

Greater Cambridge Employment Update April 2023

A story of corporate resilience in turbulent times

Highlights:

Overview

- The current business environment makes it important to have timely data on employment changes. This is the eighth of a series of updates that bring up-to-date information about what is happening to corporate employment in the Greater Cambridge area.
- The April 2023 Update covers accounting year ends between May 2022 and December 2022 (the median year end is mid-October 2022). This median period captures the impact of Putin's war on the recovery from Covid. We compare this period with the previous year, which covers the second and third Covid lockdowns as well as the coming out of lockdowns.
- This update is obtained by sampling the CBR annual corporate database of all businesses based in the wider Cambridge region. It covers a large sample of companies representing 63% of corporate employment in Greater Cambridge.

Areas

- Corporate employment growth in the Greater Cambridge area increased from 5.1% in 2020-21 to 6.2% in 2021-22, suggesting that corporate employment growth continued to recover from the effects of the pandemic despite the onset of Putin's war (**Figure 2.1, p8**).
- The strong performance of the Greater Cambridge corporate economy during 2021-22 was driven by a buoyant KI economy, which saw employment grow by 7.7% in 2021-22 (8.8% in 2020-21) (**Figure 2.1, p8**).
- Overall employment growth also benefited from the robust performance of non-KI sectors. Non-KI employment growth was substantially higher in 2021-22 (4.3%) than it was in 2020-21 (0.9%), pointing to continued recovery amongst sectors that were severely hit by lockdowns and other Covid-related restrictions (**Figure 2.1, p8**).
- Both Cambridge and South Cambridgeshire achieved faster employment growth in the latest year compared with one year earlier. Employment growth in Cambridge was high at 6.9% in 2021-22, up from 5.8% in 2020-21. Similarly, employment growth in South Cambridgeshire was 5.7% in the last year against a 4.6% rate in the previous year (**Figure 2.1, p8**).

- However, there is variation in these growth rates across both industry sectors and firm sizes.

Sectors

- 'Information technology and telecoms', the second-largest sector in Greater Cambridge after 'Life science and healthcare', was the fastest growing sector during 2021-22 (14.3% compared with 8.3% in 2020-21) (**Figure 2.2, p9 & Figure 2.4, p12**).
- 'Life science and healthcare' grew its employment by 5.0%. This rate of growth, albeit lower than that of the ICT sector, happened after an exceptional performance in the previous year (12.4%) (**Figure 2.2, p9 & Figure 2.4, p12**).
- 'Knowledge intensive services' continued to grow during 2021-22 (3.3% against 7.8% during 2020-21), while the 'High-tech manufacturing' sector returned to growth after suffering a fall in employment in the previous year (3.6% and -1.3%, respectively) (**Figure 2.2, p9 & Figure 2.4, p12**).
- The results paint a more multifaceted picture for non-KI sectors. Sectors such as 'Other services' (e.g. hotels, pubs and restaurants), 'Other business services' (e.g. employment agencies) and 'Wholesale and retail distribution', which were severely hit by lockdowns and other Covid-related restrictions, saw a strong bounce back in employment (**Figure 2.2, p9 & Figure 2.4, p12**).
- By contrast, sectors such as 'Construction and utilities' and 'Transport and travel' have been struggling to return to growth in the aftermath of Covid. Total corporate employment in these sectors during 2021-22 remained below its pre-pandemic levels (**Figure 2.2, p9 & Figure 2.4, p12**).

Size groups

- One-person businesses grew by 2.4% in the latest year, a rate that is somewhat lower than total employment growth across all size classes. However, their small size means that they have played a minor role in employment growth – only 53 extra employees compared with the addition of 4,081 employees by other businesses.
- Whilst 1-9 employee businesses tend to have been the fastest growing companies in sectors such as 'Education, arts, charities, social care' and 'Knowledge intensive services', 10+ employee businesses exhibited particularly fast growth in 'Information technology and telecoms', 'Other services' and 'Other business services' (**Figure 2.3, p11**).
- The group of 10+ employee businesses tends to dominate employment growth given its large aggregate size. These businesses are significant contributors to the growth achieved by sectors such as 'Information technology and telecoms', 'Other services'

and 'Other business services'. Businesses with 10+ employees are also behind the drop in employment observed in 'Construction and utilities', 'Transport and travel' and 'Manufacturing' (**Figure 2.3, p11**).

- Employment of 1-9 employee businesses increased by 2.5% in 2021-22. This growth was driven primarily by non-KI sectors (**Figure 2.8, p18**).
- The picture looks different for 10+ employee businesses. Although non-KI employment increased much faster in 2021-22 compared with 2020-21, employment growth was substantially higher in KI sectors than it was in non-KI sectors. As a result, employment growth in this size class was 6.9% in 2021-22 (**Figure 2.8, p18**).
- Employment growth to 2022 was faster than employment growth to 2021 in both 1-9 employee and 10+ employee size classes (**Figure 2.8, p18**).

Comparison of employment and turnover growth

- We complement the findings from the employment update by examining a sample of 122 companies with accounting year ends between May 2022 and December 2022 which have provided both employment and turnover data for the last three years.
- We found in previous reports that turnover had fared worse than employment, partly reflecting the operation of the furlough scheme. Our latest analysis reveals that, with the recovery from Covid, normal service has been resumed and turnover growth exceeds employment growth as it did pre pandemic (**Table 5.1, p33**).
- The recovery is evident for both the KI and non-KI companies included in this sample. Employment growth was stronger among the KI companies, which saw employment increase by over 10% in both years. Non-KI companies achieved positive but lower employment growth. Turnover grew by 19.5% in 2021-22 (15.3% in 2020-21) for KI sectors, while non-KI sectors achieved turnover growth of over 10% in each year (**Table 5.1, p33**).

Stop press

- We provide a snapshot of the impact of events in the Greater Cambridge corporate economy by considering a small sample of companies with interim results for the six-month periods ending between May and December 2022. For each company we look at turnover growth in the same six-months period in 2020 and 2021.
- Within this group of companies (all knowledge intensive), total turnover grew by 25% in their latest six months (2021-22) compared with a growth of 19% in the same period last year (2020-21).

- Therefore, our findings suggest that the growth of these successful KI companies has remained robust into 2022. The perusal of their interim reports also offers some further insights into the robustness of these KI companies despite the impact of the pandemic and the cost of living crisis on their business.

Concluding remarks

- In the previous updates, we expressed concerns over the pace of the recovery from Covid due to the substantial disruption to both supply and demand and associated decline in living standards following Putin's invasion of Ukraine.
- Overall, the results of our April 2023 Update tell a story of strong corporate resilience during a very turbulent period. Our next update will examine whether the robust performance of Greater Cambridge-based businesses continued into the Autumn of 2022, when the UK cost of living crisis worsened as inflation peaked at 11.1% (a 41-year high).

1. Tracking Greater Cambridge corporate employment – the April 2023 Update

The Centre for Business Research (CBR) at Cambridge University has developed three methods for tracking the employment and turnover of companies based in the wider Cambridge region (for further details see Appendix A4).

The first is the **annual draw** of all companies within the region.¹ It is comprehensive and also examines company births and deaths along with company location changes. This gold standard work does suffer from being less timely. The results of the 2021-22 annual draw were published in early April 2023 and examined employment in the accounting years ending from 6th April 2021 to 5th April 2022 (see CBR's notes titled "The Economic Geography of the Cambridge City Region – A Story of Corporate Resilience" and "An Economic Census of the Cambridgeshire and Peterborough Region – Opportunities and Challenges").² Since December and, to a lesser extent, March dominate companies' choice of year ends, the modal year end for the annual draw is early December 2021. For comparison, the ONS Business Register and Employment Survey (BRES) provisional annual employment data published in October 2022 has September 2021 as its latest information (and we will have to wait another year before these are confirmed as final).

The second method involves an **update** of companies in the Greater Cambridge area achieved by sampling the annual corporate database in April and October. On each occasion a large sample is drawn (over 40% on average) of companies that have reported in recent months. This brings more timely information about what is happening to employment, but does not take account of births and deaths or location changes. For example, this April 2023 Update includes companies with a financial year end between May 2022 and December 2022 and has a modal year end of mid-October 2022. This median period captures the impact of Putin's war on the recovery from Covid.

We use the update sample to provide estimates of employment for those companies with a year end between May 2022 and December 2022 that have not yet reported. We then use this larger sample to compare the performance of this sample of companies in 2021-22 with their performance in 2020-21. The final analysis sample for the April 2023 Update is 5,599 companies representing about 63% of corporate employment in the Greater Cambridge area. A sample of this size, with good coverage of all sectors and company sizes, should give a very accurate picture of what is happening to continuing businesses in the region.

The third method has a much smaller sample since it examines recent changes in both turnover and employment growth. This sample is restricted to 122 companies in Greater Cambridge with accounting years ending between May 2022 and December 2022 which have provided both employment and turnover data for the last three years. Since large businesses provide both employment and turnover figures, the sample is quantitatively significant, with total employment over 15,000 and total turnover of £2.8bn. For this sample of companies, we examine their employment and turnover growth in the last year against the growth one year

¹ The underlying core corporate database has been established and maintained with the ongoing support of Cambridge Ahead, and is currently sponsored by Arm, Cambridgeshire and Peterborough Combined Authority, Greater Cambridge Partnership, Marshall of Cambridge and Mills & Reeve.

² These notes can be found at:

<https://www.cbr.cam.ac.uk/wp-content/uploads/2023/04/1-the-economic-geography-of-the-cambridge-city-region.pdf> ("The Economic Geography of the Cambridge City Region – A Story of Corporate Resilience")

<https://www.cbr.cam.ac.uk/wp-content/uploads/2023/04/2-an-economic-census-of-the-cambridgeshire-and-peterborough-region.pdf> ("An Economic Census of the Cambridgeshire and Peterborough Region – Opportunities and Challenges")

earlier. The comparison between these two measures allows us to evaluate the impact of the furlough scheme on employment in the corporate sector in Greater Cambridge.

The fourth method is a **snapshot** of very recent growth that draws on a small sample and should be regarded as merely indicative. It considers only the largest businesses (top 100 by employment or turnover) and examines those that have filed interim reports for six-month periods ending between May 2022 and December 2022. The nine companies in the snapshot sample do not provide employment figures in their interim reports, but together they represent a combined annual turnover of about £769m. The gain from focusing on interim results is that most of the activity reported in the accounts took place in 2022. We compare turnover in this period with the same six-month period in 2020 and 2021.

The remainder of this report is structured as follows. Section 2 presents the results of the April 2023 employment update, drawing on a set of charts that we developed specifically for this study. The section examines growth of Greater Cambridge-based companies by area, industry sector and firm size. Section 3 provides an analysis of the contribution of business births, deaths and relocations into and out of the area to corporate employment growth in KI and non-KI sectors. Section 4 looks more closely at differences in performance between KI and non-KI sectors by analysing the latest employment data from ONS. The section includes a comparison of Greater Cambridge against the nation at the individual sector level, which we present for the first time in this report. Section 5 complements the findings from Section 2 by discussing the results of the April 2023 Update sample that includes both employment and turnover growth. Section 6 shows the findings of the snapshot sample, while Section 7 offers some concluding remarks. Appendices A1-A3 provide a summary of employment growth rates by sector for Greater Cambridge as a whole, as well as for Cambridge and South Cambridgeshire separately. Appendix A4 explains the methodology underpinning the Greater Cambridge Employment Update.

2. April 2023 employment update results

In this section, we present the results of the April 2023 employment update, the eighth of a series of updates aimed at providing a timely picture of the performance of the Greater Cambridge corporate economy. This update captures the impact of Putin's war on the recovery from Covid. We compare this year against the previous year, which covers the second and third Covid lockdowns as well as the coming out of lockdowns.

2.1. Analysis by area

In the previous updates, we expressed concerns over the pace of the recovery from Covid due to the substantial disruption to both supply and demand and associated decline in living standards following Putin's invasion of Ukraine. This is the first time since we started our employment updates work that we are able to examine whether the onset of Putin's war has been impacting the recovery of Greater Cambridge businesses from the effects of the pandemic.

Figure 2.1 depicts employment growth in KI and non-KI sectors during 2020-21 (horizontal axis) and 2021-22 (vertical axis) by area. This chart allows us to compare the performance of each area over time. It is drawn from a large sample of 5,599 companies with accounts for the years ending May-December 2022. The position of the area marker relative to the 45° line indicates whether a given area grew more or less fast than last year. Areas with positive growth in 2021-22 are found above the horizontal axis and those with positive growth in 2020-21 appear to the right of the vertical axis. It shows growth for KI, non-KI and all sectors for Cambridge, South Cambridgeshire and for Greater Cambridge overall. A summary of employment growth rates by sector for each area is reported in Appendices A1-A3.

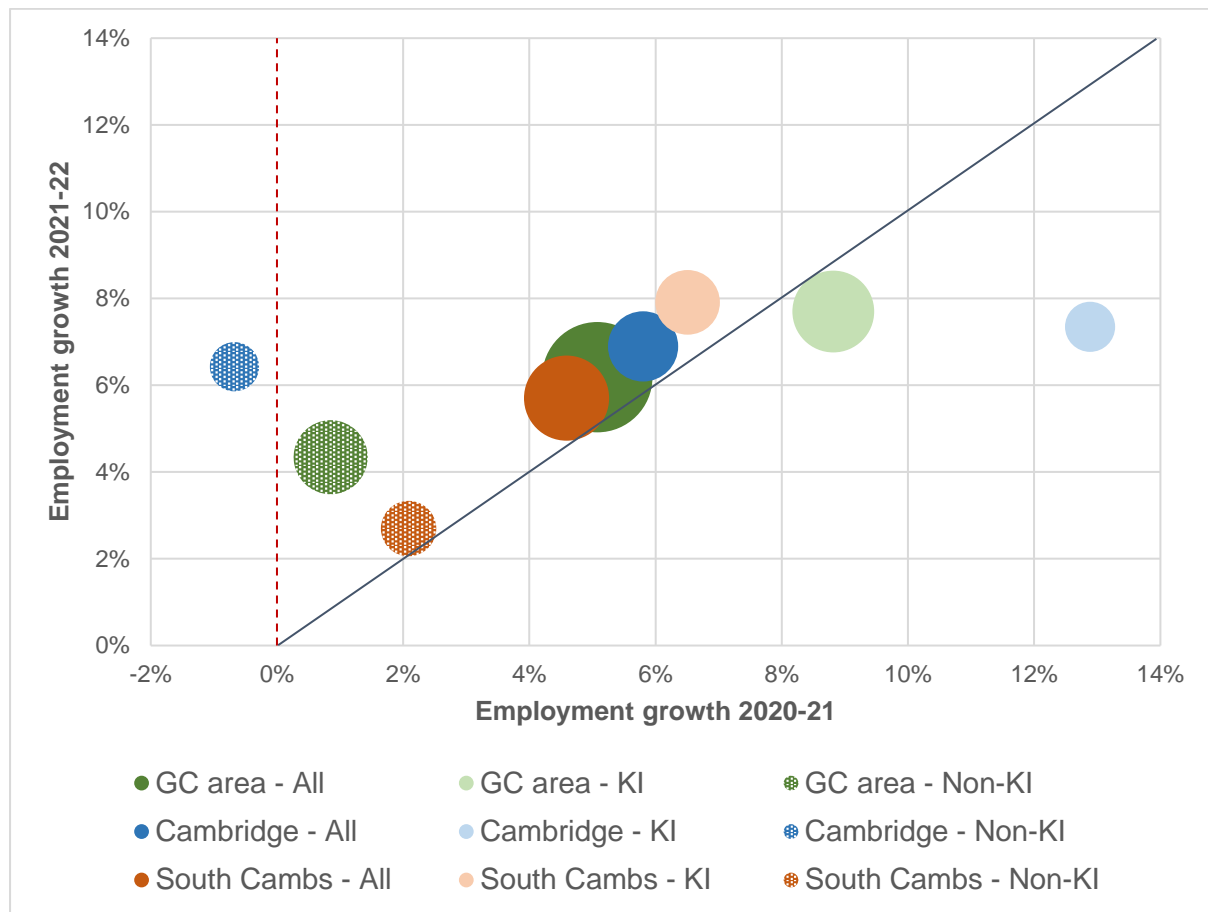
Figure 2.1 portrays a picture of continued and faster overall employment growth in the Greater Cambridge area during the year to mid-October 2022. Growth in the area increased from 5.1% in 2020-21 to 6.2% in 2021-22, suggesting that corporate employment growth continued to recover from the effects of the pandemic despite the onset of Putin's war.

However, it must be noted that our results might reflect the performance of a somewhat exceptional sample of companies, which did not delay publication of their latest accounts despite the ongoing uncertainty about the cost of living crisis. The fact that most of the sample companies did not need more time to file their accounts could suggest that they have been less impacted by the changing business environment than companies that have yet to file their latest accounts. We have attempted to mitigate selection bias by conducting another data draw just a couple of weeks before completing the report, which allowed us to include the latest data for a further 831 companies.

The 6.2% employment growth over the median period to mid-October 2022 (April 2023 Update) is somewhat lower than the 6.7% growth to early March 2022 (October 2022 Update), which captures the impact of the coming out of Covid lockdowns but largely predates Putin's war. However, there are considerable differences across both sectors and areas.

Our data show that the strong performance of the Greater Cambridge corporate economy during 2021-22 was driven by a buoyant KI economy, which saw employment grow by 7.7% in 2021-22 (8.8% in 2020-21). In each of the charts the size of the bubble is proportional to total employment in that area or sector. The bubble that identifies KI sectors is to the right of the bubble for non-KI sectors – showing that KI sectors grew faster than non-KI sectors.

Figure 2.1 Employment growth by area – 2021-22 vs 2020-21



Note: The size of each bubble is proportionate to the number of employees in 2020-21 on a continuous scale.

Source: Cosh & Caselli, CBR.

Overall employment growth to 2022 also benefited from the robust performance of non-KI sectors. Employment growth of non-KI sectors was substantially higher in 2021-22 (4.3%) than it was in 2020-21 (0.9%), pointing to continued recovery amongst sectors that were severely hit by lockdowns and other Covid-related restrictions.

Turning to the individual districts, both Cambridge and South Cambridgeshire achieved faster employment growth in the latest year compared with one year earlier. Employment growth in Cambridge was high at 6.9% in 2021-22, up from 5.8% in 2020-21. Similarly, employment growth in South Cambridgeshire was 5.7% in the last year against a 4.6% rate in the previous year.

The KI sectors showed a particularly high degree of dynamism in South Cambridgeshire, where KI employment growth increased from 6.5% in 2020-21 to 7.9% in 2021-22. This was helped by the performance of Darktrace, Frontier Developments and Bango, who added over 600 employees combined.

The growth of the KI sectors in Cambridge was also strong (7.3% in 2021-22 compared with 12.9% in 2020-21), driven by the additions of 212 employees by AstraZeneca and 142 employees by Abcam.

We found a different picture for non-KI sectors. Whilst non-KI employment growth in Cambridge witnessed a strong bounce back during 2021-22 (6.4% against -0.7% during 2020-

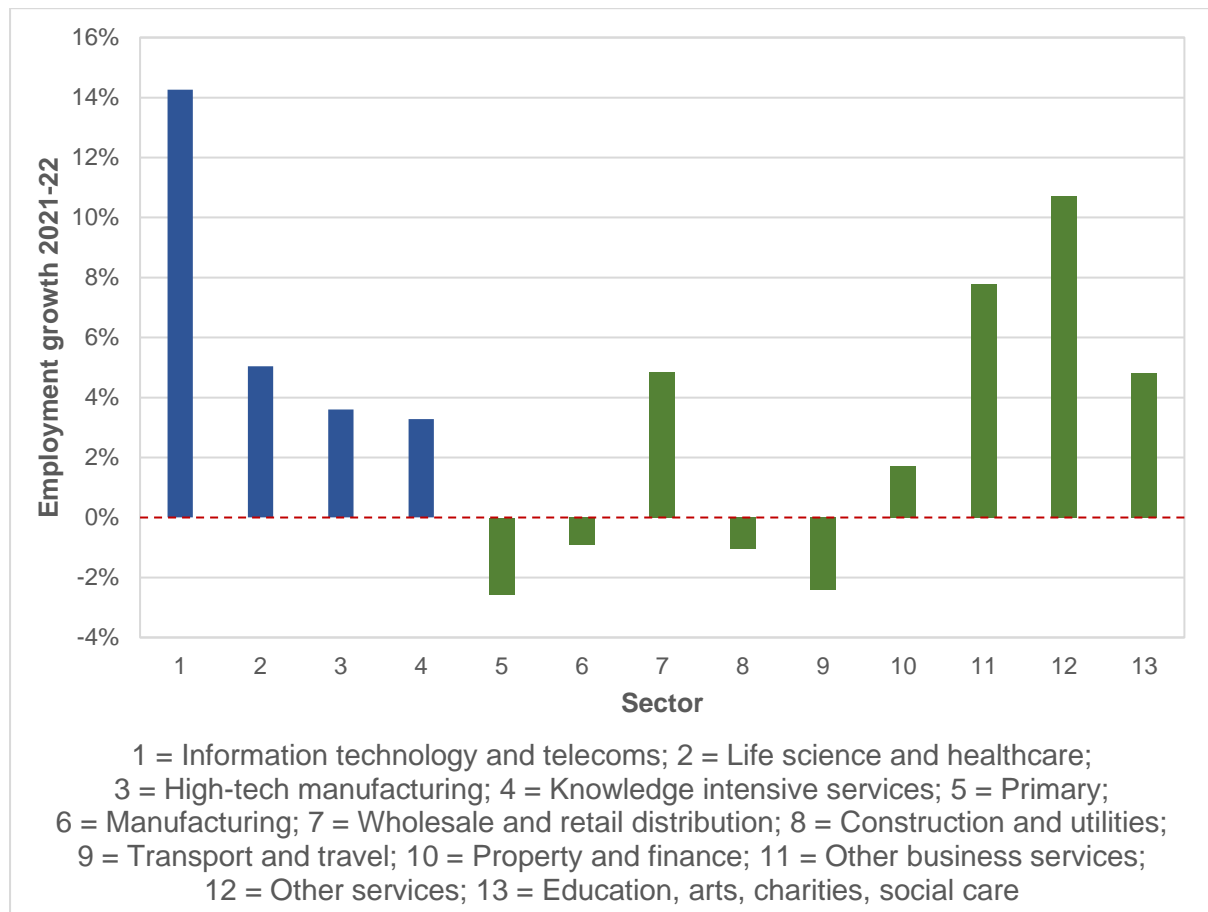
21), non-KI employment growth in South Cambridgeshire was only marginally higher last year than it was the previous year (2.7% and 2.1%, respectively).

2.2. Analysis by sector

Greater Cambridge

Figure 2.2 looks more closely at differences in performance across industry sectors by distinguishing between 4 KI sectors and 9 non-KI sectors. It compares these 13 sectors by examining their employment growth during 2021-22 (on average the year to mid-October 2022), the latest year covered by this work.

Figure 2.2 Employment growth 2021-22 by sector in the Greater Cambridge area



Note: Blue bars identify KI sectors, whereas green bars are for non-KI sectors.

Source: Cosh & Caselli, CBR.

'Information technology and telecoms' was the fastest growing sector during 2021-22 (14.3%). Growth in the sector reflects an increase in employee numbers by some of the largest ICT companies in the Greater Cambridge area, particularly Darktrace (27.9%) and Frontier Developments (22.6%).

'Life science and healthcare', the largest KI sector in Greater Cambridge, grew its employment by 5.0%. This rate of growth, albeit lower than that of the ICT sector, happened after an exceptional performance in the previous year (12.4%). Among the companies contributing to the growth of the Life Science sector in 2021-22 are Abcam (8.9%) and AstraZeneca (5.1%).

'High-tech manufacturing' (3.6%) and 'Knowledge intensive services' (3.3%) saw positive but more limited growth in the year to mid-October 2022. Leading manufacturer of microscopes Carl Zeiss Microscopy (13.0%) and high-tech engineering company Cambridge Mechatronics (5.1%) are but two examples of fast growing companies in these sectors.

The results paint a more multifaceted picture for non-KI sectors.

'Other services' (10.7%), 'Other business services' (7.8%), 'Wholesale and retail distribution' (4.8%) and 'Education, arts, charities, social care' (4.8%) showed robust growth during 2021-22. Some of the companies behind this growth are specialist school meal provider Lunchtime Co. ('Other services'), laundry and dry cleaning specialist Swiss Laundry ('Other business services'), owner of local garden centres Scotsdale Nursery and Garden Centre ('Wholesale and retail distribution') and accountancy training provider First Intuition Cambridge ('Education, arts, charities, social care').

Employment went up, although less strongly, also in the 'Property and finance' sector (1.7%).

Conversely, employment growth to 2022 was negative in the 'Primary' (-2.6%), 'Transport and travel' (-2.4%), 'Construction and utilities' (-1.0%) and 'Manufacturing' (-0.9%) sectors.

Figure 2.3 expands on the results from Figure 2.2 presented above by providing a breakdown of employment growth to 2022 by both industry sector and firm size. Companies were assigned to two size classes: 1-9 employees; 10+ employees. Further analysis by firm size with individual sectors grouped into KI and non-KI sectors is presented in Section 2.3 below.

The results from Figure 2.2 pointed to robust employment growth across KI sectors, whereas there was a mixed picture for non-KI sectors. Figure 2.3 augments these results by suggesting that there is variation in employment growth rates across both industry sectors and firm sizes.

Looking at percentage growth rates for small businesses can be problematic. Most small businesses do not grow and the median growth is uninformative at 0%. However, a few small businesses can grow very fast in percentage terms (e.g. from 2 to 8 employees). It is these rare businesses that create the overall growth of smaller businesses.

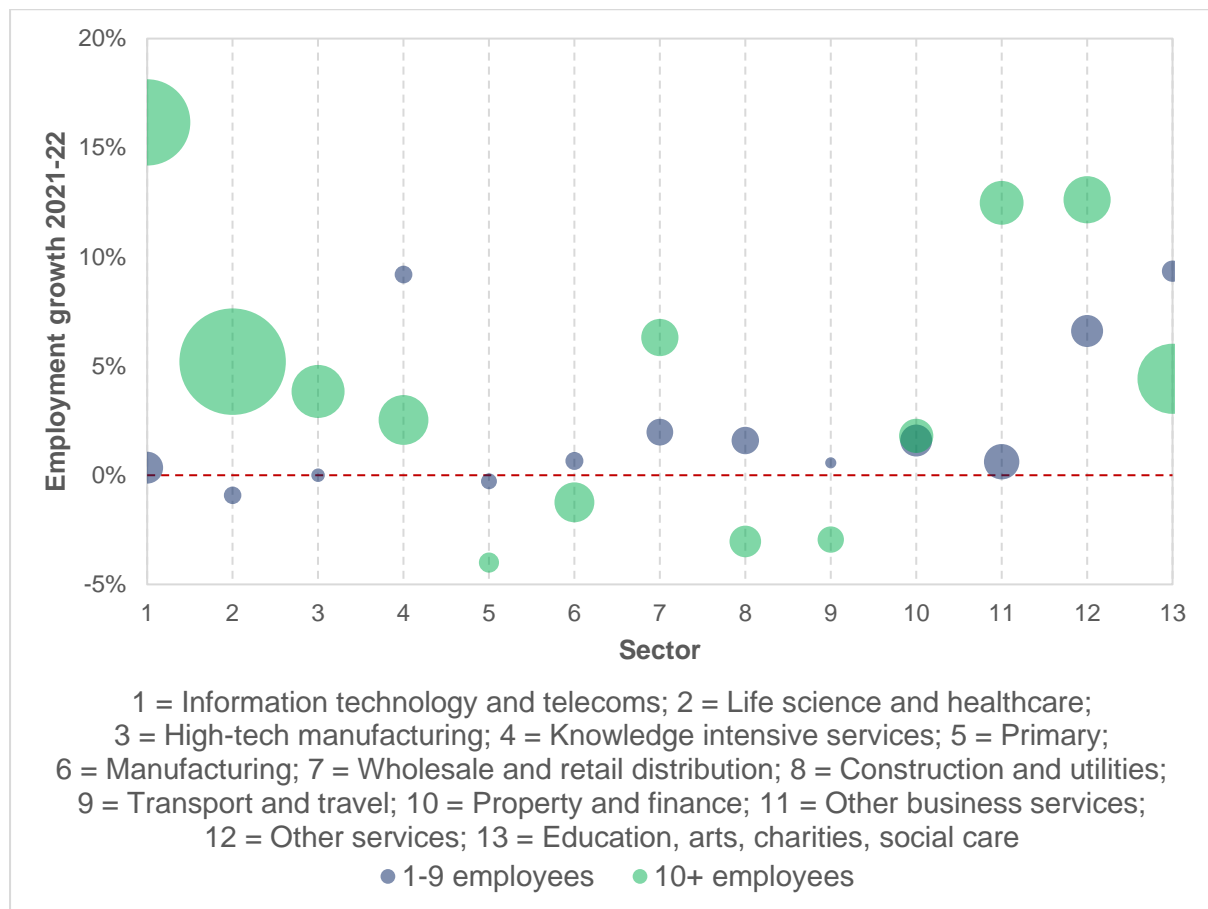
Businesses with 1-9 employees tend to have been the fastest growing companies in sectors such as 'Education, arts, charities, social care' and 'Knowledge intensive services'. However, the relatively small size of their bubbles shows that their impact on total employment growth was somewhat limited.

Good examples of fast growth in the 1-9 employee businesses are iKVA, an early-stage AI knowledge management company spun out of the University of Cambridge and the Alan Turing Institute, and PatientSource, a software company that has developed a cloud-based platform to facilitate secure communication within the healthcare sector.

In turn, 10+ employee businesses exhibited particularly fast growth in 'Information technology and telecoms', 'Other services' and 'Other business services'.

The group of 10+ employee businesses tends to dominate employment growth given its large aggregate size. These businesses are significant contributors to the growth achieved by sectors such as 'Information technology and telecoms' (e.g. Darktrace), 'Other services' (e.g. Lunchtime Co.) and 'Other business services' (e.g. Mills & Reeve). Businesses with 10+ employees are also behind the drop in employment observed in 'Construction and utilities' (e.g. Durman Stearn), 'Transport and travel' (e.g. All Parcels Cambridge) and 'Manufacturing' (e.g. Histon Sweet Spreads).

Figure 2.3 Employment growth 2021-22 by sector and firm size in the Greater Cambridge area



Note: The size of each bubble is proportionate to the number of employees in 2020-21 on a continuous scale.

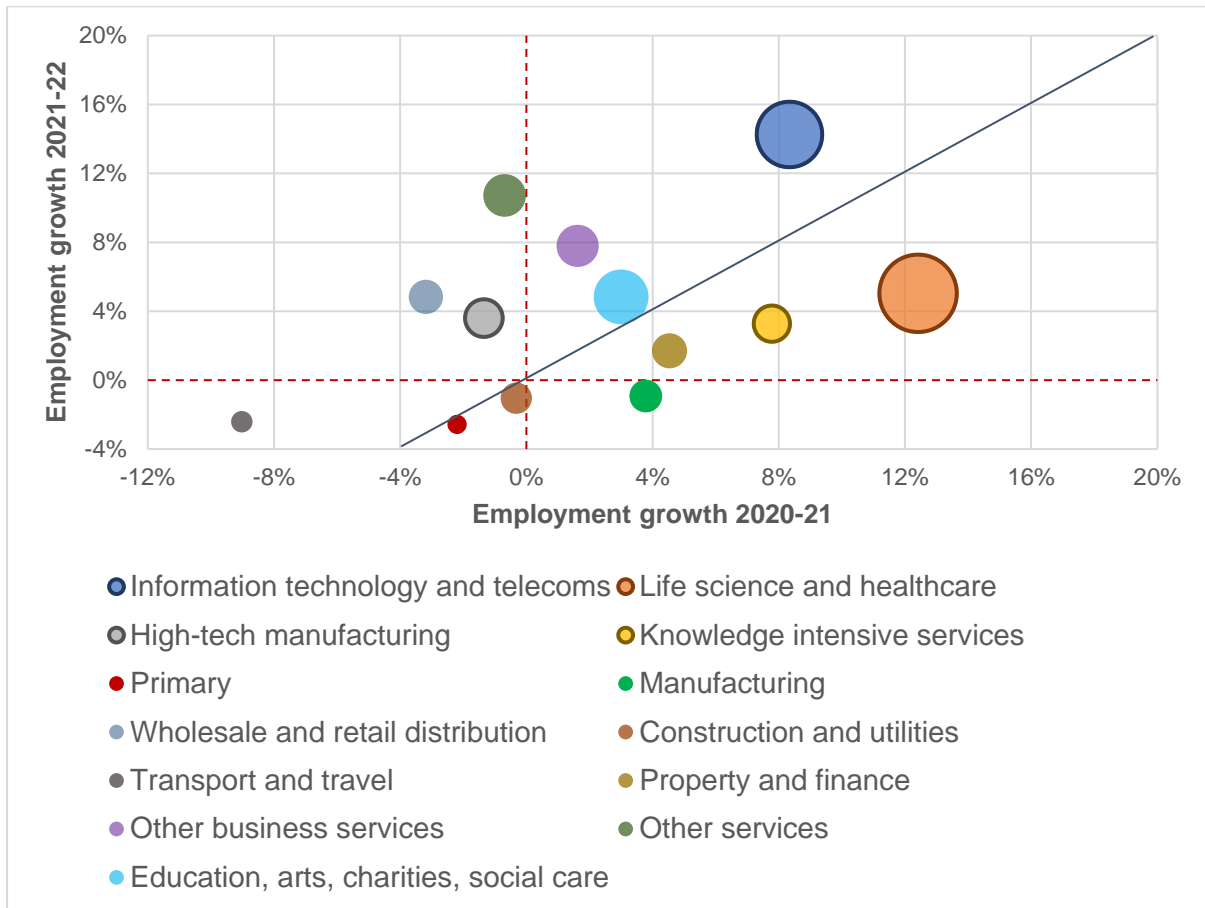
Source: Cosh & Caselli, CBR.

Figure 2.4 compares the 13 industry sectors according to their employment growth during 2020-21 (horizontal axis) and their employment growth during 2021-22 (vertical axis). This chart allows us to compare the performance of sectors over time. The position of the sector marker relative to the 45° line shows whether the sector grew more or less fast than last year. Sectors with positive growth in 2021-22 are found above the horizontal axis and those with positive growth in 2020-21 appear to the right of the vertical axis.

'Information technology and telecoms', the second-largest sector in Greater Cambridge, saw employment growth accelerate during 2021-22 (14.3% compared with 8.3% in 2020-21). This result, which was driven by Darktrace (27.9%) and Frontier Developments (22.6%), is particularly encouraging given that our April 2023 Update sample covers about two-thirds of corporate employment in the ICT sector in Greater Cambridge (see the fourth data column of Appendices A1-A3).

Employment growth in the largest sector, 'Life science and healthcare', was strong at 5.0%, down from an exceptional 12.4% in the previous year. Among the companies contributing to this growth are Abcam (8.9%), AstraZeneca (5.1%) and STEMCELL Technologies (11.0%).

Figure 2.4 Employment growth by sector in the Greater Cambridge area – 2021-22 vs 2020-21



Note: The size of each bubble is proportionate to the number of employees in 2020-21 on a continuous scale. Bubbles with an outline identify KI sectors.

Source: Cosh & Caselli, CBR.

'Knowledge intensive services' continued to grow during 2021-22, yet at a lower rate compared with 2020-21 (3.3% and 7.8%, respectively). This was helped by the steady growth of several companies, for example Cambridge Econometrics (5.7%), Cambridge Mechatronics (5.1%) and AudioTelligence (3.1%).

The 'High-tech manufacturing' sector returned to growth after suffering a fall in employment in the previous year (3.6% and -1.3%, respectively), when leading high-tech manufacturers such as Hexcel Composites continued to face a reduction in demand due to the impact of Covid on their customers.

The results for the 'High-tech manufacturing' sector differ from those for the low- and med-low-tech 'Manufacturing' sector, where employment decreased by 0.9% in 2021-22 after growing by 3.8% in 2020-21. One of the largest manufacturers in the Greater Cambridge area, Histon Sweet Spreads, experienced a 6.2% decline in employment. This and other manufacturers in the area have had their business impacted by supply chain disruptions and inflationary pressures following Putin's war.

Similarly, there are signs that the 'Construction and utilities' and 'Transport and travel' sectors have been struggling to return to growth in the aftermath of Covid. Total corporate employment in these sectors during 2021-22 remained below its pre-pandemic levels.

Brexit, Covid and the ongoing war in Ukraine have made it difficult for agricultural businesses to source labour, particularly experienced and skilled workers. Consistent with these observations, we find that employment growth to 2022 was negative within the 'Primary' sector (-2.6%) for the second consecutive year.

By contrast, employment growth was faster last year than it was the previous year in 'Other services' (10.7% and -0.7%, respectively), 'Other business services' (7.8% and 1.6%), 'Wholesale and retail distribution' (4.8% and -3.2%) and 'Education, arts, charities, social care' (4.8% and 3.0%).

Whilst only about one in ten companies operating in the 'Other services' sector reported an increase in employee numbers during 2020-21, the sector showed a strong bounce back in employment growth during 2021-22. Among the businesses behind this growth are owner of Quy Mill Hotel & Spa Quy Investments (76.3%), coffee shop and café Jamaica Blue (35.0%) and specialist school meal provider Lunchtime Co. (15.1%).

The faster growth in 'Other business services' in the latest year relative to the previous year was helped by an increase in employment at various law firms (e.g. Mills & Reeve), cleaning services companies (e.g. Swiss Laundry) and employment agencies (e.g. The Care Staff Consulting).

Employment growth in 'Wholesale and retail distribution' reflects a pick-up in business performance for a number of companies, for example owner of local garden centres Scotsdale Nursery and Garden Centre (4.9%). Employment to 2022 grew somewhat faster for wholesalers (5.6%) than for retailers (4.6%).

Employment growth in the 'Property and finance' sector was positive in 2021-22 but somewhat lower than in 2020-21 (1.7% and 4.5%, respectively).

Cambridge

Figure 2.5 compares sectors based on their employment growth during 2020-21 (horizontal axis) and their employment growth during 2021-22 (vertical axis), this time focusing on Cambridge.

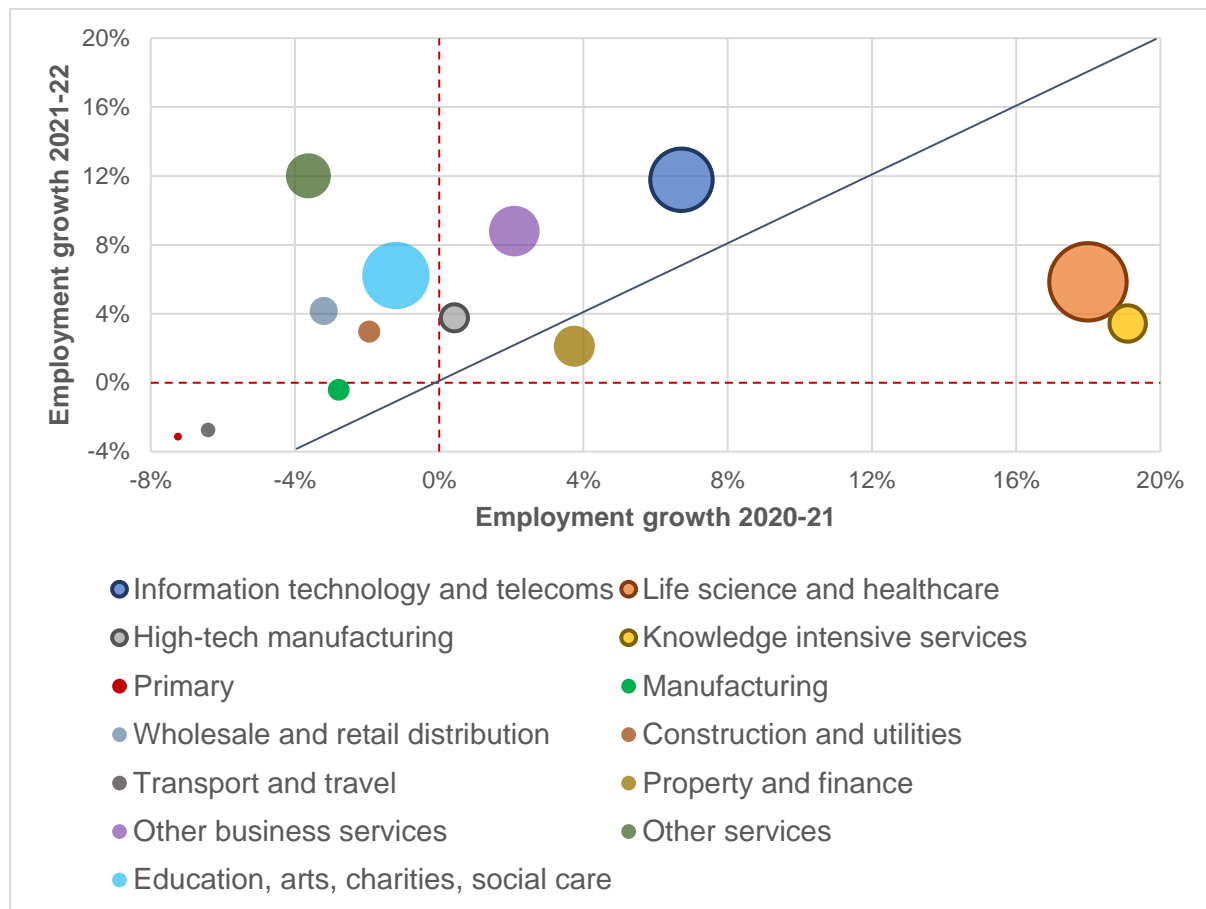
Employment growth of Cambridge-based businesses was particularly fast in 'Information technology and telecoms', where it reached 11.8% in 2021-22 (up from 6.7% in 2020-21). This growth benefited from the strong performance of Agile Analog (58.1%) and Cambridge Intelligence (10.2%).

Last year's employment growth in 'Life science and healthcare' and 'Knowledge intensive services' was strong (5.9% and 3.4%, respectively), albeit lower than one year earlier (18.0% and 19.1%). Abcam ('Life science and healthcare') and Cambridge Mechatronics ('Knowledge intensive services') were key drivers of this growth.

'High-tech manufacturing' saw employment growth accelerate from 0.4% in 2020-21 to 3.8% in 2021-22.

Amongst non-KI sectors, the largest difference in employment growth between 2021-22 and 2020-21 is found for 'Other services'. Growth in the sector was 12.0% last year against -3.6% the previous year, helped by a pick-up in employee numbers by Cambridge United Football Club (41.3%), Jamaica Blue (35.0%) and Lunchtime Co. (15.1%).

Figure 2.5 Employment growth by sector in Cambridge – 2021-22 vs 2020-21



Note: The size of each bubble is proportionate to the number of employees in 2020-21 on a continuous scale. Bubbles with an outline identify KI sectors.

Source: Cosh & Caselli, CBR.

Other non-KI sectors witnessing higher employment growth during 2021-22 compared with 2020-21 are ‘Other business services’ (8.8% and 2.1%, respectively), ‘Education, arts, charities, social care’ (6.2% and -1.2%), ‘Wholesale and retail distribution’ (4.2% and -3.2%) and ‘Construction and utilities’ (3.0% and -1.9%).

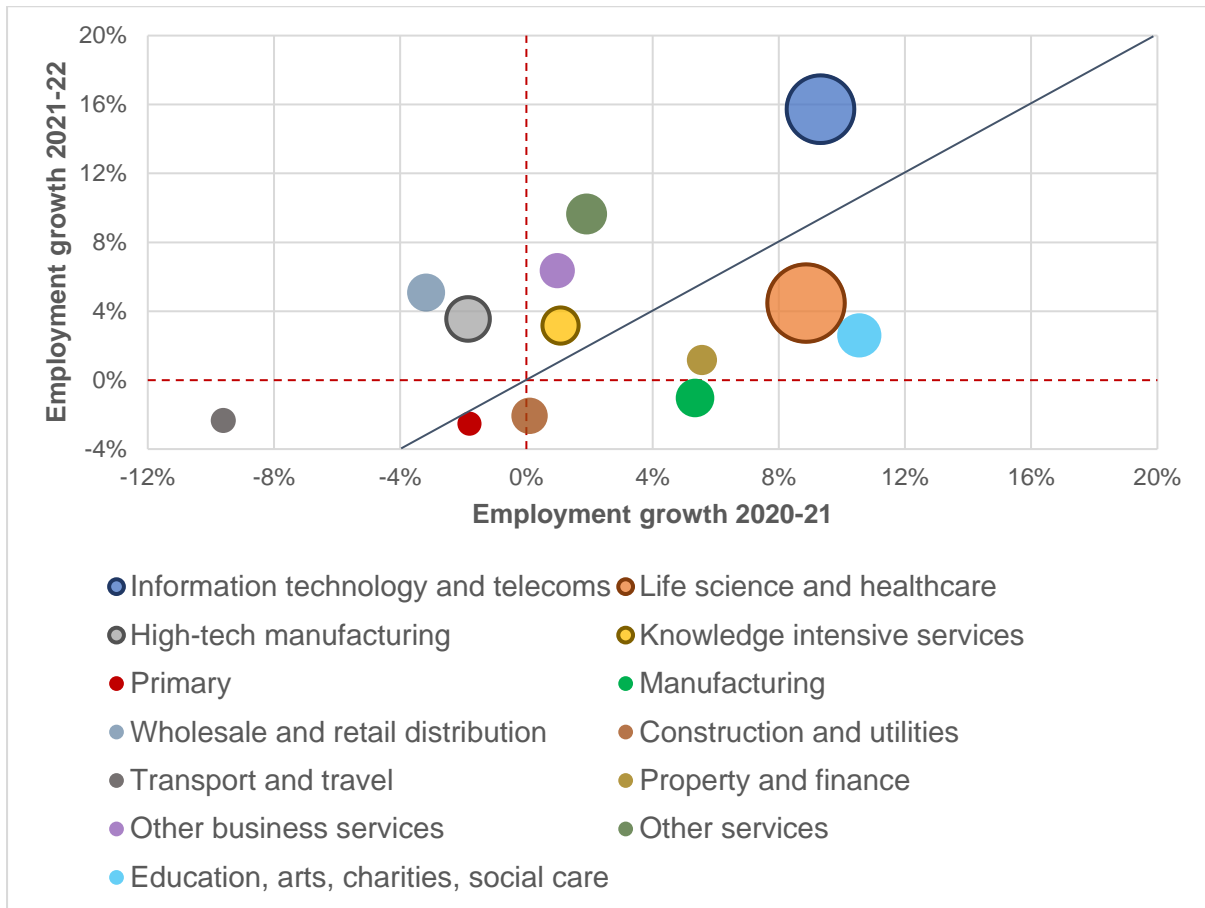
Among the companies behind the robust growth in ‘Other business services’ in the most recent year are law firm Mills & Reeve, commercial cleaning contractor Trinity Harper Cleaning and nursing agency The Care Staff Consulting.

On the contrary, employment growth remained negative in the ‘Primary’, ‘Transport and travel’ and ‘Manufacturing’ sectors.

South Cambridgeshire

Figure 2.6 focuses on South Cambridgeshire and compares sectors based on their employment growth during 2020-21 (horizontal axis) and their employment growth during 2021-22 (vertical axis).

Figure 2.6 Employment growth by sector in South Cambridgeshire – 2021-22 vs 2020-21



Note: The size of each bubble is proportionate to the number of employees in 2020-21 on a continuous scale. Bubbles with an outline identify KI sectors.

Source: Cosh & Caselli, CBR.

Similar to Cambridge, South Cambridgeshire-based companies in ‘Information technology and telecoms’ showed fast employment growth in the latest year. Employment growth in the sector accelerated from 9.3% in 2020-21 to 15.7% in 2021-22, driven by a considerable increase in the number of staff employed by Darktrace (27.9%) and Frontier Developments (22.6%). Overall, the sample for our April 2023 Update represents 82% of corporate employment in the ICT sector in South Cambridgeshire.

‘Life science and healthcare’, the largest sector in South Cambridgeshire, reached 4.5% employment growth in 2021-22 (8.9% in 2020-21). Behind this growth is a steady increase in employee numbers by STEMCELL Technologies (11.0%) and Mission Therapeutics (8.9%).

Employment growth to 2022 was faster than employment growth to 2021 also in ‘High-tech manufacturing’ (3.6% and -1.8%, respectively) and ‘Knowledge intensive services’ (3.2% and 1.1%).

The results for the ‘High-tech manufacturing’ sector, which benefited from a 13.0% increase in employment by Carl Zeiss Microscopy, contrast with those for the low- and med-low-tech ‘Manufacturing’ sector. Employment of Manufacturing companies decreased by 1.0% in 2021-22, largely because of a reduction in staff numbers by Histon Sweet Spreads (-6.2%).

'Other services' (9.6% and 1.9%, respectively), 'Other business services' (6.4% and 1.0%) and 'Wholesale and retail distribution' (5.1% and -3.2%) are the only non-KI sectors with higher employment growth in the last year than in the previous year.

The 'Other services' sector exhibited the fastest growth amongst all non-KI sectors. Owner of Quy Mill Hotel & Spa Quy Investments (76.3%) and healthcare provider Corazon Health (12.8%) are examples of companies showing a strong pick-up in employment growth after suffering a decline in the year to mid-October 2021.

The faster employment growth in the 'Other business services' sector was helped by higher employee numbers at laundry and dry cleaning specialist Swiss Laundry (22.9%) and recruitment agency Pure Resourcing Solutions (21.7%).

Employment growth was positive in 2021-22 but lower compared with 2020-21 in 'Education, arts, charities, social care' (2.6% and 10.6%, respectively) and 'Property and finance' (1.2% and 5.6%).

As is the case for Cambridge, there was negative employment growth in the 'Primary' and 'Transport and travel' sectors. Conversely, the results for 'Construction and utilities' for South Cambridgeshire differ from those for Cambridge. Employment growth in the sector fell in 2021-22, mainly as a consequence of lower staff numbers at civil engineering company Durman Stearn (-7.1%).

Greater Cambridge

Figure 2.7 offers another comparison across sectors, this time looking at their employment change (rather than their employment growth) during 2020-21 (horizontal axis) and 2021-22 (vertical axis). Similar to Figures 2.4-2.6, this chart allows us to compare the performance of sectors over time. The position of the sector marker relative to the 45° line indicates whether employment change in the sector was higher or lower than last year. Sectors with a positive change in employment during 2021-22 are found above the horizontal axis and those with a positive change during 2020-21 appear to the right of the vertical axis.

Since % changes can sometimes be misleading, Figure 2.7 examines changes in employment in terms of the number of people employed. In this case, the findings from Figure 2.7 largely confirm those from Figure 2.4.

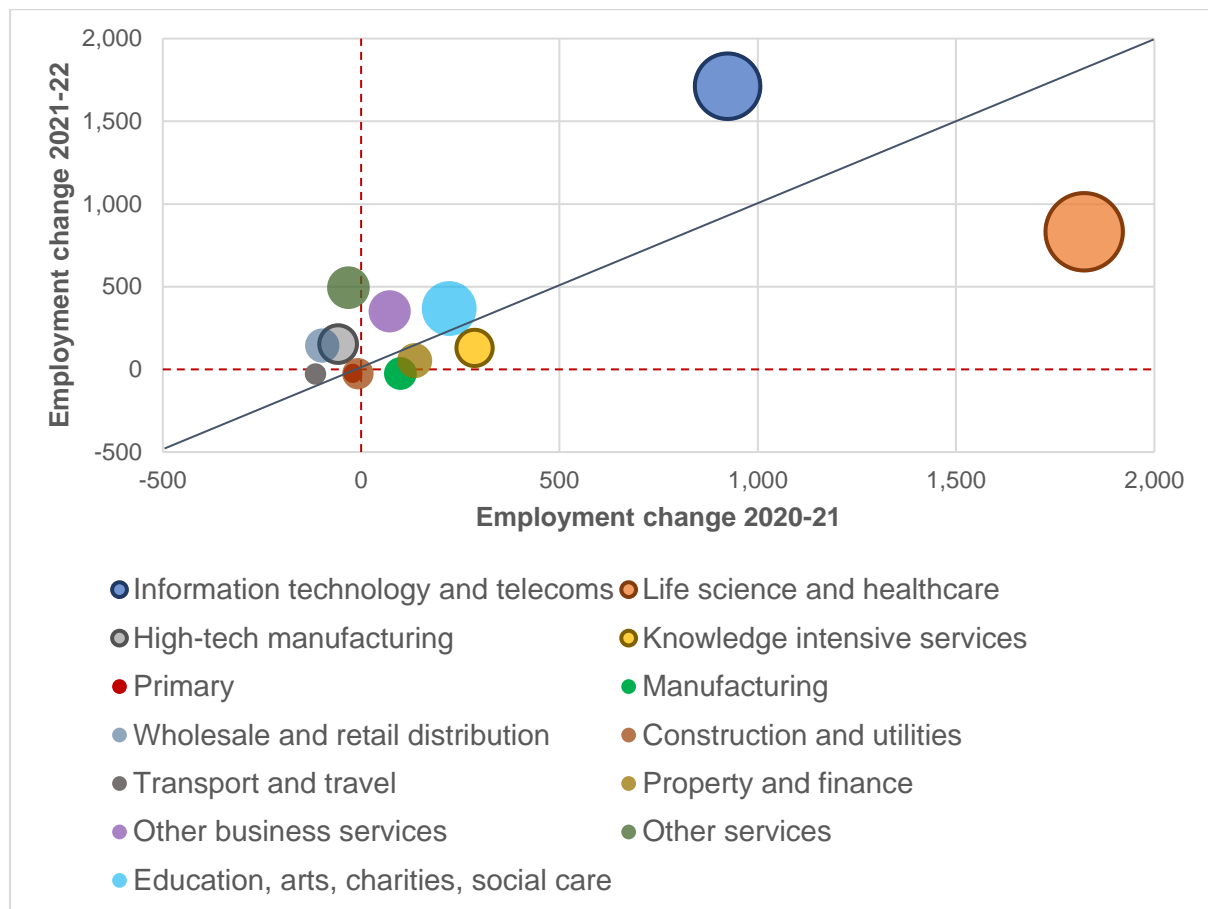
The performance of the 'Information technology and telecoms' and 'Life science and healthcare' sectors stands out when examined in terms of absolute employment changes.

'Information technology and telecoms' had the largest employment change in 2021-22, adding 1,712 employees in the latest year compared with 924 one year earlier. Darktrace (402 employees), Frontier Developments (132 employees) and Bango (99 employees) contributed over a third of the employment change to 2022.

There was a change of 832 employees in 'Life science and healthcare' in 2021-22 (1,823 in 2020-21). A significant share of the employment change to 2022 is associated with AstraZeneca (212 employees) and Abcam (142 employees).

Amongst non-KI sectors, employment change in 2021-22 was higher than employment change in 2020-21 in 'Other services', 'Education, arts, charities, social care', 'Other business services' and 'Wholesale and retail distribution'.

Figure 2.7 Employment change by sector in the Greater Cambridge area – 2021-22 vs 2020-21



Note: The size of each bubble is proportionate to the number of employees in 2020-21 on a continuous scale. Bubbles with an outline identify KI sectors.

Source: Cosh & Caselli, CBR.

The largest employment change to 2022 is observed for 'Other services' (494 employees compared with -32 employees in 2020-21). Cambridge United Football Club (62 employees), Lunchtime Co. (52 employees) and Quy Investments (29 employees) accounted for almost a third of the total employment change in the sector during 2021-22.

The 'Property and finance' sector had a modest positive change in the latest year (53 employees), whilst the 'Transport and travel' (-28 employees), 'Construction and utilities' (-26 employees) and 'Primary' (-24 employees) sectors showed a negative (albeit small) employment change for the second consecutive year.

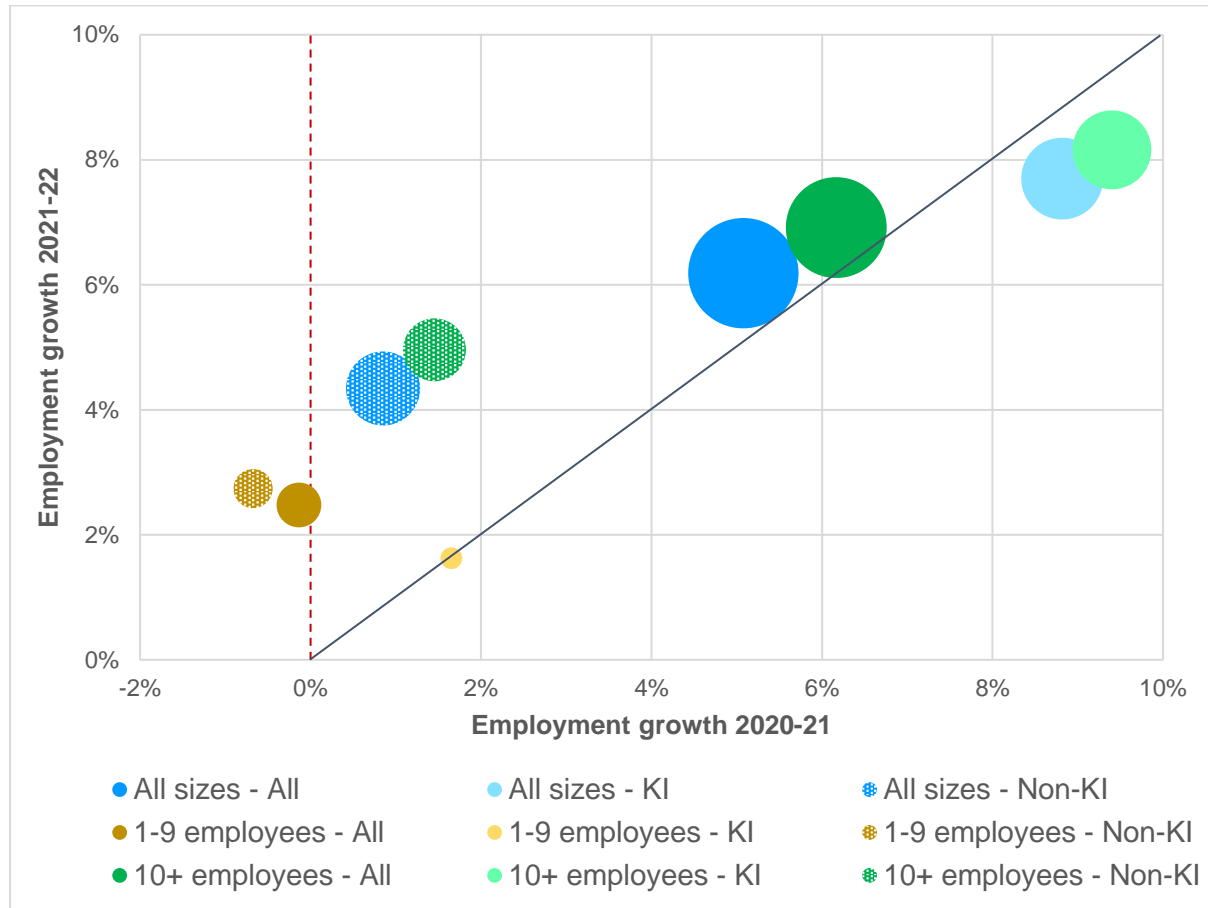
Collectively, KI sectors added 2,827 employees during 2021-22, whereas non-KI sectors contributed 1,307 employees.

2.3. Analysis by firm size

Figure 2.8 shows employment growth in KI and non-KI sectors during 2020-21 (horizontal axis) and 2021-22 (vertical axis) by firm size. This chart allows us to compare the performance of size classes over time. The position of the size marker relative to the 45° line indicates whether the size class grew more or less fast than last year. Size classes with positive growth

in 2021-22 are found above the horizontal axis and those with positive growth in 2020-21 appear to the right of the vertical axis.

Figure 2.8 Employment growth by firm size in the Greater Cambridge area – 2021-22 vs 2020-21



Note: The size of each bubble is proportionate to the number of employees in 2020-21 on a continuous scale.

Source: Cosh & Caselli, CBR.

Employment growth to 2022 was faster than employment growth to 2021 in both 1-9 employee and 10+ employee size classes.

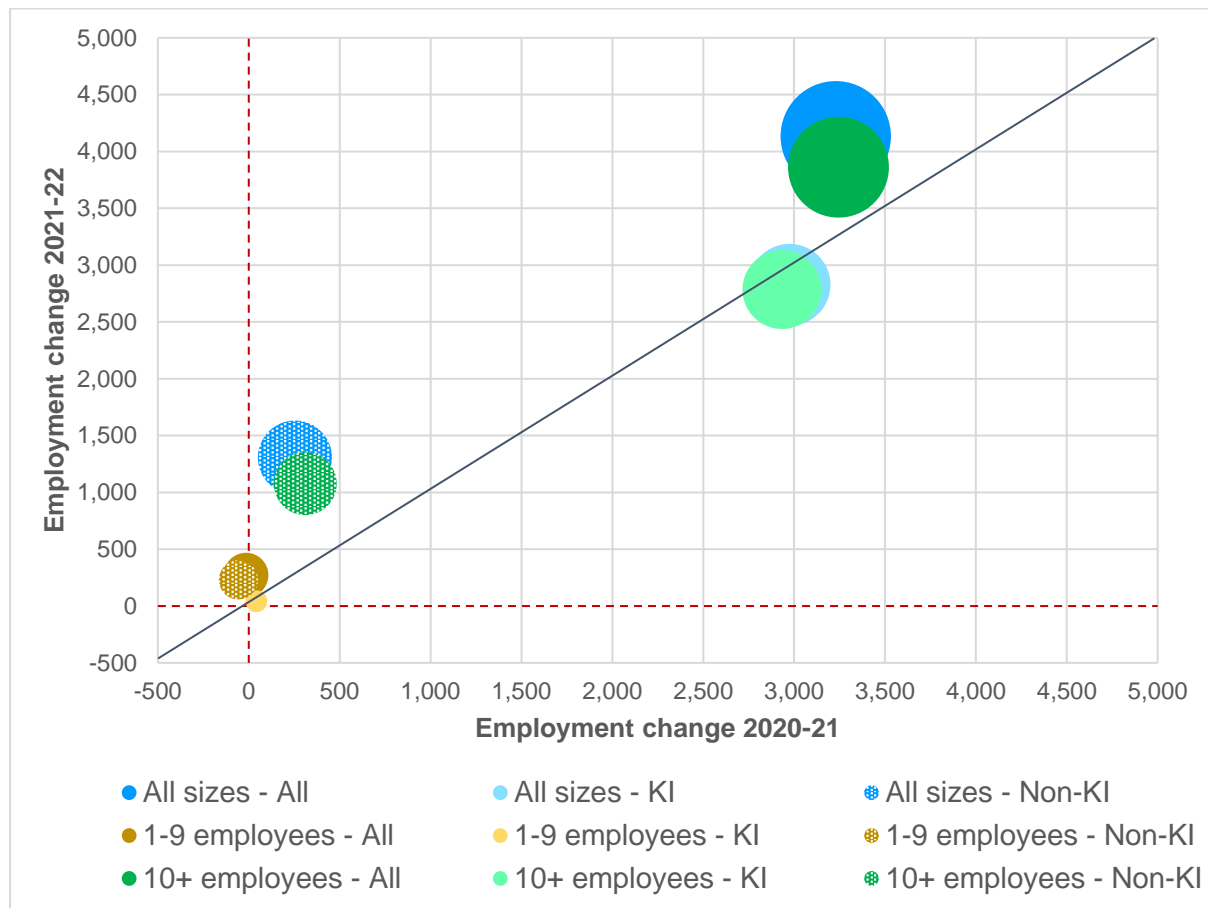
Employment of 1-9 employee businesses increased by 2.5% in 2021-22 (-0.1% in 2020-21). This growth was driven primarily by non-KI sectors, which saw employment grow by 2.7% in the latest year compared with -0.7% one year earlier. KI sectors in this size class grew less fast than non-KI sectors, reaching 1.6% in 2021-22 (1.7% in 2020-21).

The picture looks different for 10+ employee businesses. Although non-KI employment increased much faster in 2021-22 compared with 2020-21 (5.0% and 1.5%, respectively), employment growth was substantially higher in KI sectors than it was in non-KI sectors (8.2% and 5.0% in the latest year, respectively). As a result, employment growth in this size class was 6.9% in 2021-22 (against a figure of 6.2% in 2020-21).

Given the strong performance of both size classes in the most recent year, which covers the first months of Putin’s war but largely predates the worsening of the UK cost of living crisis around October 2022, corporate employment in Greater Cambridge grew faster during 2021-22 (6.2%) compared with 2020-21 (5.1%).

Figure 2.9 compares size classes based on their employment change during 2020-21 (horizontal axis) and 2021-22 (vertical axis). Similar to Figure 2.8, this chart allows us to compare the performance of size classes over time. The position of the size marker relative to the 45° line indicates whether employment change in the size class was higher or lower than last year. Size classes with a positive change in employment during 2021-22 are found above the horizontal axis and those with a positive change during 2020-21 appear to the right of the vertical axis.

Figure 2.9 Employment change by firm size in the Greater Cambridge area – 2021-22 vs 2020-21



Note: The size of each bubble is proportionate to the number of employees in 2020-21 on a continuous scale.

Source: Cosh & Caselli, CBR.

The picture obtained from employment change data largely supports the conclusions drawn from employment growth data.

After a drop of 15 employees in 2020-21, employment change at 1-9 employee businesses was positive in 2021-22 (272 employees). The employment change in the most recent year originated primarily in non-KI sectors (230 employees compared with 42 employees for KI sectors).

Similarly, the employment change in 2021-22 (3,862 employees) was larger than the employment change in 2020-21 (3,244 employees) for businesses with 10+ employees. However, this increase is associated mainly with KI sectors, which saw an employment

change of 2,785 in 2021-22 (2,933 in 2020-21). In turn, employment change in non-KI sectors was 1,077 in the latest year, up from 311 in the previous year.

Overall, corporate employment change to 2022 across all size classes was 4,134 compared with 3,229 in the year to 2021.

The next section analyses the composition of employment growth in KI and non-KI sectors in the Greater Cambridge area over the past decade.

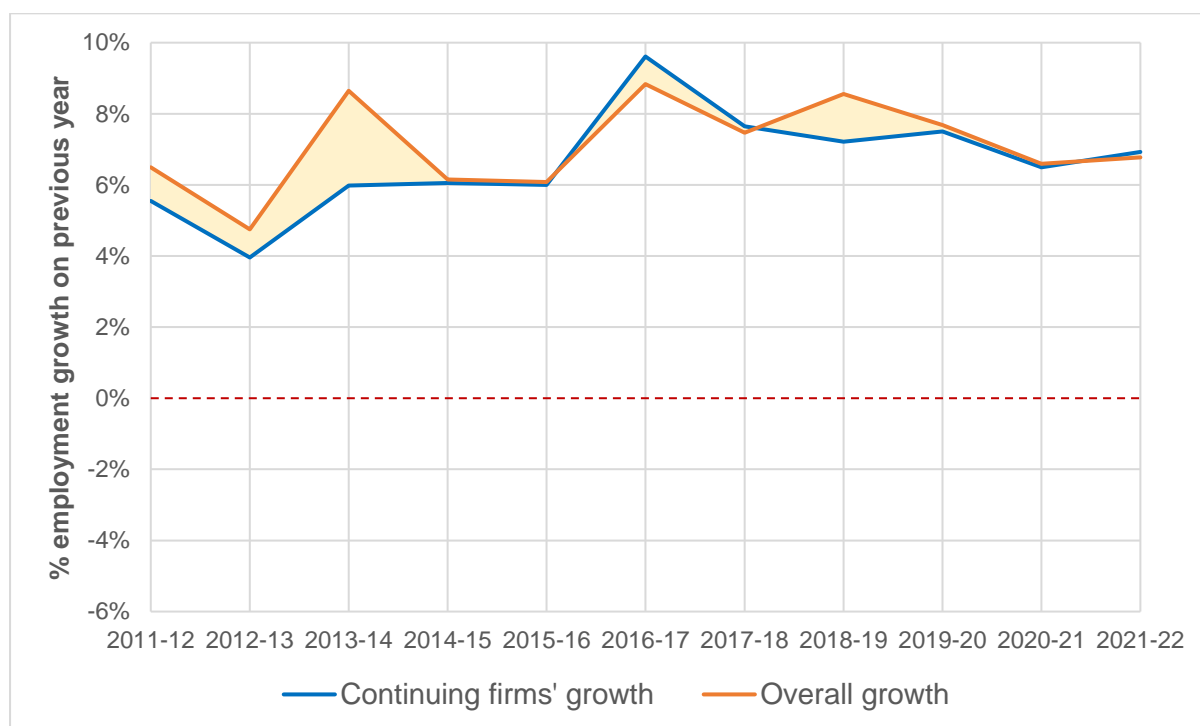
3. The composition of employment growth in KI and non-KI sectors

The previous section has examined the recent performance of Greater Cambridge-based companies that were alive during the past three years. However, overall corporate growth also depends on additions to the business stock caused by company births and deaths, along with location changes into and out of the area.

This section examines the contribution of net entrants, that is, companies born or moved in less those died or moved out, to the growth of Greater Cambridge corporate employment. Since this contribution may be masked by differences across sectors, we distinguish between KI and non-KI sectors.

Figure 3.1 presents an analysis for KI sectors. It shows the annual employment growth of continuing firms (i.e. companies that were based in Greater Cambridge and alive at the beginning and end of the year) against overall growth in the area. The shaded area between the two lines represents the impact of net births and net relocations on employment growth.

Figure 3.1 Contribution of net entrants to employment growth in the Greater Cambridge area – KI sectors



Note: The contribution of net entrants to employment growth is represented by the shaded area.

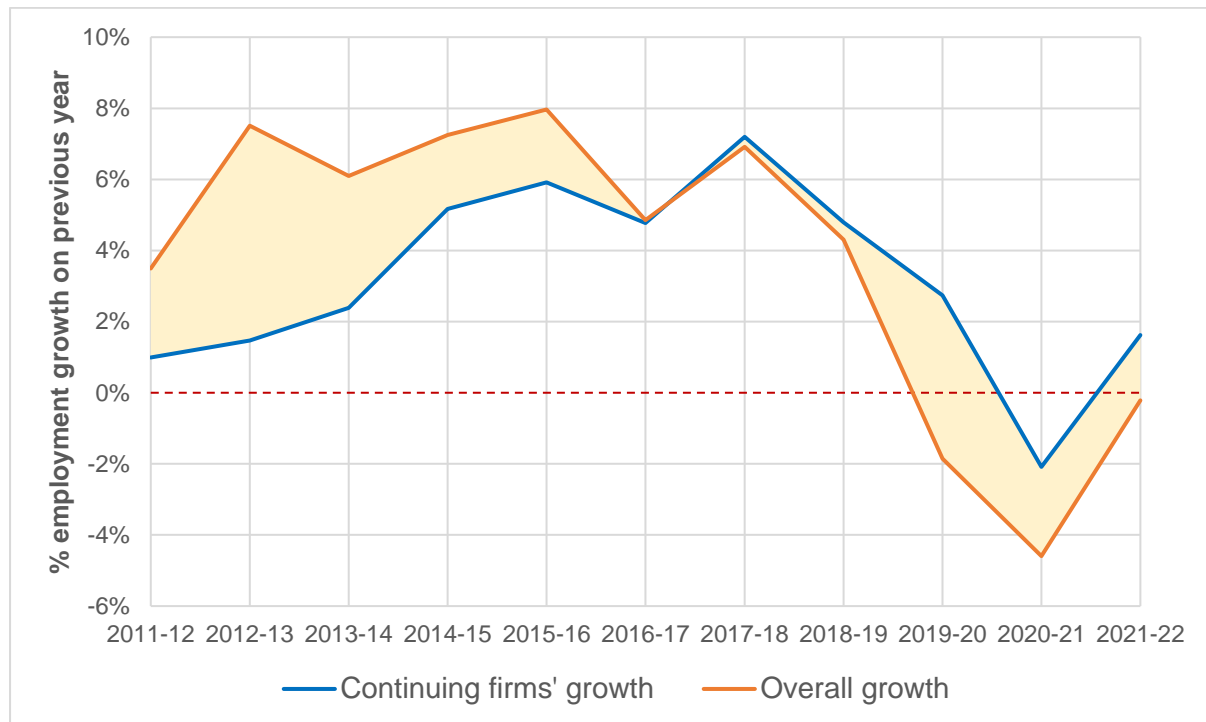
Source: Cosh & Caselli, CBR.

Overall growth in KI sectors has been strong throughout the period (around 7% on average) and has held up well through Covid. Overall growth was higher than the growth of continuing firms in the first half of the decade, indicating that net entrants had a positive impact on KI employment growth in Greater Cambridge. The contribution of net entrants spiked in 2013-14, partly reflecting the incorporation of ProQuest European Holdings (over 300 employees in 2013-14) as a separate entity. This effect has tended to disappear in more recent years, when overall growth has been driven by the growth of continuing firms. The gap between the two lines for 2018-19 would be even smaller if Illumina, who relocated from Chesterford Research Park (Uttlesford LAD) to Granta Park (South Cambridgeshire LAD) and is thus treated as a relocation into the area, is removed from the analysis.

These results suggest that the net effect is generally quite modest. However, it must be noted that our measure of net births may underestimate the positive contribution made by company births, in that it captures the loss of employment when a company dies and the number of employees in the first year when a company is born. These newly formed companies may then grow rapidly in their first few years, but this rapid growth is assigned in our analysis to continuing firms (those in existence for two years or more) and not to births.

Figure 3.2 provides an equivalent analysis for non-KI sectors.

Figure 3.2 Contribution of net entrants to employment growth in the Greater Cambridge area – Non-KI sectors



Note: The contribution of net entrants to employment growth is represented by the shaded area.
Source: Cosh & Caselli, CBR.

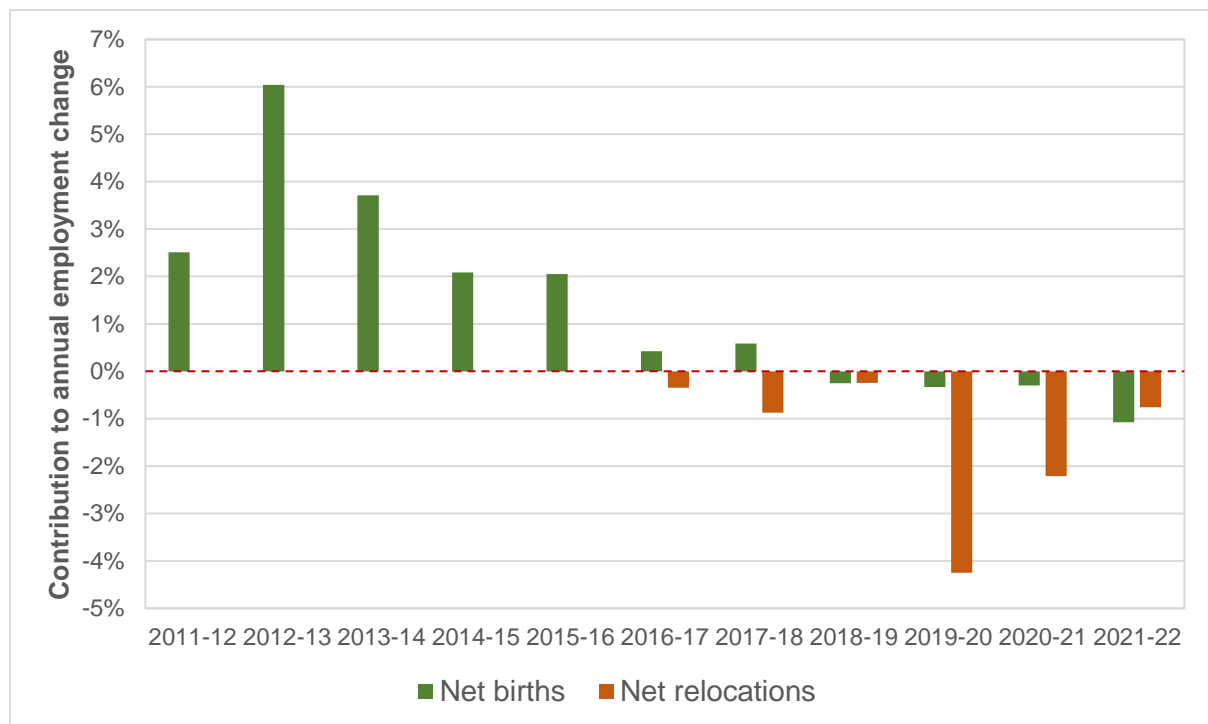
The picture for non-KI sectors looks different from the picture for KI sectors. Overall growth in non-KI employment was robust in the first half of the period, but has slowed down markedly since then and was negative in the year when the pandemic struck. There was a peak in 2012-13, which partly reflects a growth in incorporations of schools due to changes in legislation (overall growth in 2012-13 would be 3.4% rather than 7.5% if the Education sector is excluded from the analysis). Overall growth, albeit still slightly negative, picked up in the most recent year as the economy recovered from the worst effects of Covid.

Most importantly, our analysis reveals that net entrants went from having a positive influence on non-KI employment growth up to 2016-17 to having a negative influence in the latter part of the period. Overall growth in non-KI employment was 6.2% on average up to 2016-17 (compared with 3.4% for continuing firms) and 0.9% after that (2.9% for continuing firms). The positive influence in the first part of the period is due to company births, whilst the negative influence in the second part of the period is due to companies moving out of the area (as we shall see in Figure 3.3).

Taken together, the results of our comparison between KI and non-KI sectors indicate that the reduction in the contribution of net entrants to employment growth over the past decade

reported elsewhere (see CBR’s note titled “The Economic Geography of the Cambridge City Region – A Story of Corporate Resilience”) is associated principally with the non-KI sectors. It is interesting to examine whether this reduction is driven mainly by changes in company births and deaths or by changes in company relocations into and out of the Greater Cambridge area. Figure 3.3 shows the contribution of net births and net relocations to annual employment change in non-KI sectors.

Figure 3.3 Contribution of net births and net relocations to employment change in the Greater Cambridge area – Non-KI sectors



Note: Data on net relocations are available from 2016-17.

Source: Cosh & Caselli, CBR.

The contribution of net births to non-KI employment change in Greater Cambridge was positive and strong up to 2017-18. Net births offset net relocations in 2016-17 and, to a lesser extent, in 2017-18. Since then, the contribution of net births turned negative and could not offset the negative impact from net relocations (perhaps as the non-KI companies were pushed further out by KI companies). The impact from net relocations was particularly large in 2019-20, as Booking.com’s decision to relocate its head office to Manchester resulted in a loss of over 1,300 employees across Greater Cambridge.

Overall, these results suggest that the reduction in the contribution of net entrants to employment growth observed in recent years is driven mainly by a fall in birth rates. Although it is possible that housing- and transport-related challenges have made the Greater Cambridge area less attractive, there is evidence to suggest that this reduction is a national rather than a local phenomenon (ONS Business Demography 2021).

The next section delves deeper into differences in performance between KI and non-KI sectors by presenting an analysis of the latest employment data from ONS.

4. Analysis of ONS employment data

This section begins with an analysis of the latest payroll-based employee data released jointly by HMRC and ONS, before turning to a more detailed comparison of KI and non-KI sector performance using data from ONS's Business Register and Employment Survey (BRES).

4.1. Employment growth by area – PAYE RTI data

The experimental monthly estimates of payrolled employees measure the number of people paid through a Pay As You Earn (PAYE) scheme. These estimates, which were introduced during Covid to provide further insight into the UK labour market, are sourced from HMRC's PAYE Real Time Information (RTI) system and are intended to cover the whole employee population (self-employment is not included). According to ONS (March 2023 release), "[t]hese statistics also have the potential to replace some of those based on surveys, which could reduce the burden on businesses needing to fill in statistical surveys".

The usefulness of PAYE RTI data for our analysis is that they provide a timelier estimate of corporate and non-corporate employee growth than other sources. The latest release available at the time of writing is the March 2023 release, which has local authority-level data through February 2023.³ Importantly, these data are also broken down by local authority, allowing for an up-to-date picture of what is happening in the Greater Cambridge area and elsewhere.

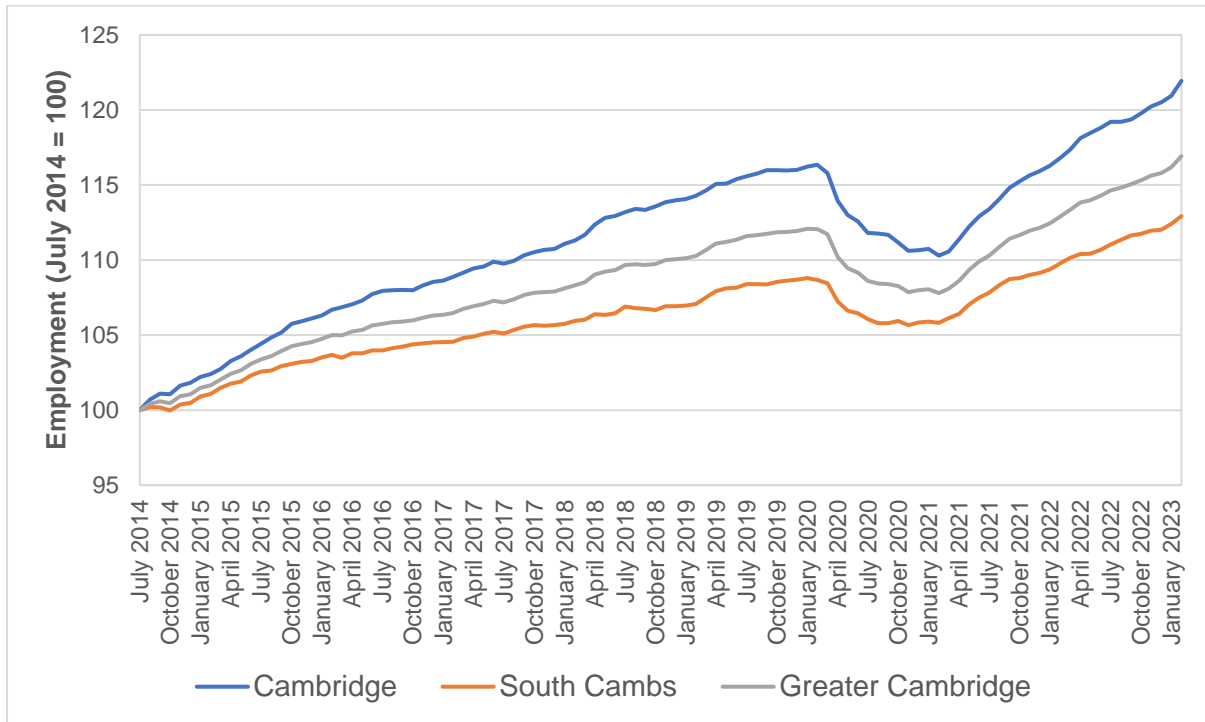
Figure 4.1 examines payrolled employee growth for selected geographic areas. Part (a) focuses on the Greater Cambridge area, while part (b) compares Greater Cambridge with the wider Cambridgeshire and Peterborough Combined Authority area ('Combined Authority' hereinafter), the East of England and the UK.

The number of payrolled employees in the Greater Cambridge area increased steadily until February 2020 (2.0% on average over the previous five years). This trend was interrupted when Covid first hit the UK in March 2020, which caused a downward trend until March 2021. During this 12-month period, payrolled employees fell by 3.2% (-4,500 employees) despite the protection offered by the furlough scheme. The number of payrolled employees started to pick up as lockdowns and other Covid-related restrictions were gradually eased from March 2021, reaching its pre-pandemic levels around November 2021. Employee growth has been strong since and appears to have resumed its longer-term trend as businesses and the wider economy learn how to live with Covid. Payrolled employees in Greater Cambridge increased by 3.3% in the 12 months to November 2022 and by 3.6% in the 12 months to February 2023 (although figures for February 2023 are early estimates and may be subject to revisions).

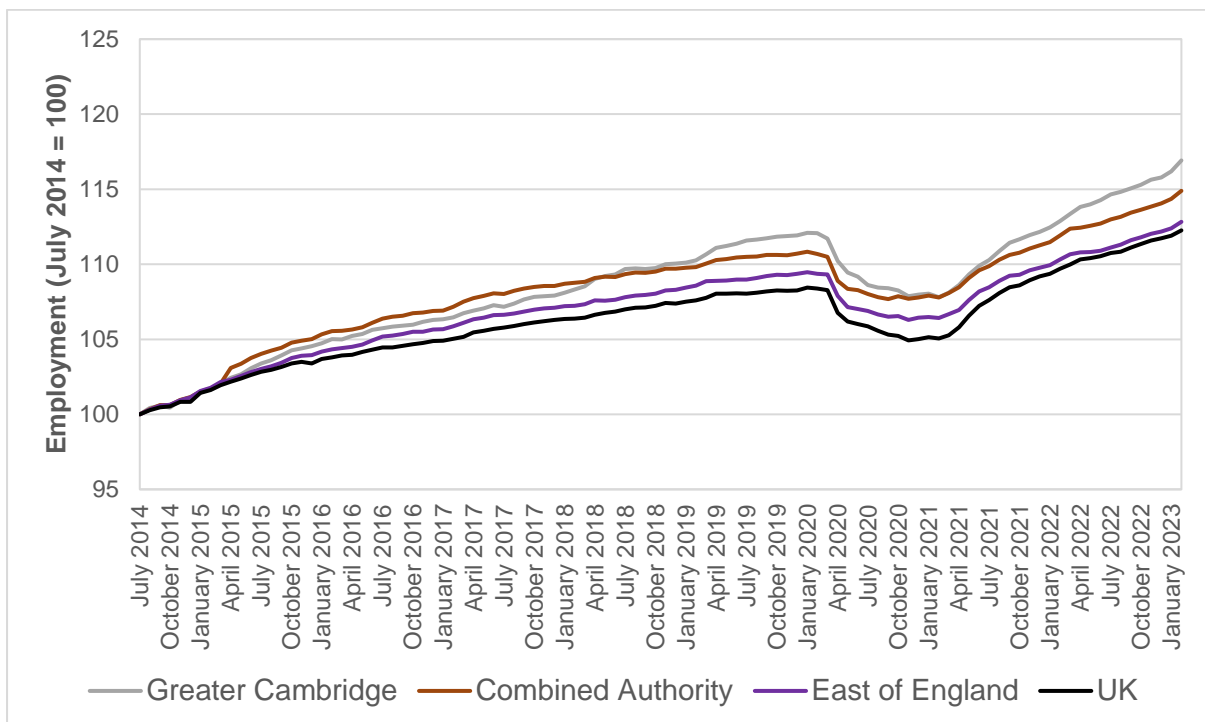
³ An earlier analysis of payrolled employees up to February 2022 was published in our June 2022 Update.

Figure 4.1 Payrolled employees by area

(a) Cambridge, South Cambs and Greater Cambridge



(b) Greater Cambridge, Combined Authority, East of England and UK



Note: Payrolled employees are individuals receiving paid remuneration through Pay As You Earn (PAYE). It includes people who have not done work but are an employee (e.g. those on paid leave), whilst it excludes self-employment.

Source: PAYE RTI (HMRC/ONS).

Part (a) of Figure 4.1 also reveals that Cambridge and South Cambridgeshire have shown a similar pattern, albeit with some differences. During the period before the onset of the pandemic, payrolled employees grew faster in Cambridge (2.6% pa between February 2015 and February 2020) than in South Cambridgeshire (1.5% pa). By contrast, the data for the Covid-affected period indicate that the pandemic caused larger employment losses in Cambridge (-4.5%, or -2,900 employees, in the year to March 2021) than in South Cambridgeshire (-2.1%, or -1,600 employees). Since March 2021, both districts have seen a return to growth and are now above their pre-Covid levels. Employee growth in the post-lockdown period has been particularly strong in Cambridge (4.0% in the 12 months to November 2022 and 4.4% in the 12 months to February 2023, compared with 2.7% and 2.9% respectively for South Cambridgeshire).

The comparison presented in Part (b) of Figure 4.1 shows that the pattern observed for the Greater Cambridge area largely mirrors that for the wider Combined Authority, the East of England and the UK. However, payrolled employee growth pre Covid was higher in Greater Cambridge (2.0% pa between February 2015 and February 2020) than it was in other areas (1.7% pa for the Combined Authority, 1.4% pa for the East of England and 1.3% pa for the UK). The number of payrolled employees fell sharply in all areas during the period including the three Covid lockdowns, particularly in Greater Cambridge, but bounced back when lockdowns were lifted in the spring of 2021. During this post-lockdown period, payrolled employee growth in Greater Cambridge (3.6% in the 12 months to February 2023) outperformed growth in the other areas (2.7% pa for the Combined Authority, 2.3% pa for the East of England and 2.3% pa for the UK).

4.2. Employment growth in Greater Cambridge – Comparison across sources

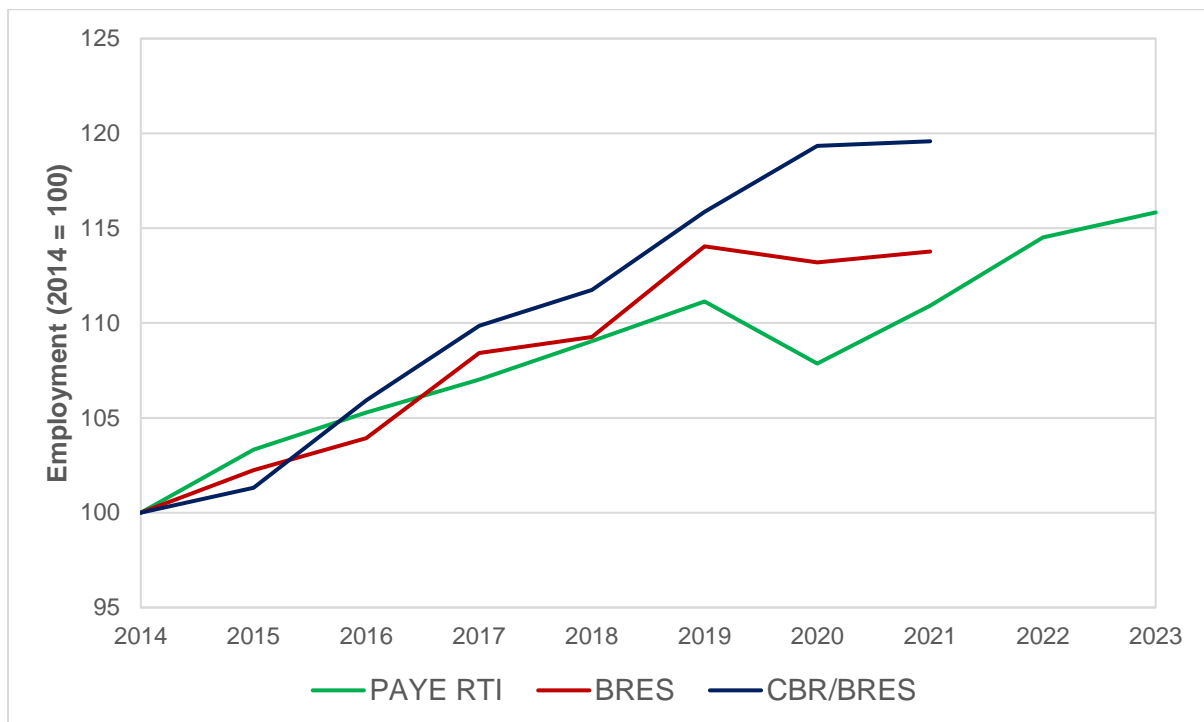
Alongside a comparison across geographic areas, it is instructive to examine the payroll-based measure against alternative measures of employment. We are particularly interested in exploring whether the pattern identified in the payroll data for Greater Cambridge (i.e. fast growth before Covid, drop during Covid and bounce back after Covid) is confirmed by other employment data.

Figure 4.2 compares employment growth in the Greater Cambridge area across three sources: PAYE RTI; BRES; and CBR/BRES. CBR/BRES is a method of deriving a compromise growth figure, using CBR data for half of the sectors where local corporate employment dominates and BRES data for the other half of the sectors where non-corporate employment is relatively high. Like BRES, CBR/BRES data covers the period until 2021.

PAYE RTI, BRES and CBR/BRES all point to robust employment growth in Greater Cambridge throughout the period for which comparable data is available (i.e. 2014-2021). Employment grew by 2.6% pa according to CBR/BRES, 1.9% pa according to BRES and 1.5% pa according to PAYE RTI. Nonetheless, some important differences exist across these sources.

Whilst BRES and CBR/BRES show a similar growth in employment in the period preceding the onset of the pandemic (2.7% pa and 3.0% pa, respectively), PAYE RTI reports a slightly lower growth rate of 2.1% pa. The differences across the three sources are even more apparent for 2020, a year that includes the bulk of the Covid impact.

Figure 4.2 Comparison of employment growth in the Greater Cambridge area across sources



Note: BRES data are available until 2021 on an annual basis and have September as the reference month. PAYE RTI data are for September each year to facilitate comparison with BRES (except for 2023, which uses February as the latest available data).

Source: BRES (ONS); CBR; PAYE RTI (HMRC/ONS).

CBR/BRES indicates that employment in Greater Cambridge held up well through the pandemic, helped by the strong performance of the KI corporate economy – particularly its Life Sciences and ICT clusters – as well as the growth of the health services sector. By contrast, PAYE RTI suggests a considerable drop in payrolled employees after Covid struck (-2.9%), which is puzzling if one considers that payrolled employees placed on furlough during the pandemic are included in these statistics. BRES shows a more moderate drop of 0.7%. This difference between PAYE RTI and BRES is intriguing. All sources report positive employment growth in the latest year, with PAYE RTI exhibiting the highest growth rate (2.8%) following the considerable drop one year earlier. It will be interesting to see what BRES and CBR/BRES will show for 2022 and 2023 when the data becomes available.

These differences across sources would call for a more disaggregated analysis by sector, ideally comparing KI and non-KI sector performance using PAYE RTI data against other sources. However, we are unable to carry out this analysis because: (1) PAYE RTI data are available only for broad sectors (e.g. ‘Manufacturing’) and do not allow for a split between KI and non-KI sectors; and (2) sectoral data from PAYE RTI are available at the East of England level and not at the local authority level.

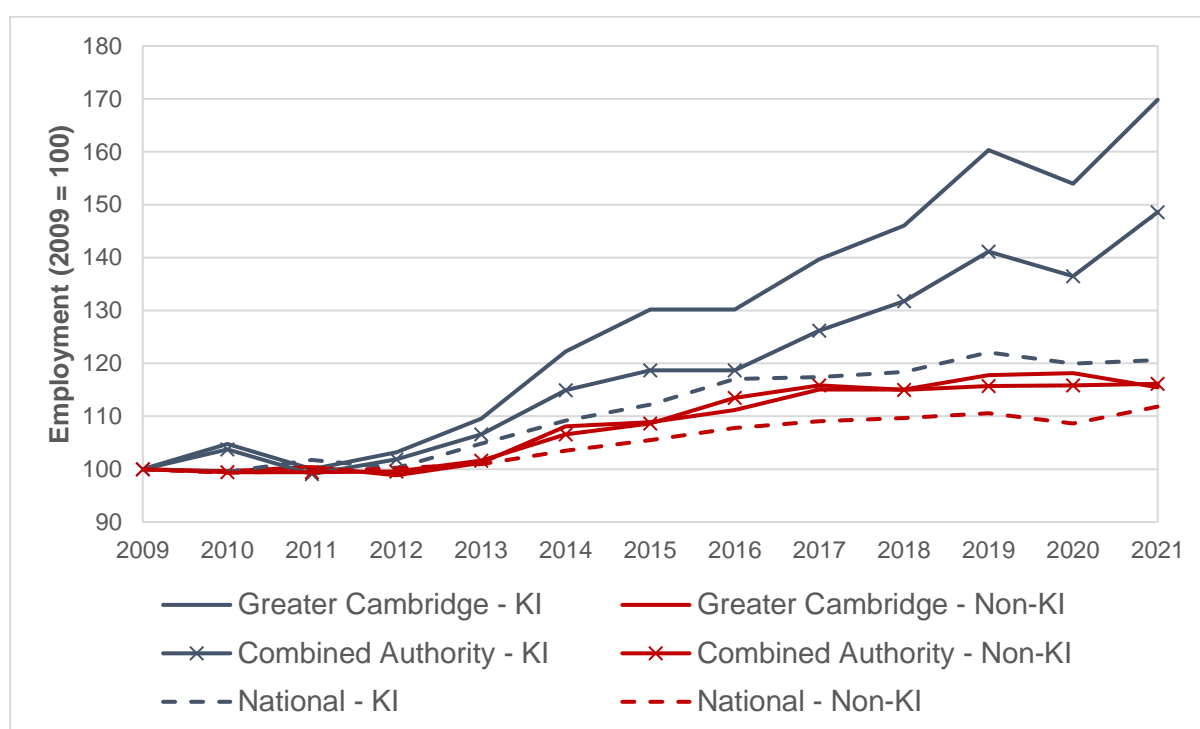
Although the payroll-based method allows for timely estimates of employment, it also has the limitation of being based on where employees reside rather than where they work. This limitation associated with PAYE RTI is particularly relevant to an area like Greater Cambridge, where the relatively high levels of in-commuting may result in an underestimation of the actual number of employees working there. This approach is in stark contrast to ours, which assigns employees to the company’s principal location and is thus closer to BRES.

Due to the lack of disaggregated sectoral data from PAYE RTI, we now look more closely at the link between KI and non-KI sectors by examining BRES data.

4.3. Employment growth in Greater Cambridge – Comparison across sectors

Our recent comparison of employment growth in the Greater Cambridge area against the country using BRES data (see CBR’s note titled “An Economic Census of the Cambridgeshire and Peterborough Region – Opportunities and Challenges”) showed that KI employment in the area increased much faster than the national average (4.5% pa and 1.8% pa, respectively, over the period 2010-2021). It would appear that KI activity in Greater Cambridge has also pulled the performance of non-KI sectors above the national average (1.3% pa and 1.1% pa, respectively). These results are illustrated in Figure 4.3.

Figure 4.3 BRES employment growth – Greater Cambridge vs national

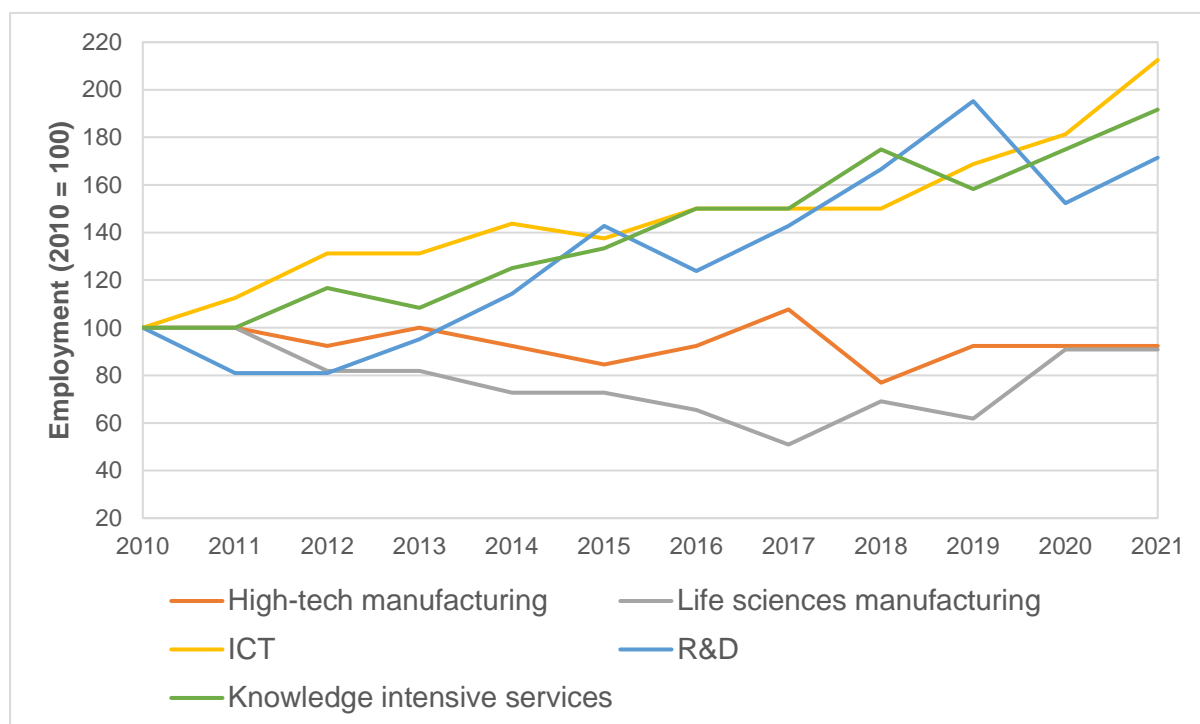


Source: BRES (ONS).

In this section, we augment these findings by examining which KI sectors are behind the fast growth in employment in the Greater Cambridge KI economy and which non-KI sectors appear to have benefited from the buoyancy of the local KI economy. The analysis carried out hereinafter is based entirely on BRES data. The latest set of BRES results (‘provisional results 2021, revised results 2020’) cover the growth period from September 2020 to September 2021.

We start with an analysis of BRES employment growth in the Greater Cambridge area between 2010 and 2021 for the 5 KI sectors. It must be noted that BRES has a different sectoral classification than the one used in the first part of this report. Whilst we take SICs as the point of departure and assign companies to purpose-built sectors that are economically relevant to the area, BRES is based purely on self-reported SICs. The results of this analysis are presented in Figure 4.4.

Figure 4.4 BRES employment growth in the Greater Cambridge area – KI sectors



Source: BRES (ONS).

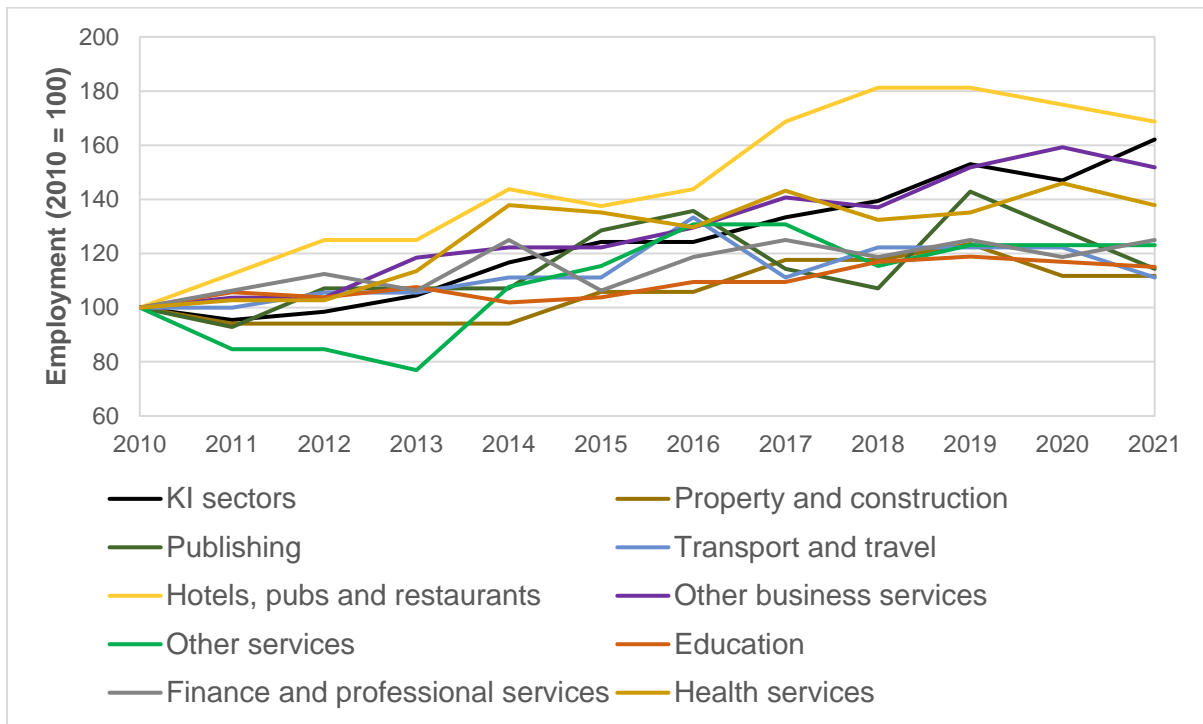
Figure 4.4 shows that the exceptional performance of the Greater Cambridge KI economy is driven by the ‘ICT’, ‘Knowledge intensive services’ and ‘R&D’ sectors. BRES data points to the ‘ICT’ sector as the fastest growing KI sector in Greater Cambridge, increasing from 8,000 employees in 2010 to 17,000 employees in 2021 (7.1% pa against a national average for the sector of 2.9% pa). Employment growth during this 12-year period was similar in the ‘Knowledge intensive services’ sector (6.1% pa compared with 2.4% pa for the country). The ‘R&D’ sector, the largest KI sector locally according to BRES, saw a 5.0% pa employment growth (2.2% pa for the country).

Conversely, employment decreased slightly over time in the ‘High-tech manufacturing’ and ‘Life sciences manufacturing’ sectors (-0.7% pa and -0.9% pa, respectively), in line with the national trend. BRES data suggests that there were 6,000 employees working in the ‘High-tech manufacturing’ sector during 2021, but only 1,250 in ‘Life sciences manufacturing’. This latter figure likely under-records the number of jobs in Life Sciences manufacturing in Greater Cambridge (CBR corporate data reveals that there were over 2,600 employees working in the ‘High-tech manufacturing – life sciences’ sector alone during 2021-22, plus 1,500 employees in the ‘Medical instruments’ sector).

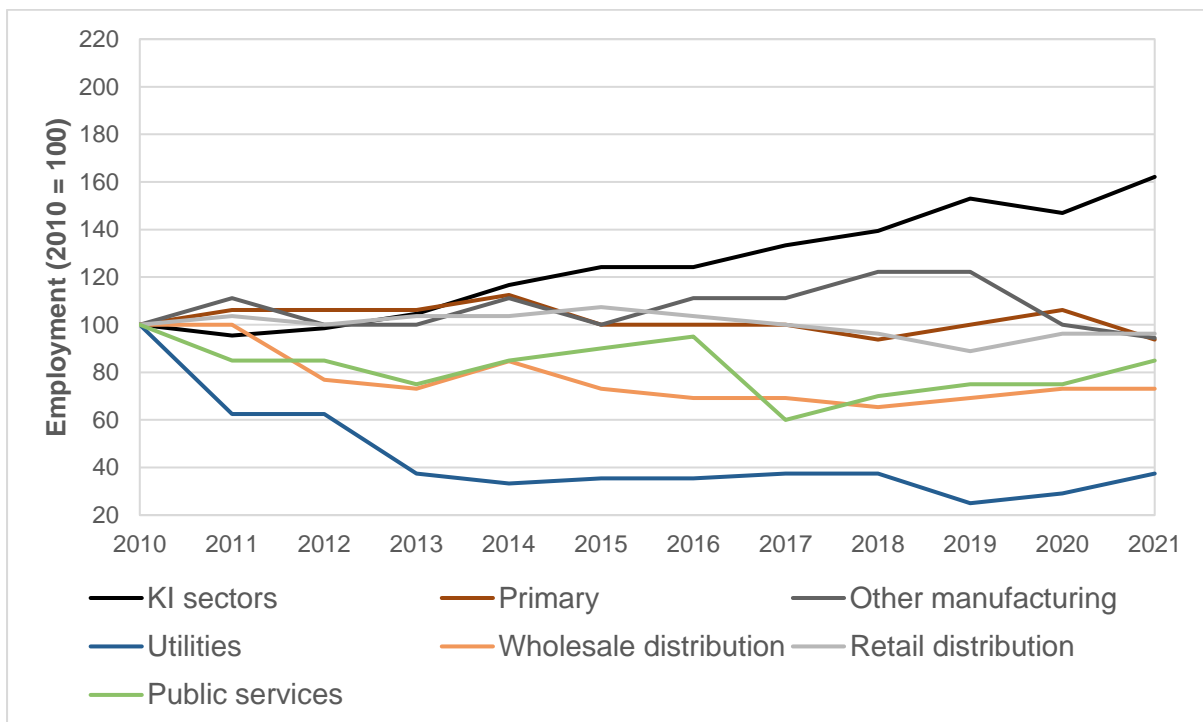
Given the strong growth of the ‘ICT’, ‘Knowledge intensive services’ and ‘R&D’ sectors, we now explore which non-KI sectors in Greater Cambridge appear to have taken advantage of this growth. Figure 4.5 splits the 15 non-KI sectors into those that have reported positive employment growth during the period 2010-2021 and those that have reported negative growth during the same period. The line for the 5 KI sectors as a whole is included for comparison. **Please note that the scale used for Part (a) of Figure 4.5 is different from that used for Figure 4.4 and Part (b) of Figure 4.5 to bring greater clarity.**

Figure 4.5 BRES employment growth in the Greater Cambridge area – Non-KI sectors

(a) Non-KI sectors with positive annual employment growth 2010-2021



(b) Non-KI sectors with negative annual employment growth 2010-2021



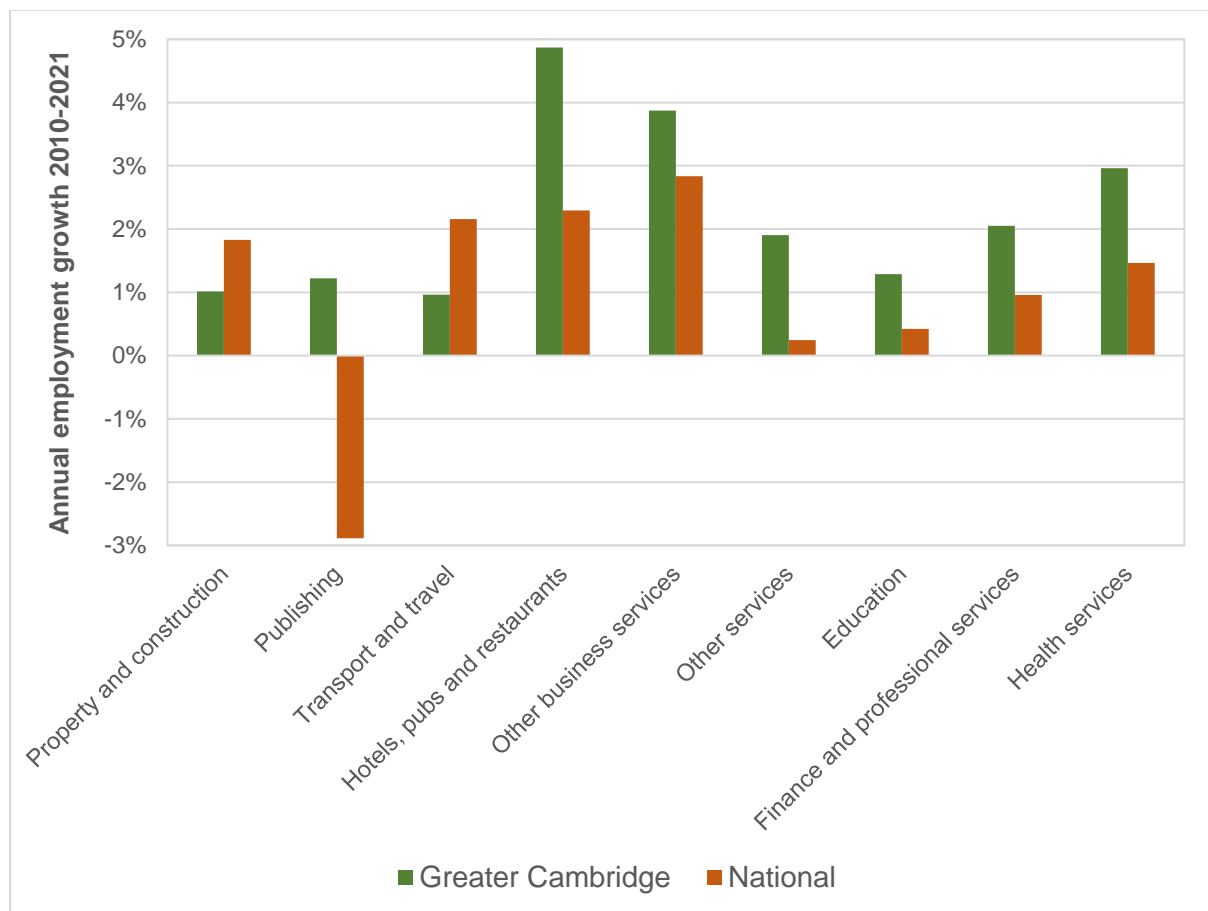
Source: BRES (ONS).

As illustrated in Part (a) of Figure 4.5, 'Hotels, pubs and restaurants' (4.9% pa), 'Other business services' (3.9% pa) – which includes employment agencies and management consultancies – and 'Health services' (3.0% pa) emerge as the fastest growing non-KI sectors

in Greater Cambridge during the 12-year period covered by our analysis. Employment growth was somewhat lower, yet still higher than the average for all non-KI sectors combined (1.3% pa), in 'Finance and professional services' (2.0% pa) and 'Other services' (1.9% pa) – which includes arts, entertainment and recreation activities as well as other cultural activities. 'Education' (1.3% pa), 'Publishing' (1.2% pa), 'Property and construction' (1.0% pa) and 'Transport and travel' (1.0% pa) had positive but more modest growth. By contrast, the 6 non-KI sectors included in Part (b) of Figure 4.5 such as 'Wholesale distribution' (-2.8% pa), 'Other manufacturing' (-0.5% pa) and 'Retail distribution' (-0.3% pa) suffered a reduction in employment over time.

Finally, we focus on the 9 non-KI sectors with positive employment growth throughout the 2010-2021 period (Part (a) of Figure 4.5) to examine how they fared relative to the national average for that sector. The results are shown in Figure 4.6.

Figure 4.6 BRES employment growth for non-KI sectors with positive annual employment growth 2010-2021 – Greater Cambridge vs national



Source: BRES (ONS).

We find that, except for 'Property and construction' and 'Transport and travel', all the non-KI sectors with positive employment growth over the entire period outperformed the country. For example, employment growth was 3.9% pa in Greater Cambridge against 2.8% pa for the country for 'Other business services'; 3.0% pa and 1.5% pa for 'Health services'; and 2.0% pa and 1.0% pa for 'Finance and professional services'.

Therefore, our analysis of the latest BRES data appears to suggest that the expansion of the Greater Cambridge KI sectors has pulled the performance of several non-KI sectors above the national average.

We now turn to the results of the April 2023 turnover analysis.

5. April 2023 employment and turnover update results

The analyses presented so far have examined only changes in employment, but we have turnover data for a sufficiently large subset of the companies to make turnover analysis worthwhile. We look at Greater Cambridge-based companies with three years of actual turnover and employment data; and with accounting year ends between May and December. This gives us a sample of 122 companies (representing about 21% of total employment of the companies analysed in Section 2). Table 5.1 provides a comparison of employment and turnover growth rates over the past two years for this group of companies.

Table 5.1 Comparison of employment and turnover growth rates over the past two years in the Greater Cambridge area (April 2023 Update)

Greater Cambridge area Sample of companies with both employment and turnover for the last three years	Turnover growth %pa		Employment growth %pa	
	2020-21	2021-22	2020-21	2021-22
KI COMPANIES				
Number of companies	39	39	39	39
Totals in 2021 and 2020	£1,564m	£1,870m	8,161	9,044
Median growth	7.8%	11.2%	0.0%	0.6%
Weighted average growth	15.3%	19.5%	10.3%	10.8%
NON-KI COMPANIES				
Number of companies	83	83	83	83
Totals in 2021 and 2020	£886m	£977m	5,812	6,080
Median growth	-0.2%	12.8%	0.0%	0.0%
Weighted average growth	10.3%	10.4%	0.5%	4.6%

Source: Cosh & Caselli, CBR.

In recent updates we have found that the pandemic affected turnover more strongly than employment due to the operation of the furlough scheme. The table above shows that with the recovery from the pandemic normal service has been resumed and turnover growth exceeds employment growth as it does usually.

Employment growth for these companies providing both employment and turnover data was notably stronger among the 39 KI companies, which saw employment increasing by over 10% in both years for this group of companies. Non-KI companies achieved positive but lower growth in each year, which was less than half the growth achieved by KI companies in this sample in 2021-22. These findings are in broad agreement with those found for the full sample – see Appendix A1.

We found in previous reports that turnover had fared worse than employment, partly reflecting the role of the Government's furlough scheme in holding up employment in sectors with declining sales. However, we can see that the recovery from the early impact of the pandemic is evident for both years for both KI and non-KI companies. Turnover growth increased from 15.3% in 2020-21 to 19.5% in 2021-22 for this KI sample. Non-KI sectors also achieved turnover growth of over 10% in each year.

The next section discusses the results of the April 2023 snapshot.

6. April 2023 snapshot results

This section summarises the results of the April 2023 snapshot. Having seen in Section 5 the results for employment and turnover data, this section uses just the nine companies that have presented interim results for the six-month periods ending between May and December 2022. Only turnover data is available and together they represent a combined annual turnover of about £769m.

The gain from focusing on interim results for six-month periods is that most of the activity reported in the accounts took place in 2022. For each company we look at turnover growth in the same six-months period in 2020 and 2021.

6.1. Turnover growth

Total turnover for this group of companies grew by 25% in their latest six months (2021-22) compared with a growth of 19% in the same period last year. The findings of the previous section are reinforced for this sample and suggest that the growth of these successful KI companies has remained robust into 2022.

6.2. Companies' comments on recovery from the Covid-19 pandemic

We report below some comments from the companies' latest reports. They offer some further insights into the robustness of these businesses despite the impact of the Covid-19 pandemic and the cost of living crisis on their business.

Darktrace delivered continued high revenue and constant currency ARR growth in the period, underpinned by its multi-year contract model. This growth was achieved despite a noticeable second quarter slowdown in new customer additions resulting from the current macro-economic environment. To offset this new customer slowdown, the Group leveraged its past and ongoing investments in customer success, and increased focus on larger account sales and upsells, to drive increases in both average new contract and existing customer contract ARR.

Darktrace: Global leader in cyber security AI

In October 2022, the Company raised £0.5 million by way of a share subscription from an existing shareholder. The net proceeds of this share subscription will be used for working capital purposes. Business has expanded significantly since the end of the period with revenue in the three months following the end of the period expected to be more than three times the revenue in the first six months. In addition, cash collection has continued favourably with a further £2.3 million being collected since the period end, taking total cash collection to date to circa £6.8 million. Tenders for significant volumes have begun to be awarded in India.

CyanConnode Hldgs: Delivers Wi-Fi solutions for utility metering and lighting control

In 2022, Science Group again demonstrated its resilience and delivered another solid performance, despite the deterioration in the global economy. While all businesses performed creditably, those servicing the consumer sector were most impacted by the economic slowdown.

Science Group PLC: Science and technology consultants

Throughout the challenges resulting from the pandemic and the subsequent supply chain shortages, the business has remained resilient, and demand has rebounded such that we are able to report a record year of revenues, improving margin and progression of our strategic goals which we believe will bolster growth in future years. The positive trading momentum in 2022 has continued into the new financial year and we expect to generate healthy levels of operating cashflows.

Quixant PLC: Makes products for the global gaming and broadcast industries

Our mission is to provide life science researchers with highly validated products and services to advance biological research and achieve their goals faster. We do this by continuously innovating and providing our customers with high-quality tools, together with expert customer support. Our product offering includes an extensive portfolio of antibodies and related protein research tools that are fundamental to our customers' research and experimental workflow. Our customers are primarily researchers in academic institutions, research institutes and pharmaceutical, biotechnology and diagnostics companies. 2022 was a challenging year. We faced inflationary pressures on our costs, supply chain disruptions and the ongoing impact from COVID-19, particularly in China. However, even in this environment we delivered major change programmes aligned to our strategic priorities. Our confidence in the performance of the business is unwavering, and we continue to expect to achieve our revenue target of £450m-£525m by 2024 (from £362m currently).

Abcam PLC: Provides biological and tools for drug discovery

The success that the IQGeo team achieved in 2022 continues to validate our core strategy, our sales model, and our software technology strategy going forward into 2023. Our 92% increase in revenue is evidence of the investment being made in network infrastructure by the telecom and utility industries and our ability to respond with innovative software solutions. Our success in 2022 has given us a renewed confidence to continue our focus on core business growth and product innovation. We are operating in strong telecom and utility markets that we believe will continue to invest in new technology for the long term.

IQGeo Group PLC: Provides geospatial software for the telecoms and utilities

We have transformed and re-energised Xaar as demonstrated by our good performance and further strategic progress with positive contributions from across the Group. We have delivered strong profitable revenue growth and the important milestone of achieving full year profitability which represents great progress against our plan. From these strong foundations we will continue to invest for growth and the rollout of our product roadmap as we enhance our vertically integrated offer.

Xaar PLC: Digital inkjet printing technology

The Company made further incremental investments in its sales and marketing channels during 2022 to drive further growth in ARR and the subscription base, following the successful investment made in 2021. As noted in the Principal activities and performance measures section above, the annualised recurring revenue increased by £2.6m to £27.3m at 31 December 2022. Revenue grew by 7.9% during the year in line with ARR growth.

Quartix Technologies PLC: Vehicle GPS tracking

The 24i business (which focuses on streaming video services) won six customers in the final quarter of 2022 and this momentum has continued in the first quarter of 2023. Trading continues in line with expectations. The focus for 24i in 2023 is to continue to grow revenue and ARR at double digit percentages whilst also increasing profit margins. For our Amino business (which connects Pay TV to streaming services), as previously communicated, the wider macro-economic situation resulted in a decline of revenues in the second half of 2022 as some customers delayed their orders of new streaming devices, preferring to run down their existing inventory. This trend has continued longer than we expected and device sales in the first half have been materially lower than anticipated. While Amino continues to have a strong sales pipeline for second half of 2023, the recovery is now not expected until later in the financial year. As a result, management now expect Amino's outturn for the full year ending 30 November 2023 to be substantially lower than originally anticipated.

Aferian (Amino Technologies) PLC: Global media and entertainment technology

By bringing telcos and merchants with subscription services together, Bango is solving a key problem in the market. The Bango Digital Vending Machine provides a way for merchants to leverage the trusted billing relationship and ready marketing channel telcos have with consumers. Revenue up 38% to \$28.5M (FY21 \$20.7M). Trading momentum in 2023 has continued, in particular for Bango Digital Vending Machine (“DVM”) technology. 2023 exit ARR is now expected to reach \$10M, comfortably ahead of previous \$7M guidance.

Bango PLC: Technology and services helping global businesses to grow

The Company followed its strong performance in 2021 with a 31% growth in revenues to £5.9million in the first half of 2022 (H1 2021: £4.5 million). Order intake was in line with the Board’s expectations at £7.2 million, up 44% on a like-for-like basis on H1 2021 (H1 2021:£8.6 million, including £3.6 million of one-off orders) and the Company has a growing, qualified pipeline of opportunities for the second half of 2022. The contracted order book was £18.6 million at 30 June 2022 increasing from £17.1m at 31 December 2021. The order book provides the Company with visibility over future revenues and provides a solid foundation from which the Company can continue to invest in product and commercial development to further expand the business.

Cambridge Cognition Hldgs PLC: Digital solutions to assess brain health

Revenue for the first half of the year increased by 16% over the comparative period to £57.1 million (H1 FY22: 49.1 million) through the release of F1® Manager 2022 in August 2022, ongoing sales of the current portfolio and new PDLC (paid-downloadable content) for existing games. The outturn over the five remaining months of this financial year is dependent on a number of variables, including the timing and contribution from the scheduled Foundry releases and the macro-economic environment. The Board believes it is still possible to

surpass last year's record revenue performance of £114 million, particularly if one of the upcoming Foundry titles is a conspicuous success. However, given the number of variables and the more challenging economic outlook, the Board have set a minimum expectation of delivering revenue of not less than £100 million in FY23.

Frontier Developments PLC: Developer and publisher of videogames

The statutory reporting year continued to be impacted by the Covid 19 pandemic for most of the period to varying degrees of severity. Turnover increased from the very low levels in 2021 of £1.0m to £2.8m, higher than in 2020 but not back to the 2019 levels. We were open for the whole period, however Government restrictions severely impacted the business for short periods such as the social distancing and limits on the number of guests allowed to meet indoors, these weren't lifted until 19th July 2021. Christmas 2021 was impacted by the Kent variant resulting in everyone cancelling their plans ahead of Christmas day for fear of having to isolate. As the business demand recovered we, like all of the hospitality industry, suffered from a lack of staff especially experienced staff.

Quy Investments Limited: Owners of Quy Mill Hotel & Spa

7. Concluding remarks

The April 2023 Update is the eighth of a series of updates that provide timely data on corporate employment changes in the Greater Cambridge area. The findings in this report are drawn from a sample of 5,599 companies with accounting year ends between May and December 2022. This sample, which covers almost two-thirds of corporate employment in the area, has a modal year end of mid-October 2022. Therefore, it captures the impact of Putin's war on the recovery from Covid. We compare this period with the previous year, which covers the second and third Covid lockdowns as well as the coming out of lockdowns.

The picture that emerges is one of continued and faster employment growth in Greater Cambridge during the year to mid-October 2022. This faster employment growth was driven by a buoyant KI economy, which continued to expand at fast rates despite the supply chain disruptions and inflationary pressures following Putin's invasion of Ukraine. ICT and Life Sciences alone, the two largest KI clusters in the area, added over 2,500 employees (out of a total change of 4,100 employees). The resilience of the Greater Cambridge corporate economy was also helped by a pick-up in employment growth amongst non-KI sectors. Sectors such as 'Other services', 'Other business services' and 'Wholesale and retail distribution', which were severely hit by lockdowns and other Covid-related restrictions, saw a strong bounce back in employment. These results point to continued recovery amongst non-KI sectors despite the challenging macroeconomic environment. The finding that employment growth in Greater Cambridge has continued to recover from the impacts of Covid is confirmed by the latest ONS data, which we analysed in this report.

We complement these findings by studying the performance of a smaller sample of companies for which we have both employment and turnover data over the past three years. We found in previous reports that turnover had fared worse than employment, partly reflecting the operation of the furlough scheme. Our latest analysis reveals that, with the recovery from Covid, normal service has been resumed and turnover growth exceeds employment growth as it did pre pandemic. The recovery is evident for both the KI and non-KI companies included in this sample. Employment growth was stronger among the KI companies, which increased their employment by over 10% in both years. Non-KI companies achieved positive but lower employment growth. Turnover of this KI sample increased by 19.5% in 2021-22 (15.3% in 2020-21), while non-KI sectors achieved turnover growth of over 10% in each year.

Finally, we augment the results for turnover by providing a snapshot for companies with interim accounts ending between May and December 2022. Total turnover for this group of companies (all knowledge intensive) grew by 25% in their latest six months compared with a growth of 19% in the same period last year. These findings reinforce those from the employment update sample and suggest that the growth of these KI companies has remained robust into 2022. The perusal of their interim reports also offers some further insights into the robustness of these KI companies despite the impact of Covid and the cost of living crisis on their business.

Overall, the results of our April 2023 Update tell a story of strong corporate resilience during a very turbulent period. Our next update will examine whether the robust performance of Greater Cambridge-based businesses continued into the Autumn of 2022, when the UK cost of living crisis worsened as inflation peaked at 11.1% (a 41-year high).

Andy Cosh

Giorgio Caselli

Centre for Business Research, University of Cambridge

April 2023

Appendix A1. Employment growth by sector in the Greater Cambridge area

April 2023 Update	Number of companies	Total empl 2021-22	Total empl 2020-21	% of GC total 2020-21	Empl growth 2021-22	Empl growth 2020-21
KNOWLEDGE INTENSIVE SECTORS						
Information technology and telecoms	816	13,717	12,005	65.1%	14.3%	8.3%
Life science and healthcare	261	17,338	16,506	83.6%	5.0%	12.4%
High-tech manufacturing	173	4,400	4,247	52.0%	3.6%	-1.3%
Knowledge intensive services	240	4,092	3,962	55.8%	3.3%	7.8%
TOTAL KI SECTORS	1,490	39,547	36,720	68.7%	7.7%	8.8%
OTHER SECTORS						
Primary	138	911	935	76.1%	-2.6%	-2.2%
Manufacturing	233	2,690	2,715	68.2%	-0.9%	3.8%
Wholesale and retail distribution	413	3,123	2,979	56.5%	4.8%	-3.2%
Construction and utilities	508	2,461	2,487	53.1%	-1.0%	-0.3%
Transport and travel	103	1,132	1,160	71.1%	-2.4%	-9.0%
Property and finance	714	3,163	3,110	53.2%	1.7%	4.5%
Other business services	995	4,854	4,503	45.5%	7.8%	1.6%
Other services	646	5,101	4,607	51.8%	10.7%	-0.7%
Education, arts, charities, social care	359	7,983	7,615	67.1%	4.8%	3.0%
TOTAL NON-KI SECTORS	4,109	31,418	30,111	57.0%	4.3%	0.9%
TOTAL ALL SECTORS	5,599	70,965	66,831	62.9%	6.2%	5.1%

Source: Cosh & Caselli, CBR.

Appendix A2. Employment growth by sector in Cambridge

April 2023 Update	Number of companies	Total empl 2021-22	Total empl 2020-21	% of Camb total 2020-21	Empl growth 2021-22	Empl growth 2020-21
KNOWLEDGE INTENSIVE SECTORS						
Information technology and telecoms	367	4,990	4,464	48.3%	11.8%	6.7%
Life science and healthcare	101	7,137	6,742	92.4%	5.9%	18.0%
High-tech manufacturing	25	991	955	74.7%	3.8%	0.4%
Knowledge intensive services	109	1,684	1,628	74.6%	3.4%	19.1%
TOTAL KI SECTORS	602	14,802	13,789	69.0%	7.3%	12.9%
OTHER SECTORS						
Primary	23	62	64	34.0%	-3.1%	-7.2%
Manufacturing	69	486	488	71.1%	-0.4%	-2.8%
Wholesale and retail distribution	133	850	816	54.3%	4.2%	-3.2%
Construction and utilities	150	520	505	59.1%	3.0%	-1.9%
Transport and travel	31	213	219	53.8%	-2.7%	-6.4%
Property and finance	338	1,781	1,744	56.5%	2.1%	3.7%
Other business services	423	2,880	2,647	59.3%	8.8%	2.1%
Other services	276	2,350	2,098	58.5%	12.0%	-3.6%
Education, arts, charities, social care	203	4,984	4,692	82.5%	6.2%	-1.2%
TOTAL NON-KI SECTORS	1,646	14,126	13,273	64.9%	6.4%	-0.7%
TOTAL ALL SECTORS	2,248	28,928	27,062	66.9%	6.9%	5.8%

Source: Cosh & Caselli, CBR.

Appendix A3. Employment growth by sector in South Cambridgeshire

April 2023 Update	Number of companies	Total empl 2021-22	Total empl 2020-21	% of S Cambs total 2020-21	Empl growth 2021-22	Empl growth 2020-21
KNOWLEDGE INTENSIVE SECTORS						
Information technology and telecoms	449	8,727	7,541	82.0%	15.7%	9.3%
Life science and healthcare	160	10,201	9,764	78.4%	4.5%	8.9%
High-tech manufacturing	148	3,409	3,292	47.8%	3.6%	-1.8%
Knowledge intensive services	131	2,408	2,334	47.5%	3.2%	1.1%
TOTAL KI SECTORS	888	24,745	22,931	68.5%	7.9%	6.5%
OTHER SECTORS						
Primary	115	849	871	83.8%	-2.5%	-1.8%
Manufacturing	164	2,204	2,227	67.6%	-1.0%	5.3%
Wholesale and retail distribution	280	2,273	2,163	57.3%	5.1%	-3.2%
Construction and utilities	358	1,941	1,982	51.7%	-2.1%	0.1%
Transport and travel	72	919	941	76.8%	-2.3%	-9.6%
Property and finance	376	1,382	1,366	49.6%	1.2%	5.6%
Other business services	572	1,974	1,856	34.1%	6.4%	1.0%
Other services	370	2,751	2,509	47.3%	9.6%	1.9%
Education, arts, charities, social care	156	2,999	2,923	51.6%	2.6%	10.6%
TOTAL NON-KI SECTORS	2,463	17,292	16,838	52.1%	2.7%	2.1%
TOTAL ALL SECTORS	3,351	42,037	39,769	60.4%	5.7%	4.6%

Source: Cosh & Caselli, CBR.

Appendix A4. Greater Cambridge Employment Update methodology

This appendix describes the purpose and methodology of regular updates of the corporate database.

Annual draw

Dr Cosh and Dr Caselli at the CBR hold a corporate database of local companies with data going back twelve years. The current database goes from 2010-11 to 2021-22 audited company data and covers the accounting periods of companies ending in the 2021-22 financial year. The results of the 2021-22 annual draw were made available at the beginning of April 2023. The reasons for the delay in publication relative to the accounting periods are:

- The need to wait until most companies have filed their accounts at Companies House.
- The incorporation of all company births and deaths.
- The careful checking of any changes in ownership, or corporate structure.
- The investigation of changes of location by companies into and out of the area.

This yields a comprehensive picture each year of the total employment of all companies that are based in the Cambridgeshire and Peterborough Combined Authority, Greater Cambridge, or Cambridge Ahead (Cambridge City Region) areas. It enables us to analyse the composition of growth split into growth of continuing businesses, less the decline due to companies dying or moving out of the area, plus the contribution to growth of company births and businesses moving into the area.

A full description of the methodology used can be found at:

<https://www.cbr.cam.ac.uk/wp-content/uploads/2023/04/10-cbr-database-methodology.pdf>

Various analyses can be found at:

<https://www.cbr.cam.ac.uk/research/research-projects/the-cambridge-corporate-database-regional-growth/#item2>

Updates

Timings

The current circumstances for business make it important to attempt to have more timely data. This can be achieved by using a sampling approach drawing upon the most recently published accounts.

We carry out two updates each year and this can be seen in Table A1. If we look at 2023, we propose April and October updates which will yield estimates of growth for the years to mid-October 2022 and early March 2023. These periods will capture: the impact of Putin's war on the recovery from Covid (April update); and the effects of the unfolding cost of living crisis (October update). However, it must be remembered that the update takes no account of births or deaths, or of changes in location.

Table A1 Summary of Greater Cambridge Employment Updates

Draw Name	Sample or All	Accounting year ends within:	Median growth period	Release date	Insight into:
<i>Annual draw 2021-22*</i>	All companies	6 th April 2021 to 5 th April 2022	Year to early December 2021	April 2023	Recovery from worst impacts of Covid
<i>Update April 2023**</i>	Sample	May 2022 to December 2022	Year to mid-October 2022	May 2023	Impact of Putin's war on recovery from Covid
<i>Update October 2023**</i>	Sample	December 2022 to April 2023	Year to early March 2023	November 2023	Impact of unfolding cost of living crisis
<i>Annual draw 2022-23*</i>	All companies	6 th April 2022 to 5 th April 2023	Year to early December 2022	February 2024	Impact of unfolding cost of living crisis
<i>Update April 2024**</i>	Sample	May 2023 to December 2023	Year to mid-October 2023	May 2024	Early recovery from cost of living crisis
<i>Update October 2024**</i>	Sample	December 2023 to April 2024	Year to early March 2024	November 2024	Assessment of robustness of Greater Cambridge economy

Notes: * commissioned and sponsored by Cambridge Ahead, Arm, Cambridgeshire and Peterborough Combined Authority, Greater Cambridge Partnership, Marshall of Cambridge and Mills & Reeve; ** commissioned and sponsored by the Greater Cambridge Partnership and Cambridge Ahead.

Update Sample (using April 2023 Update example)

We download data from FAME for any company in Cambridge, South Cambridgeshire, Huntingdonshire, or East Cambridgeshire that has available accounts for the periods ending between May 2022 and December 2022. We then check 2020-21 and 2021-22 employment data against the existing figures on the database. Differences can occur for a number of reasons and are corrected to ensure that consistency and accuracy are maintained across the years under review.

We eliminate companies from the update sample that do not have actual employment data for the last two years. Finally, we create a file with the following information for those remaining in the update sample (**3,098** companies this time representing total employment of **33,795**):

- Company name
- Company registration number
- LA District
- Sector
- KI or non-KI
- Size class in 2020-21 – 1 = 1 employee, 2 = 2-9 employees, 3 = 10 or more employees
- Latest employment 2021-22 (on average mid-October 2022)
- Employment 2020-21 (on average mid-October 2021)
- % change in employment over last year (i.e. on average to mid-October 2022)

Next, we produce a table showing the number of companies in each of the four KI sectors and nine non-KI sectors and their total employment in the latest and previous year. This table is then reproduced separately for our three size classes.

We then create three measures of growth over the latest year: the unweighted arithmetic mean, the median and the weighted mean. The first suffers from extreme values and also attaches the same importance to a large company as that for a small company. The second will often have the values of zero since a large proportion of companies do not change size. Therefore, it is the latter that we use for the next stage of the work.

Updating the corporate database for the Greater Cambridge area

We take from our corporate database all companies currently alive that are based in Cambridge or South Cambridgeshire. We select a sample of those companies that have accounting periods ending between May 2022 and December 2022 (whether, or not, they have yet reported). For companies that were included in the update sample we enter their employment data for the last three years. For the remaining companies that have not yet reported in 2021-22 we next download the latest FAME data and check employment data for the last three years against the existing figures on the database. Following this, we create a file with all the companies based in the Greater Cambridge area (**5,599** companies representing total employment of **70,965**) with the following information:

- Company name
- Company registration number
- Local Authority District
- Sector
- KI or non-KI
- Size class in 2020-21 (as above)

- Employment 2019-20
- Employment 2020-21
- Employment 2021-22
- % change in employment between 2020-21 and 2021-22

We now use the estimates of growth by size and sector from the update sample to create an estimate of the size of each company and sector in 2021-22. This allows us to compare the most recent growth of each sector and size class over the most recent year 2021-22 in comparison with the year 2020-21 for this sample of companies. The year 2021-22 captures the impact of Putin's war on the recovery from Covid, whereas the year 2020-21 covers on average the second and third Covid lockdowns as well as the coming out of lockdowns. Since Covid-related restrictions started to be lifted during spring 2021, companies with a December year end had a higher proportion of months during the recovery period compared to companies with a May year end.

The resulting sample is shown in Appendices A1-A3 and these tables highlight how significant these companies are, representing about 63% of corporate employment in Greater Cambridge. The sample has a high coverage of total employment in this update because many large businesses have a December year end and so are captured in this update.

Analyses

Using the methodology described above we can compare the performance of our sectors over time and identify those sectors with the strongest post-Covid performance. A powerful tool for doing this is one that has as the horizontal axis the sector's employment growth rate in the year 2020-21 and as the vertical axis the annual growth shown in the update sample for 2021-22 – see Figure 2.4 above for an example. The position of the sector marker relative to the 45° line shows those growing more or less fast than last year. Sectors with positive growth in 2021-22 are found above the horizontal axis and those with positive growth in 2020-21 appear to the right of the vertical axis. This can be shown more informatively by having the size of the marker related to the total employment in that sector.

This type of chart can be used to examine different sectors, districts or company sizes. It is reinforced by an appendix that provides detailed tables (see Appendices A1-A3).