



Nottingham Trent
University

Department of Knowledge Exchange

Creative and Digital Industries in Nottingham

A sector analysis of Nottingham and the Creative Quarter

February 2022

Konstantinos Karagounis & Will Rossiter

Critical feedback and comments provided by Dr Lynn Oxborrow significantly improved the quality of this report.

For queries regarding the report please contact konstantinos.karagounis@ntu.ac.uk

The Department for Culture Media and Sports (DCMS) defines Creative Industries and the Digital Sector using the 2007 Standard Industrial Classification (SIC). Some areas of economic activity, such as the publishing of computer games, is classed as both creative and digital, whereas the broader sector might be referred to as Creative and Digital Industries. There is overlap between the DCMS definition of Creative Industries and the Digital Sector, which is referred to herein as Creative & Digital. When referring to the sector more broadly the report will use the term Creative and Digital Industries (CDI). A table is included in the appendix that shows the DCMS classifications.

The DCMS definition of Creative and Digital provides a framework for baselining but is not the only definition of Creative and Digital Industries. With omissions such as manufacture of jewellery and musical instruments, this definition could arguably be augmented and is likely to underrepresent the size and breadth of the Creative and Digital Industries in Nottingham. Notably, fashion design is often classified as wholesale or retail and even fashion designer Paul Smith is excluded from the definition.

Digital and Creative are terms that carry at least three meanings in this context. First, these terms can define enabling technologies that are used by businesses in all sectors, such as the use of CAD in advanced manufacturing. Second they can represent skills that employees bring to a business in any sector. Third, they can define a business's sectoral activity. The DCMS definition used in this report includes only the last of these three meanings. As such, a design and manufacturing company that relies heavily on creative skills and digital technologies may not be captured by the DCMS definition and will not be included in any of the subsequent analysis.

Likewise, there are activities within companies from all sectors that fall under Creative or Digital that will not be captured by the statistics. For example, digital marketing activities within a large bank would not be included in the analysis but arguably contribute to the local specialisation in the labour market. Indeed, it is difficult to imagine many companies that do not make extensive use of digital technologies.

Finally, the analysis uses the primary SIC registered by each company only. All registered businesses select classifications that they believe best describe their activity. They may choose a number of activities but one of these has to be a primary function. Therefore, businesses that have a creative or digital function that they consider to be crucial but is registered as the secondary classification will not be included in the analysis. For instance an instrument maker who defines their primary activity as manufacturing but their secondary classification is artistic creation, will be omitted from the analysis. The decision to omit secondary (or tertiary etc) classifications activity is to simplify the analysis.

Importantly, these limitations to the analysis are likely to lead to a notable underestimation of the size and importance of the sector locally. This is particularly more likely for the Creative industries that are less well defined and in which smaller companies are more prevalent. A deeper and more accurate understanding of the sector locally is possible with further resource and a more focused scope.

Contents

1. Introduction	4
Scope	5
Key findings	5
2. Businesses	6
Growth	6
Business churn rate	7
Top 20 businesses	9
Summary	10
3. Creative Quarter	11
Growth	12
Summary	14
4. Employment	15
National comparison	18
Specialisation	19
Summary	20
5. Gross Value Added	21
Growth	23
Summary	24
6. Conclusion	25
7. Appendix	26
DCMS Creative and Digital sector definitions	26
Sectoral breakdown in Nottingham and the Creative Quarter – 2-digit SIC names	27
ONS Location Quotient Methodology	28

1. Introduction

The Creative and Digital Industries is one of the fastest growing sectors in Nottingham. It is a major employer of high skill jobs that employs 7% of Nottingham's workforce. It is a high-productivity, knowledge-intensive sector that has experienced more GVA growth since 2010 than all other sectors standard industrial sectors in the area with the exception of Information & Communications.

Nottingham is developing a specialisation in the Creative and Digital Industries that is clustered in the Creative Quarter. Employment in the sector since 2015 has grown faster than most major cities including London and GVA growth is second only to London. The drivers behind this growth are the businesses which are at the intersection of the Creative Industries and the Digital Sector such as game developers, animation and video production, broadcasting, marketing agencies and even data analytics.

Cluster policy and cultural quarter initiatives have a long history in the UK and elsewhere. Academic critiques of top-down cluster policy – drawing on evolutionary economic geography – have questioned the feasibility of policy interventions intended to 'create something from nothing'¹. Similarly, others have noted the importance of an embryonic cultural presence upon which policy interventions can build². The Nottingham Creative Quarter is perhaps the best example of an initiative of this kind in the East Midlands – where a range of planning

and business development initiatives have been targeted at a pre-existing cultural presence. Indeed this 'cultural presence' in and around the Lace Market had been noted in Nottingham well before any formal designation of the cultural quarter³.

Both of these perspectives on development path creation (linked to creative quarters) point to the importance of local policymakers working 'with the grain' of the local industrial milieu (Rossiter 2018). Evidence presented in this report of the continuing development of creative and digital businesses in and around the Creative Quarter is suggestive of a local development dynamic that aligns well to the activities of the Creative Quarter Company.

There is further evidence in academic literature which suggests that entrepreneurship and innovation are stimulated where knowledge spillovers occur between related sectors⁴. The intersection of Creative and Digital in Nottingham is setting the conditions in which we might expect knowledge spillovers to take place and which could lead to further growth in entrepreneurship and innovation.

The Creative and Digital Industries show promising potential for Nottingham and its surrounding areas as a driver of innovation, economic renewal, new growth paths, and local and regional productivity growth.

¹ See [Martin & Sunley, 2003](#)

² See [Roodhouse 2010](#)

³ See [Shorthose, 2004](#)

⁴ See [Asheim et al., 2011](#)

Scope

The purpose of this report is to develop an understanding of the size, activity and economic importance of the Creative and Digital Industries in Nottingham. Given the pivotal role of the Creative Quarter Company and its remit for all sectors within its geography, a particular focus is given to the broader industrial composition in the Creative Quarter geography.

The report provides an analysis of the Creative and Digital Industries in Nottingham and the broader industrial composition of the Creative Quarter (CQ). The analysis uses data from official sources such as the Office for National Statistics (ONS) and accesses Companies House data through Fame.

Focus is given to three indicators which provide complementary perspectives.

1. The composition of the CDI business base in Nottingham and the broader industry in the Creative Quarter. This uses Fame data which draws on company registrations from Companies House. The data is available at all spatial scales and is updated on a daily basis.
2. Employment in the CDI in the administrative boundaries of Nottingham City Council as compared to other relevant geographies and other sectors within Nottingham. This uses data from the ONS Business Register and Employment Survey (BRES) which is updated on an annual basis and provides employment estimates by place of work down to local authority level.
3. Regional Gross Value Added (GVA) by industry, which is a measure of sectoral economic impact. This dataset is estimated by the ONS at a

unitary authority level (ITL3) and is used in national statistics. It is updated annually.

Key findings

- **The number of CDI businesses in Nottingham has more than doubled since the start of the millennium from 770 to 2,000 in 2021**
- **One in every five businesses in the CQ is a CDI business making this the largest single sector in the area**
- **The CQ area has experienced high growth in the broader business base, particularly in knowledge intensive sectors**
- **Nottingham has experienced some of the largest CDI employment growth since 2015, outpacing even London**
- **Nottingham has some specialisation in the CDI sector based on location quotients**
- **The CDI sector GVA is estimated to be around £1.2bn, accounting for 11% of Nottingham's total GVA.**
- **GVA in the CDI sector has grown more than all major UK cities since 2010 apart for London.**
- **CDI GVA in Nottingham has grown 4.5 times more than the average industry growth in Nottingham since 2010**

2. Businesses

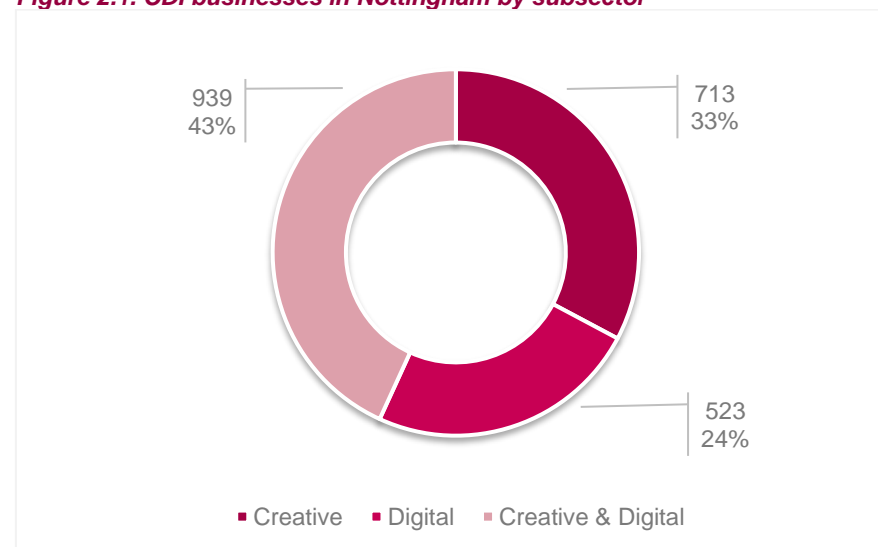
There are approximately 2,175 active CDI businesses in Nottingham based in February 2022 Fame data. The majority of these businesses (43%) fall within the Creative & Digital sector, a third are Creative and almost a quarter are Digital (see Figure 2.1). The type of activity of these businesses varies enormously. Creative businesses in Nottingham include architects, publishers, advertisers, art centres, and photographers, to name but a few. Digital businesses range from fintech, software developers and technology consultants to hardware manufacturers and telecommunication services. Creative & Digital companies in Nottingham include game developers, animation and video production, broadcasting, data analytics, and marketing agencies. A full list of SIC names in each CDI subsector is provided in the appendix. A more granular breakdown of the sectoral composition at 2-digit SIC level is also provided in the appendix.

Growth

While the creation and dissolution of businesses varies considerably in the short term, the overall pattern for Nottingham is one of growth. Figure 2.2 shows the growth in the number of new CDI businesses in Nottingham over time. The data include all business births in each corresponding year minus all business deaths. Where a business has become inactive or has dissolved it is not counted in subsequent years. Therefore, the chart shows the net cumulative active businesses by year of incorporation/dissolution and provides a composite view of new business births and survival rates. As the

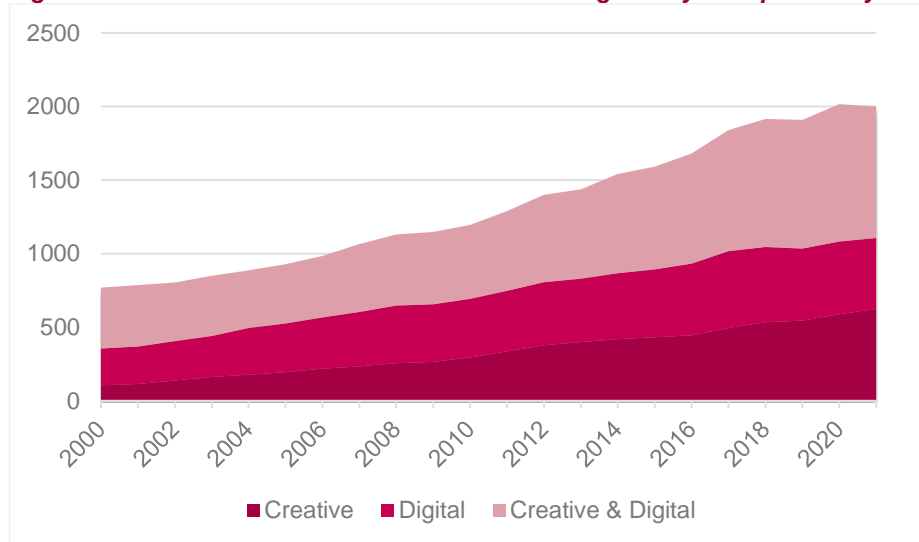
business counts are represented in years, they only go up to the end of 2021.

Figure 2.1. CDI businesses in Nottingham by subsector



The number of CDI businesses in Nottingham has more than doubled since the start of the millennium from 770 to 2,000 in 2021. The net number of Creative businesses has increased by almost five times (492%) from an estimated 105 in 2000 to 622 in 2021. Digital businesses have increased in number by 94% to 484, whereas the number of Creative & Digital businesses has increased by 114% to 890.

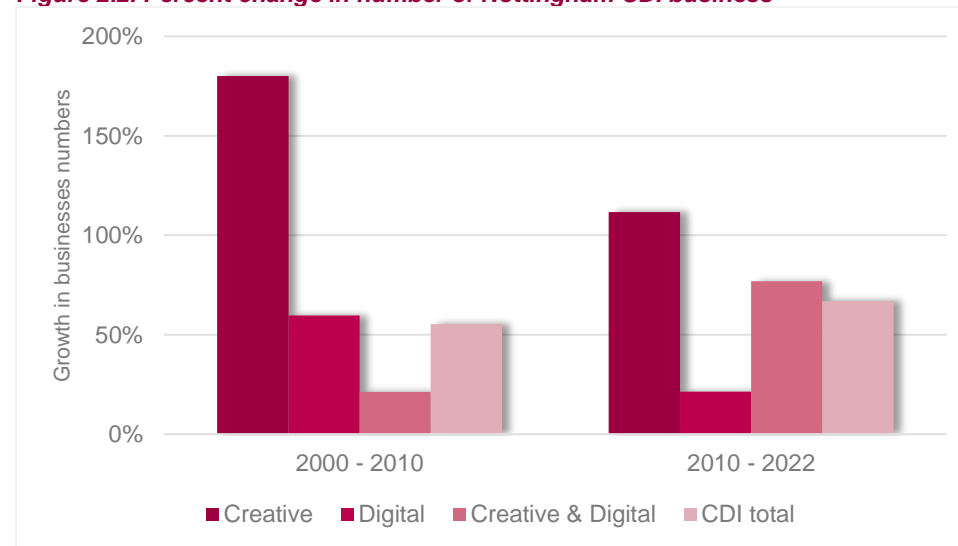
Figure 2.1. Net cumulative CDI businesses in Nottingham by incorporation year



It is not possible to establish an incontrovertible causal link between the economic development activity of major actors and the growth in CDI businesses. However, the relationship between CDI growth and a concerted local effort backed by the establishment of the Creative Quarter Company is supported in the data. Figure 2.3 shows that the growth rate in CDI businesses increases in the second half of the time period and is driven primarily by growth in the number of Creative & Digital businesses. Digital businesses as well as creative grew at a lower rate after 2010 than they did prior to 2010. However, overall CDI businesses grew in number by 67% between 2010 and 2022 compared with 55% in the preceding decade (see Figure 2.3). The sector saw no growth between 2020 and 2022, which is likely due to

the uncertainty surrounding the pandemic and national lockdown measures.

Figure 2.2. Percent change in number of Nottingham CDI business



Business churn rate

New businesses are created all the time and CDI businesses in Nottingham are being established at an increasing rate. At the same time a number of businesses are dissolved. The rate at which these events take place provides a gauge of the health of an economy. A high business survival rate is sometimes seen as a sign of a strong business base. While this might be true in some cases, it is certainly not valid when the surviving business are uncompetitive and unproductive. As new businesses enter an economy, the least productive businesses tend to be outcompeted in a process of

creative destruction. The rate at which this process takes place is known as the churn rate and a higher rate can be a signal of growing competitiveness and productivity in an economy⁵.

Table 2.1. Birth rates, death rates and churn rates in Nottingham's CDI businesses, 2021

	Creative	Digital	Creative & Digital	CDI total
Birth rate	17%	12%	12%	14%
Death rate	11%	14%	17%	15%
Churn rate	29%	26%	29%	28%

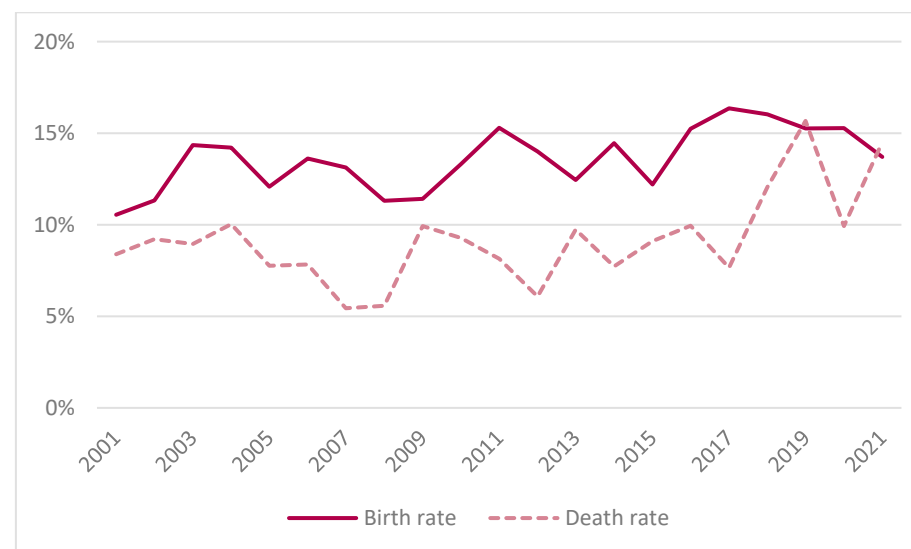
The churn rate is calculated by summing the percentage of business births and business deaths in a sector. The churn rate of Nottingham's CDI businesses in 2021 is provided in Table 2.1. In 2021 the CDI sector saw a churn rate of 28%, which was driven slightly more by deaths than it was by births. This is likely due in part to the effects of the pandemic and the national lockdowns. For comparison, in 2017 the OECD⁶ estimated the churn rate for businesses in all sectors in Great Britain to be 25%. This was the third highest churn rate out of the 29 OECD countries in the analysis.

Naturally, these rates show considerable volatility over time and are sensitive to economic events and policies. As a result, a one year snapshot of Nottingham's CDI businesses does not offer much insight. This volatility is evident in Figure 2.4 which shows birth and death rates for Nottingham CDI businesses over the last two decades. The data show a slight increasing trend in both rates with the death rate

⁵ [OECD, Entrepreneurship at a Glance, 2017](#)

overtaking the birth rate for the first time in 2019 and then again in 2021. This chart also illustrates that business creation has been increasing relative to the size of the business base in the last 20 years. This is also true for business dissolutions. Viewed together in the context of churn, these two rates show signs of a dynamic landscape with increasing business competitiveness. Despite the distortive effects of the pandemic, this may also be a signal of a sector that is becoming more productive. In turn, this can lead to higher value jobs and higher standards of living.

Figure 2.3. Business birth and death rates since 2001



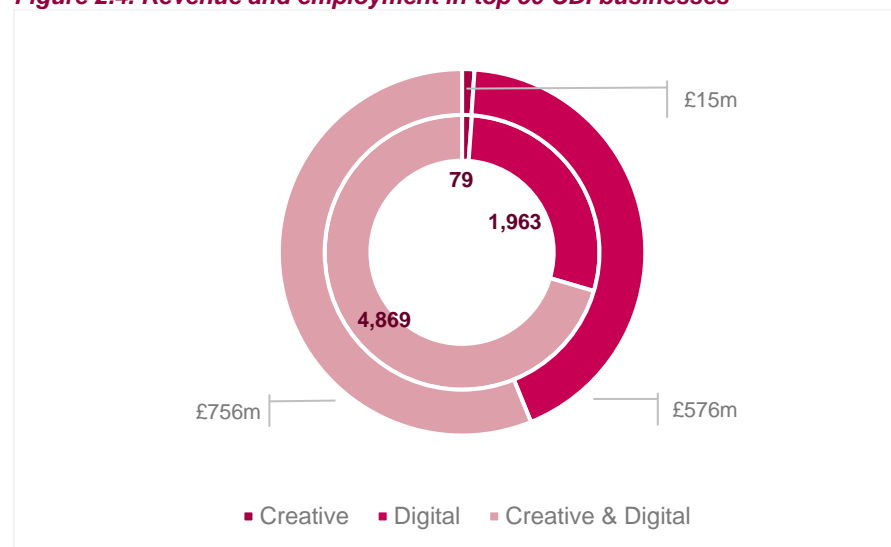
⁶ *ibid*

Top 20 businesses

The 20 largest CDI businesses by revenue with a registered address in Nottingham account for only 1% of the local business population but have a combined operating revenue of approximately £1.3bn based on their latest accounts. These businesses employ just under 7,000 staff, which, as will be shown further on in the report, accounts for more than half of the CDI workforce. The breakdown by CDI subsector provided in Figure 2.5 shows that the top 20 Creative businesses account for only a small fraction of the wider sector's revenue (outer circle) and employment (inner circle). The Creative & Digital subsector accounts for the majority of CDI revenue and employment.

While the top 20 businesses only form a small proportion of the total sector, they account for a large part of CDI revenue and employment. Of these businesses, 1 is Creative, 11 are Digital and a further 8 are Creative & Digital. Therefore, the average revenue per top 20 business is approximately £52m in the Digital and £95m in the Creative & Digital subsector. In other words, Digital & Creative businesses are considerably larger than Digital businesses. Although this provides some insight into the composition of the sector, it is important to note that, at this scale, a few high performers can distort the broader picture. The top three companies account for almost 70% of the total revenue in the top 20 and half the employment. Removing these three companies from the calculations reduces the average revenue per top 20 Digital company to about £22m and about £29m for the average Creative & Digital company.

Figure 2.4. Revenue and employment in top 50 CDI businesses



Not all economic activity is recorded in these datasets. There are a further 141 unincorporated businesses that are not included in the analysis. The datasets also miss out most freelancers and sole traders. Large numbers of freelancers and sole traders are especially likely in the Creative industries. Therefore these figures are likely to

underestimate the true size of the sector – a topic that has been covered well in other studies and reports⁷.

Summary

Since 2010, there has been a more concerted effort to support the growth of CDI businesses. The subsequent establishment of the Creative Quarter Company and the important role played by institutions like NTU, Confetti and Nottingham City Council are factors that have undoubtedly stimulated growth in the sector. Agglomeration effects are likely to have amplified this, leading to an increase in economic importance for a sector that, as explained in later sections, is beginning to define the local economy.

In summary, the CDI business base in Nottingham comprises primarily Creative & Digital businesses, which has grown in size by 114% in the last 22 years. While this growth has followed wider trends in digitalisation the number of businesses in all CDI sectors has increased in the last 20 years and the CDI sector as a whole has more than doubled in size since 2000. This growth is more pronounced in the period after 2010 when a local concerted effort led to the establishment of the Creative Quarter Company.

The sector shows signs of high competitiveness with a churn rate in line with the Great Britain average. The business birth rate has a slight uptrend in the 20 years between 2001 and 2021 but the pandemic has

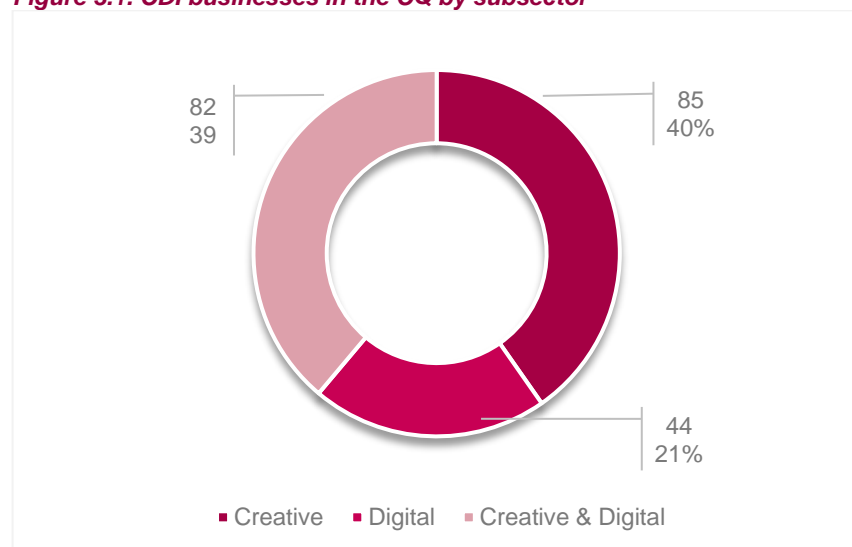
coincided with and possibly caused the death rate to surpass the birth rate for the first time in at least two decades.

Finally, the largest CDI businesses by turnover in Nottingham are found mostly in the Digital and the Creative & Digital sector. The top 50 businesses reporting turnover show a combined revenue of £1.4bn and employ an estimated 7,500 staff.

⁷ See Oxborough, Elijah and Lawton. Creative & Digital D2N2: Strategic action plan for the creative and digital industries in D2N2

3. Creative Quarter

Figure 3.1. CDI businesses in the CQ by subsector

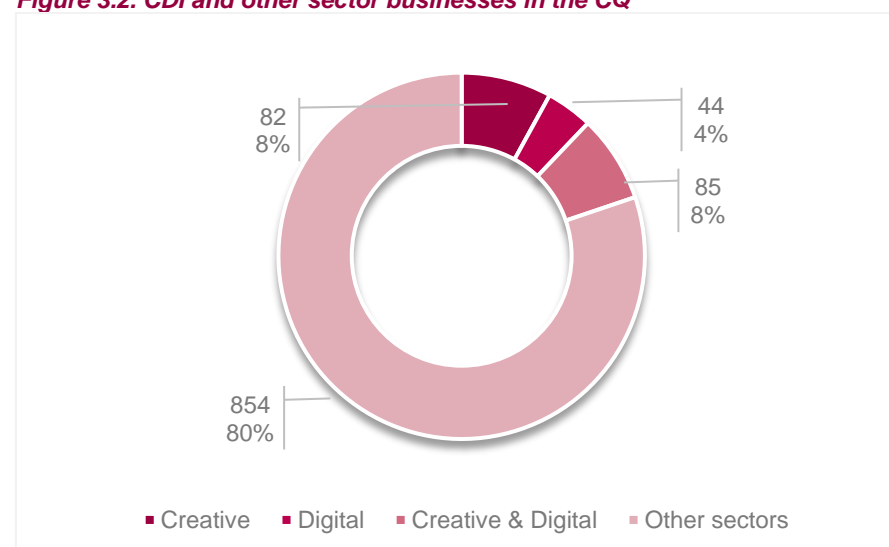


The Creative Quarter (CQ) covers an area on the east side of Nottingham city centre characterised by creative businesses and a thriving hospitality sector. Within this geography, the Creative Quarter Company’s remit extends to businesses within all sectors.

There are an estimated 1,065 businesses in the CQ and the vast majority fall outside of the CDI definition. CDI businesses in the CQ total 211 as at the beginning of 2022.

Creative businesses and Creative & Digital businesses form the bulk of the sector in the CQ with almost 80% of the total. As shown in Figure 3.1, Digital businesses form the smallest proportion at 21%.

Figure 3.2. CDI and other sector businesses in the CQ

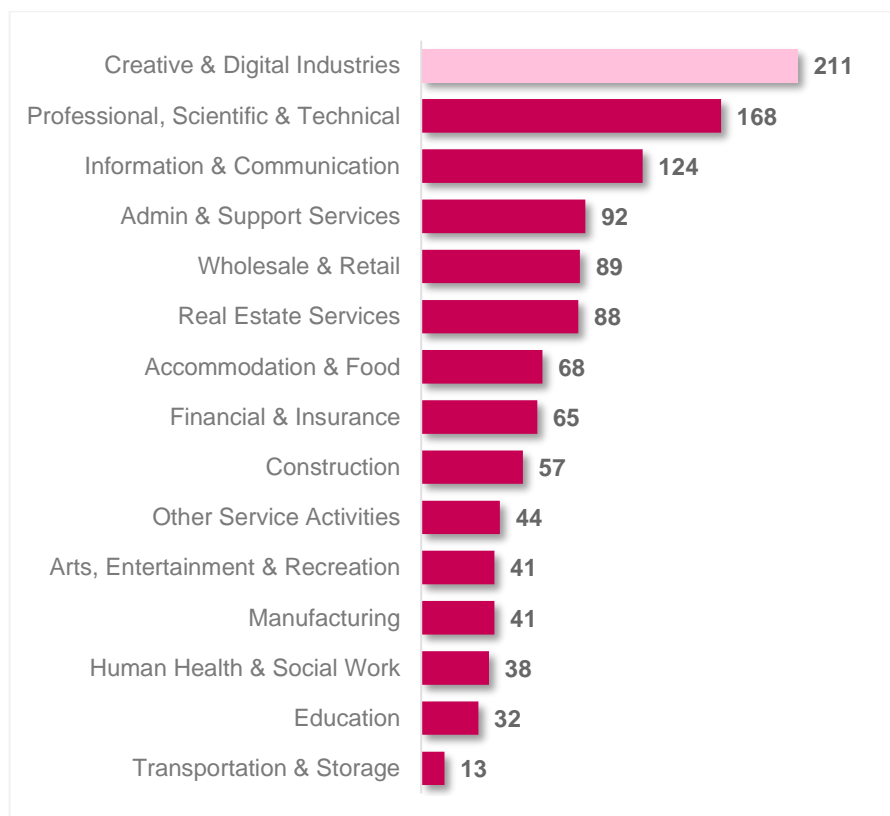


Unlike the wider Nottingham area, Creative businesses make up a considerable portion of the local business base, indicating that the CQ has a degree of specialisation in the Creative industries.

A view of the wider sector shows that **one in every five businesses in the CQ is a CDI business**, making this the largest single sector in the area (see Figure 3.2). This is further illustrated in Figure 3.3, which shows the number of businesses in each of the SIC Broad Industry Groups. It should be noted that the CDI definition used in this report is a cross section of these Broad Industry Groups and is included in the chart for comparison only. All the businesses represented in the CDI

definition will feature under one or other of the Broad Industry Groups and other cross sections could plausibly represent even higher proportions than the CDI.

Figure 3.3. Number of businesses in the CQ by sector



The sectoral breakdown highlights that the CQ is home to a large number of knowledge-intensive businesses with 292 businesses in the

Professional, Scientific & Technical and Information and Communication industries alone. The variety of other sectors and the presence of businesses in Retail and Accommodation & Food is representative of a thriving centre.

Relative to the Broad Industry Groups, CDI is the largest sector in the CQ. The large cluster of these businesses in a relatively small spatial scale indicates a high degree of specialisation in the Creative and Digital Industries.

Growth

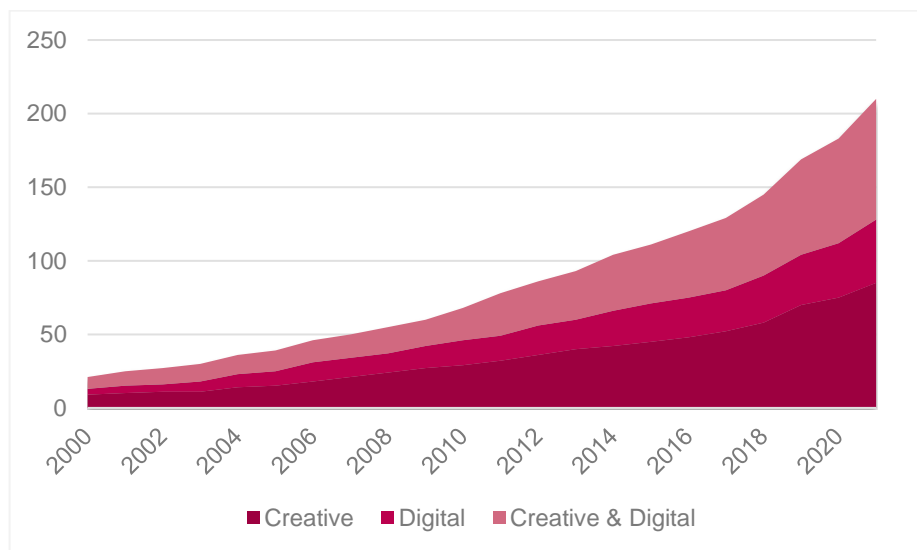
CDI businesses in the CQ follow a similar growth pattern to the wider Nottingham area but, unlike the wider area, growth in the number of businesses in the CQ area has been much more pronounced. Given the small number of businesses to start with, growth will likely appear more pronounced. Therefore, where growth is highlighted in this section it should be treated with caution. As shown in Figure 3.4, the sector has grown from 21 CDI businesses in 2000 to 211 in 2022, marking a total increase of 905%.

The number of Creative businesses in the CQ area increased since 2000, totalling 85 in 2022. Digital businesses increased to 44 in 2022 and Creative & Digital businesses increased to 82 businesses.

Compared to the four largest Broad Industry Groups, CDI businesses followed the trend despite growing by an impressive amount. Figure 3.5 shows the fastest growing sectors as defined by the Broad Industry Groups. Professional, Scientific & Technical businesses have increased 1,100% since 2000 whereas the number of businesses in

Information & Communication has increased by 933%. **The CQ area has experienced high growth in the broader business base, particularly in knowledge intensive sectors** as well as in retail and business support services. While there is evidently a large cluster of CDI businesses in the area, the growth seen by this sector is in line with a wider trend of strong growth across all businesses in the CQ.

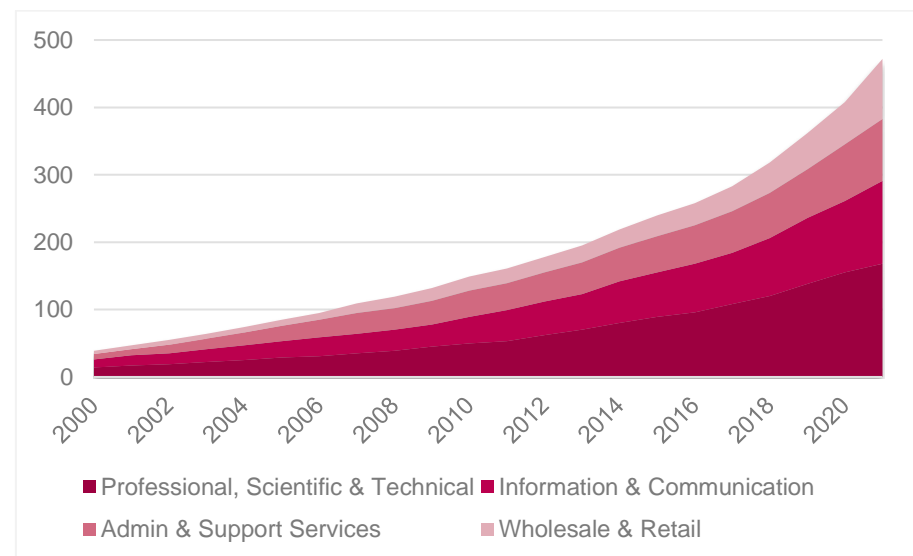
Figure 3.4. Net cumulative CDI businesses in the CQ by date of incorporation



The Creative Quarter comprise approximately 1,000 businesses from a variety of sectors. The majority of these businesses fall outside of the CDI definition but the sector accounts for one fifth of the business base – indicating a cluster of CDI businesses in the area. When

segmented into sectors using Broad Industry Groups, the largest sector, Professional, Scientific and Technical services, accounts for 16% of the total business base. The Creative Quarter has a high prevalence of businesses in the knowledge intensive sectors.

Figure 3.5. Net cumulative businesses in the CQ by date of incorporation (all sectors)



The CDI sector consists of equal parts Creative and Creative & Digital businesses with 44 of the 221 CDI businesses in the Digital sector. Since 2000, the number of businesses in knowledge intensive sectors has grown rapidly, indicating that the Creative Quarter is a source of growth in Nottingham’s knowledge economy.

Summary

The Creative Quarter has a notable number of CDI businesses that has grown considerably in the past 22 years. CDI businesses form the largest sector in the area with one in five operating in the creative and digital space. The area contains a large amount of businesses from other sectors which have also grown in number. The size and growth of knowledge intensive industries like Professional, Technical & Scientific as well as Information and Communication is particularly noteworthy.

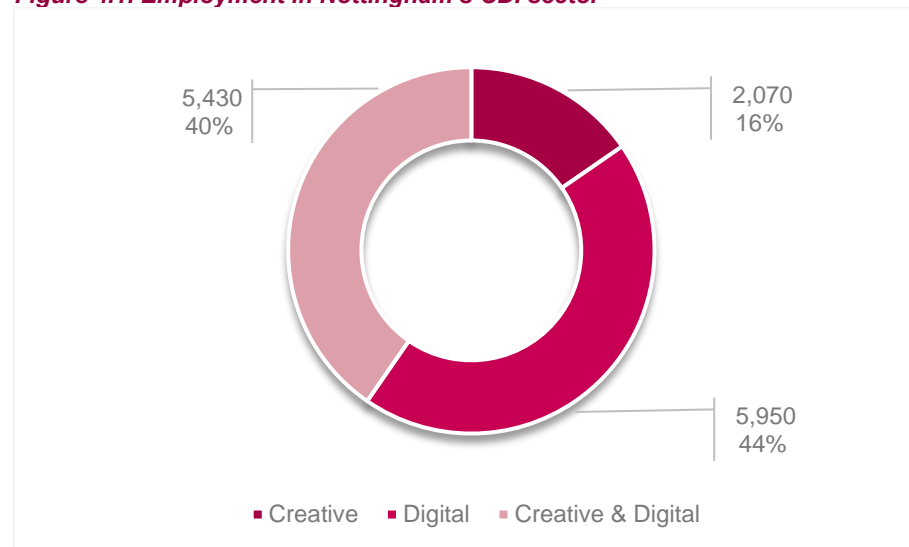
4. Employment

This section uses the latest available ONS Business Register and Employment Survey (BRES) data, which covers the period 2015 to 2020. The data are captured through surveys and provide the most accurate estimate of employment by industry at a local authority level. As a business survey it provides estimates on the number of employees in Nottingham and not residents. It is expected that many of these employees will come from the wider Travel-To-Work-Area.

Nottingham CDI businesses are estimated to employ a total of 13,450 staff, which is about 7% of Nottingham's workforce. The majority are employed in Digital businesses, which accounts for 44% of the total. Creative businesses employ just over 2,000 staff which accounts for 16% of the CDI total (see Figure 4.1). Creative & Digital, which show the biggest growth since 2000 in terms of business numbers, are estimated to employ 5,430 people based on the latest survey.

The number of employees in each subsector is an indicator of sectoral impact and economic activity. However, it is not an ideal gauge of the local sector size, particularly since a small number of large employers can employ a very large number of staff. Given the absence of large employers in Nottingham's Creative subsector, it is unsurprising that Creative businesses employ a smaller proportion of the total. It can be inferred from this that the Creative sector consists of many small employers – this is likely to be reflective of the national picture also.

Figure 4.1. Employment in Nottingham's CDI sector



Compared to the standardised Broad Industry Groups, the CDI sector is the 6th largest employer as illustrated in Figure 4.2. Labour intensive sectors like health and social care and education employ more than double that of the CDI sector. However, CDI employment accounts for a significant 7% of total employment in Nottingham.

Figure 4.2. Employment in Nottingham's Broad Industry Groups

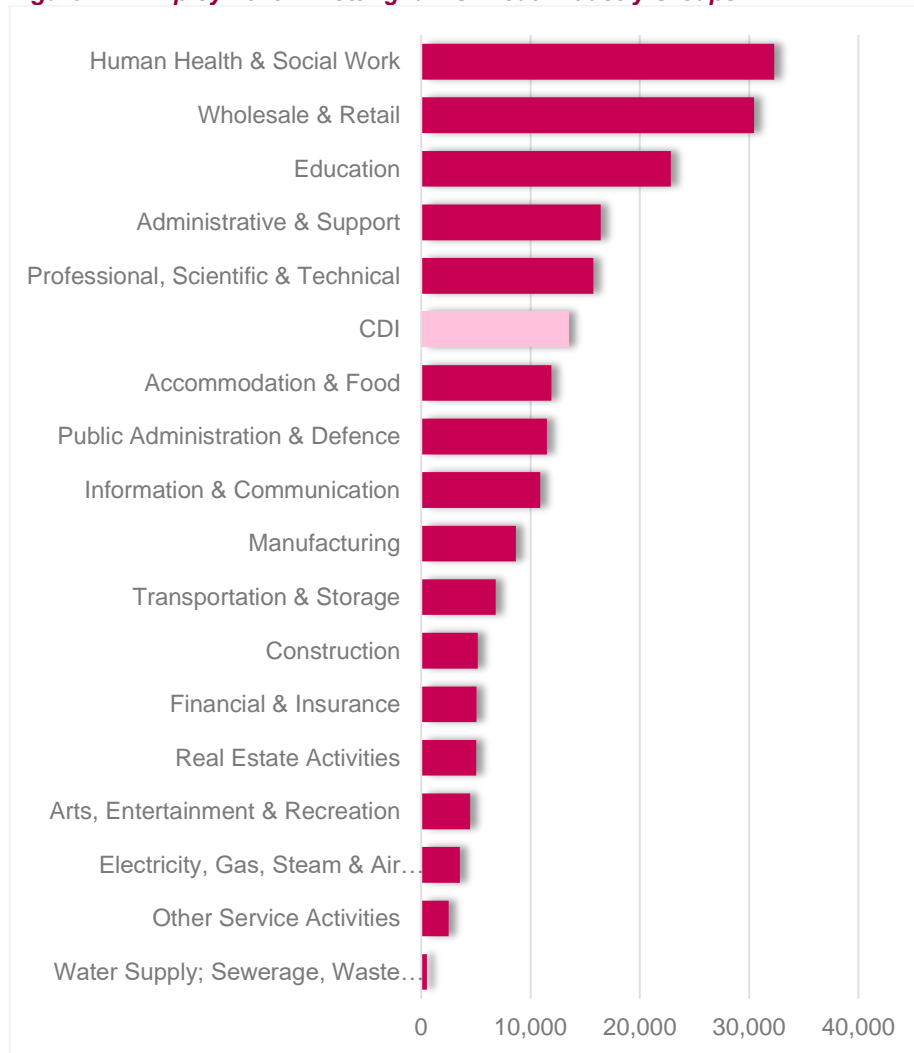
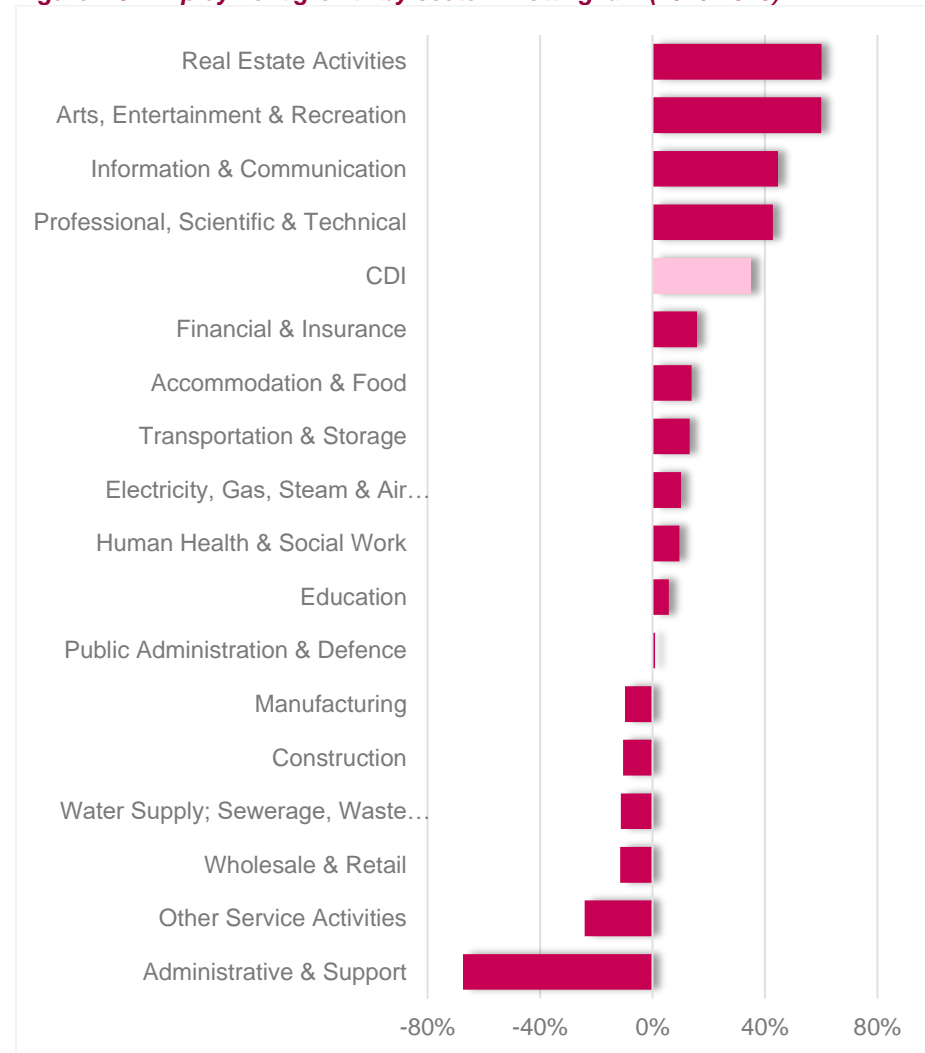


Figure 4.3. Employment growth by sector - Nottingham (2015-2020)



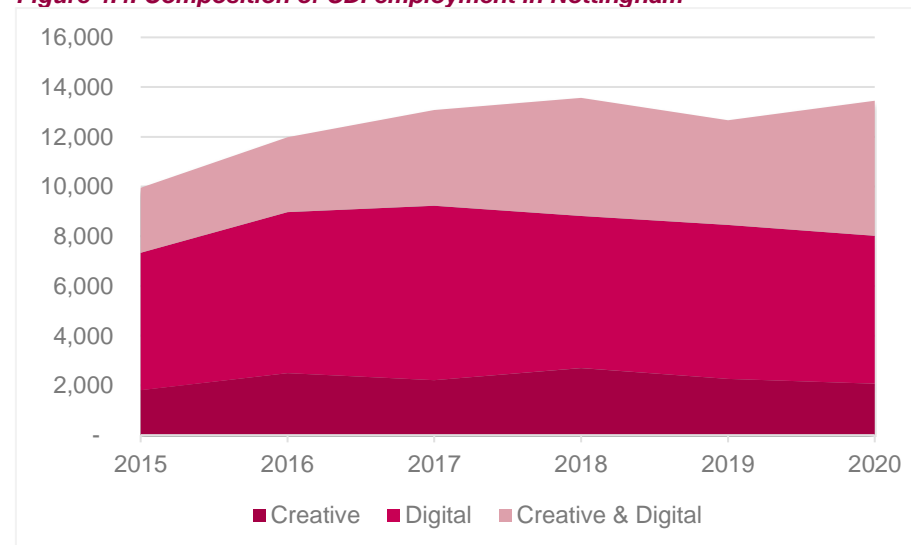
Over time this picture shows more nuance as employment growth in smaller sectors outpaces many of the larger sectors. Figure 4.3 shows employment growth between 2015 and 2020 for all major sectors as compared to the CDI sector. The four largest sectors outlined in Figure 4.3 show little or even negative employment growth in the 5 years to 2020. Employment growth in Administrative & Support Services has declined by 67% whereas in the CDI sector, which already ranks high, employment has grown by 35%. This is not entirely surprising as technological advances have at the same time increased automation of business support services and created higher demand for more skilled workers in Digital or similar sectors. This is partially evident in Figure 4.3 which shows that some of the highest growth is taking place in high value, knowledge intensive sectors.

Employment growth in the CDI sector masks some variation in the growth of its subsectors. Figure 4.4 provides a breakdown of the sector's employment growth by subsector. Overall employment growth follows an increasing trend but shows signs of a plateau.

Despite forming the largest share of total employment, the Digital sector has grown the least since 2015, by 7.6%. The Creative sector has seen employment growth of 14.7% since 2015 and remains a relatively small employer. The Creative & Digital sector, on the other hand, has grown by 107% since 2015 and has contributed most to total CDI employment growth. It is unclear whether this growth is the result of new businesses starts or growth in existing ones. Given the

evidence presented in the previous section, it is likely that the growth is due to a combination of both factors.

Figure 4.4. Composition of CDI employment in Nottingham



A 2015 study by the UK Commission for Employment and Skills⁸ maintains that the digital and creative sector is orientated towards high-skilled, high-productivity roles – this is reflected in higher than average wages in the sector. The report also finds that graduates make up a large share of the CDI workforce.

⁸ UKCES 2015. [Sector insights: skills and performance challenges in the digital and creative sector](#)

The sector is growing rapidly and technological advances are driving further demand for high-skilled and graduate roles. The current and future growth of this sector could have a large positive impact on Nottingham's productivity growth and future attractiveness to graduates as well as the wider Travel-To-Work-Area.

National comparison

The CDI sector has experienced rapid growth in the past 20 years, spurred on primarily by a maturing Digital sector – one of the fastest growing sectors in the world. This might indicate that the rapid employment growth experienced in Nottingham since 2015 may not be entirely unique. However, when compared to other major cities in the country it is evident that **Nottingham has experienced some of the largest CDI employment growth, outpacing even London.**

Table 4.1 lists the number of employees in the UK's major cities⁹ by CDI subsector. Nottingham has the second smallest sector, after Liverpool, measuring about half that of Birmingham's. While there is some variation in the relative sizes of the subsectors, Nottingham still has one of the smallest employment populations across all. This is expected given Nottingham's population. The last column, which takes this into account, shows that total CDI employment per capita is slightly above average when removing London's distortive effect.

Table 4.1. Employment numbers in major cities by CDI sector

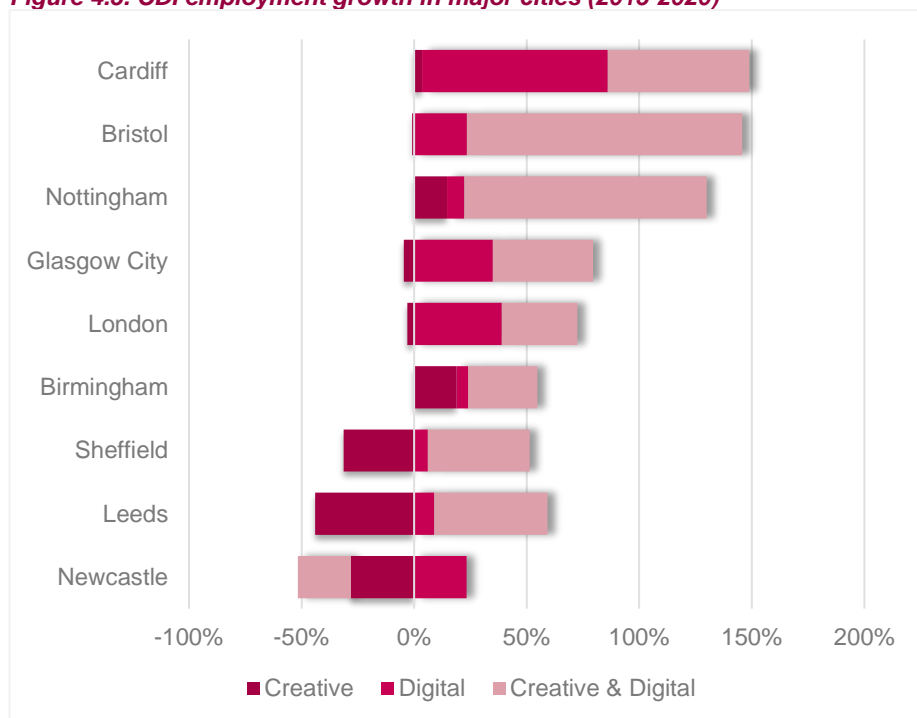
City	Creative	Digital	Creative & Digital	Total CDI	Per capita
Birmingham	8,775	8,285	9,760	26,820	0.02
Bristol	4,940	5,005	14,940	24,885	0.05
Cardiff	3,875	4,855	5,275	14,005	0.04
Glasgow	6,880	8,165	14,805	29,850	0.05
Leeds	6,120	8,590	15,505	30,215	0.04
Liverpool	3,345	3,370	4,105	10,820	0.02
London	37,860	35,385	66,215	139,460	0.48
Manchester	9,910	9,035	12,425	31,370	0.06
Newcastle	3,235	9,400	6,500	19,135	0.03
Nottingham	2,070	5,950	5,430	13,450	0.04
Sheffield	2,900	5,960	4,890	13,750	0.02

Nottingham's employment growth in the CDI sector since 2015 indicates that it is still catching up with some of the bigger cities. This is illustrated in Figure 4.5, which ranks the cities according to their growth in CDI employment between 2015 and 2020. CDI employment in Nottingham has grown more than in any other city with the exception of Cardiff and Bristol – outpacing even London. The segments of the bar chart show growth in the CDI subsectors and it is evident that Creative & Digital is the primary driver of the sector's

⁹ Belfast is a core UK city that has been excluded due to data incompatibility. For consistency with the GVA regions in the following section, London includes the City of London and Camden whereas Newcastle includes North and South Tyneside.

employment growth across the country. Cardiff, London and Newcastle all experienced most growth in their Digital sectors.

Figure 4.5. CDI employment growth in major cities (2015-2020)



From this comparative point of view, it is evident that Nottingham is developing at a greater rate than many other cities.

- Nottingham along with Birmingham are the only two cities to experience notable growth in the Creative sector.

- Nottingham has experienced one of the largest increases in Creative & Digital employment growth – second only to Bristol.
- Nottingham is one of three cities not to experience negative growth in any sector.

Specialisation

Measures such as employment growth and per capita employment allude to a specialist CDI cluster in Nottingham but are not evidence of this. For a measure of specialisation we use location quotients as defined by the ONS (see appendix).

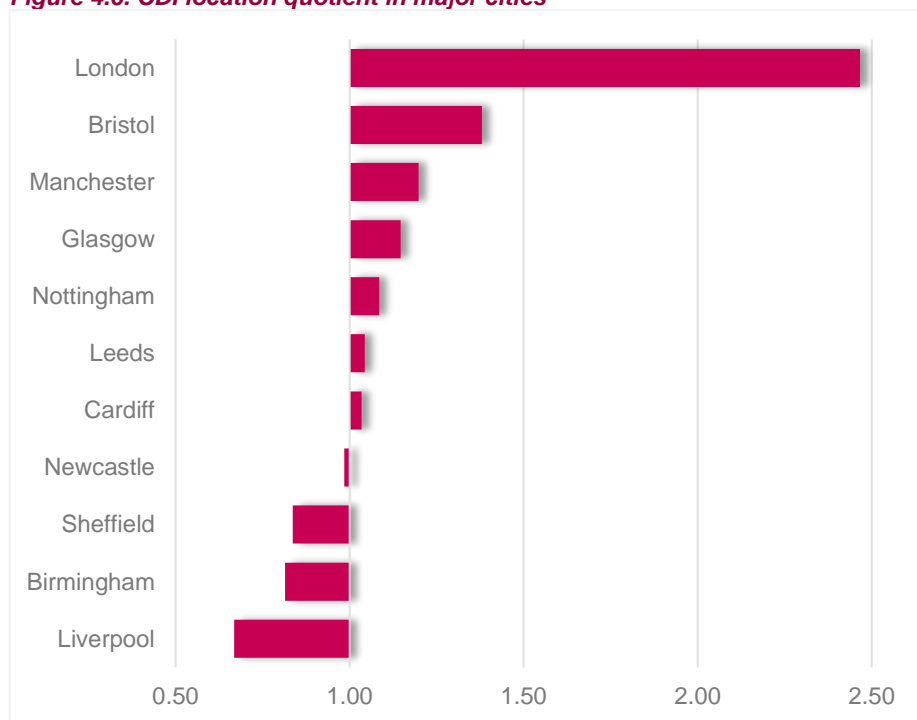
Location quotients are a measure of industrial specialisation as compared with the rest of the country. The ONS already provides for the SIC-based Broad Industry Groups and shows Nottingham to specialise in two sectors based on 2015 BRES data (LQ values in brackets)

- Electricity, gas, steam and air conditioning supply (3.6)
- Administrative and support service activities (2.7)
- Public administration and defence (1.2)
- Education (1.1)

That is, Nottingham has a larger concentration of employment in these sectors than the UK average. This relative concentration of employee jobs is assigned a numerical value. Where a place has a value higher than 1 it has a higher concentration of employee jobs in that specific sector than the rest of the country. A value of 1 indicates it is on par with the rest of the country and a value below 1 indicates a lower

concentration than the rest of the country. In other words, the location quotient provides a measure of specialisation in a sector.

Figure 4.6. CDI location quotient in major cities



The location quotient for the CDI sector is calculated specifically for this report and is presented in Figure 4.6. **Nottingham shows a degree of specialisation in the CDI sector, equal to its specialisation in Education.** In fact, while Nottingham was compared to Birmingham and Cardiff in terms of employment growth, it has a higher degree of specialisation than both.

Summary

In summary, employment in Nottingham's CDI sector has grown since 2015 and in 2020 it is comparable in size to the Professional, Technical & Scientific sector and the Accommodation & Food sector. Growth has been positive and has outpaced the growth in many of the UK's major cities including London. Growth in the sector is driven primarily by the Creative & Digital sector, while the Creative sector has also grown and the Digital sector forms the largest share of employment. Although Nottingham has a small CDI employment sector relative to other major cities, it has an average proportion when taken on a per capita basis. Importantly, Nottingham has a degree of industrial specialisation in the CDI sector which places it amongst cities like Manchester, Bristol and Glasgow.

Taken together, these factors show signs of a nascent but burgeoning CDI sector that is likely to be attracting high-value, high-productivity, knowledge-intensive jobs to Nottingham. If growth in this sector can be sustained, Nottingham can grow its knowledge economy, retain a higher proportion of graduates and attract new talent from other, traditionally more competitive parts of the country.

5. Gross Value Added

Methodological note

GVA is a measure of output that is widely used as a gauge of regional economic performance. Data for this measure are provided by the ONS at various degrees of regional and industrial disaggregation.

The dataset used in this analysis does not offer the industrial disaggregation required to construct the precise definition of the CDI sector as defined by the DCMS. Where GVA data covers wider sector classifications than those needed for CDI definitions, an estimate is provided instead. Estimates rely on an apportionment based on the number of 4-digit SIC sectors contained within the GVA classifications. Where non-CDI sectors are included in the GVA classifications, they are removed by assuming that each one of them contributes equally to that group's GVA.

As an example, GVA estimates use the 2-digit SIC code 74 (Other professional, scientific and technical activities) which consists of four 4-digit codes, one of which (7430: translation and interpretation activities) does not form part of the CDI definition. Therefore only $\frac{3}{4}$ of the GVA is used in the approximation.

In some cases this may lead to slight overestimation of GVA and in others an underestimation. While this method may not accurately reflect the GVA values to a precise point, it provides a reasonable approximation that can be subjected to sensitivity testing. Users of this report are therefore advised to treat the figures in this section as approximations.

Nottingham's total industry GVA in 2019 was £10.3bn (the latest available estimate). Figure 5.1 ranks Nottingham's Broad Industry Groups by their GVA in 2019. The two largest sectors by some distance are the Wholesale & Retail and the Human Health & Social Work sectors, with a GVA of approximately £1.3bn each. Together, these two sectors account for over a quarter of Nottingham's total GVA. Comparatively, the CDI sector is the third largest by GVA. CDI is a cross-cutting sector and is not one of the Broad Industry Groups. However, it is included in Figure 5.1 for comparative purposes. **The GVA of the CDI sector in Nottingham is estimated to be around £1.2bn, accounting for 11% of the total.** The CDI sector in 2019 was larger than the Manufacturing, Construction and Accommodation & Food sectors combined.

The CDI sector has grown considerably over time. Growth helps provide an understanding of a sector's longer-term trajectory. In this case, the largest GVA growth has been in the Information & Communications sector, which has almost doubled in value in 9 years. Compared with all of Nottingham's sectors, **the CDI sector has seen the second highest growth in GVA since 2010** (see Figure 5.2). In fact, Nottingham's total industry GVA has increased by 18% since 2010 and **the CDI sector has outperformed this average by 4.5 times.** Undoubtedly, this will mask some variation in the CDI subsectors. However, given the method used to measure GVA, a more granular sectoral breakdown will be subject to greater inaccuracies. As such, no subsector breakdown is provided in this section.

Figure 5.1. GVA by sector (Broad Industry Group – CDI comparison)



Figure 5.2. GVA growth by sector in Nottingham (2010-2019)

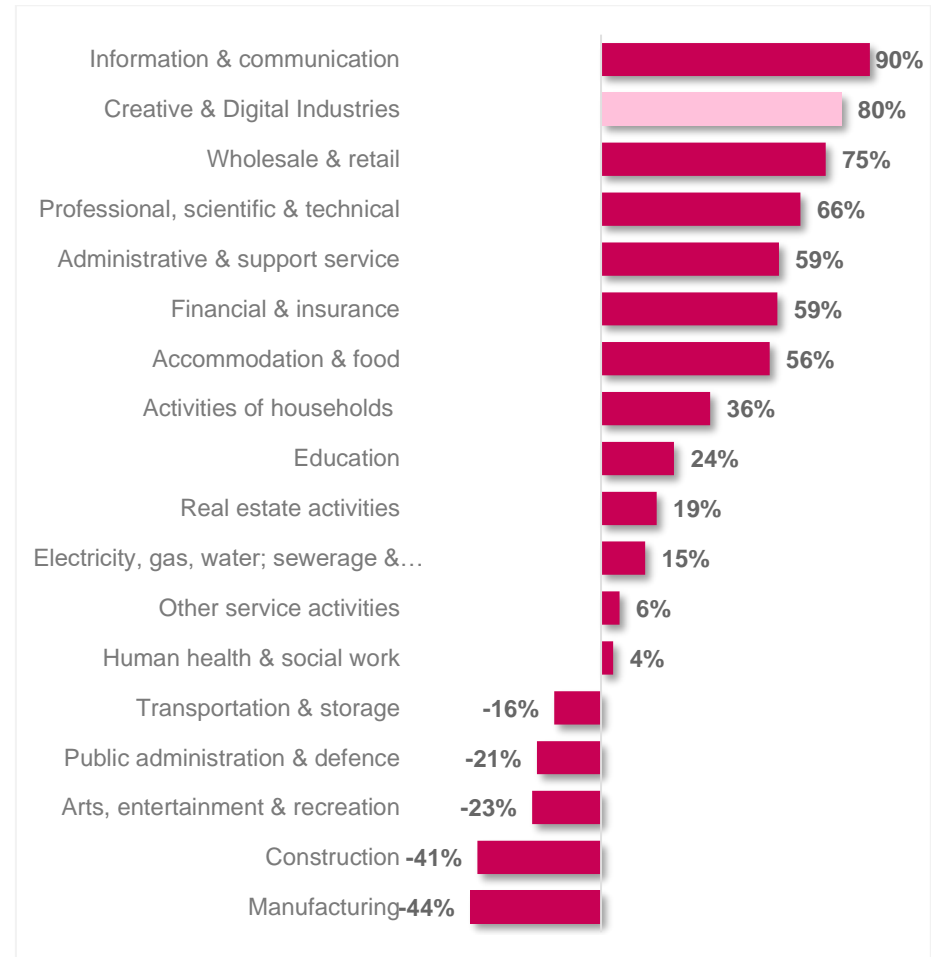
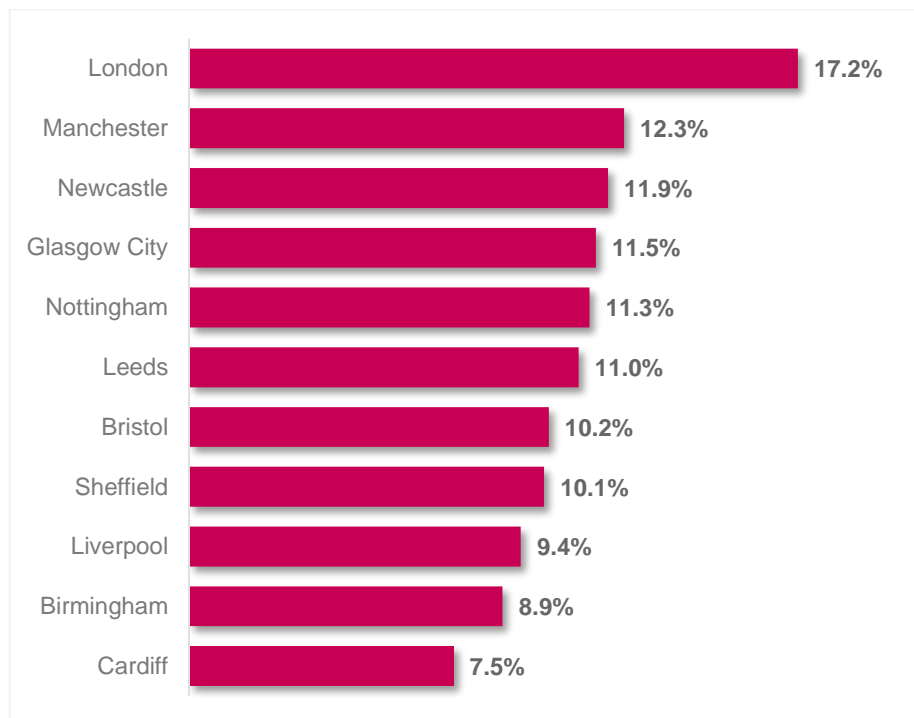


Figure 5. GVA as percent of total industry GVA by major city (2019)

The CDI sector includes many new, innovative and emerging industries and it is not surprising that the sector accounts for a large portion of GVA. Nor is it surprising that the sector has grown considerably since 2010. In fact, CDI businesses are a source of GVA

growth across most other major cities. As illustrated in Figure 5.3, London, Manchester, Glasgow and Newcastle¹⁰ all have larger CDI sectors relative to their total industry GVA than Nottingham (see Figure 5.3).

London can also create horizontal and vertical knowledge spillovers for those with close links to the capital. That is, businesses working with or within the supply chain of other well-established businesses benefit from best practice, knowhow and other technical knowledge. It is widely agreed amongst economists that this can lead to productivity growth and increased innovation in businesses.

Growth

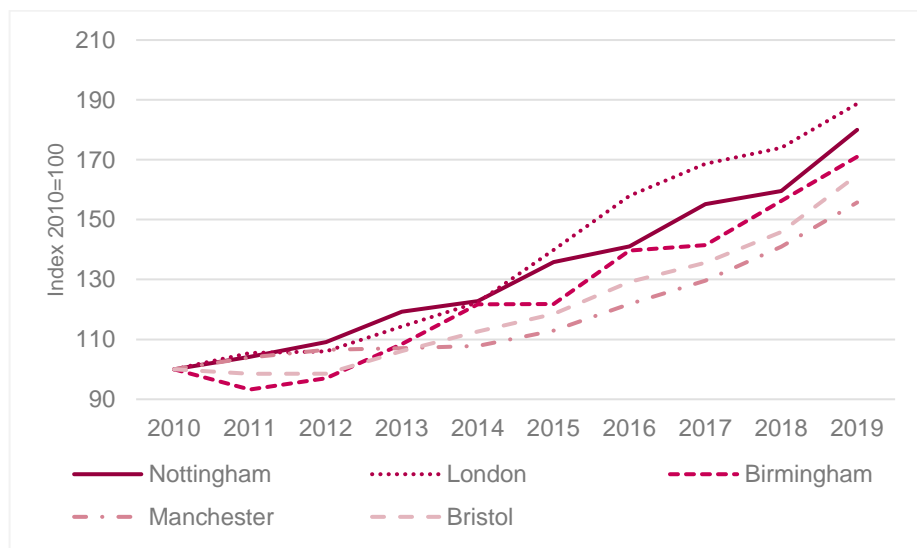
Since 2010, London and Nottingham have experienced the highest growth rate in CDI GVA. Figure 5.4 shows GVA growth in the CDI sectors of the top five cities. **GVA in Nottingham's CDI sector has grown at a faster rate than in any other UK city after London¹¹.** In the period between 2011 and 2014, the sector's GVA grew more in Nottingham than anywhere else including London. Changes in GVA could be due to the establishment of new companies, the growth of existing companies or the movement of companies in or out of a region. It is likely that growth is due to all three factors but it should be noted that GVA Figures do not shed any light on the cause of the

¹⁰ The GVA dataset uses ITL3 regions. London includes City of London and Camden; Newcastle includes all of Tyneside; Cardiff includes Cardiff and the Vale of Glamorgan.

¹¹ The same holds when indexing to year 2000.

growth. Nevertheless, GVA growth is indicative of sector growth and is often associated with employment growth.

Figure 5.4. CDI sector GVA growth in major cities (highest performers only)



Other major cities also have prominent CDI sectors, which form larger proportions of their industrial composition. However, Nottingham's CDI sector stands out amongst all other major cities in its growth. Since 2010, Nottingham's CDI sector has grown more in terms of GVA than anywhere else in the country with the exception of London. Recognising and supporting the growth of the CDI sector can be instrumental to Nottingham's continued economic growth.

Summary

GVA serves as a measure of the economic contribution of a sector or geography. The CDI sector in Nottingham ranks as one of the highest in Nottingham in terms of GVA and therefore makes one of the largest economic contributions to the local economy. Over time the sector has also grown more than all other sectors with the exception of Information & Communications, indicating that a large portion of Nottingham's economic growth since 2010 can be attributed to the Creative and Digital Industries.

6. Conclusion

The CDI sector in Nottingham is large in terms of the number of businesses, the level of employment and its GVA. It is one of the best performing sectors in Nottingham and has experienced higher levels of growth than many other major cities. The CDI sector is an emerging specialisation in Nottingham's which has the potential to drive local economic growth if current rates are sustained. The primary underlying driver is Creative and Digital businesses and the Creative Quarter is the home of a cluster of emerging businesses in this sector.

One of the most striking features of the analysis presented in this report is the evidence that it provides of significant growth in the 'creative digital' arena. This is interesting and noteworthy in the context of other local research evidence suggesting that other interesting digitally linked clusters may be emerging in Nottingham. Notable examples include fintech and health analytics (linked to BioCity). These developments may not be unrelated to the presence of Experian and its ecosystem of local specialist suppliers in the City and two universities with significant data science capabilities.

Economic geographers have and continue to debate the merits of strategies based on related or unrelated variety as opposed to more traditional forms of local specialisation. Nevertheless, the presence in the City of three apparently related, emergent digitally linked sectors is worthy of note and further exploration. They may have the potential to provide a kind of local development path analogous to that provided in Biotech by BioCity and associated businesses in the years since the Millennium.

As an emerging area of specialisation in Nottingham, the CDI sector has the potential to generate knowledge-driven growth and bring about economic transformation. It is early to be categorical about these developments, nevertheless, it is suggestive that a local economic development strategy that aims to capitalise on these apparent examples of 'related variety' should be considered.

7. Appendix

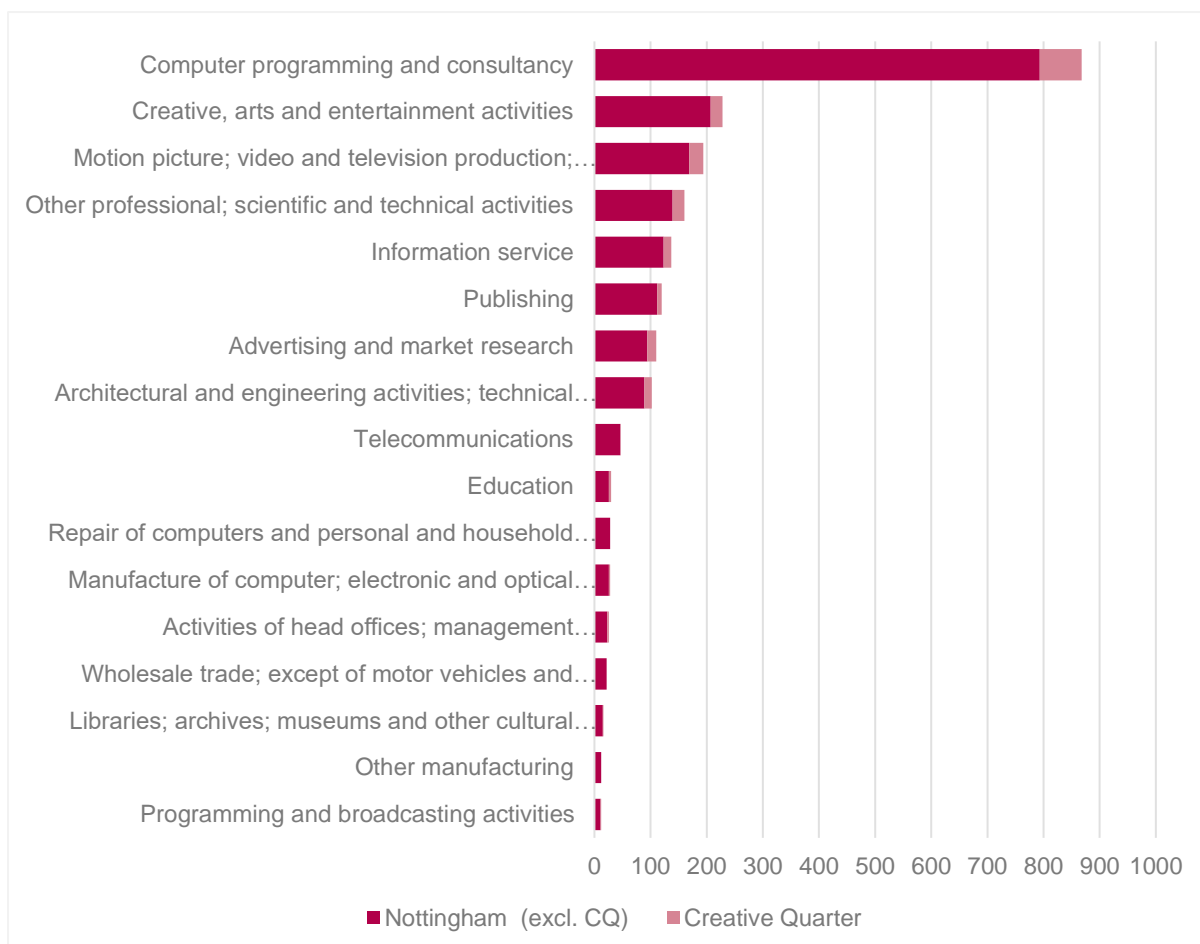
DCMS Creative and Digital sector definitions

SIC07 code	SIC07 description	Creative Industries	Digital Sector
2611	Manufacture of electronic components		YES
2612	Manufacture of loaded electronic boards		YES
2620	Manufacture of computers and peripheral equipment		YES
2630	Manufacture of communication equipment		YES
2640	Manufacture of consumer electronics		YES
2680	Manufacture of magnetic and optical media		YES
3212	Manufacture of jewellery and related articles	YES	
4651	Wholesale of computers, computer peripheral equipment and software		YES
4652	Wholesale of electronic and telecommunications equipment and parts		YES
5811	Book publishing	YES	YES
5812	Publishing of directories and mailing lists	YES	YES
5813	Publishing of newspapers	YES	YES
5814	Publishing of journals and periodicals	YES	YES
5819	Other publishing activities	YES	YES
5821	Publishing of computer games	YES	YES
5829	Other software publishing	YES	YES
5911	Motion picture, video and television programme production activities	YES	YES
5912	Motion picture, video and television programme post-production activities	YES	YES
5913	Motion picture, video and television programme distribution activities	YES	YES
5914	Motion picture projection activities	YES	YES
5920	Sound recording and music publishing activities	YES	YES
6010	Radio broadcasting	YES	YES
6020	Television programming and broadcasting activities	YES	YES
6110	Wired telecommunications activities		YES
6120	Wireless telecommunications activities		YES
6130	Satellite telecommunications activities		YES
6190	Other telecommunications activities		YES
6201	Computer programming activities	YES	YES
6202	Computer consultancy activities	YES	YES
6203	Computer facilities management activities		YES
6209	Other information technology and computer service activities		YES
6311	Data processing, hosting and related activities		YES
6312	Web portals		YES
6391	News agency activities		YES
6399	Other information service activities n.e.c.		YES
7021	Public relations and communication activities	YES	
7111	Architectural activities	YES	

7311	Advertising agencies	YES	
7312	Media representation	YES	
7410	Specialised design activities	YES	
7420	Photographic activities	YES	
7430	Translation and interpretation activities	YES	
8552	Cultural education	YES	
9001	Performing arts	YES	
9002	Support activities to performing arts	YES	
9003	Artistic creation	YES	
9004	Operation of arts facilities	YES	
9101	Library and archive activities	YES	
9102	Museum activities	YES	
9511	Repair of computers and peripheral equipment		YES
9512	Repair of communication equipment		YES

The shaded areas represent overlap between the Creative and the Digital sector. While not a DCMS definition, this overlap is defined as the Creative & Digital sector in this report.

Sectoral breakdown in Nottingham and the Creative Quarter – 2-digit SIC names



ONS Location Quotient Methodology

Location quotients can be considered as measures of either concentration or specialisation.

The results produced are equivalent whichever method is used.

For concentration

Location quotients can be interpreted as a local measure of geographical concentration of industries.

They are calculated as the quotient between the local share of employee jobs in a specific industry and the local share of national employee jobs.

$$LQ = (E_{i,r} / E_i) / (E_r / E)$$

where $E_{i,r}$ is the number of employee jobs in industry i region r , E_i is the number of employee jobs in industry i ,

E_r is the number of employee jobs in region r and E is the number of employee jobs in Great Britain.

A value of 1 means that region r has the same share of employee jobs in industry i as its share of national employee jobs.

Example - region r has 4% of manufacturing employee jobs in Great Britain, and also 4% of total employee jobs in Great Britain

A value greater than 1 means that region r has a higher share of employee jobs in industry i than its share of national employee jobs.

In the tables, concentration of an industry can be read reading across columns for a specific row.

This industry by industry data is also summarised in the alternative reference table: 'Location Quotient concentration tool'

For specialisation

Location quotients can also be interpreted as a local measure of industrial specialisation for local areas.

They compare for each industry, the industry's share of local area employee jobs with its share of total employee jobs.

$$LQ = (E_{i,r} / E_r) / (E_i / E)$$

where $E_{i,r}$ is the number of employee jobs in industry i region r , E_r is the number of employee jobs in region r

E_i is the number of employee jobs in industry i , and E is the number of employee jobs in Great Britain.

A value of 1 means that an industry's share of employee jobs in region r is the same as its share of national employee jobs in Great Britain

Example - industry i makes up 5% of employee jobs in region r and also 5% of employee jobs in Great Britain.

A value greater than 1 means that industry i makes up a larger share of employee jobs in the local area than at the national level.



ntu.ac.uk