

# Enterprise Capital Funds

Interim Evaluation

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**Research report**  
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# Executive Summary

Ipsos MORI, in association with George Barrett<sup>1</sup>, was commissioned by the British Business Bank to undertake an evaluation of the Enterprise Capital Funds (ECF) programme in January 2020. This report sets out the results of the evaluation.

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## Enterprise Capital Funds

The Enterprise Capital Funds programme was established in 2006 to increase the level of early-stage equity finance going to young businesses with high growth potential. The programme involves the commitment of public funds to address fund-raising constraints faced by venture capital (VC) funds and contribute to economic growth by stimulating investment in innovative early-stage businesses. This evaluation provides an interim assessment of the impacts of the programme, focusing on 14 VC funds and 13 fund managers receiving financial backing through the programme between 2011 and 2017.

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## Rationale for the scheme

The UK equity ecosystem has developed since the ECF programme was established in 2006, with a greater number and range of investors investing in early-stage companies. The emergence of crowdfunding platforms has also provided an additional route of funding for early-stage companies. VC funds increased their investment in early-stage/seed companies from the mid-2010s, showing greater appetite for risk and recognition of the investment opportunities in UK VC market.

The UK has closed the gap with the US in terms of the likelihood that high growth start-ups are able to attract equity funding and follow-on investments. However, the US VC sector remains more effective in providing a cash 'runway', with significantly larger investments made at every stage of company development. Fund managers consulted in the study all considered that an 'equity gap' remains present in the UK economy, despite the positive trajectory of improvement over the last 15 years. Deal sizes are also increasing and, while the £5m upper limit on investments that can be made by ECFs is sufficient to cover most early investments made in UK start-ups, the number of early-stage investments exceeding this limit is increasing.

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## Impacts on VC supply

The ECF programme met its objective to increase the supply of VC funding for early-stage companies by helping funds to close more rapidly than they otherwise would have done and enabling fund managers to raise successor funds:

- The 14 ECFs in the scope of this evaluation closed with a total value of £651m (average fund size of £47m). Private investors contributed 45 percent of this funding and all funds met the scheme's performance objective to raise at least one third of their total capital from private investors.
- The ECF programme appears to have strengthened the venture investment ecosystem by supporting emerging fund managers to raise successor funds and scale their investment

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<sup>1</sup> George Barrett was formerly Chief Economist of the Ecorys Group and provided peer review to the team.

operations. Eight of the 13 fund managers supported went on to raise successor funds and collectively raised £1.9bn via the ECF programme and successor funds at the time of writing.

- The ECF programme appeared to increase the ability of fund managers to close their initial funds and to raise successor funds. Based on comparisons to fund managers whose applications for ECF funding were not supported, up to 89 percent of the funds raised may not have been secured in its absence. This implies a total effect on the supply of VC funding of £1.7bn by 2019, and a leverage ratio of £2.80 in additional funds raised per £1 of capital contributed by the ECF programme.
- The British Business Bank's role as a cornerstone investor was considered the most critical factor in enabling these impacts. The British Business Bank's due diligence was also considered amongst the most rigorous in the market and provided an important quality signal to larger LPs. However, the time absorbed by the process created some frictions and was linked to potentially addressable capacity constraints.

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## Impacts on VC investment

The programme also met its objectives to increase levels of VC investment in early-stage companies. ECF funds mainly invested mainly in early-stage pre-revenue companies that had not previously secured equity funding. There was also little evidence that the British Business Bank crowded out other investors in the private sector:

- £545m of the £650m committed to the VC funds had been drawn down by the end of 2019, with investments made in 388 portfolio companies. ECFs predominantly placed their investment in early-stage pre-revenue companies in line with the objectives of the scheme.
- Firms supported by the ECF programme raised an estimated £4.5bn in equity funding by the end of 2019 (including follow-on investments). ECFs contributed £480m to this total, to which the British Business Bank contributed £264m.
- Firms receiving investments placed by ECFs were generally in discussions with other investors and many received alternative offers. Around 70 percent indicated they could have otherwise raised similar levels of funding, though it may have taken longer to do so. The ECF programme helped increase the supply of finance available for SMEs and allowed firms to select investors who may have added value beyond the capital invested.
- Investments placed by ECF funds did not have a short-term positive effect on the funding raised by firms. However, they increased levels of equity investment in portfolio companies by around 10 percent by the end of 2019 through follow-on investments. Portfolio companies raised between £438m and £450m in additional funding as a result of the programme and it is estimated that public funding leveraged between £176m and £184m in additional investment.
- The net effects of the programme on overall VC investment levels in the UK by the end of 2019 were estimated at £251m. This implies the programme has had a positive impact in increasing the supply of equity finance for early-stage UK companies.
- There were no signals that the British Business Bank is likely to generate a loss on its investments in the programme, and private LPs are currently expected to earn returns that exceed those on investments made in VC more broadly (as would be expected given the structure of the intervention).

## Impacts on business growth

The ECF programme had a significant impact on the growth of businesses. There was a variety of evidence that this growth would not have been achieved in the absence of investments placed by ECF backed VC funds:

- Firms grew rapidly after attracting investment from ECF backed VC funds. The turnover and employment of firms benefitting from the programme grew at an annual rate of 76 and 48 percent respectively, collectively creating almost 8,000 jobs and generating £2.2bn in additional sales by March 2019.
- The firms concerned increased their overall GVA by a cumulative total of £724m by the end of 2019. Around 18 percent of this (£130m) was driven by productivity gains. GVA per worker rose from £6,000 to £34,000 after the investment was placed by ECF backed VC funds.
- Econometric analysis suggested that investments placed by ECF backed VC increased the number of workers employed by supported firms by 23 percent by March 2018 (over and above growth that may have been achieved in the absence of the programme). The results suggest that around 35 percent of the employment growth achieved would not have happened without the investments made by the ECF funds.
- As businesses were generally at early-stage of maturity in developing and commercialising disruptive business models, the findings will understate the longer-term economic impacts of the programme. Expectations of the future private benefits of the programme will be reflected in changes in the valuations of the firms supported, which rose by 64 percent or £859m by the end of 2019.

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## Cost benefit analysis

It is too early to provide definitive figures on the economic cost-effectiveness of the ECF programme. However, the available evidence suggests that there is a high likelihood that the scheme will produce net economic benefits that exceed its economic cost (notwithstanding uncertainties in the future macroeconomic climate created by COVID-19):

- **Costs:** The present value of the potential costs associated with the programme were estimated £94.8m (assuming that the British Business Bank exits the funds over a twelve-year period following the commitment of capital), of which £63.0m had been incurred by the end of 2019.
- **Net economic benefits:** Based on changes in the valuations of the firms supported, the net additional economic benefits of the programme were estimated at £165m. This was the best available measure of how firms are expected to grow in the future. However, values were estimated based on industry best practice but have largely not yet been realised and may change over time as companies develop.
- **Value for money:** These indicative results suggest the programme may deliver £2.62 in net benefits per £1 of economic cost by 2028 (which would represent good value for money in terms of the criteria normally applied to these types of intervention).
- **GVA impacts:** On the (uncertain) assumption that the firms supported will continue to grow as they have done in the past, it is estimated that the programme will lead to a gross additional GVA impact of £630m by the end of 2028. This is equivalent to a direct effect on economic output of

£6.65 in GVA per £1 of economic costs. However, these will be subject to offsetting displacement and crowding out effects in product markets that are difficult to measure robustly.

Arguably, it is premature to undertake a cost-benefit analysis of the programme. Most firms in the scope of the study were at an early-stage of their development and estimates of impact based on their short-term expansion will understate the longer-term economic benefits involved. Additionally, few firms had achieved an exit for their investors and changes in underlying valuations are notional at this stage (and often highly conservative).

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## Conclusions

The evaluation results suggest that the ECF programme – at this interim stage – is likely to meet its objectives to support the growth of the UK economy through increasing the supply of VC for early-stage businesses in the UK and addressing the existing ‘equity gap.’ It has allowed more early-stage VC funds to reach a final close and has led to a net increase in VC investment in UK headquartered firms. The strength of the British Business Bank’s due diligence arrangements was a key contributory factor in enabling these impacts to happen.

These investments have enabled firms to grow rapidly. At the time of the research, the firms had not finished executing their scale-up plans and impacts in terms of turnover and GVA growth were not fully visible. However, future growth expectations will be capitalised into the valuations of firms benefitting from the programme. On this basis, the programme is expected to deliver economic benefits that exceed its costs as far as can reasonably be established at this interim stage.

The evidence highlighted a small number of areas where procedural enhancements could increase the impacts of the programme. Firstly, there may opportunities to increase flexibility around the restrictions on the total size of funds that ECFs are able to close, as they may be limiting the total leverage of private funding. There was also some evidence that the timescales for due diligence were being lengthened by addressable capacity constraints, and this was having an impact on investment pipelines and, in some cases, the commitment of LPs. Consideration could also be given to any possibility of strengthening the British Business Bank’s advance commitments to fund managers, as this may aid more rapid commitment of private funds.

# 1.0 Introduction

Ipsos MORI, in association with George Barrett, was commissioned by the British Business Bank to undertake an evaluation of the Enterprise Capital Funds (ECF) programme in January 2020. This report sets out the results of the evaluation.

## 1.1 Enterprise Capital Funds

The Enterprise Capital Funds programme was established in 2006 to increase the level of early-stage equity finance going to young businesses with high growth potential. The programme involves the commitment of public funds to address fund-raising constraints faced by venture capital (VC) funds and contribute to economic growth by stimulating investment in innovative early-stage businesses. The programme is administered by the British Business Bank.

## 1.2 Evaluation aims and objectives

The aim of this interim evaluation (as defined in the Terms of Reference) is to provide the British Business Bank with supporting evidence on the effectiveness of the ECF programme in terms of meeting its objectives. The evaluation aims to assess:

- Company profile and founder characteristics at the time of investment and now.
- The process recipient businesses go through in obtaining equity investment and the extent to which the portfolio companies could have received funding from other sources (finance additionality).
- Company performance (e.g. turnover and employment) at time of funding and now and how funding contributed to these outcomes (outcome additionality).
- Other potential benefits – e.g. innovation, entry to international markets, productivity improvements, increased company valuations.
- Finance additionality at the fund level in terms of how the programme helped funds to raise capital, especially amongst new fund manager teams.
- Rationale for the programme in tackling market failures affecting smaller deal sizes.
- Financial performance of the funds supported by the programme.
- Quantified estimates of the economic costs and benefits of the programme over its full life.

## 1.3 Scope

This evaluation focusses on 11 ECFs supported by the British Business Bank between 2014 and 2017 following renewal of State aid approval for the programme in 2013.<sup>2</sup> However, as the number of SMEs supported by these VC funds at the time of writing was relatively small, and in view of the additional difficulties of undertaking fieldwork during the emergence of the COVID-19 pandemic, the scope of the

<sup>2</sup> This builds on the previous evaluation undertaken in 2014.



study was extended to include three additional VC funds supported by the programme between 2011 and 2013.

## 1.4 Methodology

The evidence supporting this evaluation was collected using the following methods:

- **Development of evaluation framework:** The study was structured by the initial development of an evaluation framework. This involved an analysis of the Business Case for the programme and the application of economic theory to describe the intended causal process through which the programme was expected to achieve its intended outputs, outcomes and impacts (on financial markets and the product market). This was used to specify more detailed evaluation questions that were agreed with the British Business Bank during the initial stages of the study and were used to inform the development of research tools and interpret findings.
- **Analysis of monitoring information:** An analysis of monitoring information held by the British Business Bank was completed to provide an understanding of the funds receiving investment, how capital was deployed, and the characteristics of the businesses securing investment.
- **Interviews with fund managers:** Interviews were completed with 12 fund managers benefitting from the ECF programme. These interviews explored the role of the programme in enabling VC funds to reach a final close and supporting the development VC sector in the UK. The interviews also explored fund managers' views on how the broader VC market has evolved in the UK and the on-going relevance of the programme<sup>3</sup>.
- **Interviews with stakeholders:** Seven interviews were completed with representatives of the VC industry in the UK, institutional investors and Government to give an external perspective on the issues being explored. These interviews explored perspectives on the role of ECF in the evolution of the VC market since 2014. It was not possible to secure input from BEIS as the relevant officials were fully occupied with addressing issues arising from the COVID-19 pandemic.
- **Business survey:** A telephone survey of 80 businesses benefitting from investments made by ECFs was conducted between April and July 2020. Contact details for the firms concerned were obtained from fund managers. A total of 248 contacts were provided, giving coverage of 12 of the 14 VC funds supported by the programme and 64 percent of the 388 businesses receiving investment. The overall response rate to the survey was 49 percent<sup>4</sup>. The coverage of, and response rate to, the survey was affected by the COVID-19 pandemic. Some fund managers were reluctant to provide contact details for businesses that were responding to the crisis and, in some cases, it was difficult to reach founders or senior managers. This will introduce an unknown level of non-response bias to the findings, particularly if those that were more difficult to reach were relatively more affected by the COVID-19 pandemic.

The survey questionnaire covered the following themes: characteristics of firms prior to investment, their fundraising history, their objectives in seeking investment, intermediate outcomes from the investment, and longer-term changes in company performance. The questionnaire is not reproduced in the appendices but is available upon request.

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<sup>3</sup> The topic guide is not reproduced in the appendices but is available upon request.

<sup>4</sup> The total number of contacts received was 248, of these 85 were invalid (i.e. bad numbers) so the final number of usable records was 163. The response rate was calculated as  $80/163=0.49$ .

- **Case studies:** Eight firms were selected for more detailed research from the pool of businesses responding to the telephone survey. The case studies involved follow-up qualitative research with the aim of understanding firms' challenges in raising equity capital, how far the ECF programme addressed those challenges, and how the business used the investment.
- **Data-linking:** Records of firms supported by the programme were linked to a variety of secondary datasets to provide further quantitative information on the economic impacts of the programme. These datasets included:
  - **Business Structure Database:** This an annual snapshot of the Interdepartmental Business Register which provides annual records of the employment and turnover of all businesses registered for PAYE and VAT. The dataset was accessed through the ONS Secure Research Service.
  - **PitchBook:** Records of firms benefitting from the programme were linked to records of disclosed equity investments compiled by PitchBook, a commercial VC data provider. A total of 307 of 388 firms were tracked by PitchBook, covering 79 percent of the population of interest. PitchBook only compiles records of disclosed equity investments and may not provide coverage of smaller investments or funds seeking to keep their investments confidential.
  - **Other datasets:** The possibility of using the Annual Survey of Hours and Earnings (ASHE) and the Business Expenditure on Research and Development (BERD) surveys to provide further information on the impact of the programme on wages and R&D activity was also explored. However, coverage of the firms benefitting from the programme in these surveys was insufficient to support statistical analyses.
- **Econometric analysis:** The data compiled were used to implement a series of statistical analyses to provide estimates of the causal effects of the ECF programme on levels of equity investment and the growth of firms. It was not possible to identify a suitable group of businesses that had not received investment from ECF programme to provide an effective counterfactual. This was because fund managers did not compile records of 'dead deals' and firms reporting they had sought equity investment sampled in the UK SME Finance Survey were not sufficiently similar to firms supported by ECF (more detail is provided in Section 6).

However, as the investments of interest were made over an extensive period, it was possible to treat those businesses benefitting from the programme in later years as a comparison group for those receiving investments in earlier years (a 'pipeline' design). This approach produces robust findings where the differences between firms receiving investment in different years can be treated as random. Details of these analyses and associated robustness checks are provided in Annex B. The findings were triangulated with other sources of evidence (e.g. survey responses and depth interviews) to provide an overall view of the impact of the programme.

## 1.5 Structure of this report

The remainder of this report is structured as follows:

- **Section 2** provides an overview of the ECF programme and its intended effects.
- **Section 3** reviews the broader context and the on-going relevance of the programme.
- **Section 4** explores the effect of the ECF programme on the supply of VC funding.

- **Section 5** examines the impact of the investments by ECFs on the growth and productivity of recipient businesses.
- **Section 6** provides an early assessment of the costs and benefits associated with the programme.
- **Section 7** provides the conclusions of the evaluation.

Annex A provides a more detailed overview of the theory of change underpinning the evaluation. Annex B provides details of the econometric analyses completed to support the evaluation.

## 2.0 Enterprise Capital Funds

This section provides an overview of the Enterprise Capital Fund (ECF) programme. It sets out the programme's stated aims and objectives and describes the mechanisms by which ECFs are expected to deliver its intended outcomes and impacts. The aim of this section is to provide an organising framework for the design of the evaluation, and to set out the core evaluation questions to be addressed in meeting the objectives of the study. Annex A provides a more detailed discussion.

### 2.1 The Enterprise Capital Funds programme

The Enterprise Capital Fund (ECF) programme was established in 2006 by the then Department of Trade and Industry in response to the 2003-2004 "Bridging the Finance Gap" consultation. This consultation provided evidence of an 'equity gap' that limited how far smaller SMEs could access an efficient level of early-stage equity funding. Public intervention was deemed necessary to stimulate the supply of VC funding to businesses with high-growth potential, by providing public funding to help capitalise VC funds aiming to make smaller equity investments.

The objective of the ECF programme is to contribute to UK economic growth by increasing output and improving productivity. The programme aims to deliver a net increase in GVA that exceeds the economic costs of delivering the programme. Intermediate objectives and success criteria were defined in the Business Case for the programme, reproduced in Table 2.1.

**Table 2.1: Enterprise Capital Funds - intermediate objectives and success criteria**

Intermediate objective	Success Criteria
1: Increase supply of equity finance to businesses that would otherwise have faced difficulties raising finance due to the existence of an equity gap. In addition, have positive impact on the wider financial infrastructure	<ul style="list-style-type: none"> <li>▪ Increase supply of equity finance at least equivalent to the size of the Government commitment to the funds</li> <li>▪ Positive impact on finance infrastructure. Measured through qualitative evidence, covering:</li> <li>▪ Attracting an increased flow of fund managers into the early-stage venture capital market</li> <li>▪ Having a positive impact on the expertise and skills of fund managers so that they are better able to make investments in SMEs seeking equity finance in the longer term and in the absence of government intervention.</li> <li>▪ Attracting more entrepreneurial investors to early-stage VC market</li> </ul>
2: Increase the economic performance of recipient businesses	<ul style="list-style-type: none"> <li>▪ Increased employment</li> <li>▪ Increased turnover (and GVA)</li> <li>▪ Increased productivity</li> <li>▪ Increased R&amp;D and innovation activity</li> <li>▪ Increased export performance</li> <li>▪ Increased business owner confidence in ability to raise finance in future</li> </ul>
3: Establish a rolling programme of viable funds attracting with at least 1/3 of funding from private sector source	<ul style="list-style-type: none"> <li>▪ For each fund, secure private sector investment of at least 1/3 of fund value to deliver on time and without the need for downside protection to private</li> </ul>

Intermediate objective	Success Criteria
4: The programme will generate sufficient return on the investments made to be at least cost neutral to the taxpayer over the medium term	<p>investors and with the Government first receiving its preferred rate of return</p> <ul style="list-style-type: none"> <li>▪ Demonstrate that the fund managers selected have the expertise required to deliver the funds</li> <li>▪ All investments comply with the investment policy and restrictions</li> <li>▪ All funds able to identify investment opportunities of sufficient quality to be fully committed by the end of the investment period</li> </ul> <p>A balanced portfolio of ECFs should be established so that the aggregate performance of the multiple funds is at least cost neutral over the medium term (12-15 years) considering the opportunity cost of Government funding (4.5% at the time)<sup>5</sup></p>
5: The objective for fund managers is to maximise fund performance under the given investment restrictions and strategies agreed with Capital for Enterprise Limited (CfEL) (now the British Business Bank)	<ul style="list-style-type: none"> <li>▪ On average funds achieve the hurdle rate at which fund managers become entitled to a profit share</li> </ul>

Source: Enterprise Capital Funds ROAMEF, BEIS 2010

The ECF programme is the British Business Bank's longest standing equity programme, having been established in 2006. The programme has supported 32 ECF funds and as of September 2020, these funds has provided over £840m in capital to 604 companies (across 653 deals).

## 2.2 Evaluation framework

This section summarises how the ECF programme was expected to produce its intended impact on the supply of VC funding, levels of VC investment, and economic growth.

### 2.2.1 Rationale

The case for public intervention is grounded in the long-established concept of an 'equity gap' (a gap in the availability of equity funding between the maximum that can be raised at the start-up stage from angel investors, and the minimum amounts that can be raised from follow-on VC funds) affecting smaller, younger, innovative businesses:

- **Shortages in the supply of equity funding:** Shortages in the supply of equity finance to innovative businesses will potentially reduce the growth of the UK economy. A small share of high growth firms accounted for half the net growth in jobs in the UK between 2002 and 2013. High growth firms also produce important economic benefits by encouraging the redeployment of workers in a more productive capacity and supporting productivity growth in upstream and downstream industries. These firms tend to be dependent on equity finance to support their growth. However, there are concerns that the supply of equity finance has been insufficient to meet the needs of firms with high growth potential.
- **Market failures:** Market failures are thought to constrain the supply of equity finance at inefficiently low levels. These arise from the costs incurred by investors to obtain the information needed to assess the quality of investment propositions and to monitor the behaviour of founders and senior management. These costs do not generally vary by the size of the investment being

<sup>5</sup> Public funding comes under the form of investment into the VC fund. The loan is repaid to British Business Bank at a prioritised rate of return which is close to the 10-year gilt rate and it is updated periodically. In 2010 this rate was reduced from 4.5% to 3% in line with general reduction in the costs of Government borrowing.

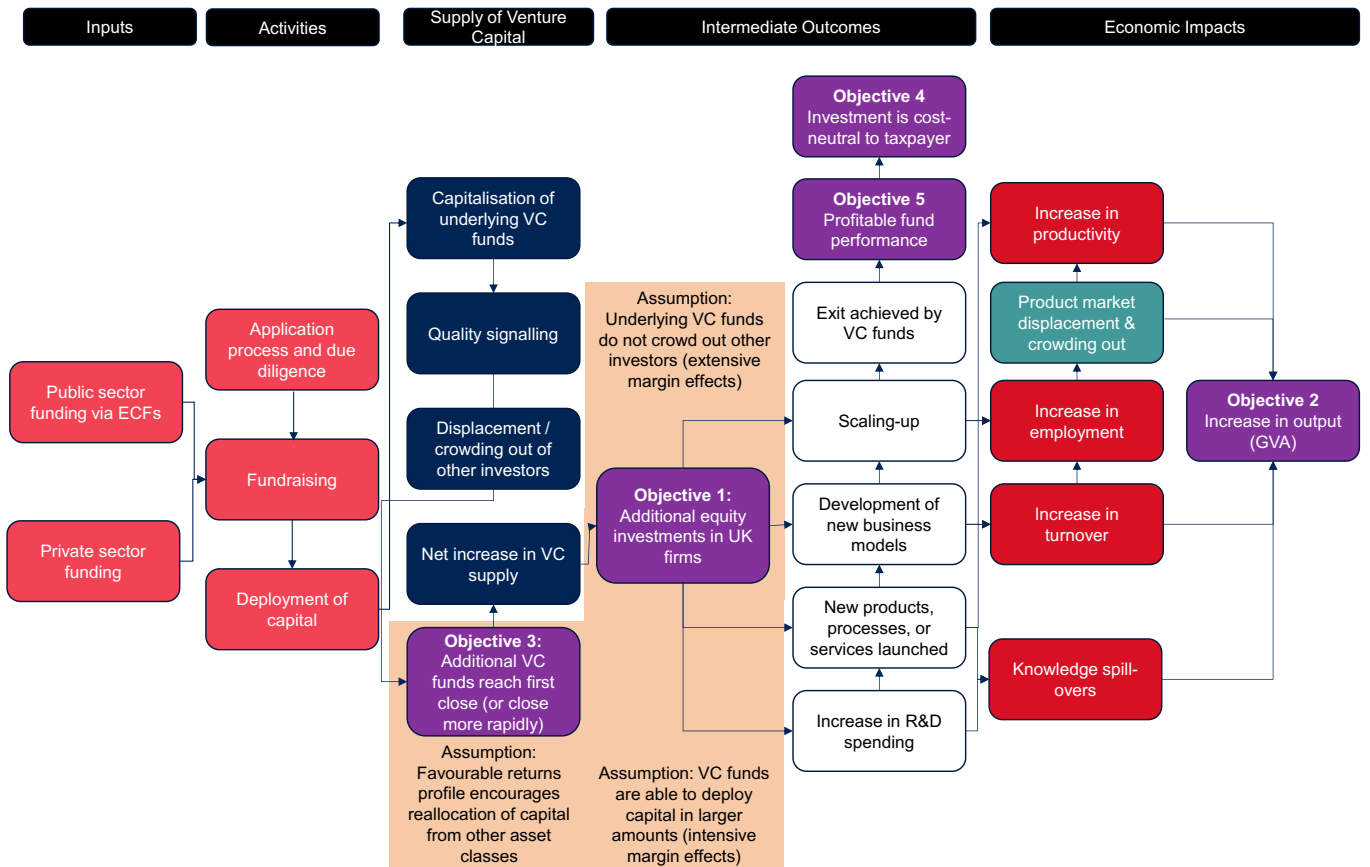
made, which limits the viability of smaller investments in earlier stage companies. VC investments may also generate positive benefits that cannot be captured by investors – such as knowledge spill-overs arising from the scale-up of disruptive innovations. There are also a small number of investors on the supply side and high-growth potential businesses on the demand side, inhibiting the development of an effective system of intermediary institutions.

These issues would lead to insufficient allocation of capital to potentially profitable VC investments, with early-stage investments affected most acutely. This will have social costs, because the additional profits associated with those investments and the social benefits of scaling disruptive technologies and business models will be foregone. These market failures justify public sector intervention to capitalise VC funds targeting early-stage companies.

### 2.2.2 Logic model

An overarching logic model for the Enterprise Capital Fund is reported below. This describes the processes through which the activities involved in the delivery of the programme are expected to lead on to its intended impacts on the supply of VC funding, levels of VC investment, and economic growth. The underlying causal mechanisms through these effects may be realised are explained in Annex A.

**Figure 2.1: Enterprise Capital Funds – logic model**



Source: Ipsos MORI analysis – links to intermediate objectives highlighted in purple.

### 2.2.3 Evaluation questions

The logic model outlined above raises important questions that need to be addressed to meet the objectives of the evaluation. Key questions to be addressed by the interim evaluation (linked to the objectives of the programme) are defined in the table below.



**Table 2.2: Enterprise Capital Funds – evaluation questions**

Intermediate objective	Evaluation questions
1: Increase supply of equity finance to businesses that would otherwise have faced difficulties raising finance due to the existence of an equity gap. In addition, have positive impact on the wider financial infrastructure	<ul style="list-style-type: none"> <li>▪ What challenges were fund managers facing in raising capital from private markets? What commitments were secured or dependent on ECF funding when an application for ECF funding was made?</li> <li>▪ How quickly did approved ECFs reach a first and final close? What types of investors have provided capital?</li> <li>▪ How far did the ECF programme enable fund managers to close the fund more quickly or at a larger scale (or at all) than they would have otherwise?</li> <li>▪ How far did the profit-sharing arrangements prove attractive to other LPs in the fund? To what extent did the restrictions placed on the investment strategy create difficulties in securing commitments?</li> <li>▪ How far did the British Business Bank's reputation provide a quality signal that attracted commitments from LPs?</li> <li>▪ How far has participation in the programme influenced the investment strategies of fund managers to focus more on investments in the UK and in earlier stage investments?</li> <li>▪ To what degree has ECF improved the skills or track record of fund managers? Has participation in the programme enabled them to raise successor funds?</li> </ul>
2: Increase the economic performance of recipient businesses	<ul style="list-style-type: none"> <li>▪ How far did ECFs invest in companies that would have otherwise struggled to raise funding/raise the most appropriate type of funding?</li> <li>▪ How did recipient businesses use the capital raised?</li> <li>▪ To what degree has the capital raised led to an increase in R&amp;D and the commercialisation of innovation?</li> <li>▪ How far has the capital raised led to an increase in employment, turnover, exports, GVA and productivity?</li> <li>▪ How far has receiving capital through ECFs increased business owner's confidence in their ability to raise finance in future?</li> <li>▪ How far has the programme enabled companies to secure follow on investment through further funding rounds?</li> <li>▪ To what degree have these economic impacts occurred in the UK?</li> </ul>
3: Establish a rolling programme of viable funds attracting with at least 1/3 of funding from private sector source	<ul style="list-style-type: none"> <li>▪ What share of commitments in ECFs have come from the private sector?</li> <li>▪ What share of ECFs met their target level of commitments from private investors at first and final close?</li> </ul>
4: The programme will generate sufficient return on the investments made to be at least cost neutral to the taxpayer over the medium term	<ul style="list-style-type: none"> <li>▪ Has the British Business Bank received returns equivalent to at least its cost of capital?</li> </ul>
5: The objective for fund managers is to maximise fund performance under the given investment restrictions and strategies agreed with CfEL (now the British Business Bank)	<ul style="list-style-type: none"> <li>▪ How do the rates of return on ECFs compare to comparable VC funds with a similar vintage year?</li> <li>▪ What returns have been paid to private investors (or are likely to be, based on current information)? How does this compare to other VC funds with a similar vintage year?</li> </ul>

Source: Ipsos MORI analysis

## 3.0 Context

The following section considers the broader context for the programme. It explores the supply of, and demand for, early-stage VC funding in the UK and how it has evolved since the renewal of State aid approval for the scheme in 2013. This section also provides evidence of the on-going strength of the rationale for the programme and features of its design. This section draws on an analysis of market data taken from PitchBook and consultations with fund managers and policy and industry stakeholders.

### 3.1 Key findings

- The supply of VC funding expanded rapidly between 2013 and 2020, both in the UK and globally. The total capital raised by UK headquartered VC funds increased from £1.9bn (2006 to 2012) to £3.1bn per annum (2013 to 2020). There were no signs of reduced appetite for VC amongst investors in the wake of the COVID-19 pandemic.
- The expansion of the supply in VC funding was attributed to the substantial growth of the technology sector in the 2010s and the increasing depth of the European start-up ecosystem. Stakeholders emphasised the critical role played by the British Business Bank, British Patient Capital and the European Investment Fund in enabling the development of the ecosystem.
- Levels of VC investment in UK headquartered companies have also expanded rapidly since 2013 (rising from £2.4bn in 2013 to over £10bn in 2020). Investment levels increased at all stages of company development and angel investors and crowdfunding mechanisms have become an increasingly important component on the investment ecosystem.
- The COVID-19 pandemic has not led any significant effects on overall VC investment levels. However, it did lead to a concentration of capital in later stage companies as risk appetite has fallen and fund managers seek to preserve the health of their existing portfolios. Start-ups and early-stage companies have found it more difficult to attract investment.
- The £5m upper limit on the total deal size into which ECFs can invest was set to concentrate investment in early-stage companies. Almost all early-stage investments made in 2013 in the UK were within this limit. However, increasing deal sizes has meant that less than 75 percent of these investments in 2020 fell within this limit. This may create a case for increasing this limit, though only fund managers focused on later stage businesses indicated that it represented a constraint on their activity.

### 3.2 Supply of early-stage VC funding

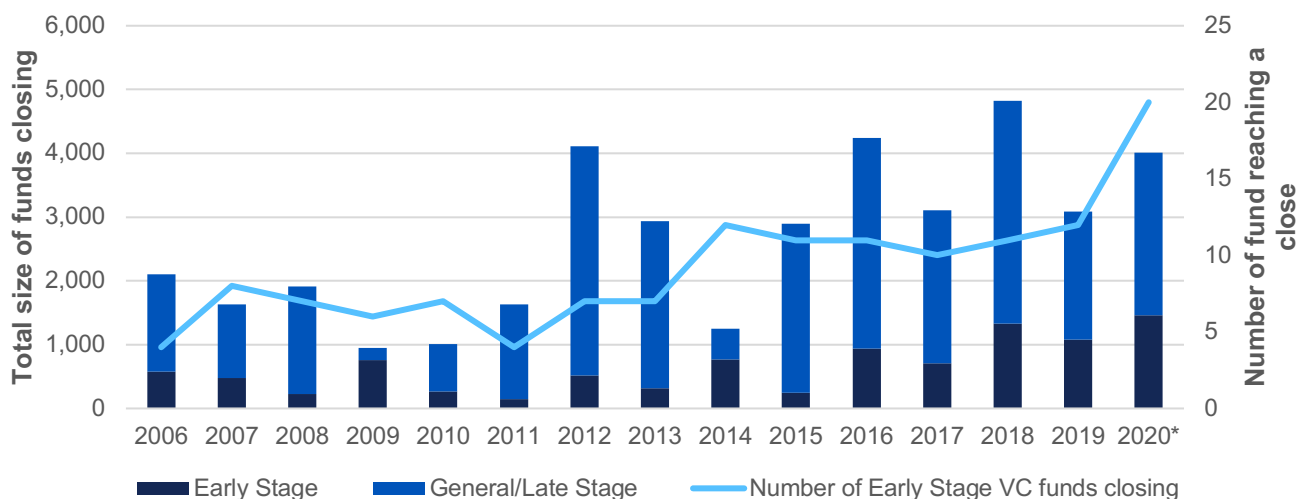
Fund-raising conditions for VC funds improved from 2013 onwards. The average annual number of UK headquartered VC funds reaching a final close rose from 24 between 2006 to 2012 to 41 between 2013 and 2020. The total capital raised by VC funds increased from £1.9bn to £3.1bn per annum. There have been no signs of reduced appetite for VC as an asset class in the wake of the COVID-19 global pandemic.

The period was also marked by growing numbers of VC funds that specialise in early-stage investments. The average number of early-stage VC funds reaching a final close rose from six per annum over the



2006 to 2012 period to 11 per annum from 2013 onwards. The total amounts raised by early-stage funds rose from £427m per annum to £811m across the two periods.

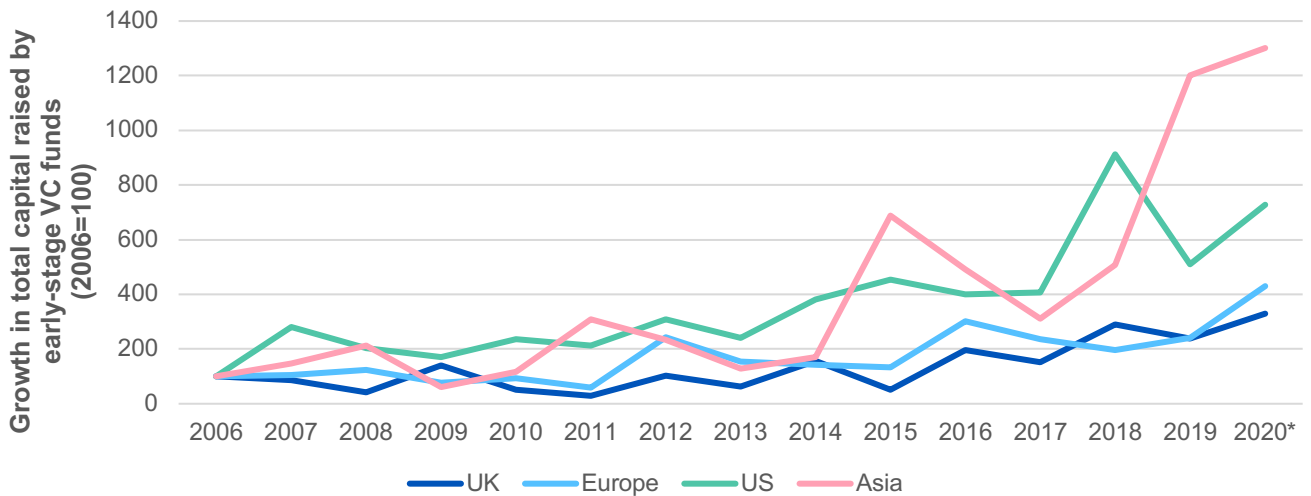
**Figure 3.1: Number and size of VC funds reaching a final close, UK, 2006 to 2020 (2019 prices)**



Source: Ipsos MORI user defined search of PitchBook. Results may differ to PitchBook's own published figures. Converted to 2019 prices using the GDP deflator. \* 2020 annualised based on January to September.

Although fundraising by UK headquartered VC funds has increased significantly, the experience of the UK has broadly matched those of other European countries. The supply of early-stage VC funding did not grow as rapidly in the UK as in North America and Asia (though it should be noted that this was predominantly driven by the Chinese VC sector which was starting from a relatively small base in 2006 relative to the size of its economy). Nevertheless:

- VC fundraising by early-stage VC funds headquartered in the UK accounted for a comparatively high share of overall fundraising (26 percent between 2013 and 2020, relative to 14 percent in the North America and 7 percent in Asia, and in line with the European average of 27 percent).
- UK based early-stage VC funds also tended to be larger on average than their counterparts elsewhere. The average size of UK funds at close was £65m over the period, compared with £50m in the US, £60m across Europe, and £55m across Asia.

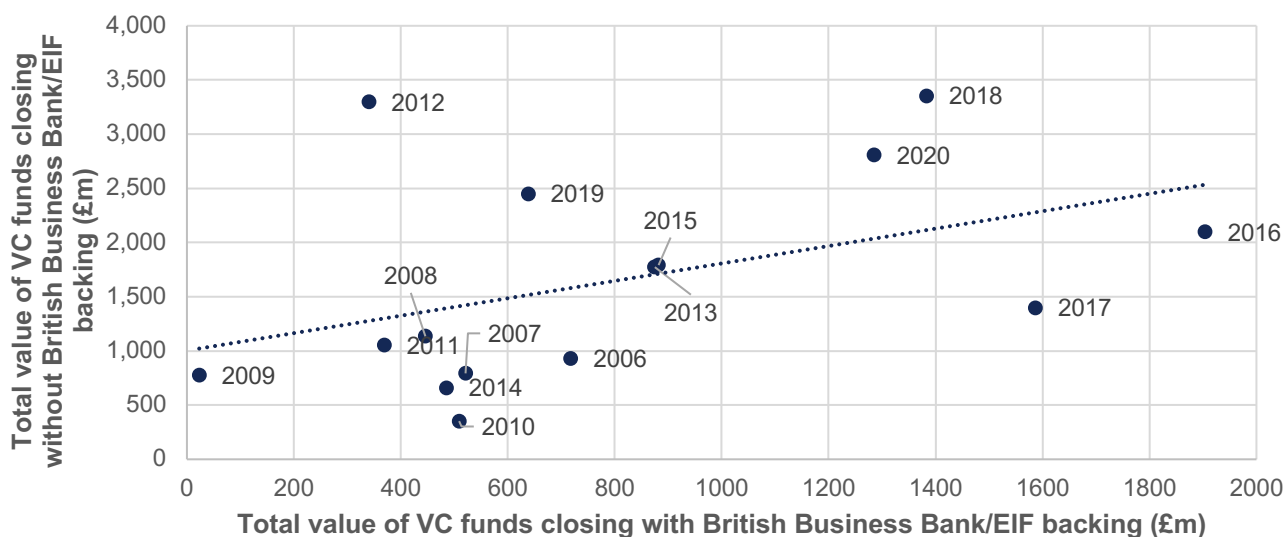
**Figure 3.2: Growth in total capital raised by early-stage VC funds, 2006 to 2020 (2006 = 100)**

Source: Ipsos MORI user defined search of PitchBook. Results may differ to PitchBook's own published figures. Index based on nominal fund values at close. \* 2020 annualised based on January to September.

Stakeholders and fund managers also highlighted the expansion in funding available to VC funds during the late 2010s and described a variety of contributory factors. The substantial growth of the technology sector during the 2010s was thought to have drawn both capital and skills to the industry. Several stakeholders pointed to the growth of the broader ecosystem, highlighting both demand side (a growth in European start-ups with more experienced founders and higher quality investment propositions) and supply side factors (including increasing interest in from US based investors, particularly at later stages, and a growth in the number of experienced fund managers).

Fund managers emphasised the critical role played by the British Business Bank (and its subsidiary, British Patient Capital) and the European Investment Fund (EIF) in underpinning the development of the ecosystem. Analysis of PitchBook data indicates that the British Business Bank, British Patient Capital, or the European Investment Fund were a Limited Partner (LP) in 70 of 331 VC funds closing between 2013 and 2020 (accounting for almost 36 percent of the total capital raised). Figure 3.3 also indicates that there was a positive correlation between the total levels of funding raised by VC funds backed by these institutions and the levels of funding raised by VC funds without public backing. Although this is not a causal measure, on the surface, this would suggest that public interventions in these markets have helped attract private funding to the asset class rather than diverting resources elsewhere.

**Figure 3.3: Correlation between funding raised by VC funds with British Business Bank and EIF backing and other funds, 2006 to 2020**



Source: Ipsos MORI user defined search of PitchBook. Results may differ to PitchBook's own published figures. Fund values in nominal prices. \* 2020 annualised based on January to September.

The level of support provided by the European Investment Fund to UK based VC funds fell in the years following the referendum on EU membership. Several fund managers highlighted the risks this could create for first time fund managers without the track record to attract backing from institutional investors that might act as anchor. Stakeholders and fund managers also drew attention to other issues that have acted as a constraint on fund-raising:

- **Consolidation of local authority pension funds:** Some VC funds relied on capital placed by smaller local authority pension funds that were more able to justify smaller investments in VC funds. Interviews with ECF fund managers indicated that the consolidation of these funds during the 2010s led to investment vehicles that are now too large to consider investments in smaller early-stage VC funds.
- **Impact of tax incentives:** Fund managers also highlighted that tax incentive schemes (particularly the Seed Enterprise Investment Scheme (SEIS)) were successful in attracting high net worth individuals to venture investments. However, several fund managers suggested that many investors in SEIS schemes did not have the long-term view needed to support patient investments in companies. The tax advantages associated with these schemes allow individuals to earn an acceptable return on their capital even if the value of the underlying assets does not change, and it was suggested that these investors would often seek to exit schemes after three or four years.
- **Technology investments:** External stakeholders in the programme raised concerns that there were specific shortages in the supply of UK based early-stage investors specialising in science and technology-based investments. This was reinforced by fund managers that described themselves as 'deep technology' investors, who generally reported that they faced less significant competition than those active in other sectors (such as digital and media).

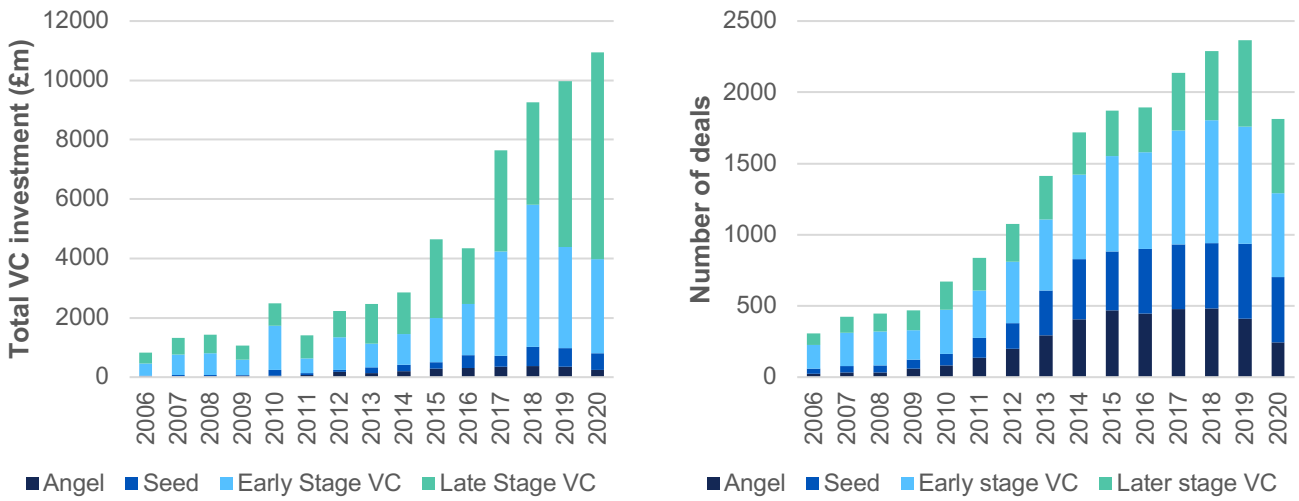
### 3.3 Investment in early-stage companies

The level of VC investment in UK headquartered firms expanded rapidly from 2013, as illustrated in Figure 3.4. Total VC investment rose from £2.5bn in 2013 to almost £10.0bn in 2019 (an increase of more than 400 percent). Growth in investment levels and deal flows were apparent across all stages of company development, and angel investors have become an increasingly important component of the investment ecosystem. Non-traditional fundraising approaches (such as crowdfunding) also grew, though accounting for a relatively small share of overall investment levels.

Levels of early-stage VC investment also grew substantially over the period and in line with other stages of investment. However, early-stage investment levels began to decline towards the end of 2019. Several factors are thought to be driving these trends:

- **COVID-19 pandemic:** The COVID-19 pandemic did not have a significant effect on overall levels of VC investment in the UK economy by September 2020. However, deal volumes contracted and capital was increasingly concentrated in a smaller number of larger investments in later stage companies (a pattern also observed following the 2008 financial crisis). While fund managers went into the crisis with substantial levels of dry powder, they reportedly focused their attention on the health of existing portfolio companies and extending their 'cash runways'. The need to do so was also exacerbated by weak conditions for Initial Public Offerings, lengthening the expected time portfolio companies could be expected to depend on private funding. This will have reduced the resources and time available to make new investments.
- **Uncertainty over future trading relationships:** Declining levels of early-stage investment predated the COVID-19 pandemic and uncertainties over the UK's future trading relationship with the EU may have also placed downward pressure on appetite for risk (which would disproportionately affect higher risk early-stage investments). As noted above, the EIF has reduced its investments in VC funds in the UK, which could also be placing downward pressure on investment levels.

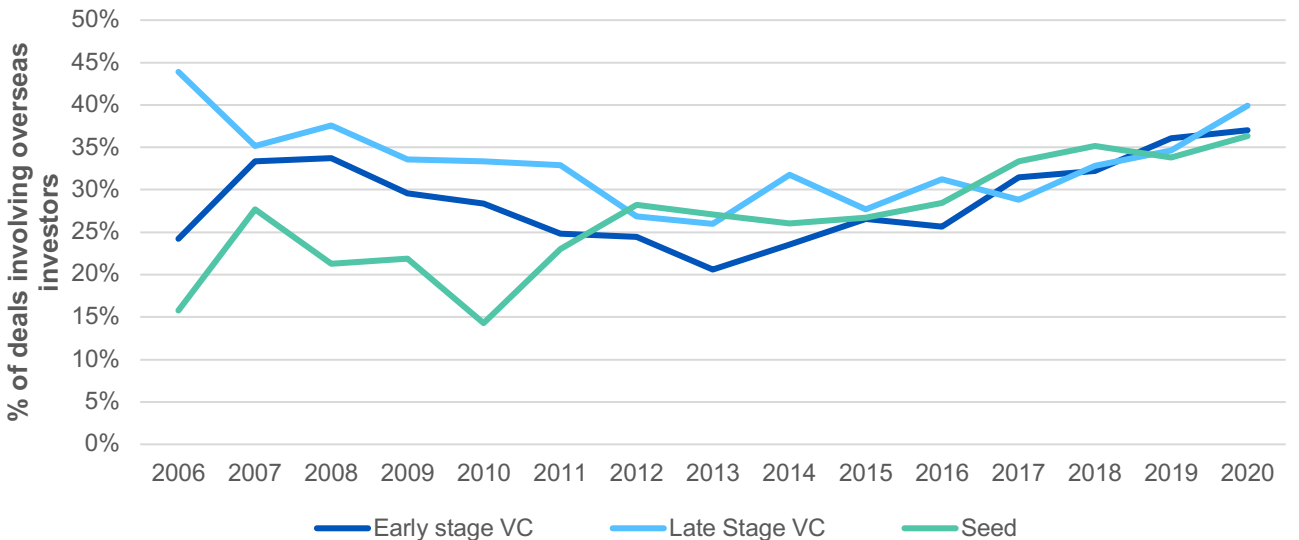
**Figure 3.4: Venture capital investment and number of deals, 2006 to 2020 (2019 prices)**



Source: Ipsos MORI user defined search of PitchBook. Results may differ to PitchBook's own published figures. Converted to 2019 prices using the GDP deflator. \* 2020 annualised based on January to September.

Funds with overseas headquarters took an increasingly important role in capitalising innovative businesses in the UK after 2013. The share of VC investments in UK headquartered early-stage companies involving an overseas investor rose from 20 percent in 2013 to 37 percent in 2020. Similar patterns were also seen at seed and later stages of company development. This is consistent with the views put forward by fund managers that conditions have become increasingly competitive, with US based investors increasingly attracted to European VC (partly due to perceived 'overheating' of the US market and pressure this has placed on valuations).

**Figure 3.5: Share of VC investments involving overseas investors, 2006 to 2020**



Source: Ipsos MORI user defined search of PitchBook. Results may differ to PitchBook's own published figures.

### 3.4 Equity gap

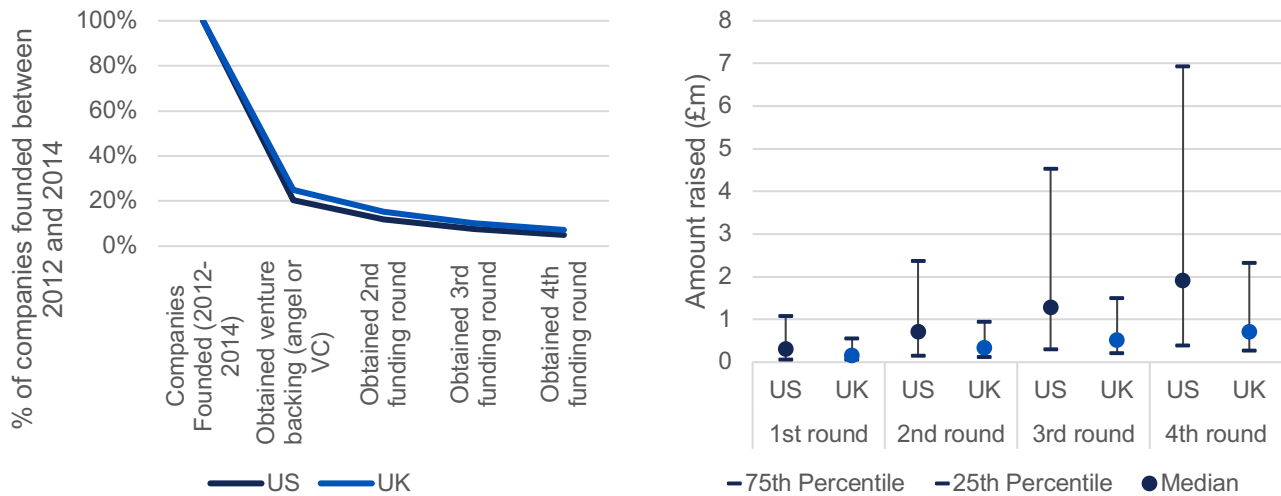
The ECF programme was established to address a ‘gap’ in the availability of venture funding for early-stage businesses. The upper limit placed on the total deal size associated with investments in new portfolio companies (£5m) was set to focus investment in early-stage companies. Although it is beyond the scope of this study to provide a quantitative estimate of the size of the equity gap, the following analysis explores how funding constraints faced by UK firms have evolved with time – drawing on comparisons with the US (generally regarded as having the most developed venture financing ecosystem) and the views of fund managers and other stakeholders in the programme.

Figure 3.6 shows the fundraising histories of a cohort of UK headquartered start-up companies founded in 2012 and 2013, in comparison to a cohort established in the US over the same period. These figures are based on the cohort of companies that are tracked by PitchBook, and some caution is required in interpreting the findings. For example, differences in the sector profile of firms established in the UK and the US and the respective size of their domestic markets may influence their capital funding requirements, and the patterns described below. Nevertheless, the results highlight:

- **Likelihood of obtaining venture funding:** There were no major differences in the share of UK based start-ups tracked by PitchBook attracting venture funding when compared to the US cohort. The share of start-up companies obtaining angel or VC backing was slightly higher in the UK (at 25 percent compared to 20 percent). The share of those companies obtaining follow-on investments from angel investors or VC funds were almost equivalent across the UK and US. This contrasts with analysis set out in the Patient Capital Review which indicated that UK firms receiving seed or Series A investment between 2008 and 2010 were less likely to raise follow on funding than equivalent firms based in the US. Subsequent British Business Bank analysis<sup>6</sup> also shows a similar trajectory of improvement.
- **Quantity constraints:** However, the amounts raised by UK firms are substantially lower than those raised by US firms and the gap increases with the number of investment rounds. UK start-ups raised a median amount of £160,000 in their first funding round, 48 percent lower than start-ups in the US. This gap increased to 63 percent (£0.7m vs £1.9m) by the fourth funding round. It is possible that these differences reflect varying capital requirements in the UK and the US. For example, the US has a substantially larger domestic market and start-ups may require deeper capital reserves to support their scale-up ambitions. It may also reflect attitude to risk. Nevertheless, on the surface, this would suggest that the US venture ecosystem remains more effective in providing a cash runway to start-ups.

<sup>6</sup> British Business Bank (2020) SBFM 2019/20 report

**Figure 3.6: Share of start-ups founded in 2012 and 2013 receiving follow-on investment and median deal values, by investment round**

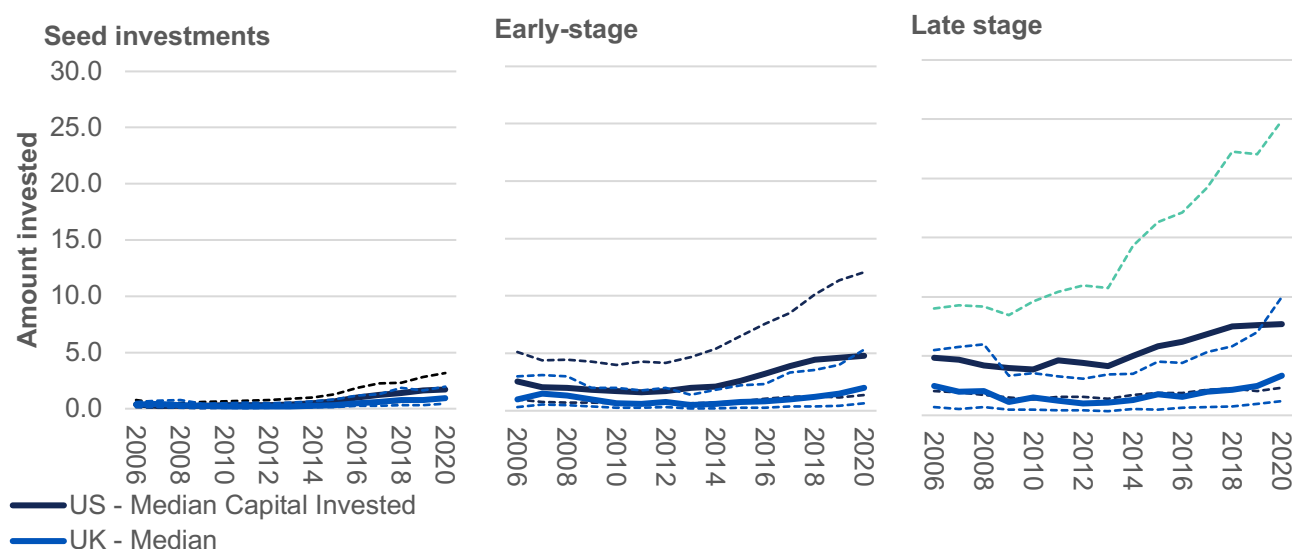


Source: Ipsos MORI user defined search of PitchBook. Results may differ to PitchBook's own published figures. Figures presented in nominal prices.

The analysis above suggests that the £5m upper limit on the deal sizes that ECFs can invest in should be sufficient to cover the investments typically made in UK start-ups in their first funding rounds. Figure 3.7 below illustrates how the median capital raised in VC funding rounds (and the interquartile range) at seed, early and late stages have evolved over the 2006 to 2020 periods:

- **Growing deal sizes:** Deal sizes have increased since 2013 at every stage, although the US has seen more rapid growth than the UK. Numerous stakeholders commented that this has partly been driven by growing competition which has helped to inflate valuations.
- **Early-stage investments:** The £5m upper deal size limit would have been sufficient to capture most early-stage investments in 2013 when State aid approval for ECFs was renewed. However, by 2020, more than 25 percent of early-stage investments would have exceeded this limit. As such, there could be a case for raising the limit on the total deal size.
- **Discrimination between early and late stage investments:** The median late stage investment in the UK was £3.4m. This highlights some of the challenges that might be encountered using the upper limit to direct funds towards earlier stage investments – more than 50 percent of later stage investments would also be captured in this limit.
- **Views on the upper limit:** This was also reflected in consultations with fund managers. While all considered that an 'equity gap' was present in the UK economy, there was no consensus on the upper limit at which deal flow was constrained and responses varied in line with the investment preferences of the fund manager. However, few fund managers reported that the £5m represented a major constraint. Those that did tended to focus on investments in revenue generating companies rather than companies that were yet to demonstrate their commercial model. Questions could also be raised about the additionality of investments in funding rounds of this size. Fund managers reporting these constraints generally indicated that they either able to invest via another investment vehicle that was not backed by the ECF programme (e.g. a successor fund) or that, while they were excluded from the syndicate, the company went on to raise the funding from other investors.



**Figure 3.7: Median capital raised and interquartile range by VC early-stage. UK and US, 2006 to 2020**

Source: Ipsos MORI user defined search of PitchBook. Results may differ to PitchBook's own published figures. Figures presented in nominal prices. Interquartile range shown by dashed lines.

### 3.5 Wider support for VC

Successive Governments have made several adjustments to help stimulate the supply of later-stage equity finance:

- Tax instruments:** HMRC operates three tax incentive schemes to stimulate the availability of seed, angel and venture finance (the Seed Enterprise Investment Scheme, the Enterprise Investment Scheme, and Venture Capital Trusts). These schemes allow individuals to make tax advantaged investments in individual companies or in small funds, with restrictions imposed on the size of the investments that can be made (focusing investment on the 'equity gap'). These restrictions have been relaxed since 2013, though additional rules to focus investment on high growth firms were introduced in 2016 in response to concerns that these instruments were being used for capital preservation rather than to fund high risk activity.
- VC Catalyst:** The VC Catalyst was created in 2013, which saw the British Business Bank invest directly in VC funds on a pari passu basis to provide further stimulus to the market to help these funds to reach a first close. £85m was committed to the programme by 2016 with a further £400m pledged in the 2016 Autumn Statement. The VC Catalyst was managed by British Business Bank's subsidiary British Business Investments, though with the creation of British Patient Capital the VC Catalyst portfolio was moved to the new entity. British Business Investment now supports equity investment through a £100m Regional Angels Programme (co-investing with angels to address regional imbalances in seed funding) and a £500m Managed Funds programme that aims leverage the resources of institutional investors into VC by capitalising a number of Fund of Funds.
- Patient Capital Review:** More recently, HM Treasury launched a review of financing for the growth of innovative SMEs. This led to the announcement of a new commercial subsidiary of the bank, British Patient Capital, with £2.5bn to provide further capacity to the market, with the aim of



raising a further £7.5bn of investment from private investors. The creation of British Patient Capital could also help offset negative effects that could arise from the withdrawal of the EIF from the UK VC market. The importance of the EIF to the UK VC market was highlighted in HM Treasury's Patient Capital Review consultation document, which indicated that between 2014 and 2016, EIF-backed funds were involved in 14 percent of early-stage investments in the UK, and 34 percent of later-stage investments (in comparison to 6 and 14 percent involving British Business Bank backed funds respectively)<sup>7</sup>. The 2019 British Business Bank Equity Tracker Report shows EIF contributed 23 percent of total fundraising by UK VC funds between 2010 and 2019.<sup>8</sup>

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<sup>7</sup> HMT (2017) Financing growth in innovative firms: consultation.

<sup>8</sup> British Business Bank (2019) Small Business Equity Tracker

## 4.0 Impact on VC supply

This section considers the impact of the ECF on the supply of VC to early-stage businesses. It draws on an analysis of management data compiled by the British Business Bank, in-depth interviews with fund managers supported by the ECF programme and an analysis of secondary data.

### 4.1 Key findings

- The 14 ECFs in the scope of this evaluation closed with a total value of £651m. Private investors contributed 45 percent of this funding and all funds met the scheme's performance objective to raise at least one third of their total capital from private investors.
- The role of the programme is, in part, to support emerging fund managers scale and become more established investors. Six of the 13 fund managers were raising their first funds, while the remainder had a range of experience. Some challenges were noted in raising awareness of the programme amongst prospective fund managers, and the scheme was not widely publicised beyond the scope of existing UK equity networks (such as BVCA or UKBAA).
- The ECF programme appears to have strengthened the venture investment ecosystem by enabling fund managers to raise successor funds. Eight of the 13 fund managers supported went on to raise successor funds and raised a total of £1.9bn in funds following their application for British Business Bank support.
- The ECF programme appeared to increase the ability of fund managers to both close their initial funds and raise successor funds. Based on comparisons to fund managers whose applications were not supported, up to 89 percent of the funds raised may not have been secured in its absence. This implies a total effect on the supply of VC funding of £1.7bn by 2019.
- The British Business Bank's role as a cornerstone investor was considered the most critical factor in enabling these impacts. The British Business Bank's due diligence was also considered amongst the most rigorous in the market and provided an important quality signal to larger LPs.
- The detailed diligence process did take time which created frictions for fund managers with the withdrawal of possible LPs or missing out on investment opportunities. This was linked to potentially addressable capacity constraints within the British Business Bank.
- The effect of the programme on the supply of VC funding may be accelerated if the British Business Bank could offer fund managers more certainty at an earlier stage of the application process (e.g. by making awards conditional on the outcome of due diligence). Some fund managers could close larger funds if restrictions imposed on the total fund size could be relaxed.
- £545m of the £650m committed to the VC funds had been drawn down by the end of 2019, with investments made in 388 portfolio companies by the end of 2019. No fund managers experienced difficulties in the deployment of capital. A higher share of investments made by ECFs reached early-stage companies than those made by other VC investors in the UK.
- There are no signals that the British Business Bank is likely to generate a loss on its investments in the programme, and private LPs are currently expected to earn returns that exceed those on investments made in VC more broadly. While it is too early to assess the financial performance of the programme, there are encouraging signs that it will meet its viability goals.

## 4.2 ECFs supported between 2011 and 2016

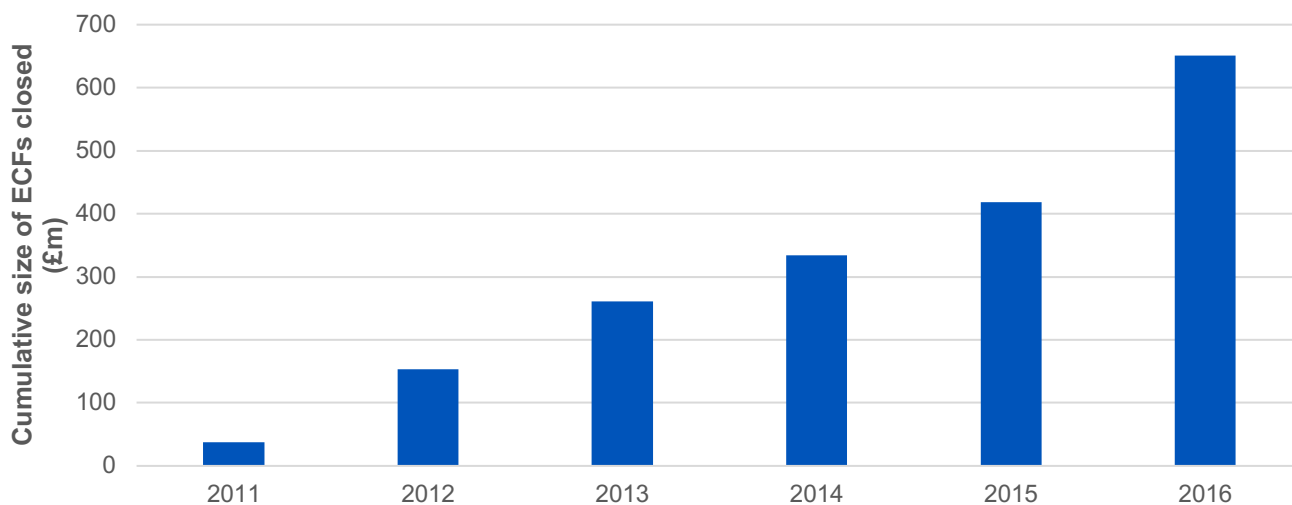
The British Business Bank received a total of 59 formal applications for the ECF programme over the period covered by this evaluation (2011 to 2016). Of these, 14 were allocated funding through the programme (11 of which were awarded funding after the renewal of State aid approval for the scheme in 2013), 39 were declined and six were withdrawn by the applicant:

- **Experience:** Funds were awarded to fund managers with varying levels of prior experience, based on data compiled from PitchBook. Six fund managers were raising their first VC funds, though some had experience of venture investing within their team. The ECF was the second or third fund for a further five fund managers (in two cases, the precursor fund was also supported by the ECF programme). Two fund managers had more extensive experience, closing four and nine funds prior to being supported by the programme.

Stakeholders generally considered that the programme was effective in supporting a broad range of fund managers and supporting a pipeline of new talent to enter the industry. However, although awareness of the British Business Bank was high, the programme was not considered to be well known. Challenges were noted in promoting the programme to new fund managers and, to some degree, there was a reliance on word-of-mouth communications from fund managers that had previously benefitted from the programme (which generated interest from experienced fund managers but not from those without a more traditional investment track record). It was suggested that the British Business Bank could potentially work more closely with trade bodies (such as the BVCA) to target communications at new and more diverse groups of fund managers.

It should also be noted that, on average, those applying for ECF funding but who were not supported via the programme, had less experience (closing an average of 0.5 funds in the past in comparison to 1.7). Experience in managing a fund was not a requirement in raising an ECF, but the process is competitive. Reasons for applications not being supported through the ECF programme ranged from lack of relevant experience in relation to the proposed investment strategy through to investment strategies with significant issues or incompatibilities with the programme's structure.

- **Size at close:** The funds closed with total value of £651m, with the British Business Bank contributing 55 percent and other limited partners contributing the remaining 45 percent. All funds met the scheme's performance objective to raise at least a third of the capital from the private sector. Figure 4.1 below shows the cumulative value of the 14 funds closed over the period of interest.
- **Limited partners:** Fund managers predominantly raised additional funds from high-net-worth individuals. There were also numerous examples of funds completing part of the overall funding package with capital placed by other types of investors – including Local Authority pension funds and University endowment funds. The average size of ECFs at final close was £47m (somewhat smaller than the average size of early-stage VC funds in the UK).
- **Geography:** The headquarters of most ECFs were in London which aligns with the UK VC market generally. A quarter of the surveyed fund managers were headquartered outside of London in Oxford and Cambridge. One of the funds in the scope of the study had an explicit focus on the Nottingham area.

**Figure 4.1: Cumulative value of ECFs closed between 2011 and 2016, £m (nominal prices)**

Source: British Business Bank management information relating to 14 ECFs funded. Figures are in nominal prices.

### 4.3 Effects on the ability of funds to reach a first close

A key objective of the ECF programme is to stimulate the supply of VC funding directed at early-stage companies. For the programme to realise this objective, the resources of the British Business Bank should be directed at funds that would not have otherwise reached a close (or would have closed at a lower value or over longer timescales). This section considers the impact of the programme on the ability of fund managers to reach a final close.

#### 4.3.1 Views of fund managers and stakeholders

Most fund managers consulted indicated that at the time they approached the British Business Bank, they were in parallel discussions with other private investors (including high net worth individuals, small institutional investors, and corporate investors) to secure the complementary private funding required by the programme. Fund managers, regardless of experience, described the process of fundraising as highly challenging owing to:

- **Difficulties in securing interest from larger institutional investors:** meaning that they would typically need to engage large numbers of small investors to reach a first close. One fund manager summarised this as *'I think, from memory, we had some interest-, we had close to 60 LPs in the fund, so you can imagine how small and long-tail it was'*. In a small number of cases where the fund manager had secured commitments from a local authority or its pension fund, these challenges were less acute.
- **Challenges in obtaining firm commitments from investors:** One fund manager described a *'delicate circular conversation where people say, 'Oh yes, that sounds very interesting,' but they don't actually make a commitment until you can show other people are also making a commitment'*. For fund managers without a prior track record, there were also reported challenges in persuading investors that their investment strategy would prove effective.

Almost all fund managers consulted suggested that they would not have closed the fund without the support of the British Business Bank. A variety of reasons were given:

- **Anchor investors:** The most important factor reported was the role of the British Business Bank as an anchor investor in the fund. As highlighted, fund managers reported that they faced

substantial challenges in securing interest from large institutional investors that could provide more substantial contributions. As it is more difficult to diversify risk in smaller portfolios, smaller funds tend to generate weaker returns and would be less attractive to private investors. Most fund managers suggested that they would not have raised a VC fund of any form without the cornerstone commitments made through the programme. This was less true of those who had previously raised an ECF – who were more likely to report that they would have closed but at a substantially lower value.

Some fund managers highlighted circular issues associated with securing funding from the ECF programme. Many fund managers reported difficulties in marketing the fund to private investors as an ECF before they had secured the commitment from the British Business Bank, as a level of certainty was needed to attract interest from private investors. The need for certainty suggests that there may be ways the British Business Bank could reduce these types of frictions in the fundraising process. For example, one option that could be considered is issuing approvals conditional on the fund manager securing sufficient private commitments and satisfactory completion of the due diligence process.

- **Returns structure:** Fund managers and stakeholders largely indicated that the asymmetric returns structure was viewed positively by external investors. Numerous fund managers indicated that the scope for earning higher returns was viewed as a key marketing feature and helped to secure the commitments of other LPs. The priority given to the British Business Bank in the event of weaker performance was not considered off putting, with LPs generally focused on the possibility of earning higher returns.
- **Constraints on investment strategy:** Fund managers did not consider that the constraints placed on investment strategies had a major impact on their ability to attract commitments from private sector partners. However, some of the sector restrictions led some fund managers to raise successor funds without backing from ECF – the constraint on investing in the financial services sector was flagged as a specific issue given the growth of FinTech in the late 2010s (though PitchBook data suggests the share of investments made by ECFs in the financial services sector was similar to the wider UK VC market). Fund managers closing ECFs under the prior State aid approval also highlighted that the previous £2m upper limit on first investments posed a more material constraint. No fund manager suggested international restrictions caused major difficulties, though – perhaps inevitably - more flexibility to make investments overseas would have been preferred.
- **Due diligence:** The due diligence process undertaken by the British Business Bank was considered as among the most rigorous in the market by fund managers and external stakeholders. Internal stakeholders considered that this was critical in allowing them to mitigate against the risks of placing public capital with fund managers without a substantial track record. As evidence of the effectiveness of these arrangements, it was highlighted that the British Business Bank had only invested in one fund from which they had not been able to fully recover their capital over the history of the programme. Fund managers viewed the overall process positively, or at the very least necessary, and comparable to that of other institutional investors. The following impacts of the due diligence process were noted:
  - **Quality signalling:** There were complex views on how far the due diligence process provided a strong quality signal to other investors. Some fund managers highlighted that *‘it was extremely thorough, and they are significantly more attentive to details than others .... it’s incredibly helpful for other LPs to have that level of scrutiny being given, because all the other LPs say, ‘Fine, if it’s good enough for the British Business Bank, that’s great,*

*it's good enough for us.'* Others were more sceptical of the importance of due diligence for smaller investors, with one fund manager highlighting that *'family offices, high net-worth individuals, and family offices, don't do any due diligence. They didn't even read the documents, frankly. It's really a trust relationship you establish with them'*. Other fund managers also highlighted that the context had moved on since they were approved for ECF, with one commenting that *'I think, today, there is the possibility that people would say, well, it's a negative to require assistance, in today's world, because the best investors don't need government support. There's an argument, I'm not saying it's true'*.

- **Preparation:** Some first-time fund managers highlighted that the experience of British Business Bank due diligence processes was particularly important in preparing them to engage with other institutional investors with comparable processes.
- **Timescales:** The due diligence process was consistently thought to absorb a large amount of time (rather than resource), with some highlighting that the process took up to 12 months. This had a variety of impacts on the fund manager. As the commitments of many LPs were not firm, fund managers sometimes found that their investors were no longer willing to commit resources to the fund by the time funding was awarded. Others reported that they entered discussions with the British Business Bank with a set of target investments to enable the fund to deploy its capital quickly. The time elapsing meant that the opportunity to invest in these targets passed.

While no fund manager suggested that the level of scrutiny involved should be reduced, there was a general perception that these timescale issues were addressable and were caused by internal capacity constraints within the British Business Bank. There was a view that the level of interest in establishing new early-stage funds had increased, and that the capacity of the Bank had not expanded to meet this additional demand.

- **Size constraints:** Finally, some fund managers highlighted areas where the rules associated with the programme were overly rigid and constrained the levels of funding raised. Two fund managers highlighted that their fundraising activities would have allowed them to exceed the target fund size agreed with the British Business Bank. However, the rules associated with the programme meant they were unable to absorb these additional commitments – and in one case, the fund manager reported they established a second fund to capture the excess funding raised. Again, moving forwards, the British Business Bank may wish to consider additional flexibility around these issues (though it should be noted that fund managers were generally complementary about the British Business Bank's flexibility to allow changes in direction once the fund was active).

#### 4.3.2 Comparisons to declined applicants

Quantitative investigation of the impact of ECFs on the ability of funds to close has been undertaken by comparing the fundraising histories of those fund managers that were awarded funding with those that applied for funding but were declined. Figure 4.2 below provides an overview of the fund-raising history of both groups following their application for support through the programme (compiled from data captured by PitchBook):

- **Number of VC funds reaching a final close:** Of the 13 fund managers benefitting from the programme, eight went on to raise a successor fund by the end of 2019 (62 percent). On average, fund managers awarded ECF funding went on to close a total of 2.5 funds following their application by the end of 2019 (including the original ECF fund). Fund managers closed an average of 1.2 successor funds without the support of the ECF programme. Only one in ten declined applicants went on to close a VC fund (an average of 0.2 funds per fund manager).



- **Capital raised:** Fund managers supported by the programme raised an average of £142m in funding following their application to the programme by the end of 2019 (a total of £1.9bn). £34m, on average, was provided by the British Business Bank through the ECF programme (£444m in total). The average amount raised by fund managers whose applications were declined was £16m.

These figures indicate that:

- **Additionality:** There appears to be a high rate of additionality in terms of the programme's effects on the ability of fund managers to close a new VC fund. The comparisons suggest that at an upper bound, 90 percent of those awarded funding may not have closed a VC fund without support from the programme. This is likely to be an overestimate for the reasons outlined below.
- **Successor funds:** Many of the fund managers supported by the programme have gone on to raise successor funds. Those awarded ECF funding closed 2.3 more funds than those who were declined. If this is treated as estimate of the impact of the programme, would imply the programme led to 30<sup>9</sup> additional VC funds closing between 2011 and 2019.
- **Supply of VC funding:** The comparisons suggest that up to 89 percent<sup>10</sup> of capital raised by funds supported by the ECF may not have been secured in the absence of the programme, or £1.7bn in total<sup>11</sup>. This does not account for the possible effects of the programme in diverting capital from other VC funds.
- **Leverage ratio:** As the ECF programme contributed £444m to this total, this implies a leverage ratio of £2.80 in additional funds raised for every £1 of ECF funding<sup>12</sup>. It is unknown how much of this investment was leveraged from the private sector as public sector institutions played a role in capitalising successor funds and information on the contributions made by individual LPs was not available.

These comparisons provide some insight into the impact of the programme on the supply of VC funding. However, owing to the nature of the due diligence process, there will be systematic differences between the two groups that may distort comparisons. For example, fund managers may be declined due to their track record or insufficient target levels of private investment. These characteristics will be linked to their ability to close the fund without public support. It is probable that fund managers benefitting from ECF funding would have been more likely to close their funds regardless of the support of the British Business Bank, and the comparisons above will likely overstate the impact of the programme. Applications are not formally scored, so it was also not possible to identify 'near misses' that more closely resemble fund managers that benefitted from the programme. The population of fund managers was also too small to apply statistical techniques to explore the impact of the programme.

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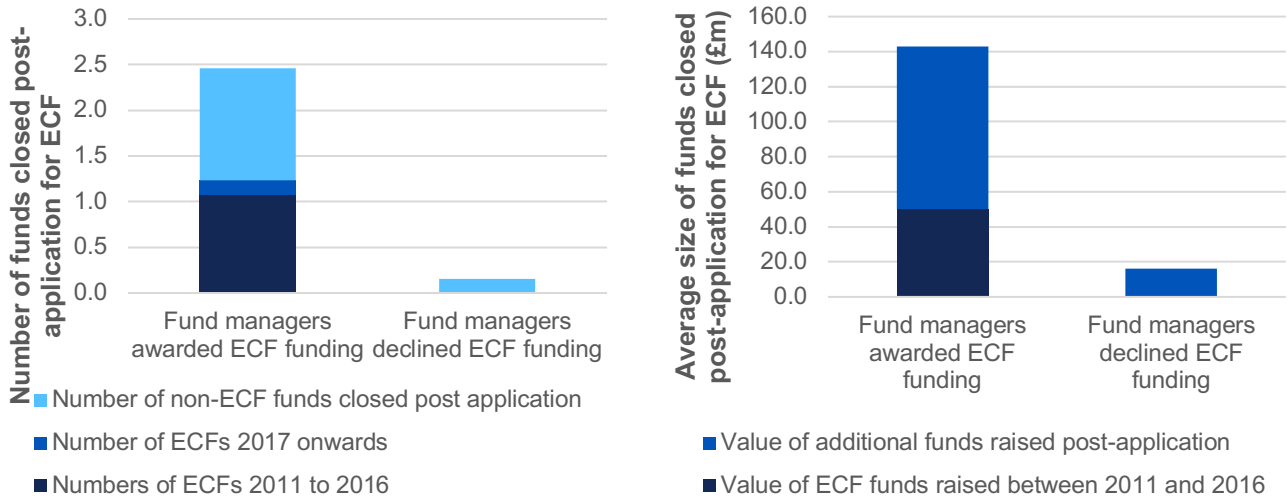
<sup>9</sup> I.e. 2.3 x 13.

<sup>10</sup> (£142m – £16m) / £142m.

<sup>11</sup> £1.9bn x 0.88.

<sup>12</sup> (£1.7bn - £0.4bn) / £0.4bn.

**Figure 4.2: Average number of funds closed and capital raised (£m, nominal prices), fund managers applying for ECF funding**



Source: Ipsos MORI user defined search of PitchBook. Results may differ to PitchBook's own published figures, 13 fund managers awarded ECF funding and 39 fund managers declined ECF funding, British Business Bank management information.

#### 4.4 Deployment of capital

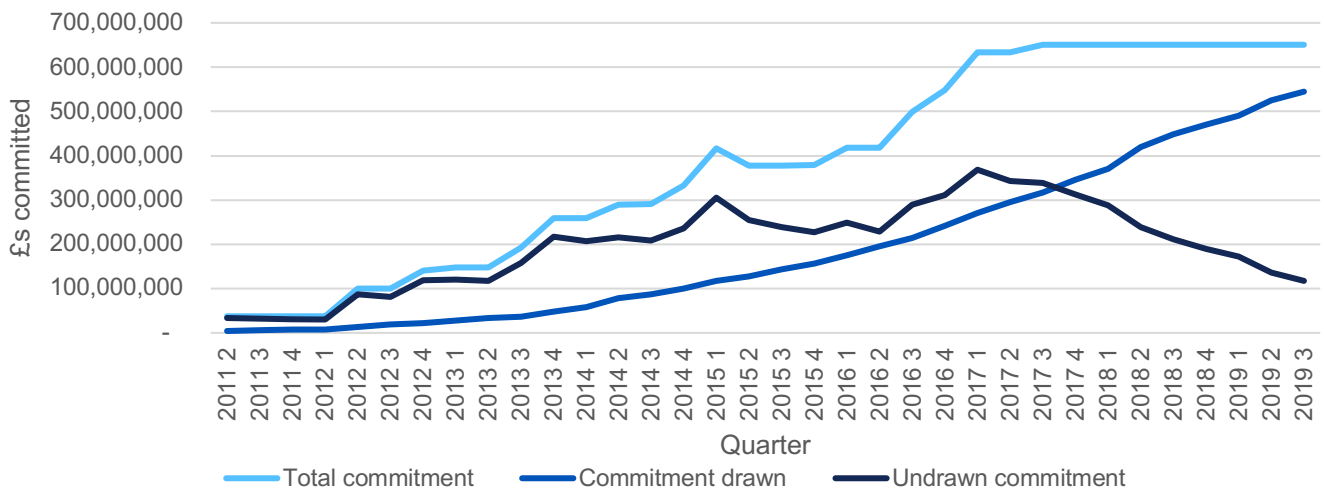
The anticipated impacts of the ECF programme are contingent on the deployment of capital. This section considers how rapidly fund managers deployed their funding and how their investment patterns differed to those of other early-stage investors. Issues in relation to how far portfolio companies may have otherwise obtained funding from other sources are considered in Section 5.

##### 4.4.1 Overall deployment of capital

Fund managers did not report any challenges in relation to deploying capital (and any frictions associated with the length of the due diligence process did not create an impediment in practice). Demand for VC funding was universally considered to exceed supply. The amount of capital deployed steadily increased from 2011 onwards and by the end of the 2019 calendar year, £545m of the £651m committed to the funds had been drawn down, with investments made in 388 portfolio companies.



**Figure 4.3: Commitment drawn down by ECF funds established between 2011 and 2016**

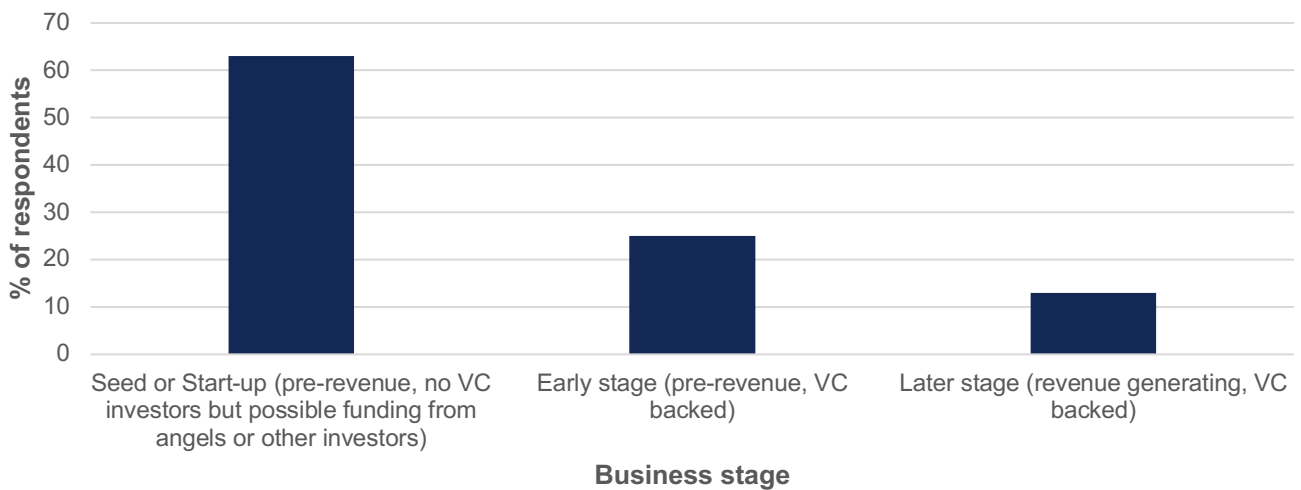


Source: British Business Bank monitoring information for 14 ECFs.

#### 4.4.2 Investment by company growth stage

The programme was intended to lever funding into early-stage companies. As shown in Figure 4.4, the majority of firms responding to the survey (63 percent) were at the seed or start-up phase and did not have backing from other VC investors. A further 25 percent had existing VC backing but were pre-revenue, and only 13 percent were revenue generating businesses. Despite scope within the investment size limits to invest in later-stage businesses, fund managers have generally focused on earlier stage companies, in line with the objectives of the scheme.

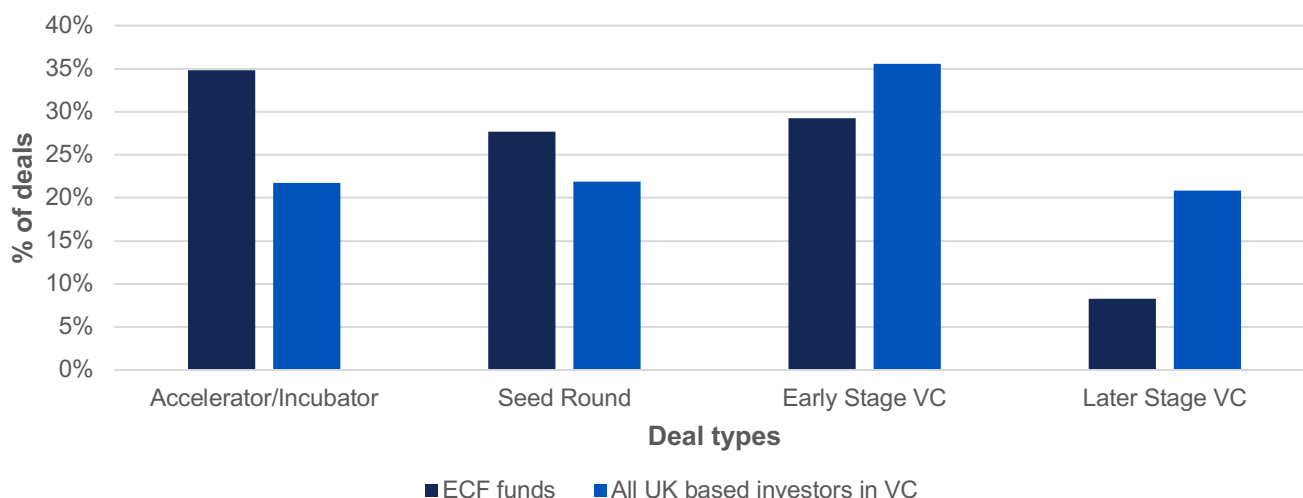
**Figure 4.4: Self-reported growth stage at the point of investment, ECF portfolio companies**



Source: Survey of firms receiving investments from ECFs, base (80)

Insight into how ECF fund managers compared to other UK based investors was obtained by linking records of the investments made to records compiled by PitchBook (which provided coverage of 307 of 388 companies receiving investment). As illustrated in the following figure, ECF funds were more likely to invest at earlier stages than other VC investors, again suggesting the scheme broadly met its objectives to boost the supply of VC funding for earlier stage companies.

**Figure 4.5: Deal types of investments made by ECF fund managers and UK headquartered VC investors (VC funds and other types of investors), 2011 to 2019**



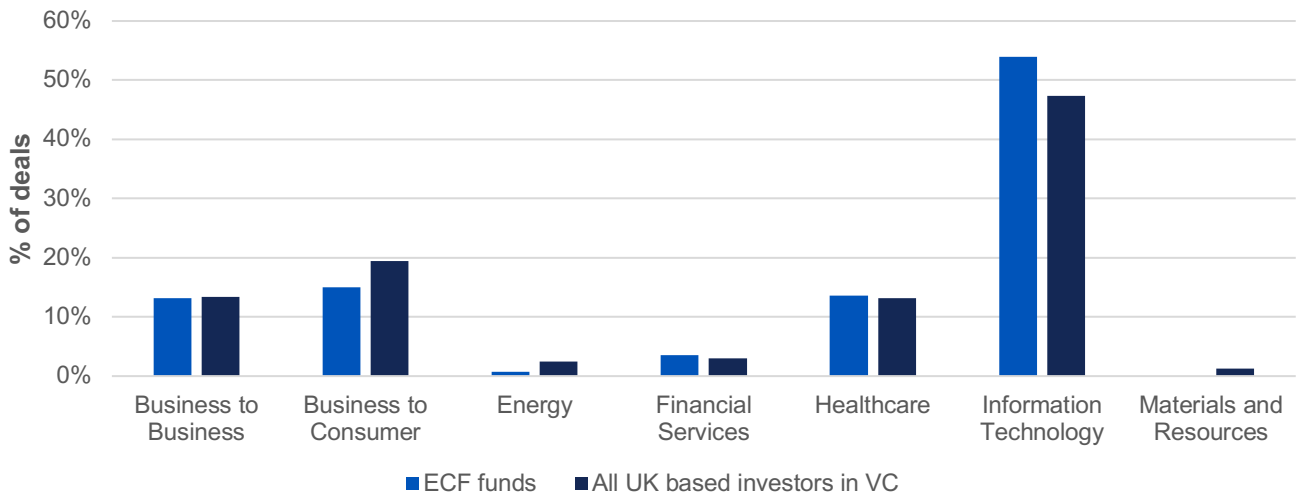
Source: British Business Bank management information (details of 307 of 388 companies receiving investments from ECFs) and Ipsos MORI user defined search of PitchBook. Results may differ to PitchBook's own published figures.

#### 4.4.3 Sector distribution of investment

The sector distribution of investments made by ECFs are compared to the investments of all UK based investors in VC in Figure 4.6. In general, ECFs invested in similar sectors to other VC investors and the programme is unlikely to have addressed sector specific issues in relation to the supply of VC.

This was a theme that received comment by both internal and external stakeholders in the programme. Stakeholders often considered that the intention of the programme ECFs was to invest in 'deep technology' sectors strongly grounded in science (e.g. life sciences or artificial intelligence) where firms were not able to quickly generate a customer base and struggled to raise funding from VC funds. One stakeholder summarised this as *"I think that the intent is often to focus on quite risky, often highly innovative, technology led businesses. I think sometimes there's a tendency of some of the ECF fund managers to do slightly easier deals. The best ECF funds, and the ones that I would like to see promoted more, are those that are prepared to do the riskier deals, particularly when it comes down to innovation risk"*. However, the British Business Bank is reliant on high-quality fund management teams coming forward with credible proposals and it may not be feasible to address this type of concern.

**Figure 4.6: Sector distribution of investments made by ECF fund managers and UK headquartered VC investors (VC funds and other types of investors), 2011 to 2019**

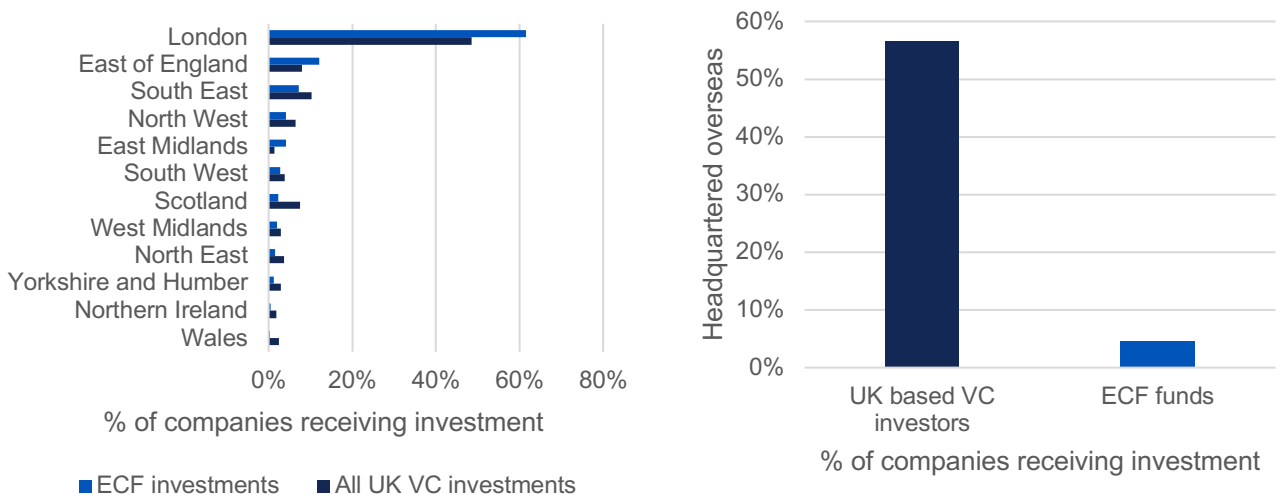


Source: British Business Bank management information (details of 307 of 388 companies receiving investments from ECFs) and Ipsos MORI user defined search of PitchBook. Results may differ to PitchBook's own published figures.

#### 4.4.4 Geographical distribution of investments

Finally, the spatial distribution of investments made by ECF funds are compared to those made by UK headquartered VC investors in the following figure. While ECF funds have concentrated their resources on making investments based in the UK, the regional profile of investments made within the UK broadly mirrored those made by other investors and were heavily concentrated in London and South East.

**Figure 4.7: Regional distribution of investments made by ECF fund managers and UK headquartered VC investors (VC funds and other types of investors), 2011 to 2019**



Source: British Business Bank monitoring information (details of 307 of 388 companies receiving investments from ECFs) and Ipsos MORI user defined search of PitchBook. Results may differ to PitchBook's own published figures.

## 4.5 Financial performance

As highlighted in Section 2, key success criteria for the programme are to (a) generate a sufficient return on the investments made to be cost neutral to the taxpayer over the medium term, (b) and to maximise fund performance given the restrictions on investment strategies. However, as shown in Section 5, few firms have reached the point at which they may seek an exit for their investors, and it is premature to draw any conclusions in relation to the financial performance of ECF portfolios.

A key feature of the ECF programme is the 'geared' return structure designed to increase returns for private investors so that they are competitive with other market investment opportunities. The British Business Bank receives a 3 percent prioritised return but, after repayment of capital, the Bank receives a lower share of the profit compared to the other private investors in the fund. In the event of good performance by the fund manager, private investors receive a greater share of the profits. This explains the differences in returns between British Business Bank and other investors seen in Figure 3.8. The Bank is set to receive a lower share of the currently unrealised value of the portfolio relative to private investors, but due to the prioritised return has received a greater share of returns realised to date.

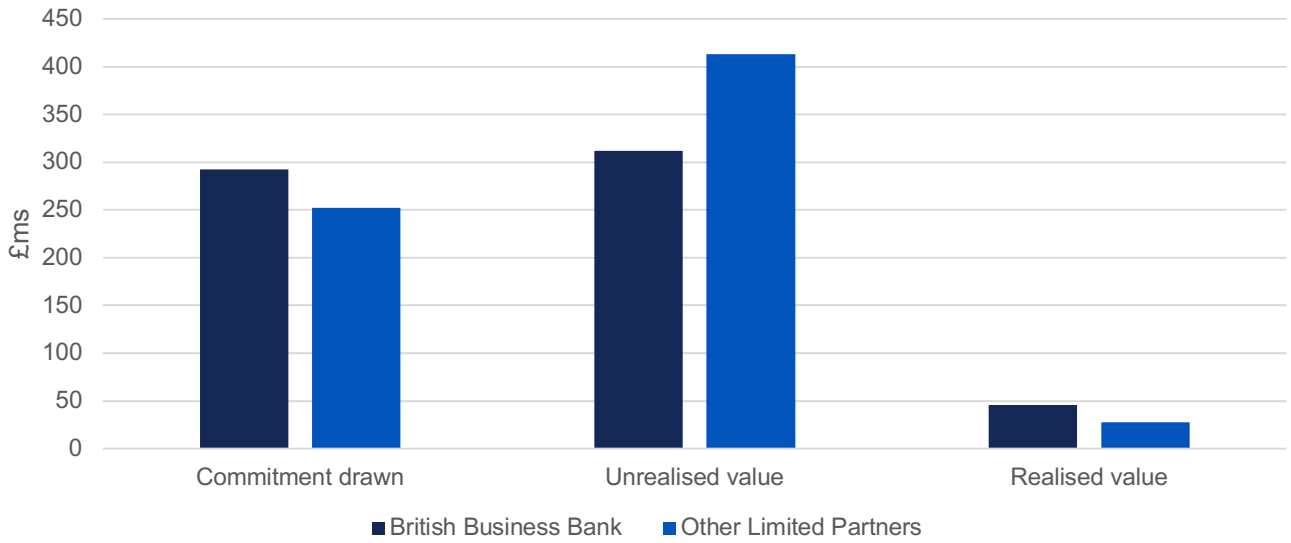
Management data based on regular valuations of ECF portfolio companies provides some indication of how the value of the investments may have changed since the funds were established, as summarised in the following figure. As of the third quarter of 2019 (i.e. latest data available), the value of the overall portfolio has increased. The value of capital drawn down from the British Business Bank had risen from £292m to £356m by the end of 2019, while the value of capital drawn down from other LPs rose from £252m to £440m. Much of these apparent gains were on 'paper' and had not been realised through the sale of the underlying assets. These figures also do not account for the possible effect of the COVID-19 pandemic on underlying valuations (which could be positive or negative given the concentration of investments in the digital sector).

Broader analysis has been completed by the British Business Bank to benchmark the financial returns associated with its investments in ECFs between 2006 and 2016 against other VC funds with similar vintage years<sup>13</sup>. These analyses suggested that the ratio of the total value of ECFs (incorporating payouts distributed to investors and the residual value of unliquidated assets) to the capital contributed by investors was 1.33 compared to 1.61 for the overall VC market. This suggests that ECFs may prove less profitable than other VC investments in overall terms. However, this ratio rises to 1.65 from the point of view of private LPs owing to the way the upside returns are distributed between the British Business Bank and private investors. These findings would also suggest that design of the scheme could be an effective means of attracting additional capital into the VC sector.

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<sup>13</sup> British Business Bank (2020) Analysis of UK VC financial returns

**Figure 3.8: Commitment drawn, unrealised value and realised value at the end of 2019, ECF funds established between 2011 and 2016**



Source: British Business Bank monitoring information. Note that owing to the prioritised return received by the British Business Bank, it has claimed a greater share of the value realised to date. However, as other LPs will receive a greater share of eventual profits, other LPs are due a greater share of the unrealised value in the portfolio.

## 5.0 Impact on Equity Investment

This section examines the impact of ECFs on the growth of UK headquartered firms following receipt of investment from ECF backed VC funds. The findings are based on a survey of 80 UK based firms benefitting from investments placed by ECF fund managers, and analysis of secondary datasets describing the fundraising history of those firms and their on-going growth. This section also incorporates the results of qualitative research with a sample of firms benefitting from the programme.

### 5.1 Key findings

- Firms supported by the ECF programme raised an estimated £4.5bn in equity funding by the end of 2019 (including follow-on investments). ECF backed VC funds contributed £480m to this total, with the British Business Bank contributing £264m.
- Firms receiving investments placed by ECF backed VC funds were generally in discussions with numerous other investors during the funding round and many received alternative offers. Around 70 percent of the firms benefitting from the programme considered that they could have otherwise raised similar levels of funding, though it may have taken longer to do so.
- While the investments placed by ECF backed VC funds did not have a short-term effect on the equity investment raised by firms, they did increase levels of equity investment in portfolio companies by around 10 percent at the end of 2019 (between £438m and £450m in total) as a result of follow-on investments. It is estimated that the British Business Bank's contribution to the programme leveraged between £176m and £184m in additional investment in these companies.
- There is some uncertainty around the magnitude of the net effects of the programme on overall VC investment levels in the UK. The most robust results indicated that ECF backed VC funds increased overall VC investment by £251m. This would imply that investors crowded out by the programme largely deployed their capital in alternative VC investments in the UK.

### 5.2 Characteristics of firms receiving investment

Businesses were comparatively recently established when they attracted investment from ECF backed VC funds. They were mostly less than five years old at this point, and just over 30 percent had been established for no more than three years. Businesses benefitting from the programme had the following characteristics at the point they attracted funding:

- **Turnover:** Most businesses (60 percent) were at the pre-revenue stage. The mean turnover of firms was £0.5m (of which 76 percent was generated from sales to UK based customers, eight percent from customers in the EU, and 17 percent from customers outside of the EU).
- **Employment:** Businesses benefitting from ECF investments employed an average of eight full-time equivalent staff in the UK.
- **R&D activities:** The firms concerned were comparatively R&D intensive and employed an average of five workers (FTEs) that were engaged in R&D activities in the UK before they obtained funding from ECF backed VC funds (more than half the workforce). Average annual spending on R&D activities was £246,000.

- **Characteristics of founders:** Most businesses were established by more than one founder (83 percent). In 23 percent of cases, the founder (or at least half of the founders) were from an ethnic minority background. Only 10 percent of businesses had a founder that was (or at least half of the founders were) female.

### 5.3 Fundraising activity

The ECF programme aims to increase the supply of equity funding to early-stage companies. This section explores the levels of equity funding attracted by firms benefitting from investments placed by ECF backed VC funds and perceptions of the impact of the programme on their ability to raise funds.

#### 5.3.1 Motivations for seeking equity finance

The case studies of SMEs that received investments from ECF backed VC funds explored their main reasons for seeking equity funding. Four main themes emerged:

- **Developing technology assets:** Six out of eight firms were technology companies and aimed to attract investment to support the development of the technology at the heart of their business model (e.g. to prepare the product or service for commercialisation or to enhance its performance).
- **Expanding operations:** Two of the supported businesses aimed to use equity capital to expand their operations in the US where they saw their core markets. Both were digital technology companies, one investing in conversations automated by artificial intelligence and the other one in the commercialisation of video content for media publishers. At the point of seeking additional investment the companies were not yet generating profits, although one of them broke even in the year before obtaining the ECF funding.
- **Hiring new staff:** The early-stage nature of many businesses (and their comparatively small sizes) often meant that workforce capacity was a constraint on growth and development. An objective of hiring new employees to address these constraints was common across all businesses, though the type of roles sought varied across firms depending on their objectives. Firms seeking to further develop their product channelled capital towards R&D roles, while others needed strategic support or communication experts.
- **Expansion of sales and marketing functions:** Three of the businesses sought additional investment to hire people in marketing roles, improve product quality checks, and achieve regulatory compliance in other markets. These companies had reached a mature level of product development prior to obtaining capital from the ECF backed VC fund and used the additional resources to focus their efforts on trying to bring their product to the market. Two of these operated in the healthcare sector, and a third in the food and beverages sector.

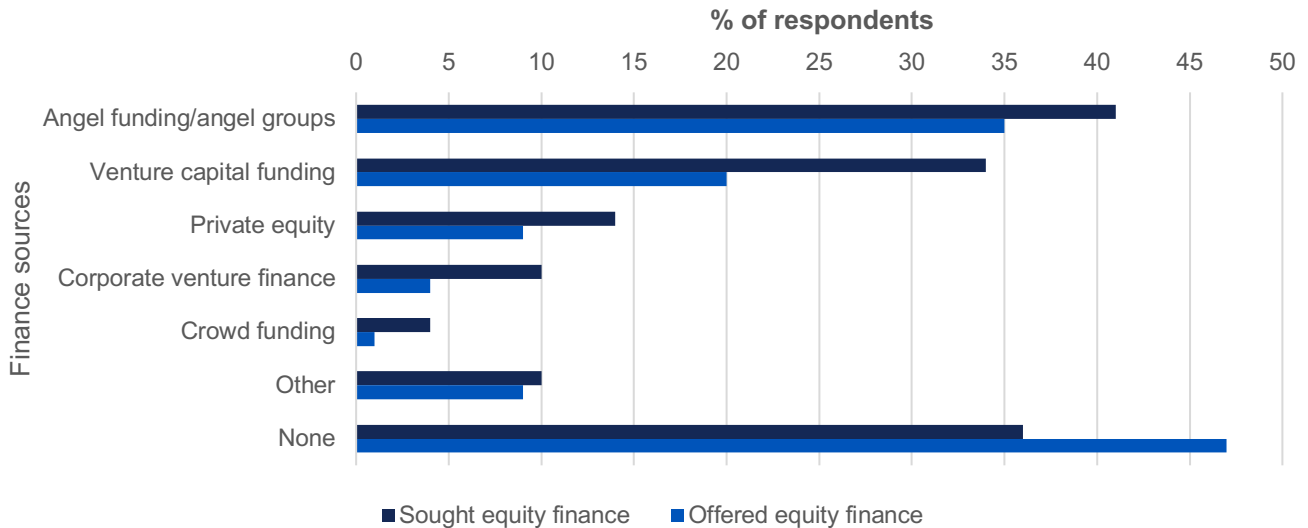
**Marketing strategy and regulatory needs:** One healthcare company, developing products for wound care that would disrupt traditional models of care required additional funding to refine their go-to-market strategy, progress their sales and marketing efforts and achieve greater regulatory compliance in more markets. The company now operates in 20 countries worldwide.

#### 5.3.2 Fundraising history

Businesses responding to the overall survey were asked whether they had previously sought equity funding before the investment from the ECF (Figure 4.2). Almost 65 percent of businesses had previously sought equity finance, typically angel funding (41 percent) and/or venture capital funding (34 percent).

In total, just over half of the recipient businesses (53 percent) were previously offered equity funding. Amongst those that had been offered funding prior to the ECF investment, the average value of funding raised was £1.4m (£750,000 across all businesses). This funding was obtained in the same year as the investment by the ECF backed VC fund, or in the previous year, in most cases. For most businesses, the investment placed by the ECF fund was its first round of VC funding.

**Figure 5.1: Types of equity finance sought and offered prior to ECF investment**



Source: Survey of businesses receiving investments from ECFs, base (80)

### 5.3.3 Fundraising activity at the time of the ECF investment

Respondents to the survey reported that they sought an average of £1.6m in equity capital from the funding round in which the ECF fund participated (this masks considerable variation, with the range extending from £50,000 to over £5m). Firms reported significant levels of engagement with potential investors to secure this funding. Around three-quarters of businesses receiving investment from ECF backed VC funds reported they had discussions with other VC funds while they were seeking ECF funding. Businesses reported approaching 6 other funds on average (a median of 7).

The main challenges in securing equity investment reported by businesses related to difficulties in identifying suitable investors (66 percent) and finding investors who shared the firm's aims and objectives (65 percent). Difficulties in demonstrating the business value proposition and/or the financial returns associated with the investment were also reported by more than half of respondents (potentially linked to the early-stage nature of the companies concerned). Similar themes emerged during the qualitative interviews with SMEs, with the main challenges relating to:

- **Fundraising experience:** All businesses interviewed reporting significant challenges in raising capital for the first time, particularly for inexperienced entrepreneurs. These issues were linked to a lack of both track record and experience of selling an innovative idea to potential investors. First-time entrepreneurs also reported issues in relation to the depth of their networks, and their awareness of investors that could potentially be interested in the project.
- **Issues with financial terms:** Two firms reported challenges in reaching acceptable financial terms with investors, flagging that they went with an ECF fund for the 'pretty incredible' terms that did not find elsewhere.

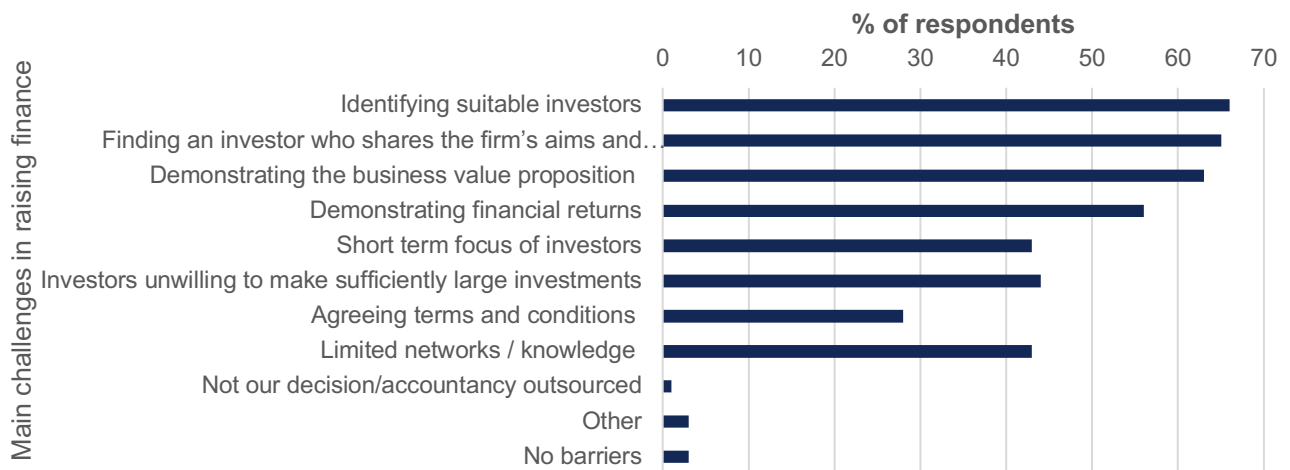


- **Experience:** One company also stressed that they chose an ECF fund over the others for the specific experience it had in the field. This highlights a possible role of the programme in improving the efficiency of the UK VC market by improving matching investees to investors.

**A media company:** One firm experienced difficulties with the terms offered by angel investors, who reportedly were asking for unacceptably high equity shares and fees. They eventually chose the ECF backed VC fund for the much more acceptable financial terms.

**A software company:** The main challenge faced securing funding was that their product was highly technical, making it difficult to explain to investors how they would get to market. They did not encounter this issue with the ECF supported VC fund, which had a very good understanding of their business and therefore was a good match.

**Figure 5.2: Challenges experienced in accessing or securing equity investment**



Source: Survey of businesses receiving investments from ECFs, base (80)

#### 5.3.4 Amounts raised

Firms reported they raised an average of £1.1m from the first funding round in which the ECF backed VC fund was a participant. This survey results aligns closely with estimates based on a larger sample of 246 ECF deals derived from figures derived from PitchBook (also £1.1m). This implies that firms collectively raised a total of £435m<sup>14</sup> in the funding round. This was made up of:

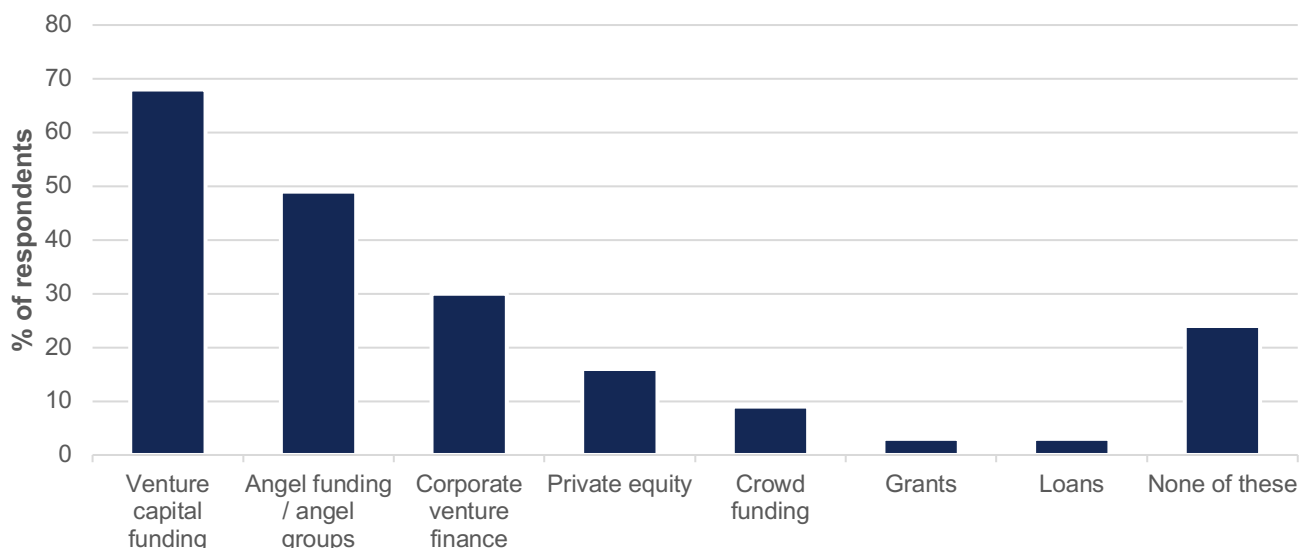
- **Investments by ECF backed VC Funds:** ECF backed VC funds invested an average of £0.5m and a total of £204m in portfolio companies concerned in their first funding round (based on British Business Bank monitoring data).
- **Funding obtained from other investors:** This implies that the firms concerned raised another £231m from other investors. The survey indicated that around three-quarters of those seeking funding from other sources received at least one funding offer (between two and three offers on average), and around two-thirds of these businesses (68 percent) accepted at least one. The survey also suggested a substantial share of this funding came from investors based overseas; firms reported that 53 percent of the total equity in the company was held by investors based outside the UK after the funding round.

<sup>14</sup> I.e. £1.1m x 388.

### 5.3.5 Follow-on funding

In addition, three-quarters of businesses (76 percent) sought additional funding since receiving their first investment from an ECF backed VC fund. Businesses predominantly sought further private funding from VC funds and/or business angels as illustrated in Figure 5.3.

**Figure 5.3: Share of businesses seeking follow-on investment by type of funding**



Source: Survey of businesses receiving investments from ECFs, base (80)

Data compiled from PitchBook indicated that:

- Of the 307 firms benefitting from investments made by ECF backed VC funds, 197 secured at least one follow-on investment by a VC fund or angel investor by the end of 2019 (64 percent).
- On average, firms attracted £10.6m in follow-on funding over 1.5 funding rounds. Follow-on funding rounds brought in an average of 3.5 new investors to the company.
- When aggregated to the population of firms supported (388), it is estimated firms benefitting from the programme raised a total of £4.1bn<sup>15</sup> in follow-on funding by the end of 2019.
- ECF backed VC funds participated in many of these follow-on funding rounds, contributing £276m to this total.

In aggregate, firms supported by the ECF programme are estimated to have raised £4.5bn in equity funding. The programme contributed £480m of this funding, with the British Business Bank contributing £264m to this. This implies that each £1 of capital deployed by ECF backed VC funds was associated with £8.47 in capital deployed by other investors by the end of 2019 (on a gross basis).

### 5.3.6 Perceived impact of investments made by ECF backed VC funds

Businesses reported mixed views on whether they would have raised similar levels of funding from alternative sources in the absence of the programme:

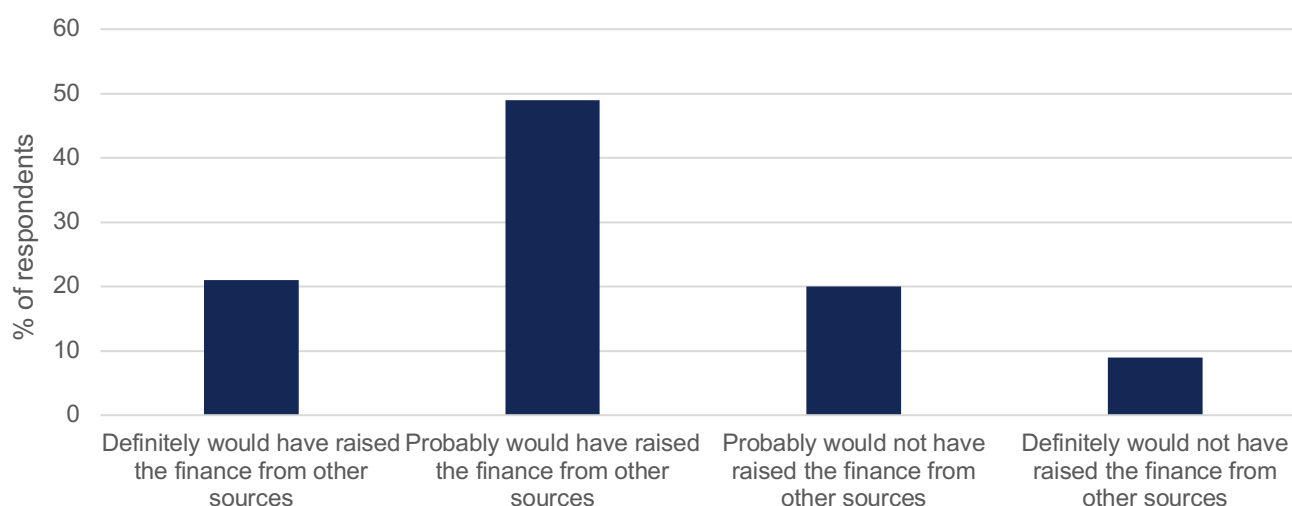
- **Overall likelihood of obtaining similar funding elsewhere:** A high share of respondents (70 percent) reported that they definitely or probably would have raised funding from other sources in the absence of the programme (as shown in Figure 5.4). This is consistent with other evaluations of public interventions in VC markets (including evaluations of the British Business Bank

<sup>15</sup> I.e. £10.6m x 388.

administered UK Innovation Investment Fund<sup>16</sup> and an early assessment of ECFs completed in 2016<sup>17</sup>). Many firms were in parallel discussions with other investors. The ECF programme allowed firms to select investors who they thought would provide more value add than just financing and often selected the ECF in preference to offers made by other investors.

- **Speed and scale effects:** While a high proportion of firms considered they would have secured the finance sought elsewhere, the survey indicated that the programme helped accelerate their fundraising. Most of those reporting they definitely or probably would have raised similar funding elsewhere (57 percent) thought it would have taken longer to do so – either up to six months longer (39 percent) or more than six months longer (18 percent).
- **Learning outcomes:** Nearly all businesses (93 percent) considered that their experience of receiving ECF funding raised their confidence in their ability to raise follow-on funding – either a great deal (68 percent) or a fair amount (25 percent). Only a small minority (8 percent) did not think it had increased their confidence.

**Figure 5.4: Perceived ability to raise similar funding from other sources in the absence of ECF**



Source: Survey of businesses receiving investments from ECFs, base (80)

## 5.4 Net impact on VC investment levels

The preceding section suggested that the firms benefitting from the ECF programme raised substantial levels of equity investment. However, the evidence was less clear on how far the companies concerned would have raised that funding in absence of the programme. This section provides more robust estimates of the gross and net impacts of the ECF programme on VC investment levels using econometric methods.

### 5.4.1 Approach

A robust estimate of the impact of the ECF programme on the fundraising of firms requires comparisons to a group of similar businesses that did not benefit from the programme. Identifying a suitable comparison group is challenging in this context. Firms that seek investment from ECF backed VC funds will differ in systematic and unmeasurable ways from those in the general business population. As illustrated by the British Business Bank's SME Finance Survey, only a small share of the UK's business

<sup>16</sup> British Business Bank (2018) Interim evaluation of the UK Innovation Investment Fund, unpublished.

<sup>17</sup> Baldock (2016) An assessment of the business impacts of UK's Enterprise Capital Funds, Environment and Planning

population seeks equity funding in each year. These businesses are typically seeking to commercialise disruptive business models and are more dependent on equity funding to finance their growth.

The effects of the programme were estimated by adopting a 'pipeline design' that exploited that the relatively long timeframes over which investments were made by the ECF backed VC funds in the scope of the evaluation. Details of the approach are provided in Annex B, but this involved treating those receiving investments in later years as a comparison group for those that were supported in earlier years. As the analysis is restricted to companies that ultimately received investments placed by ECF backed VC funds, estimates of impact are less likely to be distorted by systematic differences between those firms that do and do not receive equity investment from the funds concerned.

This approach will produce unbiased estimates of impact if there are no systematic differences between firms receiving support in different years. Descriptive analysis of the characteristics of firms did not highlight significant differences between groups of businesses supported at different times, providing some support for this assumption. There may be unobserved differences between firms supported at different stages that could bias results. For example, if firms supported in earlier years were 'first-movers' in a nascent technology area, they may acquire competitive advantage (or disadvantage) over those coming later, influencing these outcomes. However, there was no evidence gathered through the evaluation that such factors may have been significant.

The analysis was implemented by linking records of the firms receiving investments placed by ECF backed VC funds to records of disclosed equity investments compiled by PitchBook (providing annual observations of the equity investment attracted by 307 of the 388 companies benefitting from the programme). This dataset was used to implement a series of fixed effects models estimating the effect of the first investment placed by the ECF backed VC fund on equity investment attracted by the firm in the short-term and the long-term.

## 5.4.2 Results

The results of the analysis are set out in the table below:

- **Short-term effect on equity investment (Model 1 to 3):** The analyses did not indicate that the first investments placed by ECF backed VC funds increased the level of equity investment attracted by firms. This is consistent with the survey evidence that many firms were confident they would have raised funding from other sources in the absence of the programme.

The most robust model (Model 3) suggested that ECF backed VC funds had a negative short-term effect on equity investment. This could potentially be a consequence of the constraints on deal size associated with the ECFs. However, it may also be an artefact of the data, as PitchBook records deals when they are disclosed, while the British Business Bank monitoring records the date the deal was closed. If disclosure lags the finalisation of the deal, then this could contribute to the estimated negative effect.

- **On-going effects on equity investment (Models 4 to 8):** However, all models suggested that the investments made by ECF backed VC funds led to a longer-term increase in the level of equity investment attracted by firms by the end of 2019. This indicates that the ECF VC funds were better placed to support the on-going development of the firm than the possible alternatives. This could be related to the effects of the programme in enabling ECF backed VC funds to close at higher values or raise successor funds, putting them in a better position to support follow-on funding rounds. Supporting new entrants to the VC markets may also improve the diversity of fund managers, enabling more effective matching of firms with the capabilities, skills and networks of investors. The average effect on equity investment raised by the end of

2019 was estimated at between £1.1m and £4.7m. Models controlling for improving fundraising conditions over the period (Models 6 and 8) were considered the most robust.

- **Total impact on investment raised:** Aggregating the results of Models 6 and 8 across the 388 firms receiving investment through the programme gives a total estimated effect on equity investment raised by 2019 of between £438m and £450m (around 10 percent of the total investment attracted by those firms). The total public investment made in these companies through the programme was £264m, implying that the programme leveraged an additional £174m to £186m in other investment in these companies<sup>18</sup>.

**Table 5.1: Estimated (average) impact of investments placed by ECF backed VC funds on cumulative equity investment by the end of 2019**

Model	Firm level fixed effects	Time fixed effects	Estimated average effect on equity investment (£m)	Number of observations
<b>Short-term impacts: effect in the year of the first ECF investment (all firms)</b>				
Model 1	No	No	-0.37	4,268
Model 2	Yes	No	-0.41	4,268
Model 3	Yes	Yes	-0.153**	4,268
<b>On-going impacts: effects on cumulative equity investment by the end of 2019 (all firms)</b>				
Model 4	No	No	4.00***	4,268
Model 5	Yes	No	3.86***	4,268
Model 6	Yes	Yes	1.13***	4,268
<b>On-going impacts: effects on cumulative equity investment by the end of 2019 (firms tracked by PitchBook)</b>				
Model 7	Yes	No	4.70***	3,377
Model 8	Yes	Yes	1.16***	3,377

Source: British Business Bank monitoring data and Ipsos MORI user defined search of PitchBook. Results may differ to PitchBook's own published figures. \*, \*\*, \*\*\* indicates whether the estimated effect was significant at the 90, 95 and 99 percent level of confidence respectively.

### 5.4.3 Market level impacts on VC investment levels

The findings above suggest that the investments placed by ECF funds had a significant on-going effect on the fundraising of firms benefitting from the programme. However, as highlighted above, firms benefitting from the programme were frequently in discussions with other investors that may have been

<sup>18</sup> I.e. £438m or £450m minus £264m.

crowded out. The net effect of the programme on VC investment levels will depend on how far these investors reallocated their resources to alternative venture investments in UK firms or to other asset classes (or VC investments in other countries). Additionally, firms supported by the programme may have drawn investment away from other businesses seeking equity investment.

The net effects of the ECF programme on VC investment levels were explored in a final set of analyses examining the relationship between investments made by ECF backed VC funds and overall levels of VC investment at the level of the sector and region (see Annex B for further details)<sup>19</sup>. The findings of the analysis are set out in the following table. The models indicated:

- Each investment made by ECF backed VC funds in a sector and region increased overall VC investment in that sector and region by 6.0 to 13.2 percent in the same year<sup>20</sup> (Models 1 and 2). The more robust result (Model 2) was at the lower end of this range.
- Model 2 was robust to unobserved features of sectors and regions that do not change with time, and time-specific shocks affecting all regions and sectors. However, the findings were not robust to the inclusion of unobserved trends at the regional level (Model 3) and should be treated with a degree of caution.
- This was explored further by re-estimating the models excluding London from the sample (owing to its dominating effect on the dependent and independent variables). These models suggested that each ECF investment increased overall VC investment by between 10.4 and 39.7 percent (again, with more robust findings at the lower end of this range).
- The magnitude of effects when excluding London were larger than when using the overall sample. This indicates that while investments placed in companies outside of London had a positive effect on levels of VC investment, crowding-out may have been more significant in the capital. There were insufficient observations to estimate the effect of the programme in London alone.
- Given these findings, the results of Model 2 are taken as an approximation of the average impact of the programme. Applying this result to the median level of annual VC investment in sector-region 'pairs' covered by the analysis (£10.8m) suggests that each investment made by ECF backed VC funds increased overall VC investment by £0.6.
- Aggregating this result across the 388 investments made gives an estimate of the net impact of the ECF programme on VC investment of £251m.

<sup>19</sup> Broadly following the approach adopted in Brander, Du and Hellmann (2015) The Effects of Government-Sponsored Venture Capital: International Evidence, Review of Finance. The underlying econometric model took the form  $y_{ijt} = a + bT_{ijt} + a^{ij} + a^t + u_{it}$ . This model describes the relationship between the level of equity investment in sector  $i$  and region  $j$  in period  $t$  and the number of investments made by ECF backed VC funds in the same period ( $T_{ijt}$ ). The models also accounted for unobserved sector-region effects ( $a^{ij}$ ) and unobserved but time specific shocks ( $a^t$ ).

<sup>20</sup> Models with lagged effects were also explored but there was no evidence of additional impacts beyond the year of the investment.



**Table 5.2: Estimated net impact of investments placed by ECF backed VC funds on equity investment at the sector and regional level**

Model	Fixed effects for the sector/region	Time fixed effects	Time trends at the regional level	% Effect on equity investment in the sector and region (£m)	Number of observations
Including London					
Model 1	Yes	No	No	0.132**	600
Model 2	Yes	Yes	No	0.060**	600
Model 3	Yes	No	Yes	0.006	600
Excluding London					
Model 4	Yes	No	No	0.397***	540
Model 5	Yes	Yes	No	0.108*	540
Model 6	Yes	No	Yes	0.104*	540

Source: British Business Bank monitoring data and Ipsos MORI user defined search of PitchBook. Results may differ to PitchBook's own published figures. \*, \*\*, \*\*\* indicates whether the estimated effect was significant at the 90, 95 and 99 percent level of confidence respectively.

#### 5.4.4 Summary of findings

The estimated gross and net impacts of the programme on the fundraising of supported firms are summarised in the following table.

**Table 5.3: Estimated gross and net impact of investments placed by ECF backed VC funds on equity investment at the sector and regional level**

Effect	Value
<b>Gross effects</b>	
Total capital raised by ECF beneficiaries in initial funding rounds	£435m
Total capital raised by ECF beneficiaries by end of 2019	£4,500m
Contribution made by ECF backed VC funds by end of 2019	£480m
<i>of which, funded by the British Business Bank</i>	£264m
<b>Gross additional impacts (i.e. net of deadweight)</b>	
Short term (12 month) impact on capital raised by ECF beneficiaries	£0m
On-going impacts (to end of 2019) on capital raised by ECF beneficiaries	£438m - £450m
<b>Net additional impacts (i.e. net of medium term crowding out in financial markets and displacement)</b>	
Net impacts on overall VC investment in the UK by the end of 2019	£251m

Source: British Business Bank monitoring data and Ipsos MORI user defined search of PitchBook. Results may differ to PitchBook's own published figures.



## 6.0 Impacts on business growth

This section examines the impact of ECFs on the growth of UK headquartered firms following receipt of investment from ECF backed VC funds. The findings are based on the telephone survey of 80 UK based firms benefitting from investments placed by ECF fund managers, and analysis of secondary datasets describing the fundraising history of those firms and their on-going growth. This section also incorporates the results of case studies with a sample of firms benefitting from the programme.

### 6.1 Key findings

- Businesses have grown rapidly since attracting investment from ECF backed VC funds. The turnover and employment of firms benefitting from the programme grew at an annual rate of 76 and 48 percent respectively, collectively creating almost 8,000 jobs and generating £2.2bn in additional sales by March 2019.
- The firms supported have also increased their international footprint. Their share of revenues generated from overseas markets rose by 15 percentage points, while 30 percent have established plants overseas. Levels of R&D activity also expanded substantially as firms channelled resources into product development.
- The firms concerned increased their overall GVA by a cumulative total of £724m by the end of 2019. Around 18 percent of this (£130m) was driven by productivity gains. GVA per worker rose from £6,000 to £34,000 after the investment was placed by ECF backed VC funds.
- Econometric analysis suggested that investments placed by ECF backed VC funds increased the number of workers employed by supported firms by 23 percent by March 2018 (over and above growth that may have been achieved in the absence of the programme). These findings imply that around 35 percent of the employment growth of firms concerned would not have happened without the investments placed by ECF backed VC funds.
- These results capture the short-term effect of the programme. As businesses were generally at early-stage of maturity in developing and commercialising disruptive business models, this is likely to understate the longer-term economic impacts of the programme. Expectations of the future economic impacts of the programme will be partly reflected in changes in the valuation of the portfolio of firms supported, which rose by 64 percent or £859m by the end of 2019.

### 6.2 Use and impact of capital

The most common uses of the capital raised reported by businesses benefitting from investments by ECF backed VC funds included R&D activity (68 percent) and hiring new employees and other staff related activities (e.g. creating formal HR processes and staff training). This aligned closely with the objectives reported by firms (as described above). The case studies indicated the capital deployed was largely used to facilitate expansion:

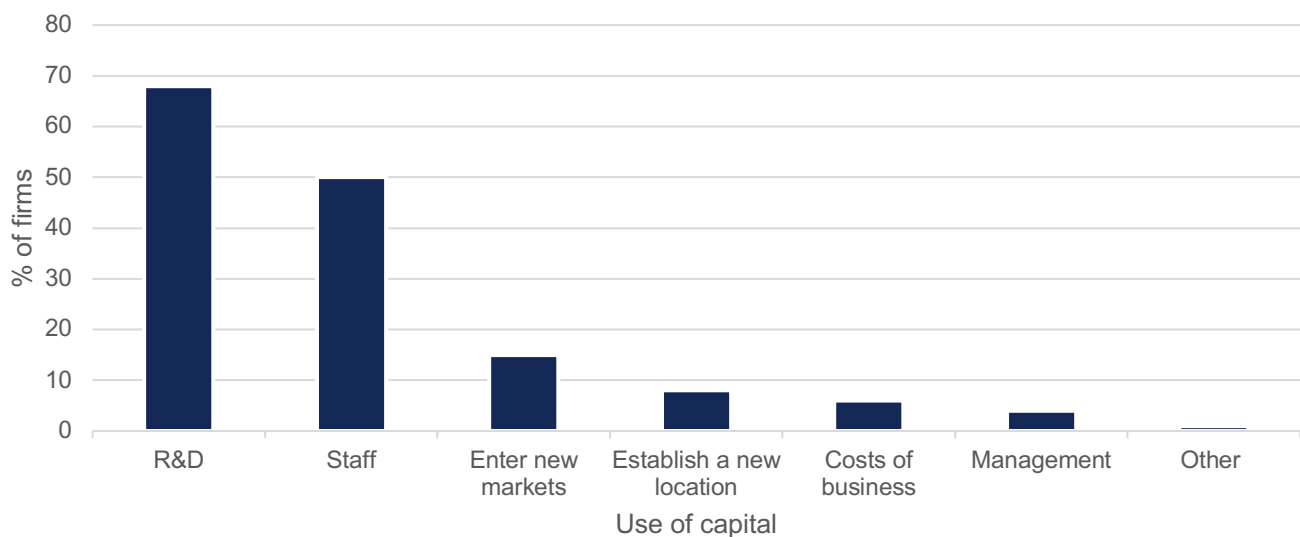
- **Staffing:** The case studies indicated that funding was primarily used to employ more staff (rather than to invest in new equipment) – either to enable additional R&D or to support the expansion of sales and marketing activities. For example, one software company involved in the application of artificial intelligence reported invested in new capabilities to enter the autonomous vehicles

market to enable further R&D. The funding was not just used to hire technical specialists – one medical device company reported using the funding primarily to scale up its sales and marketing operations (although this also required workers with specialised skills and knowledge).

- **New locations:** Less prevalent were examples of firms establishing new production locations. One company operating in the food and beverage sector reported that the investment from the ECF backed VC fund allowed it to acquire a brewery near their current location and order new manufacturing equipment (although the funding was also used to expand sales and marketing teams). Another sought to open a new office in Washington to access the US market.

**Company specialised in automated conversation:** A successful technology company employed two thirds of the capital received in opening a new office in Washington DC, recognising the US as their biggest market, while the remaining third was spent on R&D to improve their AI algorithm. The latter involved expanding their innovation team and “hiring a lot of mathematicians”. The funding also enabled them to attract more clients by improving their communication and marketing, and the firm recently acquired large contracts with major firms including AT&T, BT, DHL and Argos.

**Figure 6.1: Use of ECF funding**



Source: Survey of businesses receiving investments from ECFs, base (78)

### 6.3 Non-pecuniary support from fund managers

Nearly all businesses benefitting from the programme (91 percent) said that the fund manager associated with the ECF investment had provided non-pecuniary support that had benefitted their company. This assistance covered several areas including:

- Strategy
- Investor readiness
- Business planning
- Networking
- Finding skilled or experienced staff

- Cash flow issues

Overall, businesses that received assistance from the fund manager expressed positive views about the impact this had on improving the performance of their business. One company mentioned that the fund manager helped to create an 'AI board' to provide useful expert review. Another noted that the fund manager currently sits in the company's board and gives strategic advice on coping with competitive threats. Additional support was also given in respect to securing follow-on capital, and firms were helped by their fund manager to prepare for the funding round and to meet other potential investors. Entrepreneurs also valued fund managers' support with various operational and strategic issues that occurred during the development of the company.

**Company operating in food and beverage:** One firm declared that "bringing on the investors led to a change in the strategy for developing the business" The investment from the ECF backed fund allowed it to acquire a brewery near their current location and order another brewing kit. The funding raised was also used on product innovation as well as sales and marketing operations. This included setting up a UK wide sales team, working with brand consultants and market research agencies.

#### 6.4 Growth of firms benefitting from ECF investment

The survey indicated that the companies benefitting from the ECF programme grew rapidly after receiving their first investments from ECF backed VC funds:

- **Turnover:** The turnover of supported firms rose from an average of £0.5m per annum in the year preceding the investment to £3.7m at the end of 2019 (in 2019 prices). This equated to an annual growth rate of 76 percent or £0.7m per annum<sup>21</sup>. The distribution was skewed by a small share of firms that saw rapid turnover growth and median annual turnover growth was £40,000. In aggregate, it is estimated that the 388 UK based firms benefitting from the programme saw their sales increase by a total of £2.2bn following the first investments made by ECF backed VC funds<sup>22</sup>. Growth was driven by rapid expansion of sales in overseas markets, with firms reporting that the share of turnover generated from overseas customers rose from 24 to 39 percent.
- **Employment:** Employment also grew rapidly. The average number of workers employed in the UK by firms receiving investments placed by ECF backed VC funds rose from 8 in the year preceding investment to 32 at the end of 2019. This equates to an annual growth rate of 48 percent (or seven jobs per year)<sup>23</sup>. Overall, it is estimated that firms generated almost 8,000 jobs in the UK since being awarded investment across the whole portfolio. The average wages paid by the firms receiving investment were also high (at an average of £56,000), suggesting the programme has helped bring about highly skilled jobs. Finally, within the 58 companies in the survey sample that provided estimates of increased employment and reliable estimates of jobs created in each wage category, there were 1,432 jobs created. These are relatively well-paid

<sup>21</sup> These figures could not be fully validated against sources of administrative data as observations from the Business Structure Database were only available to 2020 (and baseline observations for firms supported in early years could not be reported owing to possible disclosure issues arising from the small number of observations available for analysis). However, descriptive analyses showed that average post-investment annual turnover growth was £952,000 for the cohort of firms receiving investment between 2014 and 2018. Average post-investment employment growth was 10.7 jobs per annum. This does not suggest that survey-based estimates are overestimating growth rates in the population of firms supported.

<sup>22</sup> Assuming turnover growth was linear rather than exponential.

<sup>23</sup> This broadly aligns with figures on recent employment growth extracted from PitchBook. For a sample of 191 firms for which data was available, recent annual employment growth averaged 35 percent per annum or 9.6 jobs per annum (note that observations are available irregularly and for different start and end points across the portfolio).

good quality jobs for skilled staff. At least 735 of these jobs (51%) paid wages or salaries in the top quartile of income in the UK (£37,000) while 9% paid less than the UK median income (£24,000). Details are provided in table 6.2 below.

- **R&D activity:** Firms benefitting from the programme also reported a substantial expansion in R&D activity since receiving investment. The average number of R&D workers employed by firms receiving investment from ECF backed VC funds rose from 5 to 19, while annual spending on R&D activities rose from £0.2m to £1.8m.
- **International expansion:** Firms also reported expansions in their overseas operations. Before receiving investment from ECF backed VC funds, firms tended to operate from a single location in the UK. By March 2020, 54 percent had opened at least one more plant, and 30 percent had opened sites in overseas markets.
- **GVA:** Estimates of the increase in economic output (Gross Value Added) associated with the expansion of the firms concerned were developed by applying the ratio of turnover to GVA derived from ONS surveys in the relevant sectors<sup>24</sup> to the expansion in turnover reported above. It was estimated that firms benefitting from investments placed by ECF backed VC funds increased their GVA by £724m (in 2019 prices) by the end of 2019. This assumes that the firms concerned spend similar shares of revenues on finished goods and services as more established firms operating in the same sector, and that this share was not altered by the expansion of the company<sup>25</sup>. As start-ups will often be expending greater resources on scaling-up their activities, this might represent an upper bound on the short-term GVA outcomes involved.
- **GVA from productivity gains:** Firms saw their revenues expand more rapidly than employment, implying an improvement in productivity. It was estimated that GVA per worker amongst firms receiving investment through the ECF programme rose from £6,000 to £34,000. The overall gain in GVA resulting from productivity gains, rather the firm's deployment of additional resources, was estimated at £130m by the end of 2019<sup>26</sup> (around 18 percent of the overall expansion in GVA). It should be noted that:
  - The ECF programme has supported many pre-revenue businesses that effectively are producing intangible capital rather than current output. Productivity gains would be expected to become a more significant driver of output growth in the future.
  - A conservative approach has been adopted in estimating productivity gains (in that they are assumed to apply only to workers that were employed by the company before they received funding). There may also be productivity gains associated with the expansion of companies if the workers recruited are more productively deployed than they would otherwise have been.

It should be noted that these results were based on the performance of the firms concerned prior to the onset of the COVID-19 pandemic and it is unknown how this is likely to affect their future growth. This issue is given more consideration in Section 7.

**Table 6.1: Growth of companies receiving investment from ECF backed VC funds**

<sup>24</sup> ONS (2019) Annual Business Survey.

<sup>25</sup> Ratios of GVA to turnover are not published by age of business.

<sup>26</sup> Estimated by applying the change in GVA per worker to the number of workers employed by the firm before it received investment.

	Average at the point of receiving ECF investment	Average end of 2019	Average annual growth rate (%)	Cumulative growth by end of 2019
Turnover	£0.5m	£3.7m	76	£2.2bn <sup>27</sup>
Employment (UK)	8.3	32.2	48	7,960 <sup>28</sup>
GVA	£0.2m	£1.1m	76	£724m
GVA per worker	£6,000	£34,000	65	£130m

Source: Survey of businesses receiving investments from ECF backed VC funds, base (80) and British Business Bank monitoring data. Results based only on firms reporting valid observations at both baseline and endline. Grossing up has been undertaken based on the average annual growth rate rather than the median owing to the skewed returns profile of typical VC portfolio (where success is driven by outliers). Details of the underpinning calculations are provided in Annex B.

**Table 6.2: Jobs Growth after funding**

Number of jobs	F11. Jobs created after funding with wage <£24,000 (before tax)	F12. Jobs created after funding with wage >£37,000 (before tax)	Total jobs created after funding
Count	136	735	1,432
%	9%	51%	100%

Source: Survey of business receiving investments from ECF backed funds, base (80). Results based only on firms reporting additional jobs created after funding and reliable estimates of jobs created (58).

**Home care:** A company specialising in the provision of home care services through an innovative platform mentioned that, in the year after they received funding, the company made “loads of progress” in terms of growth, increasing their revenue from £200,000 to £1.2 million. Furthermore, they managed to bring in more directors to help with strategic matters and were introduced to other companies that had similar platforms, enabling them to improve the technology behind their platform. Their revenue steadily grew from 2016 onwards and totalled £2.9 million in 2019.

**Successful exit:** One company exited in 2019 as a result of an acquisition by a major technology company. Almost all (more than 90%) of the capital raised from the ECF backed VC fund was used on staff and, from an initial team of three, the business grew to 20 employees a year after the funding was received, with almost all of the additional staff in R&D roles.

## 6.5 Valuations

The GVA based measures above only capture the value created by the firms in the portfolio by the time of this research and do not give an indication of what value may be created in the future. This is problematic given the nature of the businesses receiving funding, many of which were seeking to develop a technology or business model and achieve a profitable exit for their investors in the future.

<sup>27</sup> Growth in annual turnover for firms receiving investment in each ‘vintage year’ was estimated as the product of the number of firms receiving investment and the average annual growth turnover. This result was summed over the number of years elapsing since the year of investment to reach an estimate of the cumulative effect to 2019.

<sup>28</sup> The overall number of gross jobs created was estimated by multiplying the number of companies receiving investment in each ‘vintage year,’ the average growth in jobs per annum, and the number of years that had elapsed since the year of investment.

Firm valuations provide an alternative measure of the value created – in that the value of the firm should reflect investors' expectations of the present value of future profits (over and above the risk-free rate of return), an important component of GVA.

The increase in the value of portfolio companies was estimated as follows:

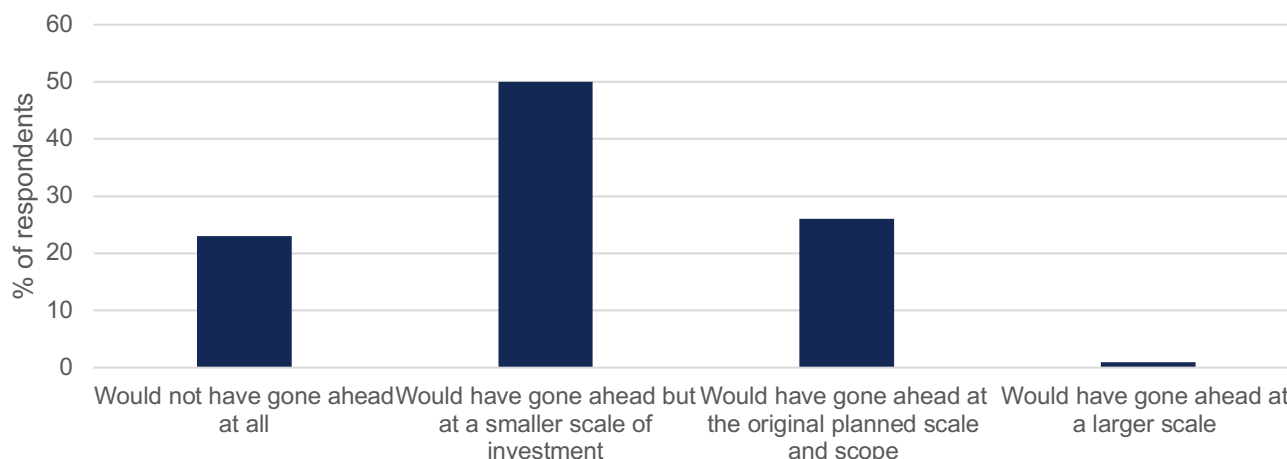
- **Baseline valuations:** British Business Bank monitoring data captures the amounts invested by ECF backed VC funds but does not capture the equity ceded by the enterprise. The value of the company at the point it received investment was estimated based on the survey results. These indicated that, on average, firms raised £1.1m in their initial funding round and ceded 32 percent of the equity in the company. This gives an average valuation of £3.4m and an overall value of the portfolio of 388 companies of £1.3bn.
- **Growth in valuations:** British Business Bank monitoring data indicates that the value of the investments made in the portfolio of companies grew by 64 percent by the end of 2019.
- **Valuations at the end of 2019:** This would imply that the value of the portfolio had increased to £2.1bn by the end of 2019. The increase in the value of the underlying portfolio was estimated at £859m.

In most cases these values were unrealised. As equity stakes in these companies are not traded in liquid markets, the price realised may be higher or lower than captured in the reported valuations. While the investment costs may provide a good measure of value for a period following the investment, estimates of changes in values driven by positive and negative factors are necessarily speculative until the point at which firms begin to earn reliable revenues and/or profits. This may lead to (in some cases, highly) conservative estimates of the increase in firm valuations. It should also be noted that this evaluation took place a relatively short period after the majority of companies received their first tranche of investment from ECF backed VC funds, and the full impact of the programme in enabling the development or demonstration of business models on underlying valuations is unlikely to be visible yet.

## 6.6 Perceived impact of investments made by ECF backed VC funds

The survey of businesses was used to explore how far they considered they would have proceeded with their business plans in the absence of ECF funding. The majority (50 percent) reported that they would have proceeded with their plans at a smaller scale of investment, while around a quarter reported they either would not have gone ahead at all or their plans would have been unaffected. Among those that reported said they would have proceeded without ECF funding, the majority (69 percent) thought that they would have then needed a longer timeframe (typically up to two more years).



**Figure 6.2: Self-assessed ability to proceed with business plans without absence of ECF funding**

Source: Survey of businesses receiving investments from ECFs, base (80)

However, respondents to the survey indicated that investments made by the ECF backed VC funds had more significant effects on their growth:

- **Turnover:** Almost 50 percent of respondents reported that they definitely or probably would not have seen similar changes to their turnover without the ECF investment (29 percent reported they would probably or definitely would have seen similar changes, and the remainder were unable to form a judgement). These effects were often considered substantial – of those that reported that the ECF investment increased their turnover, just over half considered it was responsible for 60 percent or more of their turnover growth.
- **Employment:** A similar proportion of firms (56 percent) reported that expansions in the staff numbers would definitely or probably not have occurred without the ECF investment. Of those reporting that ECF funding had an impact on the size of the workforce, almost half (44 percent) attributed 80 percent or more of their growth in employment to the funding.

## 6.7 Econometric analysis

A similar methodology to that described in 5.4.1 was used to quantify the impacts of the investments made by ECF backed VC funds on the growth of businesses. This was achieved by linking records of the firms supported by the programme to the Business Structure Database (accessed through the ONS Secure Research Service). This database is an annual snapshot of the Interdepartmental Business Register taken in March and provides annual records of the employment and turnover of all firms registered for PAYE and VAT. 369 of the 388 firms supported by the programme (95 percent) were successfully linked to the database, which provided annual data on employment and turnover between 2010 and 2018.

Further details of the analysis are provided in Annex B. However, the approach implicitly accounts for the possibility that firms may have otherwise obtained funding from other sources ('finance additionality'). However, it will not capture offsetting effects elsewhere in the economy that may arise from the growth of the firms concerned (such as the displacement of sales and output from competitors based in the UK).

It should be noted that Business Structure Database is updated based on both on administrative information compiled from tax returns and regular ONS surveys. There are some lags in the information



and in some cases, turnover data is known to be up to two years out of date. As 267 of the enterprises in the scope of the evaluation received investment in 2016 or afterwards, the following analyses only provide estimates of the short-term impact of the investments placed by ECF backed VC funds.

The findings are shown in the table below:

- **Employment:** The analyses suggested that each investment placed by ECF backed VC funds increased the number of workers employed by the firm by 23 percent by March 2018 (this result was robust to unobserved time specific shocks as well as trends at the sector and regional level).
- **Effect on turnover:** However, the results did not suggest that the investments made by ECF funds had an impact on the turnover of firms benefitting from investment by March 2018. This is not consistent with the survey data which indicated that the turnover of firms grew more rapidly than employment by the end of 2019. As there are also lags associated with the BSD data, it is likely that recent turnover growth was not yet visible in the data. However, the issue merits further investigation in the final evaluation.
- **Effect on productivity:** The findings are consistent with a scenario in which the investments made by ECF funds are effective in leveraging additional resources into early-stage companies. It appears that these resources were initially focused on evolving the companies' business model (e.g. through additional investment in product development). This will reduce productivity in the short term. The econometric analysis supports this hypothesis and indicates that each ECF investment led to a reduction in turnover per worker of 47 percent in the short term. If effects on turnover lag effects on employment (as is considered likely), then a reversal of this pattern would be expected in the medium term. In the absence of intervention, it is also possible that reductions in productivity would otherwise last longer, given the effects of the programme in enabling firms to raise capital in larger amounts.

**Table 6.3: Estimated on-going impact of investments placed by ECF backed VC funds on employment, turnover and turnover per worker by March 2019**

	Employment	Employment	Turnover	Turnover	Turnover per worker	Turnover per worker
Firm and time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Sector and regional trends	No	Yes	No	Yes	No	Yes
Estimated % effect of ECF investment	0.231***	0.235***	-0.244*	-0.176	-0.475***	-0.411***
Number of observations	1,320	1,320	1,320	1,320	1,320	1,320

Source: Business Structure Database, ONS, British Business Bank monitoring information, Ipsos MORI analysis. \*, \*\*, \*\*\* show whether the estimated coefficient was significant at the 90, 95, and 99% level of confidence respectively.

### 6.7.1 Implied additionality

The estimated impacts of the programme were used to derive a measure of the share of the overall growth of the companies concerned that can be attributed to the programme (i.e. outcome additionality). Given the short-term nature of the results, and the early focus of firms on scaling-up their employment to enable future revenue growth, the estimate of additionality was based on the programme's impacts on employment (rather than turnover).

Estimates of additionality were derived as follows:

- The econometric results provide an estimate of the average post-investment of investments made through the ECF programme. As highlighted above, the average annual growth of firms

was 48 percent, implying that without intervention, this growth rate would have fallen to 25 percent.

- The econometric analysis was based on data to the end of 2017/18. At this point, 289 firms had benefitted from the programme and an average of 1.7 years had elapsed since they had received investment.
- These growth rates were applied to the average number of workers employed on receipt of investment (8.3 jobs) for a 1.7 year period to reach an estimate of the average number of jobs created as a result of investments placed by ECF backed VC funds. This indicated firms would have grown to employ 16 workers with investment and 12 without investment, implying that the investment resulted in the creation of four additional workers per firm by the end of 2017/18.
- Aggregating this to the 289 firms supported suggested that the programme led to the creation of 1,170 jobs<sup>29</sup> by the end of 2017/18.
- As derived in Annex B, it was estimated that firms expanded by around 3,380 jobs by the end of 2017/18. This implies that around 35 percent of the employment growth of the firm can be attributed to the programme.

**Table 6.3: Estimated on-going impact of investments placed by ECF backed VC funds on employment, turnover and turnover per worker by March 2019**

	Average employment on receipt of investment	Average growth rate	Average number of years passing since investment	Average employment at end of 2017/18
With ECF investment	8.3	48	1.7	16.2
Without ECF investment	8.3	25	1.7	12.1
Additional jobs created per firm				4.0

Source: Business Structure Database, ONS, British Business Bank monitoring information, Ipsos MORI analysis. \*, \*\*, \*\*\* show whether the estimated coefficient was significant at the 90, 95, and 99% level of confidence respectively.

<sup>29</sup> I.e. 4 x 289

## 7.0 Cost Benefit Analysis

This final section sets provides a first – and at this stage only indicative - cost-benefit analysis of the programme. It first outlines some of the conceptual challenges involved in assessing the net costs and benefits of the programme, before providing an assessment of value for money based on the evidence gathered through this interim evaluation.

### 7.1 Key findings

- Arguably, it is premature to undertake a cost-benefit analysis of the programme. Most firms in the scope of the study were at an early-stage of their development and estimates of impact based on their short-term expansion will understate the longer-term economic benefits involved. Additionally, few firms had achieved an exit for their investors and changes in underlying valuations are notional at this stage (and often highly conservative).
- The indirect nature of the impacts of the programme means that some strong assumptions are needed to provide estimates of its likely net costs and benefits. This partly relates to unknown impacts of the programme on the behaviour of private investors that are crowded out by public investment. However, as the programme has largely invested in early-stage companies, there are also major challenges in projecting the lifetime benefits of the programme based on the observed short-term growth of firms receiving investment in the short-term.
- The present value of the potential costs associated with the programme were estimated at £94.8m (assuming that the British Business Bank exits the funds over a twelve-year period following the commitment of capital), of which £63.0m had been incurred by the end of 2019. This cost was made up of administrative costs incurred by the British Business Bank in its management of the programme, management fees paid to fund managers, and the opportunity cost of investing public resources in the companies concerned.
- On the (highly uncertain) assumption that the firms supported will continue to grow as they have done in the past, it is estimated that the programme will lead to a gross additional GVA impact of £630m by the end of 2028. Based on conservative assumptions, £113m of this is expected to be driven by productivity gains. Changes in the valuations of the firms supported suggest the programme may generate net additional economic benefits of £165m.
- These indicative results suggest the programme may deliver £2.62 in net benefits per £1 of economic cost by 2028. This estimate is based on valuations of firms which give the best available measure of how firms are expected to grow in the future. However, values are estimated based on industry best practice and have largely not yet been realised and may change over time as the companies develop.
- Additionally, modelling suggests that the programme may lead to a direct effect on economic output of £6.65 in GVA per £1 of economic costs. These figures will be subject to offsetting displacement and crowding out effects in product markets that are difficult to measure robustly.

### 7.2 Overall approach

The following approach has been adopted in the cost-benefit analysis:

- **Timescale for the analysis:** The oldest ECF in the scope of this evaluation received investment from the British Business Bank in 2011, while the most recent received investment in 2017. For the purposes of this analysis, it is assumed that the costs and benefits of the programme are realised over 12 years following the British Business Bank's initial commitment to the fund. This aligns with the expected timeline over which it will exit the VC funds it has supported, as most funds are extended by at least two years. The focus of the analysis is on investments that were made by the end of 2019 (no attempt is made to quantify the costs and benefits of investments that may be made in the future).

This approach may understate the long-term benefits of the programme, if the business benefitting from the programme continue to grow and raise the productivity of the UK economy beyond the lifetime of the VC funds that were supported.

- **Costs:** The cost-benefit analysis focuses on the following types of costs:
  - **Administration costs:** The costs incurred by the British Business Bank in its management of the ECF programme (such as staff salaries).
  - **Management fees:** Fees paid to Fund Managers to cover their costs in managing the funds.
  - **Opportunity cost of capital:** It is assumed only the public sector incurs an additional opportunity cost, as private resources would have otherwise been invested in other asset classes which would have generated a comparable return in the absence of the programme. The opportunity cost of capital to the public sector is assumed to be 3.5 percent per annum, in line with the discount rate recommended by the HM Treasury Green Book.
- **Economic benefits:** The cost-benefit analysis focuses on the economic benefits of the programme. This has the following elements:
  - **Measure of economic benefits:** The central focus is on productivity gains resulting from VC investments rather than the overall expansion in GVA. A focus on GVA as a measure of benefit is problematic under normal conditions as increases in output come with increases in demand for labour and other factors of production. This will place pressure on prices and encourage other firms to reduce their output in response (crowding out in product markets). Firms may also expand at the expense of the market share of domestic competitors, resulting in further offsetting displacement effects.

The economic effects of the COVID-19 pandemic are likely to alter these considerations as it has produced a supply side shock and the under- or unemployment of economic resources. If the on-going growth of firms supported by the programme helps encourage the redeployment of those resources, then the economic benefits of the programme may exceed those arising solely from efficiency gains. However, it should be noted that most of the jobs created by firms supported by the programme are relatively highly skills jobs in digital sectors that have experienced less significant direct impacts from social distancing restrictions. As the skills required are comparatively scarce, there may be less significant scope for growth of these firms to absorb economic capacity created by the pandemic.
  - **Future benefits:** The results set out in Section 6 provide an indication of the growth outcomes achieved to date, but provide no measure of the future benefits that can be anticipated from the programme. This issue has been addressed using two different approaches for the purposes of sensitivity analysis:

- **Extrapolation:** One set of results assume firms continue to grow at the same rate for the remainder of 12-year period under consideration.
- **Firm valuations:** Changes in valuations of firms have also been used to give a measure of the future benefits of the programme. The value of firms should, in efficient financial markets, reflect expectation of its future profits over and above the risk-free rate of return. While other firms may be displaced, it can be assumed that those firms will only earn a normal rate of return to capital. As such, changes in firm valuations can be broadly expected to approximate the net benefits of the programme (or at least those that will accrue to private investors).
- **Additionality:** Economic benefits have only been included in the CBA to the degree that firms would not have realised the growth outcomes above in the absence of the programme. This needs to account for:
  - **Outcome additionality:** The most robust results set out in Section 6 imply that 35 percent of the employment growth outcomes achieved by March 2018 would not have occurred in the absence of the programme. This is chosen as the primary measure of additionality as the primary focus of firms at this stage would have been on scale-up with revenue generation expected to follow.
  - **Finance additionality:** These findings implicitly account for the possibility that firms would have otherwise raised similar funding from other VC funds. However, they do not account for the likelihood that ECF backed VC funds would otherwise have reached a final close (or a close at a smaller value) in the absence of the programme. The findings set out in Section 4 indicate that:
    - At an upper bound, around 90 percent of the capital raised by ECF backed VC funds would not have been secured in the absence of the programme. This implies that some private resources were directed to ECF backed VC funds that would have otherwise been deployed in alternative investments.
    - However, it is not possible to determine how this capital would have otherwise been deployed, or the economic benefits that would have been associated with this. A simplifying assumption has been made that any private capital reallocated to ECF backed VC funds would have otherwise earned an equivalent rate of return on the available alternatives.
    - The economic benefits of the programme therefore arise from the share of the investment made that was funded by the public sector (55 percent).
    - This is a strong assumption and may overstate the net benefits of associated with the ECF programme. As shown in Section 4, ECFs tend to generate lower returns than other VC funds. The evidence set out in Section 5 suggests that the net impact of the programme on VC investment in the UK is broadly in line with the public funding committed to the programme. This implies that the programme has diverted some private investment that may have otherwise been invested through more profitable VC funds.
    - This could have social costs if the underlying investments are associated with less significant economic benefits. However, the evidence also indicated that ECFs were often able to outcompete other VC funds by offering more favourable terms – and this would imply a transfer of income from the public sector to the shareholders in the company (rather than a social cost). As such, the issue is set

aside for the purposes of this interim evaluation but would merit further exploration in the final evaluation of the programme when more exits have been achieved. Comparisons between the valuations attained by firms receiving investments from ECF backed VC funds and other early-stage investments made by VC funds would be instructive in informing this assessment.

- **Knowledge spillovers:** As illustrated in Section 6, the firms receiving UKIIF backing were relatively R&D intensive, raising the possibility that there will be or may have been further benefits through knowledge spill-overs. These benefits cannot be measured, as those benefitting from the spillover are largely unknown. While it may be possible to apply ready-reckoners from the secondary literature to provide an estimate of the possible size of these effects, this possibility has not been adopted at this stage.

## 7.3 Costs

### 7.3.1 Opportunity cost of capital

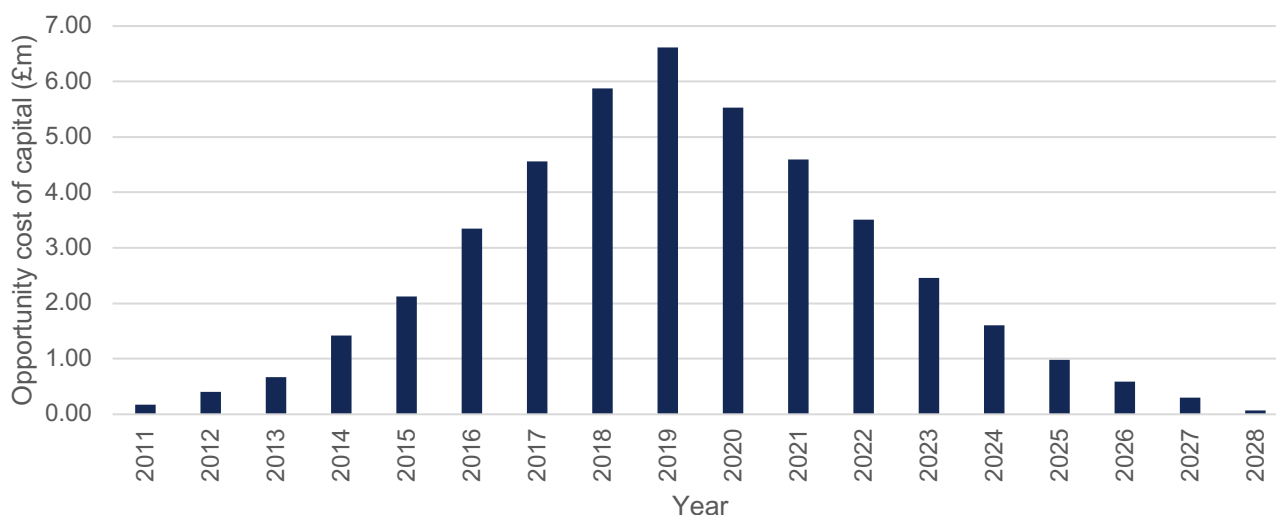
The ECF programme involved the deployment of public sector funds to finance equity investments in private sector companies. These investments will result in opportunity costs to the public sector in the form of the returns that could have been earned on alternatives. British Business Bank guidance suggests that the opportunity cost of capital to the public sector (i.e. the marginal rate of return on the best alternatives) should amount to 3.5 percent<sup>30</sup>. The opportunity costs of the ECF programme were estimated as follows:

- Opportunity costs were assumed to have been incurred from the point funds were drawn down by the 14 VC funds benefitting from the programme to the point at which the value of the investments made were realised (resulting in capital being returned to the public sector).
- Opportunity costs were assumed to have been incurred on the value of the investment at its original price until the date of exit.
- Beyond 2019, it was assumed that VC funds would begin exit their investments on a linear basis from the 6<sup>th</sup> to the 12<sup>th</sup> year following the British Business Bank's initial investment. For funds that were already invested for six or more years in 2019, it was assumed that the fund would exit its investments linearly over the remainder of the twelve-year period.
- This gave an estimate of the total public funds deployed through the scheme in each year between 2011 and 2028. The 3.5 percent discount rate was applied to reach an estimate of the associated opportunity costs. Nominal costs were converted to 2019 prices using the GDP deflator.

The following figure provides a breakdown of the estimated opportunity costs by year. The present value<sup>31</sup> of the lifetime opportunity costs of public sector funding invested through the programme were estimated at £44.8m in 2019 prices (of which £25.2m had been incurred by the end of 2019).

<sup>30</sup> The opportunity cost of investing public resources (A) in stimulating the private sector in any given year has been understood to be equal to the return that could be obtained on the best alternative use of those funds, generating a marginal rate of return of  $r$ . This was used to generate a stream of costs over time ( $Ar$ ), which were then discounted at the rate of social time preference given by the HMT discount rate (3.5 percent). The marginal rate of return on those alternative investments was assumed to be 3.5 percent in line with British Business Bank guidance. Given the nature of the intervention, a case could be made that  $r$  should equal the marginal risk-free rate of return in the private sector (assumed to be 6.2 percent in British Business Bank guidance and estimated as high as 10 percent in other studies) as assuming different marginal rates of return to public and private sector investments could imply a misallocation of resources between the public and private sectors.



**Figure 7.1: Opportunity costs of capital (2019 prices, in present value terms), 2011 to 2028**

Source: British Business Bank monitoring information, HM Treasury (2020) GDP deflator, Ipsos MORI analysis.

### 7.3.2 Administrative costs incurred by the British Business Bank

The British Business Bank incurs a range of staff and operational expenditures in its management of the programme. The British Business Bank provided details of its overall spending on these administrative costs between 2014 and 2019 (£666,000 per annum in 2019 prices on an undiscounted basis).

This evaluation focuses on a subset of 14 ECFs awarded funding between 2011 and 2017 (a total of 29 ECFs were active in total in 2019). As such, these overall costs cannot be fully attributed to those aspects of the programme of interest. Total administrative costs appeared uncorrelated with the number of funds being administered (with the costs of managing 19 funds in 2016 broadly equivalent to the costs of managing 29 in 2019). This suggests that the marginal administrative cost of additional funds is very low. However, as highlighted in Section 4, fund managers perceived the British Business Bank had faced increasing capacity constraints as the number of funds increased, resulting in elongated timescales for aspects such as due diligence. The costs of administering additional funds may therefore be being incurred over longer timescales.

In the absence of superior information, an estimate of the administrative costs associated with the programme was reached using the average annual cost per fund (£27,540 in 2019 prices). This was applied for the twelve-year period from the British Business Bank's first commitment to the fund through to being fully exited. The present value of administrative costs for the lifetime of the programme was estimated at £3.4m (in 2019 prices), of which £1.9m had been incurred by the end of 2019.

### 7.3.3 Management fees

ECF backed VC funds charge management fees which are assumed to reflect the economic costs of managing the fund. These fees usually differ during the investment period (the first five years, in which fees are charged as a percentage of the size of the fund) and the post-investment period (assumed here to be years five to 12, which are charged as a percentage of the capital invested in companies and falls as exits are achieved or investments are written off).

Data was provided on the fee rates charged by each ECF backed VC fund and were used to construct a measure of the expected management fees that would be incurred by the British Business Bank over

<sup>31</sup> Discounting was applied with a baseline of 2011 as this was when the first fund in the scope of the evaluation received capital from the British Business Bank.



the 2011 to 2028 period (based on the estimates of the capital deployed used to generate estimates of the opportunity costs of capital<sup>32</sup>). The present value of management fees incurred over the lifetime of the programme (in 2019 prices) were estimated at £46.6m (of which £35.9m had been incurred by the end of 2019).

The ECF programme leveraged additional private capital into the VC funds concerned and private investors will also incur additional fees. However, in the counterfactual scenario, it is assumed that private investors would have otherwise deployed their capital in alternative investments. The fees associated with the management of those investments may not be equal (e.g. ECFs may require more due diligence or involve more active management) but a simplifying assumption was made that they are equivalent.

### 7.3.4 Total costs

The estimated lifetime costs of the ECF programme are set out in the following table.

**Table 7.1: Summary of estimated costs, 2011 to 2028 (2019 prices, present value)**

Cost	2011 to 2019	2011 to 2028
Opportunity cost of capital (£m)	25.2	44.8
Administrative costs (£m)	1.9	3.4
Management fees (£m)	35.9	46.6
<b>Total</b>	<b>63.0</b>	<b>94.8</b>

Source: British Business Bank monitoring data, Ipsos MORI analysis.

## 7.4 Benefits

### 7.4.1 Gross economic outcomes

This evaluation provides three measures of the gross economic outcomes of the programme:

- **GVA:** Estimates of the gross change in GVA to 2019 are set out in Section 6:
  - It was estimated that the firms supported by the programme expanded their economic output by £724m by the end of 2019 (£578m in present value terms).
  - This was extrapolated forward over the 12-year lifetime of each fund by assuming firms would continue to grow at the same rate in the future (on average)<sup>33</sup>.
  - Under this assumption, the cumulative expansion in GVA by the end of 2028 is estimated at £3.3bn (in present value terms).
  - This is subject to significant uncertainty given the early-stage nature of many companies that received investment (many of which remained pre-revenue at the time of the research).
  - However, the measure will also overstate the benefits of the programme, as it does not allow either for displacement or crowding out in product markets, which cannot be reliably estimated.
- **GVA from productivity gains:** Around 18 percent of the overall expansion in GVA was driven by productivity gains (i.e. increases in GVA per worker). This relationship was assumed to hold

<sup>32</sup> Note that as the CBA does not account for future investments, the estimates of fees charged in the post investment period will be understated.

<sup>33</sup> I.e. at a rate of £240,000 per firm per annum.

in the future. The expansion in GVA associated with productivity gains was estimated at £104m by the end of 2019 and £589m over its lifetime (in present value terms). These results are likely to understate the overall productivity gains associated with the programme:

- As highlighted in Section 6, the ECF programme has supported many pre-revenue businesses. Productivity gains would be expected to become a more significant driver of output growth in the future as a greater share of firms commercialise their business models.
  - The approach adopted to estimate productivity gains is conservative. It is assumed that productivity gains are only driven by more efficient use of the resources available to the firm before they received investment from ECF backed VC funds. Any productivity gains arising from the transfer of output from less to more productive firms are omitted in this approach. This penalises early-stage companies that typically employed small numbers of workers and whose growth has largely been driven by rapidly expansion in potentially more than averagely productive employment.
  - Given the economic shock of the COVID-19 pandemic, there is scope for the programme to have more significant productivity gains if it encourages the employment of resources that would have otherwise remained unutilised (e.g. unemployed workers). However, it should be noted that many of the firms supported recruited workers with specialised and scarce skills (e.g. in R&D occupations).
- **Firm valuations:** As argued in the introduction to this section, changes in firm valuations should reflect investors' expectations of the present value of future profits over and above the risk-free rate of return. By assumption, this measure also addresses issues relating to crowding out in product markets and displacement (as any activity displaced or crowded out can be assumed to be only earn a normal rate of return). It also gives an indication of the value that may be created in the future. It was estimated that the overall increase in the value of UK headquartered firms in the portfolio was £859 by the end of 2019. However, this measure will understate the potential benefits of the programme as:
- The underlying assets are illiquid and unofficial valuations, may be excessively conservative, and actions yet to be taken by early-stage companies to develop their business models may not be capitalised into values.
  - The measure does not capture potential gains accruing to workers in the form of higher incomes or external benefits arising from knowledge spillovers.

The estimated gross economic outcomes associated with the programme are set out in the table below.

**Table 7.2: Gross economic outcomes, 2011 to 2028 (2019 prices, present value)**

	GVA	GVA	GVA from productivity gains	GVA from productivity gains	Firm valuations
	2011 to 2019	2011 to 2028	2011 to 2019	2011 to 2028	2011 to 2019
Gross economic impact (£ms, present value, 2019 prices)	577.7	3,274.7	104.0	589.4	859.0

Source: British Business Bank monitoring data and Ipsos MORI user defined search of PitchBook. Results may differ to PitchBook's own published figures.

### 7.4.2 Effect of COVID-19

The future economic impacts of the programme could potentially be influenced by temporary and/or permanent effects of the COVID-19 pandemic, efforts by Governments to contain the outbreak, and/or effects on the risk appetite of investors. Consultations with recipient businesses took place during the first wave of the COVID-19 pandemic in the UK, and respondents were asked to give their views on the potential impact of the pandemic on their future development. The main themes emerging included:

- **Disruption and quick adaptation:** All businesses reported some level of disruption to working in their operations (e.g. equipping their staff to work at home or dealing with employees abroad). However, firms appeared to adapt rapidly to new ways of working.
- **Positive outlook:** Additionally, the businesses interviewed had a positive view of the future outlook and did not have major concerns about their future development or commercialisation prospects. This was partly due to their nature (highly innovative technology companies) and the type of products/service offered (the markets for which were not significantly disrupted by social distancing requirements or the closure of large segments of the economy).

Analysis of valuations of early-stage companies suggest that investors do not consider the commercialisation prospects of UK based companies to have been substantially altered by the pandemic. Median valuations of companies receiving early-stage VC deals rose from £7.4m to £9.0m between 2019 and 2020. As such, the evidence at this stage does not give significant cause for concern and no adjustments were made to future projections to account for the possible impact of the COVID-19 pandemic. However, it should be noted that the supply of early-stage VC funding has tightened since March 2020. This could create difficulties for some companies in the portfolio if they struggle to raise sufficient follow-on funding and these issues will require closer examination in the final evaluation.

### 7.4.3 Additional economic benefits

The following adjustments were made to the results to provide estimates of the net economic benefits of the programme:

- **Outcome additionality:** As highlighted above, it was estimated that 35 percent of gross economic outcomes would not have occurred without the investments placed by ECF backed VC funds.
- **Finance additionality:** The net economic benefits of the programme are assumed to arise primarily from the contributions to the programme made by the public sector. As noted, the figures were adjusted to reflect the British Business Bank's contribution to the investments made (55 percent).

The estimated net economic benefits associated with the programme are set out in the table below.

**Table 7.3: Net economic benefits, 2011 to 2028 (2019 prices, present value)**

	GVA	GVA	GVA from productivity gains	GVA from productivity gains	Firm valuations
	2011 to 2019	2011 to 2028	2011 to 2019	2011 to 2028	2011 to 2019
Gross economic impact (£ms, present value, 2019 prices)	577.7	3,274.7	104.0	589.4	859.0
Outcome additionality	0.35	0.35	0.35	0.35	0.35

Finance additionality <sup>34</sup>	0.55	0.55	0.55	0.55	0.55
<b>Net economic benefit (£ms, present value, 2019 prices)</b>	<b>111.2</b>	<b>630.4</b>	<b>20.0</b>	<b>113.5</b>	<b>165.4</b>

Source: British Business Bank monitoring data and Ipsos MORI user defined search of PitchBook. Results may differ to PitchBook's own published figures.

## 7.5 Benefit to Cost Ratios

Estimates of the costs and benefits of the programme are brought together in the table below to provide (highly indicative) estimates of the value for money of the programme to the end of 2019 and over the lifetime of the programme. Based on the assumptions adopted and current scheme performance as of 2019, the scheme is expected to deliver economic benefits that exceed the cost of the programme with a central estimate of £2.62 per £1 of economic cost, based on changes in firm valuations<sup>35</sup>.

This central estimate is based on investors current expectations of the future profitability of firms benefitting from the capital deployed by ECF backed VC funds (unlike the GVA based estimates) and are arguably subject to smaller margins of error. However, as noted, these values are estimated based on industry best practice and have largely not yet been realised. The valuations of early-stage companies can change over time as the companies develop.

An alternative approach estimating the additional economic output created by supported businesses over the life of the programme suggested economic output increased by £3.3bn by the end of 2028 (in present value terms). This suggests the programme may deliver up to £6.65 in gross additional economic output per £1 of economic cost by 2028. This does not take account for displacement and crowding out in product markets because they cannot be measured robustly. Green Book guidance at the time of writing recommended an assumption that any demand side effects will be entirely offset by displacement and crowding out under normal economic conditions. However, the economy will be operating at less than full resource utilisation due to COVID-19 and demand side stimulus may produce short-term economic benefits.

**Table 7.4: Indicative benefit to cost ratios (£s benefits per £1 spent)**

	Firm valuations	GVA	GVA	GVA from productivity gains	GVA from productivity gains
Cost-benefits	2011 to 2019	2011 to 2019	2011 to 2028	2011 to 2019	2011 to 2028
Present value of benefits (£m)	165.4	111.2	630.4	20.0	113.5
Present value of costs (£m)	63.0	63.0	94.8	63.0	94.8
Benefit to cost ratio	<b>2.62</b>	<b>1.77</b>	<b>6.65</b>	<b>0.32</b>	<b>1.20</b>

Source: British Business Bank monitoring data and Ipsos MORI user defined search of PitchBook. Results may differ to PitchBook's own published figures.

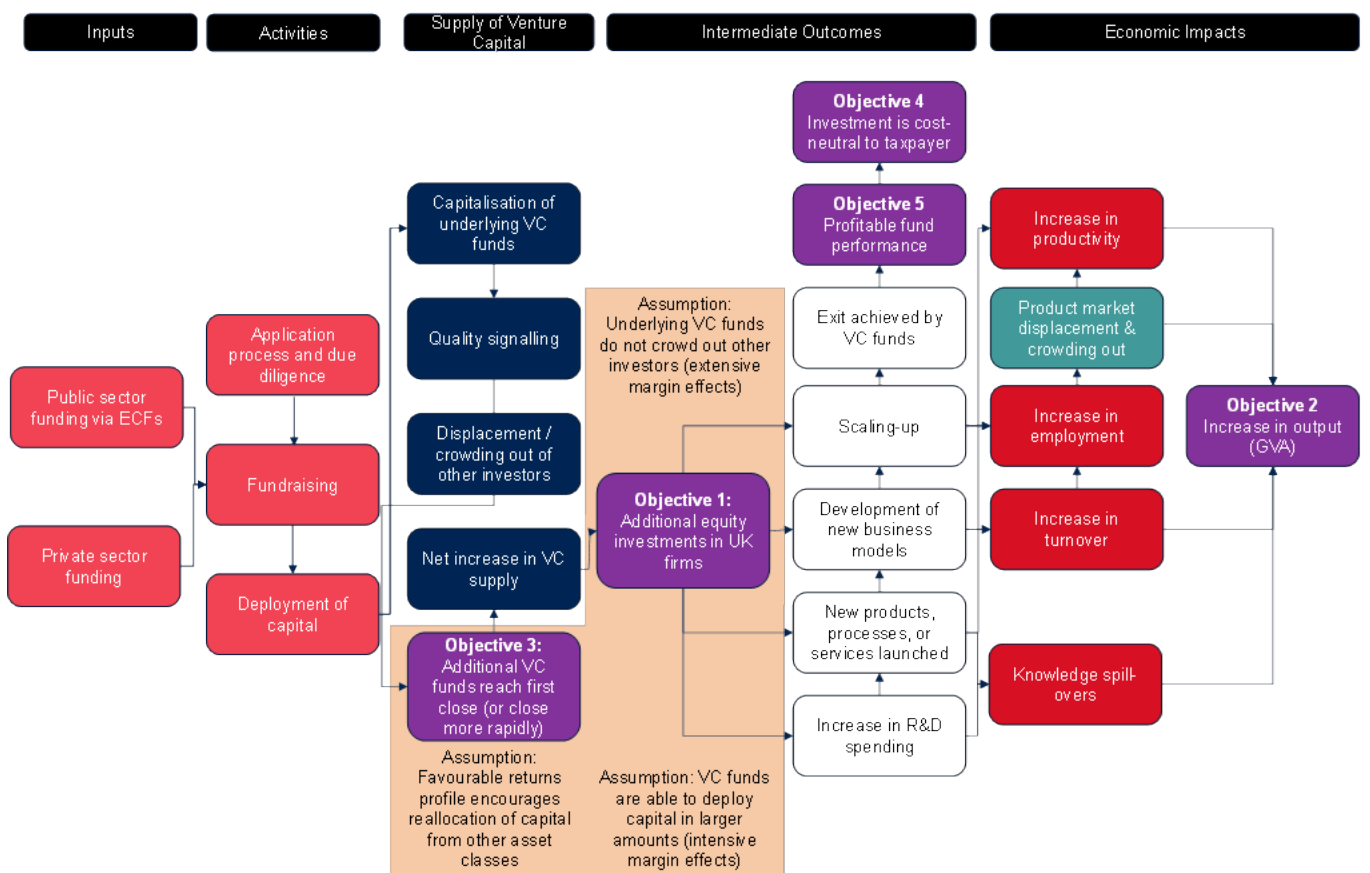
<sup>34</sup> Note that it is implicitly assumed that the economic benefits arising from any leverage of private funding into the VC sector has come at the cost of returns foregone on the alternative investments that would have otherwise been made.

<sup>35</sup> Note that this estimate does not include future changes in the value of the underlying assets, so is based on opportunity costs to date.

# Annex A: Theory of Change

The underlying logic model for the Enterprise Capital Fund is reported below. It illustrates the inputs and processes by which the programme it is supposed to deliver its outcomes and final economic impacts.

**Figure A.1 Enterprise Capital Funds – logic model**



## Inputs

The delivery of the ECF programme involves the following inputs:

- Capitalisation of VC funds:** The primary public resources absorbed by the programme is the public funding committed to capitalise VC funds (ECFs). The British Business Bank contributes up to 60% of the total fund size or two thirds if the ECF is targeting SMEs prior to their first commercial sale. Across the VC funds in the scope of this evaluation, the British Business Bank contributed £358m. Although this funding is used to purchase assets that can later be sold at a profit or loss, the commitment of this capital involves opportunity costs as those resources may have otherwise been invested in alternative uses that could have generated social returns.

- **Private investment:** Fund managers are required to attract funds from private investors (who may be high net worth individuals, family offices or institutional investors such as pension funds). Across the thirteen funds in the scope of this evaluation, fund managers attracted a total of £292m in private investment.
- **Staff resources:** The delivery of the ECF programme involves a formal application process in which proposals put forward by fund managers are assessed by the British Business Bank against a range of criteria. Funds are also subject to on-going monitoring by the British Business Bank. These processes absorb further inputs in the form of the staff resources required to implement these processes.

## Activities

The delivery of the programme involves several activities:

- **Application process and due diligence:** Prospective fund managers must submit a formal application to receive funding through the programme. The British Business Bank assesses applications against a range of criteria, including eligibility, the quality of the fund management team, the degree to which the proposed investment strategy meets the objectives of the ECF programme, and the terms offered by the fund manager. If an application is accepted, a limited partnership is established with the British Business Bank and other private investors each contributing capital to the fund through their role as limited partners to the fund.
- **Fundraising:** British Business Bank contribute up to 60 percent of the total funding or two thirds of the money if the ECF is targeting SMEs prior to their first commercial sale. The remainder is raised from private sector investors. No minimum or maximum fund size is set, though the maximum the Bank will invest in a single fund is £50 million. ECFs operate with a reduced profit share structure to stimulate the supply of venture capital in this part of the market. The Government receives a prioritised return of 3 percent on its capital but invests on terms that favour private investors when the fund is successful, so that these other investors receive a greater share of the upside. This structure aims to attract private investment and close the equity gap by generating returns that are competitive to other investment opportunities. The Bank invests on an equal footing (Pari-Passu) with other commercial investors in other VC programmes.<sup>36</sup>
- **Deployment of capital:** Fund managers act as general partners in the fund, making and managing investments into SMEs. The design of the programme places some restrictions on the investment strategy that can be pursued by ECF fund managers:
  - The SMEs must not be listed and must not operate in State aid restricted sectors (e.g. steel and agriculture).
  - The purpose of the relevant investment is, or the application of the proceeds of such investment by the relevant company should predominantly be related to or benefit the economy of the UK.
  - There is a £5 million upper limit on the total investment a business can receive in the initial funding round, including any other amount invested from other State Aid schemes or co-investors. An ECF can continue to follow-on into companies up to the lesser of 15

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<sup>36</sup> Notably British Patient Capital and UK Innovation Investment Fund (UKIIF).



percent of the fund's total commitments or €15m. This cap aims to ensure funds are directed at addressing the 'equity gap' faced by early-stage businesses<sup>37</sup>.

## Supply of venture capital

The ECF programme is expected to yield the following impacts on the supply of venture capital:

- **Capitalisation of early-stage VC funds:** Providing additional capital to funds will have a direct effect on the fundraising efforts of VC funds:
  - **Cornerstone investor:** The British Business Bank funding acts as an anchor investor contributing up to two thirds of the capital. This may give confidence to other investors that the fund will meet its fundraising objectives, enabling it to close more rapidly.
  - **Quality signalling:** The ECF programme may also indirect positive effects on the supply of funding through quality signalling. The British Business Bank completes a due diligence process examining the strengths of the fund management team and their investment strategy. If these processes are viewed as rigorous by other investors, this may also encourage them to co-invest alongside the British Business Bank , helping VC funds to reach closure more rapidly or at a larger size.
  - **Incentives:** Other LPs also have the potential to receive higher returns if the fund performs well due to the reduced profit share structure. This alters the risk and reward profile of investing in ECFs and may encourage LPs to allocate resources to early-stage funds that may have otherwise been allocated to assets with less significant risks.
- **Offsetting effects:** However, there are also risks of offsetting effects:
  - **Crowding out in financial markets:** Public resources may be allocated to funds that would have closed anyway, crowding out other private sector investors. This would be problematic if it encouraged the reallocation of private capital to other asset classes, limiting the net increase in the supply of VC funding.
  - **Displacement:** Public sector support for some funds creates the possibility that private funds are diverted from others, with possible adverse effects on their prospects of achieving closure (or resulting in closure at a smaller size).
  - **Restrictions on investment strategy:** The restrictions on the investment strategy placed by ECFs has the potential to dissuade some investors placing their capital with the funds, if those restrictions are perceived to limit the prospects of the fund earning its target rates of return. For example, a study by the National Audit Office, found that the restrictions placed on VC eligible investments led to lower returns on public investment (for Regional Venture Capital Funds) relative to commercial funds that did not have investment restrictions.<sup>38</sup>
- **Follow-on funds:** Further leverage of private capital may occur if fund managers begin to build a track record of successful fund management (a shortage of managers has been identified as key issue for the development of the VC ecosystem in the UK) – particularly if the programme

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<sup>37</sup> British Business Bank (2015) *Equity Research Report: Review of Equity Investment in Small Businesses*, available at: <https://www.british-business-bank.co.uk/wp-content/uploads/2015/03/050315-Equity-report-FINAL.pdf>

<sup>38</sup> National Audit Office (2009) *Venture capital support to small businesses*, available at: <https://www.nao.org.uk/wp-content/uploads/2009/12/091023.pdf>



has been directed at fund managers raising their first funds. As such, the programme has the potential to lead to sustained impacts on the supply of VC finance.

## Impacts on VC investment in the UK

On the assumption that the programme leads to a net impact on the supply of venture capital, the following effects might be expected in terms of investment in UK SMEs:

- **Additional equity investment into early-stage UK firms:** If the ECF programme works as expected, the capitalisation of VC funds should lead to an increase in the level of equity investment in early-stage companies based in the UK. This assumes:
  - **Demand for VC:** Investors can find a sufficiently large number of potentially profitable investments in which to deploy their capital. It should be noted that the degree that the ECF programme effectively reduces the cost of capital faced by fund managers, this may enlarge the pool of potentially profitable investments and encourage greater risk taking (e.g. by investing in earlier stage businesses that may be too risky for other VC funds facing a higher cost of capital).
  - **Crowding out of other investors in the short term:** Reduced cost of capital does not allow ECFs to outcompete other VC funds for the most profitable investments and deploying their capital in firms that would not have otherwise found it difficult to raise funding. The restrictions on the maximum investment amounts may help reduce these risks by encouraging capital to be directed towards the firms that are more likely to face issues in relation to the ‘equity gap’.
  - **Redeployment of capital:** Even where there is crowding out in the short-term, this may not be problematic if investors do not reallocate capital to other asset classes or to VC investments outside the UK (i.e. they move on to make other VC investments in the UK).

## Intermediate impacts on recipient firms

If the ECF backed VC funds deploy capital to UK SMEs and public investment does not lead to crowding out of private investors in the medium term, the following might be expected amongst the firms benefitting from the programme:

- **Increase spending in R&D activities:** Recipient businesses may use the capital to invest in R&D to support operational and product innovation.
- **Develop new products, services and/or business models:** The capital raised may also be used to develop new business models to accommodate faster or more efficient growth. These mechanisms would ultimately be expected to lead to the commercialisation of new products, services or processes.
- **Scaling up:** Additional investment will potentially benefit recipient businesses as they will be able to scale up their business operations. This could include increasing the scope of firm’s operations, recruiting new staff or expanding some activities abroad.
- **Outcome additionality:** In some cases, it is possible that firms would have otherwise achieved these results without raising venture finance (and indeed accessing VC too early in the companies’ development pathway could place too much pressure on the companies’ management team hindering their long-term development and expansion).

## Economic Impacts

Where VC funds do help to accelerate business development, a range of downstream economic impacts can be anticipated:

- **Employment:** The expansion of firms may directly result in the creation (or safeguarding of jobs). Given the focus on high growth firms, much of the expansion may occur in the short to medium term. As the level of risk associated with many business models will be high, firms may be forced to pay higher initial salaries to workers to attract the required skills, reflecting the risk premium and the future expected profits associated with their labour.
- **Turnover, GVA and productivity:** If execution of business plans was successful, then this could be expected to be accompanied by growth in sales and output (GVA). As firms were expected to earn abnormal returns, growth could be expected to be accompanied by improvements in productivity.
- **Export performance:** It could be expected that this may be accompanied by increases in exports.
- **Knowledge spill-overs:** Other businesses may adopt, adapt, or learn from innovations or advancements that arise as a result of funding, producing productivity gains elsewhere in the economy. For example, the introduction of a new business model that has proven to be initially effective could be imitated and implemented by other firms in the same or other sectors.
- **Increased confidence in ability to raise finance:** The ECF programme should also increase the ability and confidence to raise capital among fund managers as well as businesses. In the first instance the programme should lead funds close more rapidly or to a higher target than originally planned. Recipient businesses instead, should become more confident in securing subsequent funding rounds in the VC market.
- **Valuations:** Finally, if the business development enabled by venture capital increase the expected future profitability of the firms, this will lead to higher current valuations of the firm (assuming investors have rational expectations).

However, an assessment of net economic impacts also requires consideration of offsetting effects that may limit the net benefits to the UK economy:

- **Displacement:** The expansion of funded firms will likely come at the expense of their competitor's market share, resulting in corresponding reductions in employment and GVA elsewhere in the UK. Nevertheless, overall GVA will still increase if this involves a transfer of output from less to more productive producers.
- **Crowding out in product markets:** Even where firms expand without displacing domestic competitors, greater demand for factor inputs will place pressure on wages and prices, reducing demand elsewhere in the economy. Once prices have adjusted, net economic impacts will be determined by the expansion in GVA driven by productivity growth.
- **Leakage:** A third possible consequence of the UK SMEs growing their activity as a result of ECF funding, could be if they expand their operations overseas rather than in the UK. This would offset the initial positive implications of the programme on the country's businesses.

## Annex B: Technical appendix

This Annex presents the findings of the econometric analyses completed to support the evaluation and explore the causal effects of the programme on the growth of firms benefitting from investments placed by ECF backed VC funds and the levels of venture capital investment.

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### Firm level impacts

The second set of analyses examined the impact of investments placed by ECF backed VC funds on the firms benefitting from the investment.

#### Data

Two different data sources informed this analysis:

- **Business Structure Database:** Monitoring records of firms receiving investment by ECF backed VC funds were linked to ONS' Business Structure Database (BSD). The Business Structure Database provides longitudinal records on turnover and employment for all firms registered for VAT or PAYE. This data was used to explore the impacts of the investments made through ECFs on employment, turnover and productivity (using turnover per worker as a proxy measure). 369 of 388 businesses receiving support through the programme were successfully matched to the Business Structure Database. Data was obtained for the 2010 to 2018 period.
- **PitchBook data:** Monitoring records were also linked to records of equity investments compiled by PitchBook. PitchBook is a database covering private capital markets investments. It collects and structures records of equity investments that have been disclosed (through press releases, on-line searches, as well as information captured directly from equity investments). It does not capture undisclosed investments and coverage of smaller fundraisings and some other deals (e.g. where firms are operating in 'stealth' mode) will be less comprehensive. This data was used to estimate the impact of the ECF scheme on businesses' fund-raising and valuations. 307 firms supported by the programme were tracked by PitchBook. Firms that were not tracked by PitchBook were assumed not to have raised equity investment over the period. Data was obtained for the 2010 to 2019 period.

#### Counterfactual

A robust estimate of the impact of the ECF programme on the fundraising of firms requires comparisons to a group of similar businesses that did not benefit from the programme. Identifying a suitable comparison group is challenging in this context. Firms that seek investment from ECF backed VC funds will differ in systematic and unmeasurable ways from those in the general business population. As illustrated by the British Business Bank's SME Finance Survey, only a small share of the UK's business population seeks equity funding in each year. These businesses are typically seeking to commercialise disruptive business models and are more dependent on equity funding to finance their growth.

Options for constructing a suitable comparison group were limited:

- **Dead deals:** Ideally, a comparison group would be drawn from the population of firms that sought investment from ECF backed VC funds but were declined. This group of firms would most closely mirror the characteristics of those businesses that did secure funding. However, the VC

funds did not compile systematic records of ‘dead deals’ that could be shared for the purposes of the evaluation. The British Business Bank could enhance the robustness of future evaluations of its interventions in VC markets by capturing details of ‘dead deals’ in its monitoring.

- **Firms seeking equity investment:** Consideration was also given to constructing a comparison group from the sample of firms that reported that they had sought equity funding in recent waves of the British Business Bank’s SME Finance Survey. However, the sample sizes were small (just over 100 companies) and the characteristics of the companies differed substantially from those supported by the programmes (including many that were active in non-tradable service sectors, such as chains of public houses).

These challenges were addressed by adopting a ‘pipeline design’ that exploited that the relatively long timeframes over which investments were made by the ECF backed VC funds in the scope of the evaluation. This involved treating those receiving investments in later years as a comparison group for those that were supported in earlier years. As the analysis is restricted to companies that ultimately received investments placed by ECF backed VC funds, estimates of impact are less likely to be distorted by systematic differences between those firms that do and do not receive equity investment from the funds concerned. This approach will produce unbiased estimates of impact if there are no systematic differences between firms receiving support in different years.

### Econometric model

The following econometric model was used to estimate the impacts of the programme:

$$Y_{it} = \alpha + \beta T_{it} + \gamma_i + \gamma_t + \epsilon_{it}$$

This model describes the relationship between the outcome of interest for firm  $i$  in year  $t$  ( $Y_{it}$ ) as a function of receiving ECF investment in a specific year ( $T_{it}$ )<sup>39</sup>. To estimate the long-term effects of the ECF investment, the treatment variable  $T_{it}$ , was specified as follows:

- $T_{it} = 0$  before the intervention occurred.
- $T_{it} = 1$  from the year of investment onwards (i.e. until the latest available year of data)

The coefficient  $\beta$ , measures the average long-term (cumulative) effect of the programme on the outcomes of interest, the parameter ( $\gamma^i$ ) controls for any unobserved differences between firms that do not change with time and ( $\gamma^t$ ) any unobserved time specific shocks affecting all firms in the same period (e.g. a general improvement in fundraising conditions).

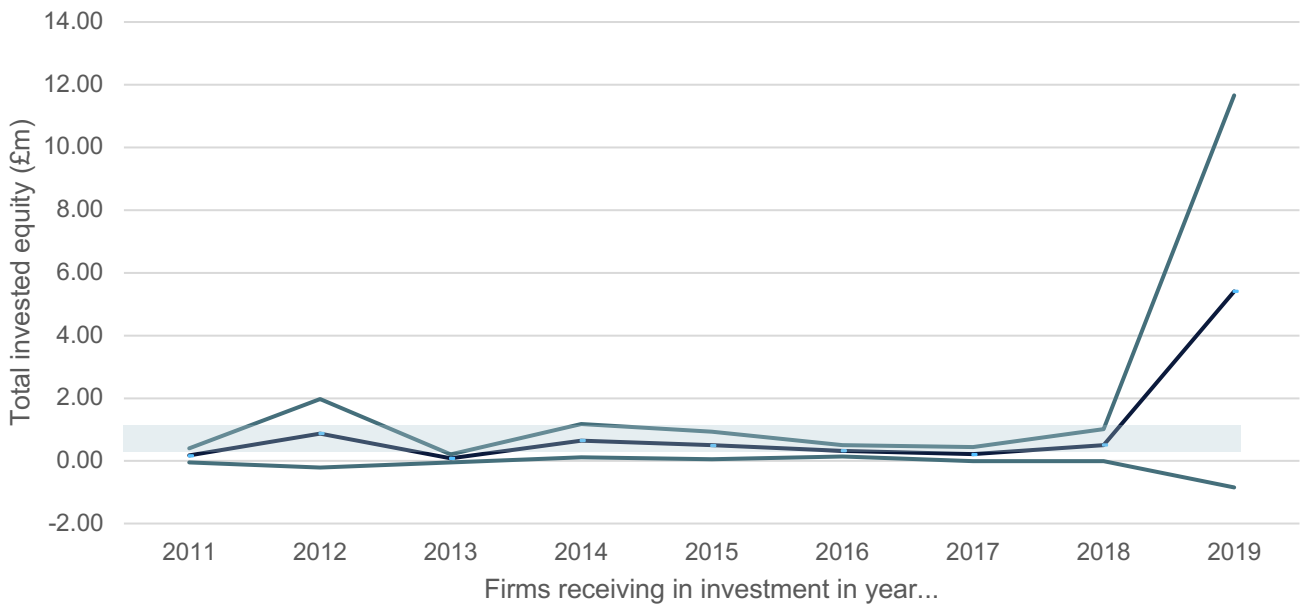
### Validity

The validity of the pipeline design depends on the degree to which it can be assumed that there are no systematic differences in the characteristics of firms receiving support in different years that are also correlated with the outcomes of interest. For example, if investors shifted focus from earlier to later-stage firms over time, then estimates of impact will combine both the effects of the programme and differences in the growth prospects of earlier and later stage firms.

The figure below shows the 95 percent confidence for the average level of funding raised by firms receiving investment from ECF (prior to the investment), for firms receiving investment in different years. This shows that in all years, there were no statistically significant differences between the fundraising histories of firms receiving support in each year and the overall sample (shown in the shaded box).

<sup>39</sup>  $T_{it}$  takes the value of zero in all years for the comparison group.

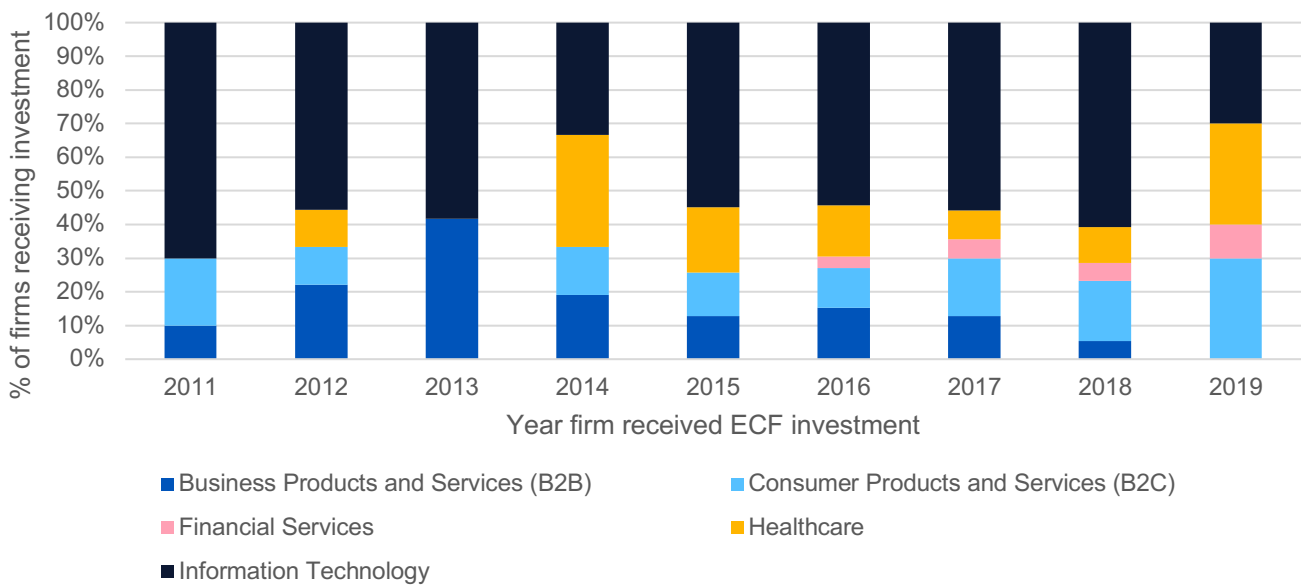
**Figure B.1: Fundraising history of firms receiving investment from ECFs in different years**



Source: Ipsos MORI user defined search of PitchBook. Results may differ to PitchBook's own published figures.

The following figure shows the sector distribution of firms receiving investment from ECFs in different years. Although the sector distribution of investment varies from year to year, there are also no systematic trends over time. As such, descriptive analysis does not highlight major threats to the internal validity of the analysis (though clearly, there may be unobserved differences between groups of firms with the potential to bias findings).

**Figure B.2: Sector distribution of firms receiving investment from ECFs in different years**



Source: Ipsos MORI user defined search of PitchBook. Results may differ to PitchBook's own published figures.

## Effects on equity investment

The estimated effects of ECFs capital on firms' equity investment and valuations are summarised in Tables 1.3 and 1.4 and the key findings are set out below:

- **Short-term effect on equity investment (Model 1 to 3):** The analyses did not indicate that the first investments placed by ECF backed VC funds increased the level of equity investment attracted by firms. This is consistent with the survey evidence that many firms were confident they would have raised funding from other sources in the absence of the programme. The most robust model (Model 3) suggested that ECF backed VC funds had a negative short-term effect on equity investment. This could potentially be a consequence of the constraints on deal size associated with the ECFs. However, it may also be an artefact of the data, as PitchBook records deals when they are disclosed, while the British Business Bank monitoring records the date the deal was closed. If disclosure lags the finalisation of the deal, then this could contribute to the estimated negative effect.
- **On-going effects on equity investment (Models 4 to 8):** However, all models suggested that the investments made by ECF backed VC funds led to a longer-term increase in the level of equity investment attracted by firms by the end of 2019. This indicates that the ECF VC funds were better placed to support the on-going development of the firm than the possible alternatives. This could be related to the effects of the programme in enabling ECF backed VC funds to close at higher values or raise successor funds, putting them in a better position to support follow-on funding rounds. Supporting new entrants to the VC markets may also improve the diversity of fund managers, enabling more effective matching of firms with the capabilities, skills and networks of investors. The effect on equity investment raised by the end of 2019 was estimated at between £1.1m and £4.7m. Models controlling for improving fundraising conditions over the period (Models 6 and 8) were considered the most robust.

**Table B.2: Estimated impacts on equity investment raised by firms**

Model	Firm level fixed effects	Time fixed effects	Estimated average effect on equity investment (£m)	Standard Error	Number of observations
<b>Short-term impacts: effect in the year of the first ECF investment (all firms)</b>					
Model 1	No	No	-0.37	0.155	4,268
Model 2	Yes	No	-0.41	0.172	4,268
Model 3	Yes	Yes	-0.135**	0.000093	4,268
<b>On-going impacts: effects on cumulative equity investment by the end of 2019 (all firms)</b>					
Model 4	No	No	4.00***	0.000	4,268



Model 5	Yes	No	3.86***	0.000	4,268
Model 6	Yes	Yes	1.13***	0.000	4,268
<b>On-going impacts: effects on cumulative equity investment by the end of 2019 (firms tracked by PitchBook)</b>					
Model 7	Yes	No	4.70***	0.000	3,377
Model 8	Yes	Yes	1.16***	0.000	3,377

Source: Ipsos MORI user defined search of PitchBook. Results may differ to PitchBook's own published figures, \*, \*\*, \*\*\* show whether the estimated coefficient was significant at the 90, 95, and 99% level of confidence respectively.

### Effects on turnover, employment, and productivity

Finally, table B.3 shows the estimated effect of investments placed by ECF backed VC funds on turnover, employment and productivity (expressed as turnover per worker).

- **Employment:** The analyses suggested that each investment placed by ECF backed VC funds increased the number of workers employed by the firm by 23 percent by March 2018 (this result was robust to unobserved time specific shocks as well as trends at the sector and regional level).
- **Effect on turnover:** However, the results did not suggest that the investments made by ECF funds had an impact on the turnover of firms benefitting from investment by March 2018. This is not consistent with the survey data which indicated that the turnover of firms grew more rapidly than employment by the end of 2019. As there are also lags associated with the BSD data, it is likely that recent turnover growth was not yet visible in the data. However, the issue merits further investigation in the final evaluation.
- **Effect on productivity:** The findings are consistent with a scenario in which the investments made by ECF funds are effective in leveraging additional resources into early-stage companies. It appears that these resources were initially focused on evolving the companies' business model (e.g. through additional investment in product development). This will reduce productivity in the short term. The econometric analysis supports this hypothesis and indicated that each ECF investment led to a reduction in turnover per worker of 47 percent in the short term. If effects on turnover lag effects on employment (as is considered likely), then a reversal of this pattern would be expected in the medium term.

**Table B.3: Estimated impact of ECF investment on turnover, employment and productivity**

Model	Turnover	Employment	Turnover per worker
<b>On-going impacts: effect on cumulative turnover / employment / turnover per worker by the end of 2018</b>			
Model 1	-0.244*	0.231***	-0.475***
Standard Error	0.059	0.000167	0.000101
Time and firm level fixed effects	Yes	Yes	Yes



Observations	1,320	1,320	1,320
<b>On-going impacts: effect on cumulative turnover / employment / turnover per worker by the end of 2018 controlling for sector and time trends</b>			
Model 2	-0.176	0.235***	-0.411***
Standard Error	0.160	0.0000791	0.000638
Time and firm level fixed effects	Yes	Yes	Yes
Sector and time trends	Yes	Yes	Yes
Observations	1,320	1,320	1,320

Source: Ipsos MORI. \*, \*\*, \*\*\* show whether the estimated coefficient was significant at the 90, 95, and 99% level of confidence respectively.

## Derivation of gross employment, turnover, and GVA outcomes

### Employment

Estimates of the total employment outcomes of the ECF programme were estimated by multiplying the number of firms receiving investment in each vintage year (derived from monitoring data) by average annual employment growth (derived from the survey) and the number of years invested. These calculations are provided in the following table.

**Table B.4: Gross employment outcomes**

Vintage year	No. of firms receiving investment	Annual growth in employment	Years invested	Jobs created by end of 2019	Jobs created by end of 2017
2011	18	6.94	8	1,000	750
2012	12	6.94	7	583	417
2013	18	6.94	6	750	500
2014	33	6.94	5	1,146	687
2015	40	6.94	4	1,111	556
2016	68	6.94	3	1,417	472
2017	100	6.94	2	1,389	0
2018	82	6.94	1	569	0
2019	17	6.94	0	0	0
<b>Total</b>	<b>388</b>	<b>-</b>	<b>-</b>	<b>7,965</b>	<b>3,382</b>

Source: Ipsos MORI analysis. Figures reported in section 6 are rounded to the nearest 10.

### Turnover

Estimates of the turnover growth of firms supported by the ECF programme in each year following the investment were estimated by multiplying the number of firms receiving investment in each vintage year

(derived from monitoring data) by average annual turnover growth (£0.7m, derived from the survey) and the number of years elapsing since the investment was made. These annual impacts were summed to estimate cumulative turnover growth between 2011 and 2019. These calculations are provided in the following table.

**Table B.5: Gross Turnover growth (£m)**

Vintage year	No. of firms receiving investment	Annual turnover growth (£m)	2011	2012	2013	2014	2015	2016	2017	2018	2019	Cum. Growth
2011	18	0.73	0	13.2	26.4	39.6	52.7	65.9	79.1	92.3	105.5	474.6
2012	12	0.73	0	0.0	8.8	17.6	26.4	35.2	43.9	52.7	61.5	246.1
2013	18	0.73	0	0.0	0.0	13.2	26.4	39.6	52.7	65.9	79.1	276.9
2014	33	0.73	0	0.0	0.0	0.0	24.2	48.3	72.5	96.7	120.9	362.6
2015	40	0.73	0	0.0	0.0	0.0	0.0	29.3	58.6	87.9	117.2	293.0
2016	68	0.73	0	0.0	0.0	0.0	0.0	0.0	49.8	99.6	149.4	298.9
2017	100	0.73	0	0.0	0.0	0.0	0.0	0.0	0.0	73.2	146.5	219.7
2018	82	0.73	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	60.1	60.1
2019	17	0.73	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Total</b>	<b>388</b>		<b>0.0</b>	<b>13.2</b>	<b>35.2</b>	<b>70.3</b>	<b>129.6</b>	<b>218.3</b>	<b>356.7</b>	<b>568.4</b>	<b>840.2</b>	<b>2231.9</b>

Source: Ipsos MORI analysis. Figures reported in section 6 are rounded to the nearest 10.

## GVA

Estimates of the turnover growth of firms supported by the ECF programme in each year following the investment were estimated by multiplying the number of firms receiving investment in each vintage year (derived from monitoring data) by average GVA growth (£0.2m, derived from the survey) and the number of years elapsing since the investment was made. These annual impacts were summed to estimate cumulative GVA growth between 2011 and 2019. These calculations are provided in the following table.

**Table B.6: Gross GVA growth (£m)**

Vintage year	No. of firms receiving investment	Annual GVA growth (£m)	2011	2012	2013	2014	2015	2016	2017	2018	2019	Cum. Growth
2011	18	0.24	0.0	4.3	8.6	12.8	17.1	21.4	25.7	29.9	34.2	154.0
2012	12	0.24	0.0	0.0	2.9	5.7	8.6	11.4	14.3	17.1	20.0	79.8
2013	18	0.24	0.0	0.0	0.0	4.3	8.6	12.8	17.1	21.4	25.7	89.8
2014	33	0.24	0.0	0.0	0.0	0.0	7.8	15.7	23.5	31.4	39.2	117.6
2015	40	0.24	0.0	0.0	0.0	0.0	0.0	9.5	19.0	28.5	38.0	95.1
2016	68	0.24	0.0	0.0	0.0	0.0	0.0	0.0	16.2	32.3	48.5	97.0
2017	100	0.24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.8	47.5	71.3
2018	82	0.24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.5	19.5
2019	17	0.24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Total</b>	<b>388</b>		<b>0.0</b>	<b>4.3</b>	<b>11.4</b>	<b>22.8</b>	<b>42.1</b>	<b>70.8</b>	<b>115.7</b>	<b>184.4</b>	<b>272.6</b>	<b>724.1</b>

Source: Ipsos MORI analysis. Figures reported in section 6 are rounded to the nearest 10.

## GVA from productivity gains

Estimates of the GVA gain associated with productivity gains were derived with the following steps:

- **GVA per worker:** The survey results implied that GVA per worker rose from an average of £5,959 at the time of the investment to £34,017.

- **GVA due to productivity gains:** The average post-investment increase in GVA was estimated by multiplying the number of workers employed by the firm prior to receiving investment from ECFs by the change in GVA per worker at the level of individual respondents. The average overall post-investment increase in GVA due to productivity gains was estimated at £185,040 (i.e. per firm receiving investment).
- **Share of overall GVA growth due to productivity gains:** The average post-investment increase in overall GVA was estimated at £1.03m<sup>40</sup>. This implies that the share of overall GVA growth driven by productivity gains was 18 percent.
- **Overall GVA due to productivity gains:** This result was applied to overall estimated GVA growth (£724m) to reach an estimate of the overall GVA growth due to productivity gains (£130m).

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## Impacts on VC investment levels

The first set of analyses explored the net effect of the investments placed by ECF funds including considering how far this crowded out other investors. These analyses examined the relationship between investments placed by ECF backed VC funds on overall levels of VC investment using aggregated data at the sector and regional level.

### Data

The analysis of market impacts was implemented using data on overall VC activity taken from the PitchBook data platform. The PitchBook data platforms compiles details of disclosed equity investments in companies and includes details of (a) the region in which the firm receiving the investment is located, (b) the sector in which it operates<sup>41</sup>, (c) the value of the investment placed (if disclosed).

Annual data on the total value of VC investment in each 'sector-region' pair between 2008 and 2019 was extracted from the platform (with investments assigned to regions based on the headquarter location of the firm). This gave a panel dataset of 1008 observations - 12 observations for each 'sector region' pair (12 UK regions (including the Devolved Administrations) and 7 sectors).

Information on the location and timing of investments made by ECFs was taken from British Business Bank monitoring information. British Business Bank monitoring information also assigns deals to locations based on the headquarter location of the firm.

### Econometric Model

For the purposes of these analyses, a credible assessment of quantitative impact ideally requires a counterfactual market that did not benefit from ECFs. Two ways of constructing a counterfactual were considered:

- **Geographical areas not benefitting from ECFs:** In principle, comparisons could be made between areas that were eligible and ineligible for ECF investment. However, no geographical constraints were set in the mandates agreed and underlying VC funds were free to invest anywhere in the UK. While there were some regions that did not benefit from ECF (e.g. Northern Ireland and Yorkshire and Humber), it would be reasonable to assume that this reflected underlying regional characteristics constraining VC investment - such as the supply of investable

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<sup>40</sup> This represents the overall growth in annual GVA, rather than the annual growth in annual GVA.

<sup>41</sup> Firms are allocated to one of seven primary industries: Business Products and Services, Consumer Products and Services, Energy, Financial Services, Healthcare, Information Technology and Materials and Resources.

propositions or relatively high search costs. As such, basic comparisons between those regions that did and did not receive ECF investment would likely overstate the effect of public intervention.

- **Sectors not benefitting from ECFs:** Ineligible sectors (e.g. Financial Services) could offer comparison markets against which the effects of ECFs could be assessed. However, there would again be concerns that those sectors differed in systematic ways from those that did benefit and could be expected to attract similar investment than those that did regardless of the intervention.

To counter these difficulties, a dose-response approach - exploiting regional, sectoral and temporal variation in the investments placed by ECF backed VC funds – was used to identify the financial market impacts of the programme as follows:

$$y_{ijt} = \alpha + \beta ECF_{ijt} + \alpha^{ij} + \alpha^t + \alpha^{jt} + \varepsilon_t$$

This model relates the overall level of VC activity (number of VC investments and total level VC investment) in sector  $i$ , region  $j$ , and period  $t$  to the number of ECF backed investments in the same sector/region pair in the same period ( $ECF_{ijt}$ ). The effect of investments made by ECF backed VC funds is captured by the parameter  $\beta$ .

This model will overstate the impacts of ECF if those sectors and regions attracting the highest levels of ECF investment are also those that were likely to attract VC investment anyway. As VC funds operate on a commercial basis this seems a reasonable expectation, and evidence from monitoring information suggested that the majority of investments were placed with firms located in London and the wider South East (regions which have historically attracted the majority of equity finance in the UK). Several steps were taken to mitigate the risk of biased results:

- Regions and sectors that did not attract any funding through ECF can be expected to differ in systematic ways to those that did. These regions and sectors were excluded from the analysis (the Materials and Resources and Energy sectors, and the Yorkshire and Humber and Northern Ireland regions). This reduced the dataset to 600 observations for 50 sector-region pairs (10 regions and 5 sectors).
- Allowances were made for unobserved differences between sector-region pairs. This was achieved by estimating the model with fixed effects ( $\alpha^{ij}$ ).
- Allowances were also made for unobserved time specific shocks affecting all regions and sectors ( $\alpha^t$ ), capturing the effects of major events such as the result of the Referendum on EU Membership.
- Additional robustness checks were undertaken by implementing the modelling to account for unobserved regional trends, and by estimating the models excluding London (which accounted for a dominating share of both overall VC investment and deals placed by ECFs).

The dependent variable was expressed using natural logarithms (so the estimated impacts capture the percentage effect of each ECF investment on overall levels of VC investment). Models were implemented using OLS.

## Findings

The findings of the analysis are set out in the following table. The models indicated:

- Each investment made by ECF backed VC funds in a sector and region increased overall VC investment in that sector and region by 6.0 to 13.2 percent in the same year<sup>42</sup> (Models 1 and 2). The more robust result (Model 2) was at the lower end of this range.
- Model 2 was robust to unobserved features of sectors and regions that do not change with time, and time-specific shocks affecting all regions and sectors. However, the findings were not robust to the inclusion of unobserved trends at the regional level (Model 3) and should be treated with a degree of caution.
- This was explored further by re-estimating the models excluding London from the sample (owing to its dominating effect on the dependent and independent variables). These models suggested that each ECF investment increased overall VC investment by between 10.4 and 39.7 percent (again, with more robust findings at the lower end of this range). These findings indicate that while investments placed in companies outside of London had a positive effect on levels of VC investment, crowding-out may have been more significant in the capital (there were insufficient observations to estimate the effect of the programme in London alone).
- Given these findings, the results of Model 2 are taken as an approximation of the average impact of the programme. Applying this result to the median level of annual VC investment in sector-region 'pairs' covered by the analysis (£10.8m) suggests that each investment made by ECF backed VC funds increased overall VC investment by £0.6.
- Aggregating this result across the 388 investments made gives an estimate of the net impact of the ECF programme on VC investment of £251m.

**Table B.1: Estimated net impact of investments placed by ECF backed VC funds on equity investment at the sector and regional level**

Model	Fixed effects for the sector/region	Time fixed effects	Time trends at the regional level	% Effect on equity investment in the sector and region (£m)	Standard error	Number of observations
<i>Including London</i>						
Model 1	Yes	No	No	0.132**	0.538	600
Model 2	Yes	Yes	No	0.060**	0.252	600
Model 3	Yes	No	Yes	0.006	0.015	600
<i>Excluding London</i>						
Model 4	Yes	No	No	0.397***	0.057	540
Model 5	Yes	Yes	No	0.108*	0.061	540
Model 6	Yes	No	Yes	0.104*	0.058	540

Source: British Business Bank monitoring data and Ipsos MORI user defined search of PitchBook. Results may differ to PitchBook's own published figures. \*, \*\*, \*\*\* indicates whether the estimated effect was significant at the 90, 95 and 99 percent level of confidence respectively.

<sup>42</sup> Models with lagged effects were also explored but there was no evidence of additional impacts beyond the year of the investment.



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