

The Economic Geography of the Cambridge City Region - a story of corporate resilience

Today we are concerned with the economic geography of the Cambridge City Region and we examine the performance of businesses that are based within a twenty mile radius of the centre of Cambridge.

Our analysis is based on an annual draw of all companies based within the Cambridgeshire and Peterborough Combined Authority area and/or within the Cambridge City Region (20-mile radius of Cambridge). This year's annual draw gathered data for twelve years from 2010-11 to 2021-22. Besides being the source of detailed analyses of employment and turnover of locally based companies, the database provides the sampling frame for the regular updates of employment changes in the Greater Cambridge area.

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.

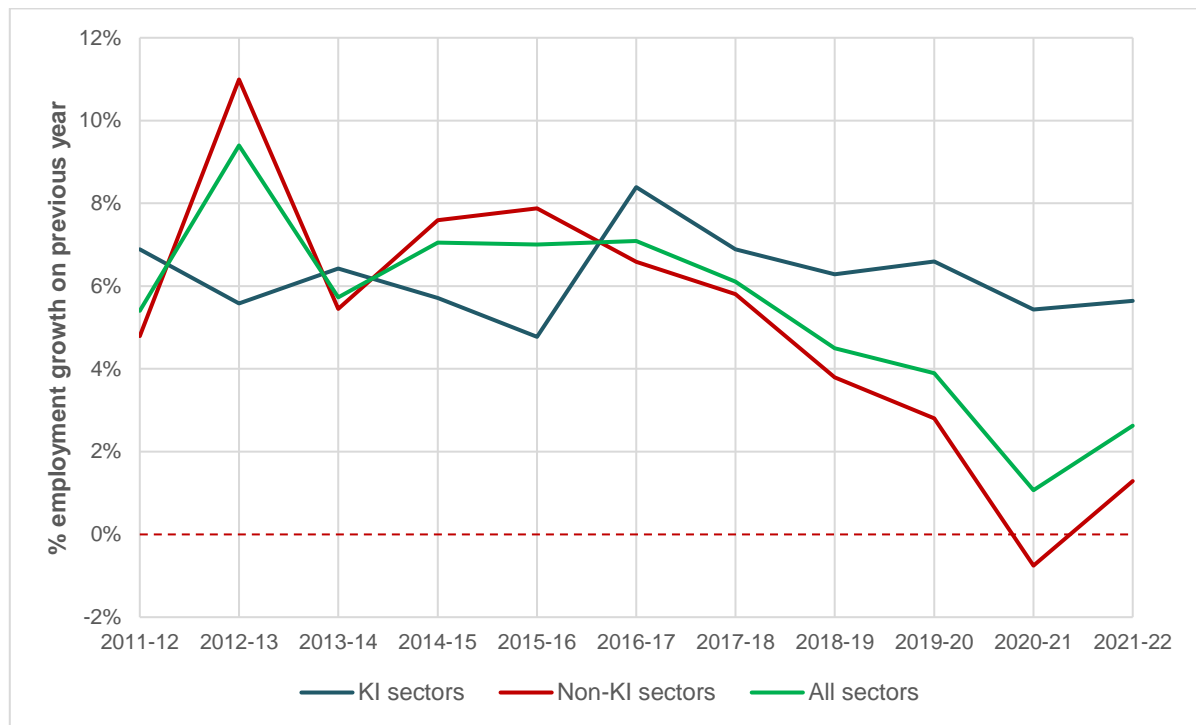
Four topics for today's talk:

1. Long term growth of the corporate sector
2. Sectoral impact of Covid:distinguishing between employment and turnover
3. The business demography of the region
4. Importance of business parks and sectoral clustering in the region.

1 Long term growth of the corporate sector

Figure 1.1 shows employment growth of the corporate sector in the Cambridge City Region over the past decade.

Figure 1.1 Employment growth pa 2011-12 to 2021-22 in the Cambridge City Region



Note: The latest year covered by the annual draw, 2021-22, includes accounting years ending between 6th April 2021 and 5th April 2022 (the median year end is early December 2021).

Source: Cosh & Caselli, CBR.

The chart provides a picture of robust and prolonged employment growth in the Cambridge City Region.

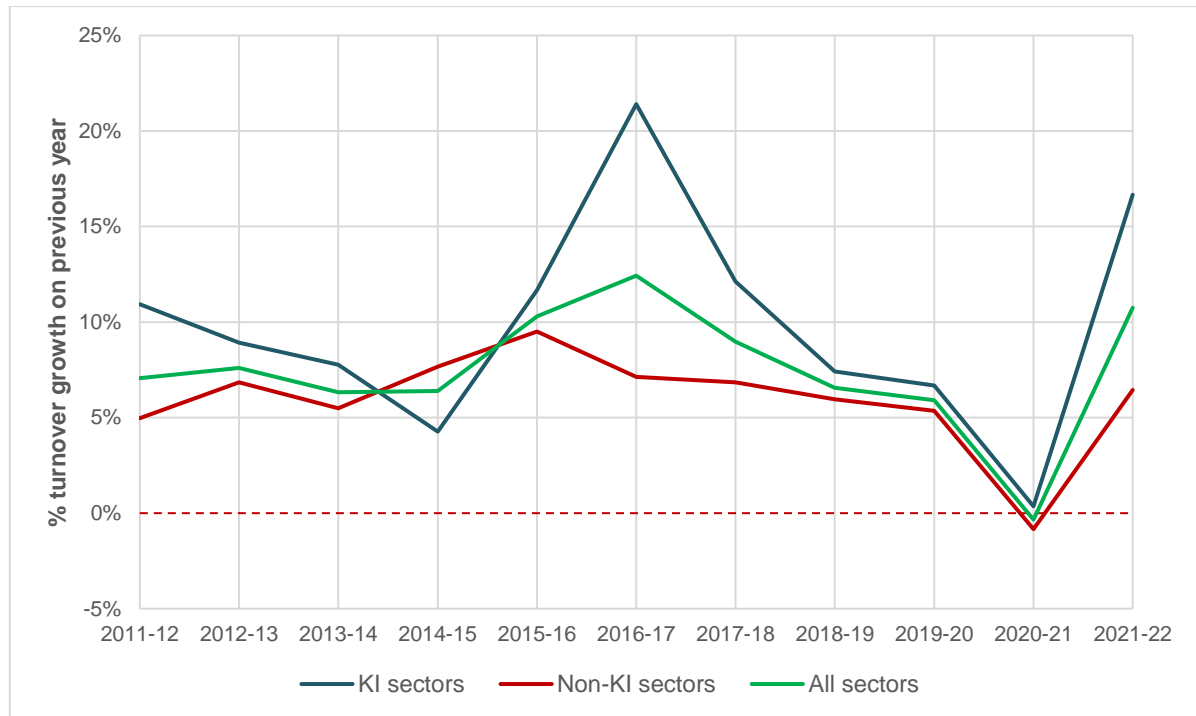
Employment increased by about 6% pa up to 2017-18, before slowing down in the latter part of the period. Although Covid certainly played a role, the data suggests that the slowdown in employment growth started to materialise well before the pandemic struck.

Employment growth reached its lowest level in 2020-21, a year that includes the bulk of the Covid impact. However, growth remained positive despite the unprecedented challenges brought by Covid, pointing to the important role of the furlough scheme.

KI sectors outperformed non-KI sectors and held up overall employment growth in the area, particularly in the aftermath of the pandemic. Non-KI sectors were behind the slowdown in employment growth during the latter part of the period and were more significantly affected by Covid than KI sectors.

An equivalent analysis based on turnover is presented in Figure 1.2.

Figure 1.2 Turnover growth pa 2011-12 to 2021-22 in the Cambridge City Region



Note: The latest year covered by the annual draw, 2021-22, includes accounting years ending between 6th April 2021 and 5th April 2022 (the median year end is early December 2021).

Source: Cosh & Caselli, CBR.

The picture for turnover reinforces our finding of a robust and prolonged performance of the Cambridge City Region.

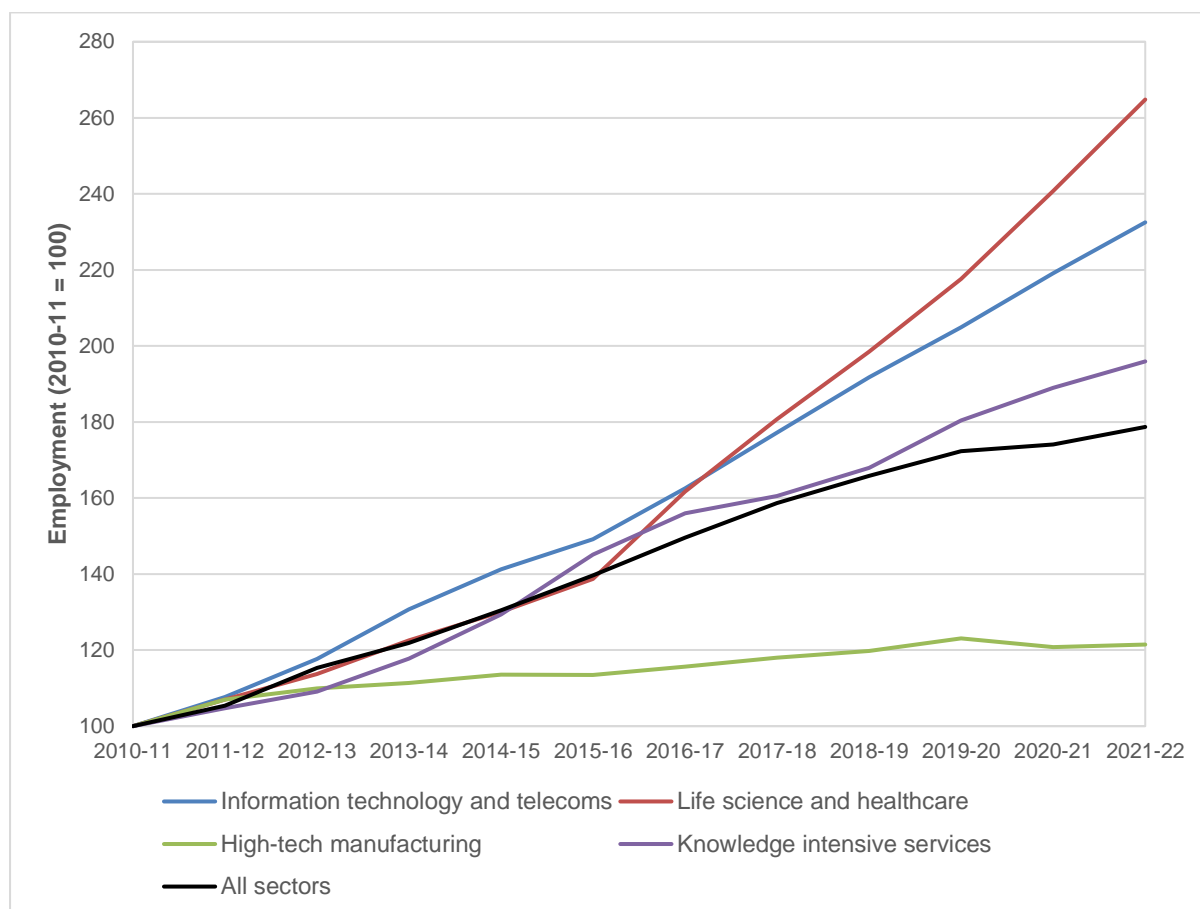
Turnover growth of KI sectors has tended to exceed turnover growth of other sectors in the area. KI sectors were also behind the spike in turnover growth during 2016-17, which reflects large increases in turnover by some of the fastest growing Life Science and ICT companies in the region (e.g. Illumina, Qualcomm and Arm).

Turnover growth dropped in both KI and non-KI sectors when the pandemic hit but bounced back as we came out of lockdowns.

Turnover growth was generally higher than employment growth, except during the Covid-affected year. The finding that turnover growth was more impacted by the pandemic than employment growth confirms the important role of furlough in protecting employment.

We now turn to a more disaggregated analysis of long-term growth in employment by sector, starting from the four KI sectors.

Figure 1.3 Employment growth pa 2011-12 to 2021-22 in the Cambridge City Region: KI sectors



Source: Cosh & Caselli, CBR.

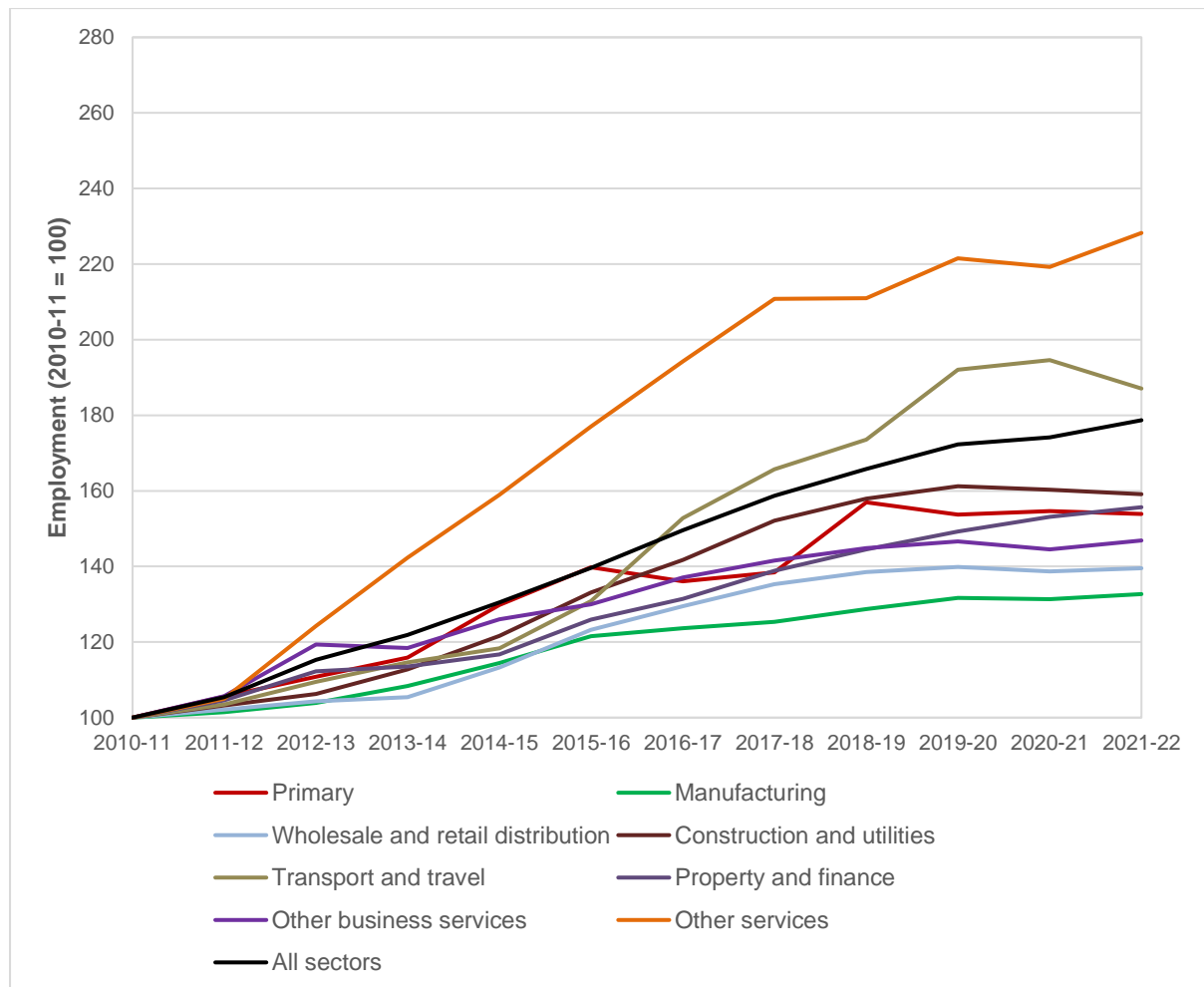
The chart vividly illustrates the exceptional growth of the ‘Life science and healthcare’ and ‘Information technology and telecoms’ sectors. Employment growth in these sectors, and to a lesser extent in ‘Knowledge intensive services’, has outstripped average growth across all sectors by a significant margin and has been the main driver behind the strong corporate performance in the City Region.

‘Life science and healthcare’ has overtaken ‘Information technology and telecoms’ around the middle of the period to become the fastest growing sector in the area. Employment in ‘Life science and healthcare’ was more than 2.5 times higher last year than it was at start of the period.

Employment growth over the past decade has been much lower in the ‘High-tech manufacturing’ sector, where employment is not yet back to pre-pandemic levels.

Figure 1.4 provides a similar comparison for non-KI sectors. The chart excludes the Education sector, where new incorporations and amalgamations of schools have inflated overall growth in the sector and may provide a misleading picture.

Figure 1.4 Employment growth pa 2011-12 to 2021-22 in the Cambridge City Region: non-KI sectors



Source: Cosh & Caselli, CBR.

We find mixed results for non-KI sectors.

The ‘Other services’ and ‘Transport and travel’ sectors exhibited the fastest rates of growth amongst all non-KI sectors and performed better than the average sector in the City Region. Employment in the ‘Other services’ sector, which includes doctors, dentists and other incorporated healthcare businesses alongside hospitality businesses, more than doubled between 2010-11 and 2021-22.

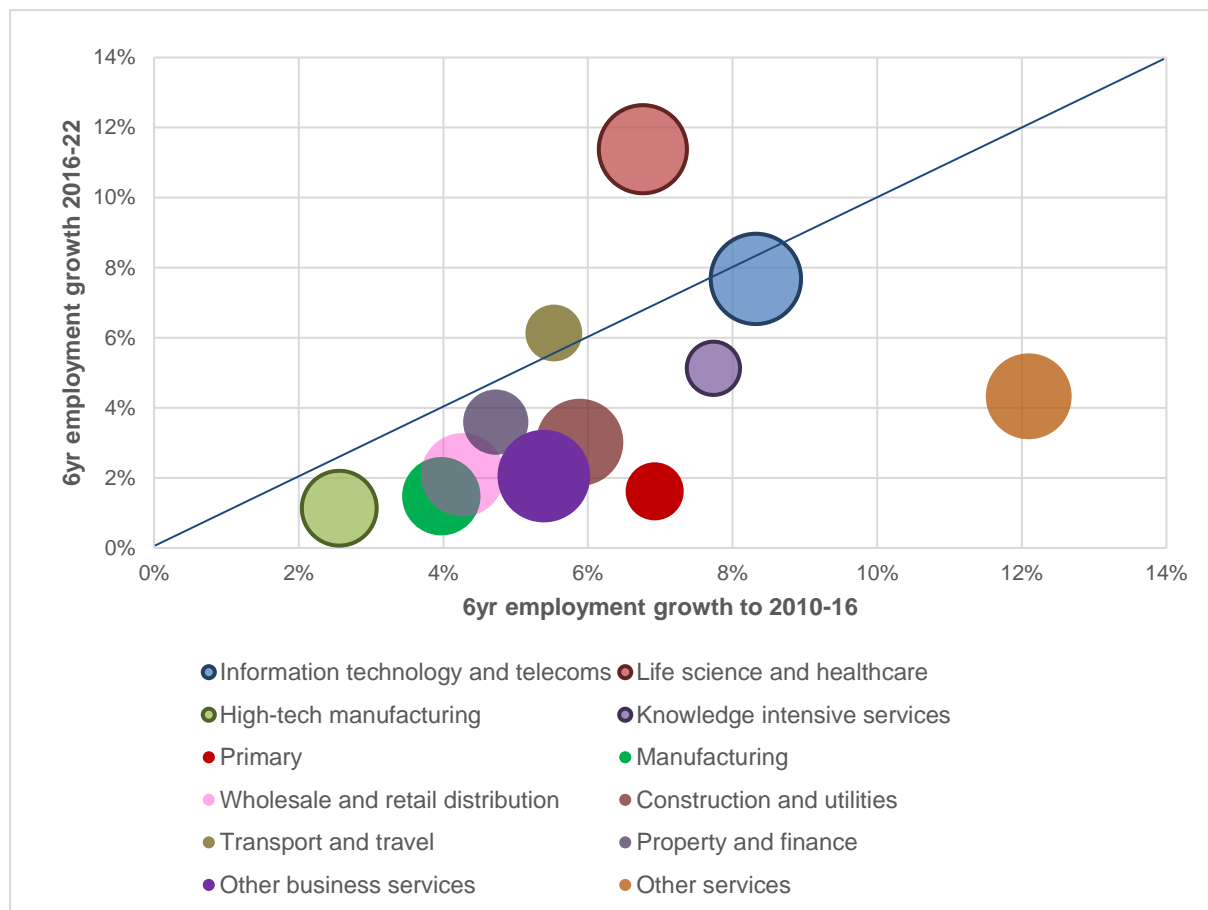
After achieving strong growth in the first part of the period, employment growth in the ‘Construction and utilities’ sector slowed down over the last few years. This result tallies with evidence on the ground, for example the lower number of cranes that can be noticed in and around the city compared with some years ago. Nonetheless,

employment in 'Construction and utilities' was about 1.6 times higher in 2021-22 than it was 12 years earlier.

'Property and finance' has seen a steady increase in employment over the past decade, while sectors such as 'Other business services', 'Wholesale and retail distribution' and 'Manufacturing' have had more limited growth. The pattern for the low- and med-low-tech 'Manufacturing' sector mirrors the pattern for the 'High-tech manufacturing' sector.

Figure 1.5 delves deeper into differences in employment growth across sectors by comparing growth in the first part of the period (2010-16) with growth in the latter part of the period (2016-22). The chart excludes the Education sector as was done in Figure 1.4.

Figure 1.5 Employment growth pa 2011-12 to 2021-22 in the Cambridge City Region: first six years vs last six years



Source: Cosh & Caselli, CBR.

Employment growth in the period including Brexit and Covid was lower than growth in the first part of the period across many sectors.

'Transport and travel' was the only non-KI sector to witness slightly higher growth in employment over the last six years (6.1%) compared with the first six years (5.5%).

The largest slowdown amongst non-KI sectors was felt by 'Other services', where employment growth decreased from 12.1% in the first part of the period to 4.3% in the latter part. This lower performance is perhaps not surprising if one considers that the 'Other services' sector, particularly hospitality businesses, was hit the hardest by Covid-related restrictions.

By contrast, KI sectors showed more similar growth between the two periods, as indicated by the proximity of the four bubbles for KI sectors to the 45° line. Employment growth in 'Life science and healthcare' was even higher in the last six years than it was in the previous six years, partly reflecting new business opportunities associated with the fight against the virus and future outbreaks in the aftermath of Covid.

2 The sectoral impact of the Covid pandemic and lockdowns

Our annual data includes companies with accounting year ends within the fiscal year. To examine the impact of the Covid pandemic on corporate employment and turnover we formed a large sample with accounting year ends between December one year and April in the following year. The sample had 535 companies and represented over 54,000 employees.

This approach enables us to compare three years: 2019-20 (pre Covid) largely predates Covid; 2020-21 (Covid) covers all three Covid lockdowns; and 2021-22 (post Covid) examines corporate performance post lockdowns. Table 2.1 shows the growth for each year relative to the previous year for KI and non-KI sectors.

Table 1 Comparison of employment and turnover growth rates over the past three years in the Cambridge City Region

Cambridge City Region Sample of companies with employment and turnover for the last three years	Turnover growth %pa			Employment growth %pa		
	2019-20	2020-21	2021-22	2019-20	2020-21	2021-22
	<i>Before</i>	<i>During</i>	<i>After</i>	<i>Before</i>	<i>During</i>	<i>After</i>
ALL COMPANIES						
Number of companies	535	535	535	535	535	535
Totals at end of each year	£14,830m	£14,180m	£16,117m	54,487	53,968	54,577
Weighted average growth	4.2%	-4.4%	13.7%	3.0%	-1.0%	1.1%
KI COMPANIES						
Number of companies	164	164	164	164	164	164
Totals at end of each year	£7,484m	£6,964m	£8,157m	20,724	21,227	21,796
Weighted average growth	6.0%	-6.9%	17.1%	5.5%	2.4%	2.7%
NON-KI COMPANIES						
Number of companies	371	371	371	371	371	371
Totals at end of each year	£7,346m	£7,215m	£7,961m	33,763	32,741	32,781
Weighted average growth	2.5%	-1.8%	10.3%	1.5%	-3.0%	0.1%

Source: Cosh & Caselli, CBR.

We do not analyse the 'All Companies' results since these depend upon the balance between KI and non-KI companies in this particular sample. If we look at the KI companies we see that both turnover and employment were strong before the pandemic struck. Growth of turnover in 2019-20 was also strong for the non-KI companies, but their growth of employment, whilst positive, was not as strong as that of the KI sector.

The findings for the pandemic period, 2020-21, clearly show a significant impact on performance despite the support of the furlough scheme. Employment growth of the KI companies slowed markedly, but their total turnover actually fell. The picture is different for this sample of non-KI companies which showed a fall in employment but a smaller fall in turnover. These findings have been reported before and bear witness to the support provided by the furlough scheme.

For the first time we are able to look at the performance of this same group of companies in the recovery year 2021-22. In the KI sector employment has resumed its previous vigorous growth and turnover has rebounded with total turnover of this group growing by 17%. The recovery of non-KI companies has been more mixed. Employment growth has been very muted whilst turnover has rebounded from lockdown giving a growth of 10% for these companies. The strong recovery of turnover relative to employment is partly a consequence of the furlough scheme.

Figure 2.1 examines the impact of Covid on employment in different sectors in this sample and shows that Life sciences and ICT and Telecoms actually slightly increased their growth during the pandemic. Knowledge intensive services growth rate decreased during the pandemic but remained positive. Whilst these three sectors grew their employment during the pandemic, their growth was slower in the post-Covid year. High-tech manufacturing showed a decline in employment during the pandemic and a more modest recovery as companies such as Hexcel Composites and Mistras Group were heavily hit.

Most of the non-KI sectors had a sharp decline in employment in the Covid year and have struggled to resume employment growth in the post-pandemic year with agriculture, business and other services most heavily impacted. Business and other services showed strong recoveries post pandemic and had some modest employment growth over the entire period. Employment in agriculture suffered during the pandemic, partly due to a combination of Brexit and the pandemic. Construction, transport and the education and charity sectors were the only three non-KI sectors to have employment higher at the end of the three year period.

Figure 2.2 provides the equivalent information for turnover growth in this sample. In most sectors we find a large decline in their growth rate in the Covid year followed by a very strong growth in the post-Covid year. Life sciences, ICT and Telecoms and Knowledge intensive services had a strong growth in turnover over the three years, (despite the life science companies in this sample having a fall in turnover in the Covid year). Hitech manufacturing and the primary sector were the only sectors with a fall in turnover over the three years. Conventional manufacturing, transport and the education and charity sectors had positive growth of employment throughout the three years.

As a rule, turnover growth exceeds employment growth but this was reversed in many sectors in the Covid year only to be spectacularly reversed again post-Covid.

Figure 2.1 The sectoral impact of the Covid pandemic and lockdowns on employment growth in the Cambridge City Region

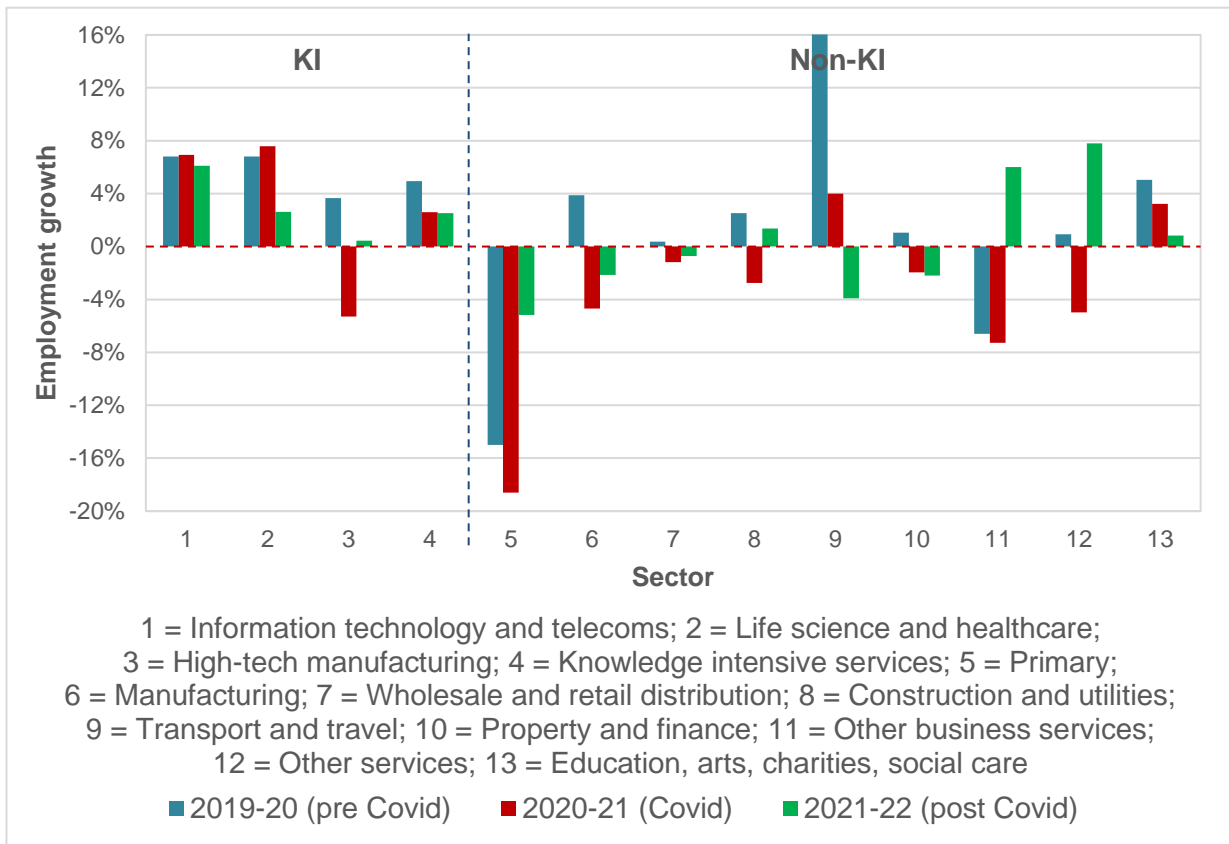
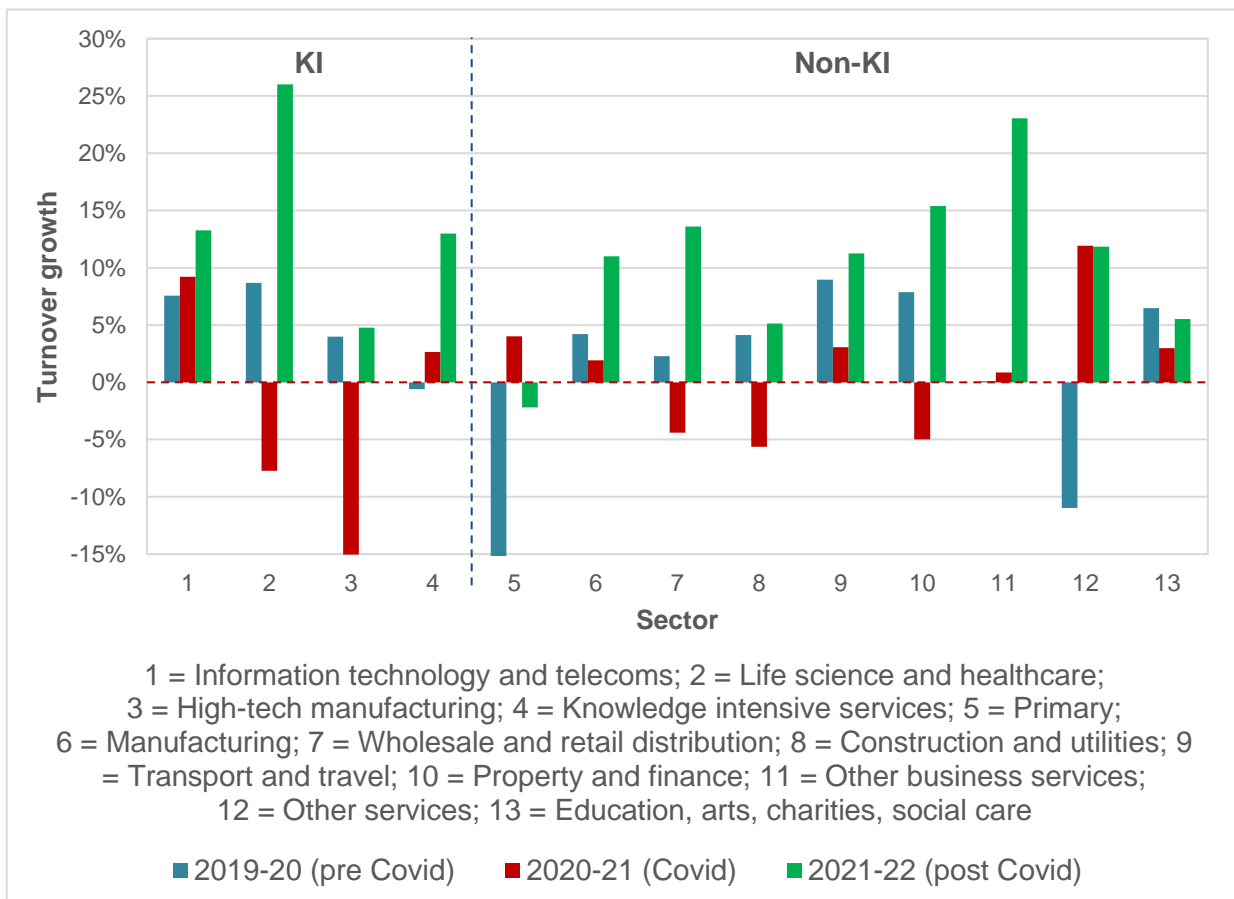


Figure 2.2 The sectoral impact of the Covid pandemic and lockdowns on turnover growth in the Cambridge City Region

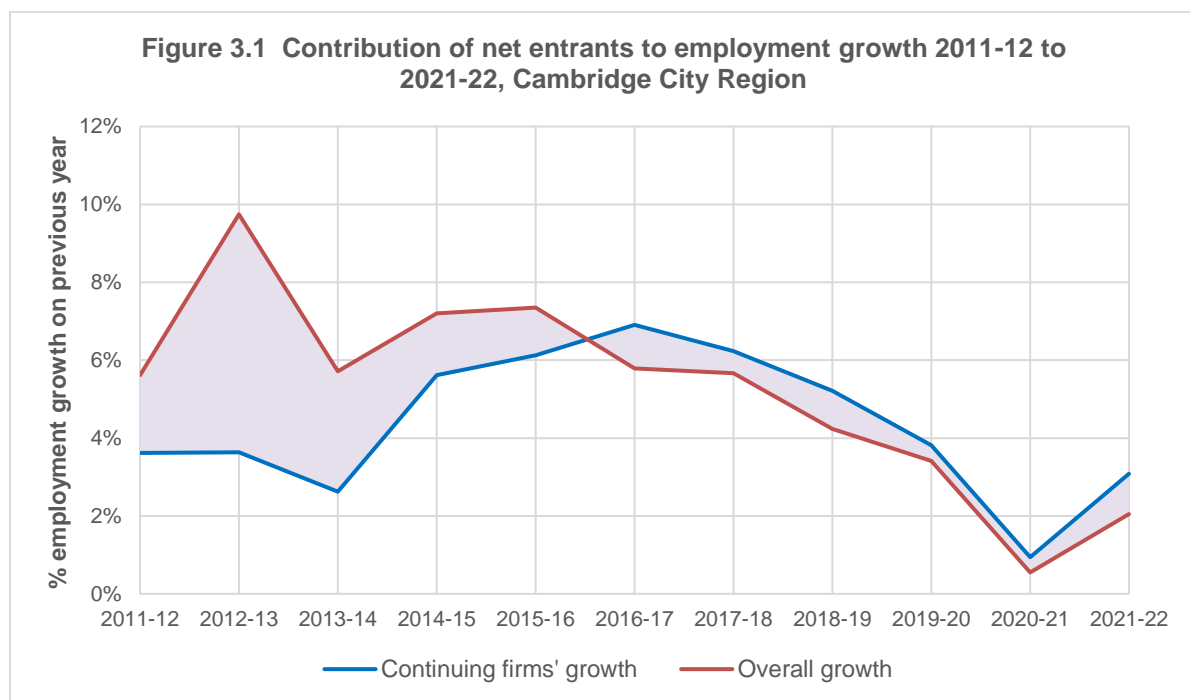


3 The business demography of the Cambridge City region

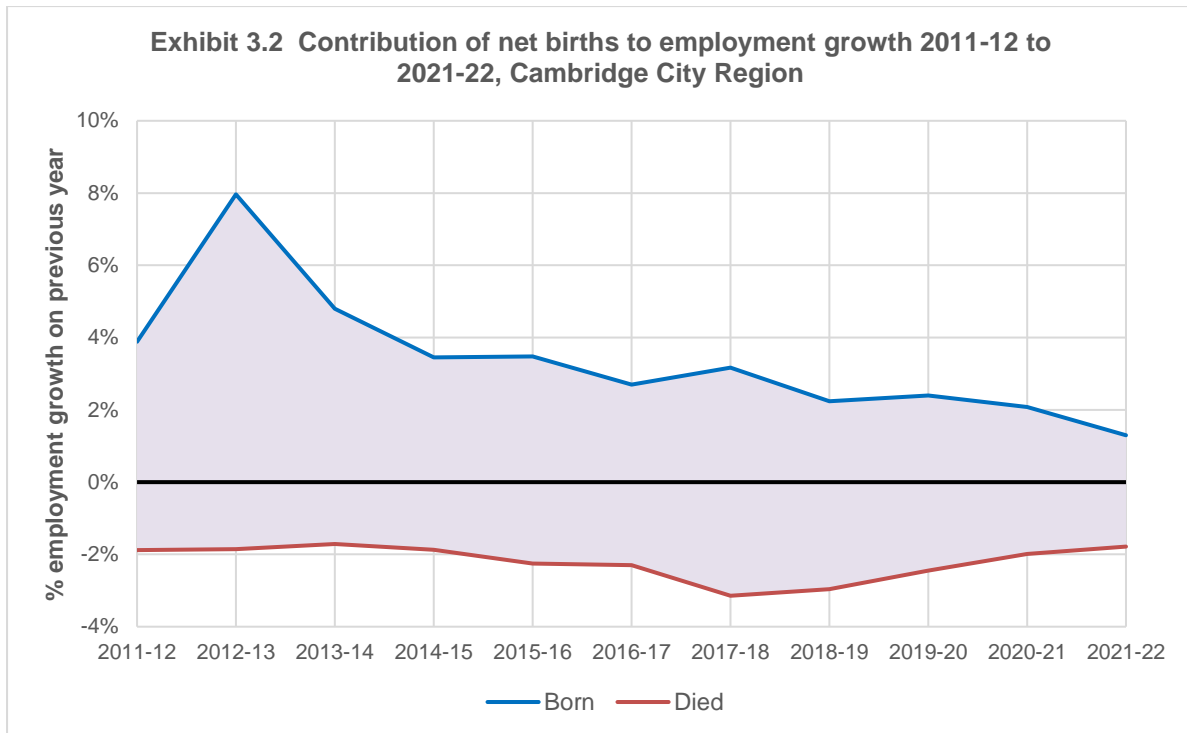
The corporate growth of the region depends not only on the rate of growth of indigenous businesses, but also on additions to the business stock caused by company births and companies moving their base to within the region (offset of course by company deaths and those leaving the region). This part of today's talk examines the importance of these demographic changes.

Figure 3.1 shows the employment growth rate each year in the Cambridge City Region along with the contribution made to that growth by continuing businesses (i.e. those that were in the area and alive at both the beginning and end of that year). The shaded gap between these lines shows the impact of net births and net relocations on the growth rate.

The figure reveals that these net additions are positive in the first half of our period (2.8% pa on average 2011-16) and become negative, though smaller (-0.7% pa on average 2016-22) in the second half. It is this reduction that accounts for most of the reduction of growth in the second half of the period compared with the first.



Further analysis shows that it is the change in net births that caused this change as can be seen in Figure 3.2 below. In fact, the main cause is the reduction in the contribution to employment growth by births which has fallen from an average of 4.7% pa during 2011-16 to 2.3% during 2017-22. The causes of this may be national (Brexit, covid, cost of living crisis etc.) or local (housing, transport, business rents etc.).



One way to examine whether this reduction in births is a local or national phenomenon is to examine national statistics. However, it must be recognised that our measure is quite different from that used by ONS. We examine genuine births of companies and not simply their registration. For example, new registrations that are put on the shelf for future use are not included until they begin to trade and produce their first meaningful set of accounts. In addition, if a company transfers its trading activity to a new company under the same ownership we do not regard this as an addition to either the stock of companies, or employment. This is careful and detailed work.

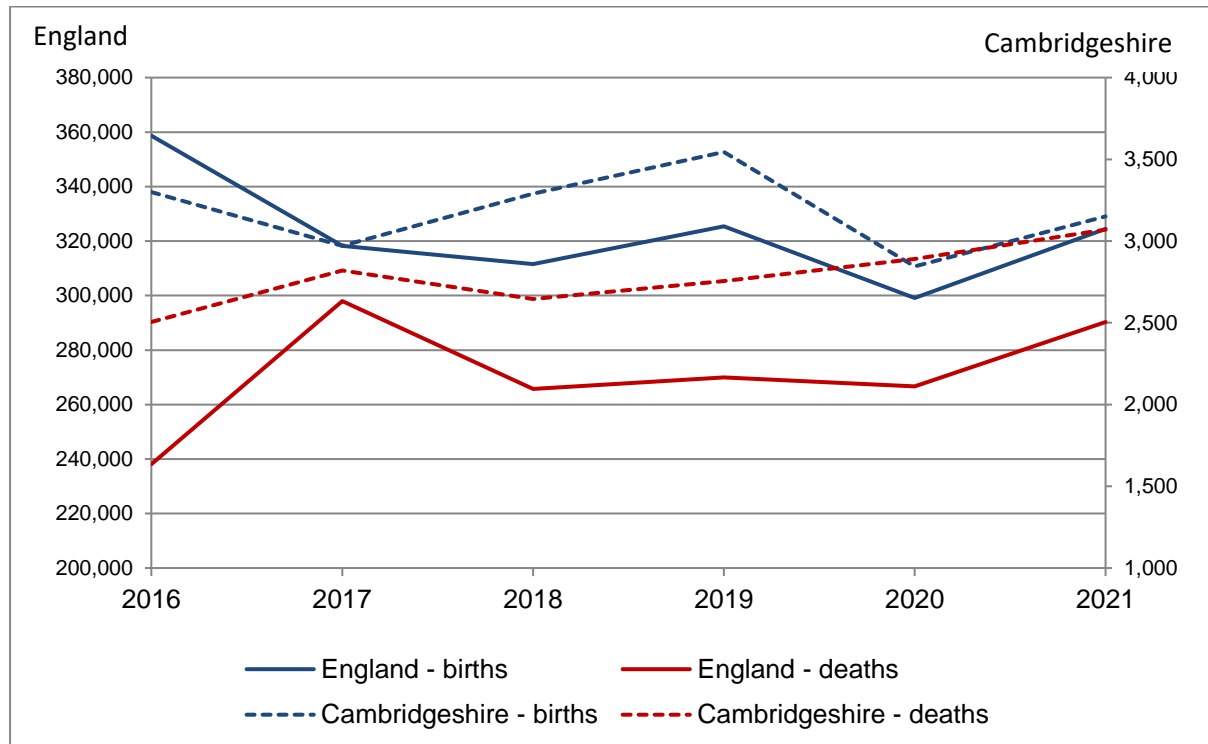
The ONS identifies company births by new entries on the Government's inter-departmental business register which is primarily based on VAT registrations. Furthermore, the ONS looks only at the number of v births and deaths and not their impact on employment growth. The ONS view of births and deaths for England and for Cambridgeshire is shown on Figure 3.1 which uses two scales.

The figure reveals two important findings. First, over the last five years in both England and Cambridgeshire using this measure it is deaths that have grown over the period more than the fall in births. Both areas also show a marked decline in net births over the period.

More importantly perhaps, net births as a percentage of the number of businesses at the start of the year, fell from 5% to 2% in England whilst Cambridgeshire net births

fell from 3% to 0% over these years. Although this measure of the impact of births and deaths over the last five years is very different from our measure, it would appear that a major part of the decline is a national effect. Hopefully this trend will be reversed in the near future since it is vital for the health of our business community.

Figure 3.3 Number of company births and deaths in England and in Cambridgeshire 2016-21



Source: ONS Business Demography 2021.

4 Business Parks in the Cambridge City region

We have examined 120 innovation and business parks that exist within our region and note that these clusters of businesses are growing in importance. Today's presentation examines thirty-seven of the largest parks and, in particular, the fourteen parks that dominate the KI activities of the region.

Table 4.1 provides information about the size and sectoral distribution of these 37 business parks which together have over 2,400 companies. These companies have over 57,500 employees.

The upper part of the table shows five parks that have a life sciences focus. The 105 companies on these parks have over 14,400 employees with almost all of these working for KI companies.

The second part of the table includes nine other KI intensive parks which have a more varied sectoral distribution and include 867 companies. Together they have almost 20,000 employees with 86% of them employed by KI businesses.

The next row summarises six other KI focused parks with 334 companies and over three thousand employees, 77% of which are employed by KI businesses. The final row shows 17 other business parks with 1105 companies on them. 80% of these businesses are in non-KI sectors. They employ over 20,000 and only 21% of these employees work in KI sectors.

Table 4.2 shows the average age and size of the businesses on these parks. As expected we find parks that have a preponderance of start-ups have companies that are both younger and smaller on average. However, each business park has a wide variety of ages and sizes. The evidence on business growth in this table shows that life science businesses have grown strongly over the last three years, followed by other KI businesses. Company growth rates on parks dominated by non-KI businesses have shown more modest growth – 3-4% pa on average.

Table 4.3 shows our estimates of the R&D spending by companies on these business parks. They are likely to be underestimates since we could not always find a reasonable estimate of a company's R&D spend, but are highly impressive in any case. The significance of R&D spending on life sciences parks is clear to see – over half of these companies were R&D active spending £1,668m in the last years and £4,010m over the past three years. The average annual R&D spend over the past three years for those that were R&D active was £24m.

The nine other large KI parks had 11% that were R&D active and these spent £1,078m in the last year and £3,034m in the last three years with an annual average spend of £10m for those that were R&D active. The R&D spending across all the business parks averaged £2.4bn pa over the last three years. Official ONS statistics for 2019 estimate business R&D for the whole of the East of England to be £5.4bn.

Table 4.1 Sectoral distribution of companies on business and science parks in the Cambridge City Region

Business Park	No of companies on park	% Life Sciences	% ICT & Telecoms	% Other KI	% Non-KI	2021-22 total employment	% of 21-22 empl in KI cos
Babraham Research Campus	56	96%	0%	4%	0%	1663	100%
Cambridge Biomedical Campus	2	100%	0%	0%	0%	5722	100%
Chesterford Research Park	21	67%	5%	10%	19%	1257	78%
Granta Park	19	68%	5%	11%	16%	4428	100%
Wellcome Genome Campus	7	86%	14%	0%	0%	1359	100%
Buckingway Business Park	28	7%	32%	25%	36%	1071	60%
Cambourne Business Park	55	5%	33%	7%	55%	1944	85%
Cambridge Business Park	90	4%	10%	1%	84%	1563	86%
Cambridge Research Park	17	24%	18%	35%	24%	1647	98%
Cambridge Science Park	208	14%	16%	14%	56%	7337	93%
Harston Mill	7	29%	43%	29%	0%	648	100%
Iconix Park	4	50%	25%	25%	0%	226	100%
St John's Innovation Park	247	11%	32%	13%	44%	3278	84%
Vision Park	211	4%	13%	6%	77%	2060	65%
<i>6 KI focused business parks</i>	<i>334</i>	<i>2%</i>	<i>5%</i>	<i>58%</i>	<i>34%</i>	<i>3,253</i>	<i>77%</i>
<i>17 other business parks</i>	<i>1105</i>	<i>3%</i>	<i>11%</i>	<i>6%</i>	<i>80%</i>	<i>20,066</i>	<i>21%</i>
All 37 Business Parks	2411	9%	13%	15%	63%	57,522	66%

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Table 4.2 Size and growth of companies on business and science parks in the Cambridge City Region

Business Park	No of cos	% KI	Average age	2021-22 total employment	Average number of employees	Unweighted average employment growth last 3 yrs % pa	Weighted average employment growth last 3 yrs % pa
Babraham Research Campus	56	100%	9.3	1663	29.7	10%	10%
Cambridge Biomedical Campus	2	100%	27.0	5722	2861.0	14%	14%
Chesterford Research Park	21	81%	12.2	1257	59.9	29%	24%
Granta Park	19	84%	20.0	4428	233.1	23%	7%
Wellcome Genome Campus	7	100%	11.0	1359	194.1	9%	5%
Buckingway Business Park	28	64%	23.0	1071	38.3	2%	5%
Cambourne Business Park	55	45%	12.0	1944	35.3	7%	4%
Cambridge Business Park	90	16%	8.4	1563	17.4	2%	3%
Cambridge Research Park	17	76%	17.4	1647	96.9	6%	4%
Cambridge Science Park	208	44%	10.5	7337	35.3	11%	10%
Harston Mill	7	100%	16.3	648	92.6	4%	1%
Iconix Park	4	100%	18.3	226	56.5	1%	2%
St John's Innovation Park	247	56%	11.9	3278	13.3	6%	19%
Vision Park	211	23%	10.3	2060	9.8	3%	12%
<i>6 KI focused business parks</i>	<i>334</i>	<i>66%</i>	<i>7.2</i>	<i>3,253</i>	<i>9.7</i>	<i>2%</i>	<i>5%</i>
<i>17 other business parks</i>	<i>1105</i>	<i>20%</i>	<i>13.5</i>	<i>20,066</i>	<i>18.2</i>	<i>4%</i>	<i>3%</i>
All 37 Business Parks	2411	37%	11.8	57,522	23.9	5%	7%

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Table 4.3 Sectoral distribution of companies on business and science parks in the Cambridge City Region

Business Park	No of cos	% KI	2021-22 total employment	% of 21-22 empl in KI cos	Total R&D last year £,000	R&D over last 3yrs £,000	% R&D active over last 3 yrs	Average spend pa of R&D actives £,000
Babraham Research Campus	56	100%	1663	100%	167,401	442,914	54%	4,921
Cambridge Biomedical Campus	2	100%	5722	100%	514,558	1,093,324	100%	182,221
Chesterford Research Park	21	81%	1257	78%	62,195	124,169	48%	4,139
Granta Park	19	84%	4428	100%	860,319	2,157,858	53%	71,929
Wellcome Genome Campus	7	100%	1359	100%	64,322	191,454	43%	21,273
Buckingway Business Park	28	64%	1071	60%	15,547	50,430	18%	3,362
Cambourne Business Park	55	45%	1944	85%	46,970	136,995	15%	5,708
Cambridge Business Park	90	16%	1563	86%	367,559	878,070	4%	73,173
Cambridge Research Park	17	76%	1647	98%	20,301	49,339	35%	2,741
Cambridge Science Park	208	44%	7337	93%	371,731	1,167,805	19%	9,732
Harston Mill	7	100%	648	100%	15,531	41,676	43%	4,631
Iconix Park	4	100%	226	100%	14,251	53,962	50%	8,994
St John's Innovation Park	247	56%	3278	84%	65,291	215,868	9%	3,129
Vision Park	211	23%	2060	65%	161,178	436,911	4%	18,205
<i>6 KI focused business parks</i>	<i>334</i>	<i>66%</i>	<i>3,253</i>	<i>77%</i>	<i>32,199</i>	<i>93,439</i>	<i>5%</i>	<i>1,947</i>
<i>17 other business parks</i>	<i>1105</i>	<i>20%</i>	<i>20,066</i>	<i>21%</i>	<i>35,638</i>	<i>88,224</i>	<i>2%</i>	<i>1,337</i>
All 37 Business Parks	2411	37%	57,522	66%	2,814,990	7,222,437	8%	12,539

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5 Conclusions

Over the years since 2010 the corporate economy of the Cambridge City region has grown considerably. KI sectors have grown strongly each year. The growth of businesses in non-KI sectors has been less strong in the second half of the period but only in 2020-21 did employment decline. Whilst the thirteen sectors examined all showed growth over the period, there is considerable variation across sectors.

Turnover growth showed a similar picture with a greater fall in 2020-21 and an even stronger recovery in 2021-22 than was the case for employment. This was analysed further in the following section.

We examined the impact of the pandemic on a sample of 535 companies with total employment of 54,000. KI companies saw employment growth falling but still positive in 2020-21, but turnover actually fell. Employment recovered in 2021-22 and turnover rebounded in spectacular fashion. Non-KI companies showed a fall in employment followed by some recovery, but had lower swings in turnover growth.

A substantial part of the decline in employment growth per annum over the past five years (from 6.9% in 2011-17 to 3.2% in 2017-22) was associated with changes in the business stock in the region.

An important cause of this was the decline in the contribution to annual employment growth of new business formation (the contribution of which fell from 4.4% in 2011-17 to 2.2% in 2017-22). Our initial analysis suggests that this may be a response to national factors.

Business parks are an important part of the innovative milieu of the Cambridge City region. We examined 37 of the most important parks from amongst the 120 that we identified in the region.

The 2,400 companies on these 37 parks have over 50,000 employees and we identified twenty KI-focused parks that have a dominant influence on innovation in the region.

We estimate that companies on these 37 parks spend an annual average of £2.4bn on R&D. This compares with corporate R&D of £5.4bn for the whole of the East of England as estimated by ONS,

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