

Greater Cambridge Employment Update February 2022

*Recovery from the pandemic progresses well
but dark clouds are looming*

Highlights:

Overview

- The current business environment makes it important to have timely data on employment changes. This is the fifth of a series of updates that bring up-to-date information about what is happening to corporate employment in the Greater Cambridge area.
- This update covers accounting year ends between December 2020 and April 2021 (the median year end is March 2021). It is based on a sample of companies covering 63% of corporate employment in Greater Cambridge. This median period captures the impact of the three Covid lockdowns in England and we compare it with the previous year, which was largely unaffected by the pandemic.
- Corporate employment growth in the Greater Cambridge area has slowed down from 4.5% in 2019-20 to 2.0% in 2020-21 – the latter is still a modest slowdown considering the scale of the challenges brought about by Covid. However, there is variation in these growth rates across both industry sectors and firm sizes (**Figure 1, p7**).
- The slowdown in employment growth over the last two years is due to a weaker performance of non-KI sectors, suggesting that they have been hit the hardest by Covid-related restrictions (**Figure 1, p7**).
- Whilst employment growth in KI sectors has remained strong at 6.2%, non-KI sectors have seen employment growth declining from 0.9% in 2019-20 to -2.9% in 2020-21. The rate of employment growth to 2021 in non-KI sectors has been negative in both Cambridge and South Cambridgeshire (-1.0% and -4.1%, respectively) (**Figure 1, p7**).

Sectors

- The Covid pandemic has had a varied impact across sectors. Sectors like Life Sciences are involved in supporting the fight against the virus and future outbreaks. Information technology and telecoms have benefited as a consequence of the increase in remote communications, gaming and internet security, which have more than offset the reduction of demand in other areas. Hospitality, travel and tourism, and some retail businesses have been severely affected by lockdowns and other restrictions.

- Consistent with these observations, we find that ‘Life science and healthcare’ (+11.7%) and ‘Information technology and telecoms’ (+7.1%) have been the fastest growing sectors during 2020-21 (**Figure 2, p9**).
- Many service sectors have suffered reduced demand from their customers as a result of the impact of Covid on their businesses. Employment growth to 2021 has declined in eight of the nine non-KI sectors, with ‘Other services’ – e.g. hotels, pubs and restaurants – experiencing a significant decline (-7.0%) (**Figure 2, p9**).
- ‘Life science and healthcare’ has seen employment growth accelerating despite the unfolding of the pandemic, while growth has also remained high in ‘Information technology and telecoms’. Among non-KI sectors, employment growth in 2020-21 has been higher than in 2019-20 only in ‘Education, arts, charities, social care’ (**Figure 4, p12**).
- The sectors with the largest fall in employment growth relative to 2019-20 are ‘Other services’, ‘Transport and travel’ and ‘Wholesale and retail distribution’. Employment growth has also slowed down in ‘High-tech manufacturing’, reaching -4.1% in 2020-21 compared with 0.1% in 2019-20 (**Figure 4, p12**).

Size groups

- One-person businesses have grown by 10.8% in the latest year, a rate that is higher than total employment growth across all size classes. However, their small size means that they have played a minor role in employment growth – only 177 extra employees compared with the addition of 1,180 employees by other businesses.
- Whilst 1-9 employee businesses tend to have been the fastest growing companies in sectors such as ‘Knowledge intensive services’, ‘Manufacturing’ and ‘Property and finance’, businesses with 10+ employees have achieved particularly fast growth in ‘Life science and healthcare’, ‘Information technology and telecoms’ and ‘Education, arts, charities, social care’ (**Figure 3, p10**).
- The group of 10+ employee businesses tends to dominate employment changes given its large aggregate size. These businesses are significant contributors to the decline in employment observed in sectors such as ‘High-tech manufacturing’ (e.g. leading producer of structural materials Hexcel Composites), ‘Other services’ (e.g. specialist event planner CDC Events) and ‘Construction and utilities’ (e.g. building services company Kershaw Group) (**Figure 3, p10**).
- Employment growth of 1-9 employee businesses has increased by 2.0% in 2020-21. This growth has been driven primarily by KI sectors (**Figure 9, p22**).

- The picture looks different for 10+ employee businesses. While employment growth has remained strong for KI sectors, the drop of 4.0% in non-KI sectors has slowed down employment growth from 5.2% in 2019-20 to 2.0% in 2020-21 (**Figure 9, p22**).
- Employment growth to 2021 has held up better in KI sectors (+2,261 employees) than in non-KI sectors (-904 employees) and this is the case in both size classes (**Figure 9, p22**).

Comparison of employment and turnover growth

- We complement the findings from the employment update by examining a sample of 348 companies with accounting year ends between December 2020 and April 2021 which have provided both employment and turnover data for the last three years.
- Turnover growth for this group of companies fell from 9.1% to 0.2% in the last year compared with a fall from 5.3% to 3.6% for employment. This fall in turnover growth, which was greater amongst non-KI sectors, is not as large as one may expect given the unfolding of the pandemic (**Table 1, p26**).
- The finding that turnover fared worse than employment partly reflects the role of the Government's furlough scheme in holding up employment in sectors with declining sales. Therefore, our results suggest that the unwinding of this scheme could have implications for employment changes.
- However, the overall picture might be less positive than the modest decline in turnover that we have found for the corporate sector, since this decline is likely to be felt more by a number of in-person service businesses (e.g. consultants, hairdressers, gyms, pubs and restaurants) many of which are not incorporated.

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 2021 and December 2021. For each company we look at turnover in the same six months period in 2019, 2020 and 2021.
- Within this group of companies (all knowledge intensive), total turnover rose from £1,093m to £1,347m (+23%) in the 2021 recovery after experiencing a decline in the previous year (when the first and second lockdowns were introduced).
- Therefore, we find evidence of a strong recovery and a marked improvement in business confidence amongst these KI companies. This is partly explained by an upturn in demand and partly by companies learning how to manage the impacts of the pandemic.

Concluding remarks

- Overall, the results emphasise the continued resilience of the Greater Cambridge corporate economy throughout the worst period of the Covid pandemic. The impact of the three lockdowns in England on Greater Cambridge-based businesses was mitigated by the strong performance of KI sectors, particularly the Life Science and ICT clusters. In turn, non-KI sectors have been hit the hardest by Covid-related restrictions and would have suffered larger falls in employment without the support of the furlough scheme.
- The unwinding of this unprecedented support package could have implications for corporate employment changes unless there is a rapid upturn in demand. This is happening at a time when the impending substantial disruption to both supply and demand caused by Putin's war will further delay any return to normality. Our next updates will cast light on these and other related issues.

1. Tracking Greater Cambridge corporate employment – the February 2022 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 2020-21 annual draw were published in March 2022 and examined employment in the accounting years ending from 6th April 2020 to 5th April 2021. 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 2020. For comparison, the ONS Business Register and Employment Survey (BRES) provisional annual employment data published in November 2021 has September 2020 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 February, June 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 February 2022 update includes companies with a financial year end between December 2020 and April 2021 and has a modal year end of March 2021. All of the companies have had their latest financial year significantly affected by the Covid pandemic, varying from ten to twelve months. The final sample for the February 2022 update is 4,636 companies representing about 63% of corporate employment in the Greater Cambridge area.

We use the update sample to provide estimates of employment for those companies with a year end between December 2020 and April 2021 that have not yet reported. We then use this larger sample to compare the performance of this sample in 2020-21 with their performance a year earlier (2019-20). On average the companies in the sample have had their latest financial year entirely impacted by Covid. 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 also examines recent changes in turnover growth. This sample is restricted to 348 companies in Greater Cambridge with accounting years ending between December 2020 and April 2021 which have provided both employment and turnover data for 2018-19, 2019-20 and 2020-21. Since large businesses provide both employment and turnover figures, the sample is quantitatively significant, with total employment over 43,000 and total turnover of £13bn. This allows us to examine their employment and turnover growth in the last, Covid-affected, year against the growth one year earlier. The comparison between these two measures allows us to speculate about the impact of the furlough scheme on employment in the corporate sector in Greater Cambridge.

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

The fourth method is a more timely **snapshot** that draws on a very 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 2021 and December 2021. The fifteen companies in the snapshot sample do not provide employment figures in their interim reports, but together they represent a combined annual turnover of about £1.2bn. The gain from focusing on interim results is that they allow us to compare turnover in the same six months period in 2019, 2020 and 2021. The first year was before the onset of the pandemic; the second year includes the first and second lockdowns in England; and the latest year covers the recovery from the worst impacts of Covid.

The remainder of this report is structured as follows. Section 2 presents the results of the February 2022 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 a novel analysis of business births and deaths in the area, which we present for the first time in this report. Section 4 complements the findings from Section 2 by discussing the results of the February 2022 update sample that includes both employment and turnover growth. Section 5 shows the findings of the snapshot sample, while Section 6 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.

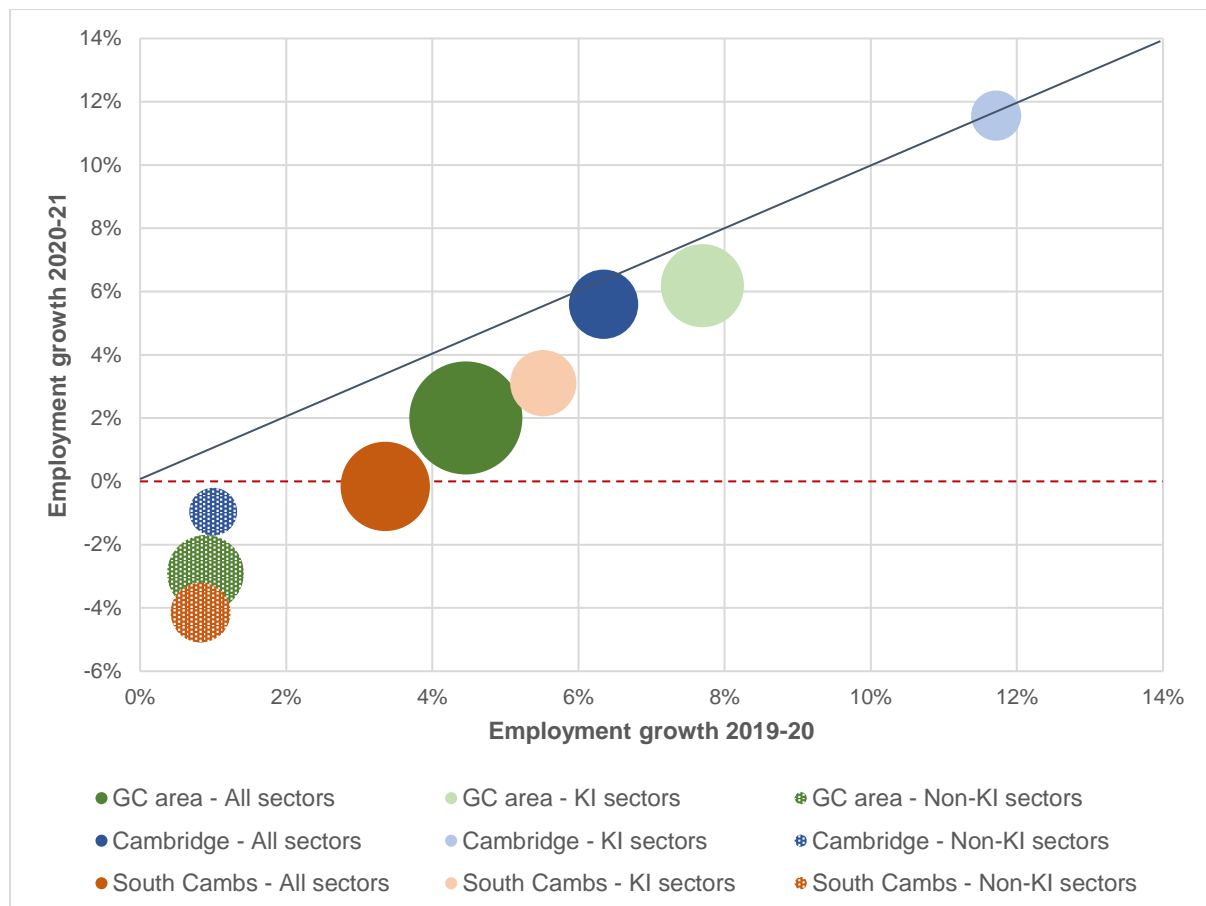
2. February 2022 employment update results

In this section, we present the results of the February 2022 employment update, the fifth 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 the three Covid lockdowns in England.

2.1. Analysis by area

Figure 1 depicts employment growth in KI and non-KI sectors during 2019-20 (horizontal axis) and 2020-21 (vertical axis) by area. It is drawn from a large sample of 4,636 companies with accounts for the years ending between December 2020 and April 2021. The position of the area marker relative to the 45° line indicates whether a given area has grown more or less fast than last year. Areas with positive growth in 2020-21 are found above the horizontal axis. It shows growth for KI, non-KI and all sectors for Cambridge, South Cambridgeshire and for Greater Cambridge overall. This chart allows us to compare the performance of each area over time. A summary of employment growth rates by sector for each area is reported in Appendices A1-A3.

Figure 1 Employment growth by area – 2020-21 vs 2019-20



Note: The size of each bubble is proportionate to the number of employees in 2019-20 on a continuous scale.
Source: Cosh & Caselli, CBR.

Figure 1 portrays a picture of continued but lower overall employment growth in the Greater Cambridge area during 2020-21. Growth in the area has slowed down from 4.5% in 2019-20

to 2.0% in 2020-21, reflecting the impact of the three Covid lockdowns in England. However, this slowdown is modest given the severity of the challenges posed by the pandemic.

Our data show that the lower employment growth in the area is due to a weaker performance of non-KI sectors during the latest year compared with one year earlier. Whilst employment growth in KI sectors has remained strong at 6.2% (against a figure of 7.7% in 2019-20), non-KI sectors have seen employment growth declining somewhat markedly from 0.9% in 2019-20 to -2.9% 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 have been growing faster than non-KI sectors.

Employment growth in Cambridge has been high at 5.6% in 2020-21, down slightly from 6.3% in 2019-20. By contrast, employment growth has been lower in South Cambridgeshire, which has exhibited a more marked slowdown from 3.4% to -0.2%.

The KI sectors have held up better in Cambridge, where KI employment growth has remained virtually unchanged at 11.6%. This has been helped by the performance of AstraZeneca and Arm, who have added 675 and 232 employees respectively.

The growth of the KI sectors in South Cambridgeshire has decreased from 5.5% to 3.1%, despite the addition of 202 and 168 employees by GW Pharmaceuticals and CMR Surgical respectively.

We found a rather different picture for non-KI sectors, which have witnessed negative employment growth to 2021 in both districts.

Despite the strong growth in employment of Fauna & Flora International (+29.8%) – the world's oldest international wildlife conservation organisation based at The David Attenborough Building in central Cambridge – the slowdown in employment by several other companies (e.g. Scudamore's Punting, one of the largest providers of punting in Cambridge – we all know how quiet the centre of Cambridge and the river were in this year – and SRD Group, which operates Clayton Hotel Cambridge) has brought employment growth in non-KI sectors in Cambridge to -1.0% in the latest year compared with 1.0% one year earlier.

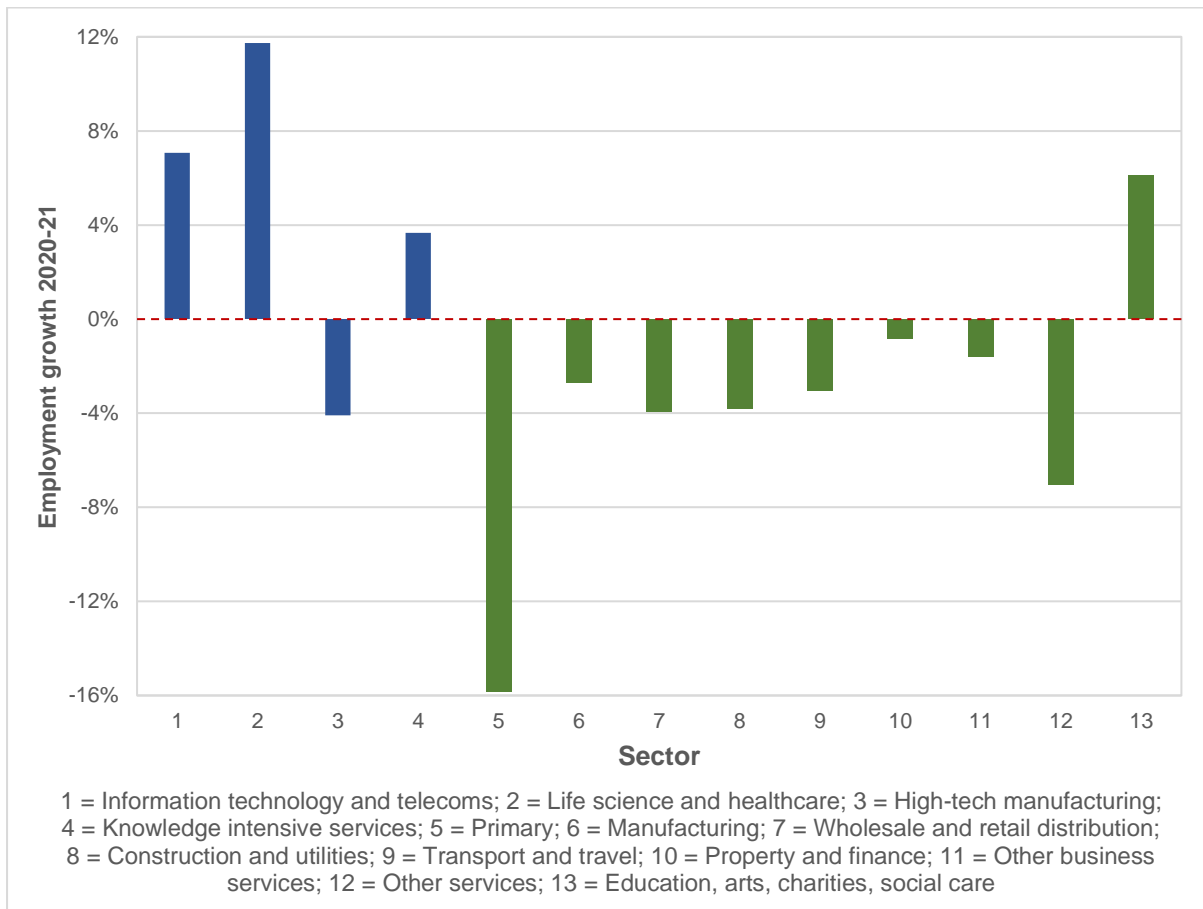
Non-KI sectors in South Cambridgeshire have shown a larger decline from 0.8% in 2019-20 to -4.1% in 2020-21, partly reflecting a continued reduction in employee numbers by leading agricultural business Spearhead International. Other companies to have experienced a decrease in their employee numbers are CDC Events (-48 employees) – a specialist event planner – and Marshall Motor Holdings' employees in the Cambridge area (-44 employees).

2.2. Analysis by sector

Greater Cambridge

Figure 2 compares the 13 industry sectors used in the analysis based on their employment growth during 2020-21 (on average the year to March 2021), the latest year covered by this work. It is drawn from a sample of companies with accounts for the years ending between December 2020 and April 2021.

Figure 2 Employment growth 2020-21 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.

'Life science and healthcare' (+11.7%) and 'Information technology and telecoms' (+7.1%) have been the fastest growing sectors during 2020-21.

The strong performance of these two KI sectors despite the Covid restrictions testifies to the resilience of the Life Science and ICT clusters in Greater Cambridge. Whilst some companies in these sectors have been hampered by the pandemic (e.g. Bourn Bioscience), others have positively benefited from it (e.g. AstraZeneca).

'Knowledge intensive services' has seen robust employment growth in 2020-21, driven by the performance of the TTP Group (+12.3%) and The Welding Institute (+5.3%).

'High-tech manufacturing' is the only KI sector to have experienced negative employment growth in the last year. This is due primarily to a drop in employee numbers by Hexcel Composites (-23.1%) – a leading supplier of composite materials for the commercial aerospace industry – who has suffered from a reduction in demand from the impact of Covid on its customers.

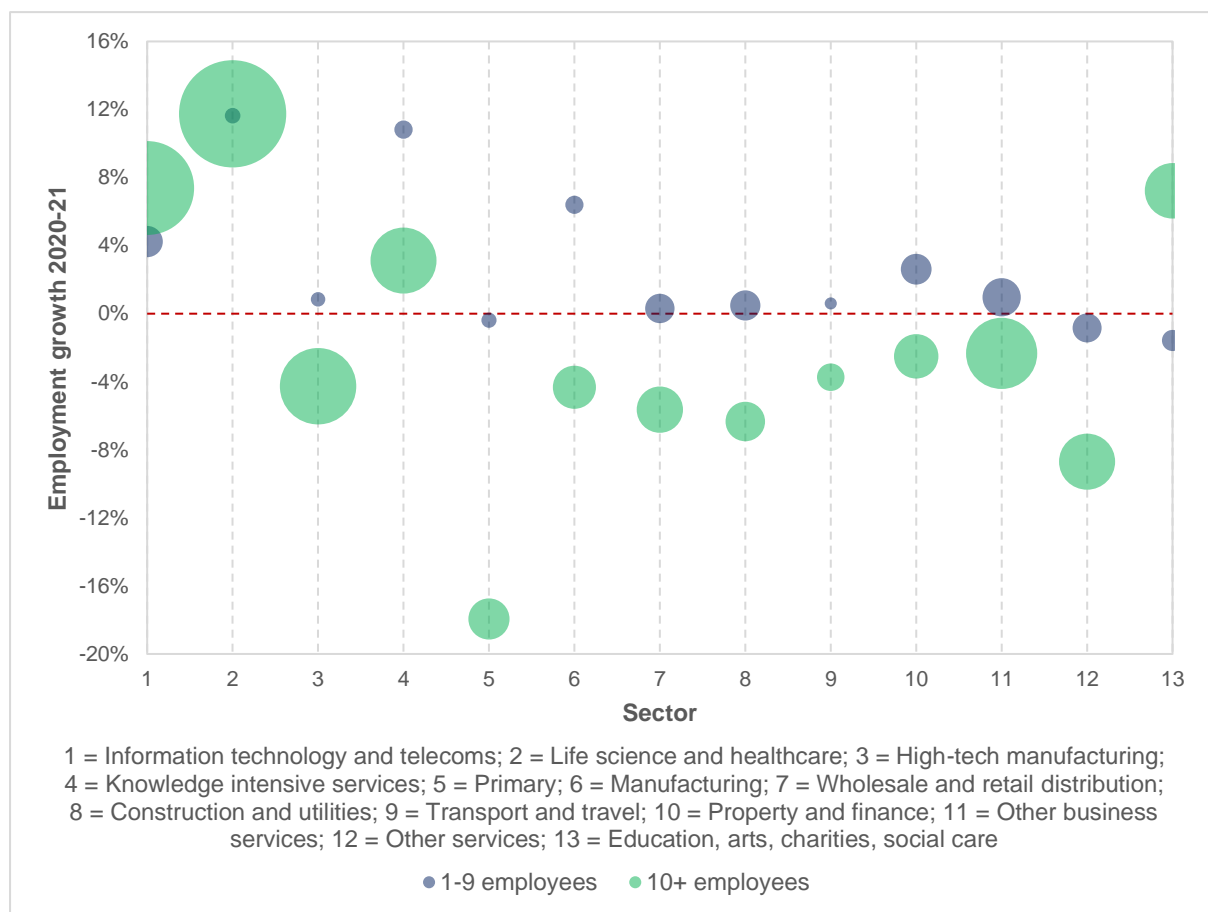
The decline for 'High-tech manufacturing' is mirrored by the performance of the low- and med-low-tech manufacturing sectors ('Manufacturing') – down by 2.7% from the previous year. Among the manufacturers who have had the largest fall in employee numbers is Volac International (-16.7%), a world leader in dairy food production. Last year's employment growth for the 'Manufacturing' sector with Volac International excluded from the analysis would be 0.3%.

Employment growth to 2021 has declined in eight of the nine non-KI sectors. ‘Primary’ (-15.8%), ‘Other services’ (-7.0%) – which includes hospitality businesses – ‘Wholesale and retail distribution’ (-3.9%) and ‘Construction and utilities’ (-3.8%) have witnessed the largest decline in employment growth.

The ‘Education, arts, charities, social care’ sector is the only non-KI sector with positive employment growth in 2020-21, largely as a result of increased employee numbers at Fauna & Flora International (+109 employees).

Figure 3 expands on the results from Figure 2 presented above by providing a breakdown of employment growth to 2021 by both industry sector and firm size. It is drawn from a sample of companies with accounts for the years ending between December 2020 and April 2021. Companies were assigned to two size classes: 1-9 employees; 10+ employees.

Figure 3 Employment growth 2020-21 by sector and firm size in the Greater Cambridge area



Note: The size of each bubble is proportionate to the number of employees in 2019-20 on a continuous scale.
Source: Cosh & Caselli, CBR.

The results from Figure 2 pointed to ‘Life science and healthcare’ and ‘Information technology and telecoms’ as the fastest growing sectors during 2020-21, whereas negative employment growth was observed for most of the non-KI sectors. Figure 3 qualifies 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 'Knowledge intensive services', 'Manufacturing' and 'Property and finance'. However, the relatively small size of their bubbles shows that their impact on total employment growth has been somewhat limited.

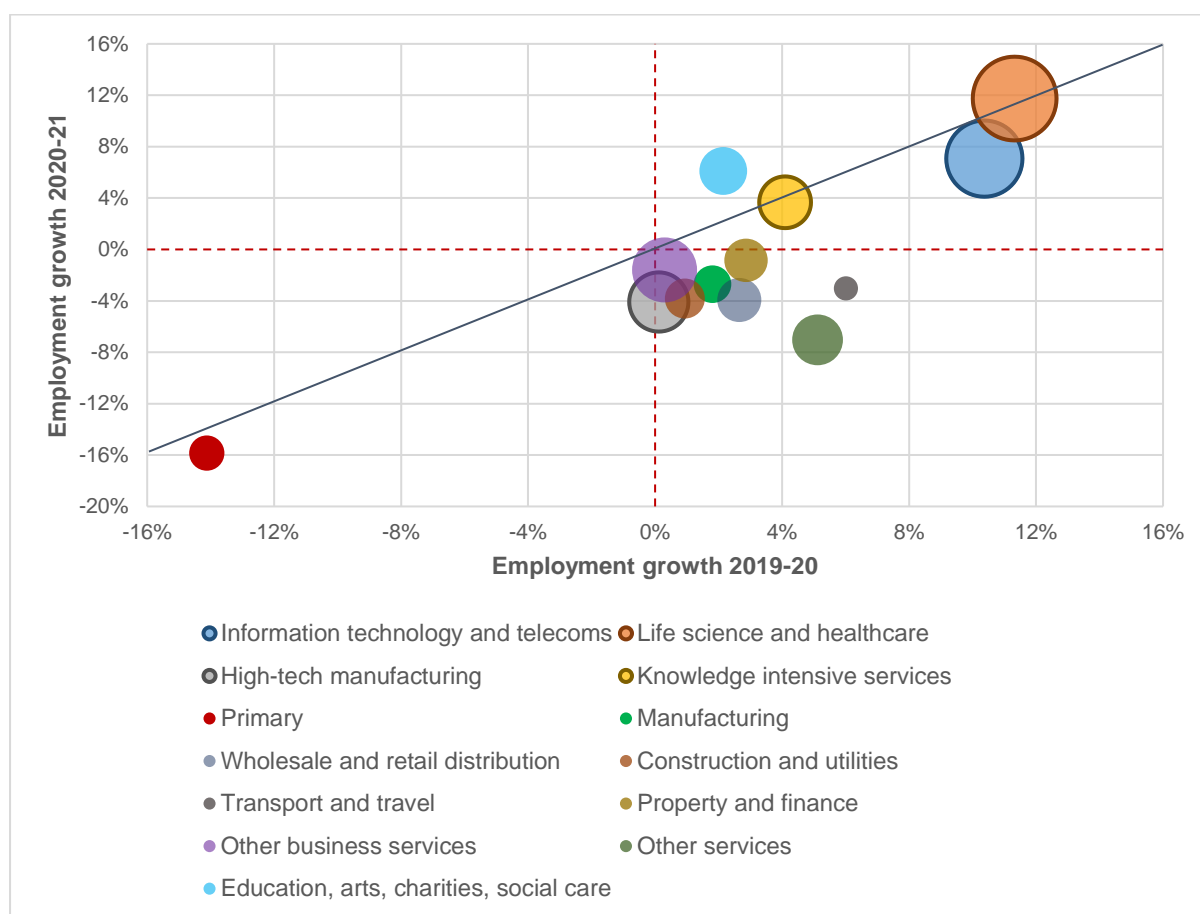
Good examples of fast growth in the 1-9 employee businesses are Riverlane, a University of Cambridge spinout that develops software and algorithms for quantum computers, and Cantab Risk Research (Risilience), a deep-tech start-up providing data-driven analytics for climate and enterprise risk management.

In turn, 10+ employee businesses have achieved particularly fast growth in 'Life science and healthcare', 'Information technology and telecoms' and 'Education, arts, charities, social care'.

The group of 10+ employee businesses tends to dominate employment changes given its large aggregate size. These businesses are significant contributors to the decline in employment observed in sectors such as 'High-tech manufacturing' (e.g. leading producer of structural materials Hexcel Composites), 'Other services' (e.g. specialist event planner CDC Events) and 'Construction and utilities' (e.g. building services company Kershaw Group).

Figure 4 compares the 13 industry sectors according to their employment growth during 2019-20 (horizontal axis) and their employment growth during 2020-21 (vertical axis). It is drawn from a sample of companies with accounts for the years ending between December 2020 and April 2021. The position of the sector marker relative to the 45° line shows whether the sector has grown more or less fast than last year. Sectors with positive growth in 2020-21 are found above the horizontal axis and those with positive growth in 2019-20 appear to the right of the vertical axis. This chart allows us to compare the performance of sectors over time.

Figure 4 Employment growth by sector in the Greater Cambridge area – 2020-21 vs 2019-20



Note: The size of each bubble is proportionate to the number of employees in 2019-20 on a continuous scale. Bubbles with an outline identify KI sectors.
Source: Cosh & Caselli, CBR.

'Life science and healthcare', the largest KI sector in Greater Cambridge, has seen employment growth accelerating during 2020-21 despite the unfolding of the pandemic (11.7% compared with 11.3% in 2019-20). This result, which has been driven by CMR Surgical (+44.6%), GW Pharmaceuticals (+23.9%) and AstraZeneca (+19.5%) is all the more encouraging given that our February 2022 Update sample covers 80% of corporate employment in the Life Science sector in Greater Cambridge (see the fourth data column of Appendices A1-A3).

Employment growth in the second-largest sector, 'Information technology and telecoms', has remained high at 7.1%, yet not as fast as in the previous year (+10.4%). Among the companies contributing to this growth are Huawei Technologies Research & Development (+37.3%), Amazon's Evi Technologies (+23.6%) and Arm (+9.8%).

A slowdown in employment growth has also occurred for 'Knowledge intensive services', which includes a number of engineering and science consultancies (e.g. The Welding Institute, Cambridge Consultants and Science Group). Employment growth in the sector has gone down slightly to 3.7% in the latest year from 4.1% one year earlier.

'Education, arts, charities, social care' is the only non-KI sector to have witnessed an increase in employment growth relative to 2019-20 (+6.1% in the latest year compared with +2.1% one year earlier).

The sectors with the largest fall in employment growth compared with 2019-20 are 'Other services', 'Transport and travel', 'Wholesale and retail distribution' and 'Construction and utilities', suggesting that non-KI sectors have been hit the hardest by Covid restrictions.

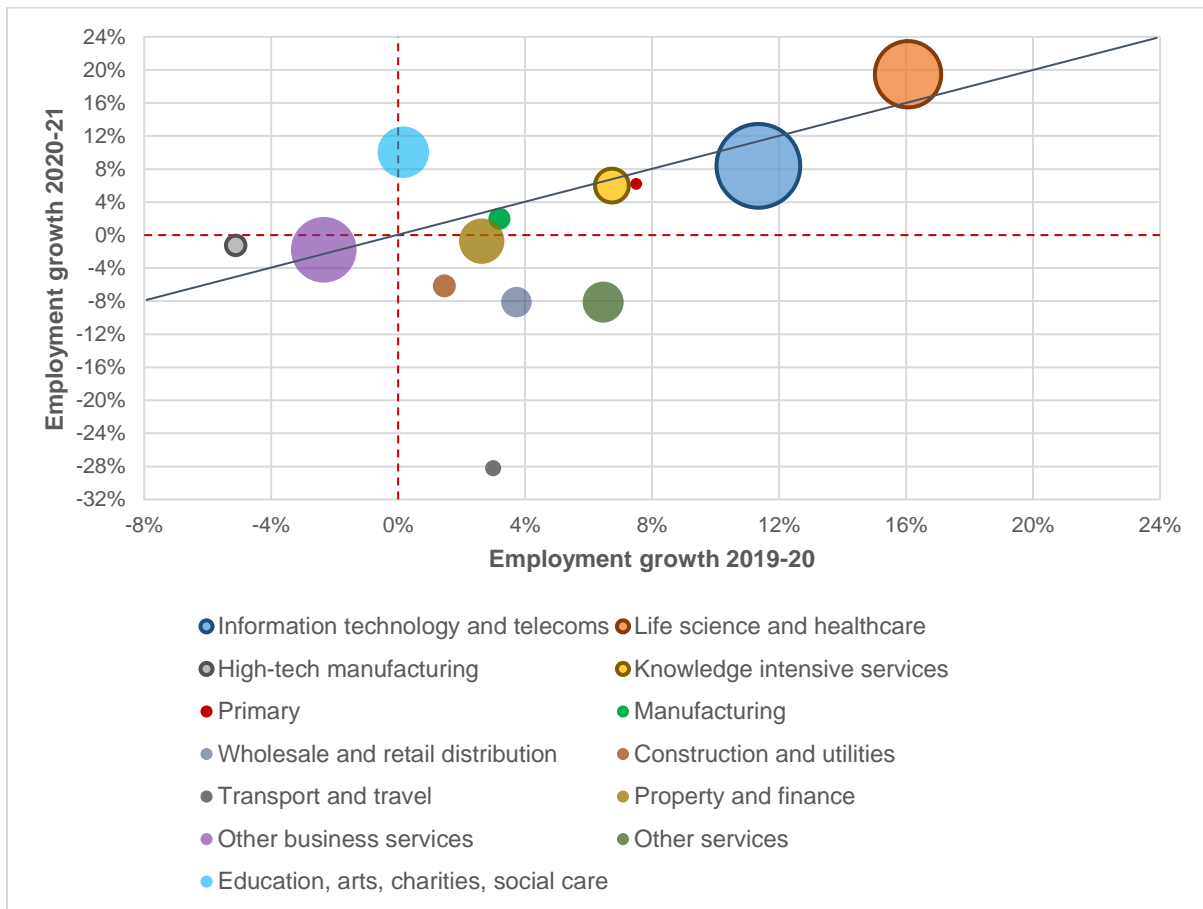
The 'Other services' sector, which includes hotels, restaurants and other hospitality businesses, has been severely affected by the pandemic. Employment growth in the sector has dropped from 5.1% in 2019-20 to -7.0% in 2020-21, with only one in ten companies showing an increase in employee numbers over the last year.

Employment in the 'Primary' sector has fallen by 15.8% during 2020-21, after experiencing a similar drop of 14.1% during 2019-20. This trend is largely explained by the continued reduction in employee numbers by Spearhead International due to challenging trading conditions and discontinued operations.

Cambridge

Figure 5 compares the 13 industry sectors based on their employment growth during 2019-20 (horizontal axis) and their employment growth during 2020-21 (vertical axis), this time focusing on Cambridge. It is drawn from a sample of companies with accounts for the years ending between December 2020 and April 2021. The position of the sector marker relative to the 45° line shows whether the sector has grown more or less fast than last year. Sectors with positive growth in 2020-21 are found above the horizontal axis and those with positive growth in 2019-20 appear to the right of the vertical axis. This chart allows us to compare the performance of sectors over time.

Figure 5 Employment growth by sector in Cambridge – 2020-21 vs 2019-20



Note: The size of each bubble is proportionate to the number of employees in 2019-20 on a continuous scale. Bubbles with an outline identify KI sectors.
Source: Cosh & Caselli, CBR.

Employment growth in Cambridge has been driven by the strong performance of ‘Life science and healthcare’, ‘Information technology and telecoms’ and, to a lesser extent, ‘Knowledge intensive services’.

Employment growth has been particularly fast in ‘Life science and healthcare’, where it has reached 19.5% in the latest year (up from 16.1% one year earlier). This largely reflects the strong performance of AstraZeneca (+19.5% on the previous year) and SDI Group (+17.2%).

‘Information technology and telecoms’ has seen employment growing by 8.4% in 2020-21, down from 11.3% in 2019-20. Amazon’s Evi Technologies (+23.6%) and Arm (+9.8%) have been the main contributors to this growth. Our February 2022 Update sample covers 81.3% of corporate employment in the ICT sector in Cambridge, the highest ratio across all sectors.

‘Knowledge intensive services’ has achieved virtually the same growth rate during 2019-20 and 2020-21 (6.7% and 6.0%, respectively). Among the fastest growing companies in the sector are Evonetix (+30.0%) and Cambridge Mechatronics (+15.9%).

After a change of -5.1% in 2019-20 – caused primarily by digital inkjet printers manufacturer Inca Digital Printers restructuring its business – ‘High-tech manufacturing’ has recorded another year of negative employment growth at -1.2%.

Among non-KI sectors, the only sector to exhibit an increase in employment growth in 2020-21 compared with 2019-20 is ‘Education, arts, charities, social care’ (10.0% and 0.2%,

respectively). Employment growth in the sector has benefited from the increase in employee numbers by Fauna & Flora International (+109 employees).

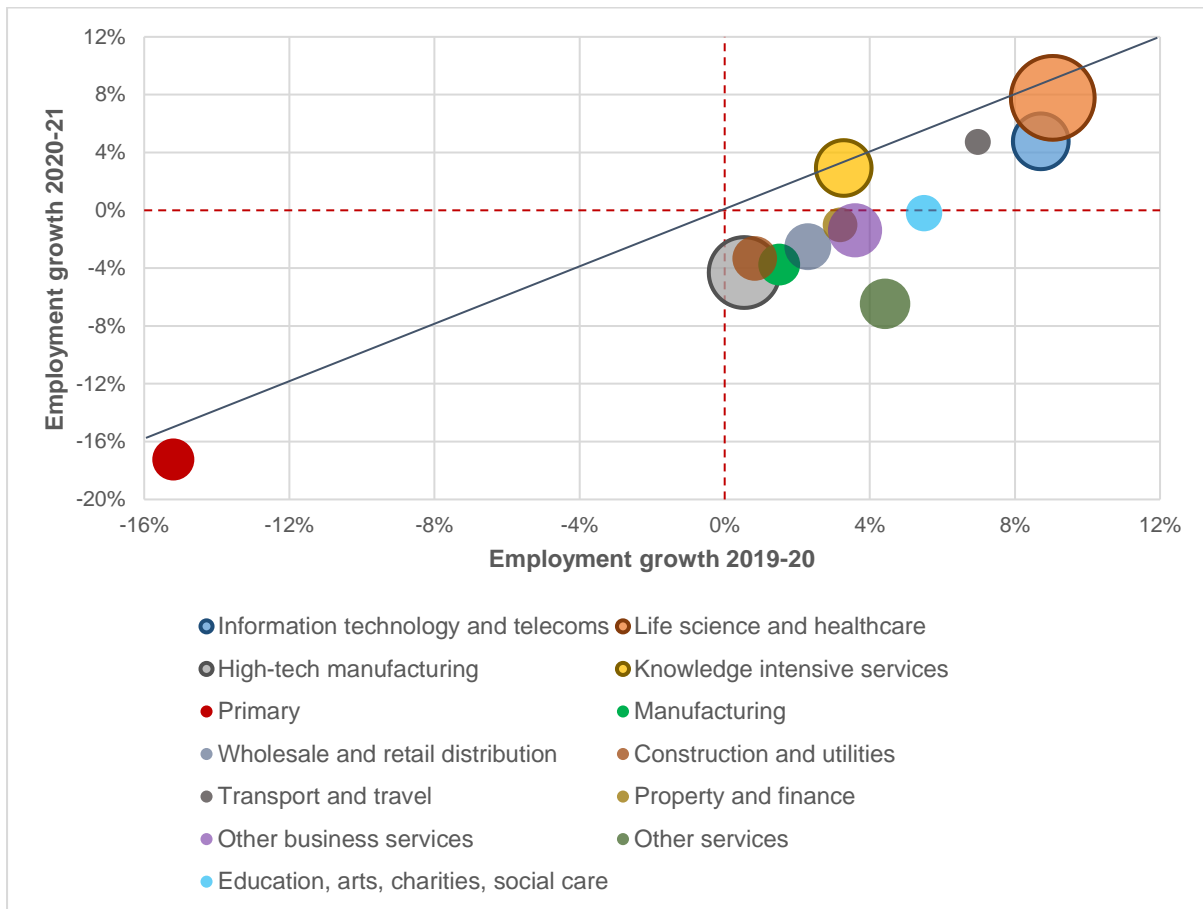
Conversely, we find evidence of a considerable slowdown in employment growth in several non-KI sectors. 'Transport and travel' (-28.2% in 2020-21 compared with 3.0% in 2019-20), 'Other services' (-8.1% and 6.5%, respectively), 'Wholesale and retail distribution' (-8.1% and 3.7%, respectively) and 'Construction and utilities' (-6.1% and 1.5%, respectively) have all seen their employment growth turning negative in 2020-21.

The fall in employee numbers in the 'Transport and travel' sector during 2020-21 reflects a combined reduction of over 60 employees by two of Cambridge's punting companies, Scudamore's Punting and Cambridge Punting. These and other similar businesses have been significantly impacted by Covid-related restrictions.

South Cambridgeshire

Figure 6 focuses on South Cambridgeshire and compares the 13 industry sectors based on their employment growth during 2019-20 (horizontal axis) and their employment growth during 2020-21 (vertical axis). It is drawn from a sample of companies with accounts for the years ending between December 2020 and April 2021. The position of the sector marker relative to the 45° line shows whether the sector has grown more or less fast than last year. Sectors with positive growth in 2020-21 are found above the horizontal axis and those with positive growth in 2019-20 appear to the right of the vertical axis. This chart allows us to compare the performance of sectors over time.

Figure 6 Employment growth by sector in South Cambridgeshire – 2020-21 vs 2019-20



Note: The size of each bubble is proportionate to the number of employees in 2019-20 on a continuous scale. Bubbles with an outline identify KI sectors.
Source: Cosh & Caselli, CBR.

Similar to Cambridge, South Cambridgeshire-based companies in ‘Life science and healthcare’, ‘Information technology and telecoms’ and, to a lesser extent, ‘Knowledge intensive services’ have shown robust employment growth in the latest year.

Employment growth to 2020-21 in ‘Life science and healthcare’ has remained high at 7.8% (compared with 9.0% in the previous year), driven by a considerable increase in the number of staff employed by GW Pharmaceuticals (+202 employees) and CMR Surgical (+168 employees). Overall, the sample for our February 2022 Update represents over three-quarters of corporate employment in the Life Science sector in South Cambridgeshire.

‘Information technology and telecoms’ has reached 4.8% employment growth in 2020-21 (down from 8.7% in 2019-20), the second highest rate after ‘Life science and healthcare’. Behind this steady growth is the strong performance of Huawei Technologies Research & Development (+37.3%), Featurespace (+17.9%) and Jagex (+10.3%).

Several ‘Knowledge intensive services’ companies, such as The Welding Institute (+40 employees) and the TTP Group (+38 employees), have increased their employee numbers over the past year. Overall employment growth in the sector has been 2.9% in 2020-21 compared with 3.3% in 2019-20.

‘Transport and travel’ is the only non-KI sector with positive employment growth in the year to March 2021 (+4.7%). This has been helped by the growing number of staff employed by

Whippet Coaches (+64 employees), which has contributed to offsetting employment losses amongst other companies in the sector.

Among the sectors with the largest slowdown in employment growth over the last year are 'Other services' (-6.5% in 2020-21 compared with 4.4% in 2019-20), 'Manufacturing' (-3.8% and 1.5%, respectively) and 'Construction and utilities' (-3.3% and 0.8%, respectively).

Nine in ten companies operating in the 'Other services' sector have seen either no growth or a decline in their employment during 2020-21. Some of the largest reductions are observed for CDC Events (-48 employees) and Si5 SpyMissions (-27 employees) – an entertainment company managing several indoor activity venues.

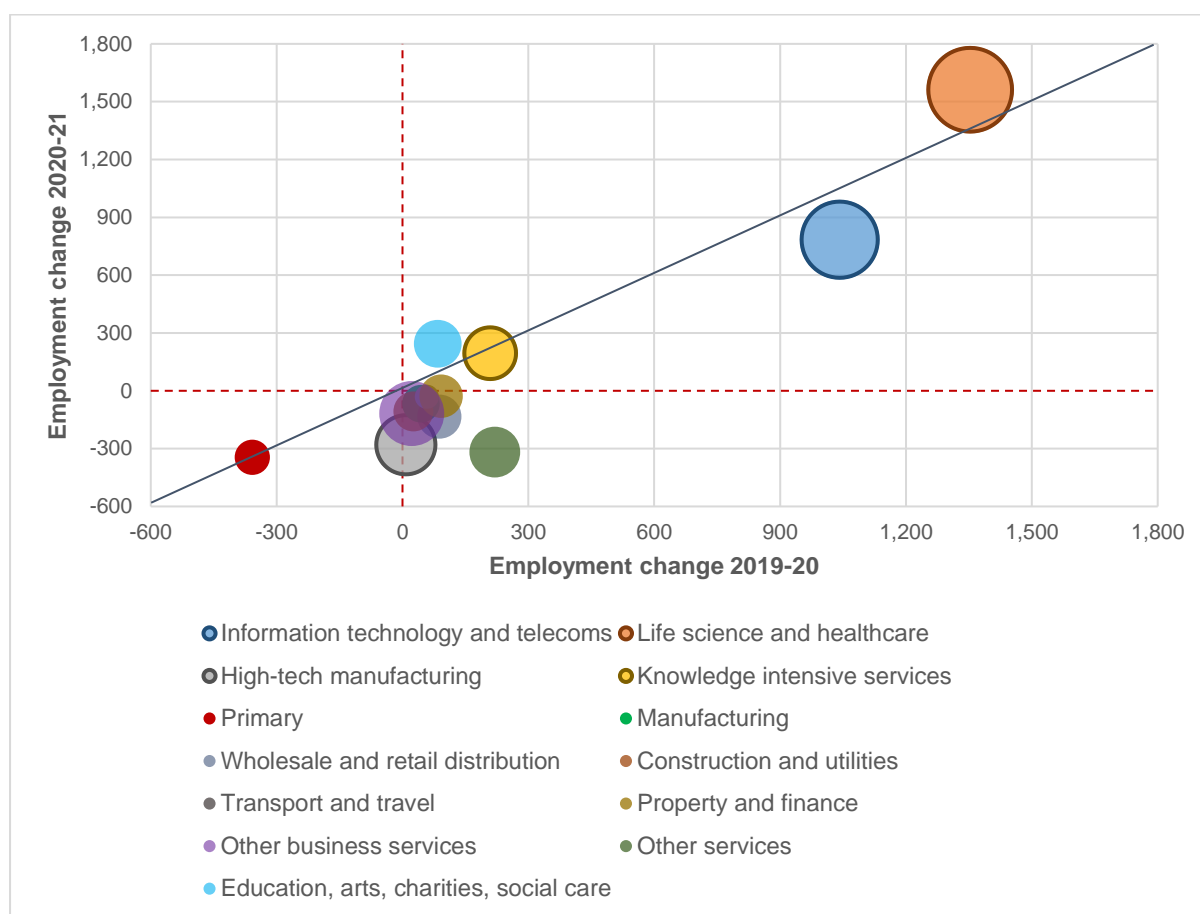
The results for the low- and med-low-tech 'Manufacturing' sector, which are driven by Volac International (-16.7%), are similar to those for the 'High-tech manufacturing' sector. Employment growth of 'High-tech manufacturing' companies has dropped from 0.5% in 2019-20 to -4.3% in 2020-21, largely because of a reduction in employee numbers by Hexcel Composites (-144 employees) and Xaar (-72 employees).

Employment in the 'Primary' sector has gone down by 17.2% during 2020-21, reflecting a continued decline in the number of staff employed by Spearhead International.

Greater Cambridge

Figure 7 offers another comparison of the 13 industry sectors, this time looking at their employment change (rather than their employment growth) during 2019-20 (horizontal axis) and 2020-21 (vertical axis). It is drawn from a sample of companies with accounts for the years ending between December 2020 and April 2021. The position of the sector marker relative to the 45° line indicates whether employment change in the sector has been higher or lower than last year. Sectors with a positive change in employment during 2020-21 are found above the horizontal axis and those with a positive change during 2019-20 appear to the right of the vertical axis. Similar to Figures 4-6, this chart allows us to compare the performance of sectors over time.

Figure 7 Employment change by sector in the Greater Cambridge area – 2020-21 vs 2019-20



Note: The size of each bubble is proportionate to the number of employees in 2019-20 on a continuous scale. Bubbles with an outline identify KI sectors.
Source: Cosh & Caselli, CBR.

Since % changes can sometimes be misleading, Figure 7 examines changes in employment in terms of the number of people employed. In this case, the findings from Figure 7 largely confirm those from Figure 4.

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

There has been a change of +1,562 employees in ‘Life science and healthcare’ in 2020-21 compared with +1,353 in 2019-20, most of which is associated with increased employee numbers at AstraZeneca (+675 employees), GW Pharmaceuticals (+202 employees) and CMR Surgical (+168 employees).

‘Information technology and telecoms’ has had the second largest employment change in 2020-21 after ‘Life science and healthcare’, adding 784 employees in the latest year compared with 1,042 one year earlier. Arm (+232 employees), Amazon’s Evi Technologies (+111 employees) and Huawei Technologies Research & Development (+93 employees) have contributed over half of the employment change to 2021.

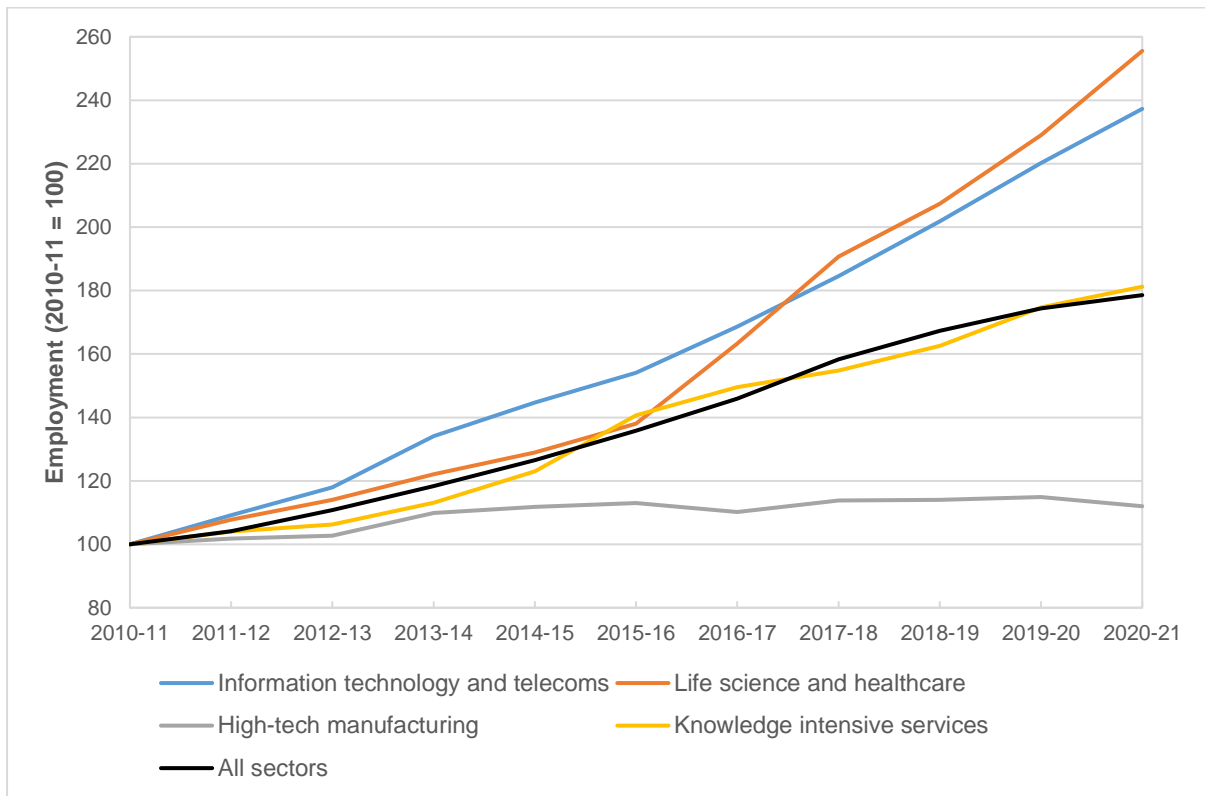
Among non-KI sectors, employment change in 2020-21 has been higher than employment change in 2019-20 only in ‘Education, arts, charities, social care’ (+244 and +84, respectively).

All of the other non-KI sectors have reported a negative employment change in 2020-21. The largest drop is observed in 'Primary' (-345 employees), 'Other services' (-318 employees) and 'Wholesale and retail distribution' (-134 employees).

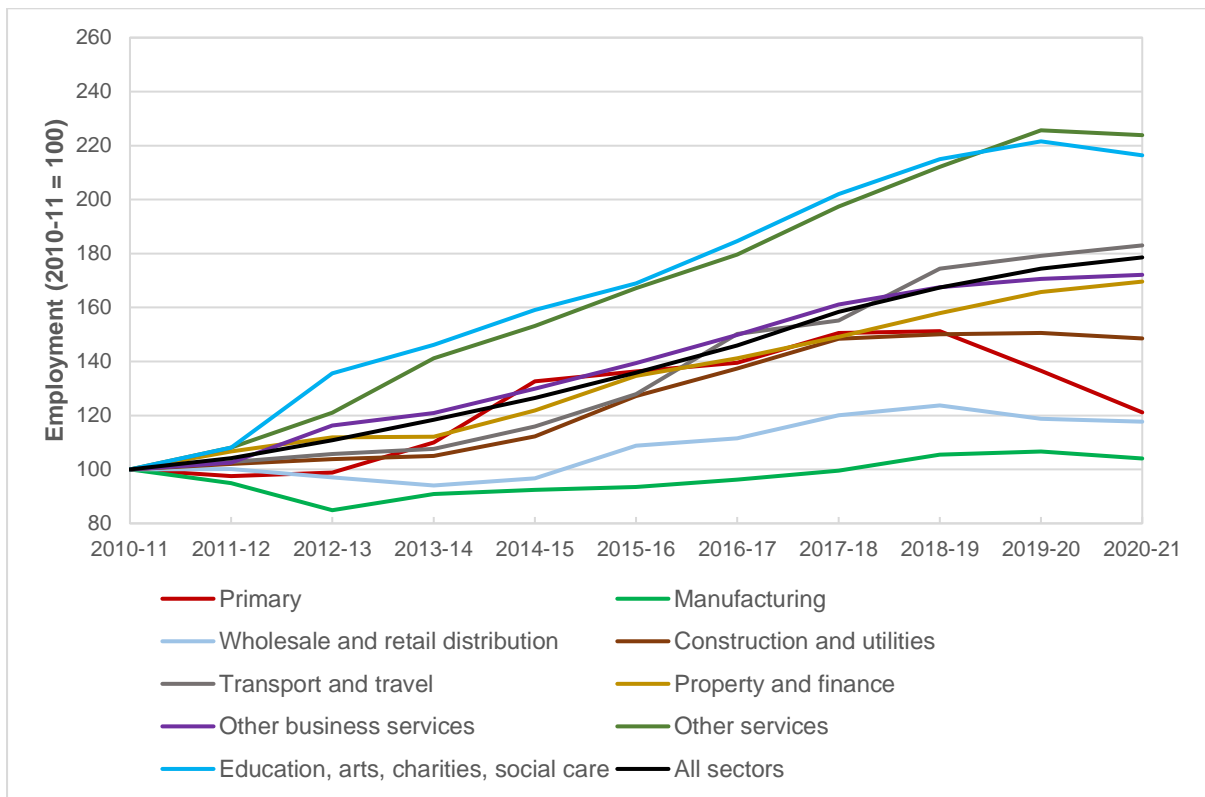
Collectively, KI sectors have added 2,261 employees during 2020-21, whilst non-KI sectors have lost 904 employees.

Figure 8 depicts the employment growth of Greater Cambridge-based companies over the last decade. Part (a) focuses on KI sectors while part (b) looks at non-KI sectors. The underlying data is from the CBR annual draw of all companies based in the area.

Figure 8 Employment growth by sector in the Greater Cambridge area – 2010-11 to 2020-21



(a) KI sectors



(b) Non-KI sectors

Note: Data is from the CBR annual draw of all companies based in the Greater Cambridge area.
Source: Cosh & Caselli, CBR.

The exceptional growth of 'Life science and healthcare' and 'Information technology and telecoms' is even more apparent when examined over the past decade. Employment growth in these sectors has exceeded growth in the other sectors by a considerable margin and has been the main driver of corporate employment growth in Greater Cambridge.

'Life science and healthcare' has overtaken 'Information technology and telecoms' in most recent years as the fastest growing sector in the area, helped by the sustained growth of several companies such as AstraZeneca, CMR Surgical and Abcam. Employment in 'Life science and healthcare' has been 2.5 times higher during 2020-21 compared with 2010-11.

By contrast, the 'High-tech manufacturing' sector has seen flat growth over time, with a drop in the last year.

We find mixed results for non-KI sectors.

Although employment growth in 'Other services' and 'Education, arts, charities, social care' has fallen in the last year, employment in these sectors has more than doubled between 2010-11 and 2020-21.

Other non-KI sectors to have witnessed a constant increase in their employee numbers over the last decade are 'Transport and travel', 'Other business services' and 'Property and finance'.

The pattern of growth for the low- and med-low-tech 'Manufacturing' sector is similar to that for the 'High-tech manufacturing' sector. Last year's employment in the sector has been virtually at the same level as in 2010-11.

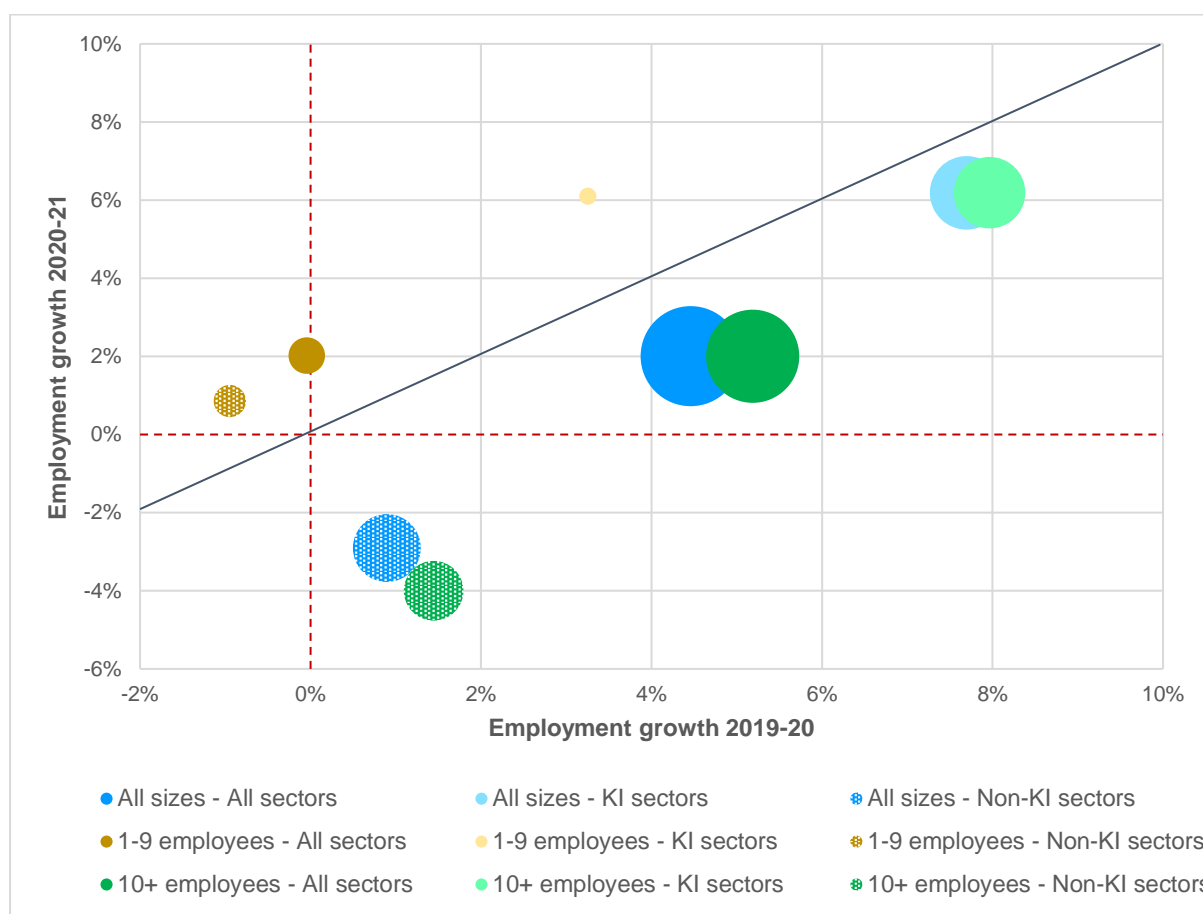
After showing strong growth in the first part of the period, employment in 'Construction and utilities' has remained stable until 2019-20 and declined in 2020-21. This result tallies with evidence on the ground, including the somewhat lower number of cranes that can be noticed in and around the city compared with a few years ago. However, employment in 'Construction and utilities' is still significantly higher now than it was at the beginning of the period.

The 'Primary' sector has exhibited similar growth until 2017-18. Employment growth has then fallen afterwards, largely reflecting a continued reduction in the number of staff employed by Spearhead International.

2.3. Analysis by firm size

Figure 9 shows employment growth in KI and non-KI sectors during 2019-20 (horizontal axis) and 2020-21 (vertical axis) by firm size. It is drawn from a sample of companies with accounts for the years ending between December 2020 and April 2021. The position of the size marker relative to the 45° line indicates whether the size class has grown more or less fast than last year. Size classes with positive growth in 2020-21 are found above the horizontal axis and those with positive growth in 2019-20 appear to the right of the vertical axis. This chart allows us to compare the performance of size classes over time.

Figure 9 Employment growth by firm size in the Greater Cambridge area – 2020-21 vs 2019-20



Note: The size of each bubble is proportionate to the number of employees in 2019-20 on a continuous scale.
Source: Cosh & Caselli, CBR.

Employment of 1-9 employee businesses has increased by 2.0% in 2020-21. This growth has been driven primarily by KI sectors, which have seen employment growing by 6.1% in the latest year compared with 3.3% one year earlier. Non-KI sectors in this size class have grown less fast than KI sectors, reaching 0.9% in 2020-21 up from -0.9% in 2019-20.

The picture looks different for 10+ employee businesses. While employment growth has remained strong for KI sectors (6.2% in the latest year compared with 8.0% in the previous year), the drop of 4.0% in non-KI sectors has slowed down employment growth in this size class from 5.2% in 2019-20 to 2.0% in 2020-21.

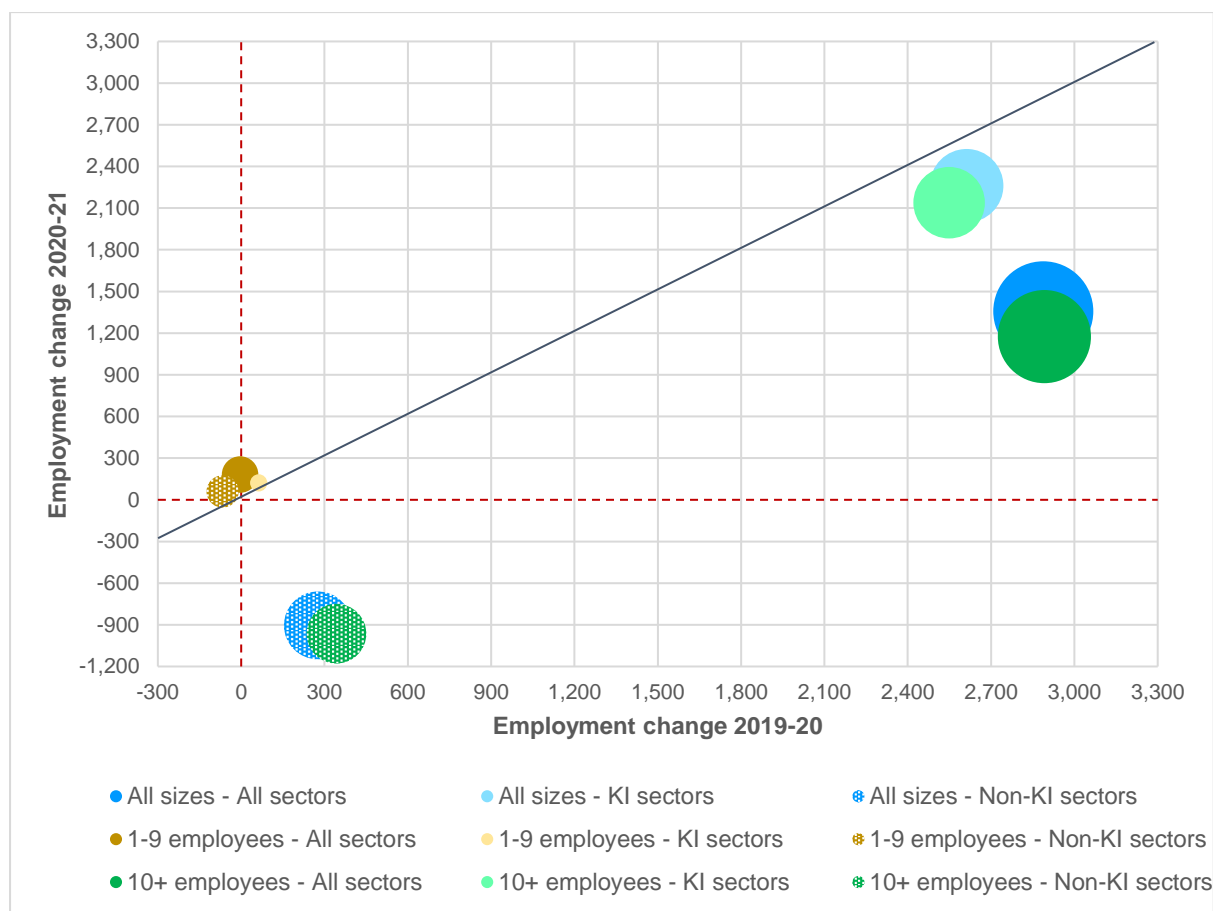
Employment growth to 2021 has held up better in KI sectors than in non-KI sectors in both size classes.

Given the large aggregate size of non-KI businesses employing ten people or more, corporate employment in Greater Cambridge has been growing less fast – albeit still remarkably considering the scale of the challenges associated with the three Covid lockdowns in England – during 2020-21 (+2.0%) compared with 2019-20 (+4.5%).

Figure 10 compares size classes based on their employment change during 2019-20 (horizontal axis) and 2020-21 (vertical axis). It is drawn from a sample of companies with accounts for the years ending between December 2020 and April 2021. The position of the size marker relative to the 45° line indicates whether employment change in the size class has been higher or lower than last year. Size classes with a positive change in employment

during 2020-21 are found above the horizontal axis and those with a positive change during 2019-20 appear to the right of the vertical axis. Similar to Figure 9, this chart allows us to compare the performance of size classes over time.

Figure 10 Employment change by firm size in the Greater Cambridge area – 2020-21 vs 2019-20



Note: The size of each bubble is proportionate to the number of employees in 2019-20 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 4 employees in 2019-20, employment change at 1-9 employee businesses has been positive in 2020-21 (+182 employees). The employment change in the most recent year has originated primarily in KI sectors (+122 employees compared with +63 one year earlier).

On the contrary, the employment change in 2020-21 (+1,175 employees) has been lower than employment change in 2019-20 (+2,892 employees) for businesses with 10+ employees. This reduction has been caused by non-KI sectors, which have seen employment change falling from +343 in 2019-20 to -964 in 2020-21. Employment change in KI sectors has been +2,139 in the latest year down from +2,549 in the previous year.

Overall, corporate employment change to 2021 across all size classes has been +1,357 compared with +2,888 in 2019-20.

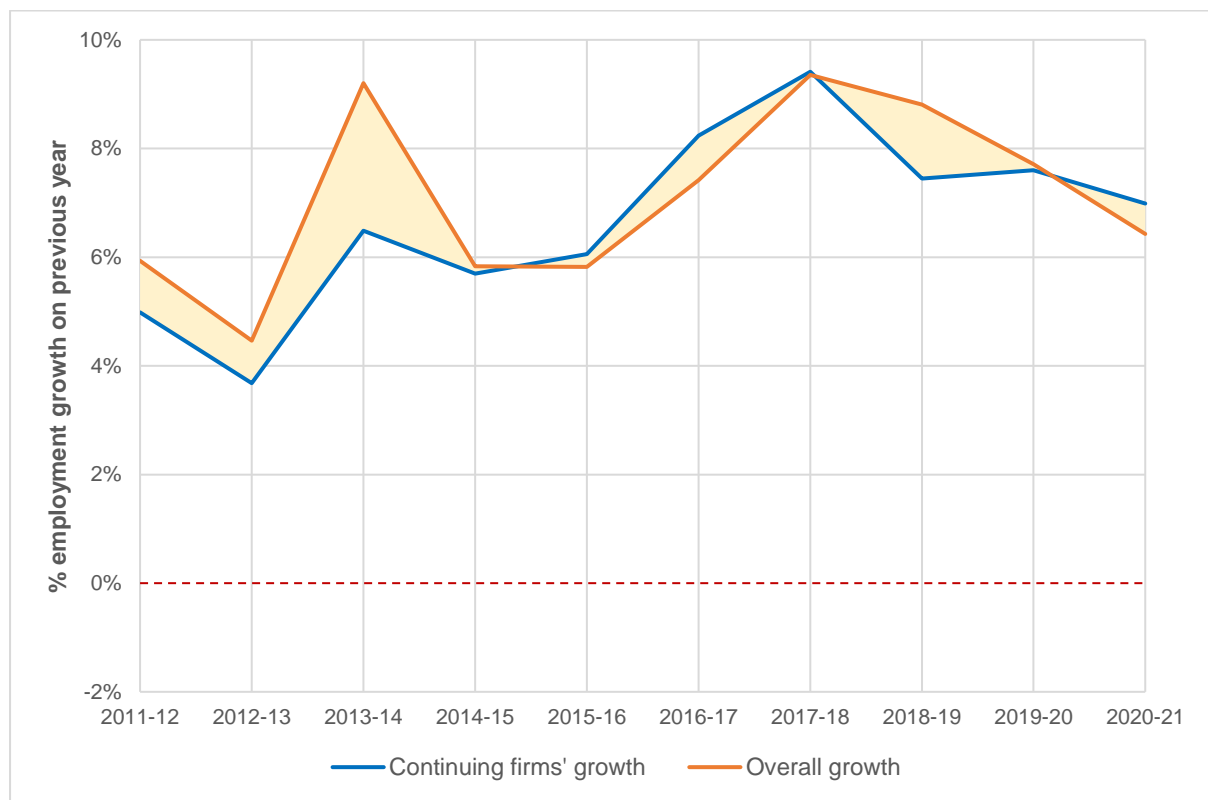
The next section analyses the composition of growth in KI and non-KI sectors in the Greater Cambridge area over the past decade.

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

This analysis explores the contribution to employment growth made by companies that were in the Greater Cambridge area and alive at the beginning and end of each year. Overall growth also includes the impact of births and deaths and location changes into and out of the area.

Figure 11a shows the growth in Greater Cambridge corporate employment in KI sectors from 2011-12 up to the latest year. Overall growth has been strong throughout the period and, as reported above, has held up well during the pandemic. However, whilst the shaded area representing the impact of net entrants (i.e. those born or moved in less those died or moved out) was a strong positive influence on growth in the first half of the decade, it has become a neutral or slightly negative influence in recent years.

Figure 11a Contribution of net entrants to employment growth in the Greater Cambridge area – 2011-12 to 2020-21, KI sectors



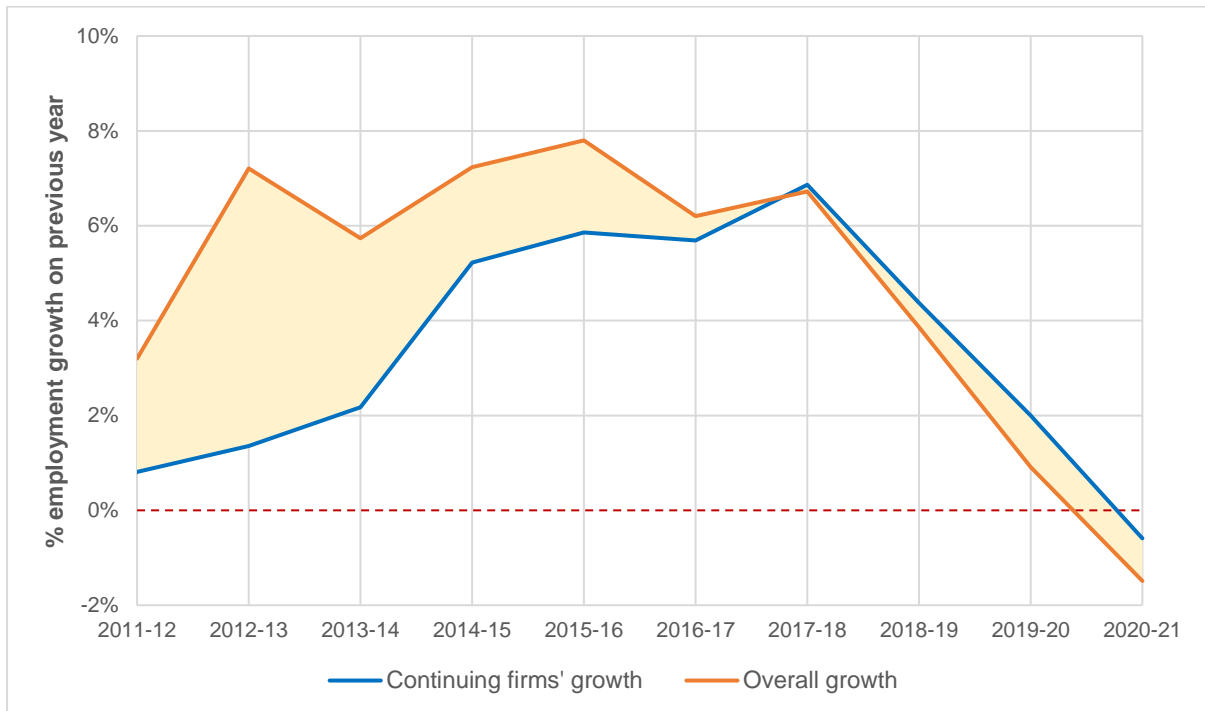
(a) KI sectors

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

Source: Cosh & Caselli, CBR.

Figure 11b shows the growth in Greater Cambridge corporate employment in non-KI sectors from 2011-12 up to the latest year. Overall growth has been strong until 2017-18, but has declined markedly since then and was negative in the latest year. The shaded area representing the impact of net entrants was a strong positive influence on growth in the first half of the decade, whereas it has become a slightly negative influence in recent years.

Figure 11b Contribution of net entrants to employment growth in the Greater Cambridge area – 2011-12 to 2020-21, Non-KI sectors



(b) Non-KI sectors

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

Source: Cosh & Caselli, CBR.

There are several possible explanations for the declining contribution in net entrants over the past decade. It could be that legislation changes led to a growth in incorporation in a number of sectors such as education in the first part of the period. Alternatively, the combination of uncertainty over Brexit and the subsequent pandemic has reduced business formation. It is also possible that the impact of the growth of Greater Cambridge on housing costs and transport has made the area less attractive. Whilst it is not possible to replicate the work above for the whole of the United Kingdom, there is some evidence to suggest that it is a national rather than regional phenomenon (UK Business Demography, ONS).

The next section presents the results of the February 2022 update sample that includes both employment and turnover growth.

4. February 2022 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, which gives us a sample of 348 companies (representing about 63% of total employment of the companies analysed in Section 2). Table 1 provides a comparison of employment and turnover growth rates over the past two years for this group of companies.

Table 1 Comparison of employment and turnover growth rates over the past two years in the Greater Cambridge area (February 2022 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	2019-20	2020-21	2019-20
ALL COMPANIES				
Number of companies	348	348	348	348
Totals in 2021 and 2020	£13,074m	£13,043m	43,385	41,866
Median growth	0.9%	7.8%	0.0%	2.0%
Weighted average growth	0.2%	9.1%	3.6%	5.3%
KI COMPANIES				
Number of companies	157	157	157	157
Totals in 2021 and 2020	£11,036m	£10,884m	31,195	29,428
Median growth	1.6%	8.1%	1.2%	4.5%
Weighted average growth	1.4%	10.3%	6.0%	7.7%
NON-KI COMPANIES				
Number of companies	191	191	191	191
Totals in 2021 and 2020	£2,039m	£2,159m	12,190	12,438
Median growth	-1.3%	6.9%	0.0%	0.0%
Weighted average growth	-5.6%	3.6%	-2.0%	-0.1%

Source: Cosh & Caselli, CBR.

Total employment of these 348 companies grew by 3.6% in 2020-21 down from 5.3% in 2019-20 – still surprisingly fast considering the restrictions associated with the first year of Covid in England. This slowdown in total employment growth is in line with the pattern observed for the broader update sample, where employment increased by 2.0% in the latest year relative to 4.5% one year earlier. This sample of companies has a much higher proportion of KI companies than the update sample reported in Section 2.

Employment growth for these companies providing both employment and turnover data was notably stronger among the 157 KI companies, which saw employment increasing by 6.0% during 2020-21 compared with a decline of 2.0% for the 191 non-KI companies.

These results confirm our findings for the larger update sample, which revealed that the growth of KI sectors remained significantly faster than that of non-KI sectors (+11.6% in Cambridge and +3.1% in South Cambridgeshire).

The effects of the pandemic on employment have been masked to some extent by the provision of furlough support. Business turnover provides a more direct measure of the impact of the pandemic on businesses and of what might have happened to employment in the absence of the furlough scheme. The results presented in Table 1 enable us to compare what has happened to turnover and employment in the last year. We can see that turnover fared worse than employment, partly reflecting the role of the Government's furlough scheme in holding up employment in sectors with declining sales. However, the decline in turnover for the corporate sectors represented by this subset of the companies is not as large as one may expect given the unfolding of the pandemic. Turnover growth fell from 9.1% in 2019-20 to 0.2% in 2020-21, with both KI and non-KI sectors exhibiting lower turnover growth in the latest year compared with one year earlier. This fall in turnover growth was greater amongst the non-KI sectors, where turnover fell by 5.6% in 2020-21 compared with a growth of 3.6% in 2019-20.

For the whole sample of 348 companies, turnover growth in 2019-20 was 9.1%, but employment growth was 5.3%. In the latest year turnover grew by only 0.2% so we would have expected employment to have fallen by several percentage points due to productivity growth in normal circumstances. Instead, employment in this sample grew by 3.6% so we can infer a powerful impact of the furlough scheme on holding up employment. The unwinding of that scheme will lead to employment loss in the corporate sector unless there is a rapid upturn in demand.

In addition, the decline in demand during the pandemic was felt more strongly by a number of in-person service businesses (e.g. consultants, hairdressers, gyms, pubs and restaurants), many of which are not incorporated. The impact of the pandemic on national chain restaurants and retailers such as Nando's and Debenhams is also not reflected in our figures. Therefore, the overall picture might be less positive than we have found for the Greater Cambridge corporate sector alone, although our recent analysis of corporate and non-corporate employment data from BRES does not appear to suggest this.

We now turn to the results of the February 2022 snapshot.

5. February 2022 snapshot results

This section summarises the results of the February 2022 snapshot. Having seen in Section 4 the results for employment and turnover data, this section uses just the fifteen companies that have presented interim results for the six-month periods ending between May 2021 and December 2021. The companies are all knowledge intensive and together employ about 6,700 employees. Only turnover data is available from the interim reports and together they represent a combined annual turnover of about £1.2bn. For each company we look at turnover in the same six months period in 2019, 2020 and 2021. The first year was before the pandemic struck the UK; the second year had the first and second lockdowns; and the latest year includes the recovery from the worst impacts of the pandemic.

5.1. Turnover growth

Total turnover for these six months periods was £1,093m in 2020 down from £1,095m in 2019 – showing the impact of the pandemic even on these fast-growing KI companies. Turnover rose from £1,093m to £1,347m in the 2021 recovery – a rise of 23%. The interim reports do not give us information on employment levels so we cannot see the furlough effect for this group.

An alternative view of growth comes from looking at the median turnover growth rate of these fifteen companies which was 27% in 2021 compared with 4% in the previous year. Eleven of the fifteen companies improved their sales growth in 2021 compared with the same period the previous year. The reason for the differences between the total weighted average growth and the median is caused by the larger companies exhibiting lower growth performance.

Whichever way we measure it, these companies are performing better during 2021 than they were during 2020. This is partly due to demand for their products returning and partly due to companies learning how to manage the effects of the pandemic. Putin's war began after the periods covered above. The impending substantial disruption to both supply and demand and associated unprecedented decline in living standards will further delay any return to normality.

5.2. Companies' comments on the impact of the Covid-19 pandemic

We report below some comments from the companies' interim reports that we examined above. They offer some further insights into the impact of the Covid-19 pandemic on their business. We noted above that the impact of Covid has varied across businesses in different sectors. However, these comments show that Covid has had a significant effect (whether positive or negative) on these businesses. These interim reports were published in recent weeks and so present an up-to-date picture of business sentiment. They appear to show a marked improvement in business confidence compared with a year ago.

Our unique Self-Learning AI technology is what sets us apart at Darktrace. We are the only cyber security company using this kind of AI to solve real-world problems at scale. Constantly evolving, it augments the security team and can act autonomously on behalf of humans. Darktrace continued to demonstrate the power of its business model, delivering significant growth over the first six months of its financial year. The Group ended 1H FY 2022 [six months ended 31st December 2021] with 6,531 customers, having grown its customer base by 39.6% year-over-year.

Darktrace: Global leader in cyber security AI

As with many companies, there have been challenges which impacted our business during the period. The year started with further Covid-19 lockdowns and ongoing component shortages, which resulted in higher costs and longer lead times. Nevertheless, we have been able to continue manufacturing and shipping our products to meet customer requirements on time.

CyanConnode Holdings PLC: Delivers mesh-based flexible wireless solutions for utility metering and lighting control

We have further evolved our product offering to help us deliver this mission while maintaining our sales focus into individual NHS trusts and expanding our focus to capture benefits of asynchronous communication to regional care delivery.

Feedback PLC: Specialist medical imaging technology company providing innovative software

In the first half of 2021, the Medical Sector continued to be particularly strong, with the other sectors, which were more affected by the pandemic, reflecting their respective market sector environments. Most sectors are now seeing the initial signs of global economic recovery.

Science Group PLC: Science and technology consultants

We are delighted to report overall revenue growth of over 30 per cent, fueled by a buoyant recovery in the global gaming market and continued success through our strategic positioning of Densitron. Component shortages and price inflation remain a challenge and we do not anticipate significant improvement in the short term. While our customers have been accepting of essential price rises, nonetheless we expect a period of continued margin volatility. However, our strong cash position and good relationship with suppliers, built up over many years, help to mitigate the impact.

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

As lab activity recovers, quarterly revenue is returning to trend. Growth accelerated across all product categories and geographic areas.

Abcam PLC: Provides biological and tools for drug discovery

Despite continued business disruption caused by the Covid-19 pandemic, IQGeo performed well against all our key metrics with strong financial performance, product innovation and go-to-market strategies.

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

Our foundations remain strong, as we continue to gain new customers and positively re-engage in our core markets. The COVID-19 pandemic continues to cause disruption for business, however we are determined to minimise interruption to the supply of printheads, and we are well-positioned to withstand further volatility caused by the pandemic.

Xaar PLC: Digital inkjet printing technology

The Group has made a good start to the second half, in line with management's expectations. The high levels of recurring revenue and opportunities to grow our fleet operations in the UK, USA, France and the rest of Europe underpin our confidence for the rest of the year and beyond. We will continue to use the financial strength of the business to invest in our core fleet operations.

Quartix Technologies PLC: Vehicle GPS tracking

Despite the disruption to hangar and manufacturing operations caused by the pandemic and the implementation of our new IFS systems, profits of £3.2m from our Aerospace and Defence businesses are ahead of those reported at this time last year (2020 – loss £0.1m). The impact of some operational inefficiency has been offset by overhead cost savings delivered through a restructuring programme completed in the final months of 2020.

Marshall Aerospace and Defence: Servicing and parts manufacture for aircraft and military vehicles

We enter the second half of the year with a clear strategy, building recurring revenues and a strong balance sheet to support software focussed M&A. The Board remains confident in the Group's ability to meet current full year expectations and in our future prospects as we execute our 2025 strategy.

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

Bango delivered another period of strong growth during the first half of 2021 finishing the period ahead of our plan. Compared with 1H20, revenue grew 49% and adjusted EBITDA almost doubled - giving us confidence that we are comfortably on track to meet market expectations for the full year.

Bango PLC: Technology and services helping global businesses to grow

We continue to make significant progress towards becoming a leading US hospital pharmaceutical company. During the first half, our team has done an exceptional job executing on our corporate objectives, despite the challenging operating environment posed by the global pandemic. The commercial launches of both Barhemsys and Byfavo are making excellent progress in terms of formulary access, the most important measure of

success in this early phase of their commercialization. Given this strong performance, we remain on track to meet our annual formulary goals for both products.

Acacia Pharma Group: Develops products to help patients having invasive treatment

The Company had a strong and profitable first half, delivering revenues of £4.5 million, a 50% year-on-year growth. Order intake was above the Board's expectations at £8.6 million and this included two substantial orders outside the Company's core area of focus that totalled £3.6 million. The Company is now delivering more clinical trial contracts than at any time in its history, which is reflected in a contracted order book at 30 June 2021 of £15.2 million, up 36% from 31 December 2020 and more than double the value at 30 June 2020.

Cambridge Cognition Hldgs PLC: Digital solutions to assess brain health

Our established portfolio of genre-leading games, supported by our nurturing approach to post-release development, delivered record financial results in FY21, through continued strong engagement with our games and our downloadable content on new and existing platforms.

Frontier Developments PLC: Developer and publisher of videogames

6. Concluding remarks

The February 2022 update is the fifth 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 over 4,600 Greater Cambridge-based companies with accounting year ends between December 2020 and April 2021. This sample, which represents two-thirds of corporate employment in the area, has a modal year end of March 2021 and captures the impact of the three Covid lockdowns in England. All of the companies have had the most part of their latest financial year, ranging from ten to twelve months, affected by the pandemic.

The picture that emerges is one of continued but lower employment growth in Greater Cambridge. This slowdown in employment growth was due to a weaker performance of non-KI sectors during 2020-21 compared with 2019-20, whilst growth in KI sectors remained strong. The impact of Covid-related restrictions on the Greater Cambridge corporate economy was mitigated by the Life Science and ICT sectors, which saw the fastest rates of employment growth in the latest year amongst all sectors. Employment growth in these sectors has more than doubled over the past decade and has been the main driver of corporate employment growth in Greater Cambridge. By contrast, we find that employment in 2020-21 was lower than a year earlier in eight of the nine non-KI sectors, with the largest drop observed for 'Other services' – e.g. hotels, pubs and restaurants. Nevertheless, employment in 'Other services' and in most of the other non-KI sectors was substantially higher last year than it was at the start of the decade.

Among the reasons behind the slowdown in employment growth in recent years is the negative impact of births and deaths and location changes into and out of the area. Whilst the contribution of these companies to corporate employment growth in Greater Cambridge has been positive in the first half of the decade, it has had either a neutral or slightly negative influence in the past few years – particularly amongst non-KI sectors. Although we can only speculate about the causes of this trend, infrastructure-related problems in the area together with uncertainty over Brexit and Covid might have all played a role.

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. Our analysis reveals that turnover suffered larger falls than employment, mostly reflecting a decline amongst non-KI sectors. These results point to the benefits of the Government's furlough scheme in protecting employment in sectors with declining sales. A comparison with recent evidence from Silicon Valley, an area which is in many ways similar to the Cambridge cluster, suggests that the furlough scheme might have also alleviated the impact of Covid on income inequality. While the economic effects of the pandemic in the UK have been largely borne by taxpayers, in the US it is mainly the workers who have suffered the worst impacts of Covid since no such scheme was adopted. This has exacerbated inequalities across the US, with income inequality in Silicon Valley growing twice as quickly as the national average over the past decade (Silicon Valley Index 2022). However, the end of the furlough scheme and the ongoing war in Ukraine might worsen existing levels of income inequality in the UK.

The Government's furlough scheme came to an end in September 2021. If the end of this unprecedented support package will lead businesses to reconsider whether they will retain their furloughed staff, there could be implications for employment changes. To cast light on these and other related issues, our next update will include an analysis of the latest Real Time Information (RTI) employment estimates produced by ONS.

Finally, we qualify the results for turnover by providing a snapshot for companies with interim accounts ending between May 2021 and December 2021. These companies are all knowledge intensive and showed robust turnover growth in their latest six months, after experiencing a drop in the previous year (when the first and second lockdowns were introduced). The perusal of their interim reports points to an overall improvement in business confidence compared with a year ago. Whichever way we measure it, these companies are performing better during 2021 than they were during 2020. This optimism is now offset by Putin's war. The impending substantial disruption to both supply and demand and associated unprecedented decline in living standards will further delay any return to normality.

Andy Cosh

Giorgio Caselli

Centre for Business Research, University of Cambridge

March 2022

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

February 2022 Update	Number of companies	Total empl 2020-21	Total empl 2019-20	% of GC total 2019-20	Empl growth 2020-21	Empl growth 2019-20
KNOWLEDGE INTENSIVE SECTORS						
Information technology and telecoms	644	11,873	11,089	67.8%	7.1%	10.4%
Life science and healthcare	187	14,862	13,300	79.9%	11.7%	11.3%
High-tech manufacturing	176	6,570	6,850	79.2%	-4.1%	0.1%
Knowledge intensive services	193	5,508	5,313	80.8%	3.7%	4.1%
TOTAL KI SECTORS	1,200	38,813	36,552	75.8%	6.2%	7.7%
OTHER SECTORS						
Primary	89	1,832	2,177	73.0%	-15.8%	-14.1%
Manufacturing	192	2,412	2,479	63.5%	-2.7%	1.8%
Wholesale and retail distribution	379	3,273	3,407	52.3%	-3.9%	2.7%
Construction and utilities	464	2,694	2,801	56.1%	-3.8%	0.9%
Transport and travel	84	992	1,023	57.4%	-3.0%	6.0%
Property and finance	523	3,277	3,305	56.2%	-0.8%	2.9%
Other business services	941	7,285	7,403	62.1%	-1.6%	0.3%
Other services	501	4,201	4,519	51.3%	-7.0%	5.1%
Education, arts, charities, social care	263	4,241	3,997	30.6%	6.1%	2.1%
TOTAL NON-KI SECTORS	3,436	30,207	31,111	52.0%	-2.9%	0.9%
TOTAL ALL SECTORS	4,636	69,020	67,663	62.6%	2.0%	4.5%

Source: Cosh & Caselli, CBR.

Appendix A2. Employment growth by sector in Cambridge

February 2022 Update	Number of companies	Total empl 2020-21	Total empl 2019-20	% of Camb total 2019-20	Empl growth 2020-21	Empl growth 2019-20
KNOWLEDGE INTENSIVE SECTORS						
Information technology and telecoms	261	7,637	7,046	81.3%	8.4%	11.3%
Life science and healthcare	67	5,387	4,509	77.3%	19.5%	16.1%
High-tech manufacturing	33	476	482	39.0%	-1.2%	-5.1%
Knowledge intensive services	77	1,361	1,284	70.5%	6.0%	6.7%
TOTAL KI SECTORS	438	14,861	13,321	75.9%	11.6%	11.7%
OTHER SECTORS						
Primary	17	137	129	63.5%	6.2%	7.5%
Manufacturing	49	462	453	61.4%	2.0%	3.2%
Wholesale and retail distribution	128	793	863	32.7%	-8.1%	3.7%
Construction and utilities	113	458	488	50.3%	-6.1%	1.5%
Transport and travel	21	173	241	50.2%	-28.2%	3.0%
Property and finance	205	1,896	1,910	60.3%	-0.7%	2.6%
Other business services	359	3,930	4,001	62.2%	-1.8%	-2.3%
Other services	200	1,439	1,566	40.4%	-8.1%	6.5%
Education, arts, charities, social care	117	2,708	2,461	31.8%	10.0%	0.2%
TOTAL NON-KI SECTORS	1,209	11,996	12,112	46.1%	-1.0%	1.0%
TOTAL ALL SECTORS	1,647	26,857	25,433	58.1%	5.6%	6.3%

Source: Cosh & Caselli, CBR.

Appendix A3. Employment growth by sector in South Cambridgeshire

February 2022 Update	Number of companies	Total empl 2020-21	Total empl 2019-20	% of S Cambs total 2019-20	Empl growth 2020-21	Empl growth 2019-20
KNOWLEDGE INTENSIVE SECTORS						
Information technology and telecoms	383	4,236	4,043	52.7%	4.8%	8.7%
Life science and healthcare	120	9,475	8,791	81.3%	7.8%	9.0%
High-tech manufacturing	143	6,094	6,368	85.9%	-4.3%	0.5%
Knowledge intensive services	116	4,147	4,029	84.7%	2.9%	3.3%
TOTAL KI SECTORS	762	23,952	23,231	75.8%	3.1%	5.5%
OTHER SECTORS						
Primary	72	1,695	2,048	73.6%	-17.2%	-15.2%
Manufacturing	143	1,950	2,026	64.1%	-3.8%	1.5%
Wholesale and retail distribution	251	2,480	2,544	65.6%	-2.5%	2.3%
Construction and utilities	351	2,236	2,313	57.5%	-3.3%	0.8%
Transport and travel	63	819	782	60.0%	4.7%	7.0%
Property and finance	318	1,381	1,395	51.3%	-1.0%	3.2%
Other business services	582	3,355	3,402	61.9%	-1.4%	3.6%
Other services	301	2,762	2,953	59.8%	-6.5%	4.4%
Education, arts, charities, social care	146	1,533	1,536	28.9%	-0.2%	5.5%
TOTAL NON-KI SECTORS	2,227	18,211	18,999	56.5%	-4.1%	0.8%
TOTAL ALL SECTORS	2,989	42,163	42,230	65.7%	-0.2%	3.4%

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 eleven years. The current database goes from 2010-11 to 2020-21 audited company data and covers the accounting periods of companies ending in the 2020-21 financial year. The results of the 2020-21 annual draw were made available at the beginning of March 2022. 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.cambridgeahead.co.uk/media/2033/cbr-database-methodology-2022.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 an update every four months, spread evenly over the year and this can be seen in Table A1. If we look at 2022, we propose February, June and October updates which will yield estimates of growth for the years to end March 2021, August 2021 and early December 2021. These periods will capture: the effects of all three Covid lockdowns in England (February update); and the impact of coming out of lockdowns and any further developments (June and October updates). 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	Relation to Covid
<i>Annual draw 2020-21*</i>	All companies	6 th April 2020 to 5 th April 2021	Year to early December 2020	February 2022	Impact of 1 st and 2 nd lockdowns
<i>Update February 2022**</i>	Sample	December 2020 to April 2021	Year to end March 2021	March 2022	Impact of all three lockdowns
<i>Update June 2022**</i>	Sample	April 2021 to December 2021	Year to August 2021	July 2022	Impact of coming out of lockdowns
<i>Update October 2022**</i>	Sample	October 2021 to April 2022	Year to early December 2021	November 2022	Impact of coming out of lockdowns

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

Update Sample (using February 2022 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 December 2020 and April 2021. We then check 2019-20 and 2020-21 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 (**7,692** companies this time representing total employment of **112,794**):

- Company name
- Company registration number
- LA District
- Sector
- KI or non-KI
- Size class in 2019-20 – 1 = 1 employee, 2 = 2-9 employees, 3 = 10 or more employees
- Latest employment 2020-21 (on average March 2021)
- Employment 2019-20 (on average March 2020)
- % change in employment over last year (i.e. on average to March 2021)

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 December 2020 and April 2021 (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 2020-21 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 (**4,636** companies representing total employment of **69,020**) with the following information:

- Company name
- Company registration number
- Local Authority District
- Sector
- KI or non-KI

- Size class in 2019-20 (as above)
- Employment 2019-20
- Employment 2020-21
- % change in employment over this year

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 2020-21. This allows us to compare the most recent growth of each sector and size class over the most recent year 2020-21 in comparison with the year 2019-20 for this sample of companies. The resulting sample is shown in Appendices A1-A3 and these tables highlight how significant these companies are, representing 63% of corporate employment in Greater Cambridge.

The sample has a high coverage of total employment in this update because large businesses tend to have either a December or March year end and so are captured in this update.

Since we include only companies that have a reporting date between December 2020 and April 2021, their performance reflects a significant impact of the Covid pandemic varying from ten to twelve months.

Analyses

Using the methodology described above we can compare the performance of our sectors over time and identify those sectors most impacted by Covid. A powerful tool for doing this is one that has as the horizontal axis the sector's employment growth rate in the year 2019-20 and as the vertical axis the annual growth shown in the update sample for 2020-21 – see Figure 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 2020-21 are found above the horizontal axis and those with positive growth in 2019-20 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, company sizes or districts. It is reinforced by an appendix that provides detailed tables (see Appendices A1-A3).