



Year 2: Future Fund Early Assessment Report - Update

October 2023

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1. Executive summary

RSM UK Consulting LLP has been commissioned by the British Business Bank (the Bank) to undertake the three-year impact evaluation of the Future Fund (a UK Government scheme that was set up to support potentially viable UK-based companies that were facing difficulties in raising equity finance due to the Coronavirus (Covid-19) pandemic). This Year 2 report is the second of three reports to be covered in the evaluation of the Future Fund, with the first report having been published in November 2022.

To recap, from the Year 1 findings, the report used primary research tools to derive early indicative signals on the impact of the Future Fund finance.

- Pandemic uncertainty reduced the supply of equity finance for early-stage companies.
- The speed with which finance was supplied was seen as key in supporting companies.
- Companies and lead investors considered the application process and features of the Future Fund to be clear.
- Research and development (R&D) was a key focus for funded firms, though broad investment trends are less clear.
- Early evidence suggests the programme may have met its short-term objectives.

In this Year 2 early assessment update, the purpose was to provide an update on the portfolio health while also developing the analytical foundations for the Year 3 interim evaluation. The performance of the portfolio group was compared with a matched counterfactual group. The relative performance of the portfolio is based on the matched sample of 504 portfolio and 235 counterfactual firms. Data analysis across fundraisings, business valuations, business survival, turnover, employment, inclusion metrics and subgroup analysis were some of the main key performance indicators (KPIs) that were analysed for outturns in 2021 (partial year post financing) and 2022. The main key findings were:

- There is a mixed picture across indicators over 2021 and 2022 - suggesting it is too early to measure the impact of Future Fund investment, to be explored further in the Year 3 report.

- Portfolio companies showed higher fundraising growth over 2021 and 2022, with total fundraisings increasing by 97% compared to 54% for the counterfactual, though momentum was lost in 2022.
- The share of portfolio firms that raised funds over 2021 and 2022 was higher than for the counterfactual (43% and 47% respectively for the portfolio group, compared to 36% and 33% respectively for the counterfactual).
- One measure of the growth prospects of the portfolio group in 2022 signalled improved longer-term growth expectations compared to the counterfactual, but the picture was mixed when looking at other valuation measures.
- The turnover growth of the portfolio group across 2021 and 2022 was lower than the counterfactual (16% and 34% respectively), but funded firms may be prioritising R&D.
- Higher portfolio employment growth in 2022 could be seen as an encouraging longer run indicator.
- Slightly better survival prospects for counterfactual firms, with 97% of active firms compared to 92% for the portfolio, but this result is only weakly significant.

From the initial matched data analysis assessment, four hypotheses were explored through additional data analysis and interviews with six Future Fund portfolio companies:

1. The Convertible Loan Agreement (CLA) structure may be impacting on portfolio investment – there was insufficient evidence to support this from the limited number of interviews undertaken and generally positive sentiment expressed towards the CLA structure.
2. Future Fund investment may have affected the timing of follow on fundraising – there was insufficient evidence to support this hypothesis.
3. Portfolio firms were more R&D focused compared to the counterfactual, so funding supported salary payments and IP development. There were some signals of this through analysis of additional data on fundraising for R&D and self-reported evidence in all six interviews, but the evidence is not yet conclusive.
4. Portfolio performance could be driven by overperformers and not captured in modelling – to be investigated further in Year 3 report.

In the upcoming Year 3 report, a mixed methods approach will be adopted to further test these hypotheses, including the impact of outliers, to provide an update on the economic impacts of the scheme. It must be noted that, at this stage and for the Year 3 report, impacts for firms may still be feeding through and the results from the impact assessment may be still too early.

1.1 This study

The Future Fund is a UK Government scheme that was set up to support potentially viable UK-based companies that were facing difficulties in raising equity finance due to the Covid-19 pandemic. It was launched in May 2020 and closed to new applications at the end of January 2021. Companies could raise between £125k to £5m from the scheme, subject to raising at least equal matched funding from private investors with the finance structured as a CLA.¹ The scheme provided £1.14bn of funding to 1,190 companies.

RSM UK Consulting has been commissioned by the Bank to undertake the impact evaluation of the Future Fund. This Year 2 report covers work undertaken between November 2022 to March 2023 and focuses on early and emerging longer-term impacts from the intervention. The Year 2 evaluation drew on two data outturns in 2021 and 2022. 2021 is a partial year given some firms were still receiving finance from the Future Fund in early 2021. It must be noted that impacts realised by firms in early-stage equity portfolios are likely to be experienced at least three² years post funding.

The Year 2 study required identifying a counterfactual group of firms, drawn from the Beauhurst database³, and the use of a propensity score matching (PSM) technique for a like-for-like comparison of business performance.⁴ This technique controls for observed factors to isolate the Future Fund impact on KPIs⁵ including fundraising, turnover,

¹ <https://www.british-business-bank.co.uk/ourpartners/coronavirus-business-interruption-loan-schemes/future-fund/>

² <https://www.angellist.com/blog/what-happens-after-you-make-a-seed-investment> Findings from this report show that after 40 months, the likelihood of exiting outweighs mark-up, signalling impacts of seed investment having fed through to business performance.

³ Beauhurst is a UK based database and research platform that tracks high-growth private companies and the organisations that fund them.

⁴ Matching is a quasi-experimental method that involves drawing a comparison group(s) that are like the treatment group based on key characteristics to estimate the causal effect of an intervention or treatment. The matching technique controls for many factors such as region, sector, furlough scheme participation, credit rating or buzzwords for example (full list in Annex F). This makes the comparisons more robust as we compare like-for-like firms.

⁵ The KPIs investigated include turnover, gross value added (GVA), employment, average/ total fundraisings, Companies House status, current stage of evolution, inclusivity (gender), exports and EBITDA. KPIs such as turnover and employment signal business performance similarly with fundraisings and valuations albeit, the latter two could be

employment and business survival. This allows the examination of the extent to which the risk of business closures was reduced, along with longer-term indicators on business performance like employment and turnover. The full list of objectives and KPIs used to measure them is in Section 2 and Annex E.

The analysis uses secondary data on the KPIs selected for the purposes of the evaluation, in contrast to the Year 1 results which were based upon self-reported surveys. The Year 2 research also builds the technical foundations for the Year 3 report. At the time of conducting the research, less than two years had passed since the programme completed all funding activities. Therefore, some of the impacts are still feeding through to business performance. The full programme impact is likely to emerge in subsequent years, particularly for longer-term indicators like turnover.⁶ In this report statistical significance was tested on single data points. Where data was provided on more than one data point, significance testing was not conducted. Formal econometric modelling will be conducted in Year 3 which will require significance testing of impact coefficients.

Impacts are unlikely to have fully fed through to the Future Fund portfolio also due to the stage of development of funded firms (start-up compared to scale-ups). It is expected a clearer picture of business performance will emerge over a three-to-eight-year horizon⁷ post intervention i.e., 2024 to 2029 for the Future Fund portfolio. This should be taken into consideration when reviewing the results at these periods post-Future Fund finance. In addition, the modelling approach used focuses on representative distributions of the population, and therefore will exclude some exceptional growth firms (outliers to the sample) that in the future will drive growth and innovation within the UK economy.

Case study interviews with six funded firms complement the analysis. Some of the case studies were selected based on their performance being like the average fundraising performance of the portfolio or those firms that had a high number of patents (a proxy for higher growth potential and innovation) while others were randomly selected. These case studies have been included as extracts in callout boxes throughout the report.

considered nearer term business performance KPIs. Data availability played a part in the selection of the variables which could be used to view the firms through a different lens i.e., inclusivity performance or performance in the international trade environment i.e., export growth rates. All KPIs were assessed relatively to a counterfactual.

⁶ Longer-term KPI's such as turnover are based on data up to 2022, almost two years after the Future Fund was closed to new applicants in January 2021. The impact of the Future Fund is likely still feeding through to these indicators.

⁷ <https://about.crunchbase.com/blog/startup-exit/> - Future Fund portfolio companies are dominated by sectors that usually R&D intensive and will likely take longer (5 to 8 years) to exit and subsequently show impacts from the Future Fund finance.

1.2 Portfolio companies had good comparative fundraising in 2021, though momentum was lost in 2022

The cumulative picture is positive as the portfolio had a higher growth in total fundraising than the counterfactual over 2021 and 2022, growing by 97% compared to 54% for the counterfactual.

In 2021, the portfolio firms' total funding growth was higher than the counterfactual group and the wider Beahurst SME aggregate. Indexing total fundraisings (2020 = 100), portfolio firms grew by approximately 150%, compared to 100% and 48% growth for the wider Beahurst SME aggregate⁸ and matched counterfactual respectively. Average funding across the portfolio firms versus the counterfactual mirrored the total trend. This analysis builds on the Year 1 report, which had pointed to additional funding for portfolio firms.

However, 2022 saw a notable pullback in portfolio funding relative to the counterfactual. Total fundraising growth contracted by 22%, compared to growth⁹ of 4% for the counterfactual group and 7% for the wider Beahurst aggregate. The average funding trend for portfolio firms was similar, contracting by 14% for the portfolio compared to 14% growth for the counterfactual.

The fundraising performance of the matched sample mirrors the UK's post-pandemic economic normalisation, including the recovery of SME funding in 2021. However, the Russia-Ukraine war and resulting inflation shock and subsequent monetary policy action (the Bank of England raising Bank Rate) have contributed to a tighter funding situation and weaker growth expectations.¹⁰ The wider market conditions have not been found to impact either group differently.

Based on these initial results, two hypotheses have been examined to provide insights into the portfolio firms' follow-on fundraising performance in 2021 and 2022. Portfolio firms may have been impacted by the CLAs not appealing to all follow-on investors within this tighter environment. However, across most of the case studies the CLA structure was not considered as a barrier for follow-on investment. Two firms reported they had converted to

⁸ This higher performance may be partially explained by the difference in types of firms that were not controlled.

⁹ In levels, total fundraisings for the portfolio firms were just under £1.3bn compared to £0.7bn and £17.5bn for the counterfactual and Beahurst aggregate SMEs in 2022 respectively (note the sample size for the counterfactual firms is 235, compared to 504 for the portfolio group).

¹⁰ [The Office for Budget Responsibility in March 2023 forecast UK real GDP to fall 0.2% in 2023](#) [Economic and fiscal outlook - March 2023 \(obr.uk\)](#)

equity within a few days after drawing down finance, so the structure of the CLA played no role in follow-on funding discussions with investors as it was seen as an equity stake in the firms share holdings. Negotiations with investors around follow-on investment for portfolio firms that had converted were more focused on the government's future intentions with the portfolio holding rather than the structure of the CLA.

Another hypothesis investigated was the extent to which the lower funding performance in 2022 could be attributable to structural differences in funding cycles, with timing and amounts raised differing between Future Fund recipients and counterfactual companies. The analysis did not produce results to evidence this and case study interviewees reported that the Future Fund had limited to no evidenced impact in terms of funding cycles. Some firms noted that the Future Fund finance acted as a bridging mechanism, rather than playing a role in follow-on fundraising activity.

1.3 Portfolio valuation to sales ratio in 2022 signals improved longer-term growth expectations but post-money valuation shows a mixed picture

Business valuations can provide insight into the expected financial health and growth prospects of firms over future years.¹¹ Valuations are determined by market capitalisation, the number of shares multiplied by price paid per share, known as 'post-money valuation'.¹² Beauhurst data shows that the matched portfolio firm's business valuation growth in 2021 was higher at 37% compared to 13% for the counterfactual. This slowed down to 14% in 2022, while counterfactual valuations rose by 64%. The trend is akin to that in fundraising growth (with funding flowing to salary payments and intellectual property (IP) generation, linked to positive investor sentiment in future valuations). The median compound annual growth rate (CAGR¹³) for 2021 to 2022 shows a similar picture, although at a smaller discrepancy at 25% valuations growth for the portfolio compared to 36% for the counterfactual.

¹¹ However, a limitation of aggregated valuations and fundraisings data is that firm performance maybe skewed by a few outliers although the matching approach has removed these to an extent.

¹² For an explanation of post-money valuation and the associated definition of this KPI, see section 4.4

¹³ The CAGR measures the average annualised growth of a variable (say investment) over a stated period of time. The CAGRs in this report relate to the KPI performance compared to 2020. It is calculated by dividing the final KPI value by the base year value, all to the power of 1 divide by the number of years between the initial and final year value. This figure minus 1 provides the CAGR.

Using the post-money valuation data, the valuation to sales ratio¹⁴ (which perhaps provides a more focused measure of perceived growth expectations) shows in 2021 that the growth for portfolio firms was significantly lower (22%) compared to the counterfactual (117%). However, in contrast to the fundraising trend, 2022 saw a higher portfolio growth rate (-15%) compared to the counterfactual group (-38%). The CAGR for 2021 and 2022 showed the counterfactual experienced higher growth at 16% compared to 2% for the portfolio. The portfolio performance picture is mixed when considering the valuations KPIs.

1.4 Relatively lower portfolio turnover growth in 2021 and 2022 - funded firms may be prioritising R&D, with stronger growth in funding used in R&D related activities

The matched analysis shows lower relative revenue growth for the portfolio firms compared to the counterfactual – 16% for the portfolio group compared to 34% for the counterfactual over 2021 and 2022. The median annual revenue growth for portfolio firms in 2022 was just under 10% compared to growth of slightly below 30% for the counterfactual. For 2021, the figures were 21% and 44% for the portfolio and counterfactual groups respectively. Both groups experienced lower growth compared to the self-reported Year 1 survey response estimates, where portfolio firms expected an average growth rate of 84% over the forecast horizon of 2022 – 2023. While this lower growth across both groups versus two years ago can be partially explained by the tightening of the macroeconomic environment, the growth of the portfolio firms was lower relative to the matched counterfactual in both 2022 and 2021. Alternatively, the strong levels of fundraising noted in section 1.2 may have resulted in weaker revenue growth in subsequent time periods due a focus on fundraising and R&D. This is in addition to the fact that it is likely too early for impacts to have fed through to turnover growth.

Given the relatively early stage¹⁵ of development of the portfolio and counterfactual groups (95% are at Growth, Seed or Venture stage)¹⁶, there is a higher likelihood that they will be

¹⁴ The value to sales ratio is a financial ratio that measures the valuation of a company relative to its annual revenue. This ratio is commonly used by investors and analysts to evaluate the relative value of a company's stock compared to its sales performance and can be useful for identifying potential investment opportunities.

¹⁵ Early stage is defined as being either Seed, Venture or Growth by the Beauhurst definitions of firms. According to Beauhurst website, Seed companies are typically young with a small team and low valuation. They are seeking regulatory approval and may receive funding from grants, equity crowdfunding, and business angels. Venture companies have achieved significant traction or regulatory approval, have received millions in funding, and have a high valuation. They are likely to have received additional funding from venture capital firms. Growth companies have been established for over five years, have multiple global offices, generate significant revenues and profits, possess valuable technology or regulatory approval, and have received substantial funding from various sources.

¹⁶ 95% of the firms in both the portfolio and counterfactual groups are categorised as either Growth, Seed or Venture stage, with the remaining 5% being classified as Established.

some way off long-run steady state revenue flows. The portfolio and counterfactual groups were predominantly either micro or small firms based on full-time employment (FTE) counts (in accordance with OECD definitions)¹⁷. This means that it could still be too early for longer-term impacts to emerge on revenues, in line with the Year 1 report finding that most of the portfolio were at pre-profit or pre-revenue stage.¹⁸

It is worth considering the most-cited use of finance in the Year 1 report among funded firms. Much of the funding went into the firms that said they were focused on R&D (85% of portfolio firms sampled)¹⁹, developing new or modifying existing goods (67%) and services and expanding digital technologies (65%). The main intended use of Future Fund finance for CLA funded businesses was maintaining cash-flow followed by maintaining R&D.²⁰ Lead investors also confirmed that 72% of CLA funded firms used the investment to maintain their R&D activities. These findings from the Year 1 report suggest that the Future Fund financed innovative and growth-orientated businesses, helping them maintain their longer-term growth prospects during a time of economic disruption. The Year 3 report will further investigate whether the funded firms may have been disproportionately focused on R&D instead of commercialisation compared to the counterfactual group.

1.5 Higher portfolio employment growth in 2022 could be seen as an encouraging longer run indicator

Employment is a key metric in determining business size. The intellectual capital that high growth firms depend on is also often picked up within employment growth trends, which can be a signal for business growth and IP development in the workforce. The median CAGR performance for the portfolio group is marginally lower, at 10% compared to 13% for the counterfactual.

The portfolio experienced lower growth relative to the counterfactual in 2021, at 10% compared to 21% respectively. However, in 2022 the portfolio growth rate was higher, 9% compared to 5% for the counterfactual. The impact from the Future Fund could take time to fully flow through to employment trends and this provides a potential early signal that

¹⁷ OECD definitions are: <10 FTE is a micro enterprise, 10 to 49 FTE is a small enterprise, 50 to 249 FTE is a medium enterprise and 250+ FTE is a large enterprise.

¹⁸ Year 1 Future Fund Early Assessment Report, pp. 95.

¹⁹ These activities require intensive research and development, for example pharmaceuticals require very long clinical trials/ testing periods for new medicines which could take upwards of 10 years.

²⁰ Year 1 Future Fund Early Assessment Report, section 1.6.

funding may have flowed to R&D activity and a greater number of staff hires in 2022 to meet R&D commitments. The lag in raising funding to hiring staff also may have influenced the higher growth rate in 2022.

Overall, employment growth rates for both the portfolio and counterfactual slowed in 2022, possibly linked to uncertain economic market conditions. The inflationary environment – with rising oil, food and energy prices and tight labour market conditions – may be a temporary shock that contributed to the cooling in performance across both groups. However, it is encouraging that portfolio had higher employment growth in 2022, potentially signalling a positive longer term growth prospect.

While it is demonstrated that high-growth firms contribute disproportionately to job creation and economic growth and that firm growth can be associated with superior outcomes, some scholars strongly caution against the growth-at-all-costs viewpoint (Coad and Srhoj, 2023)²¹.

1.6 Slightly better survival prospects for counterfactual firms but this result is only weakly significant²²

For early-stage firms, survival is a particularly important metric, given the difficulty in sustaining growth and innovation. Smaller businesses can improve productivity through increased technological adoption, innovation and employment opportunities but they are particularly vulnerable to economic shocks. This is especially important for those smaller businesses that are still establishing themselves within existing or new marketplaces. A key objective of the Future Fund was to ensure this pipeline wasn't damaged or severely disrupted as these firms typically contribute disproportionately to long term UK economic prosperity.

Using a looser matching approach, which excluded variables that could have a relationship with survival, Companies House and Beauhurst data suggest marginally better survivability prospects in the counterfactual group. There is a larger proportion of active firms (97% compared to 92%) compared to the portfolio group. The Beauhurst specific “company stage of evolution” KPI signals greater maturity in the counterfactual group, suggesting the

²¹ Coad, A., & Srhoj, S. (2023). Entrepreneurial ecosystems and regional persistence of high growth firms: A 'broken clock' critique. *Research Policy*, 52(6), 104762

²² Significant at the 10% level of significance. The proportion comparison test of active firms in the two samples p-value is 0.06 (2 decimal points)

counterfactual companies may also have a somewhat lower risk profile. The approach to estimating the business survival will be reviewed in the Year 3 report.

1.7 A mixed picture emerges across some KPIs in 2021 and 2022, suggesting it is too early for impacts to have fully fed through from the Future Fund – to be investigated further in Year 3 report

Overall, a mixed picture has emerged for portfolio performance in 2021 and 2022. It is too early to measure the full impact of Future Fund investment on portfolio companies. 2021 was a strong performance year in terms of fundraisings, in contrast to 2022. While the 2022 period will have been affected by the inflation shock, it is not immediately obvious why this would have impacted the portfolio firms in a different way to counterfactual firms.

Evidence from the Year 1 has suggested that the short-term objective of a positive experience for recipients was broadly met. The Year 2 evidence, alongside Year 1, suggests that the short-term objective of an increased supply of funding was also broadly met, although a mixed picture on whether funding prospects of recipients were like the wider market. The portfolio had higher total fundraising growth compared to the counterfactual in 2022 – albeit lower relative growth in average funding in 2022. Evidence on the remainder of the medium and longer-term objectives, measured through turnover, fundraising, employment and valuations, is too early and mixed in some instances at this stage. Further detail on the assessment of progress against objectives is shown in section 2.

Detail on findings of hypotheses tested for the Year 2 research, along with areas for further exploration in the Year 3 report, are summarised below.

Fundraising performance hypotheses — 1. CLA structure impacting portfolio investment, 2. Funding cycles changing because of Future Fund investment:

- Evidence from the case studies did not support the hypotheses that the different fundraising performance could reflect the CLA structure/CLA conversions or the prospect of them, or the distortion of fundraising cycles between Future Fund recipients and counterfactual firms. At such an unprecedented time, firms were seeking whatever finance they were able to draw down to meet cashflow demands, a theme echoed across some of the firms interviewed in the Year 1 case studies. These hypotheses will need to be further tested in the Year 3 report.

- The employment and business valuations trends show lower portfolio growth in 2021 but higher growth in 2022, different to the trend in fundraisings. Employment growth, especially for early-stage firms, could signal a focus on investment in IP and R&D through employment of higher skilled labour. This supports the narrative around future growth performance given that employment trends and business valuations could provide an indication of future growth prospects.

Portfolio firms were R&D focused compared to commercialisation — 3. Funding went to salary payments and IP development:

- Funded firms may have been more focused on R&D activities, to the expense of more immediate revenues. Across most case studies the interviewees mentioned that they were “significantly” R&D focused, and, in some cases, the Future Fund allowed them to relieve the pressure of commercialisation and continue to focus on R&D. Additional investigation of Beauhurst data found portfolio firms that raised finance for R&D grew substantially in 2021 compared to counterfactual firms. The Future Fund may have supported portfolio firms to prioritise research and development efforts compared to commercialisation. This will be further explored in the Year 3 report.

Portfolio performance driven by overperformers — 4. Outlier firm performance assessment:

- The nature of this empirical work relies on statistical techniques that focus on averages and representative distributions of the population in question. However, in doing so, exceptional growth firms (outliers to the sample) – those that in the future will drive growth and innovation within the UK economy – may be disregarded from the analysis. These firms are likely to drive the overall portfolio performance. Qualitative research tools in the Year 3 report will explore the impact of the Future Fund on such exceptional growth/outlier firms as they often are drivers of traditional venture capital (VC) portfolio performance in the long run. Quantitative techniques to draw out the impact of outliers will also be explored.

2. Progress against objectives

Table 1 below provides a summary of the stated programme objectives that the Year 2 evaluation has assessed and an initial assessment of the extent to which each objective has been met at this early stage. Evidence from the Year 1 report²³ analysis accompanies the Year 2 results. The comparison is not completely consistent or aligned as the Year 1 report analysis was based on self-reported survey responses, whereas the methodology for the Year 2 report relied on secondary data sources within the modelling. For the full list of programme objectives see Annex E: Future Fund stated programme

²³ <https://www.british-business-bank.co.uk/future-fund-early-assessment-report-2022/>

Table 1: Programme objectives specific to this evaluation and early assessment of progress.

Objective	Supporting evidence (Year 1)	Supporting evidence (Year 2)	Combined Y1 and Y2 report evidence objective assessment
<p>1. Increase the supply of finance to potentially viable UK equity backed companies that would otherwise have problems raising finance, or been underfunded, due to adverse market conditions. (Short term objective)</p>	<p>Viable UK equity backed companies:</p> <ul style="list-style-type: none"> 85-94% of firms appear to be early stage, indicating growth potential. <p>Adverse market conditions:</p> <ul style="list-style-type: none"> 63% of recipients reported funding conditions were difficult to some degree in early 2020 prior to the launch of the Future Fund, supporting the rationale of the programme. <p>Finance additionality:</p> <ul style="list-style-type: none"> 62% of recipients didn't think they would have been able to raise similar funding elsewhere. Only 26% stated they could have raised similar finance in the absence of the programme – of these, some said it would have taken longer (80%) or they would have secured less finance (32%). 36% of lead investors report they would have still invested in the company in the absence of the Future Fund. 	<ul style="list-style-type: none"> The cumulative picture is positive as the portfolio had a higher growth performance than the counterfactual over 2021 and 2022, with total fundraisings growing by 97% compared to 54% for the counterfactual. In 2021 the portfolio firms had higher funding growth compared to the counterfactual firms in total and average fundraising terms. Total fundraisings growth (indexed at 2020 = 100) was approximately 150% for the portfolio compared to 48% for the matched counterfactual. Average funding growth across the portfolio firms in 2021 came to 174% compared to counterfactual firms at 68%. 	<p>At an early stage the objective appears to have been met in most cases across Year 1 and Year 2 research.</p> <p>Year 2: Short term funding objective seems to have been met, in line with Y1 report. Portfolio companies performed strongly in 2021 compared to the matched counterfactual group. This supports the early signal of additionality in funding noted in the Y1 report.</p> <p>Year 1: Some evidence of possible financial additionality based on survey results.</p>

3. Funding **reduces risk of business**

closures caused by potentially viable businesses running out of cash in the short run. (Medium term objective)

- Too early to say but initial evidence suggests almost half (48%) of CLA funded businesses said their firm would have closed or been fairly likely to close without having received Future Fund finance. Year 2 and subsequent reports will explore business closure rates between funded businesses and wider comparison group.
- According to investors, most investees (84%) intended to use the finance to maintain working capital, indicating that for most businesses, the funding was essential to their business operations, at least in the short-run, consistent with the Fund's focus.
- Of those who brought forward their fundraisings (26% of recipients), declines in cash flow was the dominant motivation (60%), highlighting the short-run cash requirement.
- Using a looser matching approach to avoid controlling for survival, 92% currently active in the matched portfolio group, compared to 97% in the counterfactual group, result is weakly significant.²⁴
- 10% of matched portfolio currently identified as "Established"²⁵ or having "Exited"²⁶ – lower than the counterfactual (22%) but signs of scale-up firms being captured by the Future Fund.
- Significantly more portfolio firms are classified as "venture" (51% compared to 33% (counterfactual)) and as "seed" (14% compared to 8% (counterfactual)), suggesting that the counterfactual firms may have simply had a lower risk profile.

Year 2: The **counterfactual sample of firms had slightly higher survivability prospects**. Higher proportion of **venture and seed-stage companies** in the portfolio group could signal a **higher risk profile**.

Year 1: **Some early evidence** that business closures could have been averted, given the underperformance against the counterfactual. However, the closure rate is less than the VC aggregate (19% divestment write-off²⁷).

²⁴ Owing to looser matching performed on the retroactive counterfactual – differences based on survivability were removed that could also be considered as proxies – current stage of evolution, Companies House status, credit rating, and total funds raised.

²⁵ From Beahurst definition of an "Established" firm: As a rough guideline: a company that has been around for 15+ years, or 5-15 years with a 3-year consecutive profit of £5m+ or turnover of £20m+. It is likely to have multiple (often worldwide) offices, be a household name, and have a lot of traction. Funding received, if any, is likely to come from corporates, private equity, banks, specialist debt funds and major international funds.

²⁶ An Exited firm is defined as: The company has done an IPO or been acquired (MBOs to be exits are not considered, i.e., reasons to stop tracking companies, but rather a cycling trigger for starting to track a company).

²⁷ <https://www.bvca.co.uk/Portals/0/Documents/Research/Industry%20Activity/BVCA-RIA-2021.pdf>

4. Funding **reduces the risk of companies' long-term prospects being damaged** due to adverse economic conditions. (Medium term objective)

- Almost three-quarters (72%) of investors indicated their investees wanted funding to maintain research and development activities. 85% of funded companies have since undertaken R&D and 67% continued to develop new or modified goods and services.
- Modelling results suggest that there may be an additional £122k impact on investment in tangible and intangible effective capital (for recipient businesses who had invested) compared to those who did not participate. This should contribute to long term prospects for these businesses.
- The compound annual growth rate of portfolio total fundraisings grew 54% compared to 38% for the counterfactual over 2020 – 2022, but lower growth for the portfolio relative to the counterfactual in 2022
- Lower turnover growth for the portfolio compared to the counterfactual over 2021-2022 (16% compared to 34%). Revenue growth slowed for both groups in 2022 – 10% for the portfolio, compared to 26% for the counterfactual. However, the impact of the Future Fund has unlikely fed through to turnover performance. Overall, it is still too early to draw conclusions on turnover performance.
- Employment growth may provide a proxy for business investment given the early-stage nature of firms drawing finance from the scheme. Portfolio firms had marginally lower growth in 2021 but higher growth in 2022. Funding had likely gone into paying salaries to ensure the development of intellectual property – a key driver of R&D.

Year 2: Turnover signals longer-term economic fortunes for these companies and it is too **early to tell as noted for objective 3, though immediate trends look negative.** Employees are a source of long-term innovation and knowledge for funded firms **and the relative trend in employment looked negative in 2021, while performance compared to the counterfactual improved in 2022.**

Portfolio companies' funding **performance in 2022 dropped below the counterfactual group. Total fundraisings growth performance for both portfolio and counterfactual groups is comparable** as of the end of 2022.

Year 1: Some early evidence that this objective is being met – both based on the survey results and the modelling work.

-
5. To help ensure the **long-term pipeline of equity-backed companies** is not damaged due to adverse economic conditions. (Long term objective)
- Too early to tell - will be reviewed in the Year 3 report by looking at companies raising follow on rounds and business growth profiles.
 - The median compound annual growth rate (CAGR) for 2021- 2022 shows 25% valuations growth for the portfolio compared to 36% for the counterfactual, with a particular slowdown for the portfolio relative to the counterfactual in 2022.
 - Valuations to sales ratios provide a more focused measure of perceived growth expectations. The CAGR for 2022 compared to 2020 showed the counterfactual experienced higher growth at 16% compared to 2% for the portfolio, with higher portfolio growth relative to the counterfactual in 2022.
 - The portfolio performance picture is mixed when considering the valuations KPIs. Valuation trends could reflect changes in investor sentiment as we near the point of maturity on the CLA for all portfolio firms. The impact of the Future Fund has unlikely fully fed through.
- Year 2:** Short-term funding success suggests that damage from Covid-19 was limited over shorter term. **More data points will be needed to confirm longer term trends.**
- Valuation (post-money) statistics provide an insight into investor perceptions of expected performance – which showed a higher portfolio growth performance **in 2021 and declined in 2022.** However, the more focused measure (valuation to sales ratio) **was higher for the portfolio in 2022. In absolute terms the counterfactual has stronger growth prospects.** Year 3 qualitative research will explore and test hypotheses for the lower portfolio performance in 2022.
- Year 1:** Not covered.
-

Source: *British Business Bank: (2021) Final programme objectives, RSMUK*

3. Introduction

This section sets out the evaluation methodology and outline of this report. The methodology is focused on secondary data sources: the Bank's Management Information (MI) data²⁸, the Inter-Departmental Business Register (IDBR)²⁹, Beauhurst³⁰ and RSM Tracker³¹. This report complements and develops the analysis undertaken for the Year 1 report, which was informed by primary data collection e.g., surveys of recipients and non-recipients of the Future Fund. This evaluation has also developed the data foundations required for the Year 3 report.

The KPIs were selected to provide an assessment of four of the seven objectives as detailed in Table 1. Fundraisings and business valuations, aligned with the Year 1 findings, provide signals for the short/ medium-term objectives (1, 3, 4) whereas turnover and employment seek to give insights on the longer-term objective (5). To understand the business survivability and portfolio quality, company stage of evolution and current status were examined. It must be noted it is still early, two years post-intervention, so the insights are indicative. Impacts are unlikely to have fully fed through at this stage.

²⁸ MI refers to data collected by the British Business Bank on portfolio firms that are tracked. This data is used for validation, cross-checking, and identifying the business ID of portfolio firms for sourcing information from other databases. The MI data includes information such as the ethnic and gender composition of the founding and management teams, revenue, dates of various agreements and registrations, number of employees, and the CLA category and status.

²⁹ The IDBR is a comprehensive list of UK businesses, employed for statistical purposes by the government, offering a primary sampling frame for business surveys carried out by the Office for National Statistics (ONS) and other government departments. The IDBR data, sourced mainly from Value Added Tax (VAT) and Pay As You Earn (PAYE) records, includes additional information from Companies House, Dun and Bradstreet, and ONS business surveys, covering approximately 2.7 million businesses across all sectors of the economy, with data on business activities made available, such as turnover, employment, and location. Turnover data from the IDBR is related to a reference year and data is provided on a calendar year basis. IDBR employment data is updated from administrative sources (Her Majesty's Revenue & Customs (HMRC) Pay As You Earn (PAYE) and Value Added Tax (VAT) records) and Office for National Statistics (ONS) Surveys. The Business Register Employment Survey (BRES) estimates are used as the main source of employment information for detailed industry and geographical employment comparisons. The employment information requested refers to a reference date in mid-September. Data returned via BRES are taken onto the IDBR on monthly basis. See ONS [IDBR](#)

³⁰ Beauhurst is a company that tracks 80k+ high-growth businesses in the UK. They provide a comprehensive dataset of UK private companies, including information on financial performance, funding history, and team members. Beauhurst serves as a suitable platform to source a counterfactual sample of firms similar to those supported by the Future Fund. The data available on Beauhurst includes information on all UK companies, people data for reaching key decision-makers, search tools for quick company and people query, network mapping of high-growth ecosystem stakeholders. See [Our Product | Beauhurst](#)

³¹ RSM Tracker is an in-house cloud-based software system that tracks company credit scores and financial health to identify emerging risks. It contains data available from Companies House. The database has been used to draw down data on exports. See: [Tracker Core \(rsmuk.com\)](#)

The years of interest are 2021 and 2022. However, 2021 is a partial year given some of the firms were still receiving funding in early 2021. This was the latest available data cut at the time of running the matched data analysis in early 2023.

This section details the methodology used, while Sections 4, 5 and 6 detail the results of the matched data analysis on KPIs. Sections 7 and 8 report the conclusions and next steps for the evaluation.

3.1 Methodology

3.1.1 Data frame development

Firm-level data has been used to compare several KPIs between the portfolio firms and the counterfactual group. These KPIs are turnover, employment, business survival (as proxied by Companies House status), exports, fundraising and business valuation. Due to the limited availability of data, not all the KPIs have been fully covered. For example, earnings before interest, taxes, depreciation and amortisation (EBITDA) and export figures are included but with a relatively small number of observations. This report presents the results of comparisons of KPIs between portfolio and counterfactual companies.

The IDBR has been used to obtain turnover and employment data for both counterfactual and portfolio firms. The advantage of using IDBR data is that it is fairly timely, with a lag of only six months i.e., a March data snapshot will be available from late September/ early October of the same year. The turnover data in the IDBR is also more accurate as it comes directly from HMRC VAT data rather than being self-reported, so it is likely to produce higher quality results.³²

When selecting the counterfactual sample, filters were applied that contained a set of criteria designed to choose only firms with similar characteristics to the Future Fund portfolio companies. The criteria were based on eligibility requirements such as the firm's incorporation date needing to be on or before 31 December 2019, date of fundraising being from 1st April 2015 to 19th April 2020 (see Annex F for full filter details) and the KPI ranges assessed³³ from the data analysis exercise on the MI data. The prefiltering reduced the risk

³² DCMS Sectors Economic Estimates 2022: Business Demographics - [Source Data Change Summary Note](#)

³³ Using the MI provided by the Bank, ranges for KPIs on turnover, FTE, region, SIC etc. were established and applied to IDBR and Beauhurst filters, pre-matching.

of matching failure. If the PSM (described in more detail in section 3.1.2) failed, the prefiltered data still aligned companies in aggregate terms.

The IDBR and Beauhurst datasets were combined by matching them using the firms' Companies House ID numbers. Observations that existed only in either one of the two datasets were discarded.³⁴ Additionally, an indicator variable was created to differentiate between portfolio firms (assigned a value 1) and counterfactual firms (assigned a value 0) within the combined data frame. Before matching, logarithmic transformation was applied to continuous variables in the data frame.³⁵ This decreased the skewness resulting from the presence of outliers, which were commonly found in distributions of variables such as turnover and total fundraisings.

3.1.2 Matching

Following the data processing and transformation steps described above, PSM was performed to construct both the portfolio and counterfactual samples. PSM is a statistical technique to create a comparison group that matches the intervention group on all known relevant factors i.e., those which affect both participation and outcomes. In this case, the treatment is the Future Fund intervention, and the outcomes are the KPIs under consideration for example, turnover and the amount of fundraising.

First, the propensity score for each firm in the combined dataset was estimated. Propensity scores represent the likelihood of a firm receiving the Future Fund intervention given its observed characteristics. A probit regression model was used to estimate the relationship between the treatment status (a binary variable indicating the observation is either portfolio or counterfactual) and the covariates such as turnover, employee, and total fundraisings figures in 2019, company age, region, Standard Industrial Classification (SIC) code, Covid-19 status receipt of furlough support and other variables (for a full list of variables, please see Annex F). The estimated propensity scores were used to match portfolio firms with counterfactual firms that had the closest score level, ensuring a robust like-for-like

³⁴ 1517 counterfactual firms and 920 portfolio firms remained after the removal of firms that had missing data from either the IDBR and Beauhurst databases.

³⁵ Note the logarithmic transformation, which is a common statistical practice, was applied to all continuous variables (except for employee counts). This was performed because of the favourable statistical properties provided by such transformation. Specifically, it reduced the variance fluctuation across observations, which was often caused by extreme values in the dataset. Employee counts were not transformed due to their relatively stable nature and limited presence of outliers. To avoid undefined values resulting from taking the logarithm of zero, 0.01 was added to all continuous observations before the logarithmic transformation was performed.

comparison. The PSM created significant alignment across many of the key characteristics outlined in Section 4. It must be noted that despite the strong match between samples, there is always a degree of statistical error in models – as well as the risk of unobserved factors.

A range of matching specifications could be applied through the package *MatchIt* in R. These included nearest neighbour matching, calliper matching, optimal full matching, coarsened exact matching and so forth.³⁶ Matching specifications can be selected by assessing the multiple metrics used to evaluate covariate balance in matching analysis. These metrics include a balanced comparison of different matching specifications in terms of their standardised mean differences, variance ratios, empirical cumulative distributive function (CDF) statistics and visual diagnostics, among others.³⁷ Another factor to consider is the tightness of the matching, wherein specifications are chosen to ensure that post-matching sample sizes remain sufficiently large for further analysis.

Based on the metrics mentioned, calliper matching specification was selected. The same matching specification was also used in a Wilson, Kacer, and Wright (2019)³⁸ study that highlighted the importance of equity finance investment for economic development in the UK and identified persistent concerns of market failure in the provision of equity finance for high growth and technically innovative firms. The specification took into consideration the distribution of propensity scores, the sample size of both groups and covariate balance.³⁹

3.1.3 Outliers could be the key in generating value for money

The matching exercise uses standard statistical applications which likely excludes tail-end firms (highest and lowest performers of the portfolio) from the sample. Given that small, high-growth businesses are inherently riskier and more prone to volatile outcomes, some

³⁶ Nearest Neighbour Matching pairs treated units with the closest eligible control unit without optimising any criterion. Coarsened Exact Matching is a form of stratum matching. It involves creating bins for covariates and performing exact matching on the coarsened versions to balance exact and approximate matching. Optimal Full Matching assigns each treated and control unit to one subclass, minimising within-subclass distances to estimate a weighted treatment effect. Calliper matching restricts the pairing of units based on a specified distance threshold, ensuring close matches on propensity score or other covariates. For more detail, please refer to the full list of available matching specifications and algorithms in MatchIt package, see Greifer, N. (2023) *Matching Methods*

³⁷ For further information on assessing the balance and choosing the specification methods, please refer to Greifer, N. (2023) *Assessing balance*

³⁸ Wilson, N. and Kacer, M. Wright (2019). *Equity Finance and the UK Regions Understanding Regional Variations in the Supply and Demand of Equity and Growth Finance for Business*

³⁹ Greifer, N. (2023) *Assessing Balance*. For the specification of choosing the width of the calliper, see Austin, P.C., 2011. Optimal calliper widths for propensity-score matching when estimating differences in means and differences in proportions in observational studies. *Pharmaceutical statistics*, 10(2), pp.150-161.

firms are potentially clustered towards the tail end of the business distribution.⁴⁰ This means that high-performing firms, despite their significant growth potential, could be overlooked and not captured by the matching specification. The data analysis will not capture the performance of these higher-performing firms, which, in the VC space are the “unicorn” cases that would (in some cases) justify the expenses of the entire scheme. This will be further investigated in the Year 3 report.

⁴⁰ Beauhurst (2022) *Startup Fail, Scale & Exit Rates in the UK*

4. Portfolio quality and characteristics

4.1 Key findings

- UK funding conditions in the first half of 2022 continued a similar trajectory to that experienced in 2021, driven by £7.5bn of equity investment to SMEs in Q1 2022. However, the economy had entered a high-inflation environment, resulting in higher interest rates and increased borrowing costs for businesses. Accordingly, investment activity declined in Q3, in line with wider European VC market trends of a cooling period following 18 months of high activity.
- By design, characteristics across the matched portfolio and counterfactual groups strongly align in traits such as region, sector, credit worthiness, age, scheme participation (Coronavirus Job Retention Scheme, Bounce Back Loan Scheme, Coronavirus Business Interruption Loan Scheme and Recovery Loan Scheme), company size, Covid-19 status⁴¹ etc. Given similarities between the groups, economic conditions are likely to have affected the performance of both the portfolio and counterfactual groups in 2022.
- Business valuations (measured by post-money valuations) of portfolio firms showed a higher rate of growth in 2021 relative to the counterfactual but in 2022, portfolio growth was lower than the counterfactual. Expected growth is impacted by investor sentiment and uncertainties can weigh on expectations. This will be further explored in the Year 3 report.
- Valuation to sales ratios provide a more focused measure of perceived growth expectations. In 2021, portfolio firm median growth was 22% compared to 117% for the counterfactual. In 2022, portfolio firms' growth fell by 15%, while the counterfactual group experienced a contraction of 38%. The valuation to sales ratio level remains higher for the counterfactual group.

⁴¹ Beauhurst assigns "Covid-19 impact tags" to all companies within its purview based on the perceived effect of the pandemic on their operations. These tags are determined by the information collected from company websites, social media platforms, and in-house analysis of how lockdown rules, regulations, and the economic climate may have influenced each business. The tags, which can vary in number for each company, span a spectrum from temporary cessation of operations to fundamental business model changes, and once assigned, an algorithm calculates the company's current and overall COVID-19 statuses, reflecting potential impacts and the company's response over time. For detail, please visit: <https://www.beauhurst.com/>

- Portfolio firms tended to have higher representation of females across both founders and key people, with slightly better performance relative to the counterfactual. A higher share of portfolio companies has a majority female leadership (>50% identifying as female) across Directors and Founders, but the results are insignificant.

4.2 Introduction

Sections 4, 5 and 6 develop the narrative on the current state of the Future Fund portfolio by examining the trends in various KPIs linked to the programme objectives such as business survival, early indications for longer-term portfolio quality and innovation and growth prospects. It is worth noting that most portfolio firms are likely to have either repaid or converted by March 2024, as most loans will mature 36 months after companies received Future Fund finance. Conversions are subject to a minimum of 20% discount rate on top of the annual 8% rate of interest. This will likely play an important role in the final portfolio allocation.

The matching process, as defined in section 3.1.2⁴², enabled the comparison of a statistically like-for-like counterfactual group which is detailed in the characteristic comparison below. The relative performance of the portfolio is based on the matched sample with 504 and 235 portfolio and counterfactual firms, respectively.

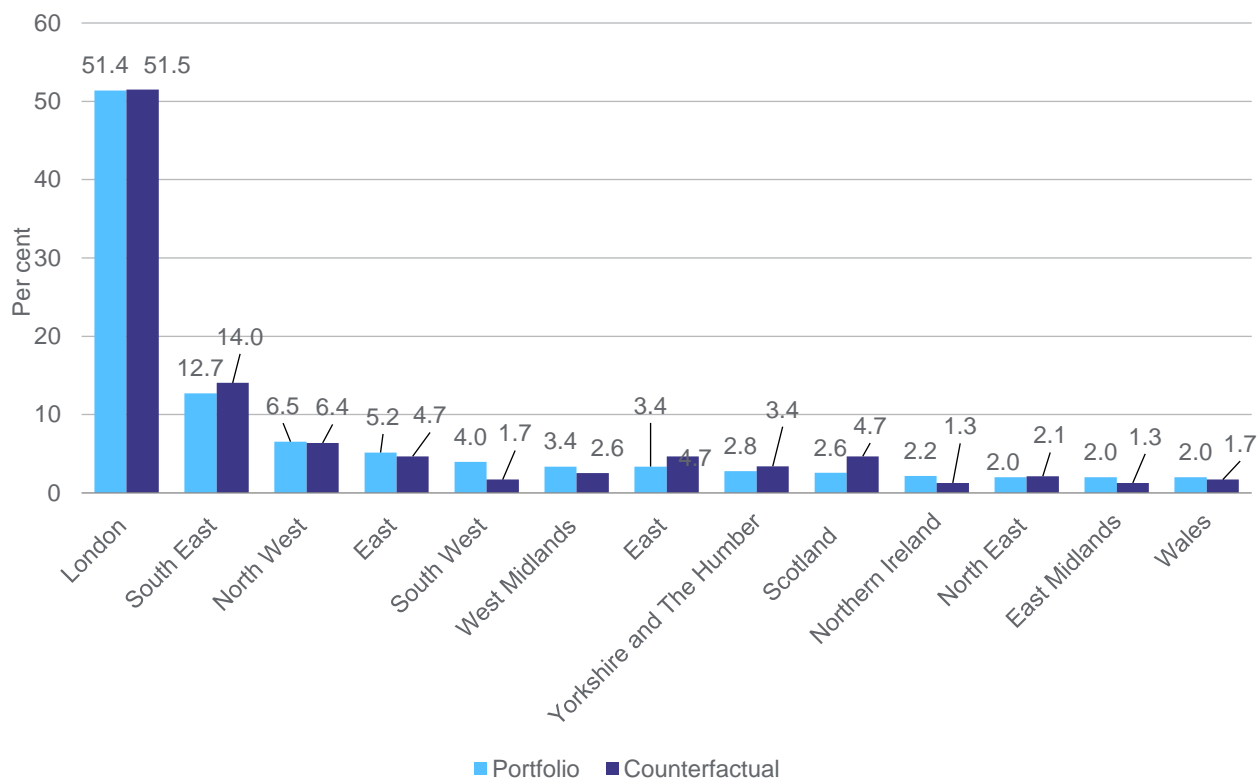
4.3 The characteristics of the matched portfolio and counterfactual group strongly align – macroeconomic environment likely to have similar impact across both groups of firms

The PSM created alignment across many of the key characteristics outlined below. It must be noted that despite the strong match between samples, there is always a degree of statistical error in models and there could be a risk of omitted variable bias. It is expected that the impact of the recent macroeconomic market adversity was experienced equally across both groups, given characteristics strongly aligned making the firms as like-for-like as possible.

⁴² Technical detail of the matching can be found in Annex F.

The firms align well in terms of their registered trading addresses (Figure 1).⁴³ Around half of companies are based in London across both groups.

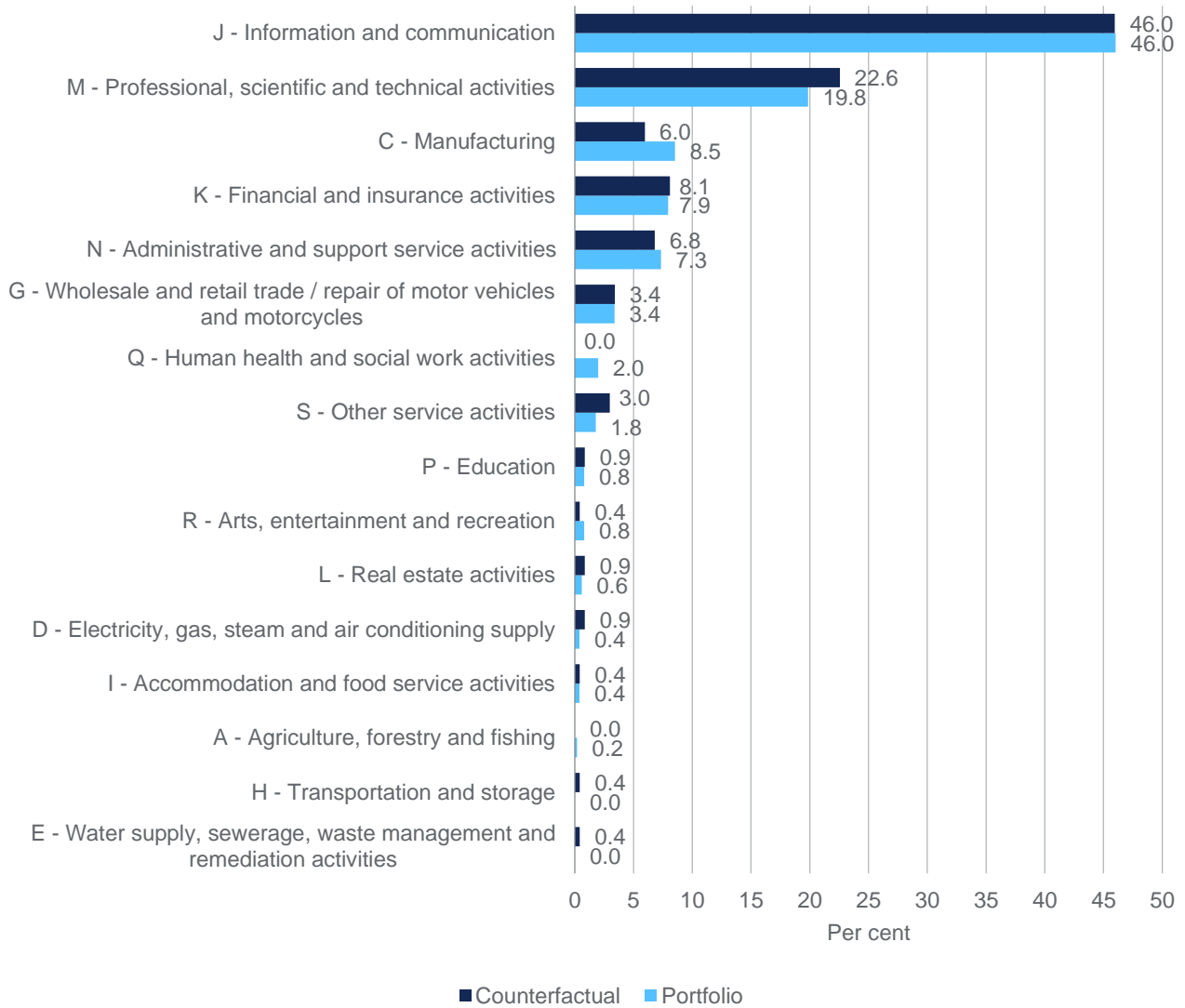
Figure 1: National and regional distribution of the matched sample



Similarly, the match performs well across sectors as illustrated by the high-level SIC comparison in Figure 2.

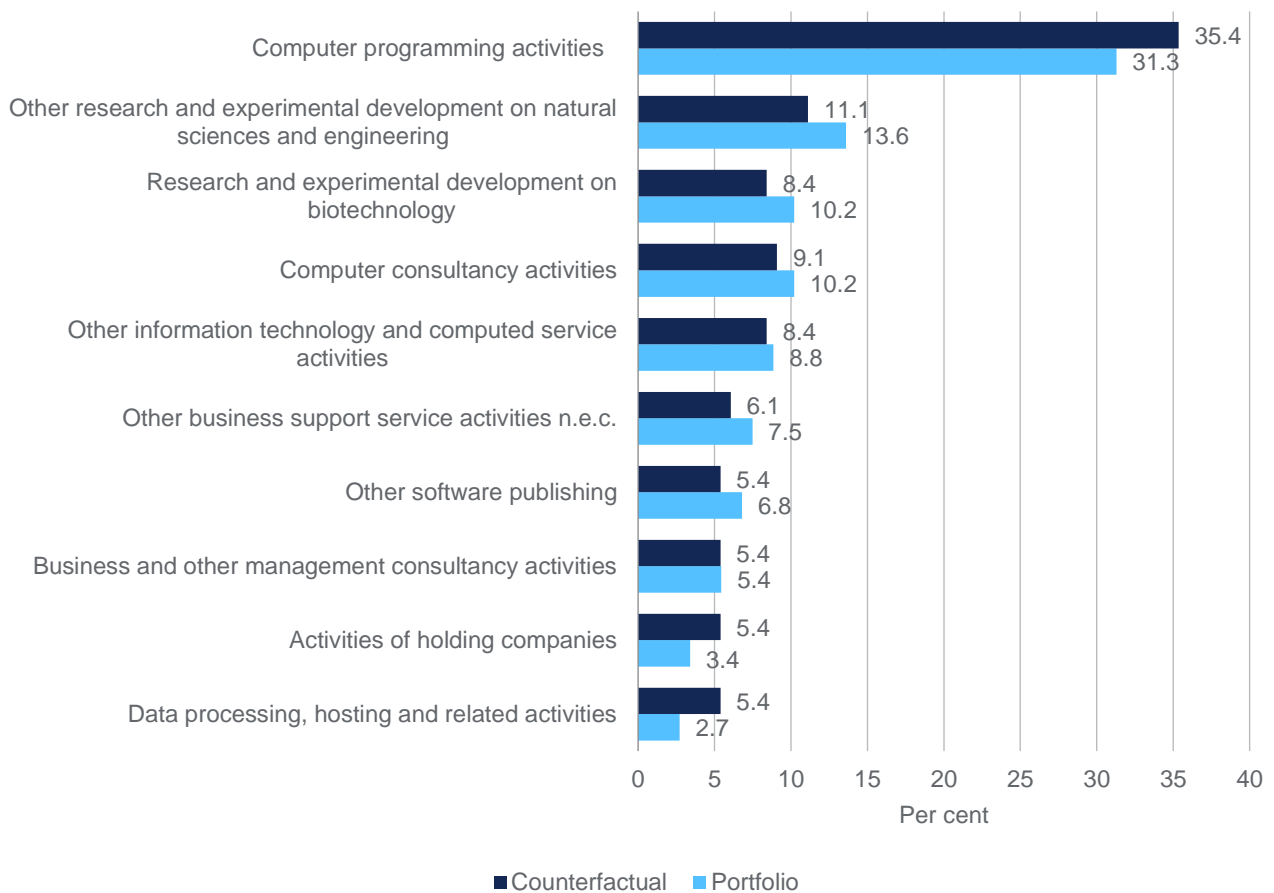
⁴³ The registered trading addresses within these regions have been used in the matching. These would be considered more appropriate given the head office and registered addresses may not necessarily represent the region where revenues are generated. This is especially true of early-stage enterprises where a home address could be used of a key person which could be in a different region to where the business carries out transactions and generates earnings.

Figure 2: SIC sectoral distribution of matched sample



As the definitions of the activity of firms can blur across the sectors, the matching was conducted at a more granular 4-digit scale (Figure 3).

Figure 3: SIC distribution of matched sample for the top 10 industries in 4-digit terms



To refine the sectoral classifications further, the Beauhurst “Buzzwords” and “Sector classifications” have been included within the matching algorithm. Given the clustering of early-stage firms around predominantly tech focused sectors, the further classification splits will capture firms at a more granular level. Again the “Buzzwords” and “Beauhurst Sectors” closely align in Figure 4 and Figure 5, albeit with marginally more variability.

Figure 4: Top 10 Beauhurst sectors for portfolio companies and counterfactual companies

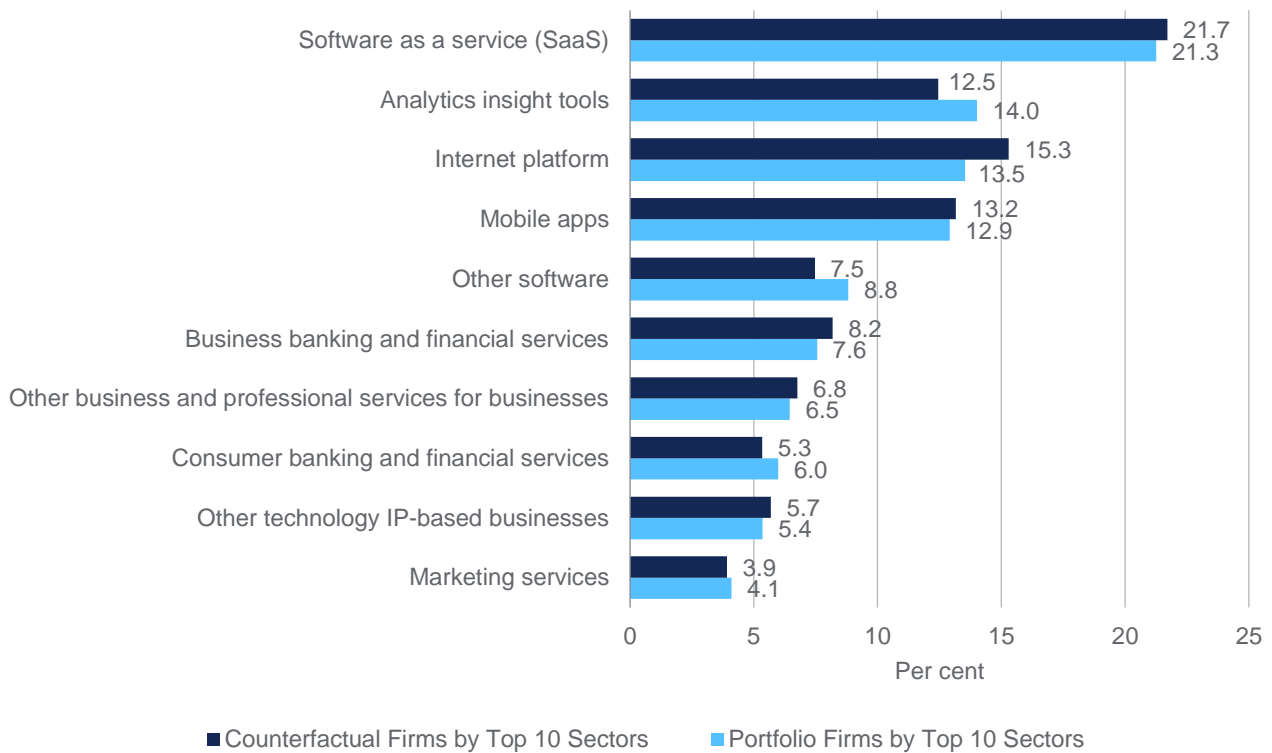
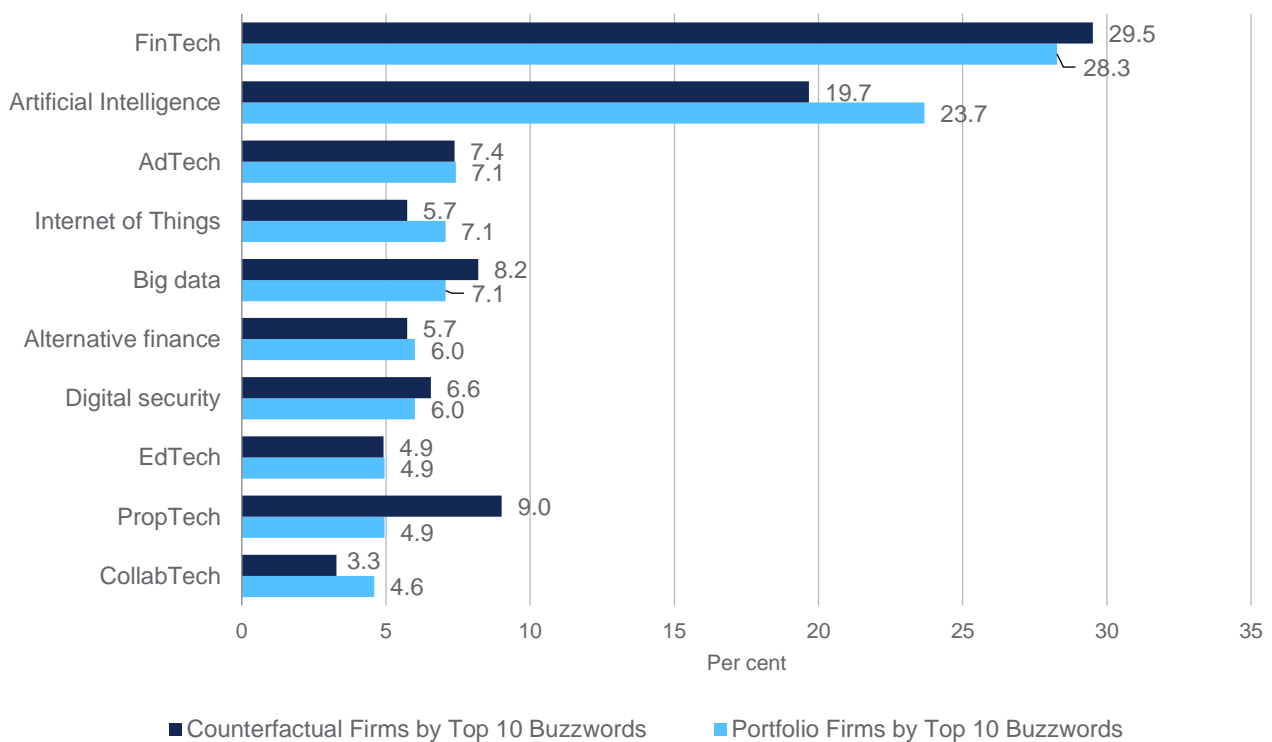
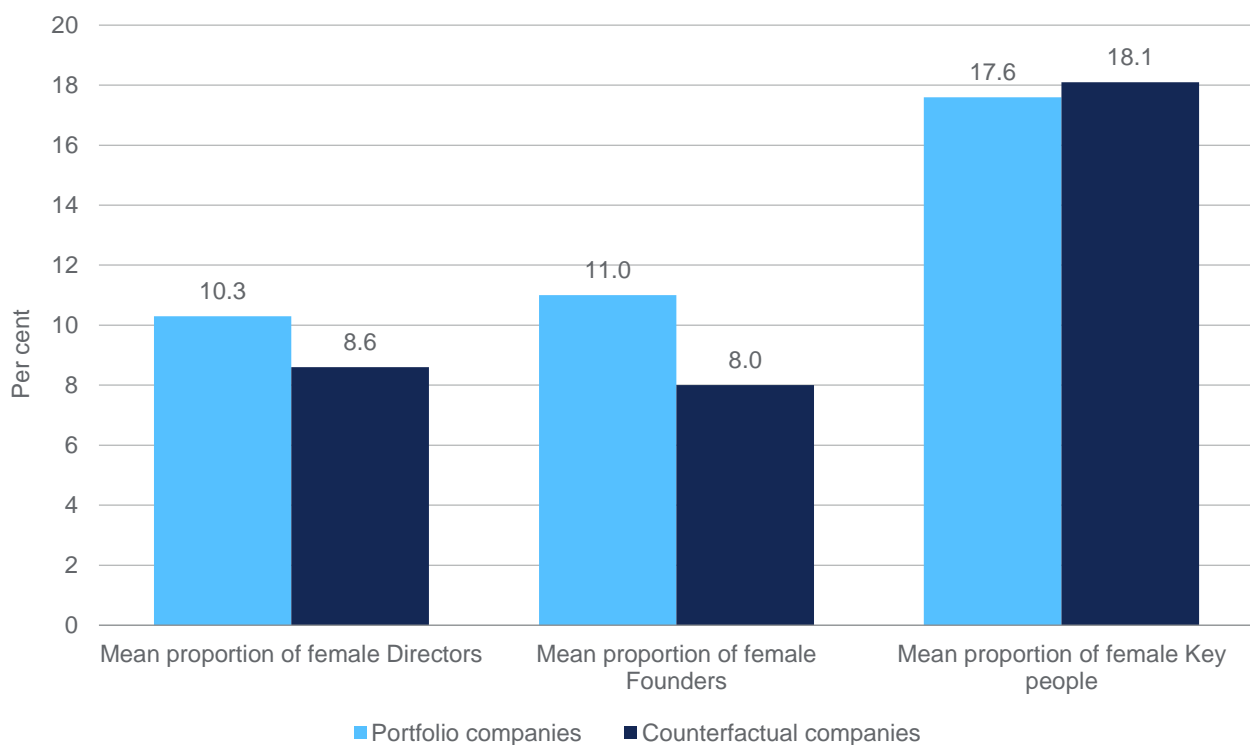


Figure 5: Top 10 Beauhurst buzzwords for portfolio companies and counterfactual companies



In line with the Public Sector Equality Duty, the gender of founders, directors and key people have been compared between the portfolio and matched counterfactual groups. The representation of females in leadership roles is marginally higher across the portfolio group of firms, with a higher proportion of female directors (10% compared to 9% for the counterfactual) and founders (11% compared to 8% for the counterfactual) (Figure 6). This is an encouraging trend since studies show that diversity and inclusivity directly benefit business performance and lead to innovative thinking.⁴⁴ However, the low “n” weakens the results validity and broadly speaking representation differences are marginal across both groups of firms.

Figure 6: Female gender balance across key individuals in the portfolio and counterfactual firms⁴⁵



The comparison of female-dominated leadership (where over 50% of individuals in leadership roles identify as female) across directors, founders and key individuals shows marginally higher portfolio performance the counterfactual across “Directors” and

⁴⁴ Dezsö, C.L. and Ross, D.G. (2012). Does female representation in top management improve firm performance? A panel data investigation. *Strategic Management Journal*, 33(9), pp.1072–1089

⁴⁵ NB: The information is drawn from the Network feature of the Beauhurst platform, which uses data from Companies House and information from company websites, social media and press releases. These data only show those who are identified as female, with the rest assumed to be non-female.

“Founders”. Among portfolio firms, 2% had majority-female directors and 6% majority-female founders. This compares to 1% and 3% from the counterfactual group. However, the results are statistically insignificant at 10% significance level for Directors and Founders, but significant for key people at the 10% level (Table 2).

Table 2: Female dominated (>50%) leadership representation and p-value of the proportion test between portfolio and counterfactual.

Female dominated leadership (>50%)	Directors	Founders	Key people
Portfolio	2%	6%	4%
Counterfactual	1%	3%	7%
P-value for the proportion tests⁴⁶	0.7	0.3	0.08

4.4 Focused measure of growth prospects improves for the portfolio in 2022, albeit still below counterfactual – counterfactual is marginally more mature

The initial trends in KPIs signal financial additionality of the portfolio firms in the short-term, particularly from the higher fundraising growth experienced in 2021. This is in line with the Year 1 early assessment findings.

Longer-term portfolio quality is less clear given the lower performance in the longer-term KPIs such as turnover. This is still an early-stage result given that only a few outturns in these KPIs have been realised post financing.

Business valuation⁴⁷

The business value is determined by the market capitalisation approach whereby a snapshot of the firm’s value is assessed at the time of fundraising. It is calculated by multiplying the total number of shares by the price paid per share at the time of the fundraising. The business value is termed ‘post-money valuation’ here to distinguish itself from the pre-money valuation, which is calculated by subtracting the latest valuation by the amount of fund being raised at the time of the record. Beauhurst gathers post-valuation

⁴⁶ A hypothesis test for the difference of two proportions for independent samples.

⁴⁷ Post money valuation variable used from Beauhurst.

data for companies through data provided in share allotment forms filed with Companies House.⁴⁸

Post-money valuation is an important estimate as investors' expectations of future expected cash-flows are 'built-in'. It is especially important to younger firms that have little track record of performance on which to base their valuations. However, this approach does suffer from several shortcomings, including the assumption that the investment price per share paid would also be the price paid to acquire a company completely.

Additionally, caution must be taken when observing these trends given that the share allotments aren't always accurate and other intricacies, such as shares linked to other companies/ multi-layered corporate structures or share issuance structures (provided as options), can cloud this estimate.

Turning to post-money valuation growth, which can be considered as a proxy for improving growth expectations, the median portfolio performance was higher than the counterfactual in 2021 but slipped in 2022 (Figure 7).

The trend is mirroring the fundraisings KPI. This could signal an initial short-term support which has not been fully maintained. The mean growth rate is lower for the portfolio in 2021 and 2022. The portfolio is above the counterfactual in terms of levels (Figure 8).

The median CAGR performance for the portfolio group is lower at 25% compared to 36% for the counterfactual over 2021 and 2022. This is in line with the yearly growth rate trends albeit at a smaller differential between the two groups.

⁴⁸ [Beauhurst platform](#)

Figure 7: Median post-money valuation growth rate

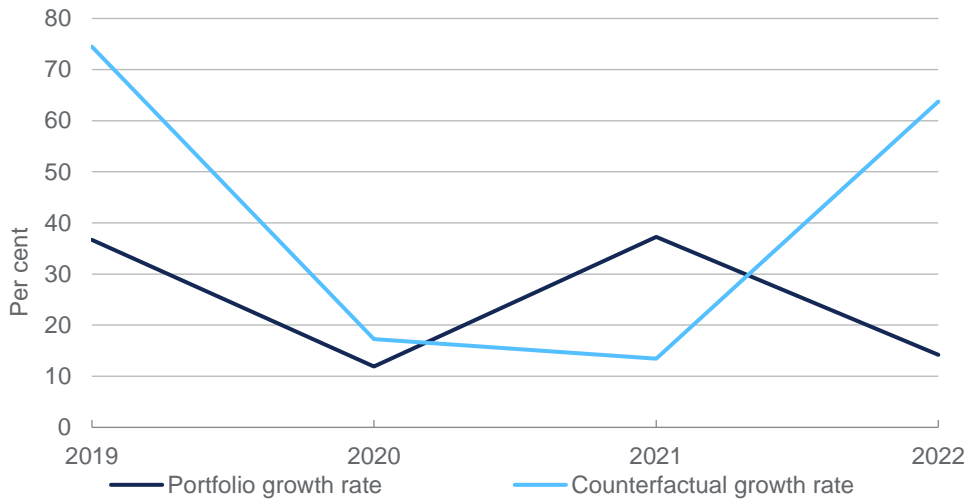
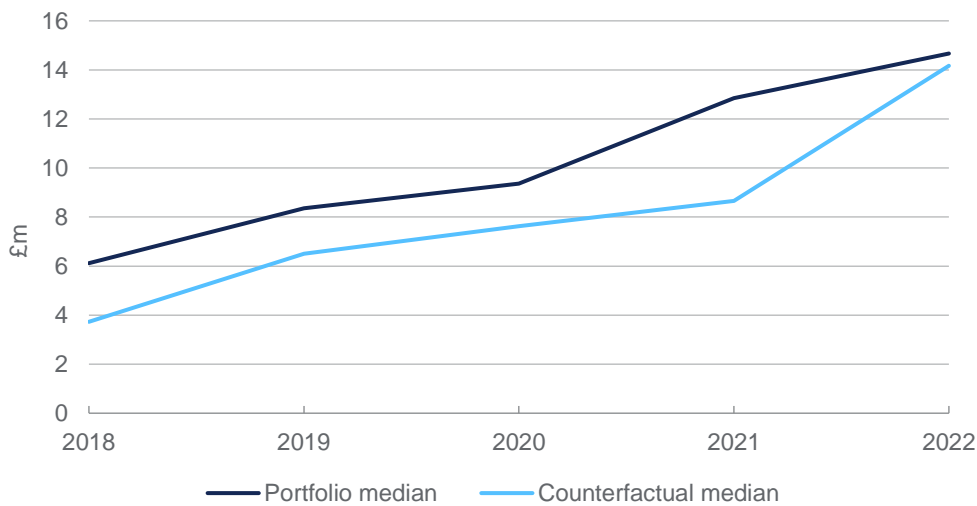


Figure 8: Median post-money valuation (£m)



These valuations have been given a confidence rating which, on a yearly basis, is split into the percentage of high, medium and low confidences by Beauhurst. A high level of confidence refers to the Beauhurst data team resolving any intricacies in calculation specified in the FAQs⁴⁹. Medium and low confidence are when issues have been partially resolved. Table 3 shows that 61% and 62% of valuations were given a high confidence rating in 2021 and 2022 respectively for the portfolio and 79% and 78% for the counterfactual group. This suggests that a large proportion of these valuations had high confidence.

⁴⁹ [ibid](#)

Table 3: Proportions of business valuation confidence ratings split by portfolio and counterfactual firms

Group	Confidence Level	2018	2019	2020	2021	2022
Portfolio	High	77%	80%	79%	61%	62%
	Medium	19%	16%	17%	32%	31%
	Low	4%	3%	5%	7%	7%
Counterfactual	High	79%	78%	80%	79%	78%
	Medium	16%	18%	17%	17%	17%
	Low	5%	5%	2%	4%	4%

Table 4: Number of firms with post-money valuations data per year

Number of observations post-money valuation	2018	2019	2020	2021	2022
Portfolio “n”	293	287	200	189	197
Counterfactual “n”	105	107	82	72	69

Valuation to sales ratio

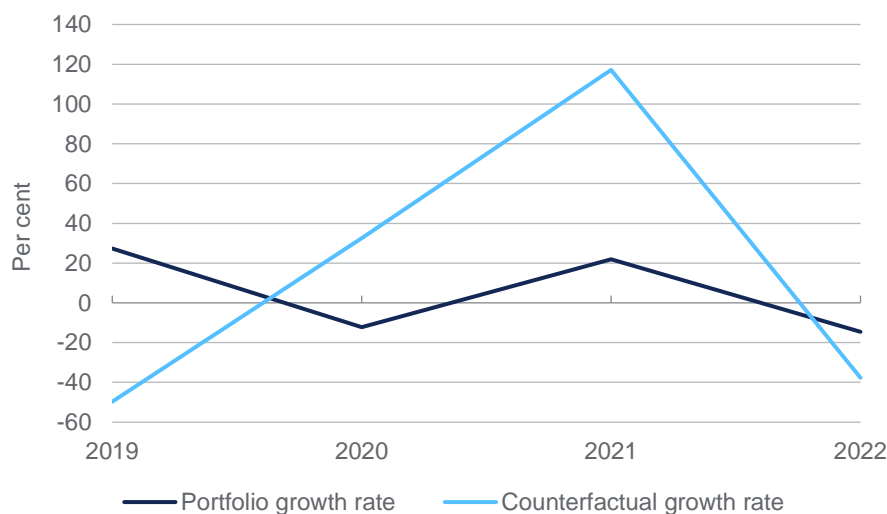
Using the post-money valuations data, the valuation to sales ratio was computed through dividing the post-money valuation by turnover. This provides a more focused measure of a firm’s growth prospects, accounting for the earnings of the business. With the difficulty in obtaining a reliable price-to-earnings (P/E) ratio for the firms, which is a more widely used valuation ratio, the valuation to sales ratio is therefore computed instead.

This ratio must be considered an approximation given the post-money valuation is calculated through extrapolating the market capitalisation at the time of fundraisings.

Figure 9 shows the portfolio firms' ratio growth rate was 22% compared to growth of almost 117% for the counterfactual in 2021. This could be influenced by the relatively large fluctuation in valuation observed within the counterfactual groups, potentially intensified by the limited number of observations and the general strong market conditions during 2021 and the first half of 2022.⁵⁰ However, this was reversed in 2022, where portfolio firms performed relatively better with a contraction of 15% compared to a 38% contraction for the counterfactual group. The fall in expectations across both groups was likely driven inflationary market conditions in 2022. Based on this metric, growth expectations of portfolio firms seem to be improving relative to the counterfactual.

The median CAGR performance for the portfolio group however is lower at 2% compared to 16% for the counterfactual over 2021 and 2022. This is in contradiction to the yearly growth rate trend between the two groups. This highlights the mixed picture associated to valuations trends.

Figure 9: Valuations to sales ratio growth rate



⁵⁰ British Business Bank *Small Business: Finance Markets 2022/23* pp.99-100

Figure 10: Median valuations to sales ratio

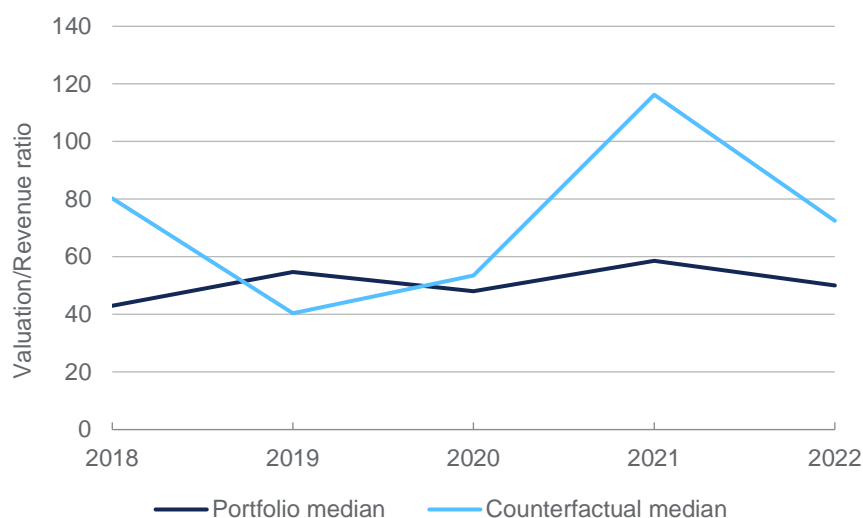


Table 5: Count of number of firms that have reported post-money valuations and turnover figures to create the valuations to sales ratio

	2018	2019	2020	2021	2022
Portfolio “n”	283	277	192	184	190
Counterfactual “n”	105	106	79	71	68

A caveat with these KPIs is that given the early-stage nature of the firms receiving funding, most are likely to be at a pre-revenue stage of development. Valuations will likely be driven by expectations and assumptions on perceived growth performance which are subject to investors’ perceptions and assessments. Valuing firms is even more difficult in uncertain market conditions which could be reflecting the large swings in the growth rate.

5. Business survival

5.1 Key findings

- Survival rates for the counterfactual group were marginally higher than those of the portfolio, with 97% active firms compared to 92% for the portfolio, based on Companies House status. The retroactive counterfactual approach used a looser matching specification which may have marginally reduced the quality of the match as a trade-off for an assessment of the business survival status of the portfolio.
- The current stage of evolution signals a difference in firm maturity based on the Beuhurst classification. The proportion of counterfactual firms that were classed as “Established” and “Exited” was around 22%, compared to only 10% for the portfolio. This maturity differential of the counterfactual firms may signal a lower risk profile. Post-portfolio management may be impacting investors decisions to invest as was noted in the limited case studies.

5.2 Introduction

Business survival is a key objective of the Future Fund. The pipeline of future potential equity-backed enterprises drives innovation and growth and is essential for securing longer-term economic prosperity for the UK. Early-stage firms bring additional benefits such as increased competition within markets through technological advancements, jobs and broad investment in R&D. One of the primary objectives of the Fund was to mitigate damage to this pipeline caused during the pandemic.

Please note that this section uses a looser matching than in Sections 4 and 6 – this is to avoid controlling for variables that have a relationship with survival in creating the matched portfolio and counterfactual group. In this assessment, two KPIs have been used to assess business survivability. One of these is the “Companies House status” (Beuhurst variable, sourced from Companies House data), which provides the current trading status of a firm.

The other is the “Current Stage of Evolution” (Beauhurst specific classification), which uses over 40⁵¹ proprietary criteria to describe the stage a firm is classified within.

5.3 Approach to business survival KPI estimation

To assess the business survival performance of the portfolio and counterfactual, the matching needed to be loosened to ensure the KPIs are not biased. A few adjustments were made to the data and matching method for this assessment:

- **Data: Filters used on the Beauhurst platform were relaxed and adjusted.** Applying filters on the fundraising variable specifically, it was possible to restrict the stage of evolution for firms who raised funding during April 2015 to April 2019 to “**seed, venture, growth or established**” pre-matching. An improvement to this method would be the use of a historical status or stage directly from April 2015 to April 2019 across all firms in the Beauhurst database to draw a comparable counterfactual group – however this feature is not possible in the current database at the time of writing.
- **Matching: The matching excluded the variables “Companies House status, Current stage of evolution, credit ratings and total amount raised”.** These are specified in Table 6. Excluding these variables from the matching criteria allows the KPIs to vary across time and firms are not excluded on the basis of not being active at the current time of the data download. To assess the relative survivability performance, the looser-matching criteria was applied and remodelled to avoid over specifying the model and controlling for the survivability characteristics. The following covariates were dropped from the matching process:

⁵¹ <https://platform.beauhurst.com/help/faq>

Table 6: Covariates dropped from retroactive counterfactual analysis

Variable	Exclusion reasoning
Current Companies House status	Directly correlated to survivability – KPI used for assessment.
Current stage of evolution	Directly correlated to survivability – KPI used for assessment.
Total amount fundraised	At an early stage of an enterprise’s development, equity financing is the most widely used source of finance. Debt finance will be more difficult to obtain due to the lack of financial statement history and risk associated with new ventures.
Credit rating	Credit ratings are signals of credit worthiness which is the likelihood of default – a proxy for survivability.

The matching in this case used a logit model compared to a probit as before as the matched subsample now fitted a logistic functional form (probability assignment) to estimate propensity scores. This is purely for ensuring the quality of the match is sustained.⁵²

5.4 Counterfactual firms have marginally higher survivability prospects

Figure 11 and

Figure 12 compare the Companies House status and point towards greater strength in the counterfactual group. There is a larger proportion of active firms (97% compared to 92%)⁵³ in the counterfactual group. This provides a signal that despite the funding facility, portfolio firms may have found market conditions during the pandemic more difficult to sustain growth and development compared to the counterfactual.

⁵² Probit is not used because the consequent covariate balance tables and plots showing the distributions of propensity scores are clustered at both ends of the distribution, rather than within the centre. The use of logit eliminates such issue. The choice of using probit vs logit depends on the appropriate fitness of the data to the model.

⁵³ Significant at the 10% level of significance. The proportion comparison test of active firms in the two samples p-value is 0.06 (2.d.p)

Figure 11: Portfolio firms' Company House status (n = 545)

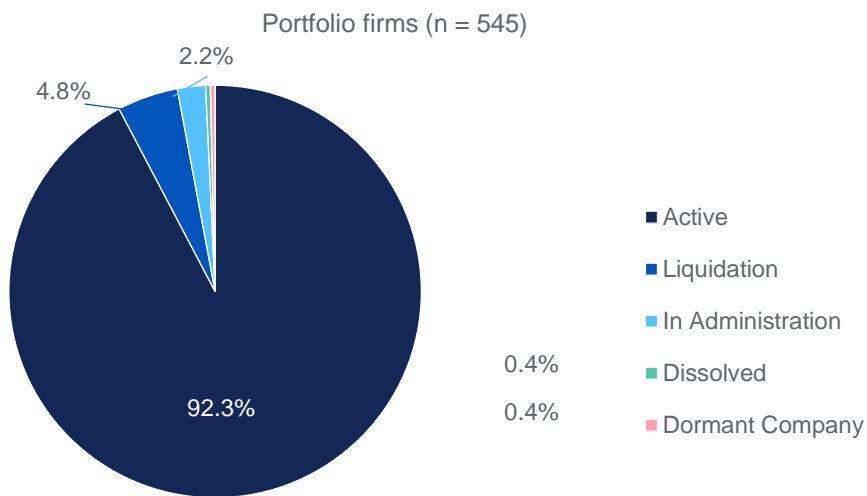
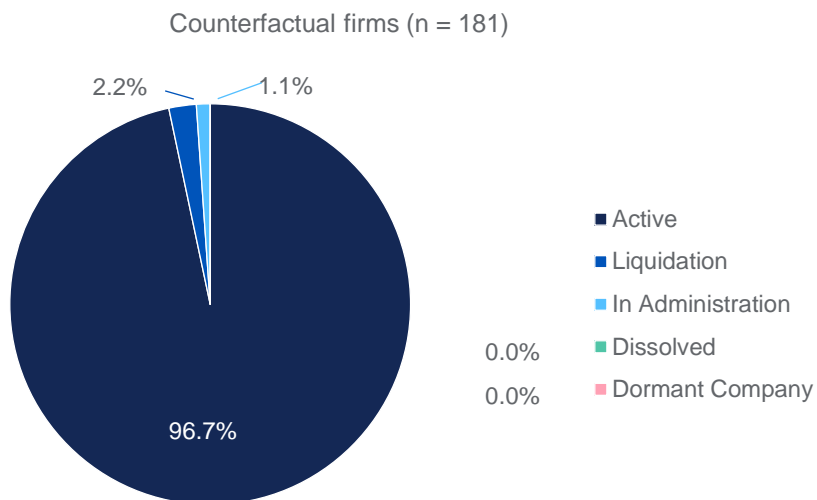


Figure 12: Counterfactual firms' Company House status (n = 181)



5.5 Counterfactual firms are more mature – signals lower risk profile

The counterfactual group are more mature, based on business stage of evolution, which potentially implies they have a lower risk profile.

Figure 13 and Figure 14 compare the stage of evolution, with approximately 22% considered to be “Established” or to have “Exited” for the counterfactual compared to only 10% of the portfolio. As seen in Figures 13 and 14 the counterfactual firms seem to display

a higher degree of maturity measured by current stage of evolution compared to the portfolio and could also be the cause of the different survival statistics between the two sets of firms – this potentially signals a lower risk profile for the counterfactual group.

Figure 13: Portfolio firms' current stage of evolution (n = 545)

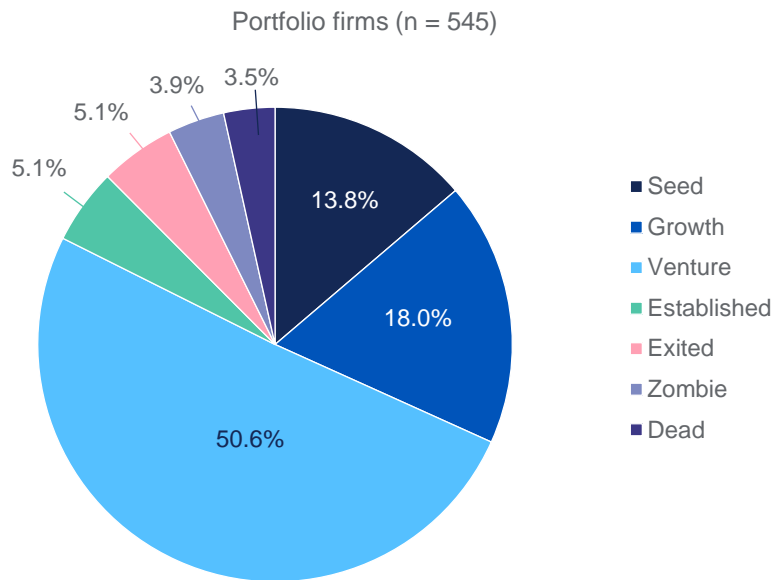
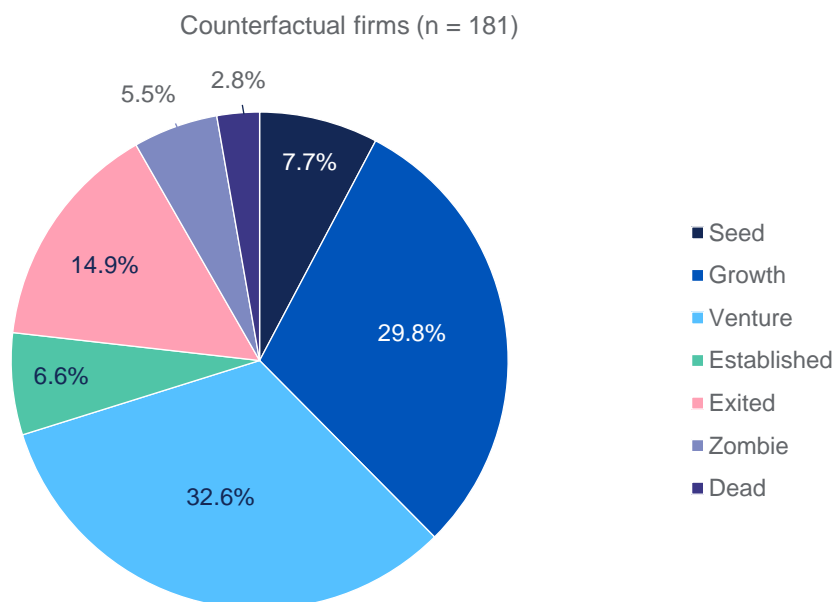


Figure 14: Counterfactual firms' current stage of evolution (n = 181)



6. Funding impacts

6.1 Key findings

- Total fundraisings growth was higher for the portfolio compared to both the counterfactual and wider Beauhurst SMEs group in 2021. This changed in 2022 with a significant easing in fundraising growth which fell below the counterfactual group.
- Average fundraising growth for the portfolio was higher in 2021 (174%) compared to 68% for the counterfactual – over double in terms of growth performance. However, 2022 saw a significant pullback in growth performance for the portfolio firms.
- Looking at the CAGR of average funding growth, the portfolio performance was higher over 2021 and 2022 with growth of 54% compared to 38% for the counterfactual.⁵⁴ Compared to the 100 base in 2020, by 2022 the portfolio total funding was 97% higher compared to counterfactual 54% higher.
- Reasons for lower fundraising growth in 2022 are unclear. One of the six case study interviewees mentioned uncertainty regarding the government's intentions with portfolio management, compared to other private investors that have clearer strategies i.e., holding assets for five years or until exit, which may have impacted other investors. This and other hypotheses will be further investigated in the Year 3 report.
- The median matched sample turnover shows a relatively lower growth performance of the portfolio in both 2021 and 2022. Revenue growth accelerated in 2020 – 50% and 26% for the portfolio and counterfactual groups respectively. However, for both the portfolio and counterfactual groups growth slowed consistently in 2021 and 2022, to 21% and 10% for the portfolio and 44% and 26% for the counterfactual. The median CAGR was 16% for the portfolio over 2021 and 2022 compared to 34% for the counterfactual.
- Employment trends were better compared to revenue, with a marginally higher portfolio growth in 2022 but lower growth performance in 2021. Funding may have gone into paying salaries to ensure the development of intellectual property, a key

⁵⁴ The CAGR represents the annualised rate of return needed for an investment to increase from its initial balance to its final balance, assuming the profits generated are reinvested at the end of each period throughout the investment's duration.

component in R&D. This mirrors the valuation to sales ratio trend and provides a signal that funding may have supported future growth expectations. It also follows the signals from the Year 1 survey results in that 85% of portfolio firms surveyed reported funding into R&D, which could reflect funding used to finance salary payments. The median CAGR for the portfolio was 10% compared to 13% for the counterfactual over 2021 and 2022.

- London-based portfolio firms showed stronger funding growth in 2021 but weaker performance in 2022. Similarly, the top SIC sector “Computer programming, consultancy, and related activities” (i.e., SIC 62) demonstrated a strong funding performance in 2021 but weaker in 2022. Both clusters reflect the same trend observed across the aggregate average fundraising trend.

6.2 Introduction

In this section the results from the analysis of key performance indicators across the matched portfolio and counterfactual group of firms are explored. The assessment is focused on longer-term indicators such as turnover as well as average fundraisings and business valuations to capture additional changes in the near-term. The impact of the Future Fund has likely only partially fed through to some of these metrics.

6.3 Higher portfolio firm fundraising performance in 2021 – lost momentum on average in 2022.

Total and average fundraisings

Fundraisings are a proxy for investment as early-stage firms use most of the funds raised to support product development activities. Early-stage firms invest heavily in R&D and working capital, which is likely the primary investment activity being undertaken by firms of this profile. For all portfolio firms, funding in 2022 would be follow-on funding secured post the Future Fund financing (April 2021 onwards).

Figure 15 shows that total fundraisings was relatively higher for the portfolio compared to both the counterfactual in 2021 and 2022.

Figure 15: Total fundraisings for portfolio, counterfactual and Beauhurst SME (£bn)

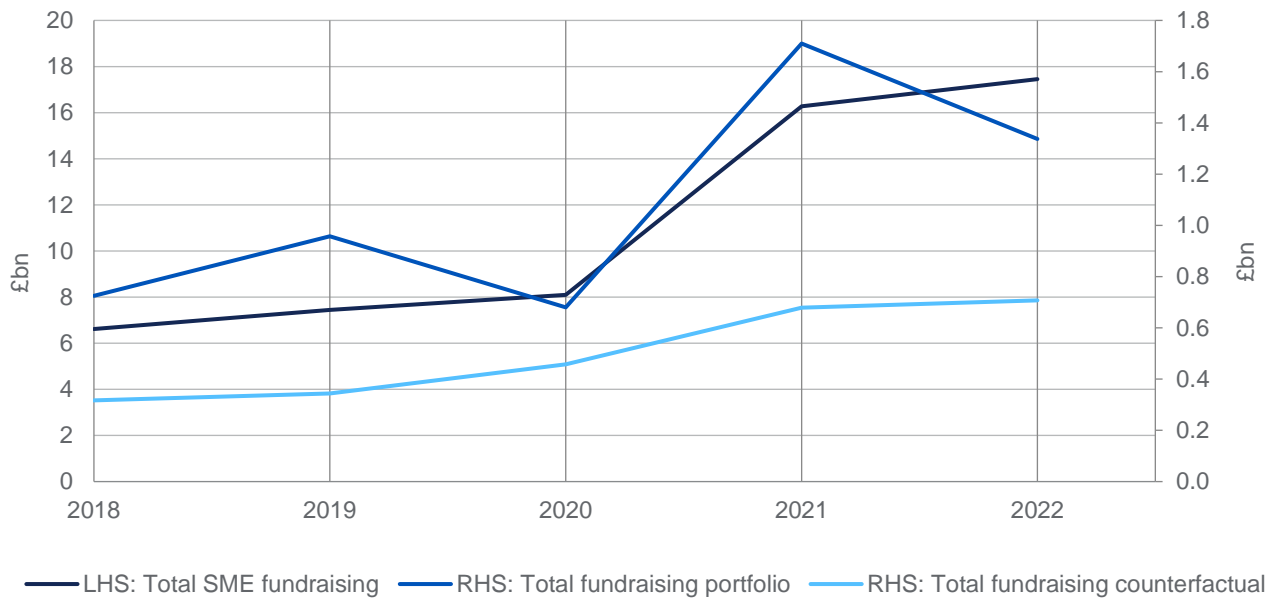
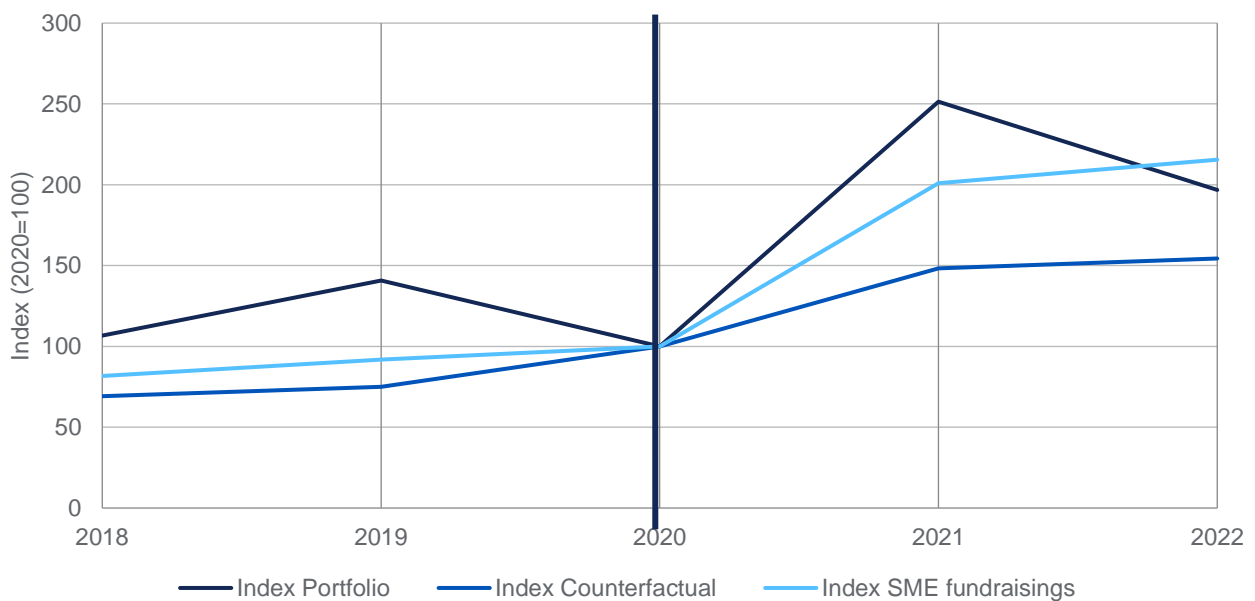


Figure 16 highlights this performance of a higher portfolio growth in 2021 total fundraisings indexed to the year 2020 = 100 which was approximately 150% growth since 2020 compared to 48% growth for the matched counterfactual since 2020. The index however declined in 2022 by 22% for the portfolio compared to a rise of 4% for the counterfactual. This resulted in the cumulative total fundraising performance across 2021 and 2022 being 97% for the portfolio group compared to 54% for the counterfactual group.

Figure 16: Total fundraising index⁵⁵ (2020 = 100)



⁵⁵ The index reflects total funding amounts compared to base 2020.

Taking into account the number of fundraisings that have been conducted during 2021 and 2022, the annual growth in average fundraisings, Figure 17 below also highlights a higher portfolio growth performance of 174% in 2021 compared to counterfactual firms at 68%. 2022 however saw a portfolio performance pullback with growth in average fundraisings falling by 14% compared to a 14% rise for the counterfactual.

The CAGR in average fundraisings over 2020 to 2022 is 54% for portfolio firms compared to 38% for the counterfactual. The portfolio remains higher than the counterfactual on a cumulative basis.

Additionally, over 2021 and 2022, the proportion of the portfolio group that fundraised was 43% and 47%, respectively, compared to 36% and 33% respectively for the counterfactual.

Figure 17: Average fundraising growth rate

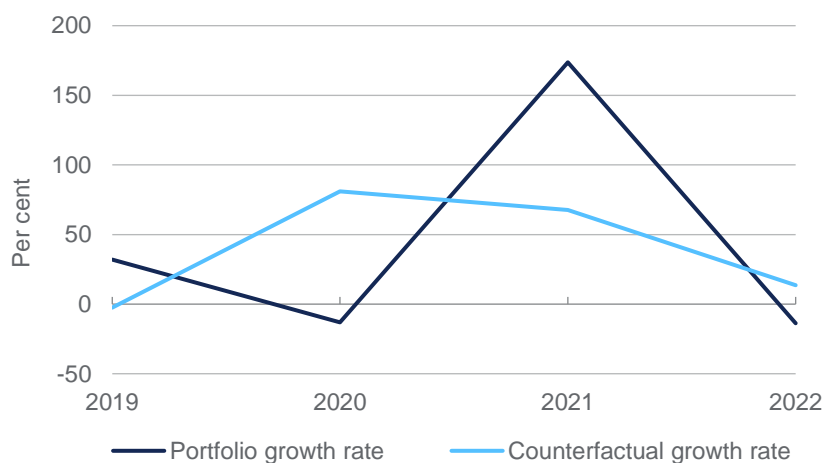
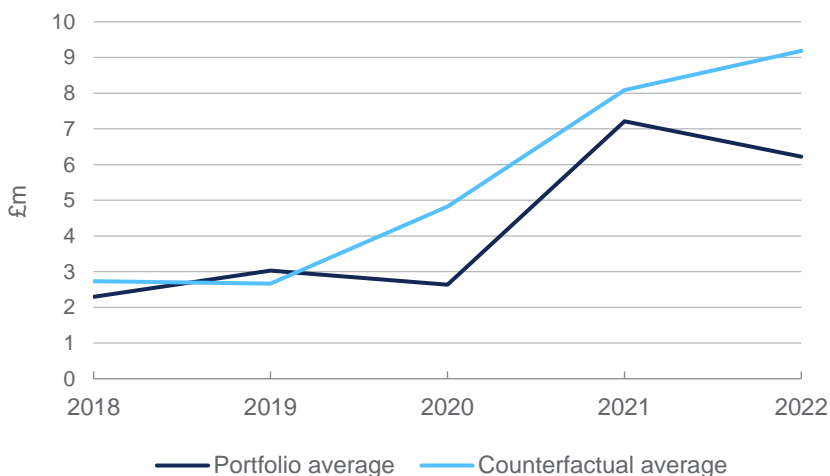


Figure 18: Average fundraising value (£m)



There are two hypotheses that could explain the funding trends, i.e., higher portfolio growth performance in 2021 and lower growth performance in 2022. Further analysis has been completed to investigate them and these are:

1. CLA structure and/or future portfolio management could be a cause for concern for prospective and incumbent investors for follow-on investment.
2. A potential distortion to the funding cycles (synchronisation of funding for portfolio firms).

1. Investors' decision to provide follow-on funding, especially in 2022, may have been influenced by the structure of the CLA. Information gathered from case study interviews indicated that the majority of interviewees did not express concerns regarding the terms and conditions of the CLA. In fact, they held a positive view towards it. However, one interviewee highlighted their investors were more concerned with the future management of the portfolio and the government's intentions i.e., exiting, selling the fund, or holding onto the assets etc. Yet it is still too early to draw any concrete conclusions based on these figures and the limited case study evidence. The investor concern about the future management of the portfolio is at odds with the government having a very small share. The specific terms and conditions of the CLA such as the minimum 20% discount rate could pose dilution concerns, especially with any prospective new investors, who would see their returns diminish or may request similar discounts before investment. This was not reported in the limited case studies but will need to be further explored in the Year 3 report as part of the qualitative workstream. Extracts from the case studies have been outlined below.

Future Fund recipient 'A' Case Study

Company A, which operates in the digital technology space and received capital from the Future Fund, noted the fixed terms of the CLA were fair and helped to provide clarity around funding arrangements. However, the company admitted some investors were concerned over the uncertainty posed by possible political change and described **“having the government as an owner is acceptable but ... if another party were to take over tomorrow, what would happen to the Future Fund.”** That said, the term and conditions were never a source of concern.

“It was clear how you [the shareholder] gets diluted, the next funding round coming up would be the same terms and conditions. It [the terms and conditions of the CLA] is all fine.”

Future Fund recipient 'C' Case Study

Company C mentioned the loan's terms and conditions posed no difficulty in attracting new investment. In fact, the loan was swiftly converted shortly after being received and investors were fully informed about the funding structure and expressed their support.

“It was structured to convert into equity within a few days, and it never featured in our discussions with investors. The terms of conversion were not viewed as onerous.”

Future Fund recipient 'D' Case Study

Company D's interviewee recalled that 'Convertible Loan Agreement' was well understood and also indicated that the investors were familiar with this term and described that **“the CLA is a valuable concept. Our investors also recognize its value. One advantage is our familiarity with it. Some venture capitalists even attempt to emulate these terms. It benefits our company.”**

2. Another possible hypothesis regarding the funding pullback in 2022 could be that the Future Fund may have distorted businesses funding cycles. The rapid supply of finance from the scheme, due to an immediate need within equity markets that were quickly drying up⁵⁶, could have led to firms bringing forward funding rounds to coincide with the Future Fund offering. Therefore, portfolio firms that have drawn down finance from the Future Fund between May 2020 and early 2021 may have obtained adequate capital over that period. This may not have originally been built into funded firms financing strategies. The limited case studies broadly mention that this was not the case and the Future Fund predominantly acted as a bridging finance mechanism at a time of heightened uncertainty in the financial markets.

Future Fund recipient ‘C’ Case Study

Company C’s interviewee commented on the funding cycles as being unaffected for their firm since the funding was used as a runway to support a follow-on round.

“It arrived at a useful time as even if it did not necessarily impact the frequency of funding, it helped to increase the investment runway.”

Future Fund recipient ‘D’ Case Study

Interestingly, in this case, the interviewee mentioned that follow-on funding was not in the short-term plans of the firm. This isn’t due to funding cycle distortion, rather their model to raise future finance would be more of a strategic steer.

“Looking forward [company D] are probably not going to be looking to raise additional capital in the next year as they are instead focusing on trying to bring in strategic investors.”

⁵⁶ The Year 1 report highlighted the speed of funding was crucial to the decision to draw down finance from the Future Fund.

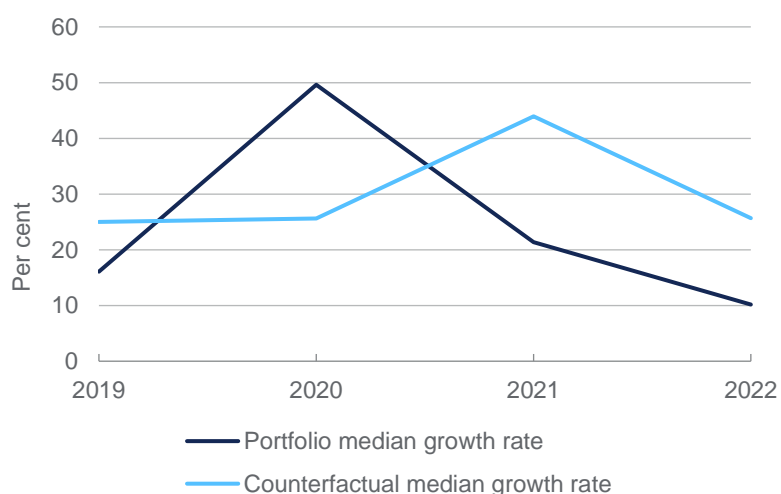
6.4 Lower portfolio revenue growth performance in 2021 and 2022 – maybe still too early to judge given the focus on R&D

Turnover

The median CAGR performance for the portfolio group is lower at 16% compared to 34% for the counterfactual over 2021 and 2022. This is in line with the yearly growth rate trend albeit at a larger differential between the two groups.

Looking at median turnover growth (Figure 19), the portfolio group had a lower growth performance compared to the counterfactual group in 2021 and 2022. A similar picture emerges in the mean turnover (Figure 21) in terms of a lower growth performance for the portfolio firms. Given the close matching has taken into consideration several traits and firm characteristics, the trend could signal that portfolio firms may have focused on activities that don't have an immediate commercial impact. This is likely the case for most early-stage firms. The focus on R&D has been noted throughout all case studies as firms all identified themselves as predominantly R&D focused firms. An alternative perspective (see Ben-Hafaïedh and Hamelin 2023)⁵⁷ could be that the lower portfolio performance in 2021 and 2022 may be a result of a “high-growth penalty”. In other words, the strong levels of fundraising noted in section 1.2 may have resulted in weaker revenue growth in subsequent time periods, albeit it is likely too early for impacts to have fed through to turnover growth.

Figure 19: Median turnover growth rate



⁵⁷ Ben-Hafaïedh, C., & Hamelin, A. (2023). Questioning the growth dogma: a replication study. *Entrepreneurship Theory and Practice*, 47(2), 628-647.

Figure 20: Median turnover value (£m)

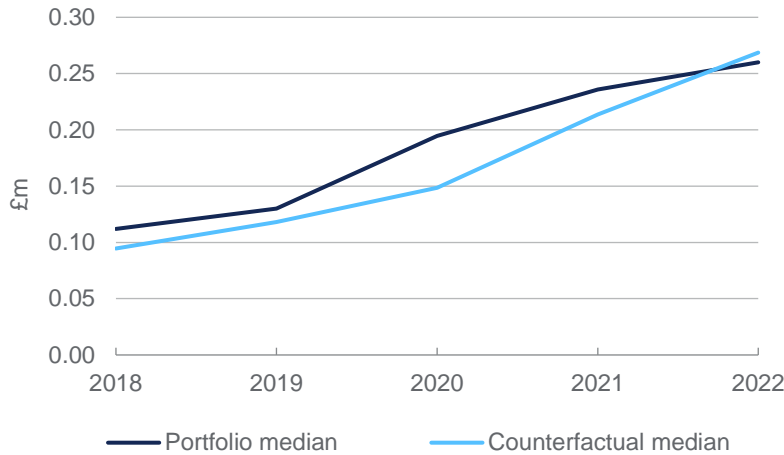
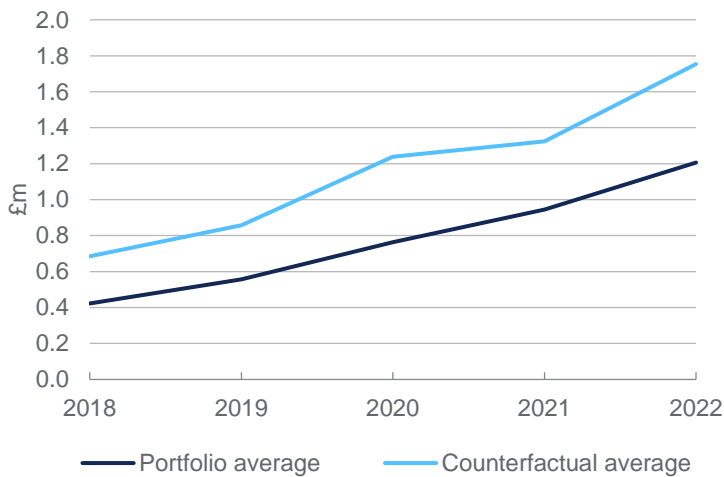


Figure 21: Mean turnover value (£m)



In addition to the qualitative evidence, the R&D focus was noted extensively in the Year 1 report through the survey responses. To test the hypothesis further, data was obtained from the Beauhurst platform on firms that have been identified specifically as R&D focused. This variable has been sourced through secondary data sources such as Companies House data, which have strict definitions on R&D to qualify as an R&D specifically focused firm.

The analysis conducted focused on isolating both the portfolio and counterfactual firms that have raised funds over the years, and then grouping them based on their fundraising reasons, for which the relevant data was available in Beauhurst. The findings revealed a noteworthy increase in the proportion of portfolio firms that raised funds specifically for R&D purposes over the years. In 2021, there was a substantial increase of 154% in the

proportion of portfolio firms raising funds for R&D compared to the counterfactual firms. Specifically, 49 out of 236 (21%) portfolio firms raised funds for R&D in 2021, whereas only 21 out of 257 (8%) firms did so in 2020. This indicates a potential improvement in the R&D focus of funded firms compared to the counterfactual, with a lower increase of firms in the counterfactual raising R&D funds in 2021 - 66% (n = 25 out of 85 in 2021 against n = 17 out of 96 in 2020). However, in level terms the proportion of portfolio firms raising funding in the name of R&D tracks below the counterfactual, albeit a change in a positive direction towards an innovative focus.

Similarly, in 2022, the portfolio firms experienced modest growth of 3% (n = 46 out of 215) in R&D specific fundraising, whilst the counterfactual firms saw a contraction of 7% (n = 21 out of 77). These results indicate a significant rise in R&D-focused fundraising activities amongst portfolio firms following the Future Fund financing, confirming the qualitative evidence across the Year 1 analysis and the limited case studies conducted for this report.

Future Fund recipients 'A to F' Case Studies

According to the case studies, **R&D emerged as a principal activity** among the majority of firms interviewed, with commercialisation also frequently addressed. It was stated by Companies A to F that although a portion of the funding is allocated to commercialisation efforts, **R&D continues to constitute the bulk of their operations**. Several firms indicated that the Future Fund played a crucial role in advancing product development and implementation, and that **R&D continues to be the predominant focus** for these portfolio firms.

Future Fund recipient 'A' Case Study

"We are very heavily R&D-focused [business]"

Future Fund recipient 'B' Case Study

"R&D tech focus hasn't changed but it is now [also] commercially driven."

Future Fund recipient 'D' Case Study

"Our focus on R&D is heavily in development, the focus on commercialisation has only come in in the last 12 months."

6.5 Higher relative portfolio employment performance in 2022, although cumulative performance marginally lower

Employee count

The median CAGR performance for the portfolio group is marginally lower at 10% compared to 13% for the counterfactual. This is contradictory to the yearly growth rate trends which shows a higher yearly performance in 2022.

Turning to the yearly employment trends (Figure 22), the picture showed slight improvement as portfolio employment growth was higher than in 2022. However, the margin was less than 5%. The counterfactual however has a relative higher growth performance in 2021 compared to the portfolio. The overall performance for the portfolio firms remains a mixed picture.

Figure 22: Employee count growth rate

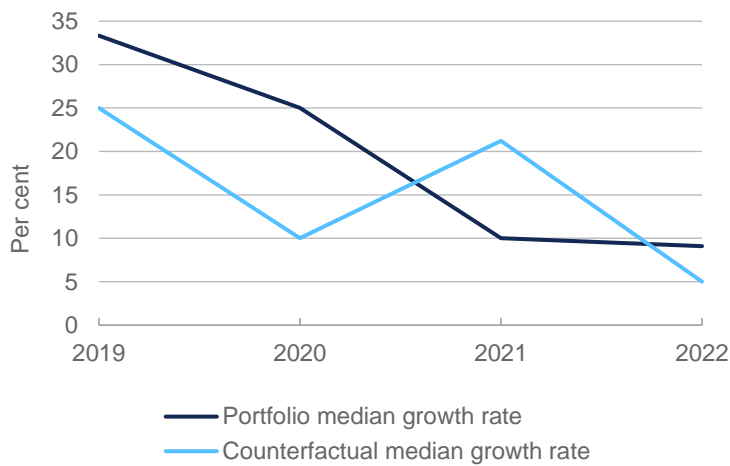


Figure 23: Employee count

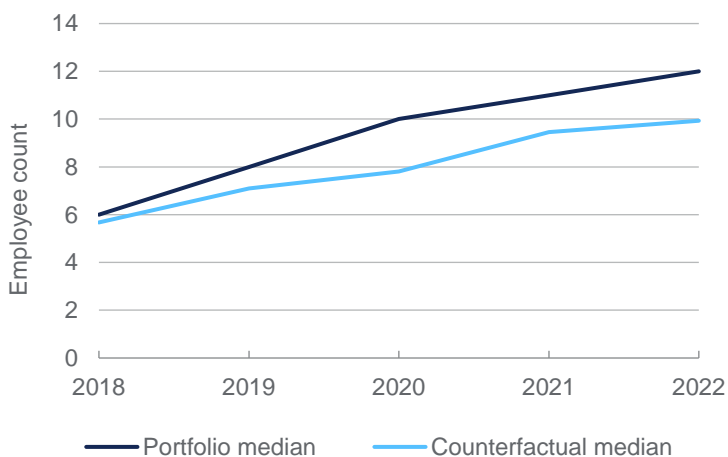
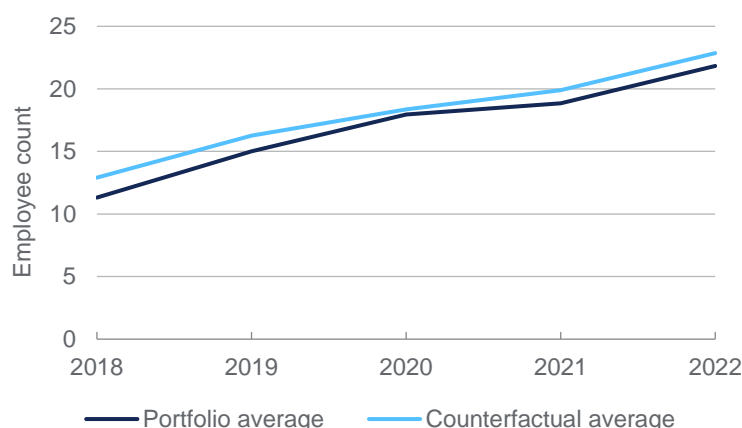


Figure 24: Employee count mean



The employment trend follows a similar trajectory to valuation to sales which proxies for growth expectations. Funding has likely fed through to salary and wage payments generating IP and subsequently firms may have required to increase the workforce to develop their businesses further. A majority of the firms in the sample have focused activities in the services sector, particularly in sectors that require knowledge experts and highly skilled labour.

Another possibility is that as more firms choose to either convert to equity or repay the loan, the uncertainty surrounding conversion is removed. With clarity around conversion, it was noted that firms typically increased their staffing and investment levels, which might be reflected in the increase in hiring activities of portfolio firms as a degree of uncertainty had been removed and firms could focus on increasing business performance.

Future Fund recipient 'E' Case Study

Company E noted that there had been a sizeable increase in headcount by more than 2.5 times, a part of which can be attributable to the Future Fund capital and described "***the Future Fund was a great way to extend our cash runway for the financing in a secure way***".

Future Fund recipient 'C' Case Study

Company C mentioned that the funding provided a critical steppingstone to help build the team that was required for the company to grow overall and described "***the Future Fund has allowed us to progress into a development stage company***".

“The Future Fund was integral to our funding model”

Evidence gathered from other similar schemes by the Bank, such as the Midlands Engine Investment Fund and the Northern Powerhouse Investment Fund, shows employee growth tends to be strong during the first two years following the intervention but then tapers off.⁵⁸ This trend signals it still could be too early for inference to be drawn two years post Future Fund financing. The Year 3 report will need to consider the time taken for impacts to feed through to longer-term KPIs in the assessment of portfolio performance.

This is also substantiated with the findings from (Brown et al, 2017)⁵⁹. It was noted that periods of rapid growth are rarely sustained and oftentimes result in organisational destabilisation within these firms, coupled with subsequent poor performance. This occurs because rapid growth can often lead to an influx of new employees which can result in managerial overstretch etc. These organisational factors can then cause weaker performance in future time periods. This is difficult to detect from aggregate data and will need to be probed by future interviews with the control group.

6.6 Cluster analysis

This section outlines the selected analysis of the granular clusters within the two groups, examining trends based on the London region (top regional flow of Future Fund finance), the SIC 62 sector (i.e., the "Computer programming, consultancy and related activities" sector) and CLA status. For a full examination of the various sub-groups, including the top regions, top two-digit SIC sectors, company size based on employee counts, gender distribution, loan size and a comparison across current CLA statuses, see Annex AAnnex A: Sub-group comparisons.

London based portfolio firms' have lower turnover growth performance in 2021 and 2022 compared to the London based counterfactual firms.

The portfolio firms with trading operations based in London have a higher median turnover relative to the matched counterfactual firms throughout 2018 to 2021 (Figure 25). The opposite is true in 2022. However, considering the growth rate of turnover, the matched

⁵⁸ British Business Bank (2022) *Northern Powerhouse Investment Fund Interim Evaluation Report*; British Business Bank (2023) *Midlands Engine Investment Fund – Interim Evaluation Report*

⁵⁹ Brown, R., Mawson, S., & Mason, C. (2017). Myth-busting and entrepreneurship policy: the case of high growth firms. *Entrepreneurship & Regional Development*, 29(5-6), 414-443.

counterfactual firms performed better with a higher growth rate in 2022 (48%) compared to the portfolio firms (22%). Counterfactual firms show a bounce back in 2022 compared to the slip in growth in 2021, relative to the portfolio firms that continue to fall in 2022.

Figure 25: London turnover median growth rate

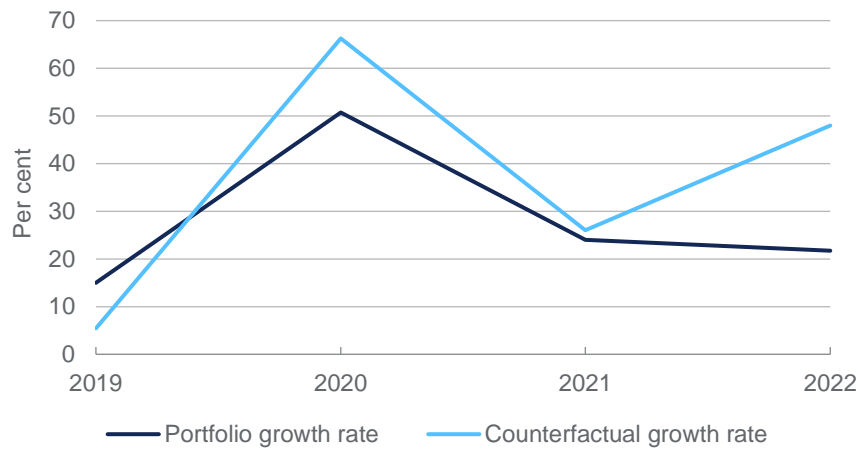
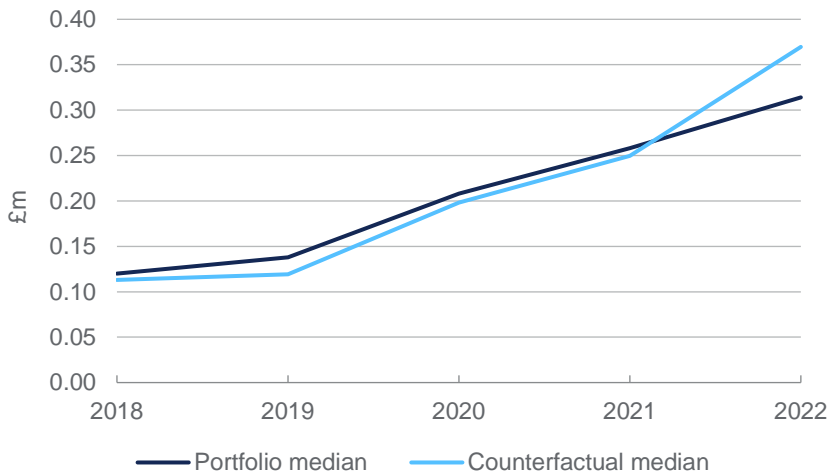


Figure 26: London turnover median value (£m)



The fundraising trend within the London cluster aligns with the aggregate trend across both 2021 and 2022 (

Figure 27 27). Considering London firms comprise over 50% of the total matched sample, there is no surprise that it mirrors much of the general trend in the aggregated picture. The portfolio fundraisings grew by 162% in 2021. This is marginally below the aggregate average funding growth rate of 174% in 2021. Due to the low “n” firms that had very large growth rates were likely to have a larger influence on the results. These are indicative of specific cluster performance.

Figure 27: London average fundraisings growth rate

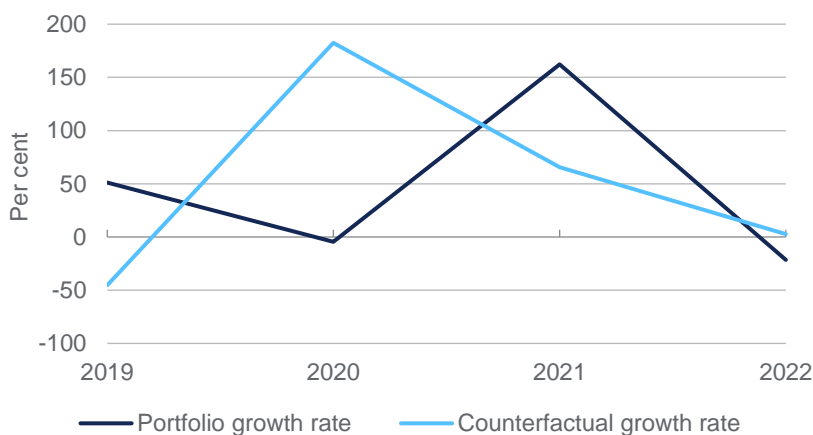
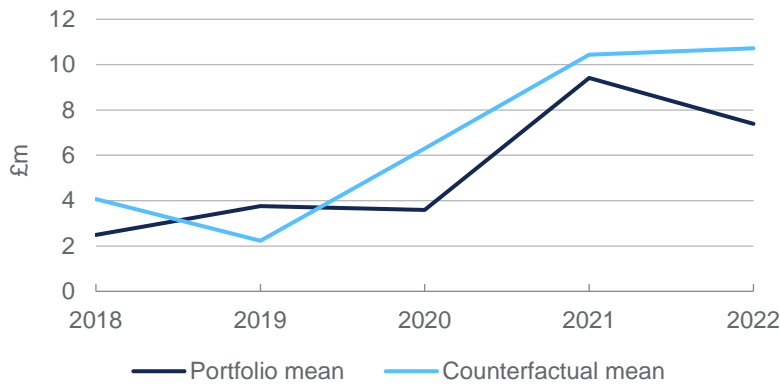


Figure 28: London average fundraisings value (£m)



Top “two-digit” SIC sectors show strong 2021 but weaker 2022 in fundraising – in the similar ballpark as the aggregated assessment.

The “Computer programming, consultancy and related activities” sector (SIC 62) is the top two-digit classified sector for Future Fund participants. Median SIC 62 turnover growth mirrors the aggregate median growth in 2021 and 2022 (Figure 29). However, a closer inspection on the fundraisings growth rate reveals a higher portfolio firms growth performance compared to the counterfactual in 2021 (Figure 31). 2022 saw a pullback in portfolio funding growth performance with a contraction below the counterfactual. Counterfactual firms exhibit substantial momentum growth in 2022 when compared to the portfolio firms, with their turnover and fundraising growth rates reaching approximately 100%. Again, the low “n” makes it difficult to draw inference and these are indicative at best.

Figure 29: Computer programming, consultancy, and related activities turnover median growth rate

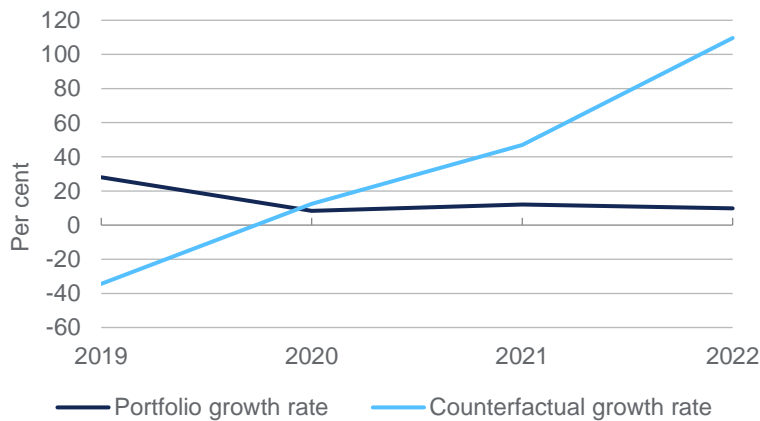


Figure 30: Computer programming, consultancy, and related activities turnover median value (£m)

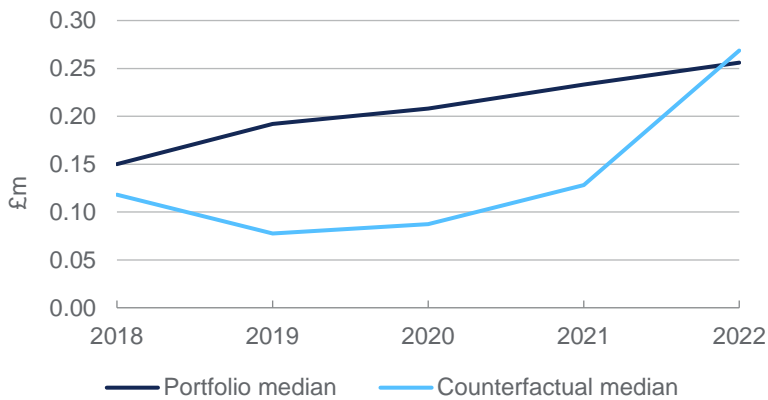


Figure 31: Computer programming, consultancy, and related activities average fundraisings growth rate

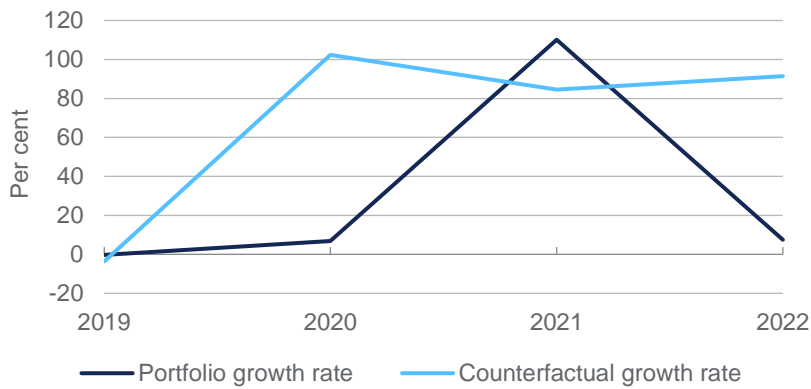
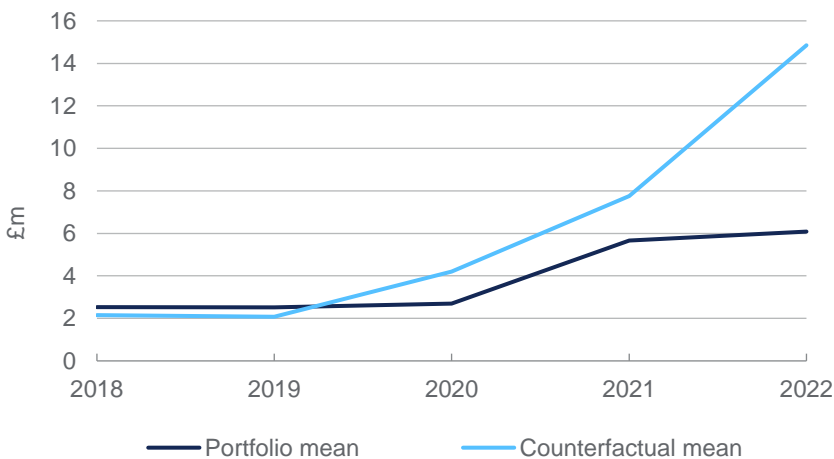


Figure 32: Computer programming, consultancy, and related activities average fundraisings value (£m)



Company size growth trends follow a similar pattern as the aggregate in 2022

Companies House data classifies company size using three criteria⁶⁰: turnover, balance sheet totals and average number of employees. In the analysis below, the classification was based on the FTEs. These are “micro firms” (less than 10 employees), “small” (10 to 49 employees), “medium” (50 to 249 employees) and “large” (250 and above).

Median turnover growth for micro firms was higher in 2022 compared to micro counterfactual firms (Figure 33). Whereas for the small firms the turnover growth performance trend mirrored the aggregate (Figure 37). However, as with other KPI assessments it is too early to draw inference from these early results.

Across the size classifications, the portfolio firms broadly experienced higher relative fundraisings growth performance in 2021, demonstrating stronger growth compared to the counterfactual. However, in 2022, they experienced a relative decline compared to the counterfactual. For “micro” firms’ fundraisings growth in 2021 for the portfolio firms was 99% compared to the counterfactual’s 38% (Figure 39). Portfolio firms classified as “small” grew 134% compared to the counterfactual’s 44%.

However, in line with the aggregate, 2022 saw a lower relative fundraisings growth performance across the “micro” and “small” portfolio firms growing 35% and -11% compared to the counterfactuals 107% and 28% for micro and small respectively (Figure 35 and Figure 39). Micro and small firms are the only groups with a significant amount of data to draw inference and trends in growth resemble the aggregate (see Table 7 below).

Table 7: Matched sample firm size counts defined by OECD FTE definitions

Sample size:	Micro	Small	Medium	Large
Portfolio “n”	273	179	28	0
Counterfactual “n”	127	81	18	0

⁶⁰ <https://www.gov.uk/government/publications/life-of-a-company-annual-requirements/life-of-a-company-part-1-accounts#micro-entity>

Figure 33: Company size “micro” turnover median growth rate

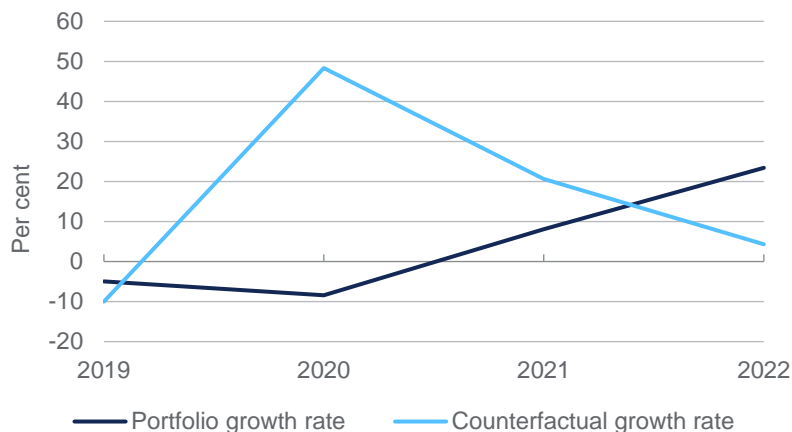


Figure 34: Company size “micro” turnover median value (£m)

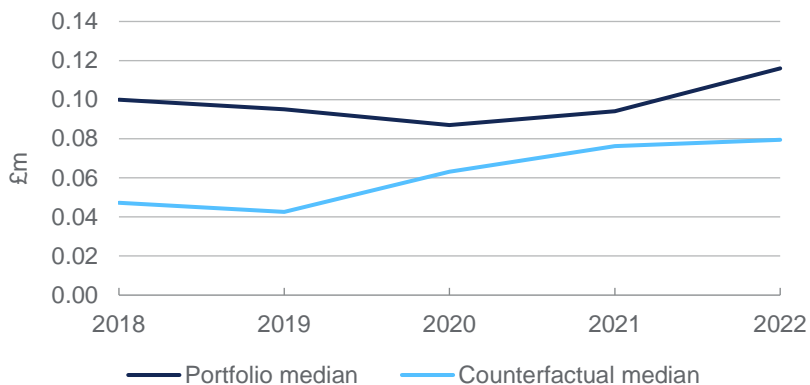


Figure 35: Company size “micro” average fundraisings growth rate

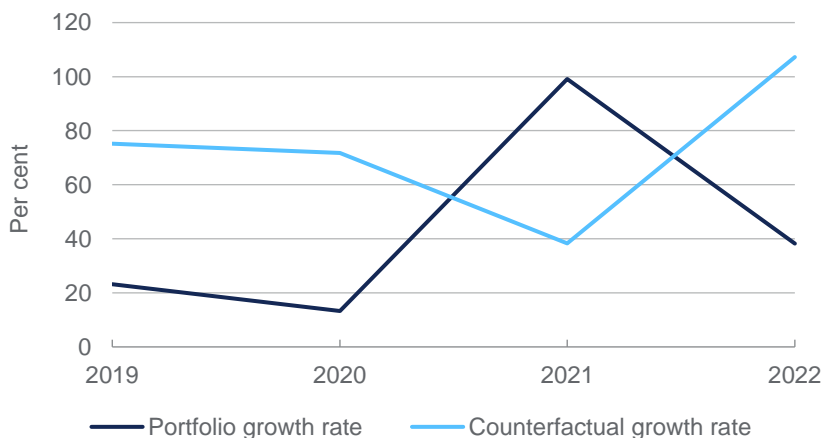


Figure 36: Company size “micro” turnover median value (£m)

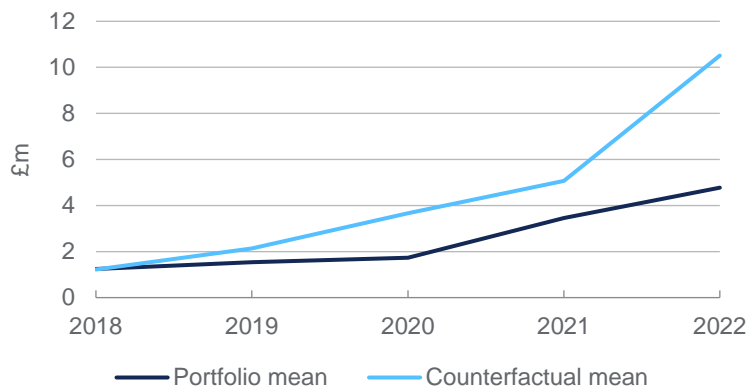


Figure 37: Company size “small” turnover median growth rate

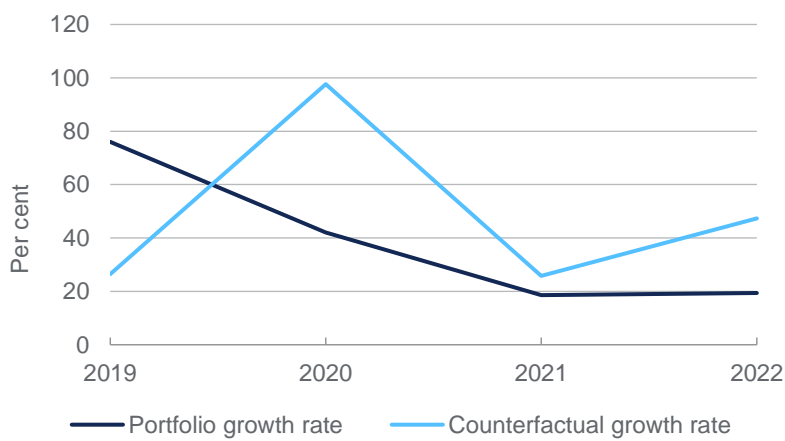


Figure 38: Company size “small” turnover median value (£m)

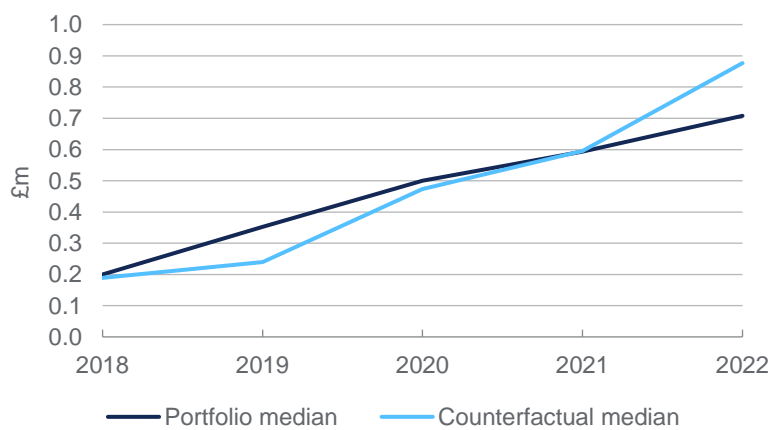


Figure 39: Company size “small” average fundraisings growth rate

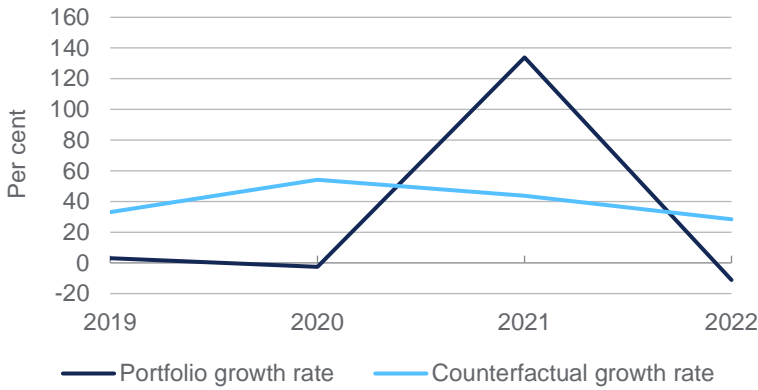
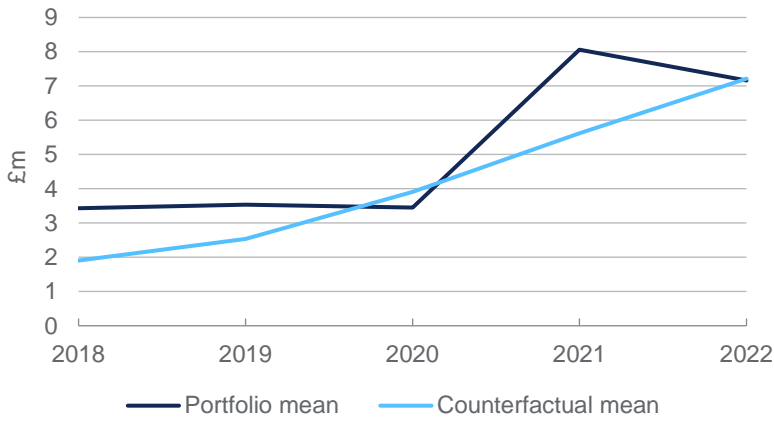


Figure 40: Company size “small” average fundraisings value (£m)



6.7 Additional KPIs paint a similar picture, however, low “n” weakens insight

Looking at other KPIs (exports, EBITDA) the results are inconclusive given the low number of observations obtained through the secondary data sources. In light of better data, the assessments below provide an indication of the insights to be drawn from these variables.

Figure 41 below highlights the trends in EBITDA. This metric is widely used when comparing like-for-like firms as it tries to measure the underlying profitability of a business regardless of assumptions applied on depreciation and financing choices. The negative EBITDA across both groups signals poor cash flow, but given the early-stage nature of firms, this result isn't surprising. However, these trends are marred by a low number of observations, especially for the 2022 outturn.

Figure 41: EBITDA growth rate

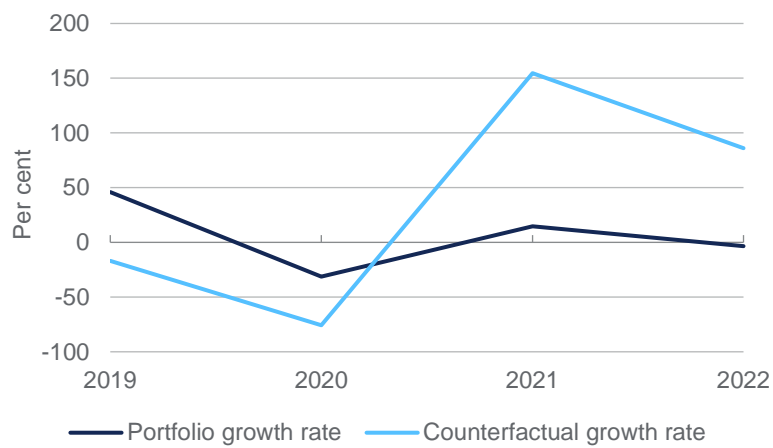


Figure 42: EBITDA value (£m)

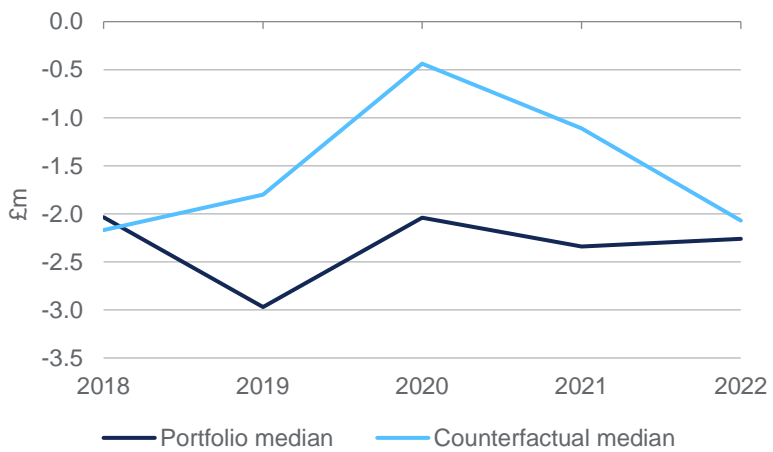


Figure 43: EBITDA mean value (£m)

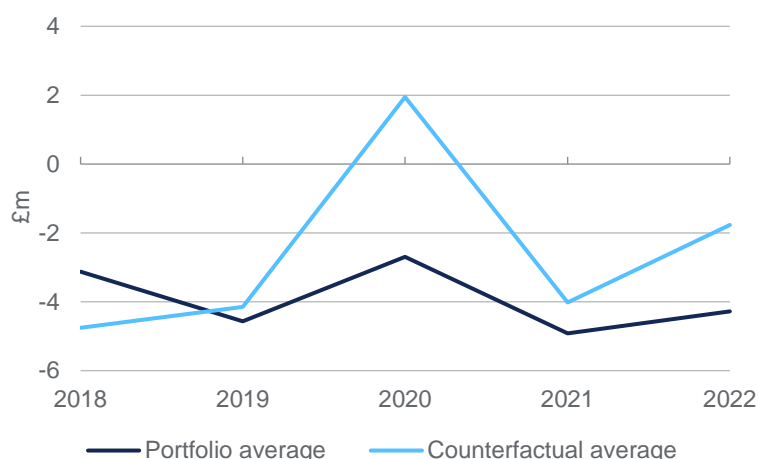


Table 8: Count of the number of firms that published EBITDA

Sample size:	2018	2019	2020	2021	2022
Portfolio “n”	68	71	15	69	18
Counterfactual “n”	30	32	7	39	3

Exports

Firms that can trade on an international scale are usually large, given the expansion into new markets and the upfront intensive capital cost commitment required. Benefits are experienced in terms of lower long-run average costs associated with comparative advantage. Unsurprisingly, only a handful have reported engaging in export activity. It makes sense for a low number of SMEs to engage in international trade activities given the early-stage companies the Fund sought to support.

Figure 44: Exports growth rate

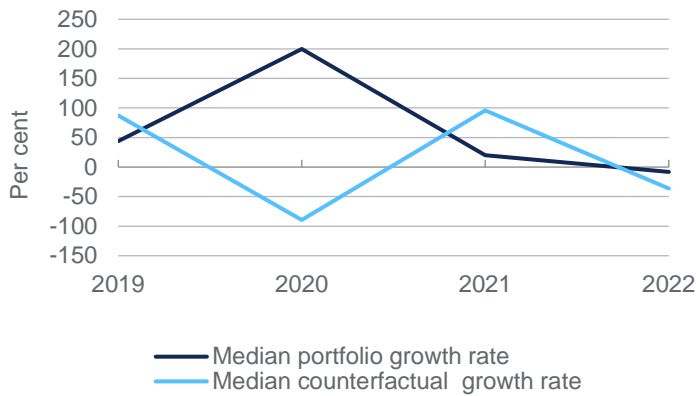


Figure 45: Exports value (£m)

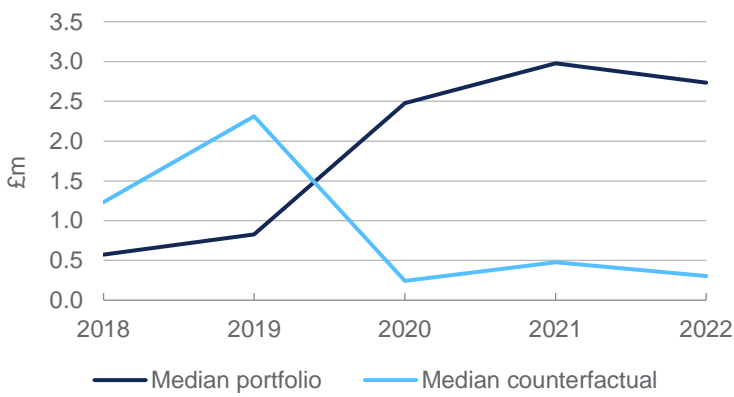


Figure 46: Mean exports value (£m)

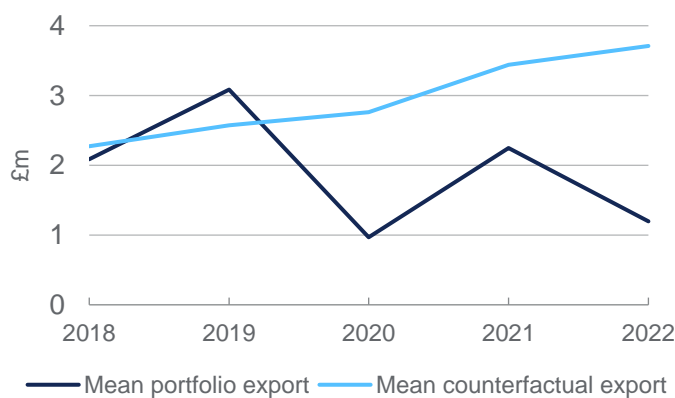


Table 9: Count of export data (RSM Tracker)

Sample size:	2018	2019	2020	2021	2022
Portfolio “n”	12	16	11	17	4
Counterfactual “n”	6	9	12	15	3

7. Conclusions

The Future Fund is a government-backed equity finance scheme that was launched in an uncertain and volatile economic environment. The focus was on otherwise viable companies with good growth prospects that were having difficulty obtaining finance as a direct result of the pandemic. The programme was not designed to address structural or general market problems. The Year 1 analysis signalled a higher relative growth performance of the portfolio across broad investment⁶¹ and a broadly expected acceleration in relative turnover performance in 2022 and 2023. Four hypotheses were proposed based on the relatively weaker funding performance in 2022, albeit stronger growth expectations (valuations trends) and overall mixed picture:

Hypotheses	Investigative insight/ Evidence
<p>1. Portfolio firms focused on R&D investment post Future Fund financing – explaining the funding and turnover trends in 2021 and 2022.</p>	<p>Portfolio firms are predominantly engaging in R&D investment, in particular investment in human capital, with funding fed into salary payments for higher-skilled labour. This may be limiting their focus on near term commercial KPIs like turnover.⁶² This has been confirmed across all six interviews as well as the follow-on analysis conducted on the R&D variable captured in Beauhurst – showing higher growth in fundraisings for R&D in 2021. Portfolio firms still trail the counterfactual in level terms, although, it does provide a positive directional shift for the portfolio.</p>

⁶¹ Broad investment was a term used in Year 1 survey to capture the use of capital and short-term assets. Survey respondents were asked to provide an estimate for all effective investment that increases capacity to deliver goods and services over the medium to long term. The broad nature of the question goes some way in reflecting working capital or short-term assets needed for business operations which, for the firms in scope, would be a relatively larger proportion of their investment expenditures.

⁶² This is backed by the finding from Year 1 report, in which it shows that much of the funding went into the firms that said they were focused on research and development (R&D) (85% of portfolio firms sampled), developing new or modifying existing goods (67%), and services and expanding digital technologies (65%). The main intended use of Future Fund finance for CLA funded businesses was maintaining cash-flow followed by maintaining R&D. Lead investors also confirm that 72% of CLA funded firms used the investment to maintain their R&D activities. These findings from the Year 1 report suggests the Future Fund funded innovative and growth orientated businesses, helping these companies maintain their longer-term growth prospects during a time of economic disruption.

<p>2. The CLA structure, uncertainty around CLA conversion prospects, or the future government intentions of the final portfolio holding could be limiting investor appetite for portfolio investment – explaining the lower relative growth performance in total and average fundraisings in 2022.</p>	<p>Evidence from the case studies did not support the hypotheses that different fundraising performance could reflect the CLA structure/CLA conversions or the prospect of them, with generally positive sentiment towards the CLA structure amongst interviewees. As part of the case study interviews, one of the six companies interviewed reported investor uncertainty over what the intentions are for future portfolio management. There may have been shareholder dilution concerns related to the equity conversions and the terms and conditions of the CLA, but no evidence was found in the limited case studies. In fact, for some businesses this wasn't even a consideration in follow-on investment negotiations, albeit these firms had converted to equity within a few days of drawing down finance through the Future Fund.</p>
<p>3. Funding cycles may have been realigned due to the introduction of the Future Fund at a time where firms may not have necessarily been seeking a fundraising round. This may have distorted the cycles for portfolio firms which could explain the lower relative growth performance in 2022.</p>	<p>The limited cases found no evidence pointing towards a distortion in funding cycles, rather the finance acted as a bridging finance mechanism or support with follow-on financing, plugging an immediate finance need during the pandemic induced market adversity.</p>
<p>4. The relevance of the matched analysis may also be affected by the presence of outliers in the portfolio group, which</p>	<p>The nature of this empirical work relies on statistical techniques that focus on averages and representative distributions of the population in question. However, in doing so, exceptional growth</p>

could make a disproportionate impact on the programme's value for money.

firms (outliers to the sample) – those that in the future will drive growth and innovation within the UK economy – may be disregarded from the analysis. These firms are likely to drive the overall portfolio performance. Qualitative research tools in the Year 3 report will explore the impact of the Future Fund on such exceptional growth/outlier firms as they often are drivers of traditional venture capital (VC) portfolio performance in the long run. Quantitative techniques to draw out the impact of outliers will also be explored.

More detailed analysis will need to be undertaken in Year 3, especially that focusing on qualitative methods. The fourth hypothesis will be revisited in the Year 3 analysis given the data limitations around including outlier cases in statistical analysis. It is likely that as with traditional VC portfolios, there may exist a few firms that will go on to generate extraordinary growth. In the Year 3 report the case studies will have a focus on these potential firms.

Another component to consider more broadly is the adversity stemming from the new inflationary market environment. Investment activity in the UK declined in Q3 2022; this is in line with the wider European VC market trends that showed a cooling trend after 18 months of high activity. This could be attributed to the cost-of-living crisis, driven by rocketing energy prices primarily stemming from the Russia-Ukraine war, and is likely still feeding through to the markets. Central banks are raising rates across Western economies to calm inflationary pressures, but this also entails more costly debt and, more importantly, a more difficult environment to attract investors and raise funds. The Year 3 report analysis and data extract will need to be considered carefully in terms of when initial impacts are likely to feed through to KPIs, thus providing a clearer context for the analysis.

8. Evaluation next steps

Year 3 Interim evaluation (2023/2024)

The Interim evaluation will repeat the research methodology and modelling with additional economic analysis, including richer IDBR data and internal monitoring information. This will provide an update on the programme's economic impacts at a time when most of the CLAs will have converted, repaid, or been written off.

Learnings from the Year 1 and Year 2 evaluations will also be internalised to ensure the mixed methods approach to assessing the impact of the Future Fund will capture various nuances identified in the previous years. These will include, but not be limited to, an assessment of the potential outlier cases that could bring in future extraordinary growth and subsequent market returns, which could generate a greater than market rate of return. The four hypotheses need to be further explored through the mixed methods approach, although the R&D focus of the portfolio firms seems to be broadly confirmed.

Annexes

Annex A: Sub-group comparisons

A.1 Introduction

This section details the complete analysis of the characteristic clusters across the portfolio and counterfactual firms. The various sub-groups assessed are the top three regions (London discussed above in Section 6.6), top three 2-digit SIC sectors (SIC 62 – Computer programming, consultancy, and related activities, discussed above in Section 6.6), company size (based on employee counts), gender distribution and loan size. For each sub-group, the trends in turnover and average fundraisings were examined. In most instances, it must be caveated that the granularity of the clusters significantly reduced the number of observations, and any outliers are more likely to skew the results. Where low “n” exists, this is outlined in the analysis below.

A.2 Other top regions show similar trends in performance to the aggregate

The South East and East of England regions were respectively the second and third most common in which SMEs were located, based on trading location data from Beauhurst. The South East comparison shows a similar relative performance to the overall trend across turnover (Figure 47). As Figure 49 shows below, South East fundraisings present a comparatively more optimistic trend for the portfolio group, as they consistently were higher than that of the counterfactual 2021 and 2022. This contrasts with the aggregate trend for the portfolio group of a higher relative growth performance in 2021 but a lower relative growth performance in 2022. Note that the number of observations for the South East cluster is 64 for the portfolio group and 33 for the counterfactual, so the low “n” weakens the insight validity.

Figure 47: South East turnover median growth rate

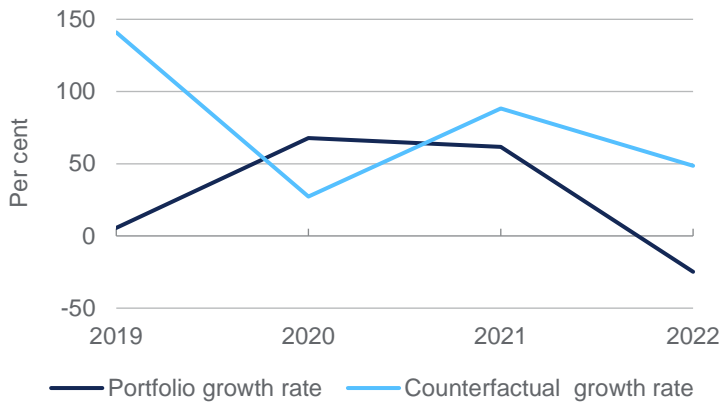


Figure 48: South East turnover median value (£m)

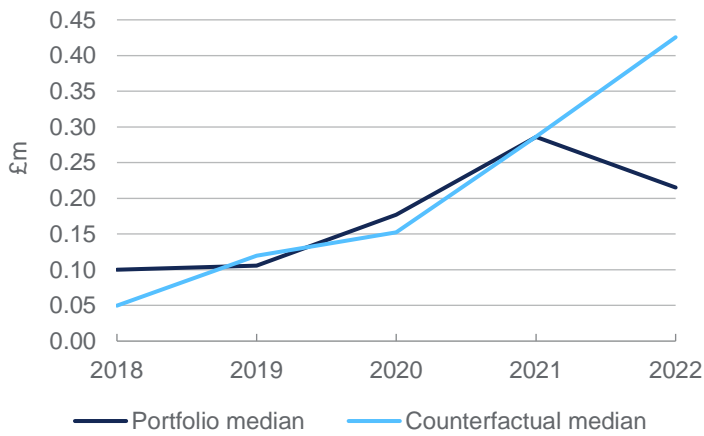


Figure 49: South East fundraising average growth rate

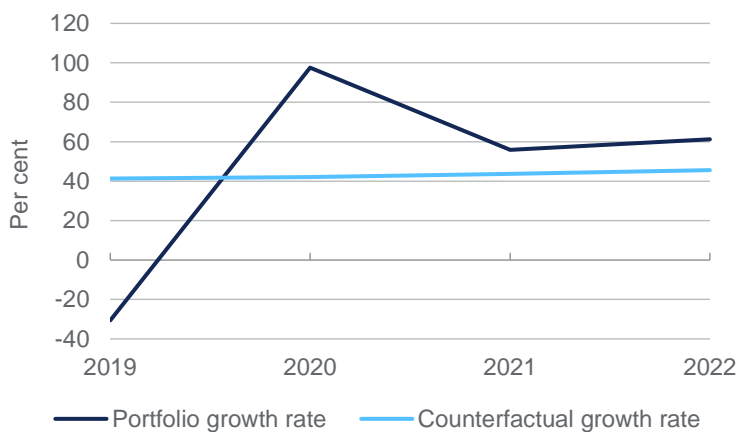
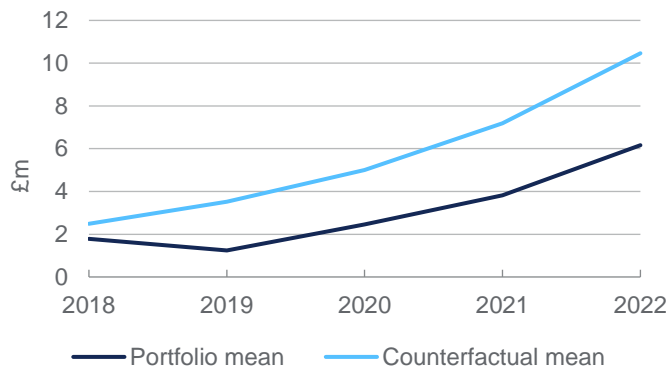


Figure 50: South East fundraising average value (£m)



Despite the seemingly lower relative growth performance across the East of England, the results are, as in the case for the South East cluster, inconclusive given the significantly low “n” adds uncertainty to the validity of the insight i.e., portfolio firm n = 43 and counterfactual n = 22. The charts have been included for completeness.

Figure 51: East of England turnover median growth rate

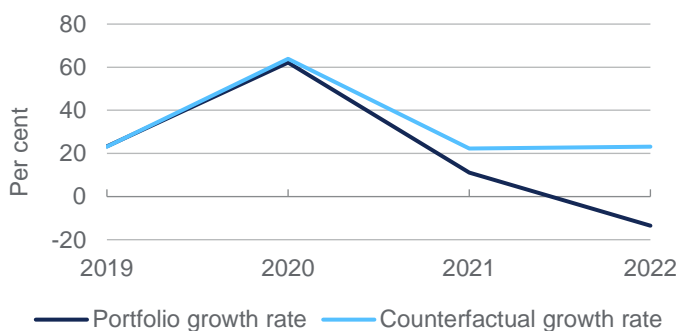


Figure 52: East of England turnover median value (£m)

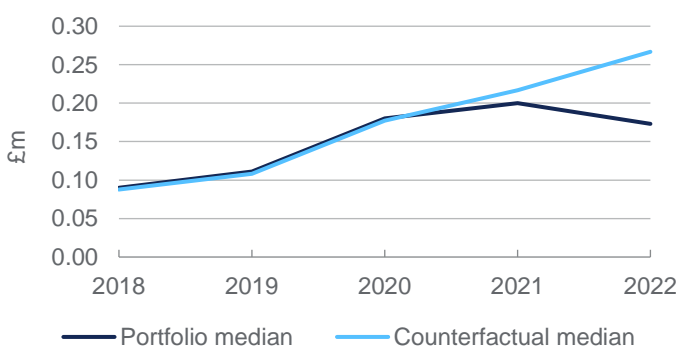


Figure 53: East of England fundraising average growth rate

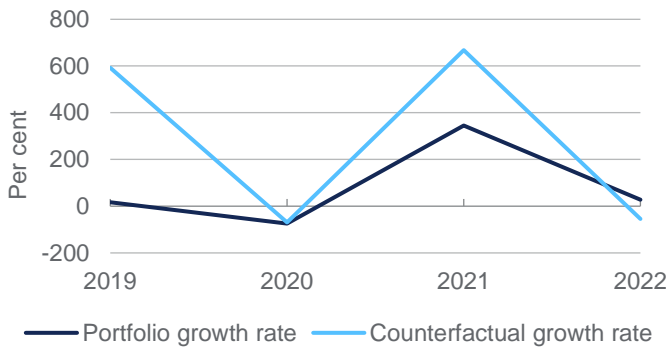
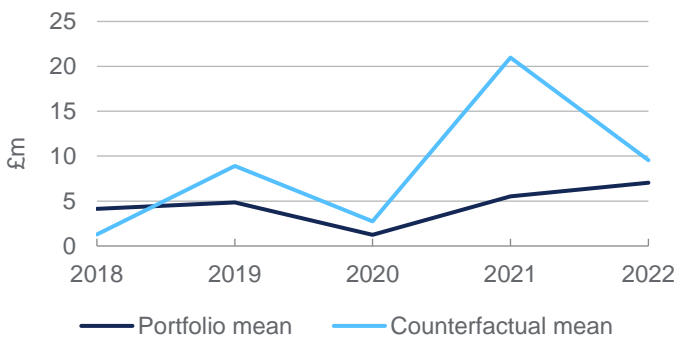


Figure 54: East of England fundraising average value (£m)



A.3 Top “two-digit” SIC sectors show strong 2021 but weaker 2022 – similar to aggregate funding trend

In addition to the top SIC sector covered in the analysis in 6.6 Cluster analysis, the second most common two-digit classified sector for Future Fund participants is SIC 72: “Scientific research and development”. The turnover growth picture aligns to the general trend in this instance, with the lower relative portfolio growth performance in both 2021 and 2022. The picture is also similar in terms of fundraisings data with a higher relative growth performance in 2021 and lower relative growth performance in 2022 for the portfolio. However, looking at sectors beyond the top two-digit SIC sector, runs the risk of significantly low “n”, with SIC 72 portfolio firms n = 59 and counterfactual firms n = 39.

Figure 55 shows that the portfolio turnover growth rate for 2021 and 2022 was lower than the counterfactual. This is consistent with the aggregated turnover trend described in

section 6.4 Lower portfolio revenue growth performance in 2021 and 2022 – maybe still too early to judge.

Figure 55: SIC 72 turnover median growth rate

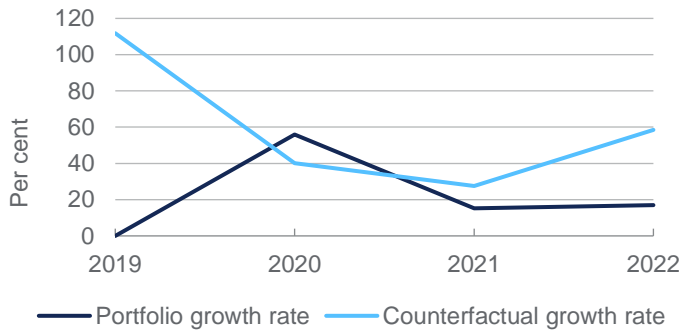


Figure 56: SIC 72 turnover median value (£m)

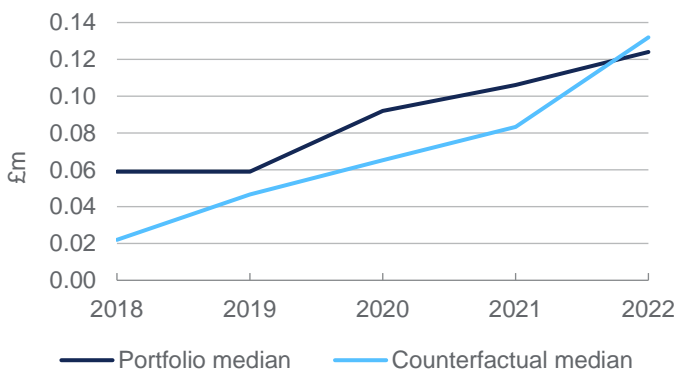


Figure 57 illustrates the performance of both portfolio and counterfactual fundraising trend for SIC72. The trend mimics that in the aggregate i.e., 135% higher relative growth performance in 2021 and a lower relative growth performance of 48% compared to the counterfactual at 88%. The turnover growth trend has not been presented due to significantly low “n”.

Figure 57: SIC 72 average fundraisings growth rate

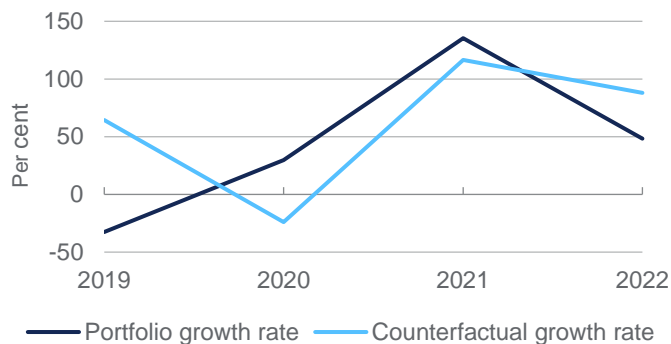
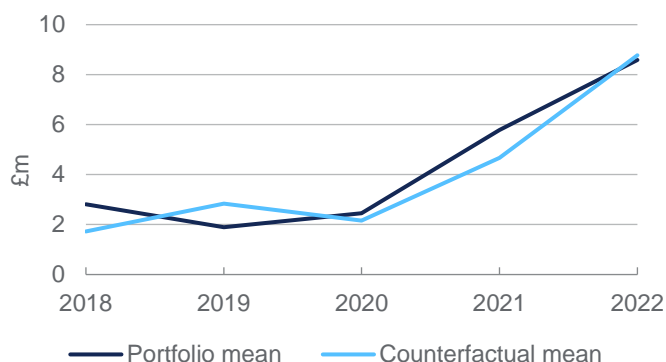


Figure 58: SIC 72 average fundraisings value (£m)



A.4 Female majority leadership generally shows higher performance but low “n”

Across all the leadership metrics, directorship, founders and key people, fundraising trends mirror closely the aggregated picture for firms that have a majority of female leaders (>50% of female representation), where the portfolio was higher than the counterfactual in 2021 and lower in 2022. Figure 59 to Figure 69 refer to the matched sample of firms that had a majority of their leadership teams identify as female. The remainder of the leadership teams within these groups of firms identify as non-female⁶³ – the limited classification is due to data limitations.

As Figure 61 shows, average fundraisings contract by 15% in 2022 for the portfolio firms where the directorship is dominated by females, compared to growth of 70% in the female-

⁶³ The information is drawn from the Network feature of the Beauhurst platform, which uses data from Companies House and information from company websites, social media and press releases. These data only show those who are identified as female, with the rest assumed to be non-female.

dominated directorship counterfactual firms. The turnover trend aligns with the aggregate trend – a lower relative portfolio growth performance in 2021 and 2022. However, these results are marred by the low number of observations.

Figure 59: Directorship (>50% female) turnover median growth rate

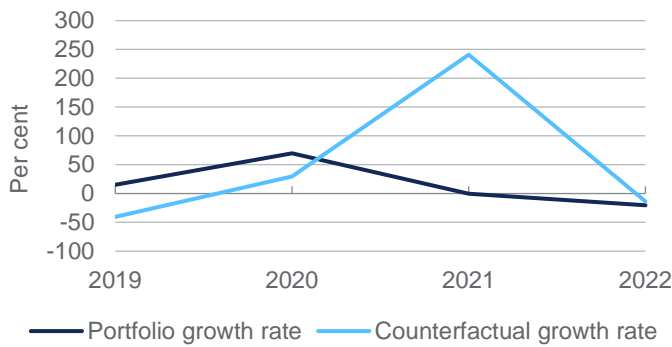


Figure 60: Directorship (>50% female) turnover median value (£m)

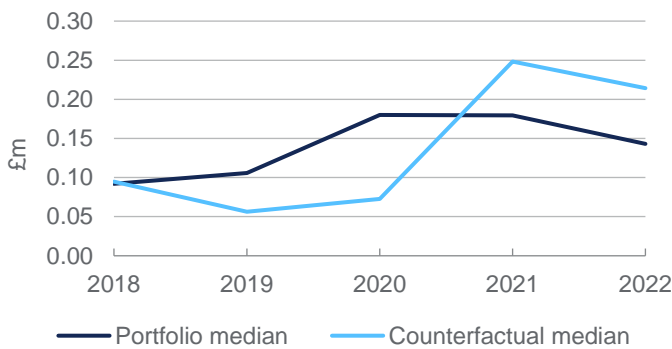


Figure 61: Directorship (>50% female) average fundraisings growth rate

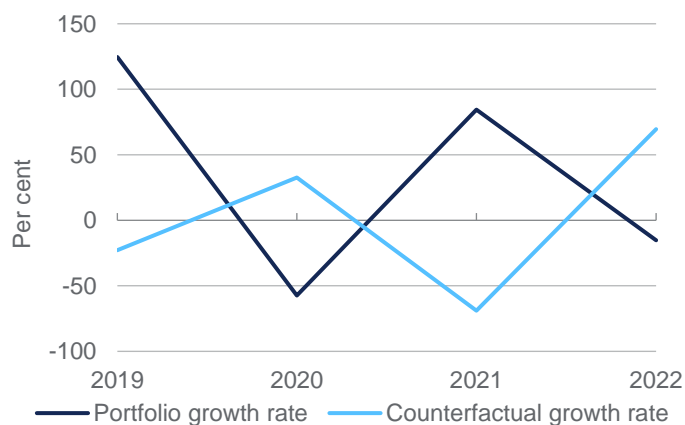


Figure 62: Directorship (>50% female) average fundraisings value (£m)

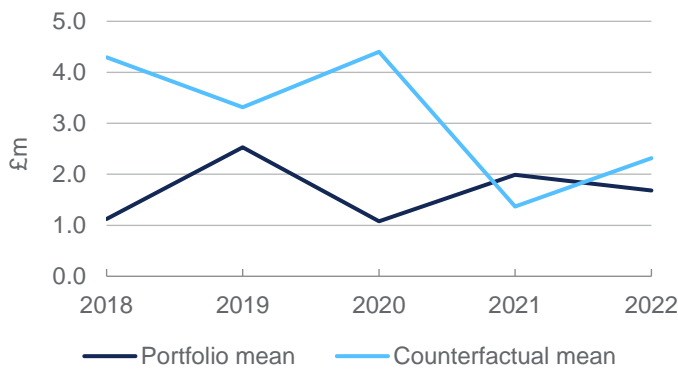


Figure 63: Founders (>50% female) turnover median growth rate

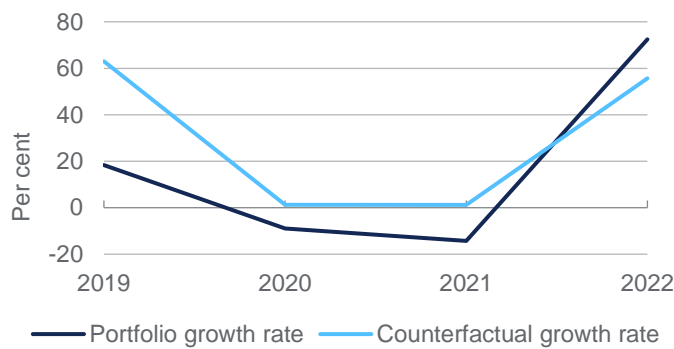


Figure 64: Founders (>50% female) turnover median value (£m)

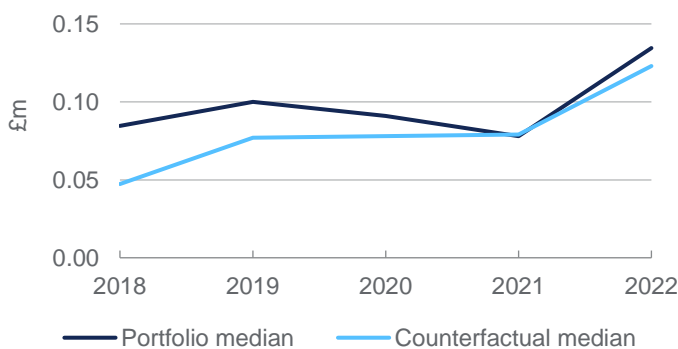


Figure 65: Founders (>50% female) average fundraisings growth rate

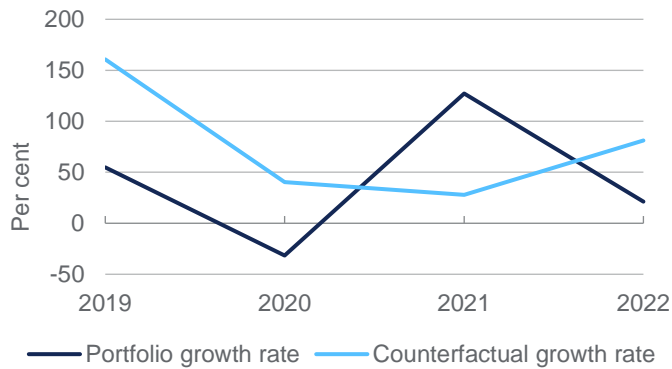


Figure 66: Founders (>50% female) average fundraisings value £m

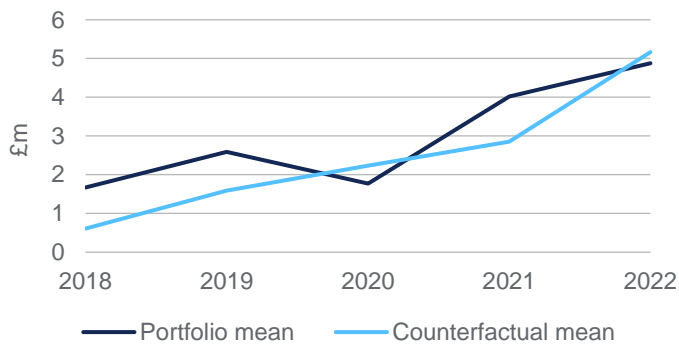


Figure 67: Key People (>50% female) turnover median growth rate

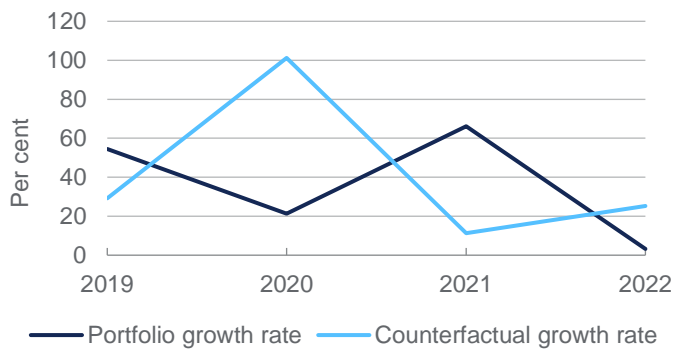


Figure 68: Key People (>50% female) turnover median value (£m)

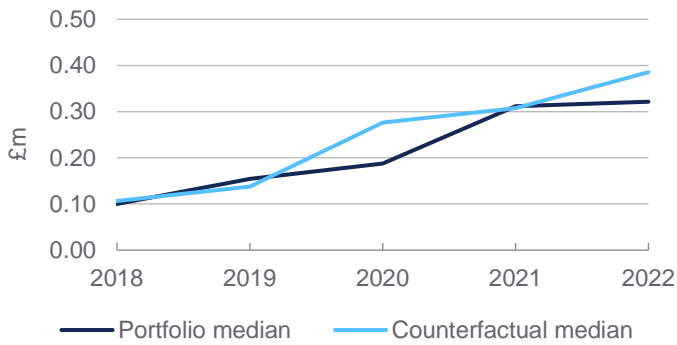


Figure 69: Key People (>50% female) average fundraisings growth rate

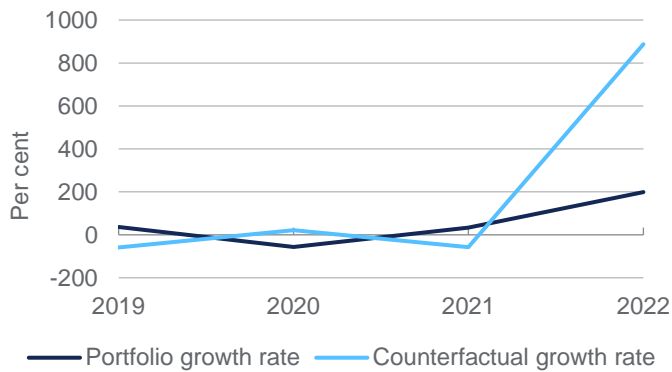
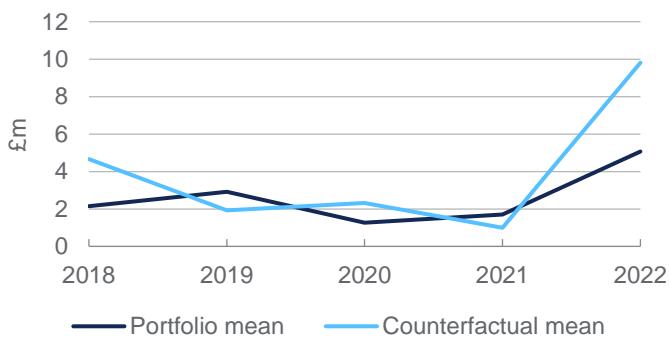


Figure 70: Key People (>50% female) average fundraisings value (£m)



A.5 Turnover trend is similar to the aggregate across all loan size clusters

The comparison of loan size required an analogue comparator in the counterfactual group of firms, where the amount fundraised in 2020 was used as an approximation. The comparison was of firms that raised similar levels of finance in 2020. However, the results are in the same locus as in the aggregate case. This is partly explained by the significant pre-filtering and further controls through the matching, comparing like-for-like firms.

Turnover growth again emulates the trend in the aggregate with a lower relative portfolio growth performance in both 2021 and 2022, for the portfolio firms who drew down less than £250k through the Future Fund (Government loan amount only, not matched) as well as those who drew down >£1m through the Future Fund.

The relative performance in fundraising for the portfolio firms showed higher relative growth in 2021 and lower relative growth in 2022, compared to the counterfactual. For portfolio firms that had raised less than £250k through the Future Fund, 2022 fundraisings showed a growth rate of 28% (still below the 56% growth for the counterfactual), whereas the portfolio firms that raised more than £1m experienced a contraction in growth in 2022. This compares to the counterfactual groups in those clusters that grew.

Figure 71: Loan size (<£250k) turnover median growth rate

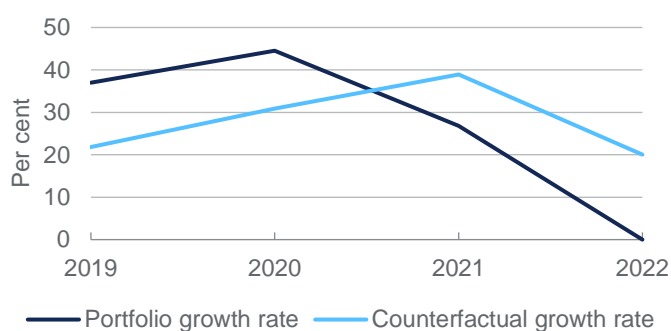


Figure 72: Loan size (<£250k) turnover median value (£m)

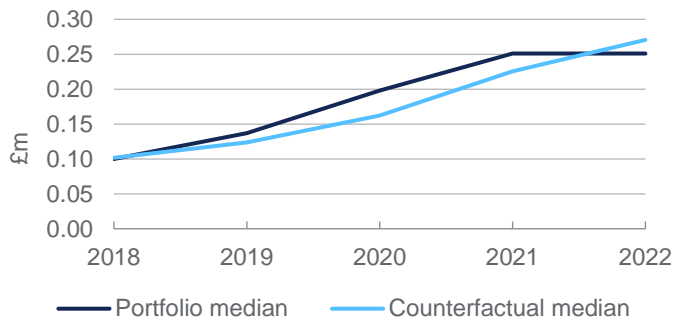


Figure 73: Loan size (<£250k) average fundraisings growth rate

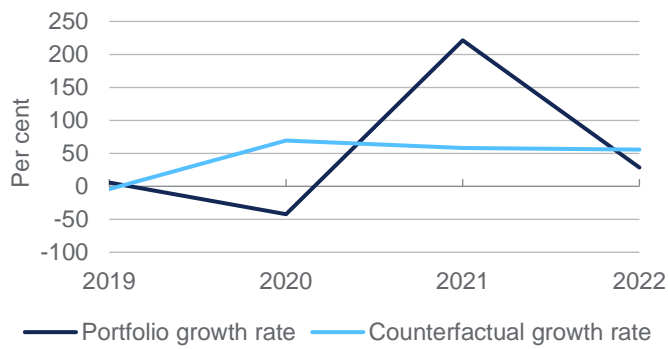


Figure 74: Loan size (<£250k) average fundraisings value (£m)

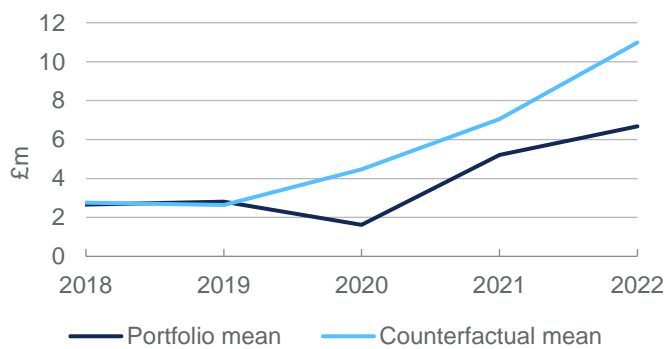


Figure 75: Loan size (> £1m) turnover median growth rate

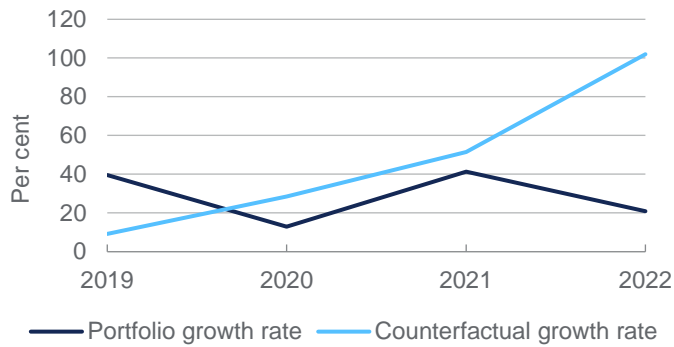


Figure 76: Loan size (> £1m) turnover median value (£m)

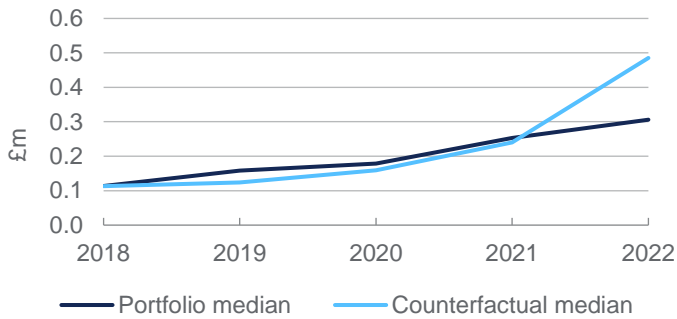


Figure 77: Loan size (> £1m) average fundraisings growth rate

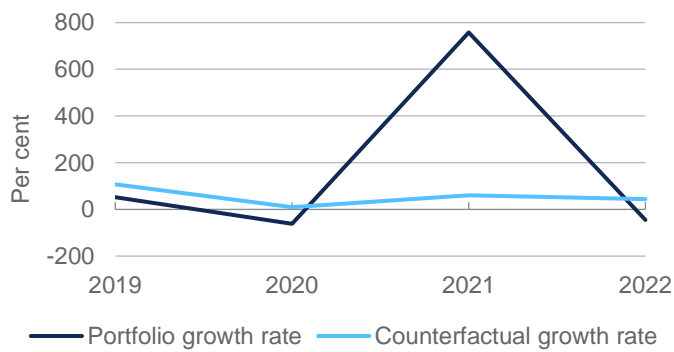
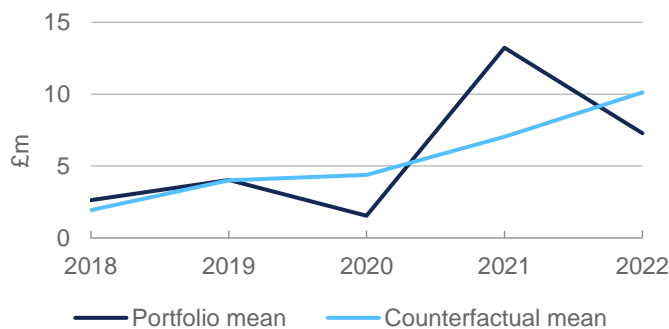


Figure 78: Loan size (> £1m) average fundraisings value (£m)



A.6 Medium company size trend insight constricted by low n

Figure 79 and Figure 81 are constricted by low “n” (portfolio = 28 firms, counterfactual = 18 firms). This is unsurprisingly given the scheme was designed to support early-stage firms. Company size can serve as a proxy for stage of development, with firms that employ a larger workforce typically having larger business operations. It is likely that this effect has been partially controlled for in the matching process. No firms had employees above 250.

Figure 79: Company size “medium” turnover median growth rate

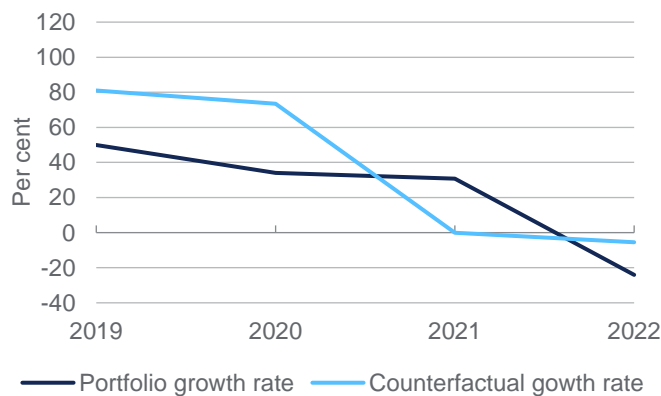


Figure 80: Company size “medium” turnover median value (£m)

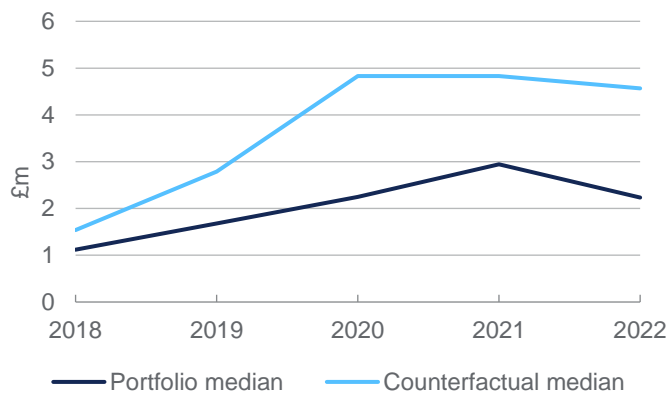


Figure 81: Company size “medium” average fundraisings growth rate

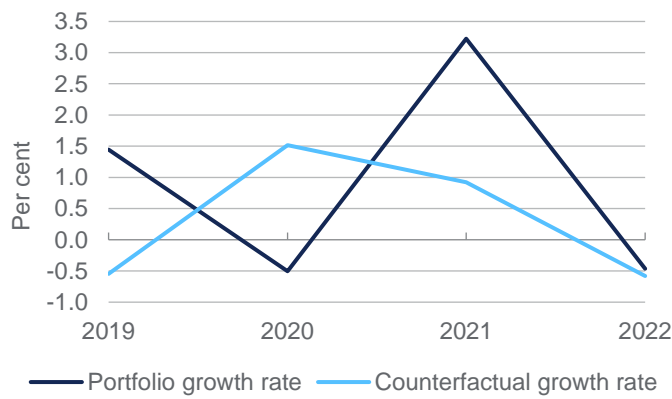
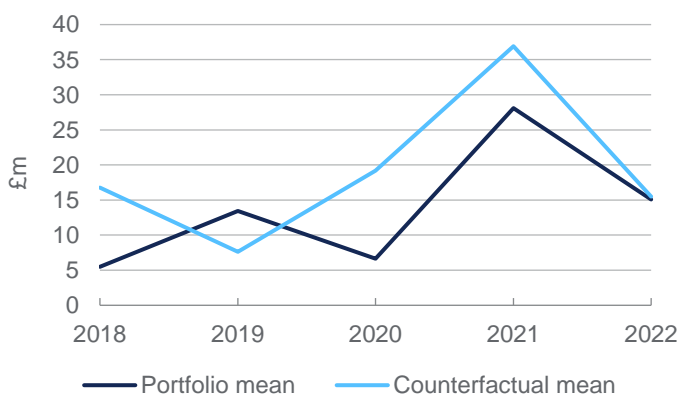


Figure 82: Company size “medium” average fundraisings value (£m)



A.7 Year 1 counterfactual group triangulation to retroactive counterfactual – similar business survival stories

Figure 83 to Figure 86 show the business survivability charts described by the “Companies House status” and “Current stage of evolution” using the counterfactual group drawn within the Year 1 report. The latest data snapshot from Beauhurst was used to resample the counterfactual group, with the aim of triangulating the results in section 5. However, the counterfactual in this instance is based on filters applied on a MI data extract that is one-year old. Compared to a year ago, the characteristics of the portfolio group only marginally differed. The results again signal marginally better survivability prospects within the counterfactual group, however, are more closely aligned than in the results from the retroactive counterfactual comparison above (section 5). Active firms across both groups are 93% to 97% in the portfolio and counterfactual groups respectively.

Figure 83: Portfolio firms’ business status

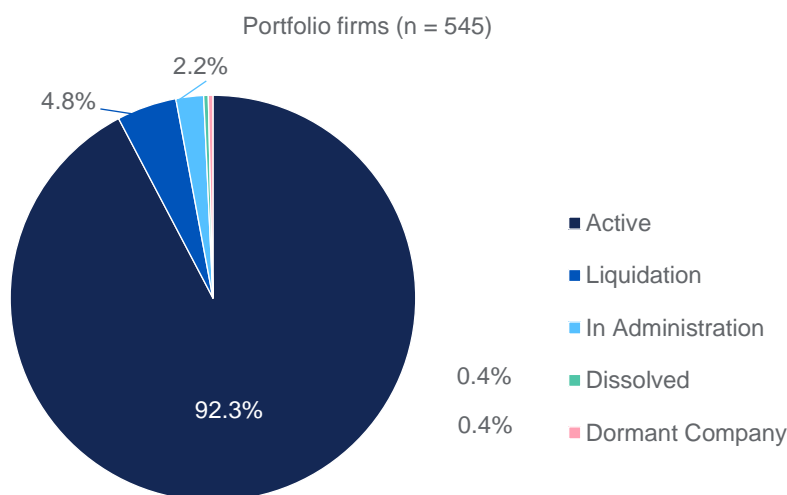


Figure 84: Counterfactual firms' business status

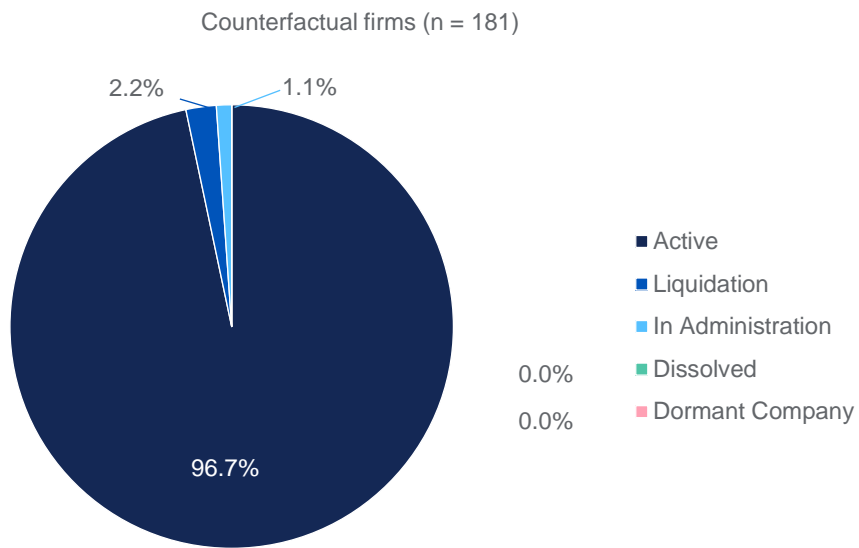


Figure 85: Portfolio firms' stage of evolution

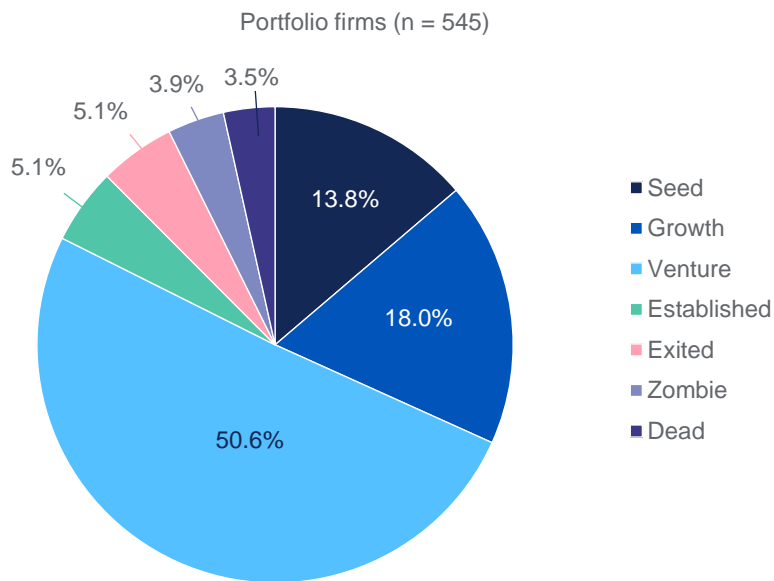
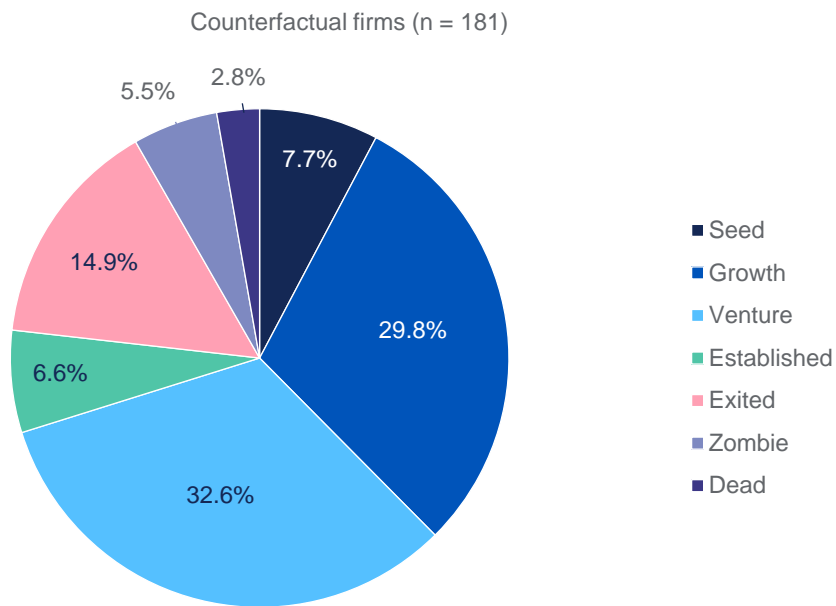


Figure 86: Counterfactual firms' stage of evolution

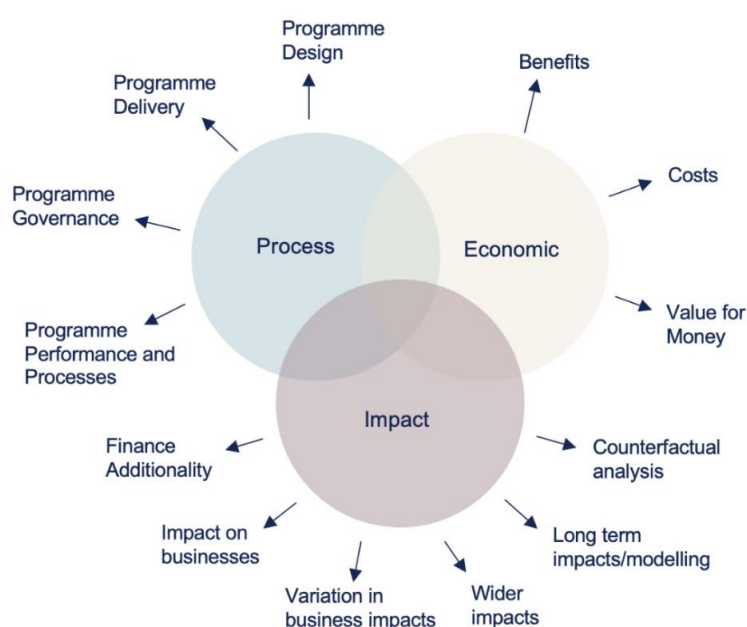


Annex B: Evaluation questions

The study

The aims of the evaluation are to conduct a process, impact, and economic evaluation to determine whether the programme has been successful in meeting its objectives and is likely to offer His Majesty's Government (HMG) VfM. The purpose of this early-stage evaluation is to understand if the objectives of the Future Fund were achieved with key research questions split into process, impact, and economic evaluation strands:

Figure 87: Key study areas and assessment outcomes for the evaluation.



The evaluation will address 22 research questions which are split between process evaluation and impact evaluation as well as more detailed sub questions which are organised under each of these headline questions (see below).

Programme design

How effective was the programme design in increasing the availability of finance for equity backed companies in the target group affected by Covid-19?

- Did programme design successfully mobilise private sector capital alongside HMG's investment?
- Was the programme design successful in generating sufficient demand from investors?

To what extent has Future Fund capital been used for the intended purpose?

- Has programme funding been used appropriately by companies and their investors in relation to; fraud, excessive risk taking, gaming of returns, etc.?

Programme delivery

How was the programme delivered?

- Was the programme established in sufficient time to respond to the immediate financing need?
- Were appropriate procurement procedures followed when appointing an agent to deliver the programme?
- Was the infrastructure in place to process the necessary volume of applications to desired timescales?
- Do businesses and investors have a positive experience of the application process and are applications processed in a timely manner.

Programme governance

How effective are the Future Fund processes and governance arrangements?

Programme performance

How is the programme performing in terms of its likely financial performance?

- What does the quality of the portfolio look like and how does it compare to the wider market of equity backed companies?
- Are CLA write-offs, repayments and conversions in line with expectations?

Additionality of finance

To what extent was the finance provided by the Future Fund additional?

- To what extent would recipient businesses have been able to raise finance in the absence of the programme?
- To what extent did the Fund displace funding by private sector managers in the market?
- To what extent did finance go to unviable companies, whom would have been unable to raise finance prior to Covid-19?
- To what extent did it not reach viable companies?

Impact of investment on businesses

How was the finance used by beneficiaries?

To what extent did the investment, unlocked by the Future Fund, impact on business survival in the short and long run?

To what extent did the investment, unlocked by the Fund, impact on employment and turnover levels in the short and long run?

What were the impacts of the programme on longer term business survival, growth and performance?

Long term impacts

What impact has the Future Fund had on recipient businesses in the longer run?

- Has the programme reduced the risk of recipients' long-term prospects being damaged?
- What long term growth outcomes have been achieved in terms of employment, turnover, and valuation?

To what extent were these outcomes additional?

- How did recipient businesses perform in the long run when compared to a suitable counterfactual group?

To what extent has the long-term pipeline of equity-backed companies been protected?

Costs

What were the administration costs of the programme?

What were the write-offs from the programme?

To what extent do write-offs align with expectations?

Benefits

What is the value of the economic activity saved by the programme?

What are the financial returns from repaid CLAs and successful exits?

What are the wider economic benefits in terms of supporting the wider equity eco-system?

VfM

Did the programme represent good VfM?

- Is the overall GVA saved and generated by Future Fund recipients greater than the economic cost of delivering the programme?

What was the overall exchequer impact of the Fund?

- Are Exchequer costs & returns within the range of British Business Bank & HMG expectations?
- Are there any lessons that could be applied to future programme appraisals?

Annex C: Future Fund eligibility criteria

Investor	Company
An “investment professional” within the meaning given to that term in article 19 of the (Financial Promotion) Order (FPO)	The company must have raised at least £250k in equity from third-party investors in previous funding rounds in the last five years (from 1 April 2015 to 19 April 2020, inclusive)
A high-net-worth company, unincorporated associated or high-value trust falling within article 49(2) of the FPO	If the company is a member of a corporate group, it must be the ultimate parent company
A “certified sophisticated investor” or a “self-certified sophisticated investor” within the meaning given in articles 50 and 50A respectively of the FPO	The company does not have any of its shares or other securities listed on a regulated market, a multilateral trading facility, a recognised investment exchange and/or any other similar market, stock exchange or listing venue
A “certified high net worth individual” within the meaning of article 48 of the FPO	The company must be a UK-incorporated limited company or be eligible to apply as a non-UK parent company (see specific eligibility criteria in the FAQs for non-UK parent companies)
An equivalent professional, high net worth, institutional or sophisticated investor in accordance with applicable law and regulation in such investor’s home jurisdiction	The company must have been incorporated on or before 31 December 2019 (or if it is a non-UK jurisdiction company, this criterion applies only to at least one UK subsidiary operating company)
An association of high net worth or sophisticated investors within the meaning of article 51 of the FPO	At least one of the following must be true for the company (this criterion applies to the group): (i) half or more employees are UK-

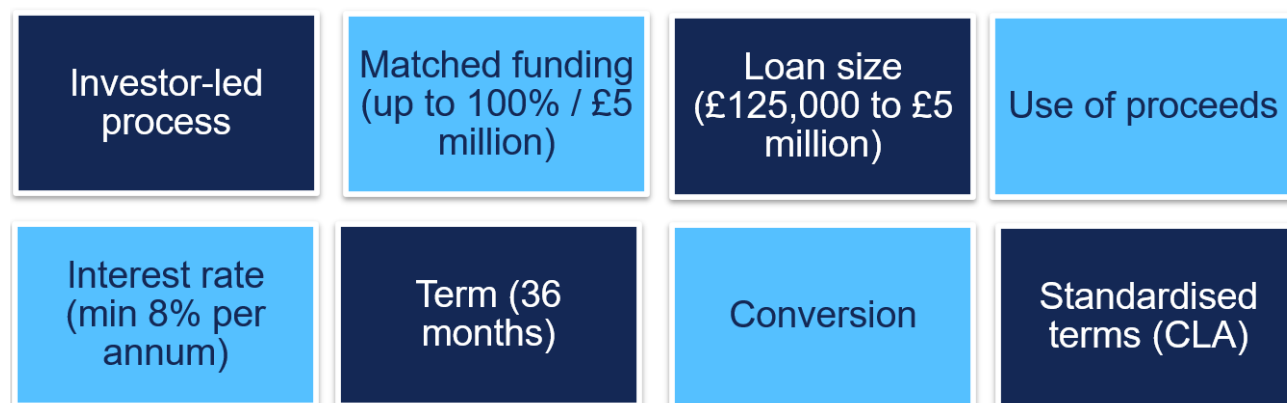
based; (ii) half or more revenues are from UK sales

Capable of being classified as a “professional client” within the meaning given in the glossary to the FCA Rules

Annex D: Overview of the scheme

The Future Fund was launched in May 2020 to support the UK's innovative businesses affected by Covid-19. These businesses had been unable to access other government support schemes due to either being pre-revenue or pre-profit - and typically rely on equity investment. The Fund was designed to be rolled out quickly, in order to immediately meet the needs of companies trying to raise finance during the pandemic.

Figure 88: Key features of the Future Fund



Investor led process – the investor is responsible for making the application to the British Business Bank.

Match funding – the Bank's investment must be matched by co-investment from private sector investors.

Use of proceeds – funding must not be used to (a) repay any borrowings; (b) pay any dividends; (c) pay any bonuses; (d) pay any advisory fees.

Interest rate – the loans have a minimum of 8% interest rate per annum or more and will accrue until the loan converts.

Term – the loan will mature after 36 months. The company cannot repay the loan early other than with the agreement of all the investors.

Conversion – the loans will convert into shares in the company in certain circumstances, including an exit or a new funding round.

Standardised terms - investors and the Bank both invest using a CLA instrument, which is predefined and cannot be negotiated.

Rules based application process – a loan is available provided investor meets the eligibility criteria and passes Anti-Money Laundering (AML) and Know Your Customer (KYC) checks.

Monitoring and reporting – daily monitoring and weekly reporting of progress on the scheme.

Roles:

HMT – responsible for setting the terms of the CLA instrument together with the scheme rules.

BEIS – responsible for assessing how the scheme could be implemented in a way that was consistent with the policy intent as well as consulting with industry representative groups on scheme mechanics. BEIS holds financial responsibility for the Future Fund as it sits on BEIS balance sheet.⁶⁴

British Business Bank – responsible for all the operational aspects and day-to-day decision making on the approval/rejection of applications, particularly those escalated for further consideration.

PwC – appointed as Future Fund delivery partner responsible for delivering the portal by which applications are made, due diligence checks, and ongoing dialogue with investors and companies on application information, supporting documentation and clarifications.

⁶⁴ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1036058/1210-APS-CCS0621807886-001_BEIS_ARA_20_21_Web.pdf

Annex E: Future Fund stated programme objectives.

	Objective
Short term (programme delivery to end of January 2021)	<ol style="list-style-type: none">1. Increase the supply of finance to potentially viable UK equity backed companies who would otherwise have had problems raising finance, or been underfunded, due to adverse market conditions.<ul style="list-style-type: none">• Programme set up and open for applications by end of May 2020.• Future Fund to make available at least £250m of funding for eligible companies by the end of September 2020. <hr/> <ol style="list-style-type: none">2. Recipients have a positive experience (e.g., speed, clarity and ease of the application process).<ul style="list-style-type: none">• Over 75% of SME recipients report they are satisfied with using the programme (based on basket of measures using existing survey questions at time of early assessment).• 90% of complete applications are processed within 21 days. 'Complete' is defined as where all the company, solicitor and investor information are present (including bank account and solicitor's confirmation) and the 'end point' is when the CLA is issued.
Medium term (during first 2-3 years of programme before	<hr/> <ol style="list-style-type: none">3. The fund is reducing the risk of business closures caused by potentially viable businesses running out of cash in the short run.<ul style="list-style-type: none">• The proportion of Future Fund recipient businesses that raise a subsequent equity round from external investors <hr/>

**CLAs are repaid/
converted)**

is similar to the wider market, with a lower incidence of company deaths.

4. To reduce the risk of companies' long-term prospects being damaged due to adverse economic conditions relating to Covid-19 (e.g., cuts to employment/ reductions in R&D and product development) and companies return to their long-term growth path once conditions stabilise.
 - Qualitative assessment of how programme funding is used by recipient company to offset negative impact of Covid-19 and to enable company to return to its long-term plan.
 - Quantitative assessment of company long-term growth rates in line with other equity backed companies.
-

**Long term (over the
life of the
investment)**

5. To help ensure the long-term pipeline of equity backed companies is not damaged due to adverse economic conditions relating to Covid-19.
 - Qualitative assessment of the health of UK early-stage equity eco-system, with input using Beauhurst data on number and % of equity deals at each stage. Pre-Covid (2019), the distribution of equity deal volume is 41%, 40% and 19% between seed, venture and growth stages respectively, although consideration of long-term decline in % of deals going to seed stage is needed.
-
6. Within the constraints of a standard set of eligibility criteria, to ensure that the funding provided is used for the purpose intended.
 - Qualitative assessment that programme funding is being used in an appropriate way by companies and their investors in relation to fraud, excessive risk taking, gaming of returns, etc. given the nature of the scheme where approval is based on a set of standard eligibility criteria. This will be considered on an ongoing basis.
-

-
7. The programme provides a net economic benefit to the wider economy.
- The NPV of additional GVA saved and generated by recipient businesses over the life of the programme should be greater than the economic cost of delivering the programme, so that overall economic welfare is increased.
 - Exchequer costs and returns are within the range of HMG and British Business Bank expectations detailed prior to launch and increased in line with budget.
-

Annex F: Year 2 Modelling Methodology

F.1 Introduction

In addition to the analysis provided, the approach taken in the Year 2 report also lays the data foundations for the Year 3 report. The methodology adopted in this report differs from that of the Year 1 report which focused on self-reported data from survey respondents. The sources used in this report to build a data frame included the Bank's MI data, Beauhurst, IDBR, and RSM Tracker (exports data). A further exploration of the Orbis and Beauhurst databases provided insight on R&D spending.

There were five distinct stages required to perform the data analysis within this study:

1. Data identification and sourcing
2. Data frame development
3. Hypothesis testing
4. Modelling
5. Data analysis on the modelled data set

The sections detailed below will cover the steps taken in developing the analysis.

F.2 Data identification and sourcing

The first step was to source the databases that housed data on the economic KPIs to be investigated.

Table 10 shows the KPIs and control variables that were identified with the corresponding database sources:

Table 10: KPIs, Matching covariates and Database sources

Outcome measure (KPI)		Data source
Business performance	GVA	IDBR – turnover, ONS – sectoral GVA

	Turnover (in thousands)	IDBR
	EBITDA	Beauhurst
	Employment	IDBR
	Business Survival	Beauhurst
	Exports	RSM Tracker (in-house data source linked to the Company House)
	Fundraisings (post Future Fund)	Beauhurst
	Business Valuation/ valuation ratio	Beauhurst
Business features	Latest credit rating ⁶⁵	Beauhurst
	Company house status	Beauhurst
	Overall Covid-19 status ⁶⁶	Beauhurst
	Current stage of evolution	Beauhurst

⁶⁵ This was the only available rating provided by Beauhurst and is likely to be a mix of pre/ post Future Fund finance. This is a limitation to using this covariate in the matching where Portfolio and counterfactual firms would likely have similar credit ratings pre-financing.

⁶⁶ Beauhurst assigns "COVID-19 impact tags" to all companies within its purview based on the perceived effect of the pandemic on their operations. These tags are determined by the information collected from company websites, social media platforms, and in-house analysis of how lockdown rules, regulations, and the economic climate may have influenced each business. The tags, which can vary in number for each company, span a spectrum from temporary cessation of operations to fundamental business model changes, and once assigned, an algorithm calculates the company's current and overall COVID-19 statuses, reflecting potential impacts and the company's response over time. For detail, please visit: <https://www.beauhurst.com/>

Furlough scheme participation	Beauhurst
Total Fundraising since incorporation	Beauhurst
Company age	Beauhurst
Buzzwords according to Beauhurst definition	Beauhurst
Number of grants received by the companies	Beauhurst
High growth list	Beauhurst
Accelerator programme participation	Beauhurst
Sectors according to Beauhurst definition	Beauhurst
Target markets	Beauhurst
Tracking reasons	Beauhurst
SME Status	Beauhurst
Director gender balance	Beauhurst
Founder gender balance	Beauhurst
Key people gender balance	Beauhurst

BBLS, CBILS, RLS indicator per firm	British Business Bank
Indicator variable for portfolio firms	British Business Bank

IDBR

The IDBR contains a list of UK businesses that is used by the government for statistical purposes. It covers approximately 2.7m businesses across all sectors of the economy. The advantage of using IDBR data is its timeliness. With a lag of only 6 months (the March data snapshot is available from late September/early October of the same year). The turnover data in IDBR comes directly from HMRC VAT data rather than being self-reported as was the case in the Year 1 report.

At the time of drawing a sample from the IDBR, RSM didn't have a designated SRS secure data space to access the disclosive data from the register. A data request was sent to the data team within BEIS (now DBT) through the Bank. The form completed and reviewed with the client team was the "Contractor MRP access form" for the ONS where details were provided on where and how we were to access the disclosive data.

In addition to this, we also provided filters that were to be applied to the register in order to streamline our sample in-line with funded firms. These filters were derived by taking ranges calculated from a set of funded firms from the MI data. Ranges were calculated for turnover, employee numbers, SIC group to apply to the IDBR data frame. In order to not constrict the sample, we only applied these filters to a 2018 anchor year and let the variables vary post 2018. We also separated out any firms that showed up in the database as having received Future Fund finance (treatment group) – using the CRNs taken from the MI data.

Once the filters had been confirmed and applied, data extracts were provided by the DBT data team per year (2017 through to 2022) on all variables incl. of CRNs (Company Reference Numbers). These were shared over an egress workspace where once downloaded, the data was destroyed from the egress workspace. We then proceeded to save the data on our approved servers and password protected the data files.

Beauhurst

The data from Beauhurst is available through the platform. The platform offers over 400 filtering options, allowing users to narrow down the range of 80k+ early-stage firms. This enabled us to select the only the range of data that were aligned with the characteristics of the portfolio group. This was important in selecting the counterfactual sample and appropriate filters were applied on the portfolio firm characteristics, which emulated a mix of the eligibility criteria and MI data analysis. See Table 11 for the detail of the filters. The prefiltering served the purpose of adding an additional layer of having a pre-matched sample that was as like-for-like as possible based on filtering limitations, meaning that any limitations in the later matching exercise could be mitigated but still have an appropriately prefiltered dataset as a baseline.

Table 11: Beauhurst filters applied to draw a counterfactual group of firms.

The most recent of the financial statement match all the following criteria:

Number of employees are between 1 – 249

Turnover is between £1 – £24,999,999

Current stage of evolution is one of Seed, Venture, Growth or Established

Registered address location is United Kingdom

Incorporation date (Companies House) is on or before 31st Dec 2019

Name does not contain PLC

Any of their fundraisings match all the following criteria:

Form of funding is any of Equity

Name of funder is not Future Fund

Amount raised is at least £250,000 from any number of rounds

Date of fundraising is from 01/04/2015 to 19/04/2020

RSM Tracker

RSM Tracker was used to source data where data was available. The export data is sourced from Companies House. However, the total number of observations in this case was only 68 to 117, which limited the inference that can be drawn on international competitiveness. In any case it is unlikely for portfolio firms to be engaging in international trade. These activities are usually associated with a larger firm profile.

Data availability remains a limitation

Although it was possible to locate the relevant variables for the data frame, however it is important to note that not all variables had complete datasets. This became particularly relevant during the modelling stage when conducting the propensity score matching exercise, as variables with limited observations had to be omitted. This will be covered in detail in section **F.5** below on Propensity Score Matching - Modelling.

For KPIs such as exports and EBITDA, figures were limited, especially in the most recent years where outturns are less likely due to data lags from the database. The focus of this assessment, however, was on fundraisings/follow-on funding.

F.3 Data frame development

Having sourced the data from various databases the next step was building the full data frame. This required data extraction from each database using the CRNs to ensure data per year was pulled together for the associated enterprises as classified in Companies House. Observations (firms) were discarded where full data wasn't available across the IDBR or Beauhurst datasets.

Additional variables were computed such as the indicator variable for portfolio firms (assigned a 1) and counterfactual firms (assigned a 0) within the combined data frame. This was required for the propensity score matching exercise. Another additional variable was created, which was *the number of days since incorporation*; this variable simply denotes the company's age such that it becomes a continuous variable. Firm-level data for the date of incorporation was provided by Beauhurst. The variable was transformed by calculating the number of days since incorporation until December 31, 2019, the year before the intervention of Future Fund.

There was not a consistent number of observations across all years due to fluctuations in the number of firms captured by the Beauhurst and IDBR database for each year. Table 12

indicates the number of observations (firms) available for each year after combining data from both IDBR and Beauhurst datasets:

Table 12: Total number of firms per year that had data across both IDBR and Beauhurst

	Portfolio	Counterfactual
2018	850	1,391
2019	967	1,534
2020	958	1,534
2021	953	1,534
2022	950	1,534

Data transformations

A logarithmic transformation was applied to all continuous variables (except for employee counts).⁶⁷ This was performed due to the properties of a log function smoothing out series that show large differentials in level terms. Specifically, it reduced the variance fluctuation across observations, which was often caused by extreme values in the dataset, and addressed some of the skewed covariates in the data frame. It was also employed to improve the symmetric distribution of these data. It also supports the interpretation of the coefficients as the log function converts level changes to percent changes, which provides an easier comparison.

Employee counts were not transformed due to the low variation in the levels.

To avoid undefined values resulting from taking the logarithm of zero, 0.01 was added to all continuous observations before the logarithmic transformation was performed.

⁶⁷ The continuous variables that were included consisted of employees in 2019, turnover in 2019, latest credit rating figures as of early 2023 (at the time of downloading the data), total amount of funds raised by firms since incorporation as of early 2023 (at the time of downloading the data), and the number of days since incorporation (i.e., company age).

F.4 Hypothesis and sample testing

When combining the dataset extracted from IDBR and Beauhurst, firms were matched using their 'CRNs', and those that didn't have data across both datasets were discarded. However, it was recognised that this approach posed potential problems.

Firstly, discarding observations might compromise the representativeness of the population of firms (the portfolio group). Secondly, the omission of certain observations by these databases might have been due to structural reasons. For instance, if one database provided information on only firms that achieved a minimum level of turnover/revenue, omitting those firms below that level would mean that the remaining sample would likely show skewness and potential for bias.⁶⁸

To test for potential bias a two-sample t-test (i.e., mean comparison test or Welch two-sample t-test) was used to assess whether the omitted sample – those observations that did not exist in either IDBR or Beauhurst – were statistically different from the remaining sample found in both datasets.

The hypothesis test was conducted on a range of covariates that were taken from the MI dataset, to ensure that there was sufficient evidence to conclude whether the samples omitted from either IDBR or Beauhurst databases were structurally different from the samples found in both databases – so tests were performed across several KPIs and characteristics.

The below is the list of variables drawn from the MI data provided by the Bank:

⁶⁸ The propensity score matching has broadly corrected for the omission bias of the portfolio and counterfactual firms, given characteristics are controlled to ensure a like-for-like comparison is conducted on the remaining sample. This may not completely represent the full population, however and in general good practice, it is vital to be as representative as possible.

Table 13: Variables from MI dataset

Variables
Business Investment Stage
Loan amount provided by government
Gross Investment Amount
Lead Business Contact Number of Employees this year
Last year revenue unchanged from Future Fund inception
Total revenue for the financial year ending December 2020
Number of Employees Quarter end June 22
Revenue Quarter end June 22
Revenue Year to June 22
EBITDA Quarter end in June 22
EBITDA Year to June 22

The results were discussed with the Department for Business and Trade (DBT) and were concluded not statistically different from the data frame sample.

In summary, despite the reduced sample size of the portfolio firms, the remaining sample in the data frame were likely to be representative.

The description below outlines the detail of the **two** mean-comparison tests conducted:

Test 1: Testing the means of firms that exist in the IDBR database

There were **1055** portfolio companies that were extracted from the IDBR database matched via the CRNs. **134** portfolio companies did not appear in the IDBR database. The MI data was used to determine significance.

The output provided is the result of a Welch two-sample t-test, which is used to determine whether there is a statistically significant difference in means between two independent samples with respect to a variable of interest. Note the null hypothesis is that there is no difference in means between the two samples.

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{se_1^2 + se_2^2}}$$

where \bar{X}_1 and \bar{X}_2 are the sample means of the two datasets for comparison and se_1 and se_2 the standard errors of the sample mean.

Overall, the results of the t-test indicate that **the null hypothesis that the two samples (data found in the IDBR versus the full dataset from the MI) are the same, cannot be rejected at a 95% confidence level – across all covariates tested.** It can be concluded that the omission of firms from the IDBR database is unlikely to distort the sample.

As an additional visual check, the distribution of the business investment stage for the two samples was drawn. This provides insight into whether the two samples have similar composition based on at which stage of investment they are classed in. This will proxy for factors such as the types of investors, the amounts invested, the resources available to the firms, the associated risks, and their growth potential. Having a similar distribution in the business investment stage variable across the two sample sizes indicates that both samples can be compared with a degree of confidence.

The detail of the results of Test 1 are tabulated as follow:

Table 14: Descriptive statistics

Variables taken from Management Information	Number of firms	Max	Min	Mean	Median
Loan amount provided by government	1,055	5,000,000	125,000	959,219	492,500
	134	5,000,000	125,000	927,741	460,000
Gross Investment Amount	1,055	14,236,785	250,000	1,939,515	985,000
	134	10,116,850	250,000	1,863,816	920,000
Last year revenue unchanged from FF inception	1,055	110,000,000	-69,282	1,999,341	357,445
	134	33,000,000	3	1,770,150	586,256
Total revenue for financial year ending Dec 2020	1,055	64,394,622	-121,280	2,366,107	440,942
	134	30,520,457	1	2,114,543	659,810
Revenue Q end Jun22	1,055	31,608,370	-55,310	665,961	95,284
	134	16,905,621	0	619,028	94,000
	1,055	105,331,857	0	2,660,316	477,056

Revenue Year to Jun 22	134	35,483,514	0	2,297,125	467,506
Number of Employees Q end Jun22	1,055	768	0	30	12
	134	448	0	28	13
Lead Business Contact Number of Employees this year	1,055	605	1	24	11
	134	220	1	23	12
EBITDA Q end Jun22	1,055	5,080,615	-11,979,646	-489,379	-179,176
	134	3,410,015	-10,745,000	-505,785	-166,373
EBITDA Year to Jun 22	1,055	13,011,974	-43,541,059	-1,846,263	-813,802
	134	4,528,022	-29,154,891	-1,803,300	-832,946

Table 15: Welch two-sample t-test

Variables taken from Management Information	P-value	Conclusion (H₀: there is no difference in means between the two samples)
Loan amount provided by government	0.7735	Fail to reject the H ₀ . No statistical significance that the two samples tend towards differing population means.
Gross Investment Amount	0.7315	Fail to reject the H ₀ . No statistical significance that the two samples tend towards differing population means.
Last year revenue unchanged from FF inception	0.6822	Fail to reject the H ₀ . No statistical significance that the two samples tend towards differing population means.
Total revenue for financial year ending Dec 2020	0.7213	Fail to reject the H ₀ . No statistical significance that the two samples tend towards differing population means.
Revenue Q end Jun22	0.7892	Fail to reject the H ₀ . No statistical significance that the two samples tend towards differing population means.
Revenue Year to Jun 22	0.4966	Fail to reject the H ₀ . No statistical significance that the two samples tend towards differing population means.

Number of Employees Q end Jun22	0.6163	Fail to reject the H ₀ . No statistical significance that the two samples tend towards differing population means.
Lead Business Contact Number of Employees this year	0.8245	Fail to reject the H ₀ . No statistical significance that the two samples tend towards differing population means.
EBITDA Q end Jun22	0.8892	Fail to reject the H ₀ . No statistical significance that the two samples tend towards differing population means.
EBITDA Year to Jun 22	0.9002	Fail to reject the H ₀ . No statistical significance that the two samples tend towards differing population means.

Table 16: Comparison of distributions by Business Investment Stage

Business Investment Stage	N = 1055	N = 134
Bridge Financing	38	2
Early Stage	541	65
Expansion/Growth Capital	184	24
Later Stage VC	101	13
Seed	99	12
Start-up	65	12
N/A	27	6

Figure 89: Histogram showing the distribution by business investment stage for firms included within the IDBR

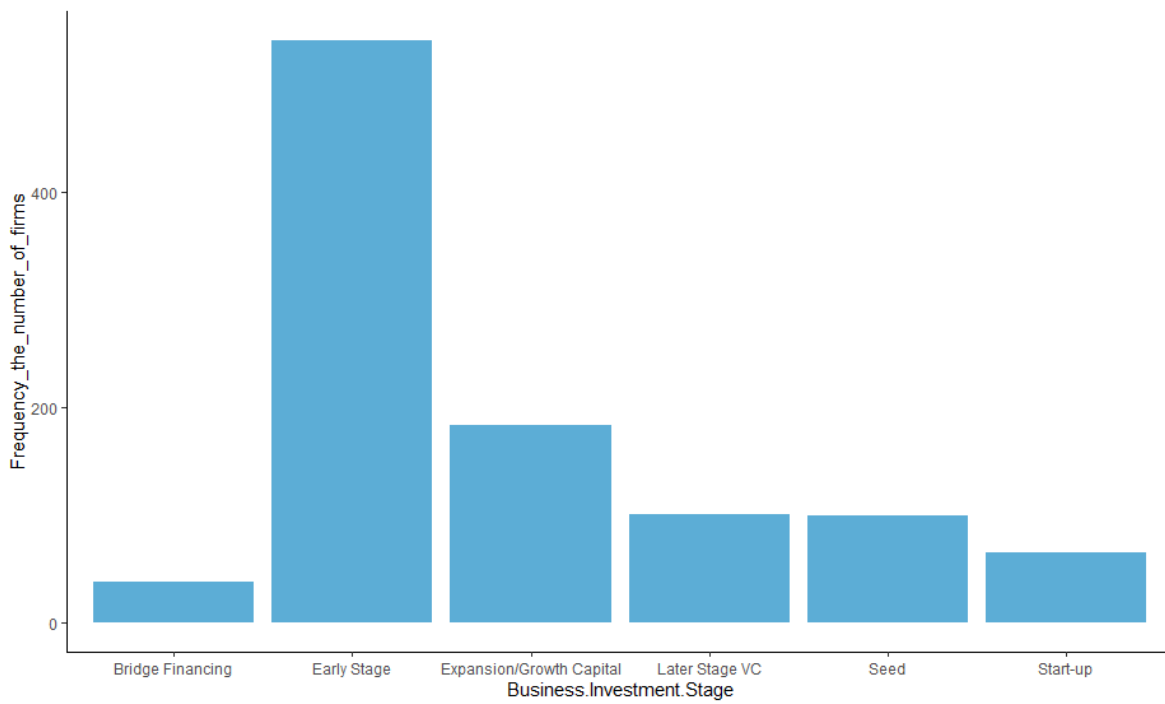
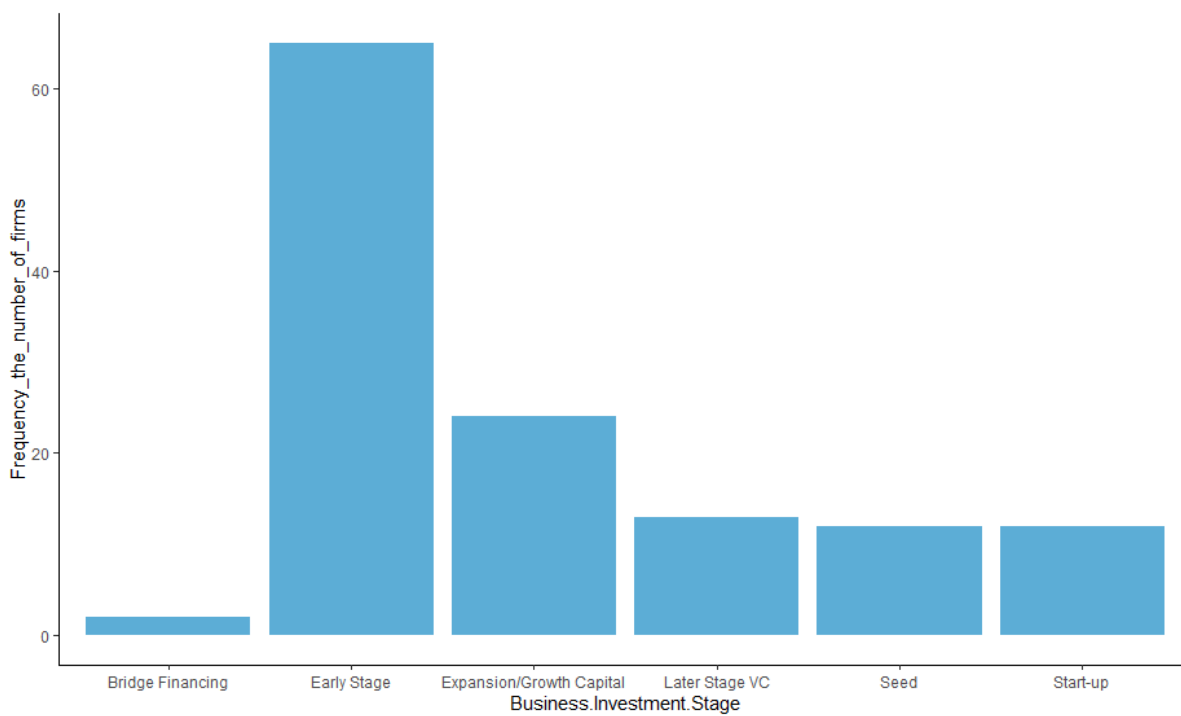


Figure 90: Histogram showing the distribution by business investment stage for firms not included within the IDBR



Test 2: Testing the means of firms that exist in the IDBR database and the Beauhurst databases

To build the data frame for the portfolio firms, ideally all 1189 portfolio firms would have been found in both IDBR and Beauhurst. However, there were missing data due to some observations being omitted from the either one or both databases. If an observation was missing in either database, it was not included in building the data frame. To confirm that the remaining observations in both databases were structurally similar to the sample of data being omitted i.e., that any missing observations were random, a second round of two-sample t-tests were conducted as a cross-check.

There were **967** portfolio companies that were extracted from the IDBR and Beauhurst database matched via the CRNs. **222** portfolio companies did not appear in the either one of the IDBR or Beauhurst.

Overall, it can be concluded from the hypothesis test that **the two data sets are not significantly different from each other at the 95% level of significance**. However, in one instance the null was rejected at a 95% level of significance for the covariate “Revenue Year to Jun 22”. This result states that the two samples are likely to differ.

The detail of the results of Test 2 are tabulated as follow:

Table 17: Descriptive statistics

Variables taken from Management Information	Number of firms	Max	Min	Mean	Median
Loan amount provided by government	967	5,000,000	125,000	946,337	475,000
	222	5,000,000	125,000	998,933	500,000
Gross Investment Amount	967	14,236,785	250,000	1,915,656	950,000
	222	10,116,850	250,000	2,002,990	1,000,000
Last year revenue unchanged from FF inception	967	110,000,000	-69,282	2,083,462	351,983
	222	33,000,000	3	1,495,848	480,422
Total revenue for financial year ending Dec 2020	967	64,394,622	-121,280	2,496,236	444,816
	222	30,520,457	1	1,597,640	513,809
Revenue Q end Jun22	967	31,608,370	-55,310	697,454	97,533
	222	16,905,621	0	503,018	92,251
Revenue Year to Jun 22	967	105,331,857	0	2,787,807	477,252
	222	35,483,514	0	1,894,331	460,704

Lead Business	967	605	1	23.91	11.50
Contact Number of Employees this year	222	221	1	23.9	11
Number of Employees Q end Jun22	967	768.00	0	31.23	12
	222	448.00	0	25.93	11.5
EBITDA Q end Jun22	967	5,080,615	-1,1979,646	-493,400	-178,522
	222	3,410,015	-10,745,000	-483,697	-178,316
EBITDA Year to Jun 22	967	1,301,1974	-43,541,059	-1,846,220	-794,647
	222	4,528,022	-29,154,891	-1,825,000	-894,960

Table 18: Two sample t-test

Variables taken from Management Information	P-value	Conclusion (H₀: there is no difference in means between the two samples)
Loan amount provided by government	0.5678	Fail to reject the H ₀ . No statistical significance that the two samples tend towards differing population means.
Gross Investment Amount	0.6379	Fail to reject the H ₀ . No statistical significance that the two samples tend towards differing population means.
Last year revenue unchanged from FF inception	0.1723	Fail to reject the H ₀ . No statistical significance that the two samples tend towards differing population means.
Total revenue for financial year ending Dec 2020	0.0816	Fail to reject the H ₀ . No statistical significance that the two samples tend towards differing population means.
Revenue Q end Jun22	0.1312	Fail to reject the H ₀ . No statistical significance that the two samples tend towards differing population means.
Revenue Year to Jun 22	0.03525	Reject the H ₀ . It is statistical significance that the two samples tend towards differing population means.
Lead Business Contact Number of Employees this year	0.9993	Fail to reject the H ₀ . No statistical significance that the two samples tend towards differing population means.
Number of Employees Q end Jun22	0.1328	Fail to reject the H ₀ . No statistical significance that the two samples tend towards differing population means.

EBITDA Q end Jun22	0.9103	Fail to reject the H ₀ . No statistical significance that the two samples tend towards differing population means.
EBITDA Year to Jun 22	0.9345	Fail to reject the H ₀ . No statistical significance that the two samples tend towards differing population means.

Table 19: Comparison of distributions by Business Investment Stage

Business Investment Stage	N = 967	N = 222
Bridge Financing	34	6
Early Stage	494	112
Expansion/Growth Capital	168	40
Later Stage VC	90	24
Seed	92	19
Start-up	64	13
N/A	25	8

Figure 91: Histogram showing the distribution by business investment stage for firms containing in IDBR & BH

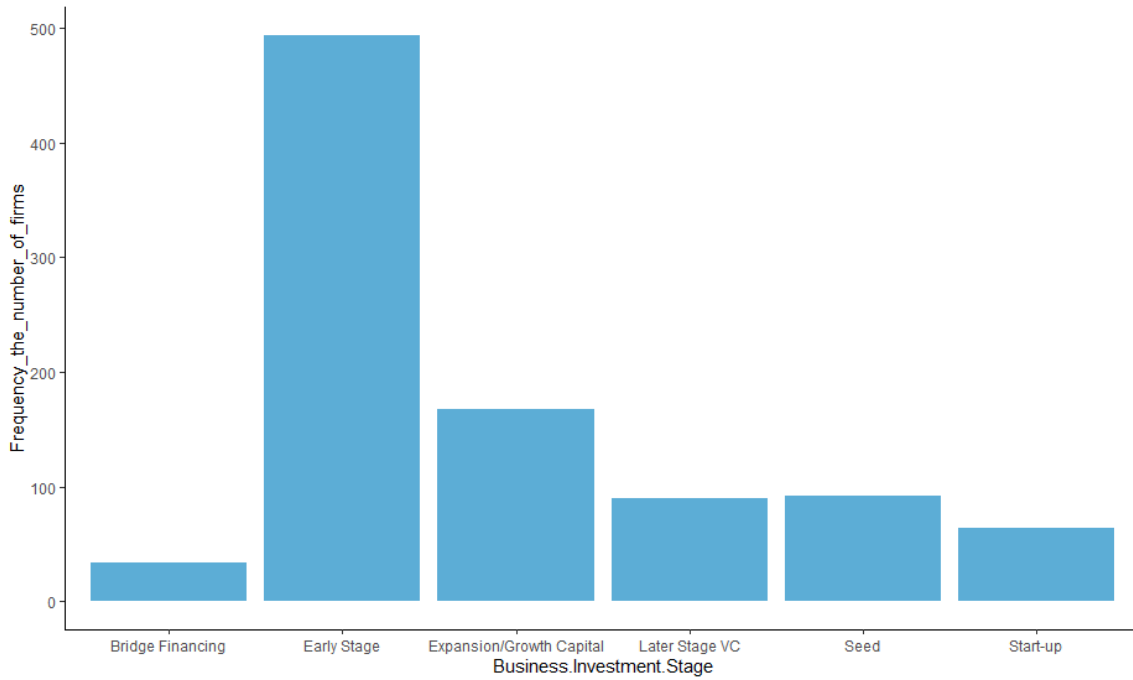
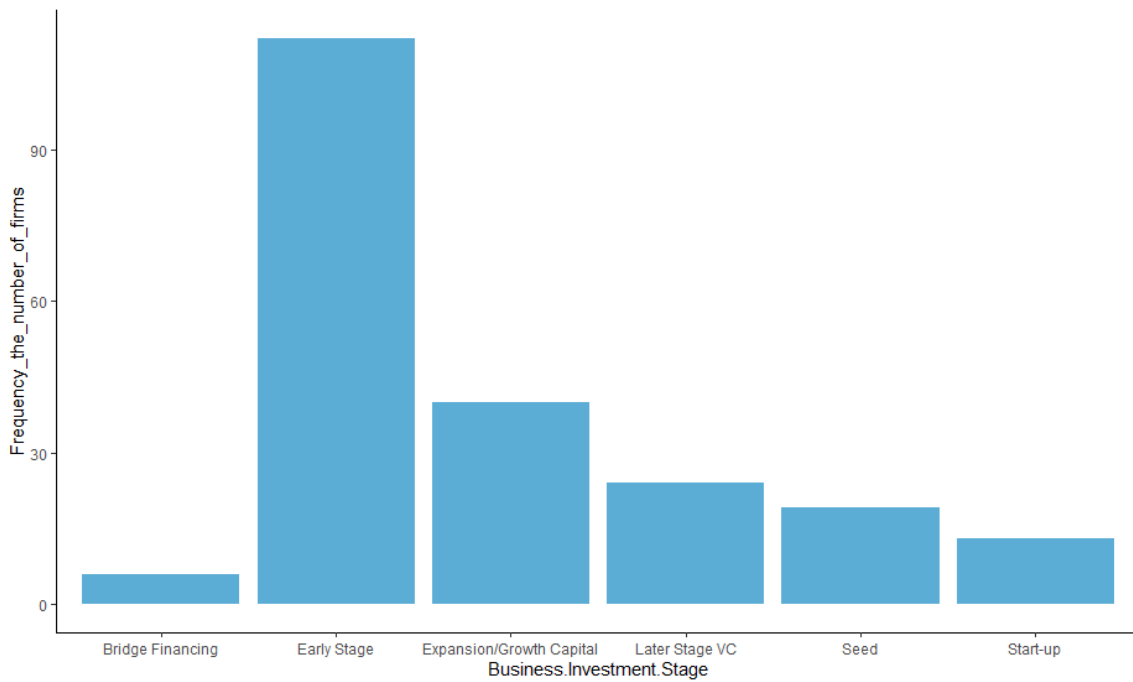


Figure 92: Histogram showing the distribution by business investment stage for firms excluded in IDBR & BH



F.5 PSM – Modelling

Variable selection

Following the data processing and transformation steps described above, the matching exercise commenced.

The first step was to test a specific model based on economic intuition regarding the covariates included within the matching specification. This model included the following covariates:

- Turnover (in thousands) in 2019
- Employee number in 2019
- Regions
- SIC 2007
- Total Fundraisings in 2019
- Latest credit rating
- Company house status
- Overall Covid-19 status
- Current stage of evolution
- Furlough scheme 2020
- Furlough scheme 2021
- Number of days since incorporation (i.e., company age)
- Buzzwords according to Beauhurst definition
- Sectors according to Beauhurst definition
- Number of Grant received by the companies
- High growth list 2019
- BBLS, CBILS, RLS

These observed variables were selected from the data frames based on their relevance in predicting whether a firm would be a recipient of Future Fund i.e., variables were included in the covariates if they were likely to contribute to this prediction.

Some of the selected variables were removed because they lacked variation.⁶⁹ Other variables, such as export and gender balance, were deemed relevant but were excluded due to poor data availability. Also note that all the not available (NA) values in the data frame had to be removed before conducting the matching exercise.

After removing them, 1517 counterfactuals and 920 portfolio firms remained before the matching exercise was conducted.

The model

The adopted technique was PSM, which is a method used to create a like-for-like comparator group of firms to the intervention group (Future Fund participants) based on their characteristics and traits. These are identified in section **F.1**.

The propensity scores⁷⁰ for each firm in the combined dataset were estimated using a probability function. A *probit* regression model was used to estimate the propensities. These scores were then used to match portfolio firms with counterfactual firms that had the closest score, ensuring a robust like-for-like comparison. In mathematical terms, the propensity scores would be estimated with the following probabilities for each individual firm selected in both the portfolio and counterfactual samples.

$$P(Y = 1|X) = \phi(\beta_0 + \beta_1 X)$$

where $\phi(\cdot)$ is the non-linear cumulative standard normal distribution function, and X is the features of the firms as detailed above.

Matching algorithm specification and selection criteria

A range of matching specifications can be applied such as nearest neighbour matching, calliper matching, optimal full matching, coarsened exact matching and so forth.⁷¹ Details of

⁶⁹ Please compare the above listed variables with

Table 10 for a list of variables that are not included in the matching exercise. The following variables are not included: SME Status, Director, Founder, Key people gender balance, Accelerator program participation, Tracking reasons, and Target markets. These variables are excluded either due to the lack of available data (i.e., NA) or the lack of variations.

⁷⁰ Propensity scores represent the likelihood of a firm receiving the Future Fund intervention, given its observed characteristics.

⁷¹ Nearest Neighbour Matching pairs treated units with the closest eligible control unit without optimising any criterion. Coarsened Exact Matching is a form of stratum matching. It involves creating bins for covariates and performing exact matching on the coarsened versions to balance exact and approximate matching. Optimal Full Matching assigns each treated and control unit to one subclass, minimising within-subclass distances to estimate a weighted treatment effect.

the matching specification choice were covered in Section 3.1.2 *Matching*, where a range of metrics evaluating the quality of matching balance showed that the calliper matching specification was the most suitable. The selection of calliper specification was based on the sample size of both groups and the covariate balance, which were the metrics that indicated the degree to which the distribution of covariates was similar across levels of the treatment. For details in covariate balance, refer to Table 20. The calliper matching was also used in Wilson and Kacer (2019) study that highlighted the importance of equity finance investment for economic development in the UK and identified persistent concerns of market failure in the provision of equity finance for high growth and technically innovative firms.⁷² **The matched sample size contains 504 portfolio firms and 235 counterfactual firms.** The lower number of counterfactual observations has also been driven in part by the choice to use matching with replacement. Allowing the model to match multiple portfolio firms to a counterfactual observation with a higher propensity score improves the quality of the match. This has reduced the counterfactual sample to under half that of the portfolio group, however.

Table 20: Matching specification

	Specification
Method	Nearest neighbour
Calliper	0.05 ⁷³
Ratio	1
Replacement	TRUE
Model	Probit

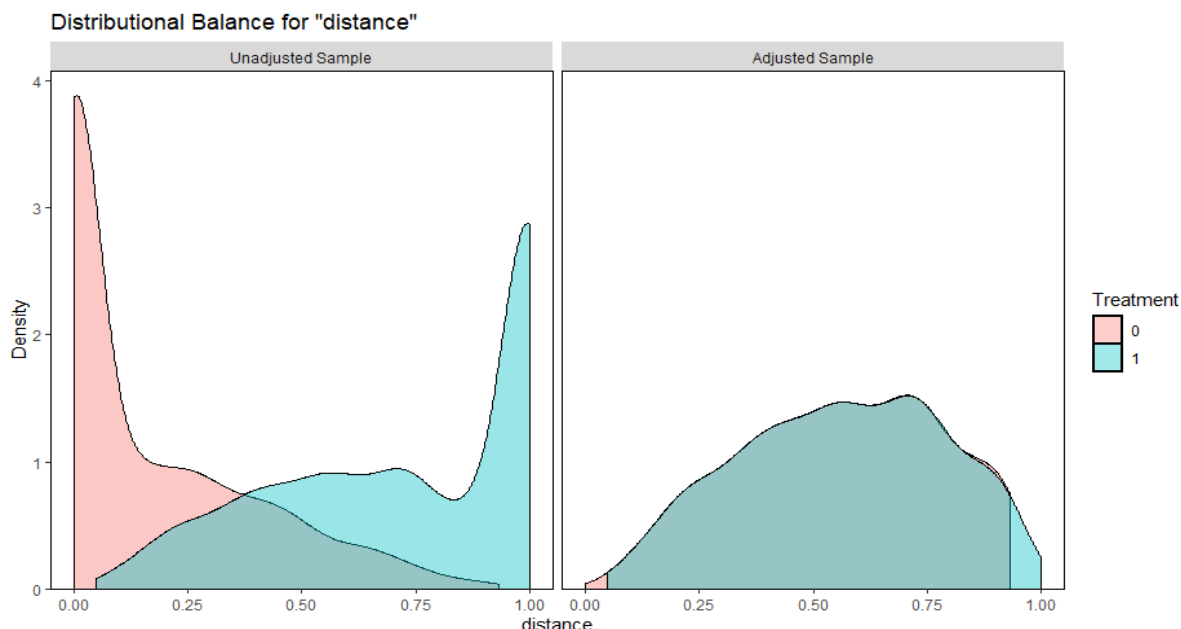
Calliper matching restricts the pairing of units based on a specified distance threshold, ensuring close matches on propensity score or other covariates. For more detail, please refer to the full list of available matching specifications and algorithms in MatchIt package, see Greifer, N. (2023) *Matching Methods*

⁷² Wilson, N. and Kacer, M. (2019). *Equity Finance and the UK Regions Understanding Regional Variations in the Supply and Demand of Equity and Growth Finance for Business*

⁷³ See Austin, P.C., 2011. Optimal calliper widths for propensity-score matching when estimating differences in means and differences in proportions in observational studies. *Pharmaceutical statistics*, 10(2), pp.150-161. It suggests the optimal calliper width should be obtained by multiplying the logit model standard deviation by 0.2. In the model presented in this report, the propensity score standard deviation of the logit model is 0.9. This, when multiplied by 0.2, is approximately 0.18. However, the plot of distributional balance for "distance" is showing misalignment. To achieve alignment of the two curves, the width was adjusted downwards to 0.05 for the plot to show alignment.

A graphical comparison of the distributional balance for before-and-after matching is presented in Figure 93:

Figure 93: Distributional Balance for "distance"



The neat alignment of both density curves after the matching indicates a strong matched sample. This shows that the distribution of covariates in the treatment group is similar to that of the counterfactual group, such that the two groups are comparable on observed covariates.

The detail of the covariate balance metrics⁷⁴ of the selected specification are shown below:

Table 21: Covariate balance

Metrics	Result
Number of variables whose Standardised Mean Difference higher than 0.05⁷⁵	214

⁷⁴ For details on the interpretation of other covariate balance metrics, visit Greifer, N. (2023) Assessing Balance, <https://cran.r-project.org/web/packages/MatchIt/vignettes/assessing-balance.html>

⁷⁵ The SMD is a measure of the difference in means of a covariate between the treatment and control groups, standardised by a standardisation factor to put it on the same scale for all covariates. A low absolute SMD means that the difference in means between the two groups is small relative to the variability of the covariate. For detail, visit Greifer, N. (2023) Assessing Balance [cran.r-project.org](https://cran.r-project.org/web/packages/MatchIt/vignettes/assessing-balance.html) & Austin, P. C. 2009. "Balance Diagnostics for Comparing the Distribution of Baseline Covariates Between Treatment Groups in Propensity-Score Matched Samples." *Statistics in Medicine* 28 (25): 3083–3107

Number of variables whose variance ratios +/- 1 from 1 (continuous variables only)	1
The mean of empirical CDF statistics	0.003962373
Remaining sample size	739 ⁷⁶

Overall, a matching specification based on the above criteria was chosen such that it had the minimal number of variables with Standardised Mean Differences (SMDs) above 0.05, variance ratios close to 1, and empirical cumulative density functions (eCDFs)⁷⁷ close to 0. The matched dataset was also restricted to a relatively small sample size, given the relatively stringent criteria for matching.

Despite the strong match, there are limitations to consider i.e., the removal of outliers which could unlock potential significant impact benefits of the combined portfolio group. These will likely fall outside the matched sample as we can see from the distributional balance Figure 93 above. Other variables which may have been omitted which we don't have data for could also provide some explanatory power, albeit given the number of covariates matched, this is likely limited.

F.6 Data analysis on the modelled data set

The matched data set comprised **504** portfolio firms and **235** counterfactual firms, totalling **739** observations. This number represents a reduction from the initial 1065 observations; this was because not all observations present in 2019, the anchor year when the matched modelling was conducted, were present in subsequent years.

⁷⁶ The total number of observations was 844. It was reduced to 739 because not every observation present in 2019 was also present in the rest of the year. See

Table 11.

⁷⁷ Empirical CDF Statistics involves comparing the empirical cumulative density functions (eCDFs) of different covariates between groups. This approach enables the evaluation of imbalance across the entire distribution of each covariate, in lieu of just its mean or variance. For detail, see Greifer, N. (2023) *Assessing Balance*

Each observation was assigned a weight.⁷⁸ The weight was used to adjust for differences in representativeness within the matched sample to control for the fact that some observations were more (or less) representative of the target population than others. All the key performance indicator data used in the analysis were adjusted for weights prior to calculating the median, median growth rate, and average shown in the main report.⁷⁹

Median statistics were primarily used throughout the report, with occasional use of the average to aid analysis. The median was chosen due to its advantages over the average when analysing business data. It is less influenced by outliers, which is especially relevant in this study where a few firms earned significantly more than the average. Therefore, the median provides a more representative measure of the sample sizes compared to the average, which can be skewed by extreme values.

An exception to the use of the median as the primary statistic was in the analysis of fundraising data. This was due to the prevalence of zero figures in the fundraising dataset, which would result in a median value being zero across the years, rendering it an unusable measurement for insights. To overcome this, average per year was chosen to analyse the trend of fundraising over time. To avoid the skewing effect of the large cluster of zero values on the mean, observations with zero values were excluded and only non-zero observations were considered when computing the average.

⁷⁸ The weights were calculated in *R* as a result of 'stratification', by which multiple strata were created between zero and one. Observations were assigned to respective stratum based on the corresponding propensity score, which is also between zero and one. Some strata would have contained relatively more observations than others based on corresponding propensity scores. The strata with more (or less) observations were assigned a weight according to which stratum they were located in. For detail, see Greifer, N. (2023) *Matching with Sampling Weights*

⁷⁹ Variables already in logarithmic terms were converted back to their original values by taking the exponential and subtracting 0.01, before the logarithmic transformation of the whole data sample.

Table 22: The number and proportion of non-zero observations for fundraising across the years in the matched sample size:

	2018	2019	2020	2021	2022
Portfolio N	315	316	257	236	215
Counterfactual N	117	129	96	85	77
	2018	2019	2020	2021	2022
Portfolio (%)	62.5%	62.7%	51.0%	46.8%	42.7%
Counterfactual (%)	49.8%	54.9%	40.9%	36.2%	32.8%

Annex G: Abbreviations

Abbreviation	Full Title
AML	Anti-Money Laundering
BEIS	Department for Business, Energy & Industrial Strategy
BBLS	Bounce Back Loan Scheme
CBILS	Coronavirus Business Interruption Loan Scheme
CDF	Cumulative density functions
CLA	Convertible Loan Agreement
CLA applicants/ non-recipients	Businesses who applied, were successful but did not take up the funding.
CLA funded businesses/ recipients	Businesses who applied and received funding from the Future Fund Scheme.

Abbreviation	Full Title
CLBILS	Coronavirus Large Business Interruption Loan Scheme
CLN	Convertible Loan Note
Covid-19	Coronavirus disease (Covid-19) is an infectious disease caused by the SARS-CoV-2 virus.
CRN	Company registration number
DCF	Discounted cash-flow
DiD	Difference-in-difference (regression)
EBITDA	Earnings Before Interest, Taxes, Depreciation, and Amortisation
eCDF	Empirical cumulative density functions
EIS	Enterprise Investment Scheme
EDI	Equality, Diversity, and Inclusion
FAQ	Frequently Asked Questions
FCA	Financial Conduct Authority
FF	Future Fund
FPO	Financial Promotion Order
FTE	Full-Time Equivalent
GBP	Great British Pound
GVA	Gross Value Added
HMG	His Majesty's Government
HMRC	His Majesty's Revenue and Customs
HMT	His Majesty's Treasury
H ₀	The null hypothesis
IDBR	Inter-Departmental Business Register
KPI	Key Performance Indicator

Abbreviation	Full Title
KYC/ CCD	Know Your Customer/ Customer Due Diligence
LHS	Left hand side
M4	M4 money supply is defined as a measure of notes and coins in circulation (M0) + bank accounts
MI	Management Information
N/A	Not applicable
Non-applicant	Business that could have applied and did not.
NPV	Net Present Value
OECD	Organisation for Economic Co-operation and Development
ONS	Office for National Statistics
Private investor (not identified as a business angel)	These are a sub-group of private investors who do not actively invest in start-up firms. Usually, they consist of family, friends, company Directors etc.
PSM	Propensity Score Matching
PwC	PricewaterhouseCoopers LLP
Q	Quarter
Q1	Quarter 1 (January to March)
Q2	Quarter 2 (April to June)
Q3	Quarter 3 (July to September)
Q4	Quarter 4 (October to December)
R&D	Research and Development
SARS-CoV-2	The virus that causes the coronavirus disease.
RHS	Right hand side
RLS	Recovery Loan Scheme

Abbreviation	Full Title
SEIS	Seed Enterprise Investment Scheme
SIC	Standard Industrial Classification
SMD	Standardised mean difference
SME	Small and Medium sized Enterprise
Stakeholders	This group consisted of senior civil servants in Government, Arm's length bodies, government agencies, industry bodies, and non-profit organisations that were involved (directly/ indirectly) with the Future Fund design/ implementation stages.
UK	United Kingdom
VAT	Value Added Tax
VC	Venture Capital
VFM/ VfM	Value for Money

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British Business Bank plc

Steel City House

West Street

Sheffield S1 2GQ

t. +44 (0)114 206 2131

e. info@british-business-bank.co.uk

british-business-bank.co.uk

Publication date: 26th October 2023

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