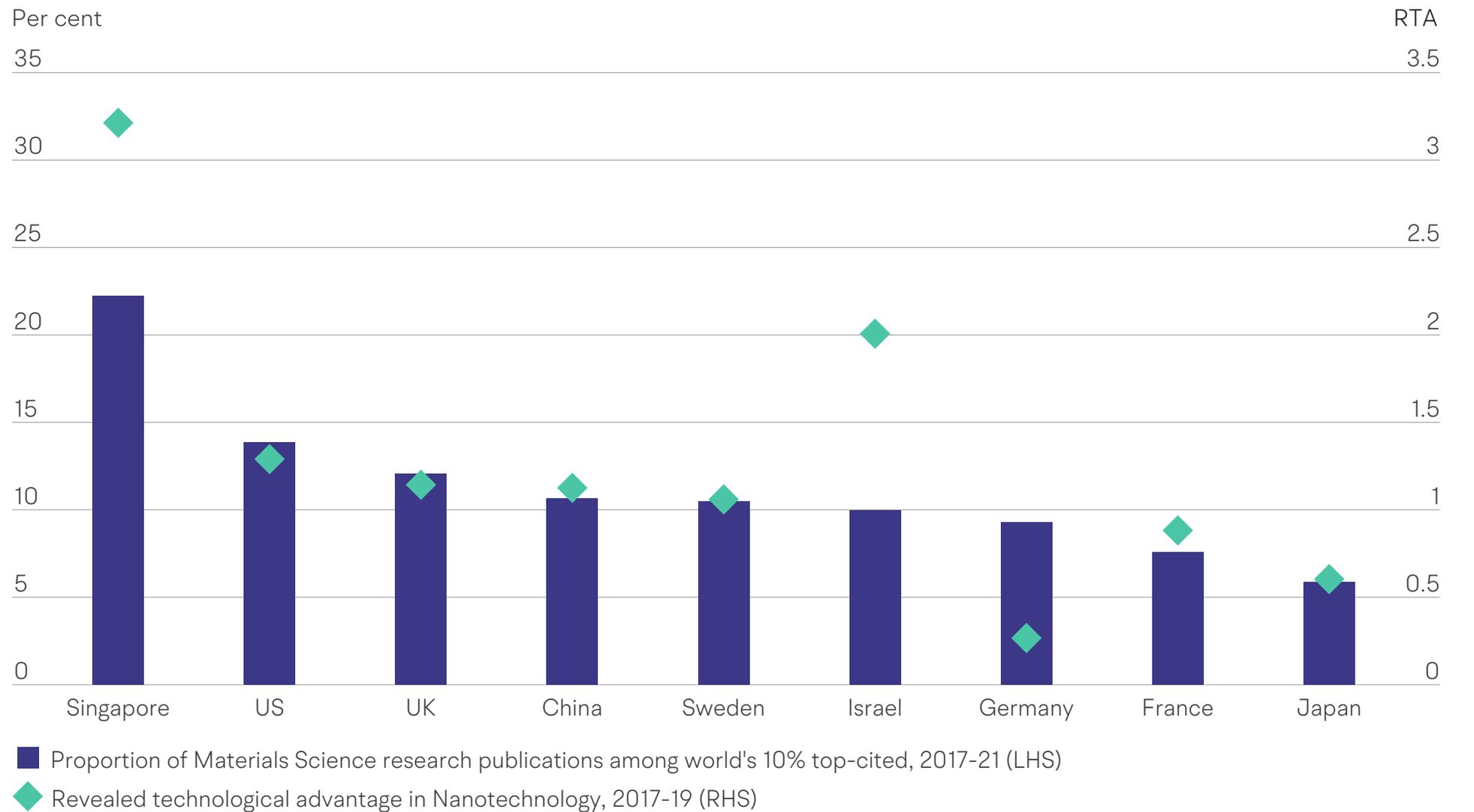
The UK has a foundation of academic excellence and R&D activity upon which to scale successful commercial Nanotech propositions. Figure 3.11 compares the UK’s performance across two R&D indicators to that of key competitor economies. The first indicator measures the proportion of the UK’s research publications in materials science (a key field within Nanotech) that are among the world’s 10% top-cited. With a proportion of 12.1% the UK ranks third behind Singapore and the US, and notably ahead of other major European countries.

The second indicator measures the UK’s revealed technological advantage (RTA), which compares a country’s share of patents in a given sector to its share of patents across all sectors. A figure above one indicates relative specialisation of a given country in a technological domain. The UK’s RTA of 1.15 suggests that it has degree of specialisation in business innovation in

Figure 3.11

**UK research excellence and technological advantage in Nanotechnology**

Source: British Business Bank analysis of OECD data



the Nanotech sector, and again it leads other European competitors (as well as China) on this measure of R&D performance.

The UK also has world class research facilities in the key application area of advanced materials, including the Graphene Engineering Innovation Centre based in Manchester and the Henry Royce Institute, a consortium of nine academic institutions (including the universities of Cambridge and Leeds). The Henry Royce Institute has worked with around 300 UK SMEs has facilitated 350 collaborations between academics and industry in the area of advanced materials. More broadly this application of nanotech contributes an estimated £14.4bn in gross value added to the UK economy, equivalent to around £72,000 per employee (25% above the UK average).<sup>31</sup>

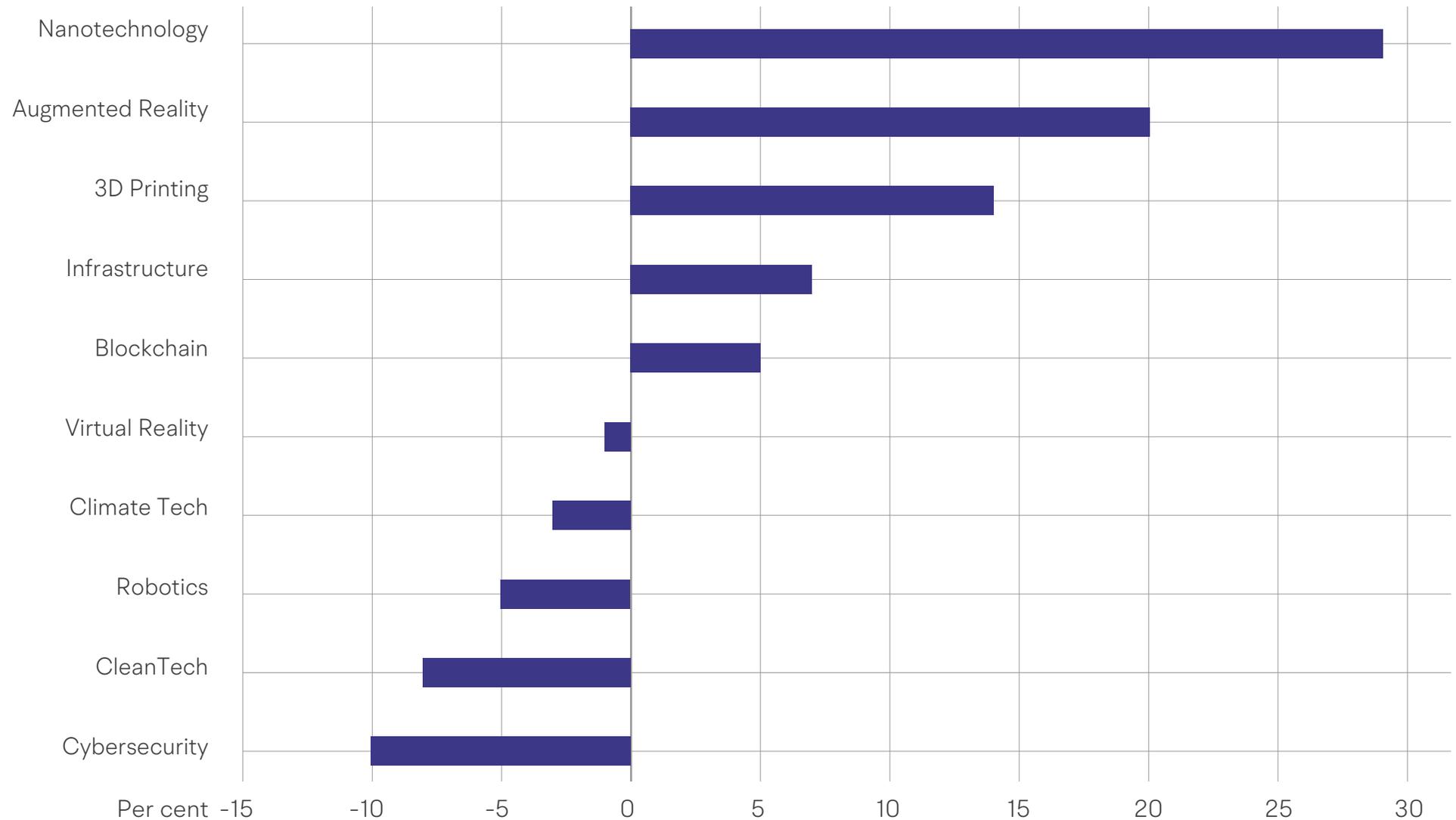
**3ii) VC investment trends in Nanotechnology**

The past ten years has seen strong growth in VC investment globally. Total VC finance rose from £556m in 2013 to a record high of £2.7bn in 2022. Annual investment growth in 2022 reached 29% in the sector, bucking the trend of the wider VC market which declined in value by 23%. In addition, as illustrated in Figure 3.12, out of all the technology areas covered in

Figure 3.12

**Annual global growth in VC investment in 2022, top ten selected technology areas**

Source: British Business Bank analysis of user defined PitchBook search. Results may differ from PitchBook's own published figures



our analysis Nanotech experienced the strongest growth in 2022, and was one of only five verticals to experience an annual increase in investment (alongside 3D printing, augmented reality, blockchain and infrastructure). The number of global VC deals also rose by 4% to reach a record high of 321 in 2022, in contrast to the wider VC market which experienced a decline in deal volume of 8%.

Focusing on the UK, VC investment has been through a cycle over the past ten years, as shown in Figure 3.13. Around the mid-2010s there was a notable increase in funding for UK businesses, with VC finance reaching an average of £108m in the three years to 2016. This measure then fell back to £80m in the three years to 2019 with much smaller deals taking place on average.

However, following this low point there has been strong growth in VC investment in the UK, with a record annual average of £259m in the three years to 2022. Over £0.75 billion was raised during the 2020-22 period as a whole, signalling that the sector is now ready to scale to greater magnitudes of funding. This is also reflected in recent increases in average deal sizes; the median deal size in the UK has more than doubled from £0.7m in 2019 to

£1.6m in 2022, and is now three times higher than its initial level of £0.5m in 2013.

Through this increased VC funding the UK has developed an ecosystem of over a hundred active nanotech start-ups, focused on sectors ranging from healthcare to renewable energy. Table 8 provides a list of the top ten current VC-backed companies ranked by total investment raised. The total number of patent families owned by each company is also provided, demonstrating the R&D intensive nature of this technology area.

The companies are generally clustered in the UK golden triangle around London, Oxford and Cambridge, with eight of the ten start-ups spinning out from research institutions – highlighting the importance of UK academia in supporting the commercialisation of UK nanotech.

Figure 3.13

**UK VC investment in UK Nanotechnology (rolling three-year average)**

Source: British Business Bank analysis of user defined PitchBook search. Results may differ from PitchBook's own published figures

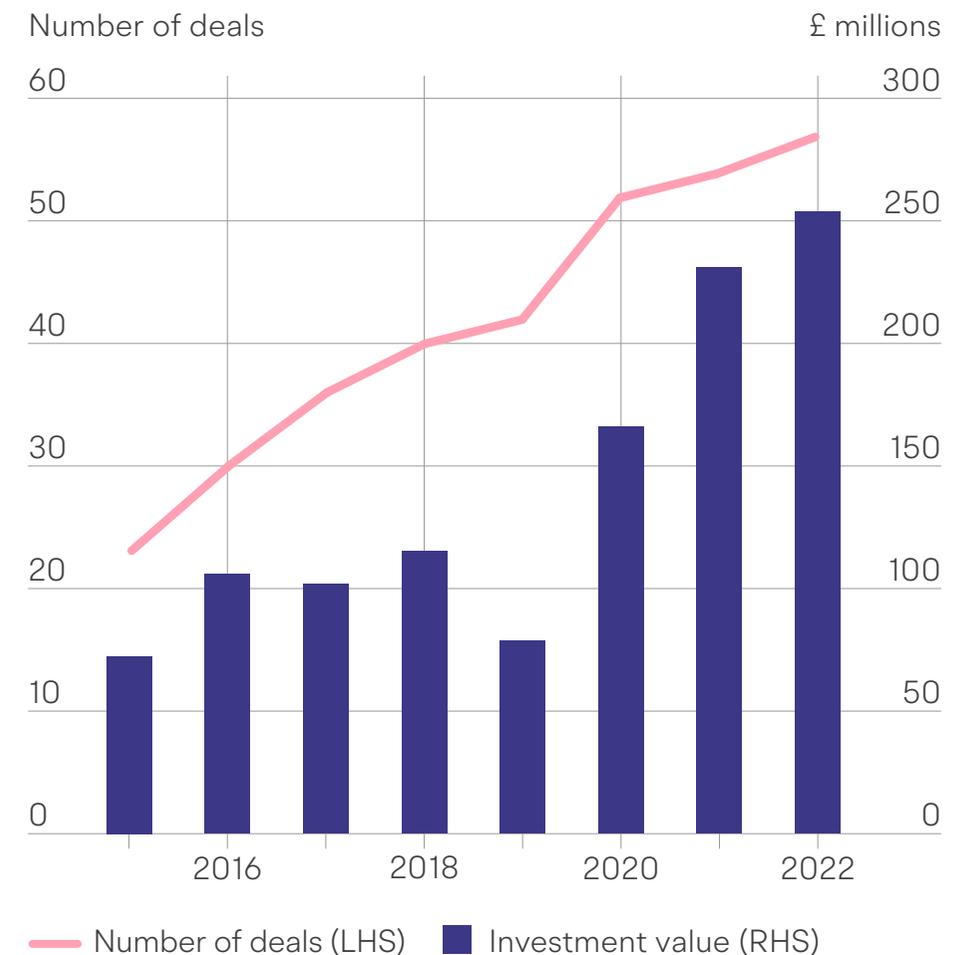


Table 8

**Current VC-backed UK Nanotechnology companies, by investment raised**

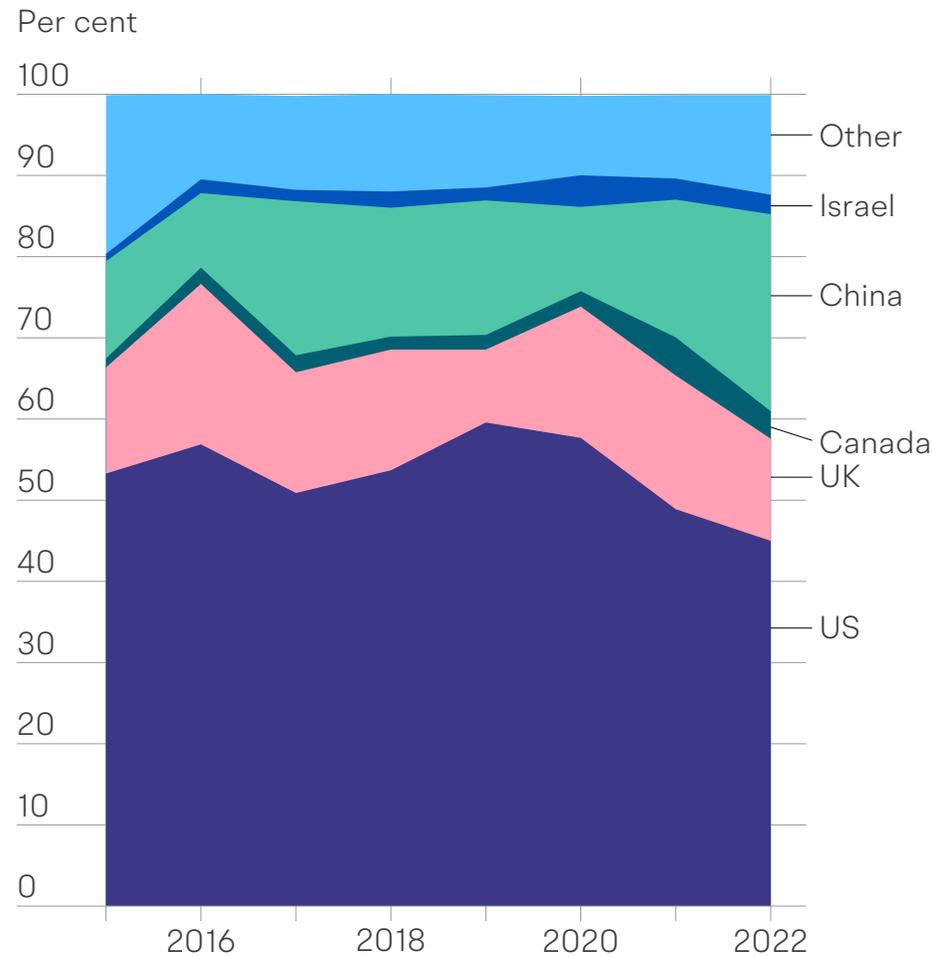
Source: British Business Bank analysis of PitchBook and Beauhurst data

Company	Primary Industry	Description	HQ City	Total Investment Raised (£m)	Total Patent Families	Spin out Institution
P2i	Materials and Resources	P2i develops liquid-repellent nano-coating technology designed to completely cover 3D objects and protect from accidental submersion, humidity and weather.	Oxford	110.4	114	Defence Science and Technology Laboratory
ONI	Healthcare	Oxford Nanoimaging designs, develops, and manufactures super-resolution microscopes.	Oxford	85.6	10	University of Oxford
DeltaDot	Healthcare	deltaDOT develops analytical instruments that separate ions based on the charge of the molecule for the life-sciences, pharmaceutical and academic industries.	London	81.8	20	Imperial College London
SiSaf	Healthcare	SiSaf has developed a trans-dermal drug delivery system with potential applications in the treatment of skin conditions such as acne.	Guildford	42.1	22	N/A
Aqdot	Materials and Resources	AQDOT develops supramolecular chemistry technology designed to enable the capture and release of materials as and when it is required.	Cambridge	28.0	21	University of Cambridge
OxSonics Therapeutics	Healthcare	OxSonics has developed ultrasound technology to deliver drugs to treat cancers and chronic lower back pain.	Oxford	22.9	10	University of Oxford
Porotech	Information Technology	Porotech develops porous GaN technology designed to enhance LED lighting.	Cambridge	19.2	34	University of Cambridge
FabricNano	Healthcare	FabricNano develops nanotechnology and biotechnology to synthesise chemicals.	London	19.0	10	N/A
NanoSyrinx	Healthcare	NanoSyrinx develops a nano-syringe that aims to allow medicine to efficiently access the interior of a cell.	Coventry	18.6	1	University of Warwick
Infinitesima	Information Technology	Infinitesima develops technology that allows the user to take 3D high-speed, nano-scale images in a non-vacuum environment, used in areas such as biotechnology and manufacturing inspection.	Oxford	18.4	39	University of Bristol

Figure 3.14

**Share of global Nanotechnology VC investment, rolling 3-year average**

Source: British Business Bank analysis of user defined PitchBook search. Results may differ from PitchBook's own published figures



Now looking at the UK's position internationally in the sector, Figure 3.14 breaks down the share of global Nanotech VC investment by country, using rolling three-year averages. The UK has achieved a significant market share over the past ten years, with a peak of 20% in 2016 – one fifth of all investment in the global market. More recently the UK's share has come down from this peak but still remains high at 16.5% in the three years to 2021 and 12.6% in the three years to 2022.

These latest figures rank the UK as comfortably the third largest market in the world, behind China and the US, raising more VC finance than Canada, Israel, France, Japan, Sweden and Germany combined. Nanotech is also one of a few technology verticals where the UK has surpassed China in total VC investment at certain points over the past decade (most recently in 2020).

In summary the evidence in this section demonstrates that, as well having an internationally competitive R&D base in Nanotech (particularly in well-funded application areas such as advanced materials), the UK has also translated this capability into an established position as one of the top three countries globally for VC investment. As this is also one of the fastest growing technology areas globally, and a cross-cutting

technology that fundamentally supports other deep tech verticals, there is a clear opportunity for the UK to double down on its current position and become a true global leader in this field.

**4. Future UK opportunity: Space Technology**

**4i) UK R&D capability in Space Technology**

Traditionally Space Technology has largely been a government-funded sector, with applications focused on communications, navigation, space observation and meteorology. However, the industry is beginning to enter an era of commercial innovation in which lower costs (and the leverage of enabling technologies such as AI and cloud computing) promise to facilitate investment in new areas such as space tourism, in-space manufacturing, geospatial intelligence and renewable energy.

This evolution will require the creation of more advanced space infrastructure such as small satellites, space electronics, low-cost rockets and improved communication systems. However, should this be harnessed, the market opportunity for this technology area is estimated in the hundreds of billions of pounds.

This section looks at the development of the UK’s space technology sector in particular, and the extent to which it is well positioned to take advantage of the global space economy.

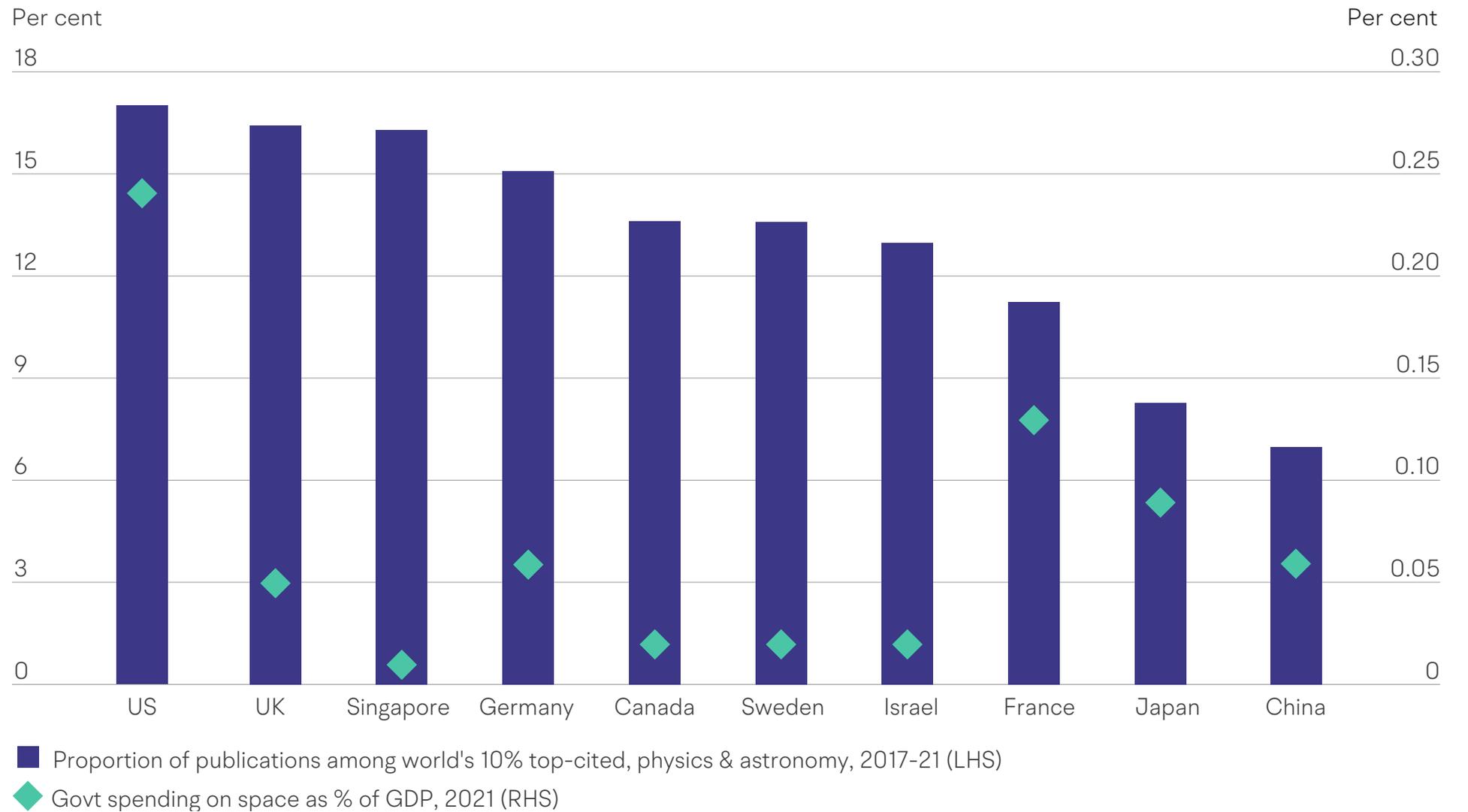
Research from the UK Space Agency finds that the space industry is a growing component of the UK economy. In 2020/21 there was a total of 48,800 jobs in the sector, equivalent to 0.15% of the total UK workforce, and the industry directly contributed £7bn of GVA (equating to 0.34% of UK GDP). In real income terms the industry grew by 5.1% in 2020/21, which outpaced the global sector (1.6%) and the wider UK economy (-7.6%) over the same period.<sup>32</sup> In terms of wider economic impacts, it is estimated that satellite services support wider industrial activities across the UK (non-financial business) economy that contributed at least £370bn to UK GDP in 2020 (equivalent to 17.7% of UK GDP).

Before examining VC investment trends it is important to consider whether the UK has a strong R&D base upon which to support business innovation and ultimately scale VC-backed companies. Figure 3.15 compares the UK’s performance across two R&D indicators to that of

Figure 3.15

**UK research excellence and public funding in Space Technology**

Source: British Business Bank analysis of OECD data



key competitor economies. The first indicator measures the proportion of the UK's research publications in physics and astronomy (a key field in Space Technology) that are among the world's 10% top-cited. With an average proportion of 16% between 2015-21 the UK ranks second behind the US (at 17%), and notably ahead of other major European countries, demonstrating a high degree of research excellence in this sector.

The second indicator measures government spending in the Space industry as a % of GDP in 2021. On this measure, however, the UK performs relatively poorly and ranks sixth out of the selected comparator country group. The UK spends 0.05% of its GDP on Space, which is five times lower than the US (0.24%) and almost three times lower than France (0.13%).<sup>33</sup> This disparity may go some way in explaining the relatively slow growth in UK VC investment previously highlighted in Figure 3.2, and explored further in this section. Addressing this gap could help in crowding in the larger value deals that are needed to propel the UK Space Technology sector to its next phase of development.

#### 4ii) VC investment trends in space technology

While a significant proportion of business investment in Space Technology has generally been made by large

incumbents, such as Boeing, Airbus and Virgin Atlantic, the industry is increasingly being disrupted by VC-backed companies. As a result, total global VC investment has risen from £170m in 2013 to £4.7bn in 2022. The last three years in particular have seen significant growth, with a 223% increase in VC finance during 2020-22 compared with 2017-19. Over the same period the total number of VC deals has also increased by 68%, demonstrating strong growth in both value and volume terms.

PitchBook note that several recent deals have highlighted VC investors' increased appetite to support a wider range of space technologies:

- SpaceX raised a £1.4bn Series F investment in June 2022, in a deal led by Mirae Asset Venture Investment. The company designs and manufactures reusable space launch vehicles for the transport of cargo, passengers and payloads into space.
- ICEYE, based in Finland, operates the world's largest constellation of synthetic aperture radar satellites capable of imaging the planet. The company plans to further develop its product line in natural catastrophe detection and add to its fleet in orbit. Last year it raised a £100 million Series D investment led by Seraphim Space.

- UK-based FocalPoint develops navigation and positioning software designed for smartphones, wearables, and the autonomous vehicle industry. The company raised £20 million in November 2022 in a deal led by GM Ventures, Molten Ventures and Gresham House Asset Management.

Focusing on recent investment trends in the UK, Figure 3.16 shows how the value and volume of VC investment has changed over time. Rolling three-year averages are used to smooth out annual data volatility that occurs when looking at more emerging sectors. Total VC finance has increased from an average of £8.1m across five deals in 2013-15, to an average of £89.6m across 18 deals in 2020-2022. Although still small in number, deals in particular have been on a steady upward trajectory over the period.

Comparing 2020-22 with 2017-19, UK growth in total investment and deal volumes was 23% and 83%, respectively. The UK market is therefore outpacing global growth in dealmaking but not in investment value, demonstrating a need for attracting larger deals to the UK to prevent it falling behind key competitor countries.

Figure 3.16

**VC investment in the UK Space Technology sector (rolling three year average)**

Source: British Business Bank analysis of user defined PitchBook search. Results may differ from PitchBook's own published figures

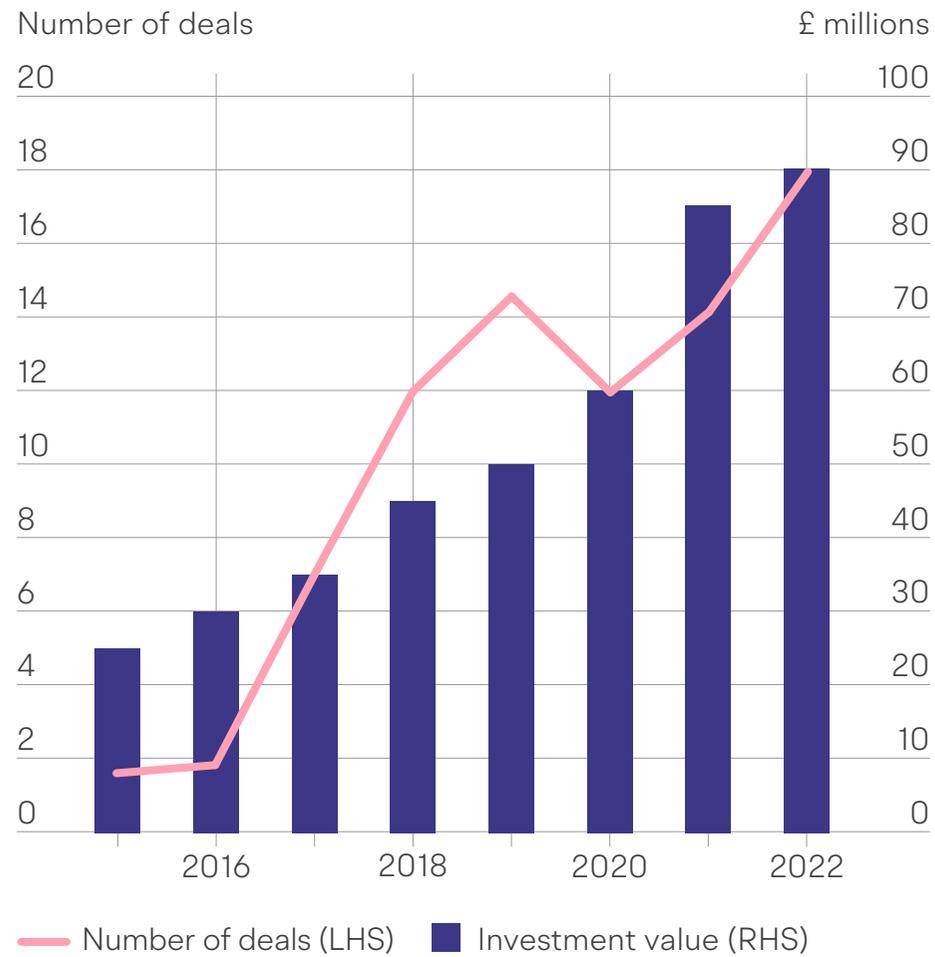
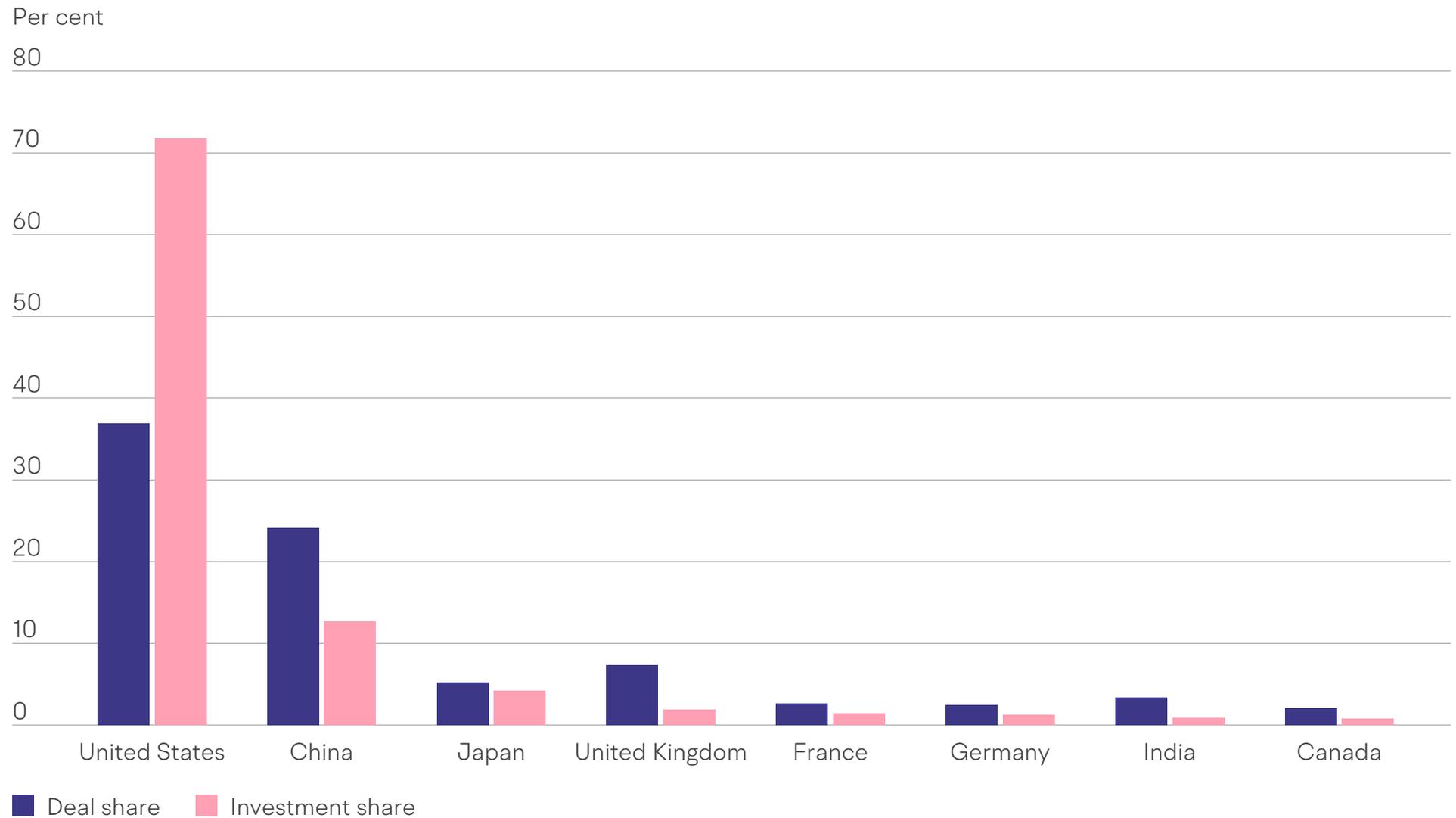


Figure 3.17

**Share of global VC investment in Space Technology by country (2020-22)**

Source: British Business Bank analysis of user defined PitchBook search. Results may differ from PitchBook's own published figures



This pattern is also evident when looking at the share of global VC investment by country, as illustrated in Figure 3.17. During 2020-22 the UK ranked third internationally for its share of Space Technology deals (with 7.3%), behind the US and China but significantly higher than Japan and other major European economies. However, the UK received less than 2% of total investment value over that period (with 1.9%), placing it much further behind the global leaders.

Again this demonstrates that the UK sector has yet to fully mature and produce a significant number of successful companies that have moved through the pipeline and raised larger deals. It does, however, have a solid foundation of dealmaking activity and a global position upon which to scale a more commercially developed industry.

Looking at some selected sub-sectors within the Space Technology vertical, the majority of global investment value over the past ten years has flowed into Space Tourism and Small Satellites. VC finance in these areas has been on a sharp increase since the mid-2010s and, in 2022, they received £1.6bn and £2.2bn respectively. While much smaller levels of investment have been seen in In-Space Manufacturing over the last decade, over

the last three years there has been notable growth in this sub-sector, with a record £293m raised in 2022.

Focusing on the business base the UK is home to over fifty active Space Technology start-ups. Table 9 provides a list of the top ten current VC-backed companies ranked by total investment raised. The total number of patent families owned by each company is also provided, demonstrating the R&D intensive nature of the technology area. The companies are generally clustered in London and Oxford as well as areas of Scotland.

Taken together the evidence in this section demonstrates that, while the UK produces high quality research in the field of Space Technology, it does not yet receive the quantum of public funding or VC investment to place it alongside the global leaders in this sector, such as the US, China and Japan. However, as this is a fast growing global sector with a significant long-term market opportunity, there is an opportunity for the UK to do more in developing its VC ecosystem through attracting larger value deals and a greater quantum of funding.

Figure 3.18

**Global VC investment in Space Technology sub-sectors**

Source: British Business Bank analysis of user defined PitchBook search. Results may differ from PitchBook's own published figures

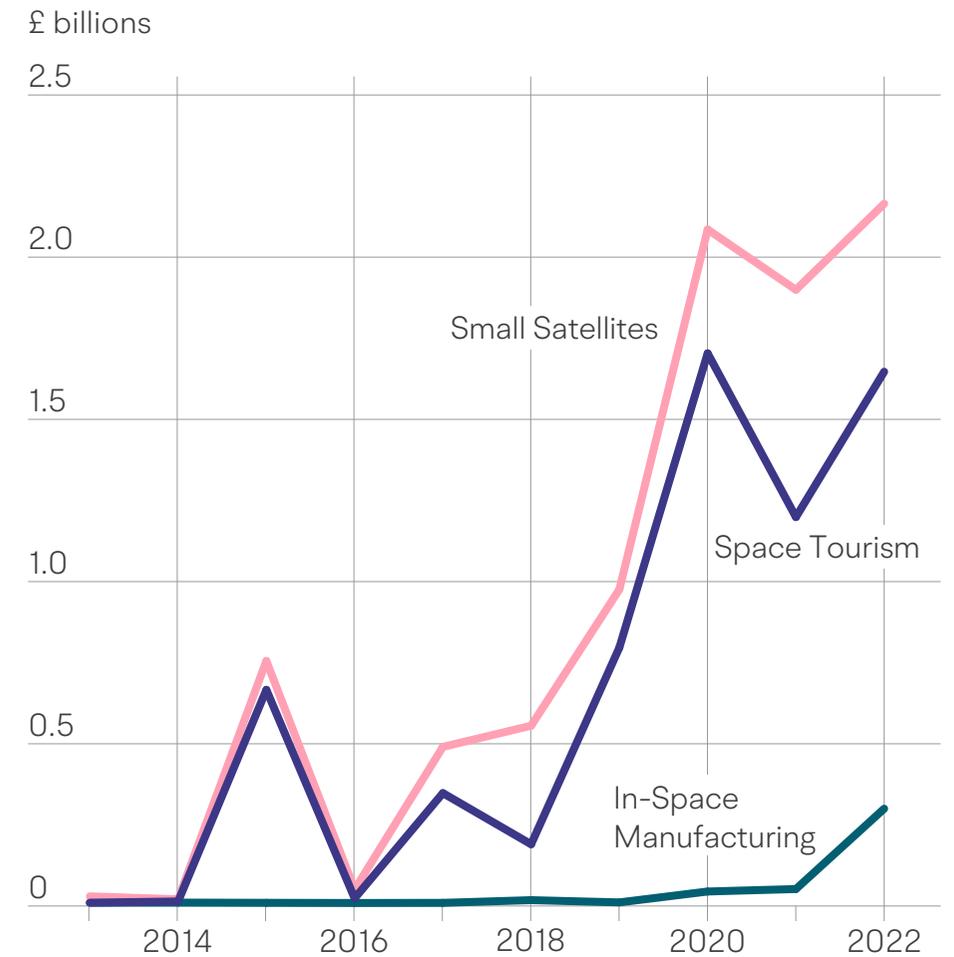


Table 9

**Current VC-backed UK Space Technology companies, by investment raised**

Source: British Business Bank analysis of user defined PitchBook search. Results may differ from PitchBook's own published figures

Company	Primary Industry	Description	HQ City	Total investment raised (£m)	Total Patent Families
Reaction Engines	Business Products and Services (B2B)	Developer of aerospace engine technology designed to assist in space access propulsion and hypersonic flight.	Oxford	128.8	30
Orbex	Business Products and Services (B2B)	Developer of orbital launch systems designed for small satellites. The company's systems are developed in-house, including rocket engines, avionics, GNC, software and structure technologies to launch small, micro, and nano-satellites into low Earth orbits.	Moray, Scotland	88.5	2
ALL.SPACE	Information Technology	Developer of a satellite antenna technology designed to offer telecommunications companies faster returns on bandwidth and access to more customers.	Reading	64.6	14
Spottitt	Business Products and Services (B2B)	Provider of satellite analytics services intended to serve the energy, environment, and infrastructure sectors.	Harwell, Oxford	30.3	
AVEALTO	Information Technology	Developer of high-altitude platform wireless infrastructure vehicles designed to provide communication services to unserved and underserved regions of the world.	London	29.2	3
Skyrora	Business Products and Services (B2B)	Developer of a space technology designed to realise the tangible benefits of responsive access to and responsible exploitation of space.	Edinburgh	24.1	3

Figure 3.19 (continued)

Company	Primary Industry	Description	HQ City	Total investment raised (£m)	Total Patent Families
Unicorp Space	Business Products and Services (B2B)	Manufacturer of aerospace transportation devices intended to reduce space transportation costs.	London	20.1	
BeetleSat	Business Products and Services (B2B)	Developer of nano-satellite communication systems designed to transform the efficiency of communications services.	London	19.4	
Satellite Vu	Business Products and Services (B2B)	Developer of satellite technology intended to address global challenges. The company's satellites monitor the temperature of buildings and oil and gas infrastructures by focusing on infrared and heat emissions in near real-time.	London	18.7	1
Planet Watchers	Information Technology	Developer of a natural resource management system designed to help users monitor their natural assets across multiple sectors.	London	15.9	

Appendix:

# Overview of Beauhurst announced deal data

In this report, the term "equity investment" encompasses any form of external equity finance, excluding transactions conducted on public equity markets, buyouts, and rounds involving only family and friends without external investors. This definition therefore captures the activity of business angels, equity crowdfunding platforms, venture capital funds, corporate venture capital, and private equity funds.

The Equity Tracker report only includes investments and deals that have been publicly announced. This includes deals that have been announced via a government regulatory organisation, a press release, a news source, or have been confirmed with investees or investors. Although equity deals involving family and friends are not explicitly excluded, they are typically not publicly announced, and therefore not captured by our figures.

Another way Beauhurst identified unannounced deals is using share allotment filings. When a company allocates its shares, an SH01 form is submitted to Companies House. The identities of the new shareholders are not

included in the SH01 form. Whilst it is desirable to include as many deals as possible in our analysis, less information is available on unannounced deals, which is why this report focuses on announced equity deals only.

We also filter the Beauhurst data for the Equity Tracker report using an SME filter, removing large companies. The filter is based on the EC definition of an SME. It covers businesses with less than 250 employees and either a turnover of less than €50m or balance sheet total of less than €43m.

Only a small proportion of equity deals are announced, showing UK equity finance is larger in practice than the announced deal and investment figures contained in this report. In 2022, there were 2,703 announced deals and 3,926 unannounced equity deals giving a total estimated market size of 6,629 equity deals. By number, announced deals made up a minority of all equity deals in 2022 (41%), which is consistent with previous years. There is some variation in the proportion of deals that are announced by region and devolved nation. Over half of the deals in Wales (53%), and the North East (61%) were announced in 2022. Contrary to that, in the South East, West Midlands, East Midlands and London only 33%, 37%, 38%, and 40% of deals were announced,

respectively. This may be a result of differences in the investor type active in each region and their relative likelihood to publicly disclose deals.

By investment value the picture is reversed, with announced deals making up 78% of the total value invested in 2022, supporting the robustness of our results as unannounced deals tend to be very small.

Angel and private investors are less likely to formally announce their investments than PE/VC investors, with larger equity deals having a greater likelihood of being announced. Investments made through the process of equity crowdfunding on the other hand, tend to get announced most of the time due to the investment opportunity being open to the public.

This year's report builds on the previous 2022 Equity Tracker Report, as there have been continued refinements to the underlying dataset to ensure that this year's report is the most accurate assessment of the UK SME equity market at this point in time. The figures in this new report supersede those previously quoted due to the inclusion of new equity deals since the previous reports were undertaken. Comparisons between figures in this year's Equity Tracker and last year's report are not recommended due to revisions in the number of historical deals.

For more information on the methodology Beauhurst used to collect this equity data, please see previous Equity Tracker reports or Beauhurst's own website.

It is important to acknowledge that other data sources exist which also cover equity deals, including the British Private Equity and Venture Capital Association (BVCA), which measures the investment activities of its members, which are mainly comprised of Private Equity and Venture Capital funds. There are also other commercial data providers which gather data through a combination of technology (e.g. web-scrapers), analyst research and self-disclosure by fund managers. These data sources will therefore have coverage of different types of investors and are not always consistent with one another. No single data source captures all equity deals in the market.

Whilst the Beauhurst announced deal dataset has good coverage of equity deals involving institutional investors, business angels are less likely to seek publicity on completed investments and are therefore less likely to be captured in the investment numbers. The UK Business Angel Association (UKBAA), which covers 18,000 investors investing through 60 groups, confirms that no robust statistics exist on the annual number of equity deals undertaken by angel investors in the UK.

Beauhurst classifies equity deals into four stages; seed, venture, growth and established. These stages reflect product development, commercialisation, sales, and profitability levels in the recipient company. As in previous reports, we combine the growth and established stages for simplicity, which we refer to as the 'growth' stage.

Beauhurst use a wide range of criteria for classifying companies between stages but the following definitions give a guide to the types of companies included in each stage:

- Seed stage encompasses young companies with a small team, and low valuation that have received lower levels of funding relative to the sector. There is a degree of uncertainty in their product-market fit or they are just getting started with the process of getting regulatory approval. Funding is likely to come from grant-awarding bodies, equity crowdfunding, and business angels.
- Venture stage covers companies that have been in existence for a few years and are in the process of gaining market traction rapidly growing sales. The venture stage does not solely correspond to funding by venture capitalists, as other investor types also provide funding to venture stage companies.

- Growth stage businesses are more developed with multiple offices or branches and substantial revenue streams (some of which may be profitable). The growth stage includes later stage VC-backed companies seeking to grow their core market, expand into new markets, or create new products/services.

Beauhurst also reports deals that are only partly funded by equity capital. Venture debt, loans, or grants issued to private companies are therefore reported if they have come in conjunction with equity finance in the specific funding round. The total reported investment may also therefore include a share of debt finance.

Beauhurst only includes deals involving the creation of new shares (injection of new capital into the company) and excludes buyout or merger and acquisition deals resulting in a change of ownership.

### Acknowledgements

This report along with its accompanying analysis was produced by Marc Krempl and Ben Morrison in the British Business Bank Economics Team. We would like to acknowledge the contribution of Dan van der Schans in supporting the analysis throughout.

We would like to thank Beauhurst and PitchBook for their support and use of their data in this report.

# Endnotes

1. PitchBook (2023), “European Venture Report Q1 2023” [https://files.pitchbook.com/website/files/pdf/Q1\\_2023\\_European\\_Venture\\_Report.pdf#page=1](https://files.pitchbook.com/website/files/pdf/Q1_2023_European_Venture_Report.pdf#page=1).
2. ONS (2023), “Consumer price inflation, UK: March 2023” <https://www.ons.gov.uk/economy/inflationandpriceindices/bulletins/consumerpriceinflation/march2023>.
3. PitchBook (2023), “PitchBook NVCA Venture Monitor Q4 2022” <https://pitchbook.com/news/reports/q4-2022-pitchbook-nvca-venture-monitor>.
4. PitchBook (2023), “PitchBook NVCA Venture Monitor Q4 2022” <https://pitchbook.com/news/reports/q4-2022-pitchbook-nvca-venture-monitor>.
5. PitchBook (2023), “PitchBook NVCA Venture Monitor Q1 2023” <https://pitchbook.com/news/reports/q1-2023-pitchbook-nvca-venture-monitor>.
6. There can be a greater time delay for the announcement of first-time fundraisings, resulting in these types of deals being identified at a later stage.
7. PitchBook (2023), “PitchBook NVCA Venture Monitor Q4 2022” <https://pitchbook.com/news/reports/q4-2022-pitchbook-nvca-venture-monitor>.
8. PitchBook (2023), “PitchBook VC Dealmaking Indicator” <https://pitchbook.com/news/articles/the-pitchbook-vc-dealmaking-indicator>.
9. A company has to meet the first condition and at least one of the remaining three conditions to be classified as an academic spinout.
10. These figures differ from the recently published report on academic spinouts by Beauhurst and the Royal Academy of Engineering, as that analysis includes unannounced deals and deals into large companies available at: <https://raeng.org.uk/media/cdvj3jjv/spotlight-on-spinouts-2022-uk-academic-spinout-trends-v2.pdf>.
11. Throughout this report, deal number and investment value calculated across industry sectors is based on weighted counts. This reflects the weighting Beauhurst attaches to the sectors an investee company covers. For example, a company in the technology and retail sectors will be counted as half a deal in each of these two sectors, rather than being counted twice under each sector. This approach ensures the aggregation of individual sectors equals the total number of deals and investment overall.
12. Beauhurst data on announced deals to all-female founding teams in 2011 only represented 18 deals so comparisons are made from 2012 onwards.
13. Limited Partners are predominantly institutional investors that invest in private equity and venture capital funds. British Business Bank funds delivered by private sector fund managers including private sector sources of capital are not included in Beauhurst’s definition of Government funds.
14. These regional programmes also provide debt finance which is excluded from this analysis.
15. British Business Bank user defined search of PitchBook platform. Results may differ to PitchBook’s own published figures.
16. The total value of the Bank’s equity commitments for ECF and BPC including NLF commitments and excluding deferred commitments.
17. These market share figures are calculated on the region or LEP area only, relating to the region or LEP area Beauhurst allocated the company to. There are incidences of NPIF, MEIF, and CloSIF backed companies with their headquarters outside the regions or LEPs. This can be the case when companies are pending relocation or where significant investment activity takes place within the respective areas while the company is headquartered outside of them.
18. For Figures 2.5 and 2.6, proportions may not sum to 100% due to rounding.
19. Beauhurst define a key person as someone with a c-suite or department head level role.
20. For Figures 2.5 and 2.6, proportions may not sum to 100% due to rounding.
21. The criteria for this analysis includes completed deals at the following deal stages: seed, early stage VC and later stage VC. This is consistent with PitchBook analysis in previous Equity Tracker reports. In terms of technology abbreviations, SaaS refers to Software as a Service, AR refers to Augmented Reality, VR refers to Virtual Reality, and IoT refers to Internet of Things.
22. PitchBook define Robotics as including “companies in this vertical develop mechanical devices that are automated or remote controlled, including machinery that performs repetitive tasks for manufacturing, machinery that performs precise tasks for surgery or semiconductor production and unmanned vehicles”.
23. PitchBook define CleanTech (clean technology) as including “companies develop technologies that reduce the environmental impact of human activities or reduce the amount of natural resources consumed through such activities.”
24. PitchBook define Nanotechnology as “Companies in the nanotechnology vertical create products by manipulating materials at an atomic level”.
25. PitchBook define Space Technology as “Space technology companies provide services, engage in scientific research, and/or develop technology related to spaceflight, satellites, or space exploration. This includes micro-satellites, nano-satellites, ground station networks, rocket technology, payload systems, spacecraft development, satellite imagery, satellite telecommunications, space-based data, space materials, space tourism and asteroid mining.”
26. Office for Life Sciences (2022) “Bioscience and health technology sector statistics 2021”.
27. Office for Life Sciences (2022) “Life science competitiveness indicators 2022”.
28. Times Higher Education World University Rankings 2023 for Life Sciences.
29. OECD Science, Technology & Innovation Indicators. This data uses IP5 patent families, which cover patent sets that have been filed in at least two IP offices worldwide (including one of the five largest patent offices). A patent family is a collection of patent applications that relate to the same concept, or similar concepts, and are filed in different locations.
30. Nominal GDP data from the UK Office for National Statistics and the US Bureau of Economic Analysis is used for this analysis, converted with annual exchange rates from the Bank of England.
31. Henry Royce Institute (2022) <https://www.royce.ac.uk/news/new-business-secretary-announces-95m-new-government-funding-for-advanced-materials-research-and-development/>.
32. UK Space Agency (2022) <https://www.gov.uk/government/publications/the-size-and-health-of-the-uk-space-industry-2022/size-health-of-the-uk-space-industry-2022#section10>.
33. UK Space Agency (2022) <https://www.gov.uk/government/publications/the-size-and-health-of-the-uk-space-industry-2022/size-health-of-the-uk-space-industry-2022#section10>.



**British Business Bank plc**

Steel City House  
West Street  
Sheffield S1 2GQ

t. 0114 206 2131

e. [info@british-business-bank.co.uk](mailto:info@british-business-bank.co.uk)

**[british-business-bank.co.uk](http://british-business-bank.co.uk)**

Publication date: June 2023

British Business Bank plc is a public limited company registered in England and Wales, registration number 08616013, registered office at Steel City House, West Street, Sheffield, S1 2GQ. It is a development bank wholly owned by HM Government. British Business Bank plc and its subsidiaries are not banking institutions and do not operate as such. They are not authorised or regulated by the Prudential Regulation Authority (PRA) or the Financial Conduct Authority (FCA). A complete legal structure chart for the group can be found at: [www.british-business-bank.co.uk](http://www.british-business-bank.co.uk)

British Business Bank plc has made every effort to use reliable, up to date and comprehensive information and analysis, but no representation, express or implied, is made by British Business Bank plc or its subsidiaries as to the completeness or accuracy of any facts or opinions contained in this report. Recipients should seek their own independent legal, financial, tax, accounting or regulatory advice before making any decision based on the information contained herein. This report is not investment advice. British Business Bank plc and its subsidiaries accept no liability for any loss arising from any action taken or refrained from as a result of information contained in this report.