Department for
Business, Energy
& Industrial Strategy

IMPACTS OF COMMERCIAL PROPERTY DEVELOPMENT

Final Report

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Contents

Executive Summary

The aim of the study has been to fill an evidence gap on the impact of commercial property developments

Cambridge Econometrics (CE), Savills and Professor Peter Tyler were commissioned by the Department for Business, Energy & Industrial Strategy (BEIS) to fill a gap in the evidence base by investigating the impacts of commercial property developments (CPD) on local labour markets in general, and productivity more specifically.

Commercial property includes all physical premises that are used to house business activities. This may include properties as diverse as offices, warehouses, farms, hotels and retail outlets. For the purposes of this study, we confined ourselves to a narrower definition, looking at general purpose new commercial and industrial property used to house office work, manufacturing or warehousing, but excluding sector-specific sites such as farms or retail outlets.

The focus of the research has been on ascertaining evidence, both quantitative and qualitative, as to the economic impacts of the development and provision of new commercial property both on the firms that occupy those sites, and on the surrounding geographic area.

Existing literature generally finds positive impacts of new commercial property developments, but, for Enterprise Zones at least, some, if not all, of the gain in employment in a local area is found to be at the expense of employment elsewhere

As part of the study, a review of existing evidence on the impact of commercial property developments (CPDs) and the methodologies used to estimate these was undertaken.

There is a substantial body of literature investigating the impacts of public sector interventions in land and property markets, both in the UK and abroad. Most of the research has focused on the contribution the interventions can make to local employment and, in particular, the extent to which the contribution is ‘additional’ to the local area. A large proportion of the literature considers the impact of Enterprise Zones, and their equivalents, in the UK, the US and France.

Many of the studies on Enterprise Zones show positive impacts on workplace employment in the local area, but the general finding is that the majority of the gain in employment in the local area is at the expense of employment elsewhere (displacement).

Overall, the literature on incubators, accelerators and similar establishments generally finds that these business arrangements constitute a viable route to support innovative entrepreneurs and business during the critical early stages of establishing themselves.

A database of CPD and firm-level data was developed to enable the subsequent analysis

A database was developed using CPD and firm-level data from the Inter-Departmental Business Register (IDBR) to provide a range of indicators of local unit activity on new CPDs. The database covers 721 CPDs, of which there are 13 Coworking Spaces, 75 Incubators, 344 Industrial sites, 38 Light Industrial sites, 220 Offices, 28 Science/Research Parks and 3 Makerspaces. The data are spread across the twelve UK regions, with most regions containing at least 50 CPDs apart from Northern Ireland (3 CPDs), Wales (32 CPDs) and the North East (29 CPDs). The firm-level data were also used to estimate the impacts of commercial property on local economic growth and productivity.

Hypothesis 1 looked at the impact on employment, turnover and productivity of firms moving to new commercial property developments

This analysis found:

- Positive impacts on employees and turnover of firms moving to a new CPD compared to moving to another property were detected across many of the models estimated.
- These impacts tend to build over time, though with much of the impact realised during the first year after moving. For all treated local units moving over 2008-12, the impact one year after moving was estimated at 11% higher and 14% higher for the levels of employees and turnover respectively. At four years after moving, the estimated impacts were 15% and 18% respectively.
- Despite positive impacts on employees and turnover, there is little evidence of productivity impacts from moving to a new CPD. Very few statistically significant productivity impacts were detected over the full set of estimates (only weakly significant positive effects for the Yorkshire and North West regions).
- Conducting the analysis on local units by move-year revealed stronger impacts on firms moving over 2007-10 compared with those moving in the later period, although positive and significant impacts on employees and turnover were found across all sample segments by move-year. This could be explained by the higher productivity of the local units moving in the earlier period.
- For the productivity-based groups, the strongest impacts were on those with the highest productivity already, although, again, positive impacts on employees and turnover were found for all groups.

- Splitting the sample by sector revealed that the impacts on employees and turnover growth were particularly strong for knowledge-intensive service (KIS) local units, while for manufacturing local units there were few impacts.
- The manufacturing local units in the study sample mainly operate in medium-tech and low-tech manufacturing sectors, and hence average productivity of these local units was markedly lower in the year before moving than that of the KIS services, again suggesting that initial productivity levels are linked to the size of the employee and turnover impacts from moving to a new CPD.

Hypothesis 2 looked at the impact of commercial property developments on employment, turnover and productivity in the surrounding area

It found:

- Evidence for displacement effects on employee growth and turnover growth in the surrounding areas following the opening of new CPDs.
- These effects were concentrated on the 0-1km ring and 1-2km rings around the CPDs, with few displacement effects detected further away.
- The findings also suggest that turnover and employee growth displacement effects were most frequent in the three years following the opening of the CPDs, while in the later years displacement effects were far less frequent.
- There were fewer productivity growth impacts picked up in the estimation, though one model found several positive productivity growth impacts in the 0-1km and 1-2km rings around the CPD. Again, the outer rings saw little impact.
- The strongest impacts on employee growth, turnover growth and productivity growth were estimated at incubator sites and science/research parks. This was not accompanied by displacement, whereas for offices, which also saw a strong uplift in productivity growth, displacement was found to occur in the inner two rings.
- The regional analysis for this hypothesis yielded mixed results, with a relatively low number of statistically significant effects detected. Further analysis would be required to draw strong conclusions at the regional level.

In addition, the analysis was conducted using only local units in the sample that were operating within a 5km radius of the new CPDs in the year before opening of the CPD, excluding any local units that moved to the CPD in any year over the study period. The key findings were:

- Negative impacts were estimated on total employee and turnover growth across local units active in the area in the year before the CPD opening. These impacts were concentrated in the inner two 1km rings around the CPD, and to a lesser extent in the third 1km ring.
- Nevertheless, positive impacts on productivity growth were estimated in the inner three 1km rings.

- Local units in the top quartile of the productivity distribution saw markedly lower negative impacts on employee and turnover growth in the inner three 1km rings than local units in the second quartile and those in the bottom half of the productivity distribution.
- On the other hand, the local units in the top quartile of the productivity distribution saw slightly smaller productivity impacts than those in the second quartile and the bottom half of the productivity distribution.
- Comparing the size of the negative impacts on employee/turnover growth on the whole area to those on local units already located in the area before the opening of the CPD, the latter impacts are markedly stronger.
- Thus, it appears that the negative employee/turnover growth impacts on local units already located in the area were increasingly offset by growth of local units that moved to or were born in the area after the CPD opening.
- At the regional level, the findings are broadly in line with the whole sample estimates, with negative impacts on employee growth and turnover growth together with positive impacts on productivity growth detected in the inner rings. However, these findings are not present across regions and there is no clear pattern between the estimated impacts across outcome variables and regions.
- Segmenting by CPD category found that areas around incubator, industrial and offices saw negative impacts on employee growth, while only areas around offices saw any statistically significant impacts on turnover growth. On productivity growth, positive and statistically significant impacts are present in the inner three rings for industrial CPDs, and for incubators in the 2-3km ring.

Further analysis for Hypothesis 2 looked at the impact of commercial property developments on wages, and also on the share of high level occupations, in the surrounding area

This further analysis used data from the Annual Survey of Hours and Earnings (ASHE), which is a sample survey and so has much less coverage than the administrative data from the IDBR (as used above).

- The analysis using ASHE data did not find many significant impacts on average wages or average normalised wages (i.e. average of wages relative to average wages in a specific sector and occupation) on the CPDs themselves. For the model estimated across all CPDs over time periods starting in 2006, the only period that showed significant growth in both average wages and average normalised wage is 2006-2012.
- The analysis on normalised wages yields only two statistically significant effects, one for Incubators and one for Science/ Research parks. However, both are in the area surrounding the CPD postcodes rather than the CPDs themselves (2-3 km and 0-1 km respectively).

- Positive impacts on the occupational mix were estimated in all five rings around the incubators over 2006-16, indicating a shift in the occupational mix towards higher skilled professions, not only on the incubators themselves but in the surrounding area. On the other hand, displacement effects on the occupational mix were found to occur in the inner three rings surrounding Office CPD sites.
- The regional analysis provides mixed results, with a relatively low number of significant impacts at the CPDs themselves for both normalised wages and change in the share of high level occupations.
- For both the regional analysis and type of CPDs analysis, the sample sizes for each category is relatively small compared to the overall analysis, which might be the reason for the mixed regression results.

Eight case studies were undertaken to add further insight to the statistical analysis

The case studies discuss the various factors contributing to the success or otherwise of the CPDs studied. Each case study provides information on the local economy, the regional economy and occupation of the site itself. A short telephone survey was also conducted to provide additional insight.

As the case study CPDs are new, the quality of space provided tends to be high, and this, together with good transport links, provides significant benefits to those firms moving in. The case study CPDs tend to be in areas with high demand for space relative to supply, and some are in areas with a good skills base. An increase in business space coincided with an increase in the number of local business and employees. However, these economic benefits are not solely related to the amount of floorspace developed. Higher quality developments were seen to be more likely to attract high-value firms with the potential to grow productivity.

For four of the CPD's the number of firms grew at a faster rate compared to employment, resulting in a decrease in the ratio of employees to local units. This suggests that these CPD's supported small start-up firms. This was particularly visible for sites that provided additional business support and guidance. Business turnover was impacted in the first year of occupation for three CPD's. This may have been caused by the costs of relocating, or due to set-up costs. However, within five years turnover had increased for all firms.

The case studies suggest that CPDs with a specific sectoral focus tended to see the highest growth in productivity and, if correctly targeted, the lowest vacancy rates. Insight from the survey data suggests that the ability to interact with similar firms plays a major role in this. This finding is further supported by the econometric analysis.

1 Introduction

1.1 Introduction and objectives

This report describes the work undertaken by Cambridge Econometrics (CE), Savills and Professor Peter Tyler for the study commissioned by the Department for Business, Energy & Industrial Strategy (BEIS) to fill a gap in the evidence base by investigating the impacts of new commercial property developments on local labour markets in general, and productivity more specifically.

Commercial property includes all physical premises that are used to house business activities. This may include properties as diverse as offices, warehouses, farms, hotels and retail outlets. For the purposes of this study, we are confining ourselves to a narrower definition, looking at general purpose new commercial and industrial property used to house office work, manufacturing or warehousing, but excluding sector-specific sites such as farms or retail outlets.

The focus of the research has been on ascertaining evidence, both quantitative and qualitative, as to the economic impacts of the development and provision of new commercial property both on the firms that occupy those sites, and on the surrounding geographic area. Previous work has been undertaken to answer this question, details of which can be found in the literature review in the appendix, and its synopsis, which follows this chapter.

This work has a wide-ranging remit; looking at the impact of a wide variety of new commercial property developments on a range of economic indicators, including employment, turnover, labour productivity, wages, and demand for skills.

The three key objectives of the overall study are:

1. To produce estimates on the impact on firm turnover and employee wages from new commercial properties.

2. To explore the role of new commercial property for driving local economic growth, local labour markets, and productivity more generally, by testing over different spatial units.

3. To support on-going work on the impact of accelerators and incubators in UK economy.[1]

[1] For example, the current work being undertaken by NESTA, supported by BEIS, that looks at the economic impacts of Incubator and Accelerator sites in the UK

This research provides evidence on whether there are any impacts on local labour markets and productivity, as well as further positive external benefits as a result of new developments.

1.2 Workplan and Phases

The project has taken place in two Phases (See Figure 1 below). Phase 1 of the project started with a review of existing evidence on the impact of commercial property developments (CPDs) and the methodologies used to estimate these. This was followed by the development a database of CPDs and firm-level data from the Inter-Departmental Business Register (IDBR) and Annual Survey of Hours and Earnings (ASHE) that can be used to estimate the impacts of commercial property on local economic growth and productivity. Phase 2 of the project undertook econometric analysis, using the database developed in Phase 1, to estimate the impacts of commercial property on employment, output and productivity, and undertook eight case studies to further inform the analysis.

Figure 1-1 below shows the workplan for the project.

1.3 Report structure

In the following chapters, we first provide a summary of the literature review (Chapter 2), followed by a description of the CPD and firm-level databases developed for the subsequent analysis (Chapter 3). We then present a description of the methodology and results of testing the first hypothesis about the impact on firms of moving to new commercial property developments (Chapter 4), followed by a description of the methodology and results of testing the second hypothesis of the impact of CPDs on the surrounding area (Chapter 5). We then present the eight case studies for a range of commercial property developments (Chapter 6), followed by conclusions and recommendations for future work (Chapter 7).

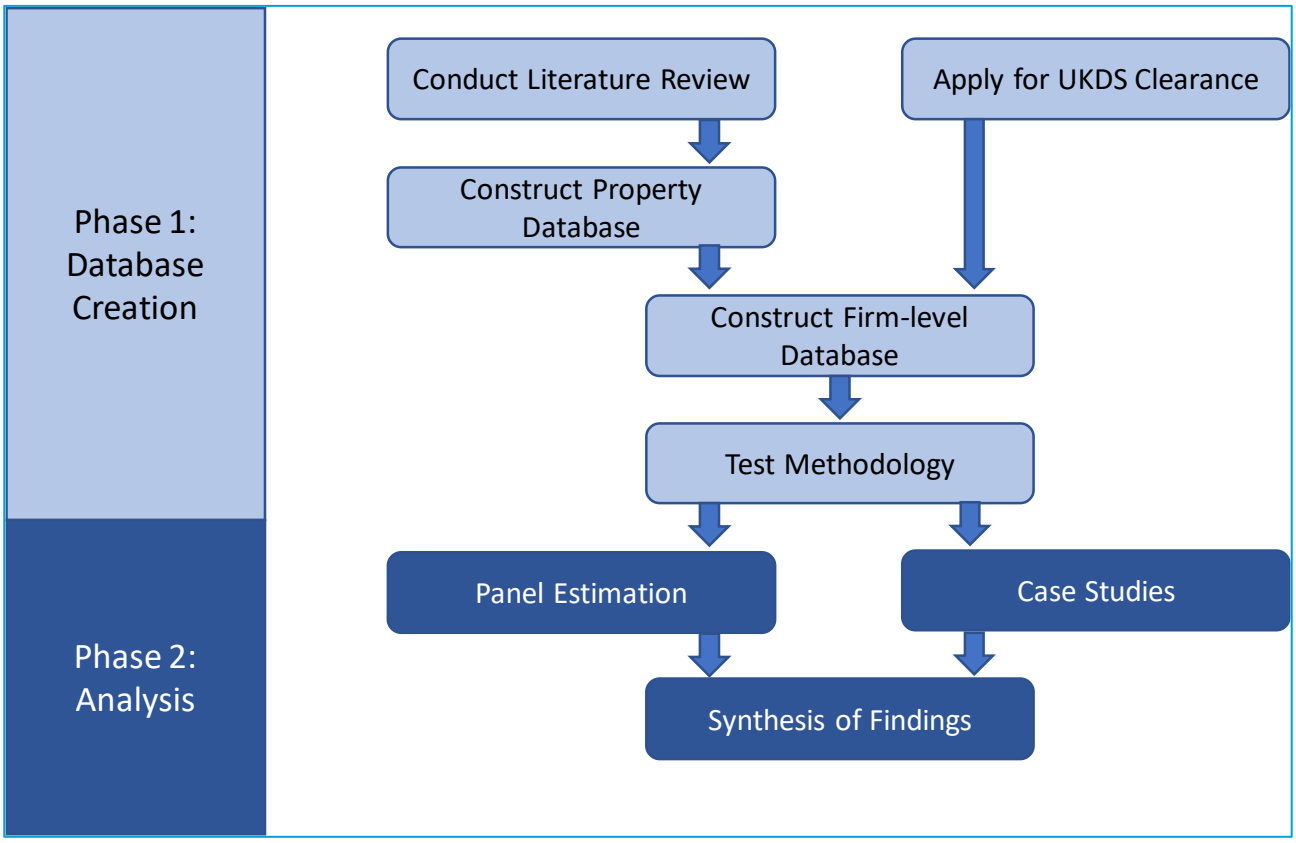


Figure 1-1: Project workplan

2 Summary of Literature Review

2.1 Introduction

This chapter summarises the findings of the literature review. The full literature review can be found in Appendix A (and the Bibliography in Appendix B). In reviewing the existing literature, the aim was to: (a) find existing evidence on the impact of commercial properties, with which we might compare (as far as this is possible) the results of the analysis undertaken in Phase 2, and; (b) review the various methodologies (especially econometric) used, so as to inform the methodology for this study.

There is a substantial body of literature investigating the impacts of public sector interventions in land and property markets, both in the UK and abroad. Most of the research has focused on the contribution the interventions can make to local employment and, in particular, the extent to which the contribution is 'additional' to the local area. A large proportion of the literature considers the impact of Enterprise Zones, and their equivalents, in the UK, the US and France.

2.2 Impact results from previous studies

Overall, the literature on incubators, accelerators and similar establishments (See, for example, Dee et al (2011), and Isabelle (2013)) generally finds that these business arrangements constitute a viable route to support innovative entrepreneurs and business during the critical early stages of establishing themselves.

The Enterprise Zone policy has been used extensively in the United Kingdom for nearly forty years and much has been learned about what it can achieve and what influences its relative effectiveness. Economic studies in the UK, USA, France and other countries have shown that displacement can and does occur and it is important to minimise competitive displacement between areas. As a very rough rule, for every two jobs created on an Enterprise Zone one may have been displaced from the local region surrounding it. Displacement of economic activity is reduced when the incentives available encourage sectors that do not compete directly with local sectors. Thus, by way of example, the early UK zones allowed retail investment to be eligible for the package of Enterprise Zone incentives and this led to local displacement of economic activity. The policy was changed to exclude this sector. New Zones in the United Kingdom are targeting Advanced Manufacturing and Knowledge Intensive Businesses where competitive displacement at the local level is less likely.

Many of the studies tend to show positive impacts of Enterprise Zones on workplace employment in the local area, but the general finding is that the majority of the gain in employment in the local area is at the expense of employment elsewhere (displacement).

A study by the Department for the Environment (1987) estimated that, for the first British Enterprise Zones, and taking account of deadweight, displacement and short-term income multipliers, approximately 1 out of every 2 jobs created on the Zones was additional to the local area of which the Zone was a part (approximately within a 10-mile radius of the Zones). This, though, did not take account of displacement from elsewhere in the UK.

Ham et al. (2011) uses evidence from US state and federal Enterprise Zones and Empowerment Zones - and employment. Also found are significant spillover effects to neighbouring tracts of the EZ. Contrary to some of the studies on US EZs, this study finds that overall, EZ programmes significantly have a positive effect on labour markets, hence their argument that these labour market interventions are efficient.

Givord et al. (2012) studies enterprise zones in France and finds evidence of negative spillovers on areas neighbouring treated areas, with EZ presence depressing the location (i.e. number) of businesses in the area just outside the EZ. The authors further argue that some of the potential benefits from the programme are offset by the increased competition coming via new businesses. EZs also bring about increased employment but not necessarily for local residents.

Gobillon et al. (2012) also studies French enterprise zones. Empirical estimates of the programme's effect on unemployment duration show that EZ schemes had a significant but small impact on the rate at which the unemployed find a job – with only a 3% increase.

Mayer (2012) studies the impact of the French EZ programme on establishments' location decisions. Empirical analysis shows that the French EZ programme has a positive and sizable effect on location choices. However, as found by some of the studies based on EZs in the US and the UK, this study also found that French EZ policy mostly generates displacement effects, with firms re-locating from untreated to within treated zone.

In studies that have looked at the impact of policies involving commercial property development on local unemployment rates (e.g. Gibbons et al, 2017), there is little evidence of a benefit to workers who live within the area at which the policy is aimed.

Gibbons et al (2017) also find that 'subsidising the development of commercial space through the Single Regeneration Budget (SRB) created some additional workplace employment in the targeted places (although we can only partially assess to what extent these were displaced from further afield). However, despite the increase of new local jobs, we find no evidence that these jobs went to local people or improved the employment outcomes of local residents'.

The What Works Centre for Local Economic Growth: Incubator Toolkit finds some evidence that incubators may increase participating firm employment and sales, but also some evidence that incubators may decrease firm survival. This latter impact, which on the face of it appears to be a negative impact, is likely to be due to incubators helping firms to more quickly gauge the quality of their business idea, and so encourage them to drop bad ideas sooner than they otherwise would have. Incubators with an affiliation to a university may also have a positive effect on survival and revenue and employment.

Link and Scott (2007) look at the economics of university research parks and we can infer from their discussion that the impact of science/research parks might be greater than other types of commercial property development.

Recent Ministry of Housing, Communities & Local Government (MHCLG, formerly DCLG) guidance on the appraisal of development interventions now recommends that the employment impacts of developments are not monetised, unless there is strong evidence of a supply side effect. The department's preferred approach to appraising development is now to use changes in land values (i.e. Land Value Uplift) to infer the net private impact.

Yet, there are a wide range of impacts associated with commercial property developments, and the aim of the current study is to fill a gap in the evidence base, focusing on the possible impacts of commercial property developments on the labour market, and on productivity in particular.

2.3 Methodologies from previous studies

The main ways in which the literature might inform the proposed methods for Phase 2 of the study is through: (a) the choice of econometric methods for the analysis, and; (b) the method for choosing the treatment and control groups for the analysis (and factors that should be taken into account).

The methodology employed by Gibbons et al (2017), both in determining the samples for analysis (through a concentric rings approach) and in the econometric methods employed, will be used to inform the current study.

Although Papke (1993) uses unemployment as the measure of labour market impact, whereas the current study will look at employment and productivity, the econometric methodology, and discussion of control groups, could also be used to inform this study.

O'Keefe (2004) argues that prior studies that compare EZ employment to employment in dissimilar areas are likely to have underestimated the impact of the programme. This reinforces the need in this study to carefully consider the characteristics of the areas and firms in the chosen control groups compared to the treatment group.

The modelling approach of Einio and Overman (2016), to investigate the impact of the local enterprise growth initiative (LEGI), could also inform our methodology on the impact of commercial property in an area, as well as possible spillovers.

3 Developing the Databases of New Commercial Property Developments and Firm-Level Data

3.1 Introduction

This chapter describes the processing of the property and firm-level data to form the various databases for the study. These are:

- Property database
- Firm-level database
- Augmented Property database

3.2 Property Database

The property database was used to estimate the historical impacts of commercial property on productivity. It has been developed by Savills using CoStar, which is the UK's leading source of commercial property market data, providing detailed indicators and analysis for over 400,000 commercial developments in the UK. The database includes data on:

- the year of construction
- floorspace
- use types
- locations (including post codes and coordinates)
- tenants
- leasing activity
- rental values
- vacancy rates
- sale prices

The indicators relating to location (postcodes and coordinates) enables the property data to be linked easily and combined with other data sources relating to the local economic and labour force conditions at various locations.

The CoStar database has some limitations. Its data is sourced through property agents across the country and it covers around 80% of all property transactions. This means that not all properties are recorded. For some development sites there might be one or two records, while in fact these sites contain more buildings. Sometimes only singular units within a development are recorded (for example one floor), without information on the total floorspace of the building.

The following provides an overview of the key tasks and characteristics of the database:

- an initial export from CoStar, consisting of new commercial developments built between 2006 and 2013, contained around 7,000 entries
- properties are located across the whole of the UK
- no size criteria have been applied
- Savills refined the dataset, focusing on data quality and proportionate distribution. This review resulted in a database of 1,488 properties, represented across 1,091 postcodes

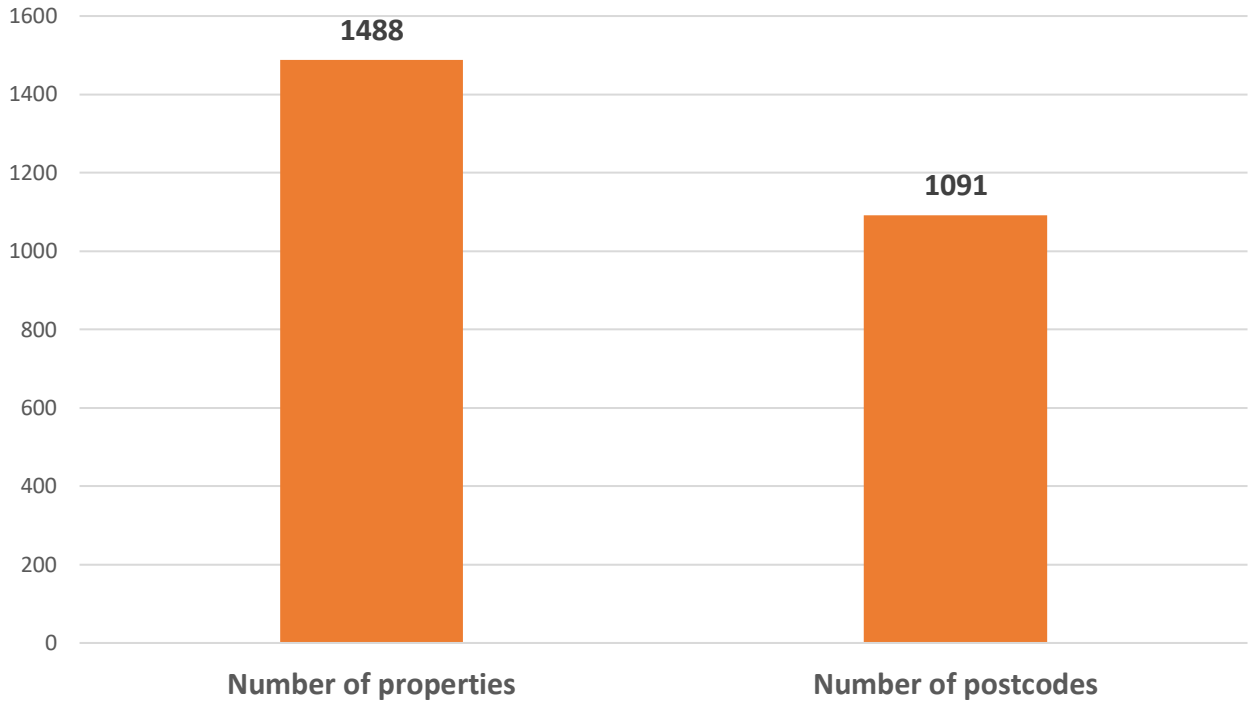


Figure 3.1: Property database overview

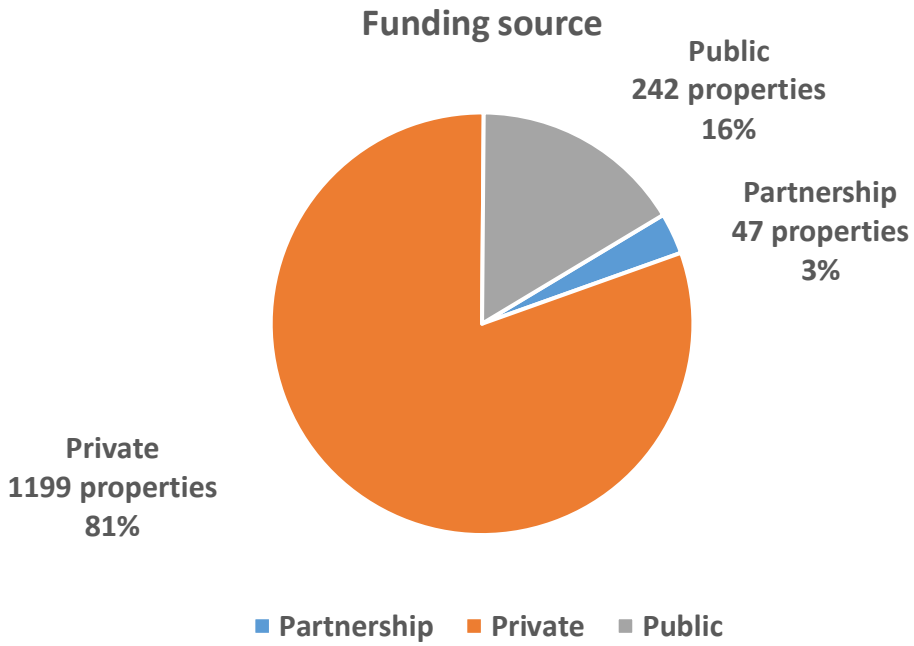


Figure 3.2: Funding source

Funding source

Site funding has been identified where possible, including private (81%), public (16%) and partnerships (3%) funded sites.

CoStar specifies an owner name, as opposed to funding streams. The owner name gives us an indication of a development's funding source:

- if an owner is a local authority, it could be reasonably assumed that the development has been publicly funded
- if an owner is a partnership, we have classified this as a partnership funding source
- all the rest have been specified as private

Property categories

The database contains the following categories:

- Incubator/co-working/accelerator – 78 spaces cross-checked with the Nesta Business incubators and accelerators: UK directory database. In this category we have new and refurbished properties. The number of incubator or accelerator sites which are on newly developed commercial properties was limited. Not all incubators have been identified. This is due to limitations of the CoStar data, which contains mainly commercial properties. Institutional properties are not covered that well as private ventures in CoStar.

- Science/research parks – 36 properties have been identified. We cover UK Science Park Association (UKSPA) members as well as other science parks identified from CoStar. There is an overlap between these categories as some incubators are

located within science/research parks. For some parks we might have several properties, and for others only one. This is due to the age criteria applied and limitations of CoStar data, which does not cover all properties.

- Industrial Estates/Business Parks – We have identified around 234 postcodes which are shared by 1,054 properties. This reflects industrial, light industrial and business parks with a number of properties in the one location.
- Single Site Commercial Space – We have identified 843 postcodes with single property entries and 417 entries with no building park specification identified. These are anticipated to represent single site commercial property developments.

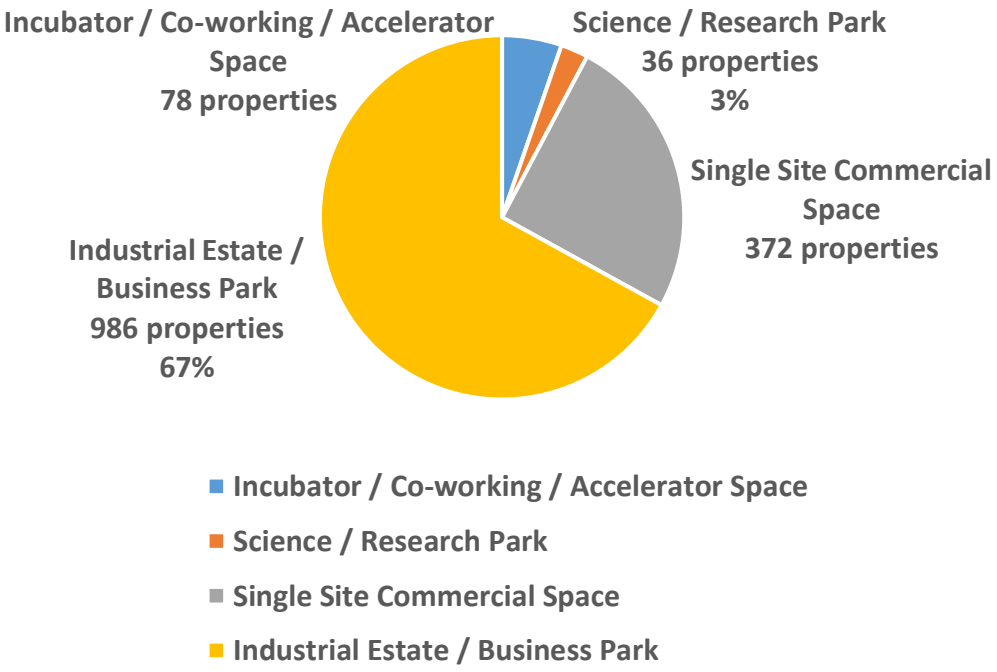


Figure 3.3: Property categories

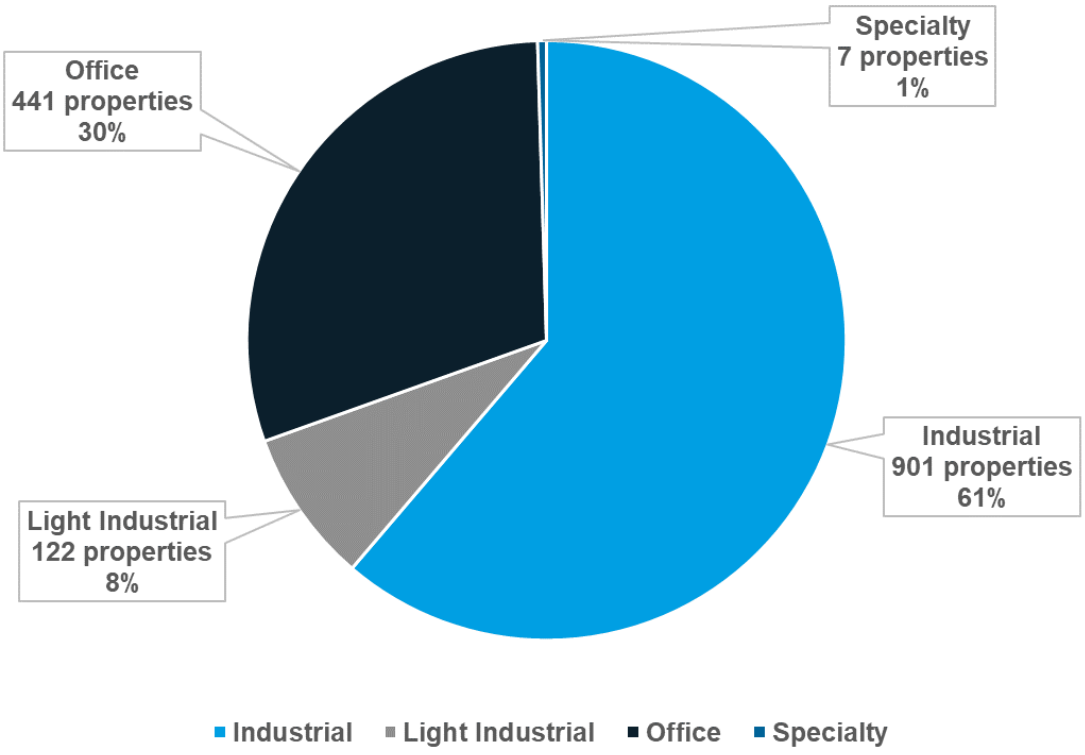


Figure 3.4: Property types

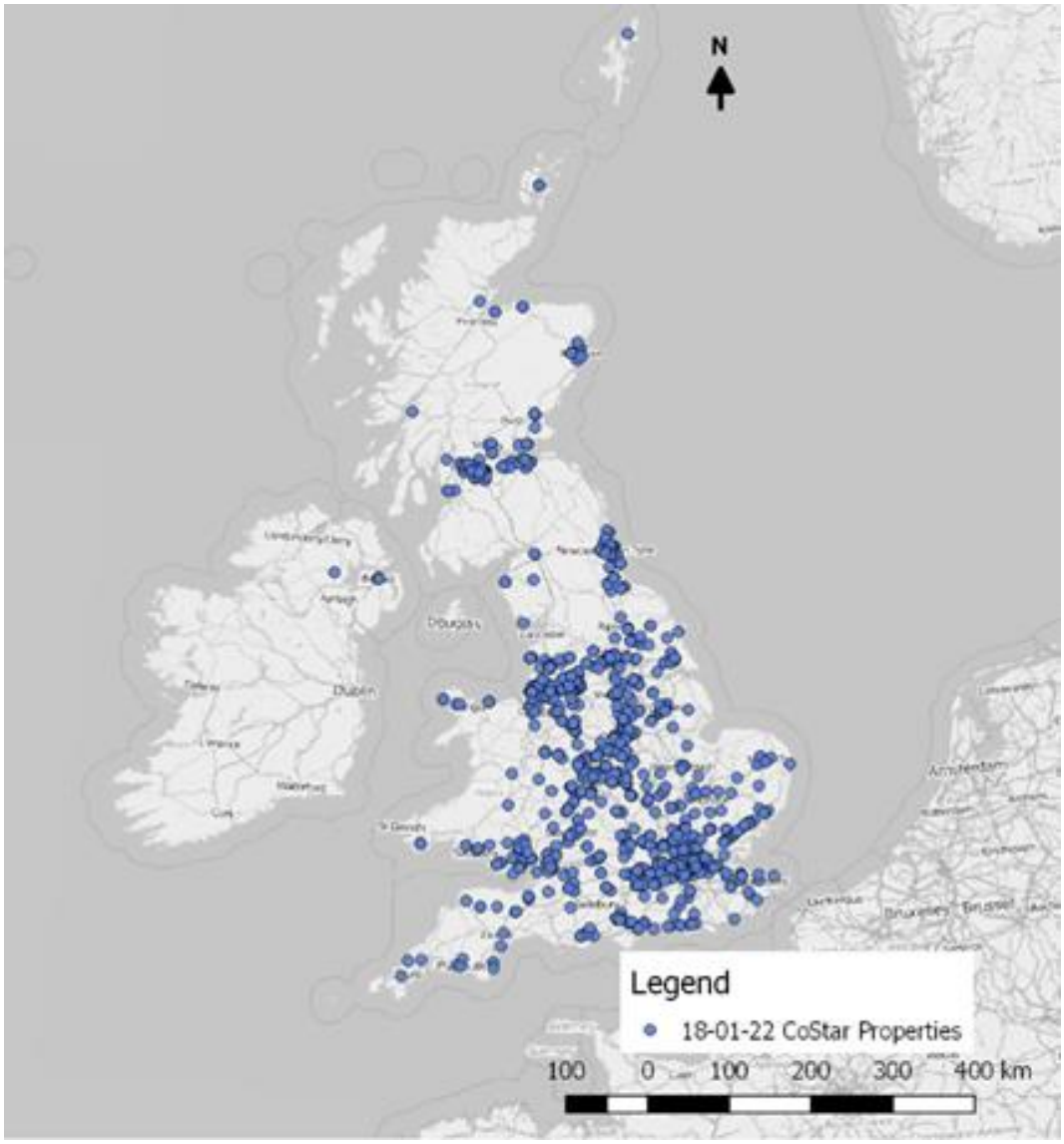


Figure 3.5: Distribution of new commercial developments – more details can be found in table 3.2

CE undertook some further processing to identify different postcodes that were contiguous and represented the same development occurring over several years, and treat these as a single extended development (e.g. an industrial estate that is extended in steps over 3 years, with different postcodes allocated to different sections).

This brought the total number of separate development sites down to 920.

3.3 Firm level data

A version of the IDBR, that had received pre-possessing by BEIS's data-science team was used.

The processing carried out by the BEIS team included:

- In cases where the recorded year of extraction from the IDBR was thought to not match the actual year the data represented, a likely year provided, which had a typical lag of 1-2 years
- Inactive enterprises/local units were removed from the database
- An indicator of data quality was provided. Data judged to be of dubious veracity by BEIS was not used for the purposes of the research

However, a significant degree of further data-cleaning was carried out by the team at CE. In some cases, the data were interpolated for use in the augmented database. This was necessary because in the augmented database averages are taken across enterprises, and so missing data would distort these averages. For the econometric analysis, only uninterpolated data will be used. The details of the data-cleaning are further detailed below:

Turnover

In some cases, the BEIS improved turnover data had missing values while ent_status – a variable indicating whether the enterprise was active or not in each year – was marked active. The missing data were interpolated using Stata command ipolate. Missing values in the last or first years of the data were assigned the same value as the present data in the nearest year. Any remaining data gaps were filled using the original IDBR turnover value.

Enterprise Employees

The enterprise employees data are based on the BEIS improved employees data. No interpolation was needed for these data as there were no missing employees values.

Local units employees

In the local units employees data, many of the data are marked as bad quality by BEIS, and thus do not have a likely year assigned as there is no reliable source to determine this. These data were dropped from the sample, so only the good quality data were used with a likely year assigned.

There were numerous duplicate records in the local units employees data where the same local unit and likely year appeared multiple times, sometimes with different postcodes, sic codes etc. A rule was applied to all these duplicates where only the record with the earliest extract year was kept.

There were also many missing values between years in the local units good quality data. These missing values were interpolated. The CPD data (i.e. Postcode, reference number

etc.) for the interpolated data were filled in by taking the record from the earliest year of quality data for the local unit.

Sharing out enterprise turnover to the local units

The local units in CPDs data were matched to the turnover and employees enterprise data for the whole of the UK, in order to find for each local unit the productivity (turnover/employees) for its corresponding enterprise. Where enterprise turnover/employees data were missing, local unit productivity was assumed to equal the average productivity of the corresponding enterprise over the study period.

Local unit employees were then multiplied by the productivity of its corresponding enterprise, to estimate local unit turnover (since turnover is not available in the local units data).

3.4 Augmented property database

Data from the completed firm-level data were then recombined with the property database to create an augmented property database with the following additional core variables:

- Unit Count – recorded at first year of data, year of development, and final year of data
- Total Employment - recorded at first year of data, year of development, and final year of data
- Total Turnover - recorded at first year of data, year of development, and final year of data
- Total Number of Unit Births and Deaths over time-period
- Total Number of Entrants and Exits to/from other postcodes over time-period
- The most common broad industrial group represented

In total, we assessed 8158 datapoints, across 857 separate CPDs, with 136 sites having insufficient data coverage either side of the year of development, leaving a total of 721 Commercial Property Developments in the sample.

The breakdown of sites by category, region and most common industrial group are shown below:

Table 3.1 – Distribution of sites by category

Category	Count
Coworking space	6
Coworking space plus	7
Incubator	64
Incubator & Coworking Space	1

Incubator / Co-working / Accelerator Space	10
Industrial	344
Light Industrial	38
Makerspace	3
Office	220
Science / Research Park	28
Grand Total	**721**

We see that 53% of the sites are either industrial or light industrial, 31% are office space, 13% are incubator space or similar, and 4% are designated science or research parks and members of the UKSPA.

Table 3.2. Distribution of Sites by UK Region

UK Region	Count
East Midlands	64
East of England	58
Greater London	131
North East	29
North West	88
Northern Ireland	5
Scotland	60
South East	79
South West	54
Wales	32
West Midlands	62
Yorkshire and the Humber	59
Grand Total	**721**

There is a good geographic spread of sites across UK regions, with the most highly-populated region being Central London (131 sites). Only Northern Ireland has so few sites (5) as to represent an insufficient sample size for statistically significant results.

Table 3.3. Distribution of Sites by Most Common Sector

Sector	Count
Accommodation & food	17
Agriculture	16
Art, entertainment & recreation	4

Construction	45
Education	4
Finance, insurance & Real Estate	8
Health	7
Information & communication	47
Manufacturing	72
Other private services	16
Professional services	336
Transport & storage	8
Utilities	4
Wholesale& retail	137
Grand Total	**721**

The most common sector is professional services, which includes scientific R&D as a subset, with 47% of all sites. Other common sectors are manufacturing, with 10%, and Information & Communication and Construction with 7% each.

Variable	Value
initial local unit count per site	3.7
local unit count per site at year of development	8.6
final local unit count per site	12.3
initial total employment per site	189
total employment per site in year of development	256
final total employment per site	261
initial total turnover per site	29178
total turnover in year of development	44599
final total turnover per site	49987
initial average employment	51.4
average employment at year of development	29.7
final average employment	21.3
initial average turnover	7932
average turnover year of development	5187
final average turnover	4068
initial labour productivity	154
labour productivity in year of development	175
final labour productivity	191

Table 3.4. selected variables calculated from the augmented property database

From table 3.4, we see a number of key facts:

- The average number of local units per development site increased significantly over the time-period, from 3.7 local units in the initial year of data to 12.3 local units in 2016.
- The average number of total employees and average value of total turnover by development site both also increased, from 189 to 261 employees, and from £29.2m to £50.0m per development site, respectively.
- However, the average size of firm shrank, both in terms of employment (51.4 employees per local unit to 21.3 employees per local unit) and in terms of turnover (£7.9m per local unit to £4.1m per local unit), suggesting that the majority of new firms were small firms or start-ups.

Finally, the average labour productivity increased, from £154,000 per employee to £191,000 per employee

4 Impact on local units moving to a new Commercial Property Development

4.1 Introduction

This chapter seeks to address hypothesis 1 of our study, which states that:

- *A local unit that moves to a newly-opened commercial property development (CPD) will experience higher levels of growth in employees, turnover and average productivity than local units with similar age, size and sectoral characteristics from the same geographic region that moves to another type of location.*

The chapter lays out our approach to assessing this hypothesis, the econometric methodology employed, and concludes with some preliminary results.

4.2 Approach

The approach to this analysis seeks to compare the performance of local units that moved to a new CPD (the treatment group) against a counterfactual for what would have happened if the local units moved to a different type of property. To establish this counterfactual, we construct a control group of local units from all local units in the IDBR dataset that moved to a property other than a new CPD. The construction of the control group is achieved through *propensity score matching* (PSM). Once the control group is constructed, we use a *difference-in-differences* approach to estimate the average treatment effect on the treated local units (ATT) by comparing the differences between the outcome variables in treatment and control groups in pre-treatment and post-treatment periods.

The first step of the PSM procedure is to estimate the probability that any local units (including the local units moving to a new CPD) move to a new CPD, based on a set of observable characteristics. To estimate this probability, a probit regression is used to regress a binary treatment variable on the set of observable characteristics (pre-treatment), thus obtaining a propensity score for each of the local units in the sample. The treated local units are then matched with the control local units based on the proximity of their propensity scores. As part of the PSM process, local units in each group with propensity scores outside of the other group's range of propensity scores are not matched, and are thus dropped from the sample, to ensure that no local units are included for which there is not a suitable comparison.

Once the control group has been selected using PSM, the difference-in-differences approach allows us to estimate the average treatment effect on the treated local units (ATT). The key assumption of difference-in-differences is the parallel trends assumption – the assumption that the outcome variable of the treated local units and the control local units would have followed the same trend in the absence of the treatment. This assumption provides the counterfactual for the difference-in-differences estimation. By comparing the differences between the outcome variables pre-treatment and post-treatment, the parallel trends assumption allows us to attribute the difference-in-differences between the trends to the effect of the treatment. This is illustrated in Figure 4-1 below. Here, the impact of the intervention is measured by the difference in the post-treatment period between YT1 and the red line directly below, which is the counterfactual outcome (based on the parallel trends assumption) had the intervention not happened.

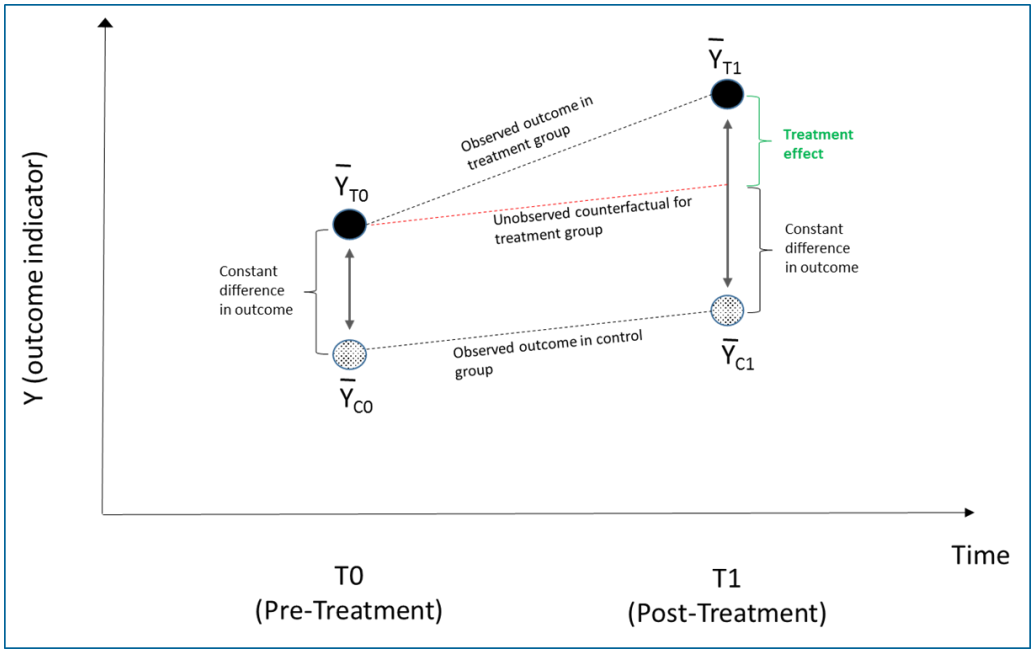


Figure 4-1: Visualising the difference-in-differences estimator

The key advantage of our approach is that it attempts to control for selection bias – bias arising when the decision to move to a new CPD is correlated with the outcome of interest (i.e. employee growth, turnover growth and productivity growth). Selection bias is likely to be an issue when studying the effect of moving to a new CPD because local units might move to a new CPD because they are performing better than the average local unit, for example if the local is moving because it is hiring more employees.

We control for two types of selection bias in particular: selection on observables; and selection on time-invariant unobservables. Selection on observables occurs when a local unit's decision to move to a new CPD is based on observable characteristics (for example

the size and sector of the local unit) and is thus controlled for through the PSM technique. The difference-in-differences approach adds further explanatory power to the analysis by controlling for selection on time-invariant unobservable characteristics (for example whether the local unit has received public funding – we don't have information for this in our dataset). This means that we can control for differences between the two groups due to characteristics that we do not have data for or cannot accurately measure, provided that the effect of these differences on the outcome variable does not vary over time. This is achieved by comparing the differences between the control and treatment group before and after treatment – if the parallel trends assumption holds, any difference in these differences is assigned to the treatment.

4.3 Matching

Matching method

A radius matching algorithm was used whereby each treatment local unit was matched to all control local units within a given propensity score distance (a caliper set to 0.001). The approach was adopted after testing a variety of alternative methods including nearest neighbour matching and PSM with Mahalanbois Distance Matching. Post-matching balancing of covariates was compared across models, with the chosen approach achieving the best balance in covariates between the treatment and control group of the models tested. A key advantage of the radius matching approach is that it allowed us to exploit the large number of potential control local units by matching many control local unit to each treated unit, thus utilising the available information as best as possible.

The specification draws on previous research using the IDBR for matching[2]. The main observable variables thought to influence the decision to move to a new CPD are growth in employees and strong business performance (i.e. turnover/productivity growth). To control for the types of local units likely to move to incubators or science/research parks we include dummy variables for knowledge intensive services and high-tech manufacturing. To ensure the control group local units are as close in characteristics as possible to the treated local units we also include variables for employee and turnover size bands[3], region and 2-digit sic code.

The variables used in the PSM are summarized in Table 4.1 below;

[2] https://www.enterpriseresearch.ac.uk/wp-content/uploads/2017/10/ERC-ResPap61-VaninoRoperBecker-revised-V3.3.pdf
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/604841/innovation-public-support-impact-report-2017.pdf

[3] Consistent with the Eurostat size band definitions http://ec.europa.eu/eurostat/statistics-explained/index.php/Structural_business_statistics_overview

Table 4.1: Variables included in the PSM model specification

Description	Variables included in model
Employee size bands (at 1 year before moving)	<2 employees; >=2 employees and <10 employees; >=10 employees and <50 employees; >=50 employees and <249 employees; >250 employees
Turnover size bands (at 1 year before moving)	<£100,000 turnover; <=£100,000 turnover and <£2m turnover; >=£2m turnover and <£10m turnover; >=£10m turnover and <£50m turnover; >£50m turnover
Growth variables	Logs of productivity and employment at 1 year before moving and 2 years before moving
Sector characteristics	58 2-digit SIC code dummy variables and High-tech manufacturing and Knowledge Intensive Services dummy variables
Location	12 region dummy variables

Source: Cambridge Econometrics.

The analysis uses data over the years 2006-16, though as data are needed both before and after the treatment, the matching was run for local units moving over 2008-12. For each of the four groups of treated local units, the matching was undertaken separately for each year in which the local units moved. Local units moving before 2008 were not matched because the data do not extend far back enough to include the lagged variables required. Local units moving after 2012 were not matched because the data do not extend forward far enough to measure the treatment effect at three years after treatment. After matching was undertaken for each move year, the treatment and control groups for each year were combined into a single dataset.

The PSM model was estimated for all local units in the sample moving over 2008-12, and also separately for each move year over 2008-12. The model was also estimated for 9 UK regions, and 5 sectors. In addition, the model was estimated for 3 sample segmentations based on productivity: local units in the top half of the productivity distribution; local units in the top quarter of the productivity distribution; and robust productivity growth local units – defined as local units that increased productivity in over the two years before treatment while also increasing both employees and turnover. In total the PSM model was estimated for 23 sample segmentations of the local units.

Matching results

Table 4.4-1 below presents the number and proportion of successful matches of each group of treated local units and the number of controls for each group. Across the sample segments, the percentage of treated local units successfully matched ranged from 33% (for local units moving in Scotland) to 81% (for local units in the top half of the productivity distribution). Looking at the full sample of treated local units around 72% were successfully

matched. For the region and sector sample segments, the number of successful matches appears broadly to be linked to the number of potential control local units available. For robust productivity growth local units and the top quarter of the productivity distribution local units, a relatively low percentage of treated local units were matched (50% and 45% respectively) despite a relatively high number of potential control units. This suggests that is was more difficult to match this type of local units with a suitable control. For all sample segments in the table below, a sufficient number of local units was matched to proceed with the econometric estimation[4].

Table 4.4-1: Successful matches of treated and control local units for each sample segment

Sample segment		Raw data	Matched data	% matched
All local units	Treated local units	1,771	1,272	71.8%
	Control local units	146,105	94,079	64.4%
All local units moving in 2008	Treated local units	298	222	74.5%
	Control local units	32,340	21,328	65.9%
All local units moving in 2009	Treated local units	353	278	78.8%
	Control local units	26,502	18,441	69.6%
All local units moving in 2010	Treated local units	382	238	62.3%
	Control local units	30,081	17,832	59.3%
All local units moving in 2011	Treated local units	353	262	74.2%
	Control local units	27,586	19,070	69.1%
All local units moving in 2012	Treated local units	385	272	70.6%
	Control local units	29,696	17,408	58.6%
East Midlands	Treated local units	137	68	49.6%
	Control local units	9,556	7,355	7.7%
East of England	Treated local units	186	131	70.4%
	Control local units	15,034	3,526	23.5%
London	Treated local units	321	219	68.2%
	Control local units	28,668	10,493	36.6%
North West	Treated local units	233	140	60.1%
	Control local units	14,552	2,375	16.3%
Scotland	Treated local units	134	44	32.8%
	Control local units	8,427	272	3.2%
South East	Treated local units	217	127	58.5%
	Control local units	25,077	6,081	24.2%
South West	Treated local units	136	80	58.8%
	Control local units	13,175	1,402	10.6%
West Midlands	Treated local units	151	87	57.6%
	Control local units	11,469	1,102	9.6%
Yorkshire and the Humber	Treated local units	96	59	61.5%
	Control local units	9,648	439	4.6%

[4] The procedure was also considered for the regions Wales, Northern Ireland and the North East, and for the high-tech manufacturing sector, but the number of treated local units was insufficient for PSM.

Manufacturing	Treated local units	169	91	53.8%
	Control local units	7,059	652	9.2%
Low-technology manufacturing	Treated local units	113	57	50.4%
	Control local units	5,577	303	5.4%
Services	Treated local units	1,599	1,149	71.9%
	Control local units	137,395	89,958	65.5%
Knowledge-intensive services	Treated local units	779	557	71.5%
	Control local units	70,632	44,825	63.5%
Non-knowledge-intensive services	Treated local units	820	582	71.0%
	Control local units	66,763	40,812	61.1%
Top half of productivity distribution	Treated local units	852	688	80.8%
	Control local units	68,631	31,843	46.4%
Top quarter of productivity distribution	Treated local units	699	319	45.6%
	Control local units	27,892	7,658	27.5%
Robust productivity growth	Treated local units	852	437	51.3%
	Control local units	68,631	22,349	32.6%

Source: Inter-departmental business register (IDBR) and CE analysis.

To measure the success of the matching in aligning the characteristics of the treatment groups and the control groups, post-matching balancing tests were conducted across all models. The post-matching tests indicated that the matching achieved a balance across all sample segments. Table 4.4-2 presents the number and percentage of covariates with statistically different means at the 10% significant level for each of the sample segments. Across all models, before matching 585 (44.5%) out of 1,316 covariates had a statistically significant difference in means. After matching, 8 covariates (0.6%) had a statistically significant difference in means, indicating a successful matching outcome. To provide further information on comparability of the matched sample, the distributions of each group's characteristics are presented in Appendix B.

Table 4.4-2: Balancing of covariates in each sample segment before and after matching

Sample segment		No. covariates with statistically different means	% covariates with statistically different means
All local units	Unmatched	61	73.5%
	Matched	0	0.0%
All local units moving in 2008	Unmatched	30	41.1%
	Matched	0	0.0%
All local units moving in 2009	Unmatched	38	49.4%
	Matched	0	0.0%
All local units moving in 2010	Unmatched	31	44.9%
	Matched	0	0.0%
All local units moving in 2011	Unmatched	30	42.3%
	Matched	0	0.0%
All local units moving in 2012	Unmatched	36	48.6%

	Matched	0	0.0%
East Midlands	Unmatched	11	28.2%
	Matched	0	0.0%
East of England	Unmatched	15	33.3%
	Matched	0	0.0%
London	Unmatched	1	3.0%
	Matched	3	11.0%
North West	Unmatched	17	32.7%
	Matched	0	0.0%
Scotland	Unmatched	4	10.3%
	Matched	1	2.6%
South East	Unmatched	27	55.1%
	Matched	0	0.0%
South West	Unmatched	14	31.8%
	Matched	0	0.0%
West Midlands	Unmatched	11	23.4%
	Matched	0	0.0%
Yorkshire and the Humber	Unmatched	9	22.0%
	Matched	0	0.0%
Manufacturing	Unmatched	7	17.5%
	Matched	0	0.0%
Low-technology manufacturing	Unmatched	38	66.7%
	Matched	2	3.4%
Services	Unmatched	4	12.1%
	Matched	0	0.0%
Knowledge-intensive services	Unmatched	26	63.4%
	Matched	0	0.0%
Non-knowledge-intensive services	Unmatched	31	68.9%
	Matched	1	2.2%
Top half of productivity distribution	Unmatched	48	60.8%
	Matched	0	0.0%
Top quarter of productivity distribution	Unmatched	35	51.5%
	Matched	0	0.0%
Robust productivity growth	Unmatched	46	58.2%
	Matched	1	1.3%

Source: Inter-departmental business register (IDBR) and CE analysis.

Parallel trend assumption

A key assumption of difference-in-differences is the parallel trends assumption – the assumption that the outcome variable of the treated local units and the control local units would have followed the same trend in the absence of the treatment. This assumption provides the counterfactual for the difference-in-differences estimation. By comparing the differences between the outcome variables pre-treatment and post-treatment, the parallel trends assumption allows us to attribute the difference-in-differences between the trends to the effect of the treatment.

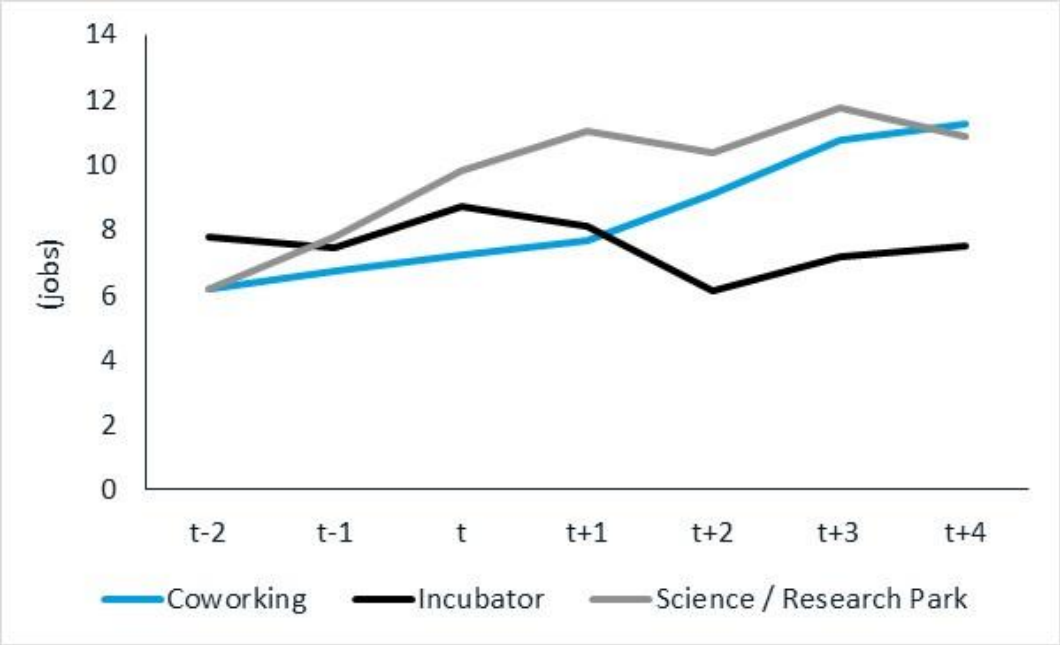
While the parallel trends assumption cannot be proven to hold, it is useful to visually inspect the pre-treatment trends in the treatment and control groups to assess whether they are broadly moving together pre-treatment. These pre-treatment trends are plotted for each of the outcome variables and sample segments in Appendix B, with the trends moving together in most cases. Note that in some cases the treatment group trends appear to be increasing faster than the control group trends, which could lead to an overstatement of the estimated impacts.

4.4 Descriptive analysis of local units moving to different types of new CPD

Analysis by CPD category

This section presents a descriptive analysis of the trends before and after moving to the new CPD in average employment, turnover and productivity of all local units in the treatment group. These trends are observed across different categories of CPDs to provide a comparative picture of the performance of local units moving to each category. An econometric analysis of the performance of local units moving to specific categories of CPD was beyond the scope of this study.

Figure 4-2 shows the average employees for local units moving to coworking spaces, incubators and science/research parks. Average employees for local units moving to coworking spaces increased steadily throughout the period and the pace of this growth picked up at period t+1, while for local units moving to incubators and science/research parks, average employees slumped in period t+2. In the post-treatment period, average employees of local units moving to science/research parks increased back to 11 jobs, while local units moving to incubators did not see a full recovery in average employees compared the pre-treatment level. In general, average employment coworking and science / research park has increased post-treatment but incubator has performed worse than pre-treatment period.



Source: IDBR.

Figure 4-2: Average employees for local units moving to Coworking spaces, Incubators and science / research parks over 2008-12

Figure 4-3 shows the average employees for local units moving to industrial CPDs, light industrial CPDs and offices. Light industrial experienced a large increase of average employees at the start of the post-treatment period but then returned to pre-treatment after four years. For industrial CPDs and offices, both experienced a slight decrease in average employees at the start of the post-treatment period but increased overall.

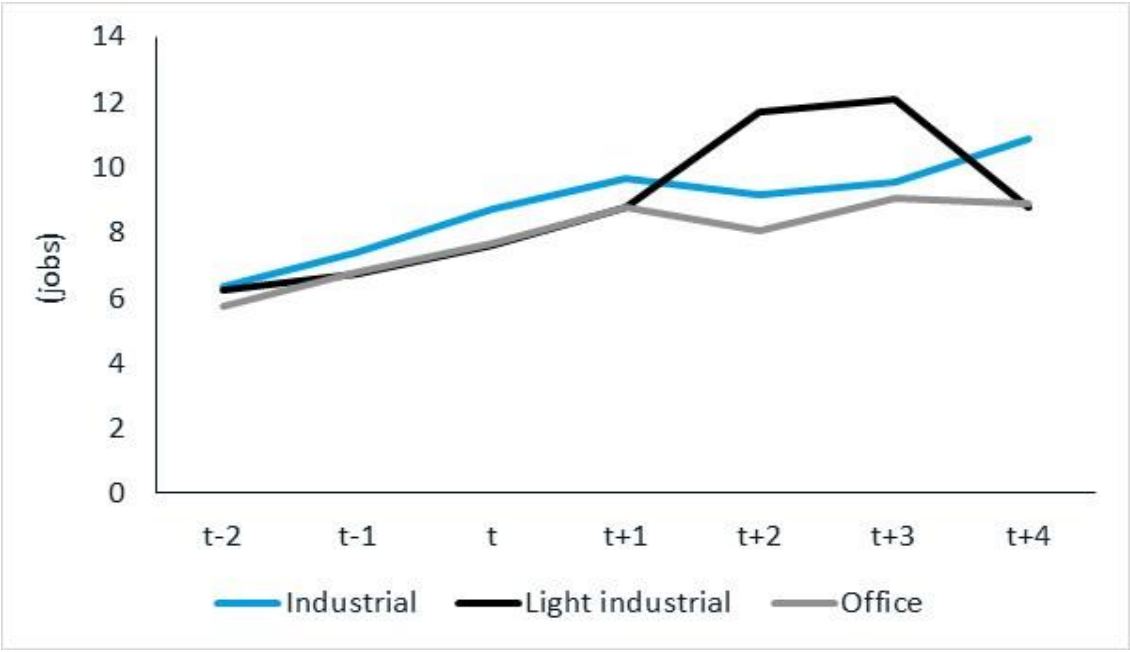
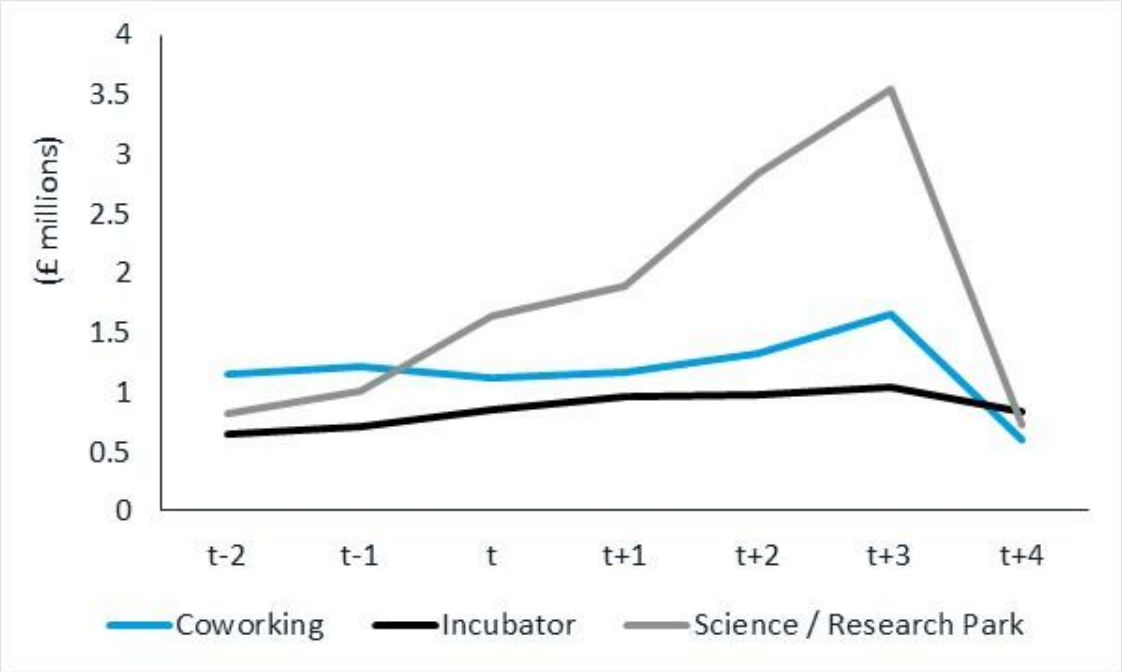


Figure 4-3: Average employees for local units moving to industrial, light industrial and office CPDs over 2008-12

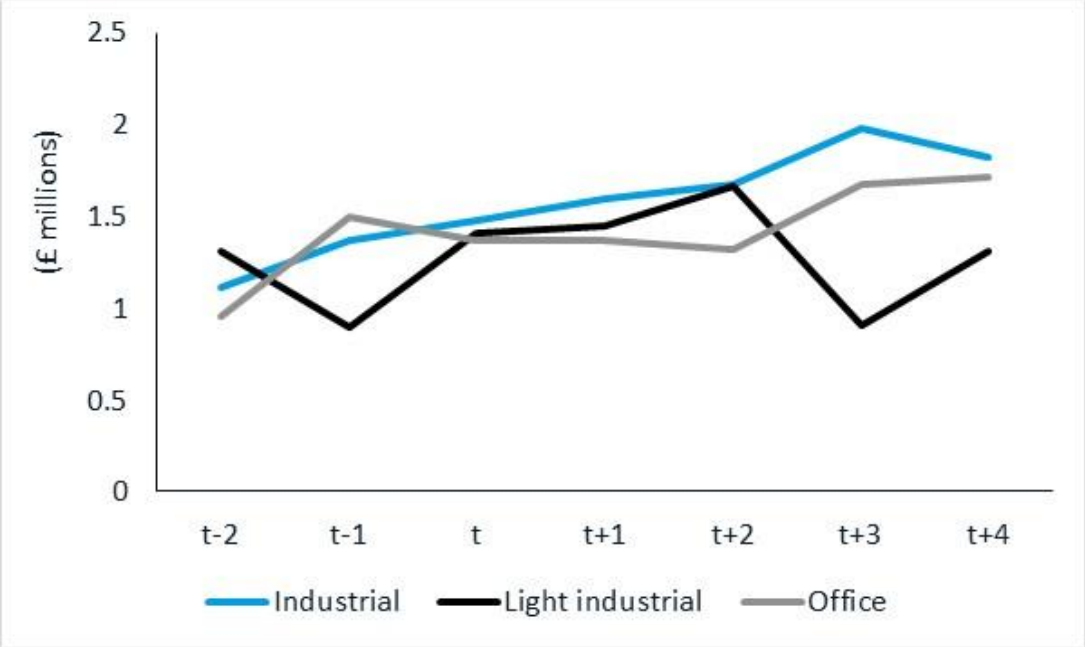
Figure 4-4 shows the average turnover for local units moving to coworking spaces, incubators and science/research parks. Average turnover for local units moving to coworking spaces and grew gently over the whole post-treatment period. Average turnover for local units moving to science / research park had been growing rapidly to around 3.5 million until post-treatment period t+3, then slumped to around 0.5 million, lower than pre-treatment period t-2.



Source: IDBR.

Figure 4-4: Average turnover for local units moving to coworking spaces, incubators and science / research parks over 2008-12

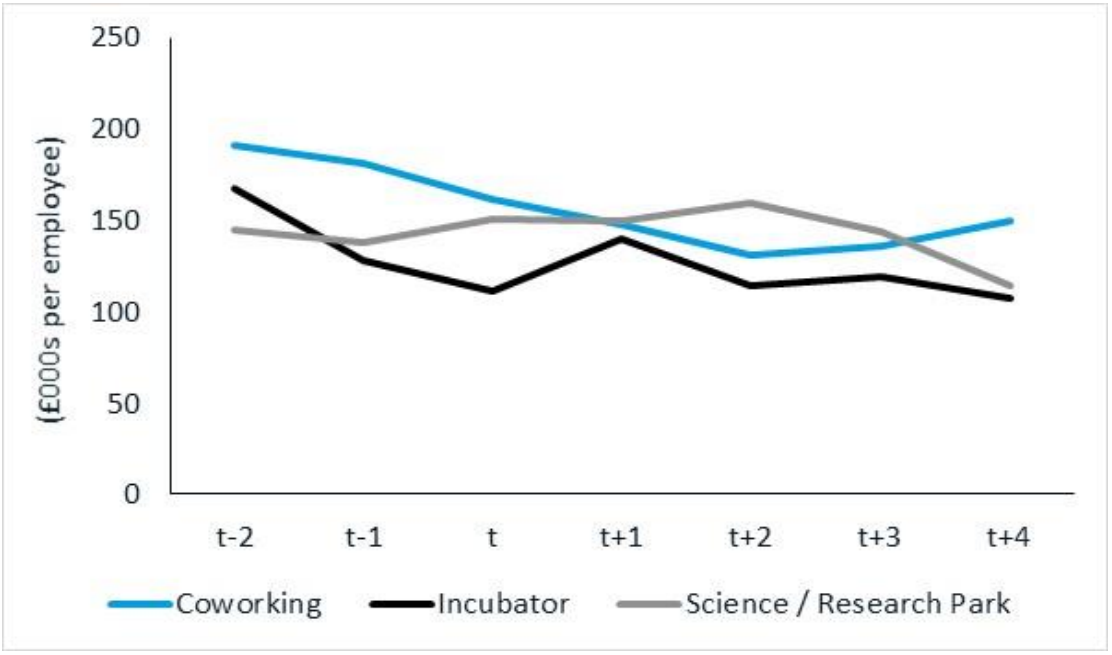
Figure 4-11 shows the average turnover for local units moving to industrial, light industrial and office CPDs. Average turnover for industrial has been growing steadily throughout the period but has not maintained its growth after post-treatment period t+3. Light industrial has increased average turnover between period t-1 and t+3 but slumped back to pre-treatment period level. Office experienced a big increase in average turnover pre-treatment and remained in that level until post-treatment period t+2, it slumped back to pre-treatment period level but started to increase in period t+4.



Source: IDBR.

Figure 4-5: Average turnover for local units moving to industrial, light industrial and office CPDs over 2008-12

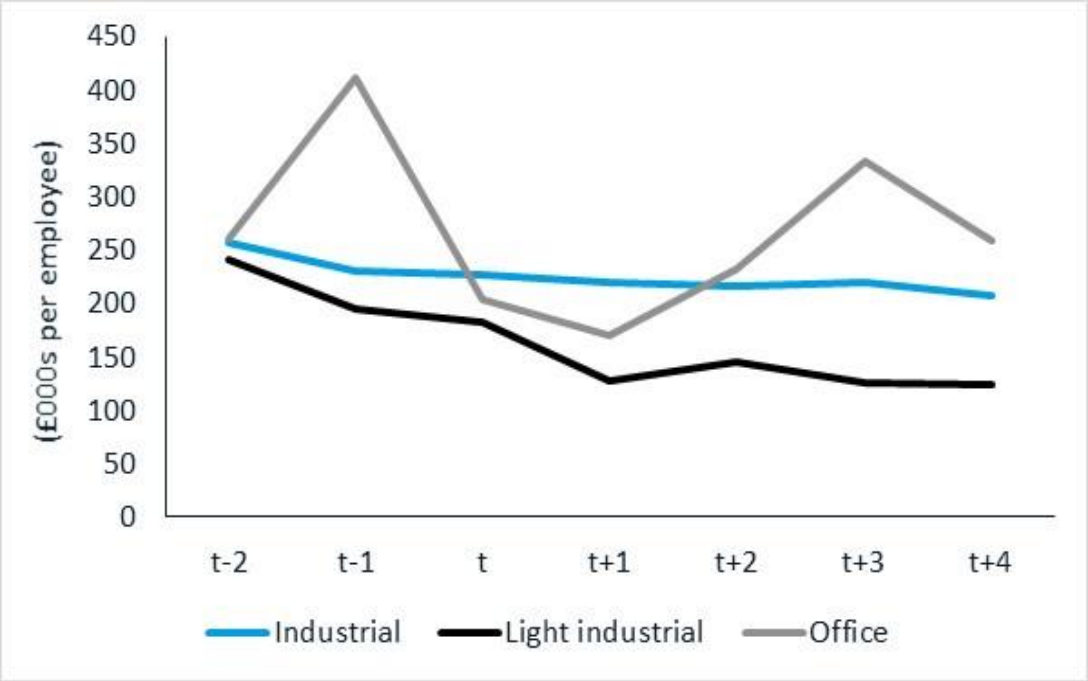
Figure 4-9 shows the average productivity for local units moving to coworking spaces, incubators and science/research parks. Average productivity for this fell across all three CPD categories over the full study period, though during this time average productivity levels fluctuated.



Source: IDBR.

Figure 4-6: Average productivity for local units moving to coworking spaces, incubators and science / research parks over 2008-

Figure 4-7 shows the average productivity for local units moving to industrial, light industrial and office CPDs. Average productivity for local units moving to industrial and light industrial CPDs decreased throughout the study period. Local units moving to offices saw large swings in average productivity, likely driven by the presence of large individual observations in the data.



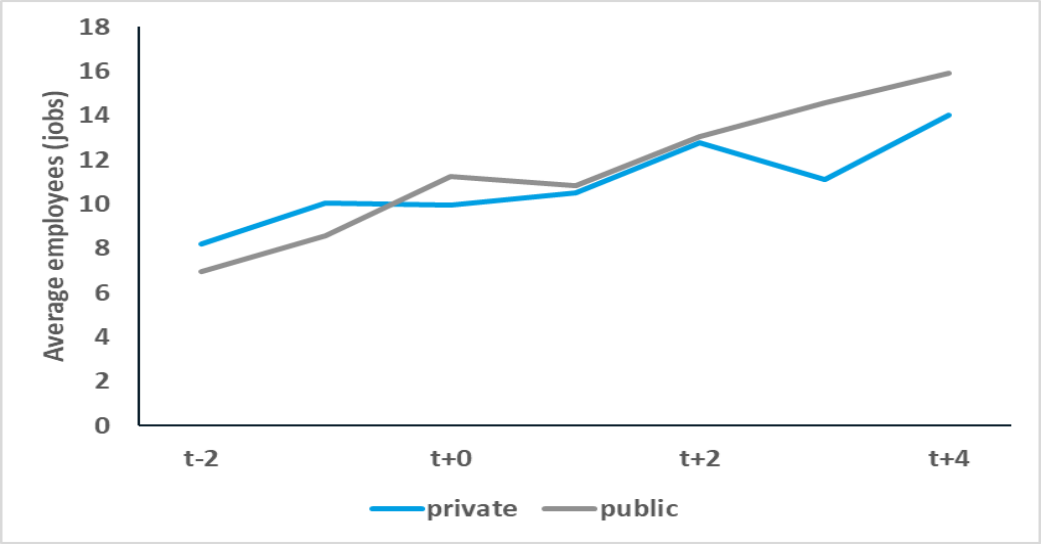
Source: IDBR.

Figure 4-7: Average productivity for local units moving to industrial, light industrial and office CPDs over 2008-12

Analysis by CPD funding type

We can also present the trends in performance of local units moving to publicly funded CPDs compared to those moving to privately funded CPDs over 2008-12. The funding information is gathered from Costar, and hence we have this information for the list of CPDs but not for the other types of property that the control group local units move to, limiting the feasibility of econometric analysis within this study.

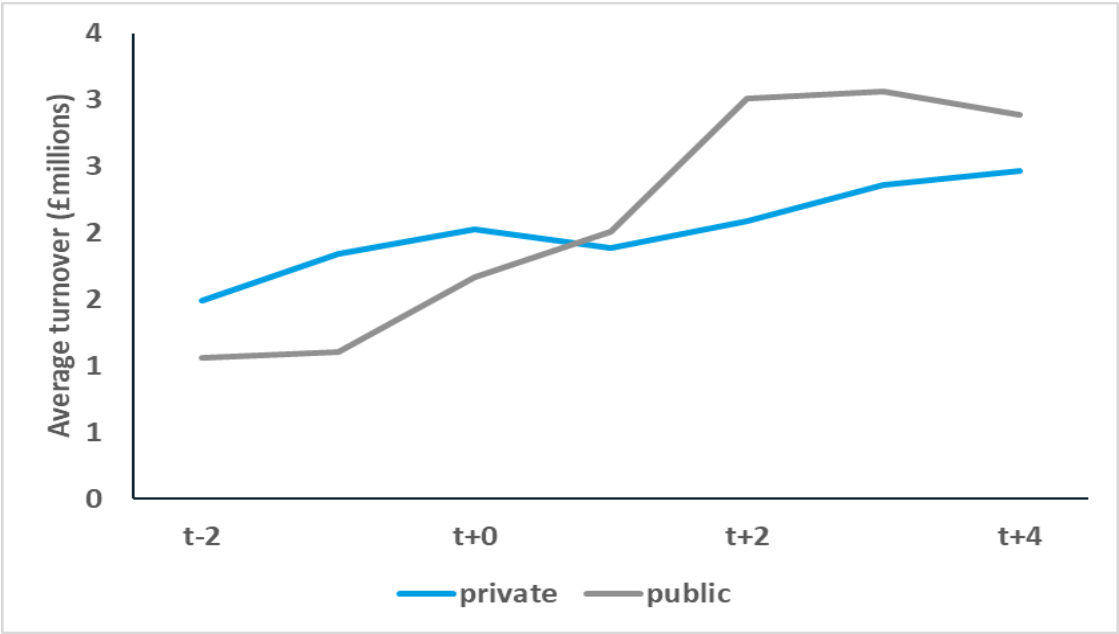
Figure 4-8 presents average employees local units moving to public and privately funded CPDs over 2008-12 from two years before the move (t=-2) to four years after the move (t=+4). Average employees in the two groups follow a similar increasing trend up to year t+2, but average employees of local units moving to publicly funded CPDs outstrips that of local units moving to privately funded CPDs in the last two years.



Source: IDBR.

Figure 4-8: Average employees of local units moving to public or privately funded CPDs over 2008-12

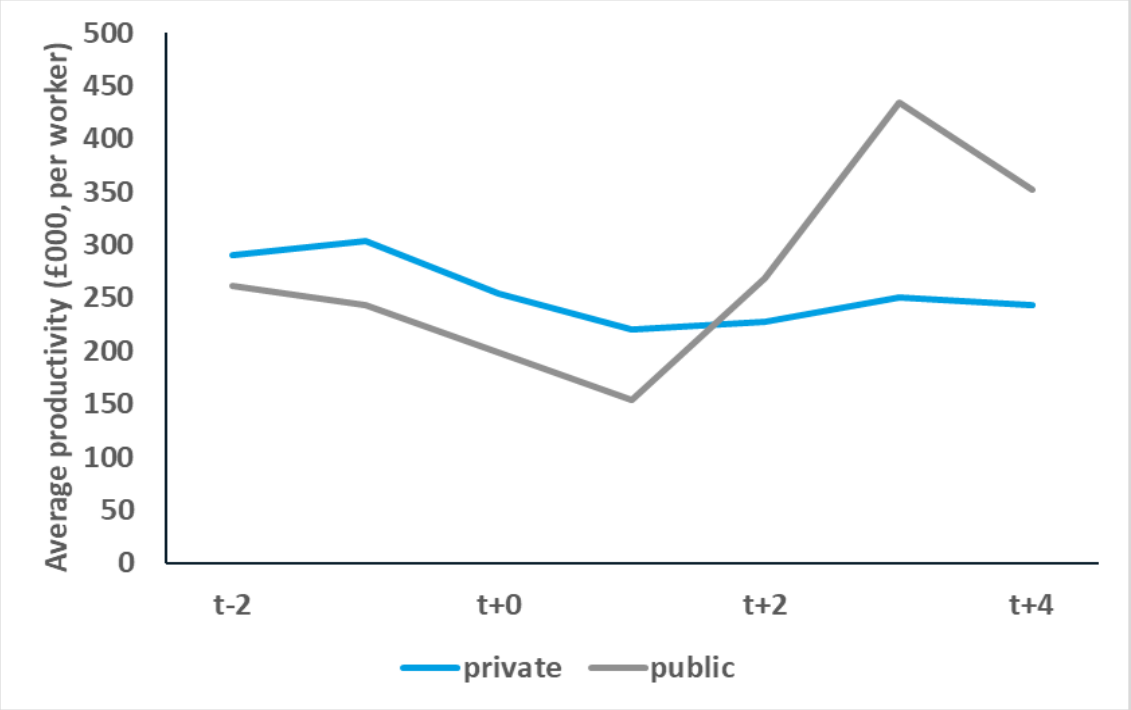
Figure 4-9 plots average turnover for local units moving to public and private funded CPDs. In the two years before the move turnover grew at a similar rate for the two groups. After moving, average turnover for the local units on publicly funded CPDs grew sharply for two years overtaking that of the other group, before falling a little over the next two years, but remaining markedly higher than the other group. In contrast, average turnover for the local units on privately funded CPDs dipped slightly at t+1, before growing steadily for the rest of the period, but overall by less than those on the publicly funded CPDs.



Source: IDBR.

Figure 4-9: Average turnover of local units moving to public or privately funded CPDs over 2008-12

Turning to average productivity, local units moving to both public and private funding CPDs saw similar falls in productivity from t-2 to t+1. From t+1 to t+3 average productivity grew rapidly for local units on the CPDs, with average productivity almost tripling, before falling in the last year but to a level still markedly higher than in the pre-move years. On the other hand, average productivity for local units moving to private funded CPDs grew modestly in the years after moving, and at t+4 was markedly lower than in the pre-move years. Figure 4-10 presents average productivity for local units moving to public and private funded CPDs.



Source: IDBR.

Figure 4-10: Average productivity of local units moving to public or privately funded CPDs over 2008-12

4.5 Estimation of impacts on local units of moving to a new CPD

Econometric specification

We estimated the ATT for the matched local units three years after moving using the difference-in-differences regression. To deal with the with problem of having treatments occurring in different years, the time dimension was rescaled so that t=0 in year before moving, t=1 in move year, t=4 three years after the move. The following econometric model was then estimated:

$$y_{it} = \alpha_t + \gamma_i + \delta D_{it} + \mu_{it}$$

Where α and γ are time and local unit fixed effects, respectively, D_{it} = $treatment_i$ x $post_t$ where treatment = 1 for local units i in the treatment group, otherwise 0, and post = 1 for years t in the post treatment period, otherwise 0. Y is the logged outcome variable, (i.e. employees, turnover and productivity). The difference-in-differences estimator is δ. The control local units are weighted in the regression using sample weights, based on the number of control local units matched to each treated local unit. This is done to correct any distortion arising from having different numbers of control local units matched to each treated local unit.

Results

The difference-in-differences estimation found positive, statistically significant impacts on employees and turnover levels after three years of moving to a new CPD compared to moving to another type of property. The estimations did not find evidence for productivity impacts, with no statistically significant impacts on any of the sample segments.

Table 4.4-3 presents the results from the difference-in-difference estimations on the matched sample of all local units moving over 2008-12 and estimated separately by move year. The results indicate a strong and statistically significant effect of moving to a new CPD on turnover and employees in each year after moving, with the effect growing in strength in each year. By t+4, the impact on employees stands at 14.8% and on turnover at 18.3%. The estimated productivity impacts are positive but not statistically significant, providing no conclusive evidence that productivity was increased as a result of moving to a new CPD.

Turning to the breakdown by move year, the results indicate stronger impacts on employees and turnover for local units moving in the earlier years compared to local units moving in the later years. For example, at t+4 the impacts on employees and turnover on local units moving over 2007-08 are estimated at around 26.4% and 24.1% respectively, while for local units moving over 2011-12 the impacts are estimated at around 9.1% and 9.9% respectively.

There is a particularly strong contrast between the turnover and employee impacts for local units moving over 2007-08, 2008-09 and 2009-10 compared to local units moving between 2010-11 and 2011-12. An analysis of survival rates of the treatment and control

groups moving in each year found that the control group had relatively low survival rates in the earlier years compared to the treatments group, which may then have driven the higher impacts on employees and turnover. Given the timing of these years around the 2008-09 recession, it appears there may be a link between the difficult economic climate of this time and lower chances of survival of CPDs moving to properties other than new CPDs relative to those moving to new CPDs. Nevertheless, this does not undermine the positive impacts estimated for employees and turnover, which are found across all move years.

Table 4.4-3: Estimated % impact after 1, 2, 3 and 4 years on employees, turnover and productivity of moving to a new CPD rather than an alternative property type

	t+1	t+2	t+3	t+4
Moving any year over 2007-12:				
Employees	11.2%***	12.3%***	13.7%***	14.8%***
Turnover	13.7%***	15.4%***	16.6%***	18.3%***
Productivity	2.0%	2.6%	2.6%	3.3%
Moving over 2007-08 only:				
Employees	25.1%***	23.1%***	24.7%***	26.4%***
Turnover	20.1%**	19.8%***	21.9%***	24.1%***
Productivity	-2.0%	-2.0%	-1.0%	-1.0%
Moving over 2008-09 only:				
Employees	14.6%***	16.5%***	17.4%***	18.2%***
Turnover	22.5%**	25.4%***	22.2%***	26.6%***
Productivity	0.4%	6.9%*	7.0%**	8.0%**
Moving over 2009-10 only:				
Employees	6.8%**	10.2%***	13.2%***	15.3%***
Turnover	13.1%**	17.6%***	20.6%***	22.9%***
Productivity	8.3%	6.0%	6.6%	7.0%
Moving over 2010-11 only:				
Employees	5.4%	6.2%	7.3%*	7.4%*
Turnover	6.4%	7.7%*	9.0%*	10.2%**
Productivity	-2.0%	0.0%	0.3%	1.1%
Moving over 2011-12 only:				
Employees	6.6%*	7.5%**	7.9%**	9.1%**
Turnover	8.0%**	8.7%**	9.3%**	9.9%**
Productivity	-2.0%	0.0%	0.3%	1.1%

Note: *, **, * indicate statistical significance at 1%, 5% and 10% respectively.**

Source: Inter-departmental business register (IDBR) and CE analysis.

Table 4.4-4 presents the estimated impacts on the local units in different productivity groups. Again, statistically significant and positive impacts on employees and turnover are detected in most cases, while no statistically significant impacts on productivity are detected. The strongest impacts are on local units which are already in the highest quartile of the productivity distribution, with impacts around 2-3pp higher than the impacts on the sample of local units in the top half of the productivity distribution. The robust productivity growth local see similar impacts as those in the top half of the distribution, which are also markedly lower than the estimated impacts on the full sample.

Table 4.4-4: Estimated % impact after 1, 2, 3 and 4 years on employees, turnover and productivity of moving to a new CPD rather than an alternative property type

	t+1	t+2	t+3	t+4
Robust productivity growth local units:				
Employees	7.8%**	8.3%**	9.0%**	9.2%**
Turnover	3.7%	6.8%	8.0%**	8.9%**
Productivity	-3.0%	-1.0%	0.0%	0.0%
Top half of productivity distribution				
Employees	7.9%***	8.2%***	9.0%***	9.7%***
Turnover	7.9%***	8.3%***	9.5%***	10.5%***
Productivity	0.2%	0.4%	0.7%	1.2%
Top quartile of productivity distribution				
Employees	11.6%***	11.5%***	12.4%***	13.1%***
Turnover	10.3%**	10.0%**	12.2%***	13.5%***
Productivity	0.0%	0.0%	1.0%	2.0%

Note: *, **, * indicate statistical significance at 1%, 5% and 10% respectively.**

Source: Inter-departmental business register (IDBR) and CE analysis.

Table 4.4-5 presents the results of the analysis for each UK Region. Positive and statistically significant impacts on employees and/or turnover are detected at least once for all regions apart from on Scotland, while no negative and statistically significant impacts are detected for any region. The strength of the estimated impact varies markedly across the regions, with the impact on employees ranging from 14.1% to 22.4% and the impact on turnover ranging from 14.3% to 45.4%. The Yorkshire and Humber and the North West regions both stand out as the only region to experience strong, statistically significant impacts on productivity at between 14.4% and 15.1% over the four impact periods, though these impacts are only statistically significant at the 10% level.

Table 4.4-5: Estimated % impact in 9 UK regions after 1, 2, 3 and 4 years on employees, turnover and productivity of moving to a new CPD rather than an alternative property type

	t+1	t+2	t+3	t+4
East Midlands				
Employees	10.3%	9.9%	10.1%	9.3%
Turnover	18.8%*	12.6%	9.3%	8.8%
Productivity	5.8%	2.1%	0.0%	0.0%
East of England				
Employees	14.0%**	14.0%**	16.5%***	17.6%***
Turnover	13.8%*	14.3%**	17.6%**	19.6%***
Productivity	1.1%	1.8%	2.7%	3.8%
London				
Employees	17.5%***	19.9%***	19.0%***	20.1%***
Turnover	11.6%**	15.5%***	17.7%***	19.7%***
Productivity	-3.9%	-2.0%	-2.0%	0.0%
North West				
Employees	13.7%**	15.0%**	15.6%**	16.1%**
Turnover	26.9%***	32.0%***	32.2%***	33.8%***
Productivity	12.0%*	14.9%**	14.1%*	14.5%*
Scotland				
Employees	4.4%	7.8%	15.7%	19.1%
Turnover	7.3%	10.2%	15.3%	17.1%
Productivity	2.8%	1.3%	0.5%	0.2%
South East				
Employees	8.9%*	10.7%*	12.2%**	14.1%**
Turnover	20.8%**	20.6%**	22.3%**	22.5%**
Productivity	10.4%	8.2%	8.1%	7.1%
South West				
Employees	18.9%***	20.4%***	22.1%***	22.4%***
Turnover	15.0%*	21.4%**	25.5%***	28.7%***
Productivity	-3.9%	0.1%	2.9%	6.0%
West Midlands				
Employees	10.8%**	12.6%*	14.2%*	15.8%**
Turnover	38.1%*	43.2%*	43.9%*	45.4%*
Productivity	29.9%	28.7%	27.0%	26.5%
Yorkshire and The Humber				
Employees	4.0%	3.8%	1.6%	1.8%
Turnover	20.0%**	19.0%*	14.9%*	15.3%
Productivity	14.8%*	15.1%*	14.5%*	14.3%*

Note: *, **, * indicate statistical significance at 1%, 5% and 10% respectively.**

Source: Inter-departmental business register (IDBR) and CE analysis.

Running the regression analysis over the five sectors indicates that the positive turnover and employee impacts are largely concentrated on service sector local units rather than

manufacturing sector local units. Estimated impacts on both employees and turnover are the strongest on the knowledge-intensive services, at around 18.8% and 20.8% respectively at t+4 (markedly higher than the impacts estimated on the whole sample). Non-knowledge intensive services also see strong impacts, though relatively lower at 11.5% for employees and 15.7% for turnover at the t+4 level. For the manufacturing sector and the low-tech manufacturing sub-sector (which comprises the majority of the manufacturing sector in the study sample), most of the estimated impacts are not statistically significant, with the two statistically significant impacts estimated on turnover only significant at the 10% level. Hence, there is only weak evidence for an impact on local unit turnover in the manufacturing sector.

Table 4.4-6: Estimated % impact in 5 UK sectors after 1, 2, 3 and 4 years on employees, turnover and productivity of moving to a new CPD rather than an alternative property type

	t+1	t+2	t+3	t+4
Manufacturing				
Employees	7.1%	7.0%	8.2%	9.4%
Turnover	7.9%	11.2%	13.3%*	12.9%*
Productivity	0.4%	2.5%	3.3%	2.1%
Low tech manufacturing				
Employees	3.0%	4.0%	3.9%	4.0%
Turnover	6.3%	11.5%	13.8%	13.0%
Productivity	2.9%	6.9%	8.3%	8.1%
Services				
Employees	11.2%***	12.1%***	13.4%***	14.7%***
Turnover	13.9%***	15.6%***	17.0%***	18.4%***
Productivity	3.6%	2.9%	2.9%	2.3%
Knowledge-intensive services				
Employees	12.9%***	14.8%***	16.8%***	18.8%***
Turnover	12.6%***	15.7%***	18.4%***	20.8%***
Productivity	-0.2%	0.8%	1.1%	1.9%
Non-knowledge-intensive services				
Employees	10.3%***	10.0%***	10.8%***	11.5%***
Turnover	15.0%***	15.0%***	15.3%***	15.7%***
Productivity	4.5%	4.7%	4.5%	4.7%

Note: *, **, * indicate statistical significance at 1%, 5% and 10% respectively.**

Source: Inter-departmental business register (IDBR) and CE analysis.

To summarise, positive impacts on employees and turnover of moving to a new CPD compared to another property were detected across many of the models estimated. These impacts tend to build over time, though with much of the impact realized over the first year since moving. No statistically significant and negative impacts were detected, and very few statistically significant productivity impacts were detected (only weakly significant effects

for two regions). Conducting the analysis on local units by move year revealed stronger impacts on firms moving over 2007-10, though positive and significant impacts on employees and turnover were found across all sample segments by move-year.

Splitting the sample by sector revealed that the impacts were particularly strong for knowledge-intensive service local units, while for manufacturing local units there were few impacts. For the productivity-based groups, the strongest impacts were on those with the highest productivity already, though again positive impacts on employees and turnover were found for all groups.

Lastly, the regional results were more varied, with some regions experiencing little impact, and some experiencing particularly large impacts. For two regional sample segments, Yorkshire and Humber and the North West, positive and statistically significant effects on productivity were estimated, though at only the 10% significance level.

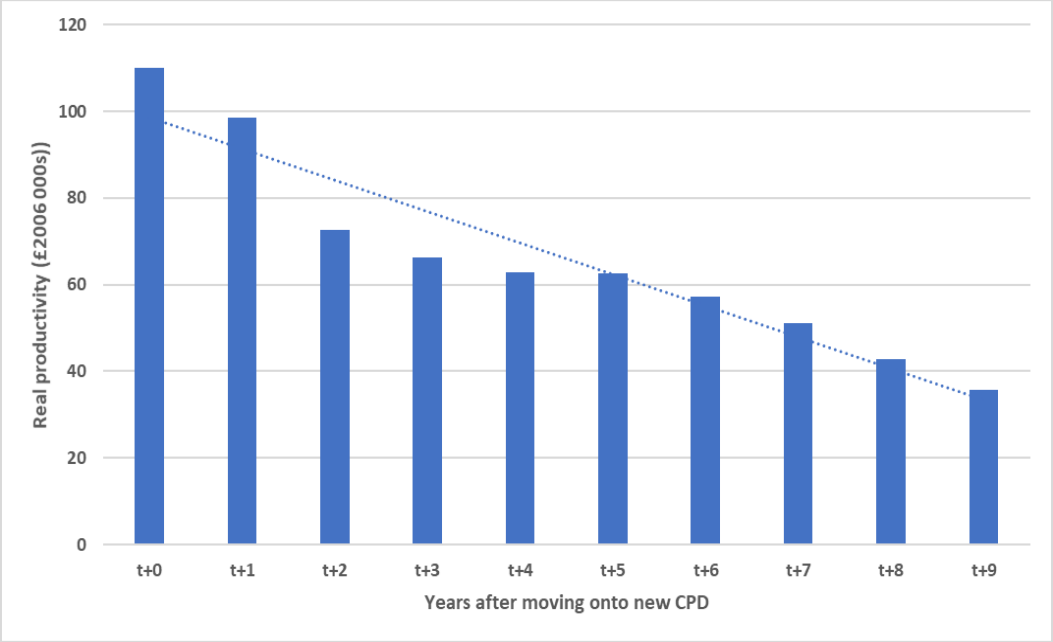
External validity

It is important to consider whether the estimated impacts might hold outside of the study period, and how timing of the move might affect these impacts. Indeed, the results from this study indicated stronger impacts on local units moving in the earlier years compared to those moving in the later years over the period 2008-12. It is thus necessary to consider the differences between local units moving in the earlier and later years and whether this could affect the magnitude of the impact of moving to a new CPD.

A comparison of the local units moving in each year across all the available years in our dataset (2006-16) reveals a clear declining trend in productivity in the year before moving to the CPD over time, depending on how long after the CPD opening the move occurs. Figure 4-11 plots geometric mean productivity[5] of local units in the year before moving, at different length periods after the opening of the CPDs. Interestingly, the more productive local units tend to move into the newly-opened CPDs sooner. Thus, there is evidently a correlation between the productivity of the local units moving onto the CPD and the magnitude of the impacts on employees and turnover. The productivity levels of local units

[5] The geometric mean is preferred to the arithmetic mean as the productivity data distribution is strongly skewed to the left (log-normal).

moving onto new CPDs is hence a significant factor when considering how local units might be affected in years outside of the study period.



Source: IDBR and CE calculations.

Figure 4-11: Geometric mean productivity of local units in the year before moving to a new CPD, by years after CPD opening

4.6 Conclusions

The results of this analysis suggest that moving to a new CPD facilitated growth in both employees and turnover of local units (relative to the impact of moving to another type of property), but without increasing productivity. Much of this impact is realised over the first year after moving; for all treated local units moving over 2008-12, the impact one year after moving was estimated at 11% higher and 14% higher for the level of employees and turnover respectively. Furthermore, the positive impacts on local unit employees and turnover are shown to build over time, over the four years after moving to the new CPD.

Conducting the analysis on local units by move-year revealed stronger impacts on firms moving over 2007-10 compared to those moving over 2010-12, although positive and significant impacts on employees and turnover were found across all sample segments by move-year. Further analysis of the sample found a strong correlation between how soon after the new CPDs had opened that local units had moved there and their productivity in the year before the move. Local units moving in the years closer to the opening of the new CPDs had higher productivity relative to local units moving into the CPDs in the later years. Given this correlation, the stronger impacts on employees and turnover in earlier

move-years appear to be linked to the higher productivity of the local units moving in these years relative to those moving in later years.

For the productivity-based groups, the strongest impacts were on those with the highest productivity already, though, again, positive impacts on employees and turnover were found for all groups. Splitting the sample by sector revealed that the impacts were particularly strong for knowledge-intensive service local units, while for manufacturing local units there were few impacts. The manufacturing local units in the study sample mainly operate in medium-tech and low-tech manufacturing sectors, and average productivity of these local units was markedly lower in the year before moving than that of the KIS services, again suggesting that initial productivity levels are linked to the size of the employee and turnover impacts from moving to a new CPD.

On the whole, the results by region also show positive impacts on employees and turnover. However, the size of these impacts are quite varied between regions, with some regions experiencing little impact, and some experiencing particularly large impacts. It is difficult to discern a clear pattern in the regional results, but it could be down to the mix of new CPDs in each region; further research would be required to unpack the regional factors that might be driving these findings. In addition, while in most cases the regional results did not show productivity impacts, for two regional sample segments, Yorkshire and the Humber and the North West, positive and statistically significant effects on productivity were estimated at the 10% significance level. Thus, there is some evidence that the productivity impacts of moving to a new CPD could be linked to the region.

5 Impact of new Commercial Property Developments on the surrounding area

5.1 Introduction

This chapter seeks to address hypothesis 2 of our study, which states that:

- *A geographic area adjacent to a newly-opened CPD will experience higher total employee growth, higher average productivity growth, and higher average wage growth in the following years, than an economically similar geographic area with no adjacent CPD.*

The chapter lays out our approach to assessing this hypothesis, the econometric methodology employed, and the estimation results. At the end of this chapter, the possible implications of these results are discussed and conclusions are drawn.

We employ regression analysis on two separate datasets in this section. To measure the impact of CPD openings on local turnover, employees and productivity the IDBR is used (building on the dataset constructed in phase 1 of the project).

Using the IDBR we look at impacts by aggregating local units at the postcode level over all local units in each postcode. In addition, we also run the analysis on *only* local units that were operating within a 5km radius of the new CPDs in the year before opening, thus excluding any local units that moved to the CPD in any year over the study period. We use this analysis to explore whether the aggregate postcode level impacts are driven by new local units moving to the local area or born there after the CPD opens, or whether the opening of the CPDs impacts on local units that were already located in the area.

To measure the impact on wages and occupational mix, the Annual Survey of Hours and Earnings (ASHE) dataset is used[6]. The data are again aggregated at the postcode level for this strand of the analysis.

5.2 Data processing

A substantial data processing task was required to construct the final dataset for econometric analysis. For each CPD a list of UK postcodes was identified corresponding

[6] https://discover.ukdataservice.ac.uk/catalogue/?sn=6689

to 5 concentric rings of 1km radius around that CPD. The concentric ring postcodes were then linked to all of the IDBR local units in each postcode over the study period (2007-15).

Building on the findings from Phase 1, local unit turnover was estimated based on the productivity (turnover/employment) of its corresponding enterprise[7]. The local unit turnover and employees data were then aggregated to the postcode level and productivity was calculated by dividing postcode level turnover by employees. Contrary to the data processing for the augmented dataset in Phase 1 where, no interpolation was used on the data, so that the econometric analysis would be based only the most accurate information available. This was done to avoid erroneous conclusions that could arise from interpolated data.

In addition to the employees and turnover data, two control variables were also processed from the IDBR data, measuring the share of knowledge intensive services[8] employment in each postcode, and the share of high-tech manufacturing[9] employment in each postcode. These types of industries were controlled for on the basis that they are high-growth industries. A variable for the number of local units in each postcode was also generated, for use in the case study analysis.

The wages data for this section is annual gross pay data recorded at individual level then aggregated to postcodes level and is obtained from the Annual Survey of Hours and Earnings. The wages data is structured as a panel with average wages and adjusted average wages recorded for each work postcode.

The concentric ring postcodes were also linked to all the ASHE individual observations in each postcode over the study period (2006-2016). The wages data were averaged across all individuals in each postcode address. In addition, normalised wages for each individual were calculated by dividing individual wages by the average wages in the individual's corresponding sector and particular occupational level. The normalised wage for each postcode was then calculated as the average of all the normalised wages across all individuals within that postcode.

[7] Turnover is not available directly for local units from the IDBR. The estimation of local unit turnover from enterprise turnover is thus the best available measure but is likely to introduce a degree of inaccuracy into the results depending on the extent to which the local unit's productivity matches its parent enterprise (which is an unknown). However, note that around 40% of enterprises have only 1 local unit, so for many of the local units in the sample, enterprise turnover should be a fully accurate proxy for local unit turnover.

[8] Using Eurostat's NACE Rev.2 code-based definition http://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Knowledge-intensive_services_(KIS)

[9] Using Eurostat's NACE Rev. 2code-based definition of high and medium-high tech manufacturing http://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:High-tech_classification_of_manufacturing_industries

5.3 Methodology

The approach to this analysis compares the performance of local units at different distances from the new CPDs (drawing on recent analysis by Gibbons et al). This is done by comparing the postcode level data across the five concentric rings and the CPD postcodes themselves. The study period is 2006-15, with the sample limited to CPDs with first year of development before 2013 (or earlier for some estimations). This ensures that there is sufficient time after the opening of the CPDs to be able to detect their effects.

The following econometric model is estimated across a range of different outcome variables and sample segmentations:

$$\Delta yit = \mu + \sum_{K}^{k} \beta D_i^k + x'_{i0}\gamma_i + \varepsilon_{it}$$

Where Δy_i is the log change [10]in the outcome variable (i.e. productivity, employees and turnover) at postcode i at time t. D_i^k are dummy variables taking a value of 1 if there is a CPD within distance band k of postcode i, 0 otherwise. This includes a dummy variable that takes a value of 1 if a postcode matches that of a CPD, this picking up the effect on local unit performance on the CPD itself. Note that the 4-5km dummy is the omitted dummy variable, and so the estimated coefficients β measure the impact on each concentric ring relative to the 4-5km concentric ring. x'_{i0} is a vector of control variables: nearest-CPD fixed-effects are controlled for by including dummy variables indicating the nearest CPD to each postcode; two additional postcode level controls are included – the share of total employees working in Knowledge Intensive Services (KIS), and the share of total employees working in High-Tech Manufacturing (HTM).

For the analysis on ASHE data, we apply a similar model as above. However, we also include other control variables which are the share of total employees working in each occupational level (from 1 to 9). Note that the regression model for normalised wages does not have any postcode level control since it has already taken into account the effect of occupation and sectors by dividing the wage data by the average wage of the corresponding occupation and sector.

A further model is estimated for the growth of high level occupations using the following model:

$$\Delta o_{it} = \mu + \sum_{K} \beta^k D_i^k + x'_{i0}\gamma_i + \varepsilon_{it}$$

Where Δo_{it} is the change in share of total employees working at high occupational level (occupation level 1 to 3). Two additional postcode level controls are also included – the

[10] Since the outcome variable distributions are skewed to the left, logs are used to better approximate a normal distribution.

share of total employees working in Knowledge Intensive Services (KIS), and the share of total employees working in High-Tech Manufacturing (HTM).

For this analysis all estimated impacts are presented using the beta coefficient from the model. These impacts can be translated into percentage point impacts on growth. To do this, first take the exponential of the coefficient, then subtract 1, then multiply by 100. For example if the model is estimated for employees over ten years of data and the coefficient on the 1-2km ring is 0.5, then the percentage point impact on employee growth is (exp(0.5)-1)x100=64.9. In other words, the estimate would indicate that, due to the new CPDs, employee growth in the 1-2km rings was 64.9 percentage points higher over the whole ten years compared to that of the 4-5km rings.

5.4 Estimation of impacts of new CPDs on employees, turnover and productivity

The results from the IDBR analysis are presented in this section, investigating the impacts of new CPDs on local employee growth, turnover growth and productivity growth. Firstly, the impacts on all local units in the 5km radius around the new CPDs are presented. Then, the impacts on only local units that were operating in the area in the year before the opening of the CPDs are presented.

Impact on all local units in the 5km radius around the CPDs

Table 5-1 shows the results from the model estimated across all CPDs over the period 2006-15. The CPDs are limited to those with the first year of development before 2013[11].

Table 5-1: Concentric rings estimates across all CPDs over the period 2006-15 for three models: baseline (no controls); with nearest CPD fixed effects; and with nearest CPD fixed effects and postcode level controls

Employees, logs						
Model:	0 km	0-1 km	1-2 km	2-3 km	3-4 km	4-5 km
baseline	0.44***	0.03*	0.08***	0.07***	0.09***	-
nearest CPD f.e.	0.39***	-0.05***	-0.01	-0.02*	0.00	-
Nearest CPD f.e. + postcode level controls	0.41***	-0.01	0.01	-0.01	0.01	-
Turnover, logs						
Model:	0 km	0-1 km	1-2 km	2-3 km	3-4 km	4-5 km
baseline	0.71***	0.14***	0.19***	0.20***	0.21***	-
nearest CPD f.e.	0.52***	-0.05*	-0.01	-0.01	0.00	-
Nearest CPD f.e. + postcode level controls	0.56***	-0.03	0.00	-0.01	0.00	-
Productivity, logs						

[11] Very similar results are found when restricting CPDs to those with first year of development before 2010.

Model:	0 km	0-1 km	1-2 km	2-3 km	3-4 km	4-5 km
baseline	0.26***	0.12***	0.12***	0.13***	0.12***	-
nearest CPD f.e.	0.14**	-0.01	0.00	0.01	0.00	-
Nearest CPD f.e. + postcode level controls	0.16***	-0.02*	-0.02*	0.00	0.00	-

Note: *, **, * indicate statistical significance at 1%, 5% and 10% respectively. Impacts are β coefficients from the regression model.**

The baseline estimates for all three variables indicate that strong performance occurred in the inner 4 concentric rings compared to the outer ring. The effect of the CPD itself on local unit performance is also clearly picked up by the model, with strong positive impacts across the specifications in the CPD postcodes. Controlling for nearest-CPD fixed effects indicates small displacement effects on the 0-1km and 2-3km rings for employee growth and the 0-1km ring for turnover growth. However, these effects are no longer statistically significant when adding in the postcode level controls, suggesting that the effects may be linked to postcode-specific factors rather than the opening of the CPD. On the other hand, after adding in the postcode level controls, statistically significant displacement effects are evident on productivity growth in the 0-1km and 1-2km rings, though these are relatively small compared to the productivity growth increase observed on the CPD postcode itself.

Table 5-2 presents the results of the same model estimated across all CPDs over different time periods, each period starting from 2006 but increasing by one year at time. The model is only estimated for CPDs with last year of development before 2009, so that postcodes around CPDs which do not open during the model time period are not included. The results are presented for the specification with the full set of controls in order to best isolate the causal impact of the CPDs.

Table 5-2: Concentric rings estimates across all CPDs over time periods starting in 2006 and increasing in length, estimated only for CPDs with last year of development before 2009, model with full controls only

Employees, logs							
Distance:	-2009	-2010	-2011	-2012	-2013	-2014	-2015
0 km	0.178*	0.269***	0.265***	0.350***	0.305***	0.268**	0.418**
0-1 km	-0.021	-0.013	-0.023	-0.025*	-0.020	-0.027	-0.018
1-2 km	-0.031***	-0.018*	-0.018	-0.028***	-0.006	-0.026*	0.008
2-3 km	-0.012	-0.122	-0.018	-0.022*	-0.021	-0.012	-0.015
3-4 km	-0.002	-0.001	-0.006	0.000	-0.005	-0.002	0.008
4-5 km	-	-	-	-	-	-	-
Turnover, logs							
Distance:	-2009	-2010	-2011	-2012	-2013	-2014	-2015
0 km	0.184	0.455***	0.444***	0.424***	0.392***	0.254*	0.513***
0-1 km	-0.036*	-0.014	-0.044**	-0.043**	-0.020	-0.038*	-0.045**
1-2 km	-0.032**	-0.011	-0.025*	-0.027**	-0.006	-0.031*	-0.015
2-3 km	-0.019	-0.014	-0.161	-0.018	-0.019	-0.012	-0.025*

3-4 km	-0.006	-0.000	-0.008	0.003	0.006	-0.009	0.003
4-5 km	-	-	-	-	-	-	-
Productivity, logs							
Distance:	-2009	-2010	-2011	-2012	-2013	-2014	-2015
0 km	0.008	0.186**	0.180**	0.073	0.094	-0.014	0.095
0-1 km	-0.016	-0.000	-0.012	-0.192	0.001	-0.011	-0.029*
1-2 km	-0.001	0.007	-0.007	0.001	-0.001	-0.005	-0.023*
2-3 km	-0.007	-0.002	0.002	0.003	0.002	-0.000	-0.011
3-4 km	-0.005	0.000	-0.002	0.003	0.012	-0.007	-0.004
4-5 km	-	-	-	-	-	-	-

Note: *, **, * indicate statistical significance at 1%, 5% and 10% respectively. Impacts are "β" coefficients from the regression model.**

The estimations find statistically significant displacement effects on employee growth and turnover growth in the first three rings in many of the models as the time period increases. These effects appear particularly frequently in the turnover growth estimates, while for both employees and turnover the effects don't appear to diminish over time. The displacement effects are concentrated in the inner two rings – only one statistically significant displacement effect was estimate for the 2-3km ring (for turnover in over 2006-15). No statistically significant displacement effects were estimated for the 3-4km ring across any of the outcome variables.

An alternative approach to looking at the impact of new CPDs over different lengths of time is to estimate the model with a rescaled time dimension, so that the time variable corresponds to the number of years after the opening of the CPD. Using this approach, the model was again estimated over different time periods, each increasing by a year and starting from the year before the opening of the CPDs. The results are presented in Table 5-3 below:

Table 5-3: Concentric rings estimates across all CPDs over time periods starting from the year before the opening of the CPD and each increasing in length by one year, estimated for all CPDs with data available over the given time period, model with full controls only

Employees, logs							
Distance:	t+1	t+2	t+3	t+4	t+5	t+6	t+7
0 km	-0.066	0.054	0.210**	0.304***	0.261***	0.159	0.207*
0-1 km	-0.051***	-0.022	0.013	-0.000	-0.010	-0.014	-0.054**
1-2 km	-0.031***	-0.023**	-0.016**	-0.012	-0.004	0.003	-0.010
2-3 km	-0.014	-0.005	-0.003	-0.004	-0.009	-0.012	-0.018
3-4 km	-0.011	0.004	0.005	0.002	0.002	-0.001	-0.002
4-5 km	-	-	-	-	-	-	-
Turnover, logs							
Distance:	t+1	t+2	t+3	t+4	t+5	t+6	t+7

0 km	-0.038	0.104	0.320***	0.417***	0.372***	0.253*	0.281*
0-1 km	-0.050***	-0.014	0.020	0.024	0.004	0.002	-0.034
1-2 km	-0.018	-0.014	-0.001	-0.002	0.009	0.018	-0.005
2-3 km	-0.011	-0.001	-0.005	-0.007	-0.007	-0.008	-0.016
3-4 km	-0.005	0.007	0.000	0.008	0.011	0.010	0.005
4-5 km	-	-	-	-	-	-	-
Productivity, logs							
Distance:	t+1	t+2	t+3	t+4	t+5	t+6	t+7
0 km	0.023	0.049	0.110*	0.113*	0.111*	0.094	0.074
0-1 km	0.016	0.009	0.008	0.026**	0.0145	0.0170	0.016
1-2 km	0.0129*	0.009	0.0158**	0.010	0.0138*	0.016	0.005
2-3 km	0.003	0.003	-0.003	-0.003	0.002	0.003	0.002
3-4 km	0.006	0.004	-0.005	0.006	0.009	0.011	0.007
4-5 km	-	-	-	-	-	-	-

Note: *, **, * indicate statistical significance at 1%, 5% and 10% respectively. Impacts are "β" coefficients from the regression model.**

There are several interesting findings from Table 5-3. For employee growth and turnover growth, positive and statistically significant impacts were not detected on the CPD postcode until three years after opening. In contrast, several negative and statistically significant impacts on employee growth and turnover growth were estimated in the inner two rings over the first few years, particularly on employee growth. These displacement effects largely disappear over the longer time periods, though a displacement effect on employee growth was detected for the t+7 model. In addition to the impacts on employee and turnover growth, statistically significant effects were estimated on productivity, with strong positive effects on CPD postcodes in the t+3, t+4 and t+5 models, but also weaker positive effects in the inner 2km rings in several instances. Unlike for employee growth and turnover growth, no displacement effects were detected on productivity growth.

The results of model estimates (with full controls) for five categories of CPD over 2006-15 are presented in Table 5-4.

Table 5-4: Concentric rings estimates across all five categories of CPD over the period 2006-15, full model only

Employees						
Sample segment:	0 km	0-1 km	1-2 km	2-3 km	3-4 km	4-5 km
Incubator	0.803***	-0.005	0.046	0.079	0.098**	-
Industrial	0.380***	-0.016	0.013	-0.014	0.005	-
Light industrial	0.415	-0.019	0.016	-0.023	0.017	-
Office	0.249	0.006	0.015	-0.021	-0.003	-
Science/research park	0.675	0.075	0.055	0.023	-0.007	-

Turnover						
Sample segment:	0 km	0-1 km	1-2 km	2-3 km	3-4 km	4-5 km
Incubator	1.338***	-0.019	0.013	0.065	0.066**	-
Industrial	0.445***	-0.008	0.007	-0.019	0.013	-
Light industrial	0.310	-0.012	0.030	0.008	-0.006	-
Office	0.600*	-0.050	-0.018	-0.011	0.000	-
Science/research park	1.124**	0.090	0.052	0.007	-0.031	-
Productivity						
Sample segment:	0 km	0-1 km	1-2 km	2-3 km	3-4 km	4-5 km
Incubator	0.535**	-0.014	-0.033	-0.014	-0.032	-
Industrial	0.065	0.008	-0.006	-0.005	0.008	-
Light industrial	-0.105	0.007	0.014	0.030	-0.023	-
Office	0.350*	-0.056**	-0.033**	0.010	0.002	-
Science/research park	0.449*	0.015	-0.003	-0.016	-0.024	-

Note: *, **, * indicate statistical significance at 1%, 5% and 10% respectively. Impacts are "β" coefficients from the regression model.**

The strongest impacts on employee growth, turnover growth and productivity growth on the CPD postcodes themselves appears to occur at incubator sites, with science/research parks also seeing particularly strong growth. The strong impact on productivity growth in incubators and science/research parks do not appear cause displacement, while for offices, which also see a strong uplift in productivity growth, statistically significant displacement occurs in the 0-1km and 1-2km rings.

The sample can also be segmented by geography. Table 5-7 presents two sets of estimates, one for CPDs in the greater London region, and one for all CPDs not in the greater London region.

Table 5-5: Concentric rings estimates over 2006-15 across all CPDs in Greater London, and all CPDs outside Greater London, model with full controls only

Employees, logs						
Model:	0 km	0-1 km	1-2 km	2-3 km	3-4 km	4-5 km
CPDs in Greater London	0.456	0.012	0.053	0.006	-0.005	-
CPDs outside Greater London	0.405***	-0.018	0.005	-0.014	0.010	-
Turnover, logs						
Model:	0 km	0-1 km	1-2 km	2-3 km	3-4 km	4-5 km
CPDs in Greater London	0.655	0.018	0.021	0.011	-0.006	-
CPDs outside Greater London	0.560***	-0.044**	-0.010	-0.016	0.009	-
Productivity, logs						
Model:	0 km	0-1 km	1-2 km	2-3 km	3-4 km	4-5 km

CPDs in Greater London	0.198	0.006	-0.031	0.006	-0.002	-
CPDs outside Greater London	0.154***	-0.028*	-0.016	-0.002	-0.002	-

Note: *, **, * indicate statistical significance at 1%, 5% and 10% respectively. Impacts are "β" coefficients from the regression model.**

The estimates for CPDs in Greater London indicate that the model may not be picking up causal impacts for these CPDs, with no statistically significant impacts detected even at the CPD postcodes. This may reflect the highly concentrated business activity in London – making it difficult to disentangle the impacts of the new CPDs from other developments not in the sample. Looking at the estimates for CPDs outside Greater London, the coefficients on the CPD postcode dummies are similar to the model estimated across all CPDs, again suggesting that the impact of CPDs in Greater London has not been detected in the model estimated across all CPDs.

The model was also run by region, with the results presented in Table 5-6 below. The findings were mixed – for many regions statistically significant effects on employee and turnover growth were not picked up on the CPD postcodes, perhaps indicating the sample is not sufficiently large when estimating the model over this level of detail. Looking at the statistically significant effects on the rings, there were a mix of positive and negative effects detected on employment and turnover growth. There were also a handful of statistically significant impacts estimated for productivity growth, with three strong effects on the CPD postcode itself estimated for East of England, South East and Yorkshire and the Humber. Interestingly, positive and significant effects on productivity growth on the 3-4km ring were also estimated for the North West and Wales. This could be due to the mix of new CPDs, or types of firm, in each region, but further analysis would be required to unpack this.

Table 5-6: Concentric rings estimates over 2006-15 across 11 UK regions, model with full controls only

Employees						
Sample segment:	0 km	0-1 km	1-2 km	2-3 km	3-4 km	4-5 km
East Midlands	0.482	-0.103**	0.001	-0.040	0.009	-
East of England	0.253	0.021	0.019	-0.022	-0.011	-
Greater London	0.457	0.012	0.052	0.005	-0.005	-
North East	0.528	0.086	-0.007	0.043	0.028	-
North West	0.063	-0.012	0.021	-0.039	0.028	-
Scotland	0.281*	0.020	0.023	0.044	0.061	-
South East	0.720***	-0.017	0.054**	0.007	0.035	-
South West	0.391	-0.009	0.058	0.006	0.043	-
Wales	0.462	-0.034	-0.021	-0.003	-0.066**	-
West Midlands	0.879***	-0.053	-0.064*	-0.041	0.012	-
Yorkshire and the Humber	-0.099	0.090**	-0.034	0.010	-0.021	-
Turnover						

Sample segment:	0 km	0-1 km	1-2 km	2-3 km	3-4 km	4-5 km
East Midlands	0.175	-0.113*	-0.047	-0.022	0.020	-
East of England	0.752**	-0.030	0.014	-0.009	-0.034	-
Greater London	0.655	0.018	0.0214	0.011	-0.006	-
North East	0.339	0.130	-0.102	-0.015	0.105	-
North West	0.267	0.004	0.045	-0.028	0.072***	-
Scotland	0.287*	-0.071	0.005	0.042	0.014	-
South East	0.984***	0.006	0.052*	0.021	0.019	-
South West	0.377	-0.091	0.011	-0.004	0.059	-
Wales	0.714	-0.031	0.009	0.007	0.019	-
West Midlands	1.007**	-0.098**	-0.068	-0.063	0.005	-
Yorkshire and the Humber	0.267	-0.005	-0.029	0.026	-0.050	-
Productivity						
Sample segment:	0 km	0-1 km	1-2 km	2-3 km	3-4 km	4-5 km
East Midlands	-0.308	-0.010	-0.048	0.018	0.010	-
East of England	0.499*	-0.050	-0.005	0.013	-0.023	-
Greater London	0.198	0.006	-0.031*	0.006	-0.002	-
North East	-0.189	0.044	-0.095	-0.058	0.077	-
North West	0.205	0.016	0.024	0.011	0.043**	-
Scotland	0.006	-0.091	-0.019	-0.002	-0.046	-
South East	0.264*	0.023	-0.002	0.014	-0.016	-
South West	-0.014	-0.083	-0.047	-0.011	0.016	-
Wales	0.252	0.003	0.030	0.011	0.085**	-
West Midlands	0.128	-0.045	-0.004	-0.022	-0.015	-
Yorkshire and the Humber	0.366***	-0.095	0.004	0.016	-0.030	-

Note: *, **, * indicate statistical significance at 1%, 5% and 10% respectively. Impacts are "β" coefficients from the regression model.**

Impacts on local units operating in the area in the year before the CPD openings

This section looks at the impact of the opening of new CPDs on local units which were already operating in the area around the CPDs in the year before they opened.

Table 5-7 presents the impacts of CPD openings at yearly intervals after the opening of the new CPDs. The results indicate negative impacts on employee and turnover growth, mainly concentrated in the inner 2 rings around the CPDs. On the other hand, positive and statistically significant impacts on productivity growth are evident, again in the inner 2 rings around the CPD.

Table 5-7: All local units operating in the local area in the year before the CPD opening

Employees, logs							
Distance:	t+1	t+2	t+3	t+4	t+5	t+6	t+7
0-1 km	-0.075***	-0.012***	-0.039***	-0.070***	-0.078***	-0.089***	-0.102***
1-2 km	-0.037***	-0.029***	-0.016***	-0.029***	-0.043***	-0.041***	-0.043**

2-3 km	-0.016**	-0.008	-0.002	-0.013	-0.022*	-0.012	-0.011
3-4 km	-0.003	0.003	0.008	0.002	-0.009	-0.010	0.012
4-5 km	-	-	-	-	-	-	-
Turnover, logs							
Distance:	t+1	t+2	t+3	t+4	t+5	t+6	t+7
0-1 km	-0.072***	-0.046***	-0.023	-0.041**	-0.057***	-0.049**	-0.072**
1-2 km	-0.40***	-0.024*	-0.001	-0.015	-0.031*	-0.016	-0.016
2-3 km	-0.020**	-0.004	0.009	-0.001	-0.009	0.008	0.003
3-4 km	-0.004	-0.000	0.006	0.008	-0.005	-0.017	0.001
4-5 km	-	-	-	-	-	-	-
Productivity, logs							
Distance:	t+1	t+2	t+3	t+4	t+5	t+6	t+7
0-1 km	0.003	0.017**	0.018*	0.029***	0.022*	0.043***	0.031*
1-2 km	-0.003	0.005	0.016*	0.015	0.012	0.026**	0.028*
2-3 km	-0.004	0.004	0.011	0.012	0.013	0.019	0.014
3-4 km	-0.001	-0.003	-0.000	0.007	0.004	-0.006	-0.11
4-5 km	-	-	-	-	-	-	-

Note: *, **, * indicate statistical significance at 1%, 5% and 10% respectively. Impacts are "β" coefficients from the regression model.**

At the regional level, the findings are broadly line with the whole UK estimates, with negative and statistically significant impacts detected on employee and turnover growth in the inner 2 rings (and with a few of such impacts in the 2-3km and 3-4km rings). However, the presence of statistically significant impacts is uneven between regions and rings. For Wales, Scotland and Greater London, no statistically significant impacts were estimated on employee growth or turnover growth. For the productivity growth impacts, only three (East of England, North East and Yorkshire and the Humber) of the eleven regions see any positive and statistically significant effects, while for the North West, negative productivity growth impacts are estimated on the inner 2 rings. Table 5-8 presents the results by region for local units already operating around the CPDs in the year before opening.

Table 5-8: all local units operating in year before opening - regions

Employees, logs					
Sample segment:	0-1km	1-2km	2-3km	3-4km	4-5km
East Midlands	-0.185***	-0.091	-0.001	0.024	-
East of England	-0.123*	-0.101*	-0.026	-0.094***	-
Greater London	-0.069	-0.017	0.027	0.008	-
North East	-0.272***	-0.150***	-0.013	-0.072	-
North West	-0.119**	-0.021	0.033	0.056	-
Scotland	0.038	0.003	0.095	0.081	-
South East	-0.078**	-0.031	-0.038	-0.004	-

South West	0.212***	-0.089*	-0.099**	-0.008	-
Wales	-0.092	0.046	-0.012	0.107	-
West Midlands	-0.082	-0.074*	-0.063	0.019	-
Yorkshire and the Humber	-0.151***	-0.080**	-0.051	-0.011	-
Turnover, logs					
Sample segment:	0-1km	1-2km	2-3km	3-4km	4-5km
East Midlands	-0.224***	-0.147**	-0.061	-0.017	-
East of England	-0.030	-0.027	0.045	-0.069	-
Greater London	-0.010	0.062	0.078	0.055	-
North East	-0.204*	-0.218**	0.011	0.065	-
North West	-0.005	0.060	0.127***	0.097**	-
Scotland	0.081	0.057	0.162	0.082	-
South East	-0.080	-0.023	-0.011	-0.033	-
South West	-0.175**	-0.052	-0.064	-0.020	-
Wales	-0.006	0.070	0.016	0.155	-
West Midlands	-0.045	-0.068	-0.051	0.015	-
Yorkshire and the Humber	-0.086	0.005	0.104*	-0.047	-
Productivity, logs					
Segment:	0-1km	1-2km	2-3km	3-4km	4-5km
East Midlands	-0.038	-0.056	-0.060	-0.041	-
East of England	0.093**	0.074**	0.071*	0.026	-
Greater London	0.059	0.078**	0.051	0.047	-
North East	0.114***	0.081**	0.094***	0.041	-
North West	-0.286***	-0.321***	-0.184	-0.150	-
Scotland	0.042	0.054	0.068	0.002	-
South East	-0.002	0.008	0.027	-0.029	-
South West	0.037	0.038	0.035	-0.012	-
Wales	0.076	0.024	0.028	0.048	-
West Midlands	0.037	0.006	0.013	-0.005	-
Yorkshire and the Humber	0.065	0.086**	0.053	-0.036	-

Note: *, **, * indicate statistical significance at 1%, 5% and 10% respectively. Impacts are "β" coefficients from the regression model.**

Table 5-9 presents the model results broken down by category of CPD. The coefficients on employment growth and turnover growth are again negative in the inner two rings. Like the regional results, not all of these impacts are statistically significant. Areas around incubator, industrial and offices saw negative impacts on employee growth, while only areas around offices saw any statistically significant impacts on turnover growth. On productivity growth, positive and statistically significant impacts are present in the inner three rings for industrial CPDs, and for incubators in the 2-3km ring. For the other CPD types, on statistically significant impacts on productivity growth were estimated.

Table 5-9: All local units operating in area in year before CPD opening - by category

Employees, logs					
Sample segment:	0-1km	1-2km	2-3km	3-4km	4-5km
Incubator	-0.141**	-0.101*	-0.048	0.025	-
Industrial	-0.098***	-0.053**	0.001	0.016	-
Light industrial	-0.084	-0.046	-0.072	0.034	-
Office	-0.120**	-0.027	0.017	0.006	-
Science / Research Park	-0.058	0.009	0.010	-0.093	-
Turnover, logs					
Sample segment:	0-1km	1-2km	2-3km	3-4km	4-5km
Incubator	-0.072	-0.052	0.017	-0.008	-
Industrial	-0.052	-0.019	0.048*	0.034	-
Light industrial	-0.045	0.007	-0.053	0.019	-
Office	-0.084**	-0.001	0.035	0.009	-
Science / Research Park	0.001	-0.004	0.052	-0.084	-
Productivity, logs					
Segment:	0-1km	1-2km	2-3km	3-4km	4-5km
Incubator	0.069	0.049	0.065**	-0.033	-
Industrial	0.046**	0.034**	0.047**	0.018	-
Light industrial	0.040	0.039	0.012	-0.014	-
Office	0.036	0.025	0.018	0.003	-
Science / Research Park	0.059	-0.013	0.042	0.009	-

Note: *, **, * indicate statistical significance at 1%, 5% and 10% respectively. Impacts are "β" coefficients from the regression model.**

The model was also estimated for groups of local units at different levels of the productivity distribution in the year before the opening of the nearest new CPD, to try to understand whether the size and direction of the impacts was related to the productivity of the local units. Table 5-10 presents the results from this set of estimations. Across all productivity groups, the negative impacts on employee and turnover growth and positive impacts on productivity growth are evident. However, the negative impacts on employee and turnover growth are markedly lower for local units in the 1st productivity quartile compared to those in the 2nd quartile and in the bottom two quartiles, which are similar to each other in magnitude. Looking at the positive productivity impacts, this relationship is reversed, with local units in the 1st quartile of the productivity distribution seeing slightly smaller impacts on productivity than those in the 2nd quartile in the 0-1km ring and the 2-3km ring. The local units in the bottom half of the productivity distribution appear to have seen fewer positive impacts on productivity, with only one statistically significant impact detected on the 2-3km ring, which is equal to the corresponding area impact on the local units in the 2nd quarter of the productivity distribution.

Table 5-10: Local units segmented by productivity levels in the year before the opening of the nearest new CPD

Employees, logs					
Sample segment:	0-1km	1-2km	2-3km	3-4km	4-5km
All	-0.116***	-0.0512***	-0.005	0.007	-
1st quartile of productivity distribution	-0.015***	-0.079***	-0.030*	-0.013	-
2nd quartile of productivity distribution	-0.196***	-0.098***	-0.038**	-0.017	-
Bottom half of productivity distribution	-0.183***	-0.122***	-0.033*	-0.000	-
Turnover, logs					
Sample segment:	0-1km	1-2km	2-3km	3-4km	4-5km
All	-0.070***	-0.021	0.029	0.014	-
1st quartile of productivity distribution	-0.119***	-0.075***	-0.003	-0.007	-
2nd quartile of productivity distribution	-0.150***	-0.098***	-0.007	-0.018	-
Bottom half of productivity distribution	-0.167***	-0.099***	0.001	0.0180	-
Productivity, logs					
Segment:	0-1km	1-2km	2-3km	3-4km	4-5km
All	0.045***	0.031***	0.035***	0.007	-
1st quartile of productivity distribution	0.033**	0.005	0.027**	0.006	-
2nd quartile of productivity distribution	0.046**	0.001	0.033**	-0.001	-
Bottom half of productivity distribution	0.017	0.023	0.033**	0.018	-

Note: *, **, * indicate statistical significance at 1%, 5% and 10% respectively. Impacts are "β" coefficients from the regression model.**

5.5 Estimation of impacts of new CPDs on wages and occupational mix

This section presents the results from the analysis of the impact of CPD openings on wages in workplaces around the CPDs. Table 5-11 represents three regression models, all with the log changes in average annual gross pay (i.e. average wages) in each postcode.

Table 5-11: Concentric rings estimates across all CPDs over the period 2006-2016 for three models: baseline (no controls); with nearest CPD fixed effects; and with nearest CPD fixed effects and postcode level controls

Average annual gross pay (log change)						
	0km	0-1km	1-2km	2-3km	3-4km	4-5km

Baseline	-0.0260	0.0389	0.0422*	0.0298	0.0176	-
Nearest cpd	-0.0145	0.0482*	0.0523**	0.0310	0.0215	-
Nearest cpd & postcode level control	-0.0127	0.0289	0.0479**	0.0274	0.0154	-

Source: Annual Survey of Hours and Earnings (ONS).

The significant growth in average wages occurs in the area within 1-2 km around the CPDs rather than on the CPDs themselves for all three models. However, the regression model with the control for the nearest CPDs and full postcode level controls is the most robust model because it takes controls for specific occupations and sectors which might already be expected to see higher wage growth.

This regression model is run for different time periods, all starting in 2006 and increasing by one year at time. The results are shown in Table 5-12.

Table 5-12: Concentric rings estimated across all CPDs over time periods starting in 2006 and increasing in length, model with full control only

Average annual gross pay (log change)							
	- 2010	- 2011	- 2012	- 2013	- 2014	- 2015	- 2016
0 km	-0.0417	0.0009	0.1055**	0.0644	0.0528	0.0557	-0.0127
0-1 km	0.0049	-0.0051	0.0203	0.0285	0.0327	-0.0052	0.0289
1-2 km	0.0068	0.0021	0.0183	0.0346	0.0472**	0.0178	0.0479**
2-3 km	0.0067	0.0165	0.0291	0.0275	0.0306	-0.0021	0.0274
3-4 km	-0.0171	-0.0269	-0.0138	0.0174	0.0140	-0.0185	0.0154
4-5 km	-	-	-	-	-	-	-

Source: Annual Survey of Hours and Earnings (ONS)

In the shorter time periods, there is significant growth in average wages at the CPDs themselves between 2006-2012. On the other hand, we can only find significant impact in the area within 1-2 km around the CPD postcodes for the longer time periods (2006-2014 and 2006-2016). These estimates are presented in Table 5-13 below.

Table 5-13: Concentric rings estimated across all CPDs over time periods starting in 2006 and increasing in length, model with normalised wages and nearest CPD

Normalised wages (absolute change)							
	-2010	-2011	-2012	-2013	-2014	-2015	-2016
0 km	0.0273	0.0502	0.0690**	0.0506	0.0467	0.0403	0.0345
0-1 km	-0.0010	0.0039	0.0156	0.0004	0.0026	-0.0132	0.0206
1-2 km	0.0058	0.0233	0.0351*	0.0056	0.0228	0.0089	0.0363*
2-3 km	-0.0158	0.0211	0.0342**	0.0306*	0.0211	0.0117	0.0256
3-4 km	-0.0443*	-0.0168	-0.0093	0.0006	-0.0040	-0.0238	0.0154
4-5 km	-	-	-	-	-	-	-

Source: Annual Survey of Hours and Earnings (ONS)

Table 5-14 presents the results of the model estimated with normalised wages across all CPDs over different period, each period starting from 2006 but increasing by one year at time. This model includes the control for nearest CPD to each postcode only and no control for sectors and occupation because the normalised wages have already taken in the effect of occupations and industrial sectors. The period 2006-2012 is the only period that show significant growth in normalised wages at the CPDs themselves as well as some of the surrounding areas (i.e. 1-2 km and 2-3 km radius).

Table 5-14: Concentric rings estimated across all CPDs over time periods starting in 2006 and increasing in length, model with occupational changes as dependent variable with nearest CPD and postcode level control for KIS and HTM sectors

Change in share of high occupational level							
	- 2010	- 2011	- 2012	- 2013	- 2014	- 2015	- 2016
0 km	-0.0014	-0.0246	0.0285	0.0267	0.0390	0.0582**	0.0606**
0-1 km	-0.0046	-0.0054	0.0041	0.0057	-0.0065	0.0041	0.0141
1-2 km	-0.0066	-0.0003	-0.0019	0.0091	-0.0055	-0.0032	0.0070
2-3 km	0.0035	-0.0022	-0.0086	0.0108	-0.0031	-0.0011	0.0071
3-4 km	0.0078	0.0012	0.0035	0.0110	-0.0034	-0.0001	0.0036

4-5 km	-	-	-	-	-	-	-

Source: Annual Survey of Hours and Earnings (ONS)

We also estimate for the impact on the changes of high occupational level across all CPDs over different periods, each period also starting from 2006 and increasing by one year at a time. This model includes the control for the nearest CPD to each postcode and the postcode level control for KIS and HTM sectors. Over the shorter time periods, there seems to be no significant impact at the CPDs themselves as well as the surrounding areas. The impacts appear to increase in the longer time periods and become significant for the periods 2006-2015 and 2006-2016.

A similar regression model is run for normalised wages and high occupational level changes as above. However, the time periods for these regressions start in the year before the last year of development in each CPD and end after a certain number of years after the last year of development in each CPD. The results are presented in Table 5-15 below. The sample size (the number of postcodes) decreases as the length of the time periods increases.

Table 5-15: Concentric rings estimated across all CPDs over time periods starting in the year before the last year of development in each CPD and end after a certain number of years after the last year of development in each CPD, model with average normalised annual wages

Normalised annual gross pay (absolute change)							
	t+1	t+2	t+3	t+4	t+5	t+6	t+7
0 km	-0.0157	-0.0638	-0.0042	0.0014	-0.0207	0.0628	-0.0202
0-1 km	-0.0268*	-0.0235	-0.0018	0.0005	-0.0103	0.0062	0.0024
1-2 km	-0.0182	-0.0027	0.0149	0.0160	0.0012	0.0432*	0.0309
2-3 km	-0.0079	0.0032	0.0108	0.0216	0.0079	0.0444	0.0364
3-4 km	-0.0164	-0.0103	-0.0008	0.0190	0.0097	0.0305	-0.0197
4-5 km	-	-	-	-	-	-	-

Source: Annual Survey of Hours and Earnings (ONS)

The result from Table 5-15 shows no statistically significant impacts detected at the CPD postcodes. For the period up to one year after the last year of development of the CPDs, there is a significant displacement effect on the normalised wages in the area within 0-1 km around the CPDs. In the longer time periods, i.e. up to six years after the last year of

developments, there appears to be a significant growth in normalised wages in the area within 1-2 km around the CPD postcodes.

Table 5-16: Concentric rings estimated across all CPDs over time periods starting in the year before the last year of development in each CPD and end after a certain number of years after the last year of development in each CPD, model with the change in share of

Change in share of high occupational level							
	t+1	t+2	t+3	t+4	t+5	t+6	t+7
0 km	0.0269	0.0256	0.0142	0.0189	-0.0020	0.0268	0.0309
0-1 km	-0.0068	-0.0116	-0.0075	-0.0129	-0.0077	-0.0097	0.0040
1-2 km	-0.0050	-0.0128	-0.0054	-0.0077	-0.0008	-0.0097	-0.0011
2-3 km	0.0059	0.0028	0.0078	-0.0003	0.0080	-0.0013	0.0096
3-4 km	0.0132	0.0012	0.0097	0.0089	0.0025	0.0023	0.0059
4-5 km	-	-	-	-	-	-	-

Source: Annual Survey of Hours and Earnings (ONS)

Table 5-16 shows no significant impact on the changes in the share of high occupational level across all CPDs themselves and the surrounding area over all time periods.

The results of model estimates for normalised wages and high level occupational changes (with some controls) for five categories of CPD over 2006-16 are presented in Table 5-17 below.

Table 5-17: Concentric rings estimates across different categories of CPDs over the period 2006-2016 for normalised wages with nearest CPD and occupational changes with controls with nearest CPDs

Normalised wages								
	0 km	0-1 km	1-2 km	2-3 km	3-4 km	4-5 km	R-squared	Number of observations
Incubator	0.0951	-0.0077	0.0267	0.1159*	0.0196	-	0.0273	1,187
Industrial	0.0126	0.0299	0.0437	0.0222	-0.0066	-	0.0381	5,280
Light industrial	0.0826	-0.0544	0.0272	0.0491	0.0357	-	0.0526	782

Science/ Research park	0.0263	0.1750**	0.0804	0.0744	0.044	-	0.0493	443
Office	-0.0711	0.0142	0.0315	-0.0065	0.0551	-	0.0421	2,984
Change in share of high occupational level								
	0 km	0-1 km	1-2 km	2-3 km	3-4 km	4-5 km	R-squared	Number of observations
Incubator	0.2505**	0.0779***	0.0734**	0.0593*	0.0719**	-	0.1664	5,074
Industrial	0.0288	0.0015	0.0046	0.0083	-0.0017	-	0.1483	21,169
Light industrial	0.0562	0.0293	0.0507*	0.0508*	0.0308	-	0.135	3,158
Science/ Research park	0.1880*	0.0392	0.0456	-0.0012	0.0048	-	0.1643	1,857
Office	0.0431	-0.0108	-0.0333**	-0.0332*	-0.0328*	-	0.1677	13,046

Source: Annual Survey of Hours and Earnings (ONS)

There seems to be no significant growth in normalised wages on the CPDs themselves across all type of CPDs. The growth in normalised wages is significant in the area within 2-3km around incubator sites and 0-1km around Science/Research park sites. On the other hand, the estimates for the growth in high level occupational change is significant for both the CPDs themselves and all the surrounding areas at incubator sites while statistically displacement occurs in the 1-2km, 2-3km and 3-4km rings at office sites. There is small significant impact on the area within 1-2km and 2-3km around light industrial sites.

The sample can also be segmented by geography. Table 5-18 below presents different sets of estimates for CPDs in different regions in Great Britain.

Table 5-18: Concentric rings estimates across all CPDs for each region over the period 2006-2016 for normalised wages with nearest CPD and occupational changes with controls with nearest CPDs

Normalised wages								
	0 km	0-1 km	1-2 km	2-3 km	3-4 km	4-5 km	R-squared	Number of observations
North East	0.0949	-0.1073	-0.0565	-0.1017	-0.1335	-	0.0349	505
North West	0.1314	0.1491***	0.1005**	0.1113***	0.0815	-	0.0476	1,325
Yorkshire & Humber	0.0108	0.0232	0.013	0.0348	-0.0228	-	0.0345	1,175

East Midlands	-0.1998	-0.0853	-0.0694	-0.0564	-0.1031**	-	0.0482	977
West Midlands	0.048	-0.0077	0.0433	-0.0145	0.0515	-	0.0542	1,137
East of England	-0.1242	-0.0368	0.0667	-0.0238	-0.0719	-	0.0613	848
London	-0.2176	0.0376	0.0351	0.0419	0.0921	-	0.0278	1,047
South East	0.03	0.0296	0.0787	0.0979	0.0636	-	0.03	1,699
South West	0.0869	-0.0041	-0.0023	0.0355	0.0053	-	0.0614	822
Scotland	0.2755**	0.0267	0.0405	-0.0292	-0.0062	-	0.0369	974
Wales	-0.4837***	-0.0491	0.0159	-0.008	-0.0137	-	0.0874	476
Change in share of high occupational level								
	0 km	0-1 km	1-2 km	2-3 km	3-4 km	4-5 km	R-squared	Number of observations
North East	0.1589	-0.0082	-0.0626	-0.0271	-0.0761	-	0.1476	1,901
North West	0.0023	-0.0016	-0.0021	-0.016	0.0019	-	0.1363	5,924
Yorkshire & Humber	0.1495*	0.0863***	0.0375	0.0133	0.0145	-	0.1378	4,541
East Midlands	0.1820**	0.0016	0.0232	0.0147	-0.0039	-	0.1418	3,896
West Midlands	0.0696	0.0097	0.0208	0.0443	0.002	-	0.1533	4,559
East of England	-0.048	0.0323	0.0469	-0.0172	0.0171	-	0.1614	3,441
London	0.0124	-0.0011	-0.0118	-0.0013	0.0042	-	0.1789	5,010
South East	0.1566*	0.0017	-0.001	0.0258	0.0146	-	0.1672	6,839
South West	0.0235	0.0322	-0.002	0.0201	0.0053	-	0.1617	3,649
Scotland	-0.0736	-0.0047	0.0101	-0.0143	-0.0035	-	0.1745	3,800
Wales	0.0078	-0.0088	-0.0021	-0.0084	0.0168	-	0.1531	1,999

Source: Annual Survey of Hours and Earnings (ONS)

Regarding the model with normalised wages, Scotland and Wales are the only two regions that have the statistically significant impacts detected at the CPD postcodes although the impact in Wales appears to be negative. Although the impact detected at the CPD postcodes in North West regions is not significant, the coefficient for the next three rings indicates significant growth in relative wages in the area surrounding the CPDs.

The estimates for the high level occupational changes shows significant growth on the CPD themselves appears to occur in Yorkshire and Humber, East Midlands and South East regions. In particular, the estimates for the ring 0-1km for Yorkshire and Humber show significant impacts although is weaker than the impact on the CPD themselves.

5.6 Conclusions

The analysis on employees, turnover and productivity for all local units around the new CPDs found evidence of displacement effects on total employee growth and turnover growth following the opening of new CPDs. These effects were concentrated on the 0-1km ring and 1-2km rings around the CPDs, with few displacement effects detected further away. The findings also suggest that turnover and employee growth displacement effects were most frequent in the three years following the opening of the CPDs, while in the later years displacement effects were far less frequent.

However, negative impacts were found on total employee and turnover growth across local units that were active in the area in the year before the CPD opening, again concentrated in the inner two 1km rings around the CPD, and to a lesser extent in the third 1km ring. Comparing the size of the negative impacts on employee/turnover growth on the whole area to those on local units already located in the area before the opening of the CPD, the latter impacts are markedly stronger. Thus, it appears that the negative employee/turnover growth impacts on local units already located in the area were increasingly offset by growth of local units that moved to or were born in the area after the CPD opening.

There were fewer *productivity* growth impacts picked up in the estimation at the whole area level, though one model found several positive productivity growth impacts in the 0-1km and 1-2km rings around the CPD (see Table 5.3). Again, the outer rings saw little impact.

Conversely, positive impacts on productivity growth were found in the inner three 1km rings for local units already located in the area. Of these local units, those in the top quartile of the productivity distribution saw markedly lower negative impacts on employee and turnover growth in the inner three 1km rings than local units in the second quartile and those in the bottom half of the productivity distribution.

On the other hand, the local units in the top quartile of the productivity distribution saw slightly smaller productivity impacts than those in the second quartile and the bottom half of the productivity distribution. This pattern could be explained by competition effects; if increased competition in the area had stronger negative impacts on local units with lower productivity compared to those with high productivity. However, there are likely other mechanisms explaining these findings. For example, positive spillover effects such as knowledge spillovers may also be at work here through local firms collaborating with those on the new CPDs. Indeed, the analysis in Chapter 4 found that relatively high productivity local units tend to move into new CPDs initially, and thus the diffusion of knowledge from such local units might lead to higher productivity in the local area.

Turning to impacts around different categories of CPDs, the analysis on all local units found productivity growth impacts mainly on the CPD postcodes themselves, with the strongest impacts estimated on incubators, followed by science/research parks and offices. Statistically significant impacts on productivity growth were not detected on

industrial or light industrial sites. However, it is interesting to note that when the model was estimated only on local units already active in the year before CPD opening, positive productivity impacts were estimated on the inner three rings for industrial CPDs, with incubators the only other category for which positive productivity impacts were estimated.

At the regional level it is difficult to determine any clear pattern in the results across outcome variables and the two alternative local unit samples (the whole sample and the sample limited to local units active before the CPD openings). It is notable (at least from a technical perspective), however, that no statistically significant impacts were estimated for Greater London, perhaps reflecting the difficulty of isolating causal impacts of the opening of CDPs in such a concentrated business area.

Lastly, the wage analysis yielded far fewer impacts, likely reflecting the small sample size of the ASHE dataset. Nevertheless, some evidence was found for positive wage impacts in the 1-2km rings and the 2-3km rings. This finding reinforces the positive impacts picked up on productivity in the IDBR analysis – as would be expected in a competitive labour market. An additional interesting finding from this analysis was the impact of incubators on the occupational mix in the local areas. Positive impacts were estimated in all five rings around the incubators over the period 2006-16, indicating a shift in the occupational mix towards higher skilled professions, not only on the incubators themselves but in the surrounding area.

6 Case Studies

6.1 Introduction

The aim of the case studies was to complement and provide additional insight to the statistical analysis presented in Chapters 4 and 5.

Eight case studies were selected from an initial short-list of 24. The final eight were selected so as to study at least one example of each of the following categories:

- Incubators
- Enterprise Zones
- Science Parks (members of UKSPA)
- City Centre Office Development
- Privately funded Industrial Parks
- Publically funded Industrial Parks

Selection also took into account the need to obtain satisfactory coverage of:

- Region of the UK
- Dominant industrial sector
- Development sizes
- Pre- and Post- Recession Time-period
- Nature of Impact: for example, sites that saw employment growth, productivity growth, simultaneous growth in both variables, or in neither

The following Chapter includes the following Sections:

- Case Study 1: Dawlish Business Park, Devon
- Case Study 2: Worksop Turbine Innovation Centre, Nottinghamshire
- Case Study 3: Chesterford Park Science Village, Cambridgeshire
- Case Study 4: Leyton Industrial Estate, Greater London
- Case Study 5: York Eco Business Centre, Yorkshire
- Case Study 6: Dalziel Building, Scotland
- Case Study 7: Evolution @ The Advanced Manufacturing Park, Yorkshire
- Case Study 8: Llangefni Trading Park, Wales
- Case Study Summary
- CPD Tenant Interviews
- Case Study Conclusions

This section indicates that in general the case study sites have been generally very successful, meet a diverse range of demands from businesses, from start-ups to major corporations in high value sectors. This also demonstrates that schemes that have been

backed through public sector spending have either been focusing at resolving a market failure, usually in the form of high quality flexible space for start-ups, or supporting highly successful ventures which accommodate high value added industries (e.g. Science Parks). From a commercial property perspective, the CPD generally outperform the wider property market in terms of rents and vacancies and therefore represent a good investment opportunity.

6.2 Case Study 1: Dawlish Business Park

6.2.1 Introduction

Dawlish Business Park is located just north of Dawlish on the South coast and is approximately 11 miles south of Exeter, in the local authority district of Teignbridge. It is a representative of the category *Publically Funded Industrial Estate/Business Park*.

Figure 6.2. 1 Dawlish Business Park within Teignbridge

6.2.2 The Development

Location

Dawlish Business Park is located off Exeter Road (A379) in Shutterton. The Park is located close to the mouth of the River Exe and has relatively poor strategic road access, with the A379 connecting, via a number of small settlements, to Junction 31 of the M5. The estate serves the immediate hinterland of Dawlish/ Teignmouth and is within reach of Newton Abbot and Torbay.

New Commercial Property Development has taken place on the site at Units 1-7. These 3-Star rated industrial warehouse units are of steel construction, with brickwork elevations of a single storey, and were constructed in 2011 to provide a total of 10,165 sqft of gross internal area (GIA). **Figure 6.2.2** shows the location of the new CPD units.

Figure 6.2.2 Site Location and New Commercial Property Development

Source: CoStar, 2018

Figure 6.2.3 New CPD units on Dawlish Business Park

Source: CoStar, 2018

Surrounding area

To the north of the business park lies a retail park, to the east and south are holiday parks, and to the west are residential communities and undeveloped farm land. The business park is identified within the Adopted Teignbridge Local Plan (2014) under Policy S17 Dawlish (Teignbridge Council, 2014, p. 34), which supports protection of 3ha of industrial land and improvements to the park.

6.2.3 Local Economy

Teignbridge is a rural, coastal district, bordering Dartmoor National Park to the West and the English Channel to the east. Population density, firm density, skills and wages are all below the national average.

Key Stats, 2016	Teignbridge	UK
Population Density	192.8	270.7
Firm Density	8.2	10.5
Employment Rate	81.1	77.7
% of population with NVQ4 or above	32.1	38.0
Average Wage (£pa)	24,931.0	28,195.0

Table 6.2. 1 Key Economic Indicators in Teignbridge

The graphs below show the growth of population, employment, GVA and productivity over the past 35 years. Population growth has been rising slowly from 1982. Employment growth has been growing in step with population, but with greater volatility. Productivity has grown from around £32,000 per worker in 1982 to around £38,000 per worker in 2008; however, it decreased in 2008 and has remained flat since that point.

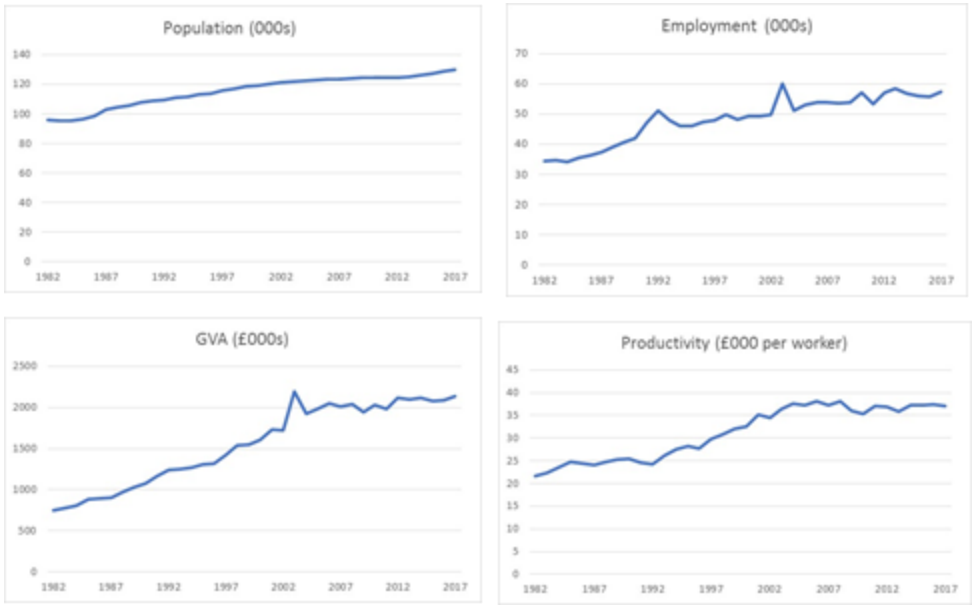


Figure 6.2. 4 Timeseries graphs of population, employment, GVA and Productivity for Teignbridge

The economy in this area is predominantly focused on the leisure and tourism market, which supports about one in every five jobs. The region was hit hard by the public-sector cuts during the financial crisis, however job growth has been strong in the real estate and professional and business service sectors in the last five years.

Manufacturing and distribution are underrepresented compared to the rest of the UK, however agriculture and food manufacturing are important locally. A recent Centre for Cities survey ranked Exeter and Plymouth first and second respectively in terms of the share of exports that go to the EU. This highlights the potential impact of Brexit on this market.

The largest sectors by employment as of 2016 are wholesale and retail and public services.

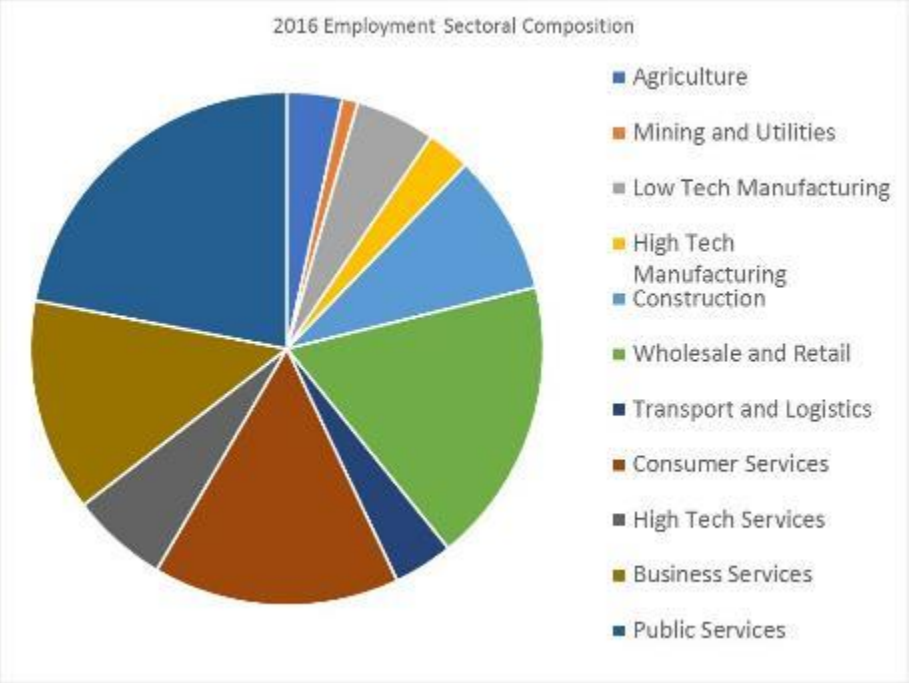


Figure 6.2. 2 Sectoral Composition of Teignbridge

Regional Property Market

The industrial market in the region totals nearly 40 million sqft of floorspace, with half accounted for by logistics property, which has underpinned demand in recent years. Limited construction and positive demand has resulted in low vacancy rates and increased rental values over recent years, suggesting a supply constrained market. This has encouraged a number of new developments and investments in recent years, with over £60 million in deals completed in 2017 across the regional market.

However, the development pipeline in the region is fairly static, with 89,000 sqft of new commercial floorspace completing in the past 4 quarters and a further 93,000 due for completion in the next 4 quarters. This is below the all-time average of over 119,000 sqft per annum. **Figure 1.8** presents the location of the four properties under construction and due for completion over the next 4 quarters. This represents 0.5% of total inventory, and has achieved 2.5% pre-lease.

Figure 6.2. 3 Properties Under Construction and due for completion in next 4 Quarters within 30km of the site

Source: CoStar, 2018

Figure 6.2.4 presents the net absorption[12], net deliveries of new stock, and vacancy levels across the region. This indicates that vacancy rates have dropped significantly since 2012 to a low of around 2%. This is the result of high net absorption (take up of available floorspace) and modest net floorspace deliveries. The chart indicates that the CPD was developed in 2012 with a spike in deliveries and vacancy rates, this was followed by increased absorption and decreasing vacancy as space was taken up. Since this time vacancy rates have continued to drop.

[12] Net absorption is defined as the net change in occupied space over a given period of time and is calculated by summing all of the positive changes in occupancy (move ins) and subtracting all of the negative changes in occupancy (move outs).

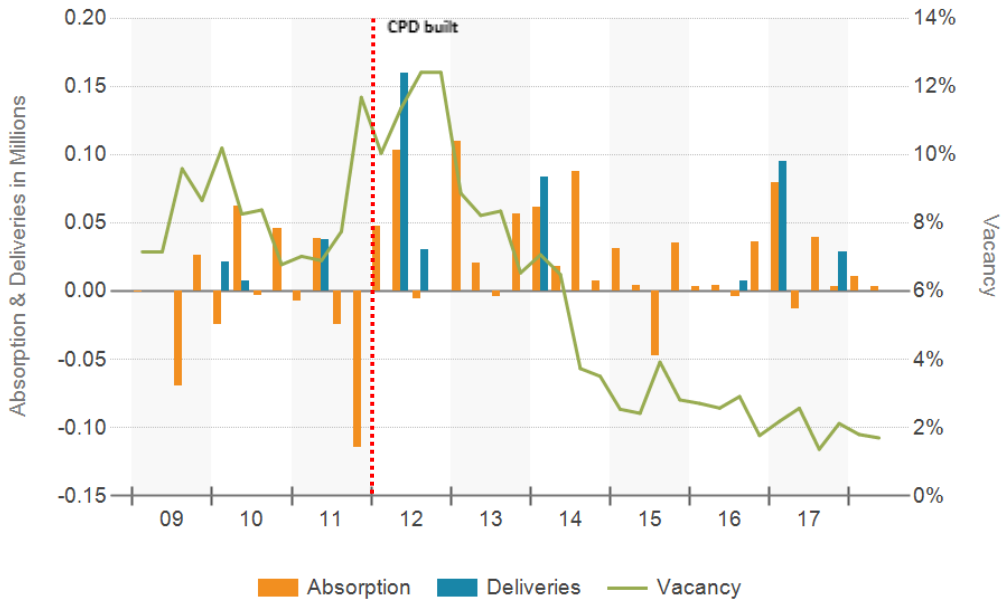


Figure 6.2.4 Net Absorption, Net Deliveries and Vacancy

Source: CoStar, 2018

6.2.4 Occupation of the Site

Ownership and Leasing Activity

The new CPD units onsite were purchased in May 2011 for £11.81 psqft and sold again in December 2011 to an independent agent for £33.45 psqft. The development is currently fully let with the most recent transactions taking place in 2014 and 2013, for £5.52 psqft, with Dawlish M.O.T Centre taking up a major leasehold.

The CPD property has performed well compared to the wider Teignbridge 2-4 Star market which currently operates with a vacancy of 2.4% and achieves asking rents of £5.35 psqft, compared to £5.86 psqft expected for the new CPD. As indicated in **Figure 6.2.10** asking rents for the new CPD are above the local and regional market rents, while **Figure 6.2.11** shows that vacancy has decreased since completion.

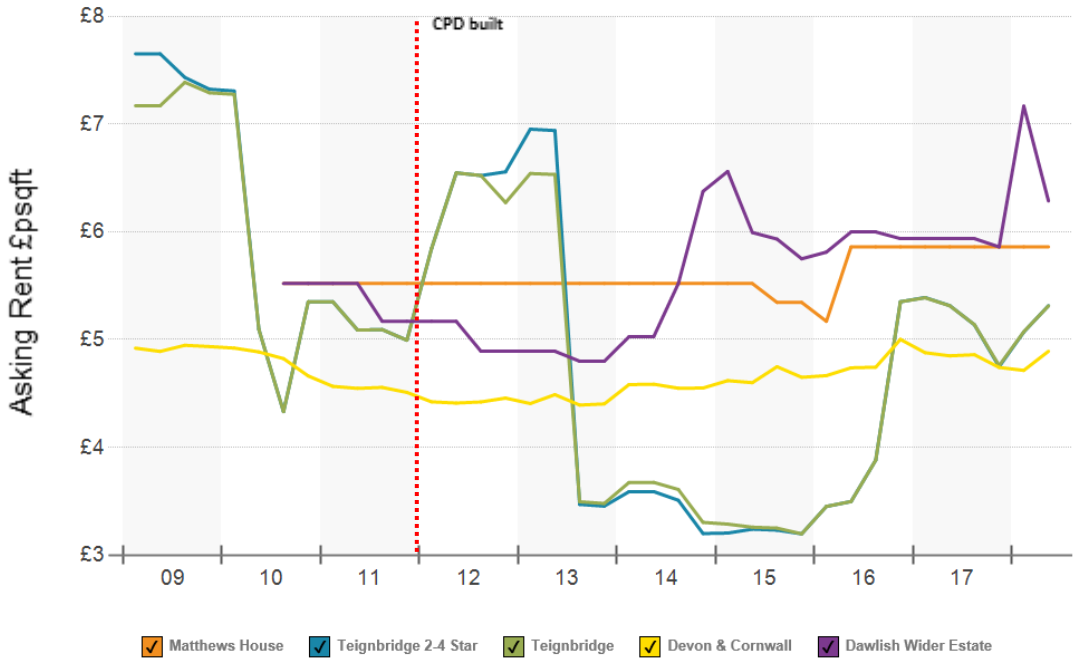


Figure 6.2. 5 Asking Rents

Source: CoStar, 2018

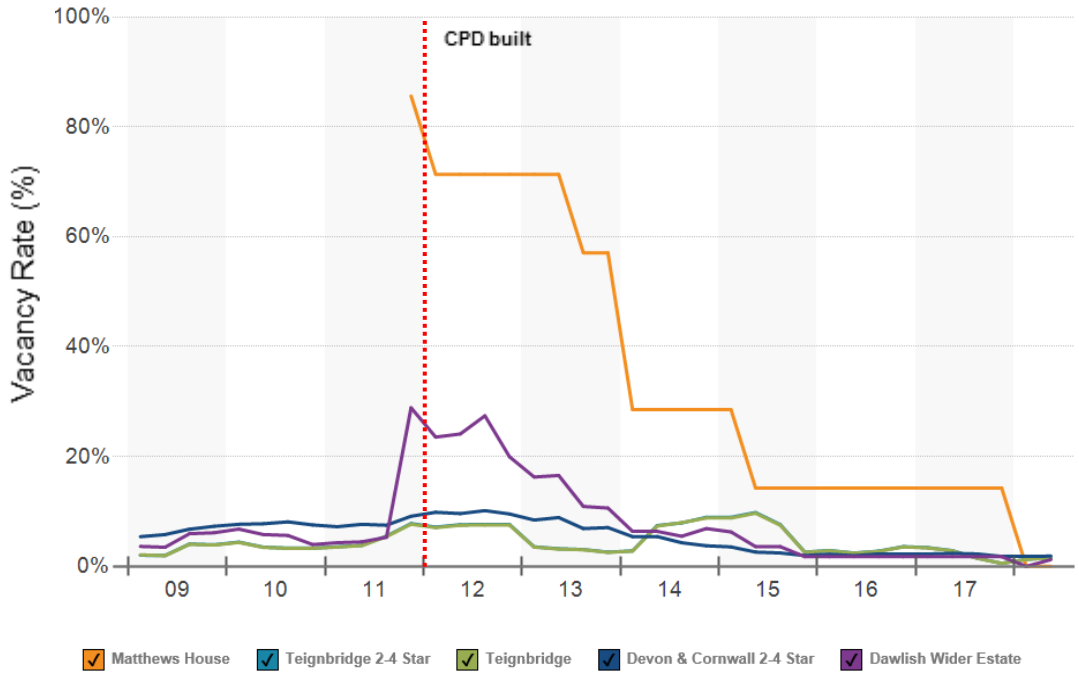


Figure 6.2. 6 Vacancy Rates

Source: CoStar, 2018

The Dawlish Business Park in general also performs well. Of the 11 commercial properties we have records for, only one has vacancy, of 1,131 sqft with an asking rent of £7.16. This is for a 3-star, light industrial unit. This suggests there is underlying strength in the property market and mirrors the wider picture across the region, of strong demand and limited supply.

Quality of Offer

The CPD is constructed to a high specification, with built-in flexibility allowing for mezzanine floors and a combination of units to form a larger scale space. The building introduces a higher quality of commercial space to the existing part of the estate, which in comparison has on average lower star ratings, offers smaller units, and provides sites that are more compromised in terms of parking provision.

Tenants

The new CPD units are leased by the Dawlish M.O.T Centre, providing car servicing. The wider Business Park includes a mix of auto trades and trade counter operators which are likely to benefit from the close proximity to the adjacent retail park for passing trade. There are also manufacturing and industrial uses at the site. **Figure 6.2.12** presents an overview of existing tenants in the CPD and across the rest of the Business Park[13].

Company Name	SF Occupied	Move Date	Industry Type
New CPD Tenants			
Dawlish M.O.T. Centre	1450	07/06/2013	Personal Services
Other Dawlish Business Park Tenants			
Allstart Auto Electrics			
Black Swan Printers (Dawlish) Ltd	2400		Manufacturing
Face Electrical	793	11/11/2014	Agri/Mining/Utilities
J & P Sheldon			
P G & D Wood Finishing's			
Paul Hamilton Flooring Ltd			
Peppers School of Motoring			
R J W Joinery			
T M S Maritime Ltd			
Teign Accountancy Services			
Teignmouth Carpet Centre			
Westec	1063	01/10/2004	Manufacturing
Western I T Ltd			

Table 6.2. 2 List of Tenants

Source: CoStar, 2018

6.2.5 Economic Impact

The table below shows that in postcode EX7 ONH, within which the new development is sited, 6 new local units entered the postcode within 2 years of the site opening. This corresponded to a drop in the size of the average firm on the site, with average employees and turnover dipping from 10 employees and £630,000 to 6.5 employees and £501,000. However, this was over a time period in which the economic growth of the wider Teignbridge local economy was extremely sluggish.

From 2013 to 2016, growth on the site has picked up, with both employment and turnover levels returning to their recent peaks. The growth in productivity is particularly noticeable, with productivity levels in the postcode doubling between 2010 and 2016 to £113,000 per employee per annum, well over three times the local average labour productivity rate.

[13] CoStar only provides partial data on tenants for commercial property.

Postcode EX7 0NH	2010 (year before development)	2013 (2 years after development)	2016 (5 years post-development)
Number of Local Units	17	23	21
Total Number of Employees	169	150	118
Employees/local unit	10	6.5	5.6
Annual Turnover (£000s) per local unit	630	501	637
Average Productivity (£000s per worker)	63.2	77	113

Table 6.2. 3 Table showing key statistics for the EX7 0NH postcode, where CPD is located

Figure 6.2. 7 shows the annual movements in local units in the EX7 0NH postcode itself (ring 0, shown in dark blue), and in the surrounding concentric rings.

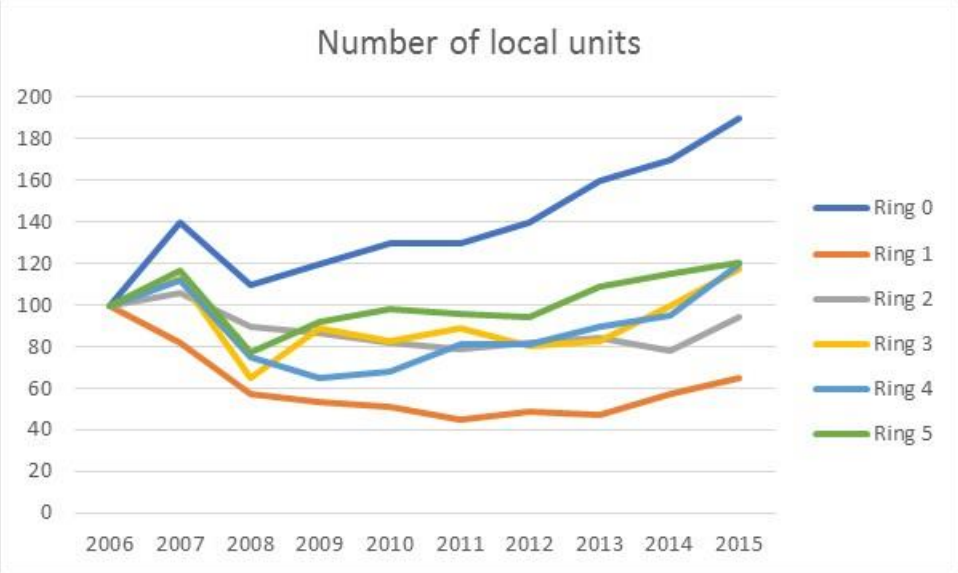


Figure 6.2. 7 Growth of number of local units in Dawlish

Figure 6.2. 8 shows the annual changes in employment. It can be seen that there was significant growth in the 2-3km ring – this is the ring that contains the CBD of Dawlish itself almost certainly unrelated to the trade park.

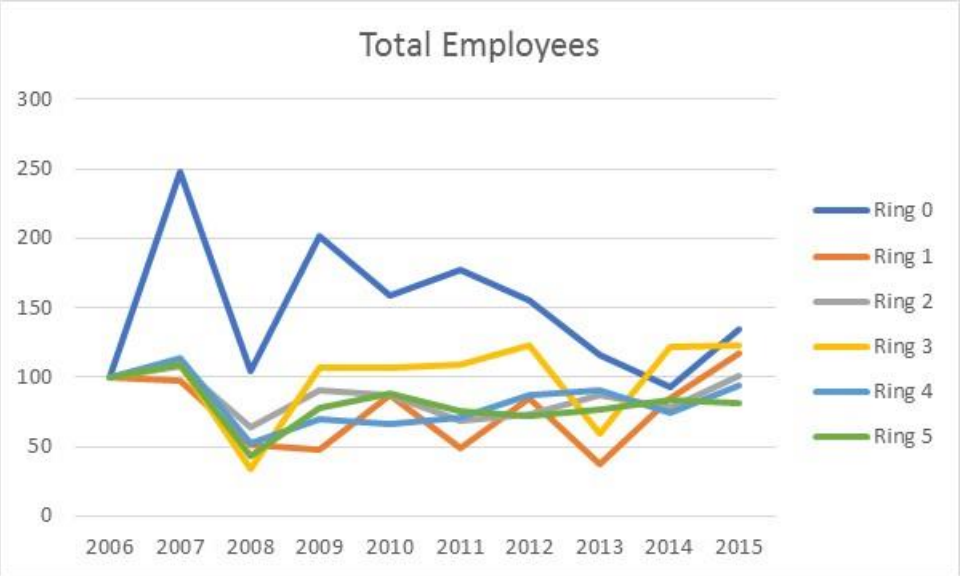


Figure 6.2. 8 Growth of total employees in Dawlish

Figure 6.2.9 shows the annual changes in turnover. Here there is significant evidence that the development of the business park had an impact over and above the growth seen in the surrounding area. However, this is offset by a fall in turnover within the 1km ring, that could be evidence for displacement of activity. More evidence would be required here before a definitive statement could be made.

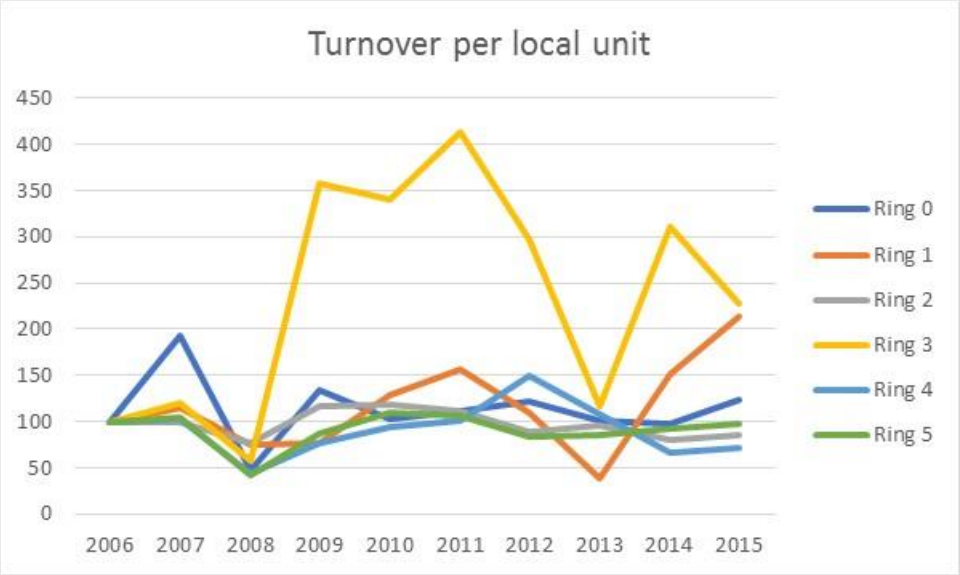


Figure 6.2. 9 Growth of turnover per local unit in Dawlish

Figure 6.2. 10 shows the growth of productivity in Dawlish. The growth in productivity at the CPD itself is lower compared to the surrounding area

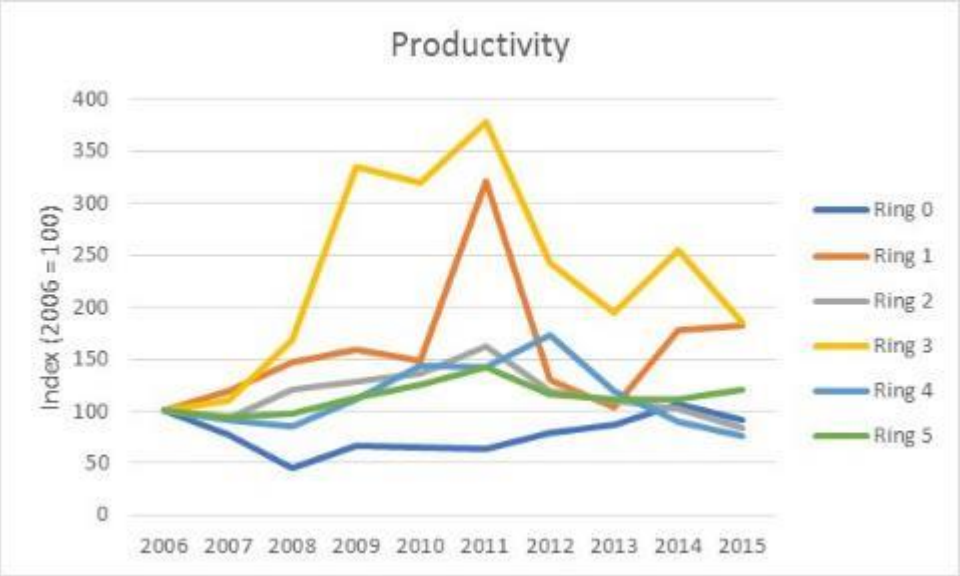


Figure 6.2. 10 Productivity growth in Dawlish

6.2.6 Lessons Learnt

The new CPD was a successful addition to the local market which serves the immediate Dawlish area. Due to the supply constrained market, and the high quality of the development, the CPD and the wider estate have performed above the local and regional averages with decreasing vacancy rates and stable rents. This has been driven by the limited supply compared to demand in the area.

Firms located in the analysed postcode have observed a reduction in the number of employees, while productivity rates per worker have increased. Turnover decreased by 20% immediately after the addition of the new CPD, however the recovery is noticeable five years later with an 80% net increase.

Key success factors include:

- Good location to service local market
- High quality units with flexible space and generous parking
- High demand for small industrial units, with no immediate competition
- Low supply within limited pipeline development and competition from residential and leisure / tourist uses
- Site protected by local policies.

6.3 Case Study 2: Worksop Turbine Innovation Centre

6.3.1 Introduction

Worksop Turbine Innovation Centre (postcode S81 8AP), is located in the district of Bassetlaw in North Nottinghamshire, 15 miles to the east of Sheffield. It is a representative of the category *Incubators.*

Figure 6.3. 1 Map showing the location of Worksop Turbine Innovation Centre (red star), within the local authority district of Bassetlaw (shaded red)

6.3.2 The Development

Location

Worksop Turbine Innovation Centre is located on Coach Crescent, Shireoaks Triangle in Worksop, Nottinghamshire. It is about 21 km east-south-east of the City of Sheffield. The Park is located close to the A57 connecting to Junction 31 of the M1.

New Commercial Property Development (CPD) has taken place on the site in 2005. These 3-Star rated offices are steel construction of two storeys and provide a total of 22,666 sqft of gross internal area (GIA). **Figure 6.3.2** shows the location of the new CPD units.

Figure 6.3. 2 Site Location and New Commercial Property Development

Source: CoStar, 2018

Figure 6.3. 3 New CPD units – Turbine Innovation Centre

Source: CoStar, 2018

Surrounding area

The surrounding area is mostly commercial. To the south of the business park run Northern railway tracks, and to the west are residential communities and undeveloped farm land. The business park is not identified within the Draft Bassetlaw Local Plan but preferred employment allocations (ref no MU1 and MU2) are located in its proximity.

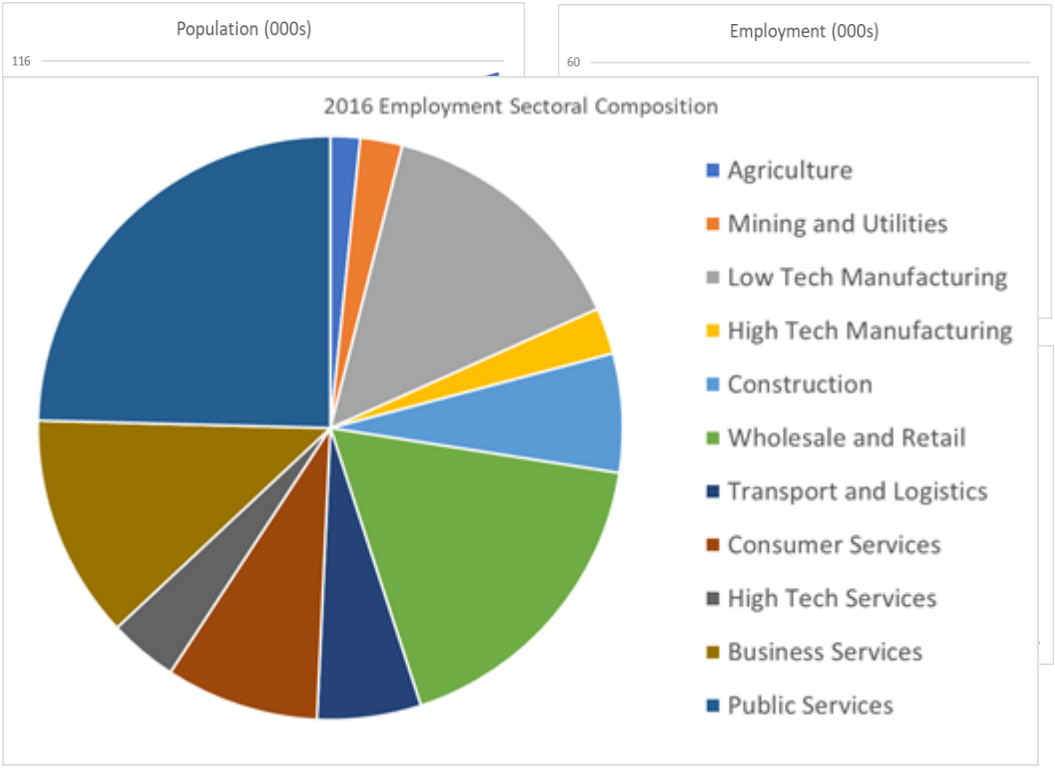
6.3.3 Local Economy

Bassetlaw is a predominantly rural district in the East Midlands, with two major towns, Worksop and Retford. The table below shows a number of key indicators for Bassetlaw, with UK figures shown for comparison purposes.

Key Stats, 2016	Bassetlaw	UK
Population Density	180.6	270.7
Firm Density	6.1	10.5
Employment Rate	75.9	77.7
% of population with NVQ4 or above	29.5	38.0
Average Wage (£ pa)	26,444.0	28,195.0

Table 6.3. 1 Table showing key economic indicators for Bassetlaw district

The graphs below show the growth of population, employment, GVA and productivity over the past 35 years. Population growth began to climb steadily in 2000, although this has not been matched with a corresponding growth rate in (workplace) employment. This may be explained by higher levels of outward commuting, rather than a significant decrease in the employment rate. Notably, employment has grown more strongly since 2011. Productivity has grown slowly from around £30,000 per worker in 1982 to around £45,000 per worker in 2011; however, this has since showed no further sustained growth.



Although the area has an agricultural and coal mining heritage, the largest sectors by employment as of 2016 are wholesale and retail and public services. This is typically characteristic of a residential area with net daily out-commuting flows. There is also a high level of low-tech manufacturing in the area.

Figure 6.3. 5 Sectoral Composition of Bassetlaw district

Regional Property Market

Office vacancies have come down steadily since peaking at just over 10% in 2012. This downward movement was driven partly by the demolition or conversion of several vacant buildings.

Figure 6.3.6 shows that there are no properties under construction and due for completion over the next 4 Quarters within 10 miles of the site.

Figure 6.3. 6. Properties Under Construction and due for completion in next 4 Quarters within 10 mile of the site

Source: CoStar, 2018

Figure 6.3.9 presents the net absorption[14], deliveries and vacancy levels across the submarket area (Bassetlaw). This indicates that vacancy rates have increased significantly since 2010 to a high of around 12%, which was observed just after completion of the CPD at the site. This is a result of low to negative net absorption (take up of available floorspace). This suggests that the CPD entered the market at a difficult time.

[14] Net absorption is defined as the net change in occupied space over a given period of time and is calculated by summing all of the positive changes in occupancy (move ins) and subtracting all of the negative changes in occupancy (move outs).

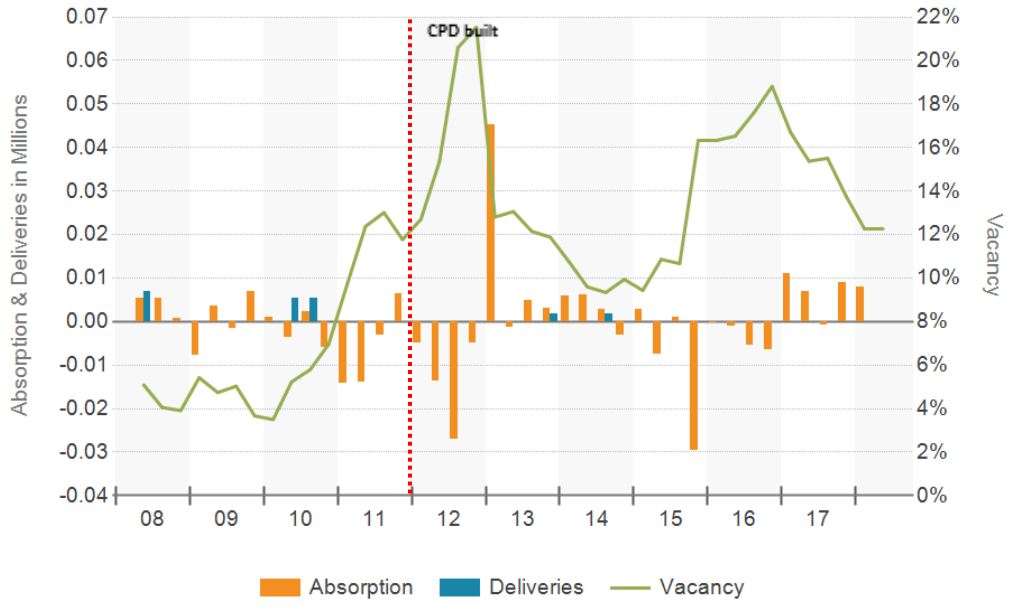


Figure 6.3.9 – Net Absorption, Net Deliveries and Vacancy

Source: CoStar, 2018

6.3.4 Occupation of the Site

Ownership and Leasing Activity

The CPD property has performed well compared to the wider estate and similarly as the submarket and market area which currently operates with a vacancy of 12.5% and achieves asking rents of £9.75 psqft, compared to £10.54 psqft expected from the CPD. As indicated in **Figure 2.10**, asking rents for the new CPD are slightly below the regional market rent, while **Figure 2.11** shows that vacancy at the CPD has decreased since 2013 to 0%.

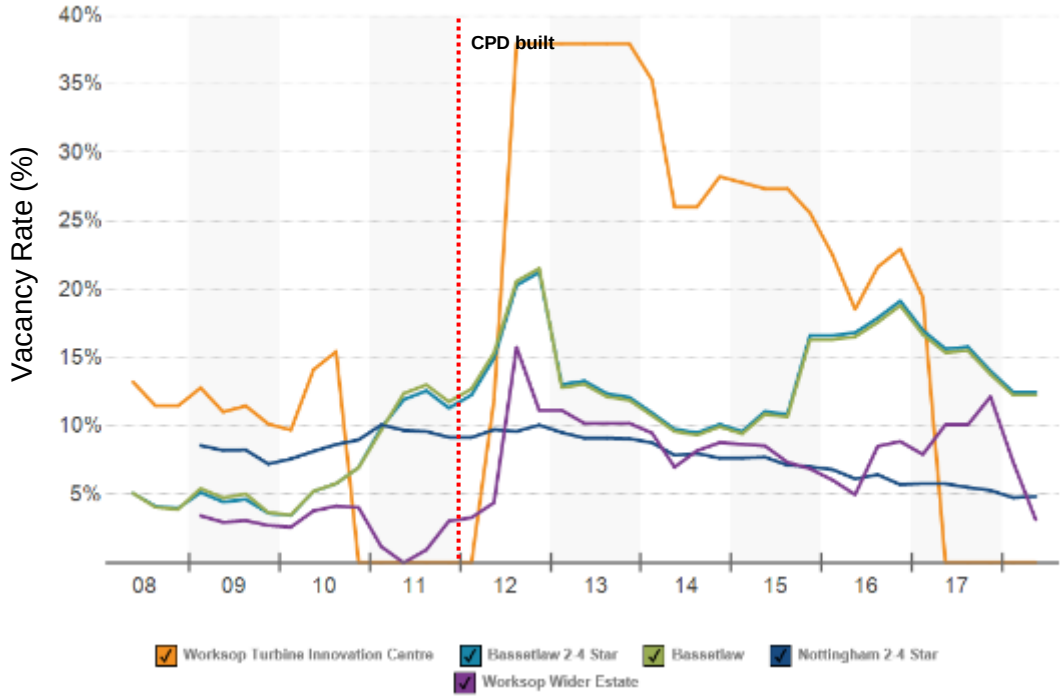


Figure 6.3.11 – Vacancy Rates

Source: CoStar, 2018

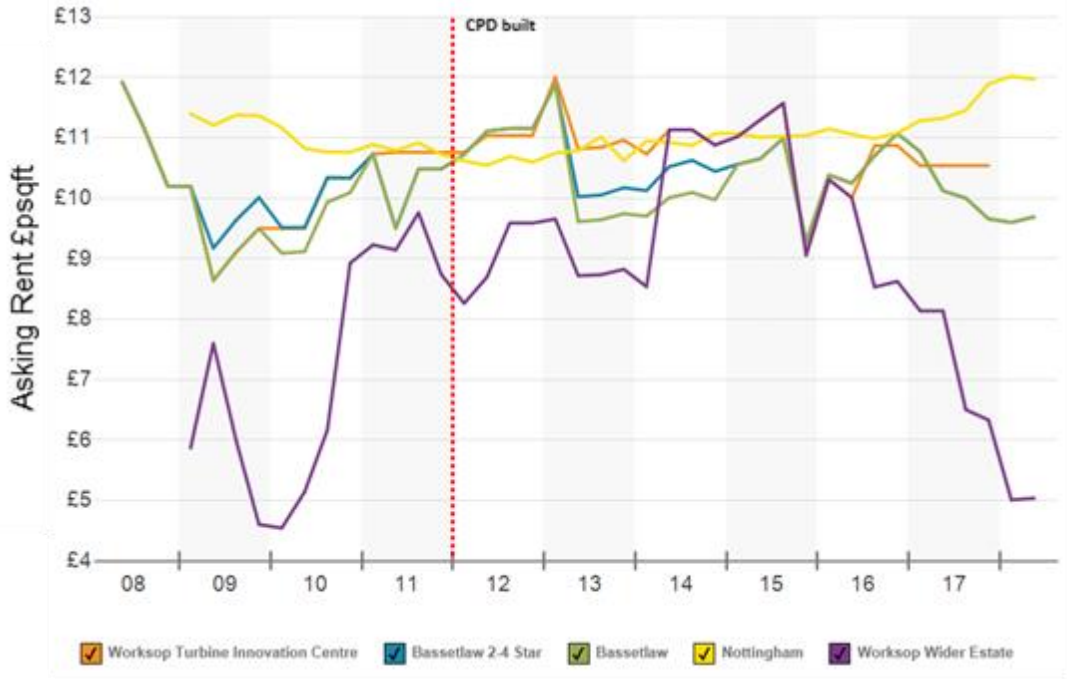


Figure 6.3.10 – Asking Rents

Source: CoStar, 2018

Coach Crescent in general also performs relatively well. Of the 5 commercial properties we have records for, none have vacancy, with an asking rent of £7.40 psqft. The asking rent has fallen since a peak in 2015 at £11.50 psqft. This suggests there is resilience in the property market and mirrors the wider picture across the region of demand and limited supply.

Quality of Offer

Worksop Turbine provides workspace for start-up and growing companies offering flexible premises with range of business support services. The space is let-out on flexible terms with short notice periods. The building is equipped with meeting rooms and conference spaces, also providing virtual offices for those not ready for office space. Regular business networking events are held at the centre, as well as a range of training events. The centre is managed by Oxford Innovation and benefits from on-site Innovation Director who is available to provide support and advice to assist resident businesses.

Tenants

Tenant data is not available for this property. The wider Business Park includes a mix of office and industrial units which are occupied by the service sector (56%), wholesale trade (25%) and manufacturing (19%). The tenant that occupies the largest area is Regency Confectionary Ltd. **Figure 6.3.12** presents an overview of existing tenants in the CPD development and across the rest of the Business Park[15].

Company Name	SF Occupied	Move Date	Use

[15] CoStar only provides partial data on tenants for commercial property.

Other Business Park Tenants			
Evas Engineering Ltd	2,282	24/12/2017	Industrial
Essential Recruitment Ltd	1,011	30/09/2015	Office
Verde Heating Ltd	1,800	10/10/2013	Industrial
Colin Jones	610	01/09/2013	Industrial
James Willis T/a Worksop Scrap Metal & Salvage Ltd	2,040	01/05/2013	Industrial
David J Brown	2,331	01/04/2013	Industrial
Mr Alan Roe	299	01/01/2013	Industrial
David Bailey	2,124	01/11/2012	Industrial
Direct CNC Limited	2,245	10/09/2012	Industrial
Domestic Heating (UK) Ltd	1,618	01/08/2012	Industrial
Mr Kevin Woodward	2,051	20/04/2012	Industrial
Mr Mark Bains	1,200	01/04/2012	Industrial
Cannonet	800	01/03/2012	Office
Mr Zak Simpson	2,400	12/01/2011	Industrial
Master Glass	2,000	22/09/2010	Industrial
Jones & Sons Maintenance & Repair	614	01/09/2010	Industrial
Mr James Wallis	2,040	01/05/2010	Industrial
Mr Alan Roe	200	01/01/2010	Industrial
Regency Confectionary Ltd	2,690	01/05/2007	Industrial

Figure 6.3.12 – List of Tenants

Source: CoStar, 2018

6.3.5 Economic Benefit

The table below shows that in the years preceding the development, the postcode experienced very little economic activity – just a single local unit with no recorded turnover. In 2011, at the opening of the Turbine Innovation Centre, there were 30 local units within the postcode, employing 683 workers, an average of 23 workers and a £688,000 turnover per unit, implying a labour productivity rate slightly below local average of £30,000 per worker per annum. In the 5 following years, the number of local units has increased to 39, however the average size of unit has shrunk, the site now hosting smaller, but relatively more productive units, with an average of 7 workers and £570,000 per unit, and a labour productivity rate of £80,000 per worker per annum.

Postcode: S81 8AP	2006 (pre-development)	2011 (year following development)	2016 (post-development)
Number of Local Units	1	30	39
Total Number of Employees	1	683	277
Employees/local unit	1	23	7
Annual Turnover (£000s) per local unit	0	688	570
Average Productivity (£000s per worker)	0	30	80

Figure 6.3.13 Table showing key statistics for the S81 8AP postcode, where the CPD is located

Figure 6.3.14 shows the growth of local units in the S81 8AP postcode, compared to the local area. We see that there are two spikes of growth, the first from 2009 to 2010, and the second from 2011 to 2014.

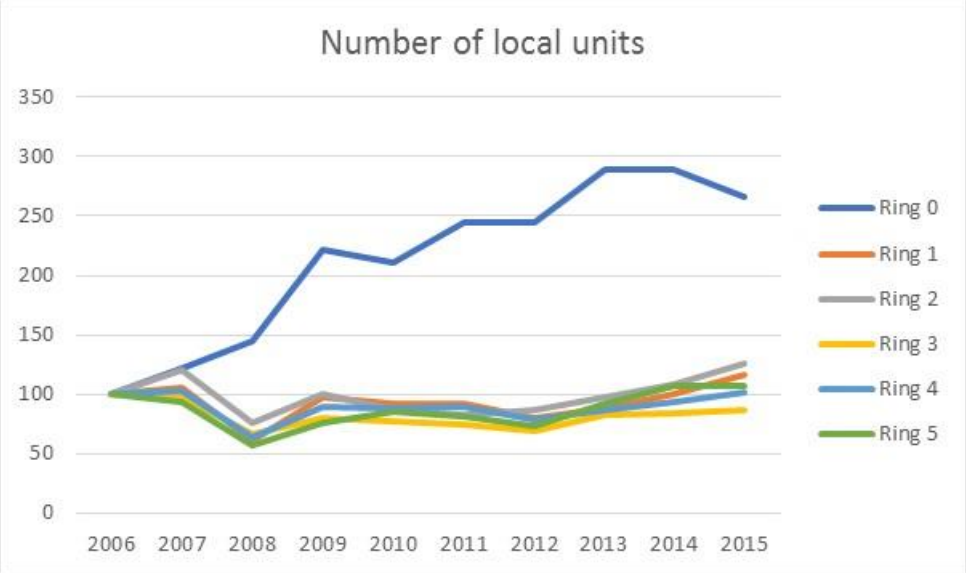


Figure 6.3.14. Growth of number of local units in Worksop

Figure 6.3.15 shows the total employment. Again, the growth within the development postcode is very noticeable.

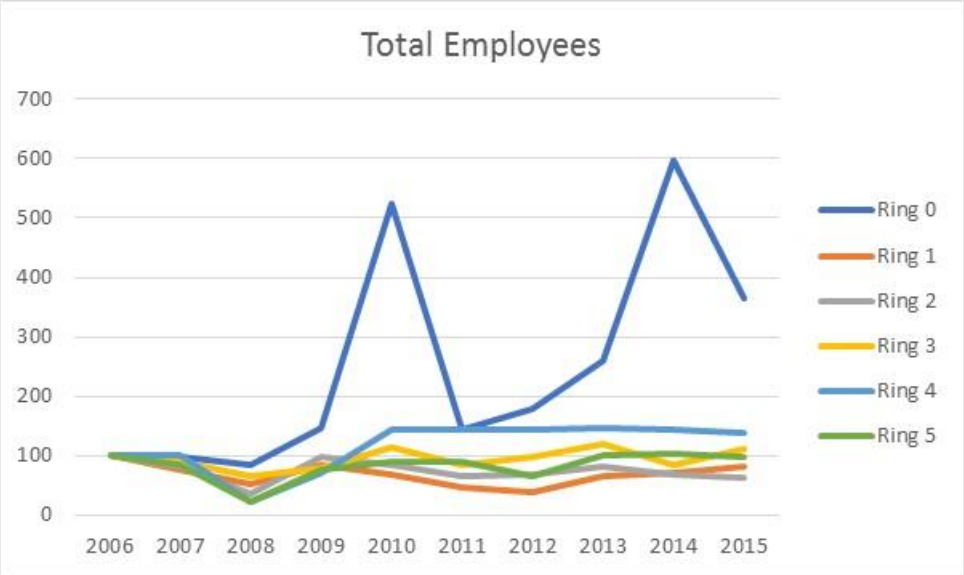


Figure 6.3.15. Growth of total employees in Worksop

Figure 6.3.16 shows the growth in turnover, with the development again dominating in comparison to the wider area.

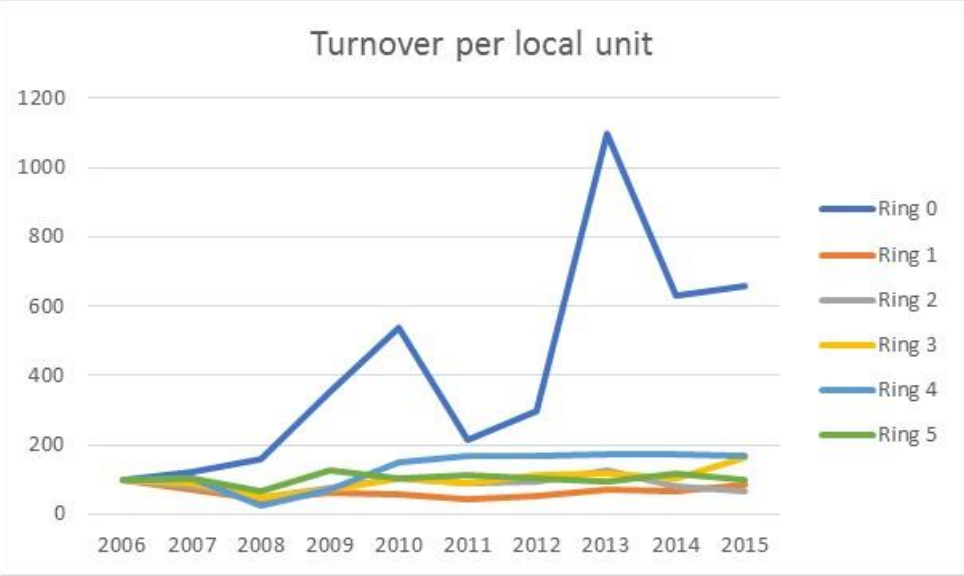


Figure 6.3.16. Growth of turnover per local unit in Worksop

Finally figure 6.3.17 shows changes in productivity. The development has generally grown faster and with greater volatility than the surrounding area.

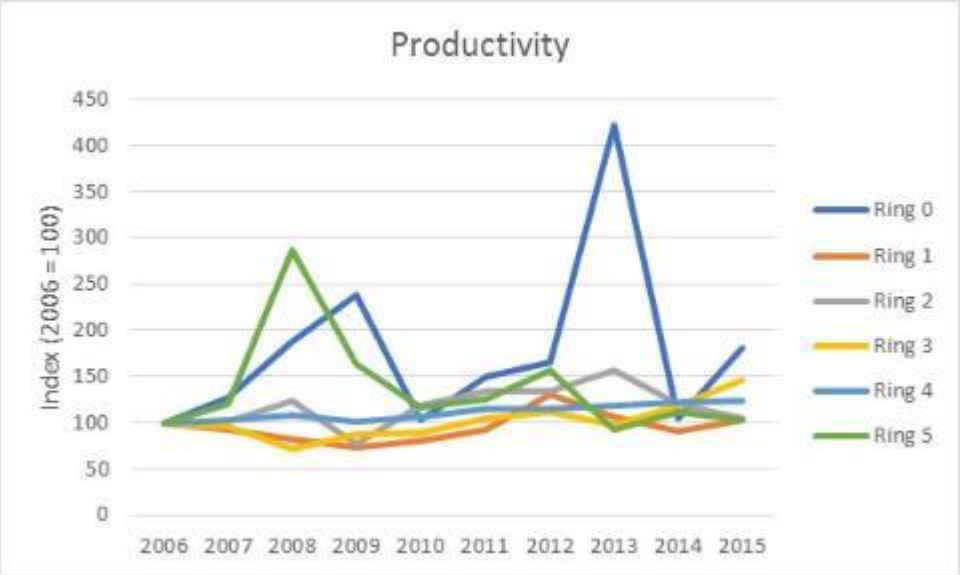


Figure 6.3.17. Productivity growth in Worksop

6.3.6 Lessons Learnt

The Worksop Turbine Innovation Centre was built during difficult market conditions with high vacancy rates and in an area characterised by high out-commuting rates. Given these caveats, the success of the development and of its resident firms has been an impressive story. The CPD managed to attract and support start-ups and growing companies mostly due to effective management from Oxford Innovation. Flexible lease terms and accommodation options, along with the wide variety of business support services offered by the operator, proved to be a successful development model which attracted and retained innovative tenants. At the moment ,all units are occupied. The productivity growth in the postcode was on average faster and greater than in surrounding area, most likely due to the innovative nature of the firms that the development specifically targeted.

6.4 Case Study 3: Chesterford Park Science Village

6.4.1 Introduction

Chesterford Park Science Village is located in the district of Uttlesford in north-west Essex, just 13 miles south of Cambridge. It is a representative of the category *Science/Research Park*.

Figure 6.4.1. Location of Chesterford Park Science Village within Uttlesford

6.4.2 The Development

Location

Chesterford Research Park is a 250-acre low-density research campus located approximately 17km south of Cambridge near the villages of Little Chesterford and Little Walden. The park is located approximately 3.5km from Junction 9a of the M11 and Great Chesterford Station, providing good access to Cambridge and London.

To date, new Commercial Property Development (CPD) has delivered 300,000 sqft of laboratory and research and development (R&D) space which has been let and occupied. Further development of an additional 900,000 sqft will extend the park further. **Figure 6.4.6** shows the location of the Research Park.

Figure 6.4.6 – Site Location
Source: (Aviva Investors, 2016, p. 7)

Figure 6.4.7 – Chesterford Research Park Plan
Source: Aviva Investors, 2016, p.11

Figure 6.4.8 – Chesterford Research Park Building Visualisation

Source: Savills, 2018

Surrounding Area

The surrounding area is characterised by undeveloped agricultural farmland, and a number of small villages.

The Research Park is an allocated employment site within the Uttlesford Local Plan 2017 and identified as an important location for economic growth and employment in a number of policies (Uttlesford District Council, 2017).

6.4.3 Local Economy

Uttlesford is a relatively rural region of East Anglia, with population density and firm density below the national average; however it possesses some significant economic assets, including the presence of Stansted airport in the centre of the district. The northern edge of the district also falls within the Greater Cambridge functional economic market area, and hosts several science parks that operate as part of the spatially dispersed “Cambridge Cluster”. Partly for this reason, the Uttlesford resident population has skill levels and wage levels considerably above the national average.

Key Stats, 2016	Uttlesford	UK
Population Density	134.6	270.7
Firm Density	8.2	10.5
Employment Rate	80.8	77.7
% of population with NVQ4 or above	46.6	38.0
Average Wage (£pa)	35,342.0	28,195.0

Figure 6.4.2 Table showing key economic indicators for Uttlesford

The graphs below show the growth of population, employment, GVA and productivity over the past 35 years. Population growth began to climb steadily in 2007. Employment has grown more strongly since 1997, matching a stronger growth in GVA. Productivity has grown slowly from around £30,000 per worker in 1982 to around £38,000 per worker in 2000. It has grown more strongly since 2001 until the financial crisis in 2008; but then recovered to the level before the crisis to around £49,000 per worker in 2015.

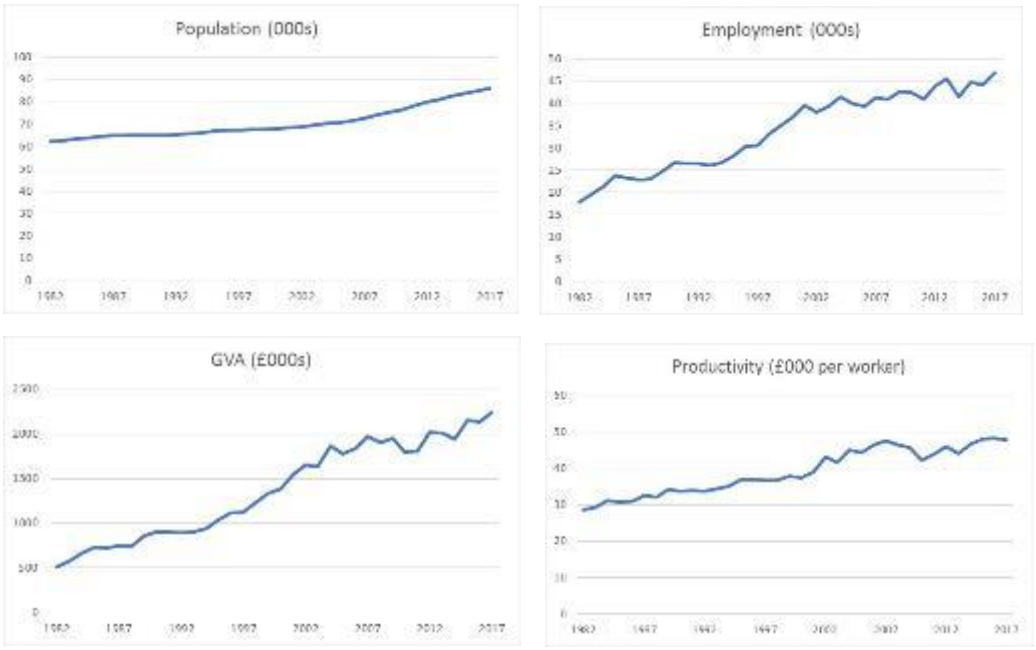


Figure 6.4.3. Timeseries graphs of population, employment, GVA and Productivity for Uttlesford

The largest sectors by employment as of 2016 are in transport and logistics, thanks to the presence of Stansted, and public services. There is also a high level of wholesale and retail in the area, and a significant High-Tech Services Sector.

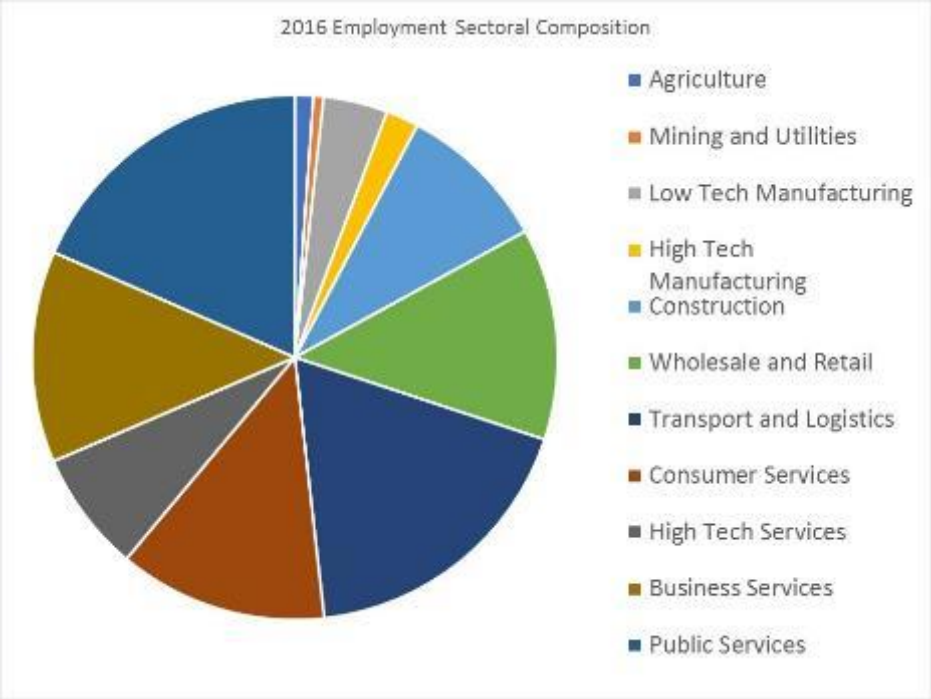


Figure 6.4.4. Sectoral Composition of Uttlesford

In the region industrial uses are mostly focused in the south towards London around the towns of Chelmsford, Harlow and Basildon. These towns are driven by financial and business services as well as growing electronics occupiers.

Regional Property Market

The total office market in the region totals nearly 20 million sqft of floorspace, 1.4 million sqft of which is 10 years old or less, and with one third (33%) of office stock located in Chelmsford and Harlow. There are no new CPD's under construction within 10 miles of the Chesterford Research Park. Across the entire region only 4 properties are under construction, delivering 209,295 sqft or 1.1% of total inventory. Of these projects, one quarter are pre-leased (25%) demonstrating the strong demand in the area. **Figure 6.4.9** presents the location of the four properties under construction.

Figure 6.4.9 – Properties Under Construction

Source: CoStar, 2018

Figure 6.4.10 presents the net absorption[16], net deliveries of new stock, and vacancy levels across the region. This indicates that many years of positive net absorption have brought the market vacancy rate down significantly since 2011, from a high of 38% to a low of around 4%. This is below the UK average of 7%. Vacancy rates are expected to remain low, with net deliveries of over 100,000 sqft expected in 2019-20. The chart indicates that the CPD is followed by a period of high absorption (take up of space) and decreasing vacancy rates.

Rents have continued to grow at an above-average rate and are now more than 10% higher than pre-recession figures. This has encouraged investment to climb and this has increased by over 150% compared to average.

[16] Net absorption is defined as the net change in occupied space over a given period of time and is calculated by summing all of the positive changes in occupancy (move ins) and subtracting all of the negative changes in occupancy (move outs).

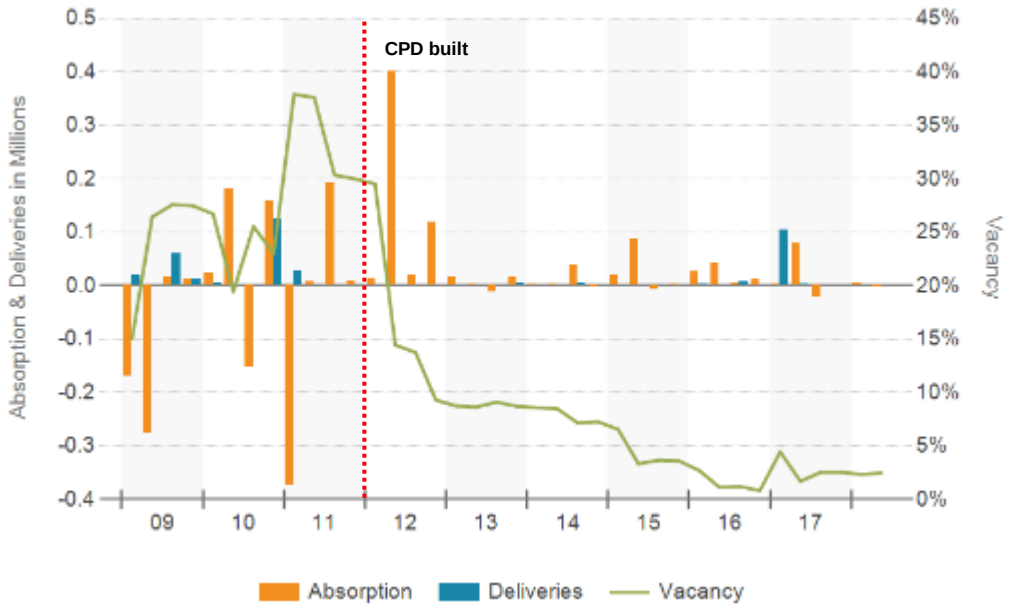


Figure 6.4.10 – Net Absorption, Net Deliveries and Vacancy

Source: CoStar, 2018

6.4.4 Occupation of the Site

Ownership and Leasing Activity

The development was led by The Churchmanor Estates Company plc and Aviva Investors. Aviva Investors are a global asset management business operating across 15 countries with a combined asset base of over £345 bn.

In 2017 it was announced that Uttlesford District Council had purchased a 50% share in the Park (believed to be the Churchmanor share) to become joint owners alongside Aviva Investors. The £45 million acquisition forms part of the council's long-term plan to generate a stable income for the future, with an estimated yield of 5.6% to 6.3% (Uttlesford District Council, 2017).

The park includes a number of plots for purpose-built developments, and also a Science Village which comprises 16 self-contained research suites over 1,515 sqft of high-tech laboratory space. The park is currently home to leading innovators such as Charles River Laboratories, Diagnostics for the Real World, Domainex and Axol Bioscience.

Asking rents across the park have fallen from a high of £28 psqft in 2015 to £22.50 in 2017, while the vacancy rate has remained at approximately 20% since 2016. While the CPD operates at vacancy rates close to 0% and the average rents at £37.00 psqft since the opening.

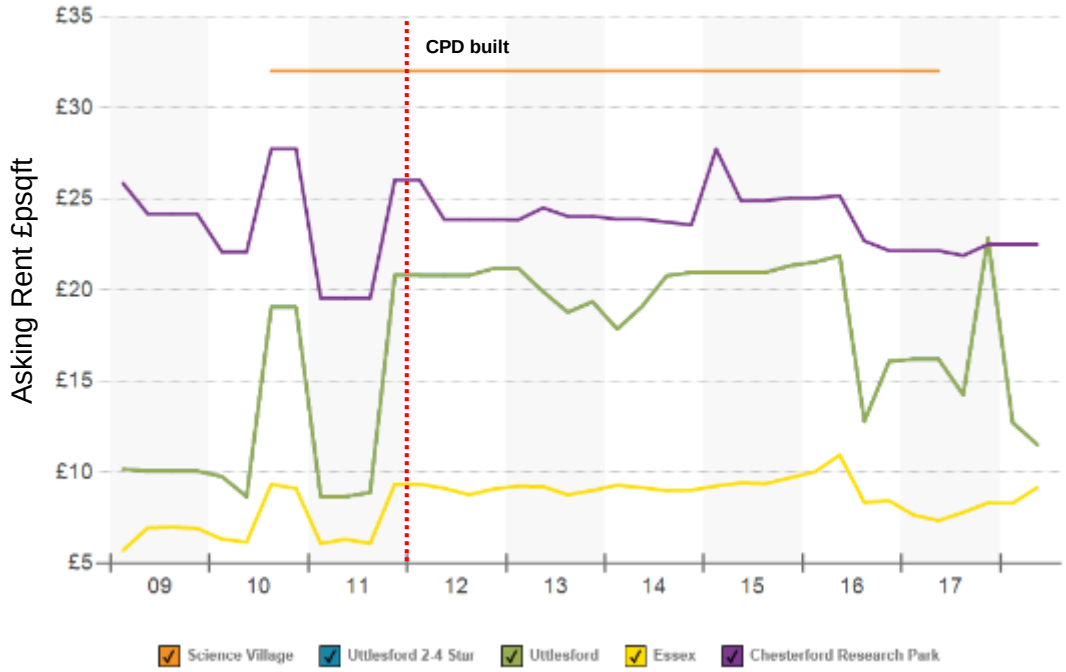


Figure 6.4.11 Asking Rents

Source: CoStar, 2018

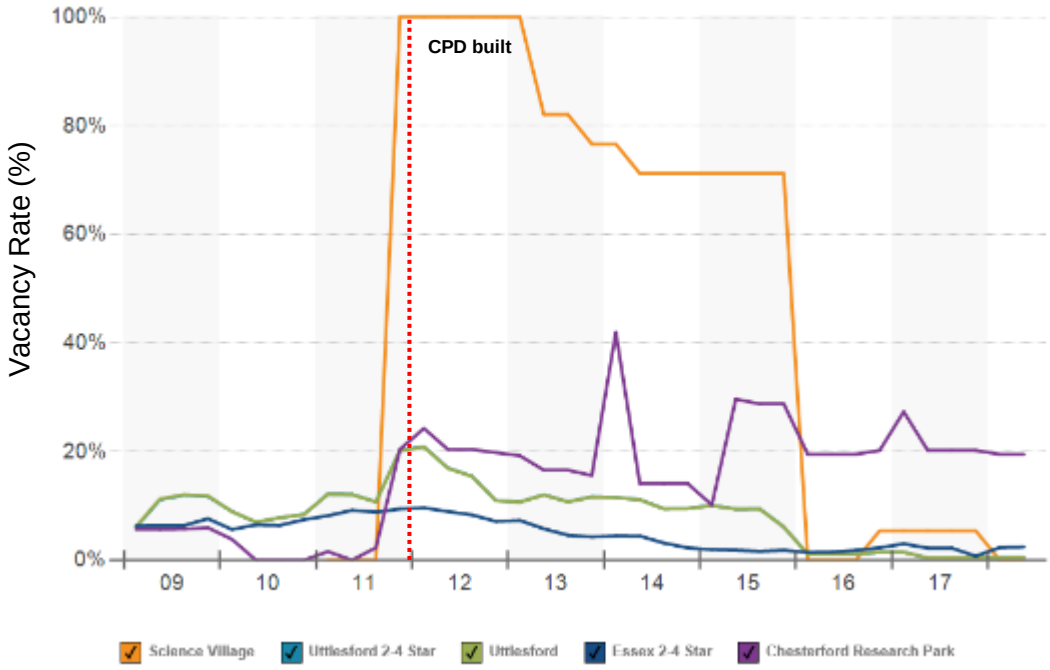


Figure 6.4.12 Vacancy Rates

Source: CoStar, 2018

Quality of Offer

The Park offers a flexible working environment for established R&D companies as well as start-up firms, providing high quality research facilities within a campus setting.

A key focus of the park is in the innovative biotechnology and pharmaceutical sectors. The park is set within the wider South Cambridge Biotech cluster which is one of the world's leading life sciences clusters. This benefits from proximity to institutes of excellence including the Babraham Institute, Wellcome Trust, Sander Institute, Cancer Research UK and Cambridge University.

Amenity provision is very good what contributes to high quality working environment. The Park tenants benefit from a 22,000 sqft central facilities hub which provides support services including conference facilities, a gym, restaurant, café bar, and concierge services.

6.4.5 Economic Impact

The table below shows that, preceding the development, in 2006 there were 6 local units, 83 workers, an average of 14 workers per local unit, £1,134,000 annual turnover per local unit and £82,000 average productivity per worker. In the year 2011 at the opening up of Chesterford Park Science Village, the number of local units increased to 15, with 482 workers and an average of 32 workers per local unit. Annual turnover per local unit increase ten-fold to £13,444,000 per local unit and average productivity per worker increased from £82,000 in 2006 to £418,000 in 2011. In the following 5 years, the number of local units decreased to 12, total workers decreased to 299, with a lower average of 25 workers per local unit but a higher annual turnover per local unit at £17,656,000 and average productivity per worker increasing to £709,000. One implication of this is that the opening up of the site has boosted employment and at the same time average productivity per worker, leading to a higher annual turnover. However, employment has decreased since the opening up of the site but, with higher productivity per worker, annual turnover still increased during these years.

Postcode CB10 1XL	2006 (pre-development)	2011 (year following development)	2016 (post-development)
Number of Local Units	6	15	12
Total Number of Employees	83	482	299
Employees/local unit	14	32	25
Annual Turnover (£000s) per local unit	1134	13444	17656
Average Productivity (£000s per worker)	82	418	709

Figure 6.4.13 Table showing key statistics for the CB10 1XL postcode, where the CPD is located

Figure 6.4.14 shows the growth of local units in the area – both the development itself and the neighbouring 2kms have all experienced growth.

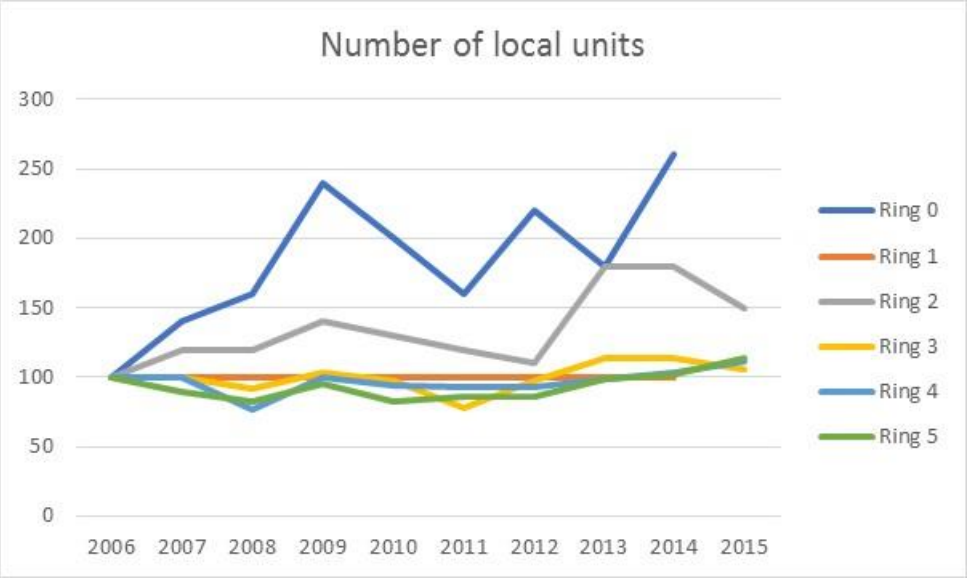


Figure 6.4.14. Growth of number of local units in Chesterford

The number of employees has grown at a rapid rate over the time period in question.

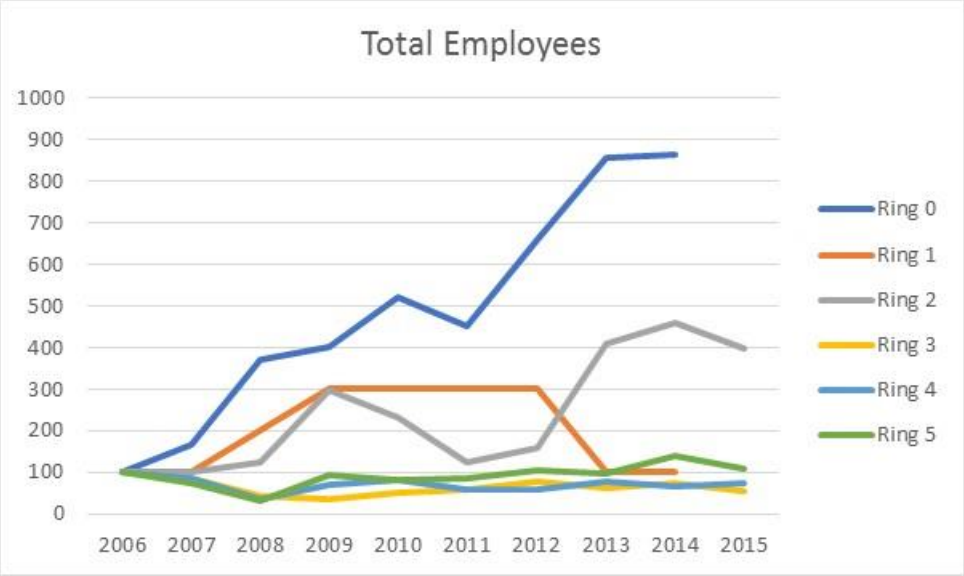


Figure 6.4.15. Growth of total employees in Chesterford

Figure 6.4.16 shows the growth in turnover; this has grown most strongly in the CPD itself and in the 1-2km ring.

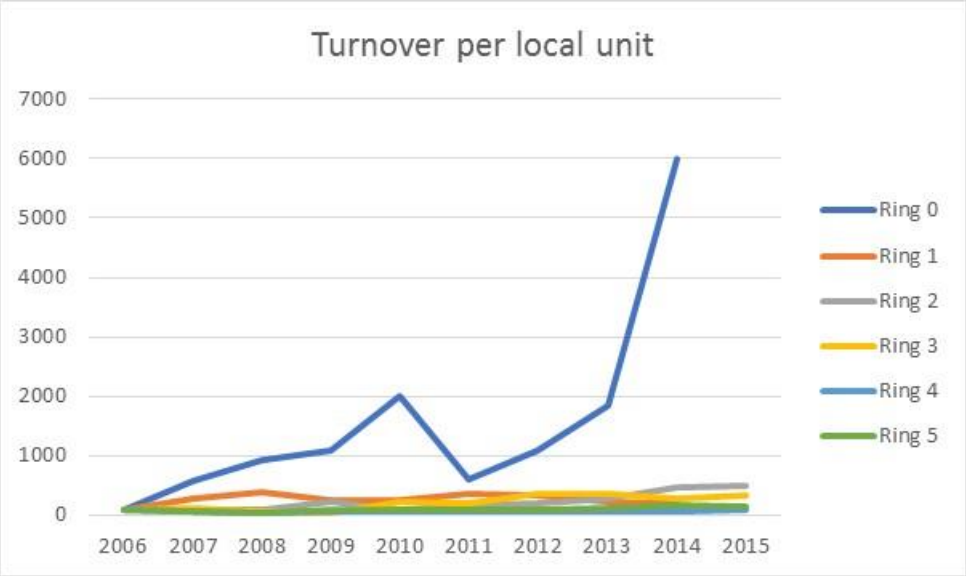


Figure 6.4.16. Growth of turnover per local unit in Chesterford

Strong productivity growth is observable in ring 0 and the 2-3 km ring.

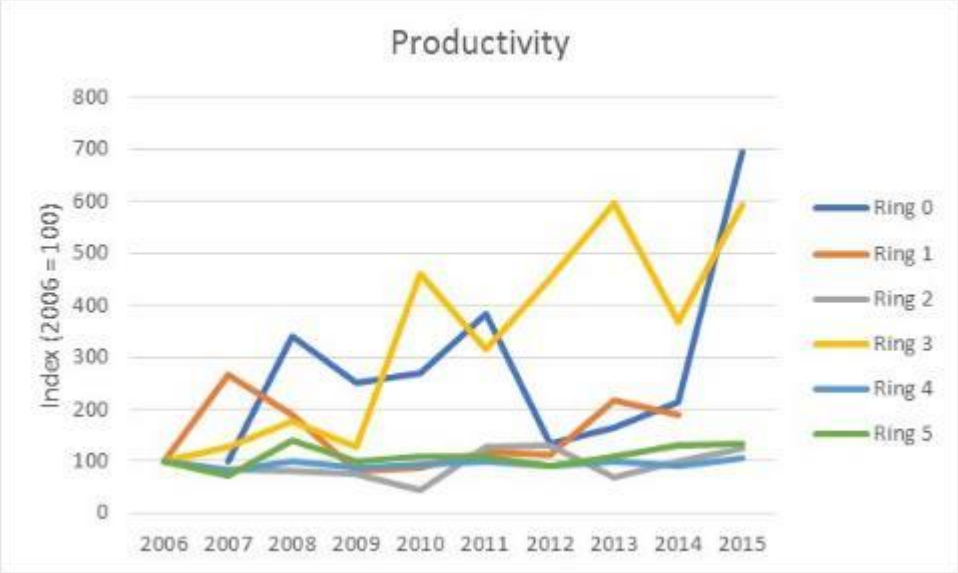


Figure 6.4.17. Productivity growth in Chesterford

6.4.6 Lessons Learnt

The site's strategic location within the Greater Cambridge biotech and pharmaceutical sector cluster proved to be a viable location for investment in new laboratory, research and development space. The high-quality facilities, delivered within a campus setting, attracted high rents and resulting in low vacancy. The annual turnover of tenants has increased 10-fold with similarly impressive growth in productivity due to characteristics of incoming tenants. The on-site facilities provide a high-quality working environment and contributed to the ability of the development to attract high-value resident firms.

While the majority of new commercial properties on the park have been fully leased, the park has a number of plots for future development, and vacancy is estimated at 20% in some of the older

units. Despite this, the park has attracted major occupiers and significant investment from the local authority, which confirms the park's long-term potential to deliver good yields on investment.

Key success factors include:

- Location within the biotechnology and pharmaceutical cluster
- High quality environment
- Flexible space and space for purpose-built property
- Strong backing from the local authority
- Good transport links
- Clear focus and vision to market to key sectors.

6.5 Case Study 4: Leyton Industrial Estate

6.5.1 Introduction

Leyton Industrial Estate is shown below within the district of Wapping Forest in north-east London. It is a representative of the category *Privately Funded Industrial Estate*.

Figure 6.5.1. Location of Leyton Industrial Estate within Waltham Forest

6.5.2 The Development

Location

The Leyton Industrial Village is located off Lea Bridge Road (A104), in Leyton, North East London. The Village has good access to the North Circular Road (A406) via the Water Works Roundabout, linking to the M11 and M25 Motorways and to the A12 to the south. Walthamstow Central Underground (Victoria Line) and Railway Station is a short drive from the site.

New Commercial Property Development (CPD) has taken place on the site with the construction of 3 new industrial and office buildings off Argall Avenue in the North West portion of the site, replacing former low-quality industrial yard areas.

New CPD additions to the estate comprise 80 small units, ranging from 500 sqft to 8,000 sqft and office units from 300 sqft. The units are of steel portal frame construction and up to two storeys. **Figure 6.5.6** shows the location of the new CPD units.

Figure 6.5.6 – Site Location and New Commercial Property Development

Source: CoStar, 2018

Figure 6.5.7 New CPD units in Leyton Industrial Village

Source: CoStar, 2018

Surrounding area

The surrounding area is predominantly industrial and forms part of Lea Bridge Gateway Strategic Industrial Location in Walthamstow Forest. The area benefits from significant regeneration investment, due to its proximity to the Olympic development area which is located 3km south of the area.

The industrial use of the area dates back to 1920 when the first buildings were constructed. More recently the traditional light industrial and small manufacturing tenants located on the estate have been gradually relocating to peripheral locations, where rents are lower. Due to proximity to residential areas and central London, the site has become popular with distribution and creative industry tenants including MADE Workshop Ltd and Steely Fox Ltd.

According to the Local Plan[17] there is a large employment land supply in the borough, but the existing stock is unfit for modern day business needs. Commercial land needs to be used more efficiently as it is coming under pressure from alternative uses, mainly residential. The Council is pledging to promote, protect and manage the Strategic Industrial Locations in the Policy CS8 – Making Efficient Use of Employment Land, offering high levels of protection to the employment land.

6.5.3 Local Economy

The table below shows a number of key indicators for Waltham Forest, with UK figures shown for comparison purposes. It is an urban area with high levels of both population and firm density, high average wages and high skill levels.

Key Stats, 2016	Waltham Forest	UK
Population Density	7064.8	270.7
Firm Density	256.1	10.5
Employment Rate	79.1	77.7
% of population with NVQ4 or above	45.7	38.0
Average Wage	30746.0	28195.0

Figure .6.5.2. Table showing key economic indicators for Waltham Forest

The graphs below show the growth of population, employment, GVA and productivity over the past 35 years. Population growth has been steadily increasing since 2007, matching with a stronger growth rate in employment. The employment rate has grown more strongly since 2012. Productivity has grown steadily from around £28,000 per worker in 1982 to around £50,000 per worker in 2017.

[17] Waltham Forest (2012) Waltham Forest Local Plan - Core Strategy

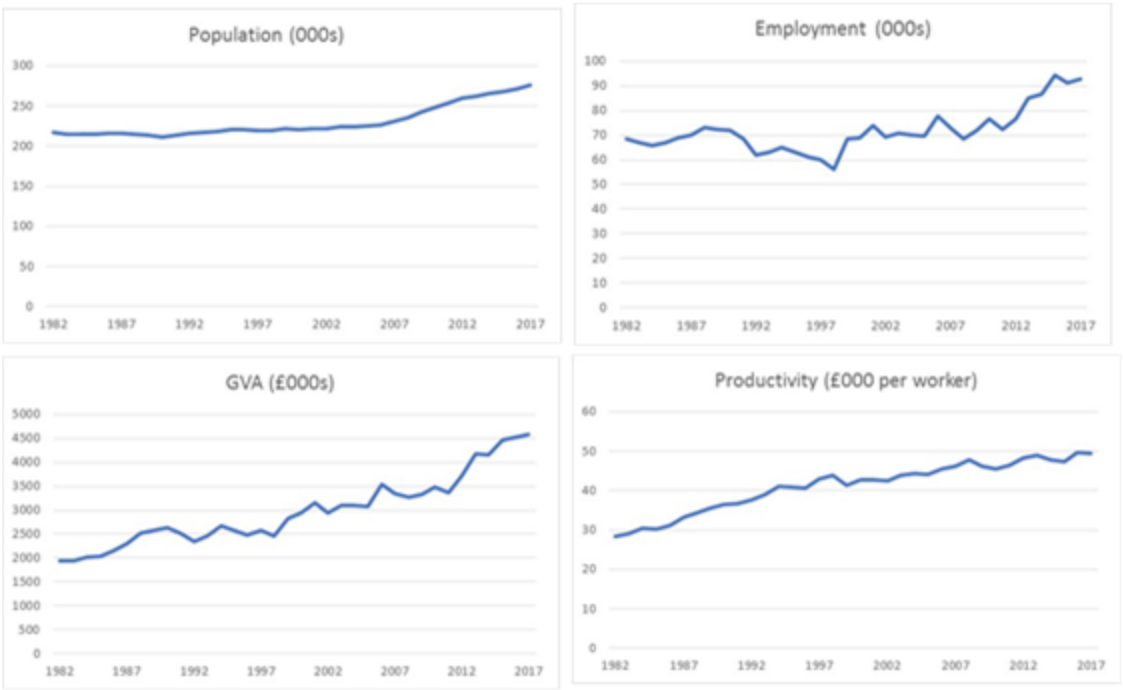


Figure 6.5.3. Timeseries graphs of population, employment, GVA and Productivity for Waltham Forest

The largest sectors by employment as of 2016 are business services and public services. There is also a high level of wholesale and retail in the area.

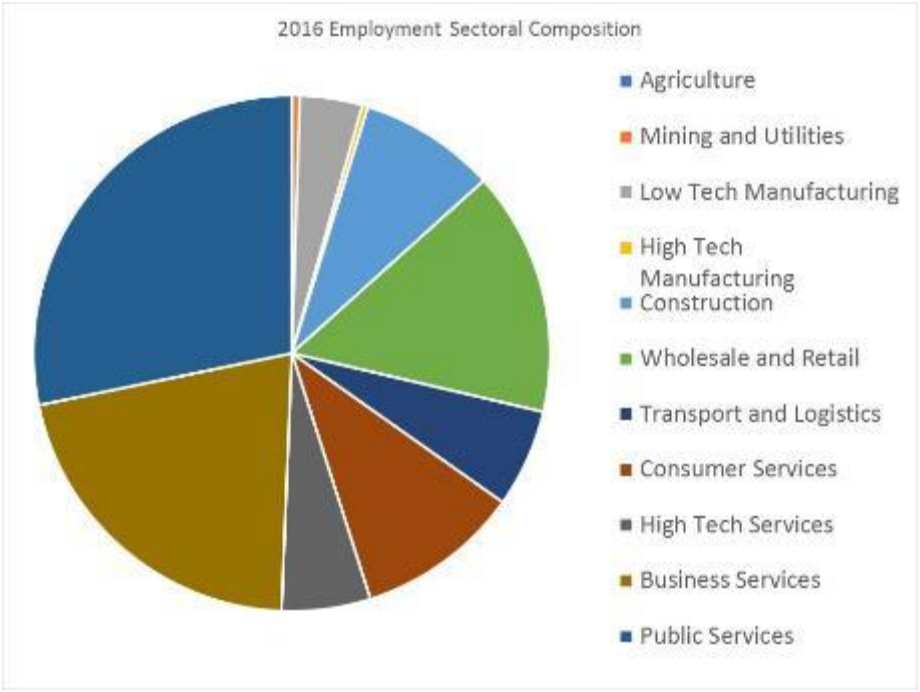


Figure 6.5.4. Sectoral Composition of Waltham Forest

London's economy has grown strongly in recent years: at 3.3% per year in 2010-16, growth was well above the national average of 2%. However, the expansion has slowed since peaking at 5.3% in 2014, with London posting growth of 1.7% in 2016 and 1.6% in 2017.

While job growth in London has soared in recent years, the outlook is more subdued. This is on account of the Brexit vote, as severe constraints on migration, if introduced, will affect nearly all job sectors across London. However, employment in London is still expected to expand by 1.6% in 2018, before rebounding to 2% in 2019.

Regional Property Market

London's large, affluent population and international connectivity makes it a key industrial and logistics hub. The Outer London North East submarket contains the boroughs of Enfield, Havering, Redbridge and Waltham Forest and it is home to a number of significant distribution warehouses and last-mile delivery units. As well as servicing London, the area provides a valuable link between London and the East of England. Larger warehouses are mainly congregated along the North Circular Road (A406) and close to the Great Cambridge Road (A10). Key occupiers include Amazon, DHL, ESAB, Tesco, and Warburtons.

Figure 6.5.8 presents the net absorption, net deliveries of new stock, and vacancy levels across the region. Vacancies have fallen sharply since 2012, due to a combination of rising demand and the loss of empty stock to other uses. Average rents have grown strongly in recent years, although the submarket is still one of the most affordable in London.

Strong demand, particularly from online retailers and delivery specialists, resulted in four consecutive years of positive net absorption in London between 2013 and 2016. Vacancies came down sharply as a consequence. Positive sentiment has caused a sharp fall in yields in London. Competition for a limited supply of assets is likely to keep yields low going forwards too.

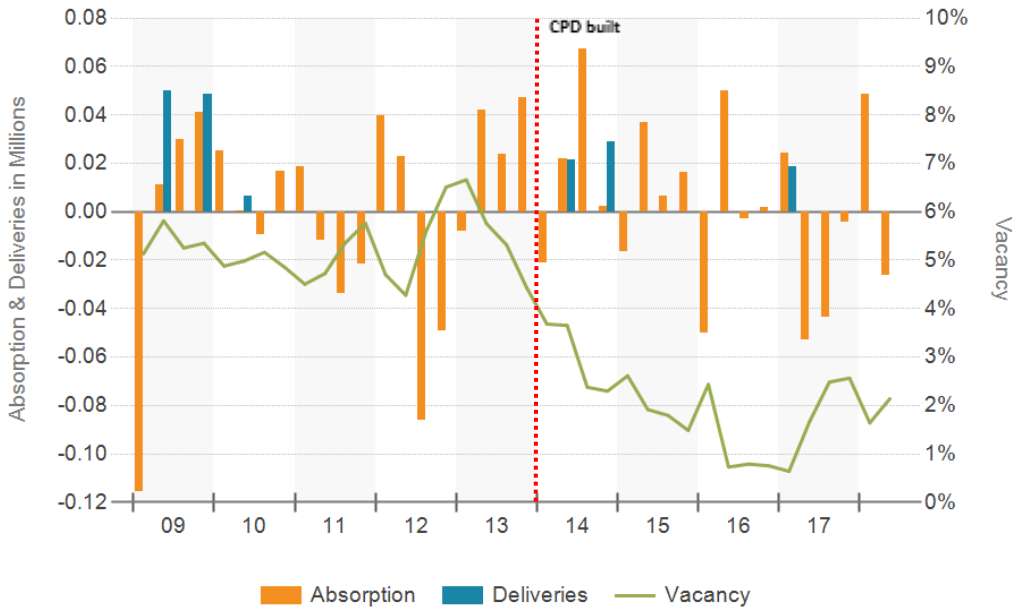


Figure 6.5.8 Net Absorption, Net Deliveries and Vacancy

Source: CoStar, 2018

There was little activity in the aftermath of the financial crisis, with very little new space delivered between 2011 and 2015. London lost stock in 2014 as warehouses were demolished for conversion to other uses. That changed in 2016 when more than two million sqft was delivered, much of which fell in London's eastern submarkets. There were far fewer deliveries in 2017, with very little currently under construction. **Figure 6.5.9** presents the location of the three areas under construction and due for completion over the next 4 Quarters, one of which is Leyton Industrial Village (Block D).

Figure 6.5.9 Properties Under Construction and due for completion in next 4 Quarters within 10 miles of the site

6.5.4 Occupation of the Site

Ownership and Leasing Activity

The new CPD additions to the estate are owned by Capital Industrial Ltd, which is a major landowner in the surrounding area. The village was bought in 2015 for £23 million pounds. The company made substantial investment in the area, capitalising on the fast growth in rental values.

The CPD property has performed well compared to the wider Lea Bridge market which currently achieves asking rents of £17.50 psqft (local agents suggest asking rents at around £25 psqft), compared to £15 psqft among peer properties. As indicated in **Figure 6.5.10,** asking rents for the new CPD are above the local and regional market rents, while **Figure 6.5.11** shows that vacancy has decreased since completion.

The vacancy rates in the estate are historically low, currently at 2.2%, compared to 0.8% in the wider industrial area and 2.4% in Greater London.

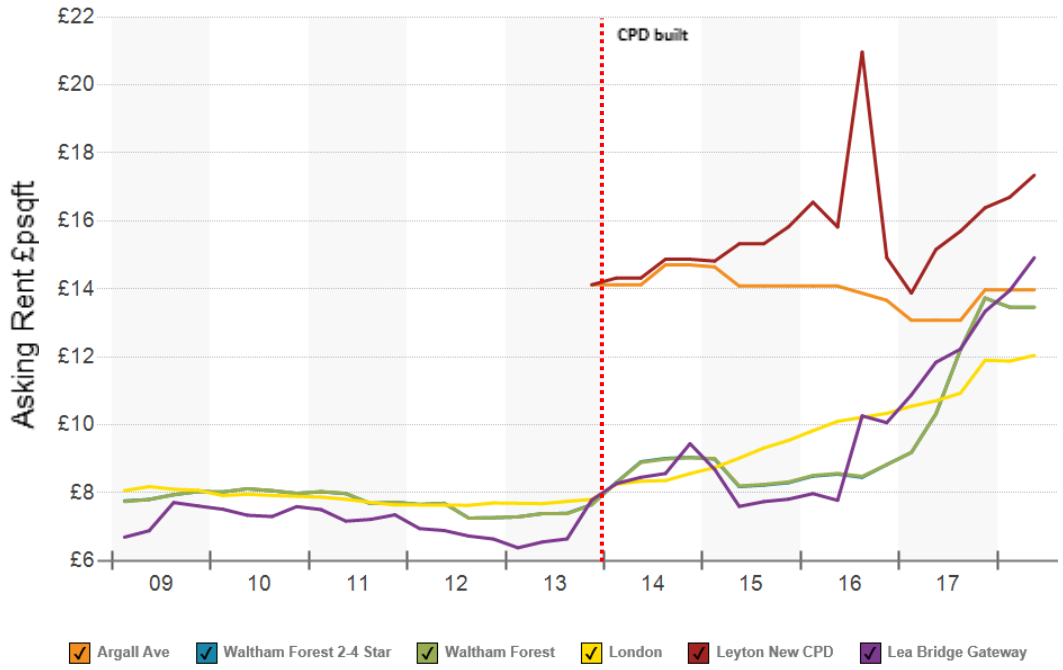


Figure 6.5.10 Asking Rents

Source: CoStar 2018

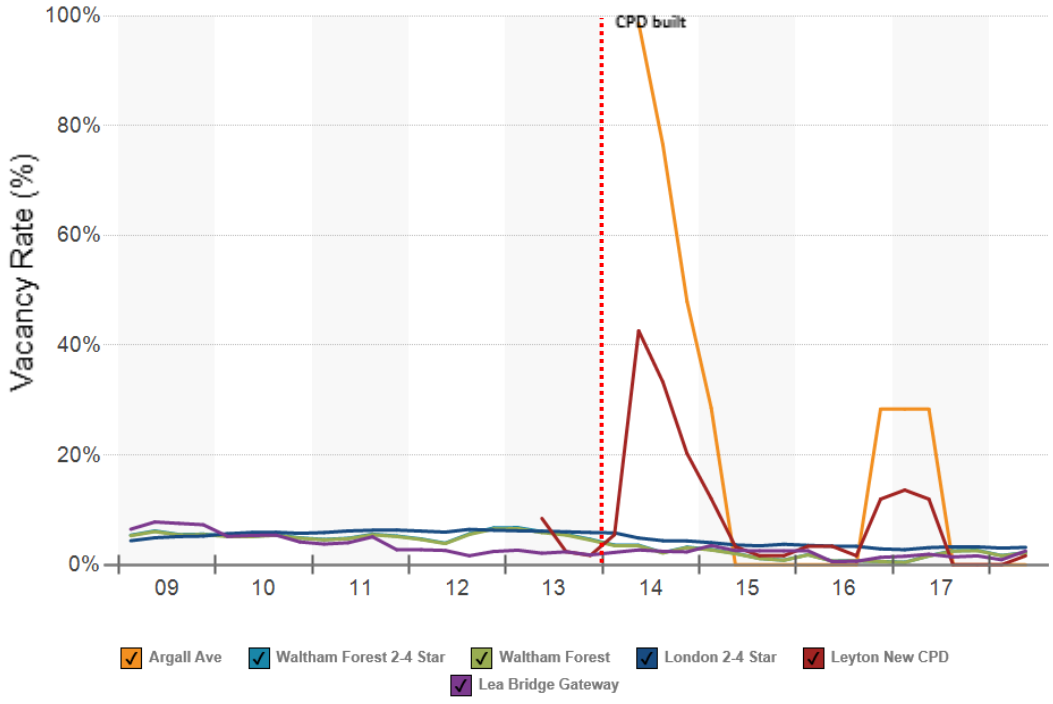


Figure 6.5.11 – Vacancy Rates

Source: CoStar 2018

On average, a property is on the market for approximately four months and the average lease length is approximately four years, with most leases signed for three to five years.

Quality of offer

The new CPD provided much needed new small industrial premises in the area which added modern, sustainable business space to the local offer. Strong economic growth in some sectors – creative, advanced light manufacturing, food production, built /sustainable environment and urban services has been observed in recent years in the area. The CPD responds to these trends by adding modern units on an existing estate, intensifying the site and widening its offer.

According to local agents there is a very low availability of new industrial units in the area and as a result the units are in strong demand and attract high rental values.

Tenants are mostly coming from Inner London areas such as Hackney and City Fringe, from which the tech and creative industries are being pushed out due to increasing rents. This shift from Inner to Outer London locations is causing strong demand for commercial space in the Lea Bridge location.

Tenants

The largest proportion of tenants are in Wholesale Trade (42.9%) followed by Services (22.7%) and Transportation & Public Utilities (18.2%). Manufacturing is the fourth industry sector present on the estate accounting for 7.5% tenants.

There is a variety of tenants including more traditional small manufacture and workshops (car repair, carpenters, printers) through specialist distribution and logistics (wine, gourmet food, exotic fruit) to creative sector (advertising, fashion). There are 80 tenants located in the postcode area and around 90 multi-occupied properties in the wider estate. **Figure 6.5.12** presents industry sectors on the Estate.

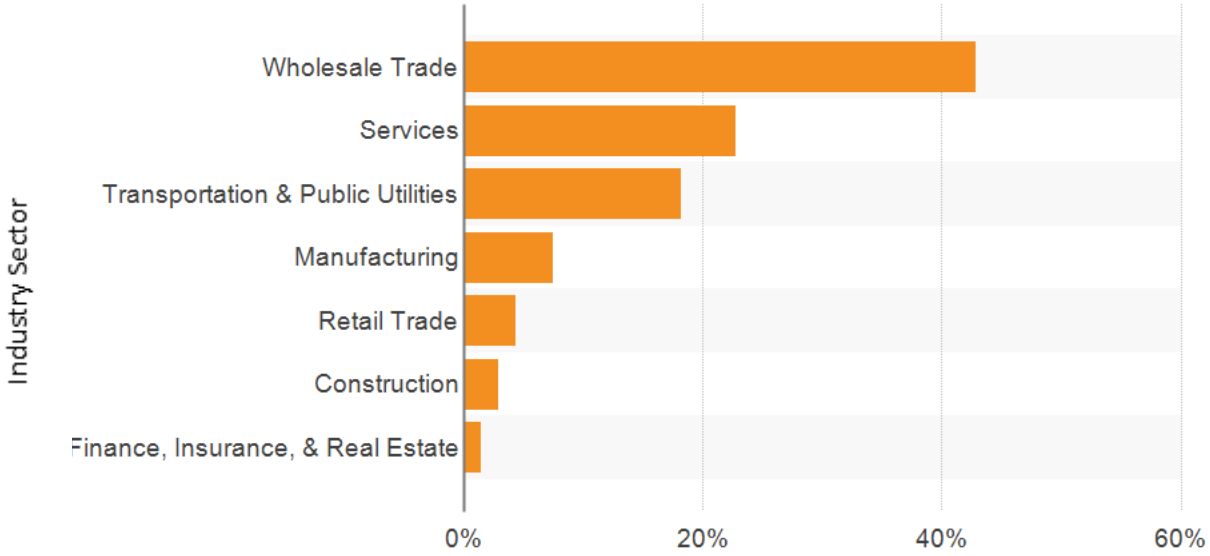


Figure 6.5.12 – Leyton Industrial Village Tenants by Industry Sector

Source: CoStar, 2018

The tenant that occupies the biggest space on the estate is Enviro Waste London (6,310 sqft). It is a waste clearance company. The second is Hamptons of London (6,080 sqft), a wine and spirit supplier. **Figure 6.5.13** presents the ten largest tenants on the estate.

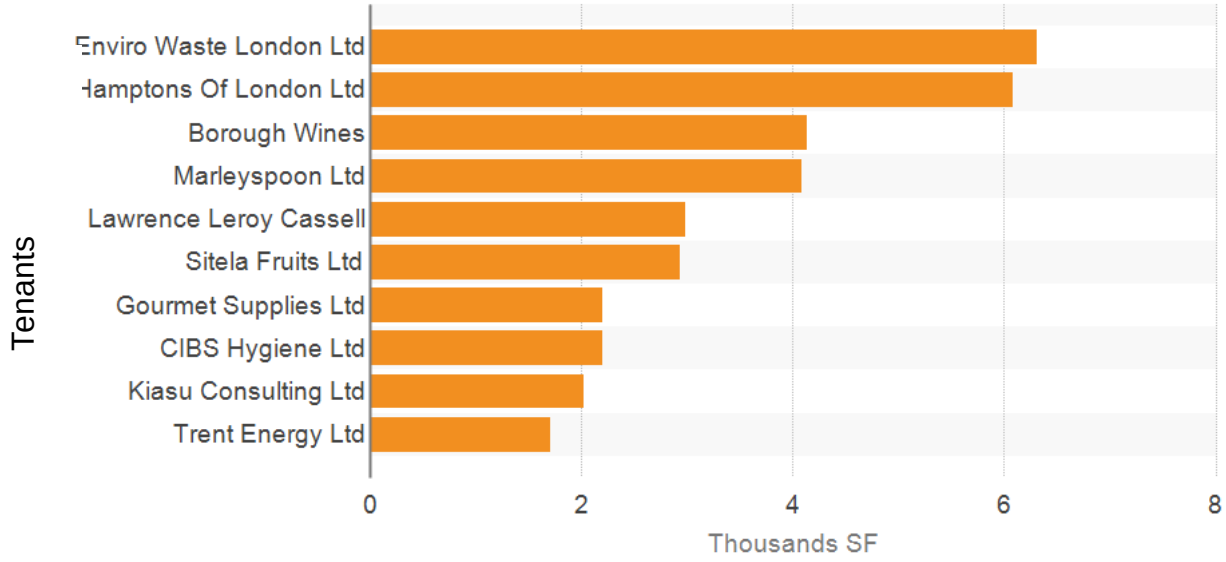


Figure 6.5.13 – Leyton Industrial Village Tenants by Floorspace Occupied *Source: CoStar, 2018*

Figure 6.5.14 presents an overview of existing tenants in the CPD development and across the rest of the Leyton Industrial Village[18].

Company Name	SF Occupied	Move Date	Industry Type
New CPD Tenants			
Aams Green Ltd	835	01/08/2014	Retailers/Wholesalers
Borough Wines	4133	14/03/2015	Retailers/Wholesalers
Charles Anthony Hicks	835	22/11/2013	Business Services
CIBS Hygiene Ltd	2198	15/07/2013	Business Services
Crowbond Groceries Ltd	1665	01/02/2014	Retailers/Wholesalers
Food Galore Ltd	1710	11/10/2013	Retailers/Wholesalers
GB TEK Ltd	835	15/11/2013	Retailers/Wholesalers
Gourmet Supplies Ltd	2200	06/06/2014	Manufacturing
Groom Property Maintenance Ltd	835	14/10/2013	Real Estate
H2O Scientific	835	01/08/2017	
Kenneth Anthony Schachter	1665	01/07/2013	Business Services
Kiasu Consulting Ltd	2022	01/08/2014	Business Services
Kyadan Ltd	835	15/07/2013	Communications
London Food Wholesalers Ltd	835	01/03/2014	Retailers/Wholesalers
Noble House Events	835	28/02/2014	Retailers/Wholesalers
Pierce Protocol Ltd.	995	12/07/2017	Business Services

[18] CoStar only provides partial data on tenants for commercial property.

Sitela Fruits Ltd	2934	15/07/2013	Retailers/Wholesalers
Steely Fox Ltd	1665	23/06/2015	Business Services
Other Leyton Industrial Village Tenants			
Bernard Balram	500	01/09/2014	Business Services
Compugrafix	363		Business Services
Ellinis Interiors Ltd	1119	01/08/2015	Manufacturing
Enviro Waste London Ltd	4600	14/06/2013	Transportation
Lawrence Leroy Cassell	2989	01/04/2014	Business Services
Mavco Ltd	6530	09/04/2017	
MJ Stapleton & Son Ltd	2795	13/06/2016	Business Services
Tammy Natasha Olasebikan	1245	29/10/2013	Business Services
Village Diner	1349		Retailers/Wholesalers
Wah Gwaan	1458	01/03/2015	Retailers/Wholesalers

Figure 6.5.14 – List of Tenants

Source: CoStar, 2018

6.5.5 Economic Impact

The table below shows that in the year 2006, there were only 2 local units within the postcode, employing 21 workers, an average of 11 workers and £587,000 turnover per unit with an average of £56,000 average productivity per worker. In 2011, at the opening of the Leyton Industrial Estate, there were 16 local units within the postcode, employing 67 workers, an average of 11 workers and £688,000 turnover per unit with £130,000 average productivity per worker. In the following 5 years, the number of local units increased to 28 and the average size of unit increased. This implies that since the development of the Leyton Industrial Estate, there are less workers per local unit but there has been an increase in average productivity per worker.

Postcode E10 7QP	2006 (pre-development)	2011 (year following development)	2016 (post-development)
Number of Local Units	2	16	28
Total Number of Employees	21	67	139
Employees/local unit	11	4	5
Annual Turnover (£000s) per local unit	587	544	889
Average Productivity (£000s per worker)	56	130	179

Figure 6.5.15 Table showing key statistics for the E10 7QP postcode, where the CPD is located

Figure 6.5.16 below show the growth in the number of local units in Leyton. It can be seen that the CPD experience a strong growth after 2010 while the number of local units in the outer rings grow at more stable rates.

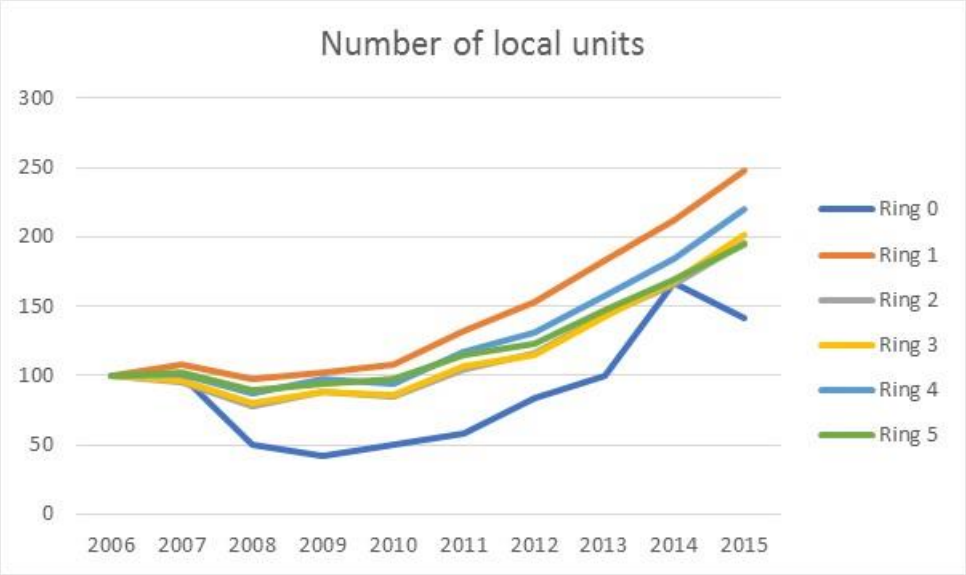


Figure 6.5.16. Growth of number of local units in Leyton

Compared to the surrounding areas, the number of employees working in the CPD grow at a similar rate to the surrounding areas from 2010 onwards.

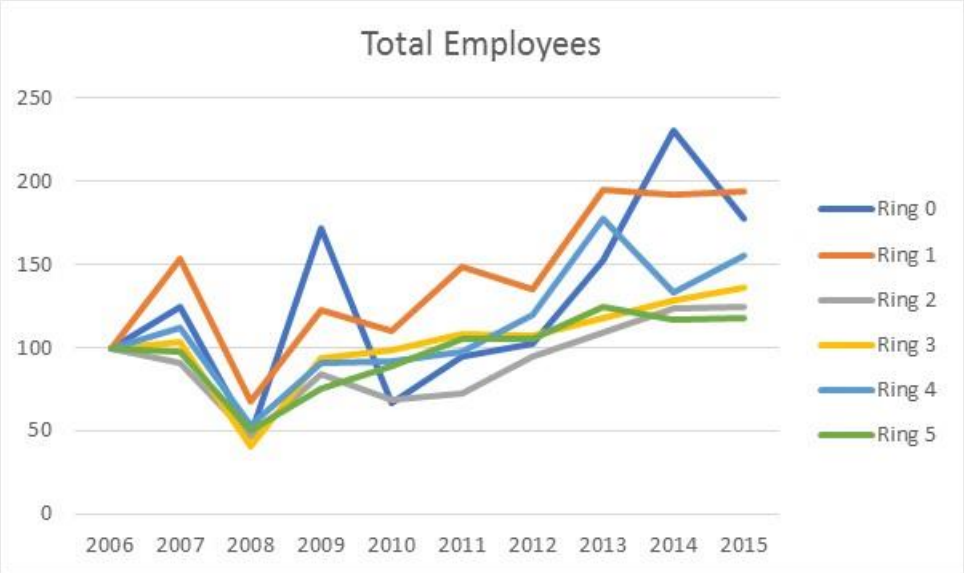


Figure 6.5.17. Growth of total employees in Leyton

The growth in turnover per local unit in different areas surrounding the CPD are very similar to each other while the ring 0 postcode itself experienced a drop in turnover between 2006 and 2009, before picking up significantly after the new development was opened.

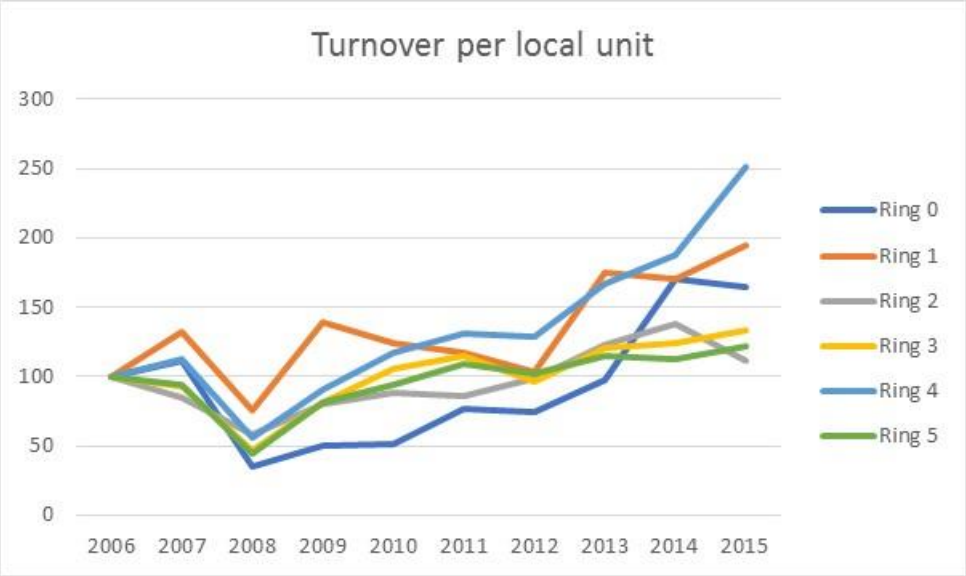


Figure 6.5.18. Growth of turnover per local unit in Leyton

Figure 6.5.19 below show the growth in productivity of the CPD as well as its surrounding areas. Similar to the growth in employee and turnover per local unit above, the productivity growth at the CPD is lower compared to the outer area in most of the years.

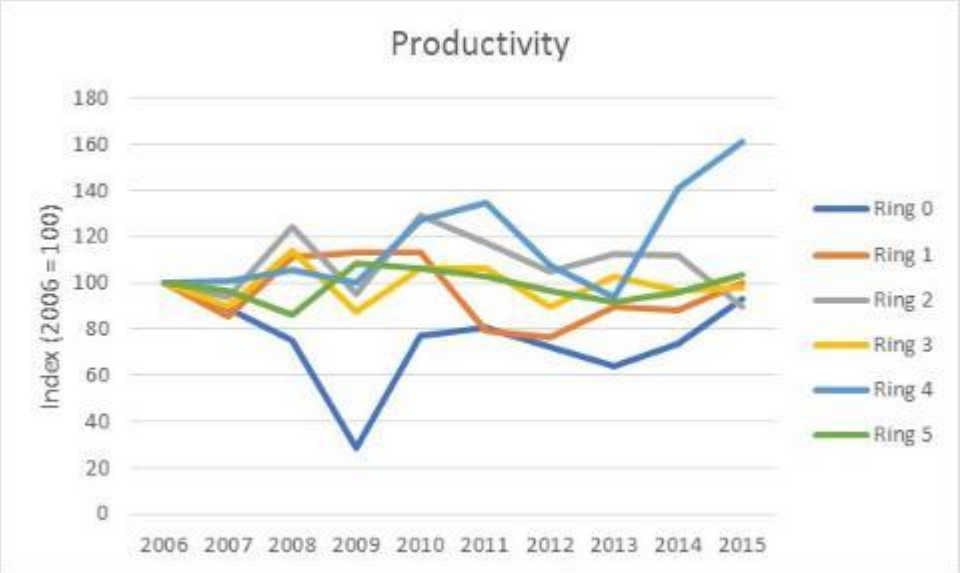


Figure 6.5.19. Productivity growth in Leyton

6.5.6 Lessons Learnt

The development of the new CPD additions which have intensified the existing industrial estate was incentivised by very high demand for small industrial units in the area. The strong growth in creative, tech and urban services sectors is contributing to the success of the estate.

The postcode area has witnessed an increase in productivity and turnover for businesses while the average number of employees per unit has fallen. There are now more smaller and more productive units with fewer employees per business. The new CPD is an extension of an

established industrial estate and broadly follows the trends observed in the wider estate. However, the growth in productivity and turnover has been slower compared to the wider estate.

The site is protected by local policies however due to the pressure from residential development there is the potential that in the future conversion to housing or colocation of employment with residential units could occur.

Key success factors of the new CPD include:

- Good location suitable for a range of occupiers
- High demand for small industrial units
- Low supply – very low delivery rates in the area due to competition from residential
- Site benefiting from regeneration initiatives in the area
- Site protected by local policies – strategic industrial location
- Local initiatives within business community focused on attracting funding.

6.6 Case Study 5: York Eco Business Centre

6.6.1 Introduction

York Eco Business Centre is located in the northern suburbs of the city of York, also the name of the local authority district. It is a representative of the category *Publicly Funded Business Estate.*

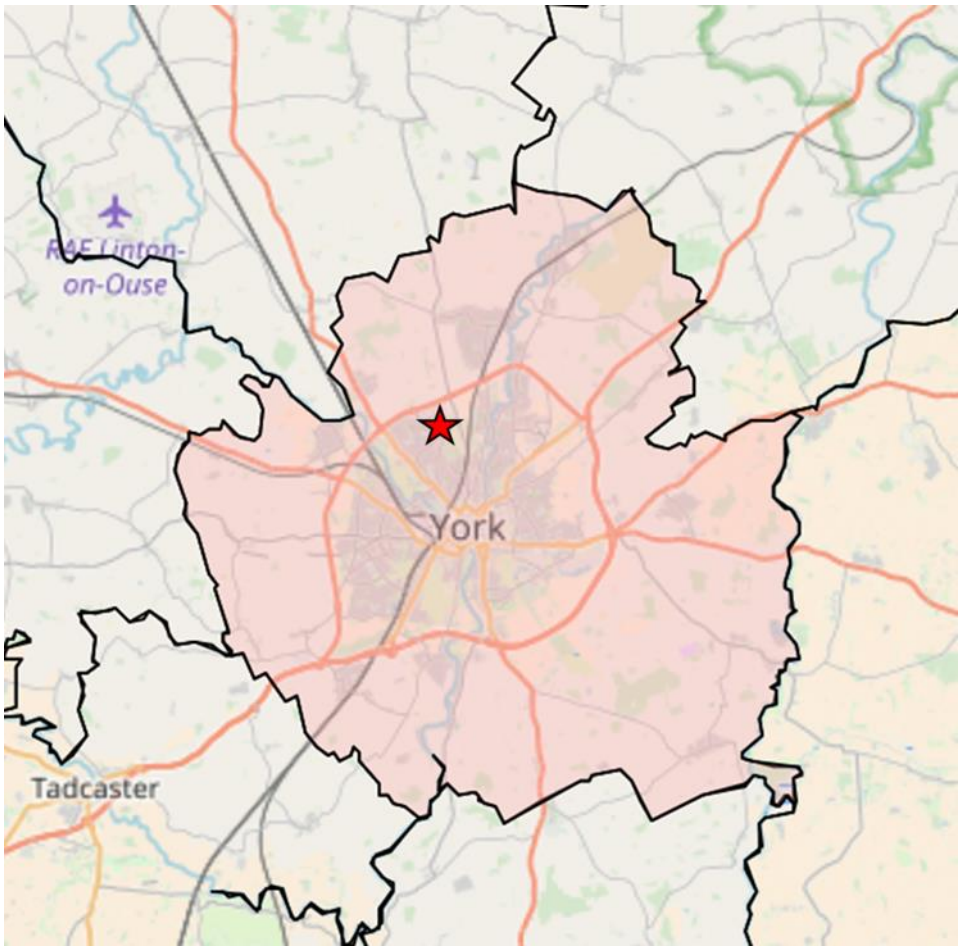


Figure 6.6.1: Map of the area showing the location of York Eco Business Centre within the district of York

6.6.2 The Development

Location

York Eco Business Centre is located on the northern fringes of York, close to the York outer ring road (A1237) on Clifton Moor trading estate. Clifton Moor is situated 3.5 km (2.2 miles) north of York city centre and has good strategic road access with links to the A1(M) via trunk roads. The trading estate serves mainly York as well as settlements to the north of the ring road – Wigginton and Upper Poppleton.

The area has a strong connection to York's aeronautical past. In 1980 Clifton Moor underwent transformation into a suburban area. A retail park and the trading estate were built on the site of the former airfield in 1980.

New Commercial Property Development has taken place on a site at Amy Johnson Way, adjacent to Vue Cinema and Sulzer Service Centre. This 3-Star rated property comprises a two-story building of steel portal frame construction, providing 63 office/studio spaces over two floors. The

building, built in 2010, is arranged around a central courtyard, has a roof terrace and provides a total of 13,270 sqft of gross internal area (GIA). **Figure 6.6.5** shows the location of the new CPD units.

Figure 6.6.5 – Site Location and New Commercial Property Development

Source: CoStar, 2018

Surrounding area

The wider estate consists of a mix of retail, leisure, commercial and industrial uses. To the north of the Eco Centre lies a retail park, to the east a service centre for all types of water equipment, to the south retail warehouses, and to the west offices. Further west lies Clifton Moor residential neighbourhood.

6.6.3 Local Economy

The table below shows a number of key indicators for York, with UK figures shown for comparison purposes.

Key Stats, 2016	York	UK
Population Density	760.8	270.7
Firm Density	25.2	10.5
Employment Rate	81.2	77.7
% of population with NVQ4 or above	42.7	38.0
Average Wage	26096.0	28195.0

Figure 6.6.2. Table showing key economic indicators for York

The graphs below show the growth of population, employment, GVA and productivity over the past 35 years. Population has been steadily increasing since 1982. The employment rate has grown more strongly since 1996. Productivity has grown steadily from around £25,000 per worker in 1982 to around £44,000 per worker in 2006, but then fell to around £39,000 per worker in 2017.

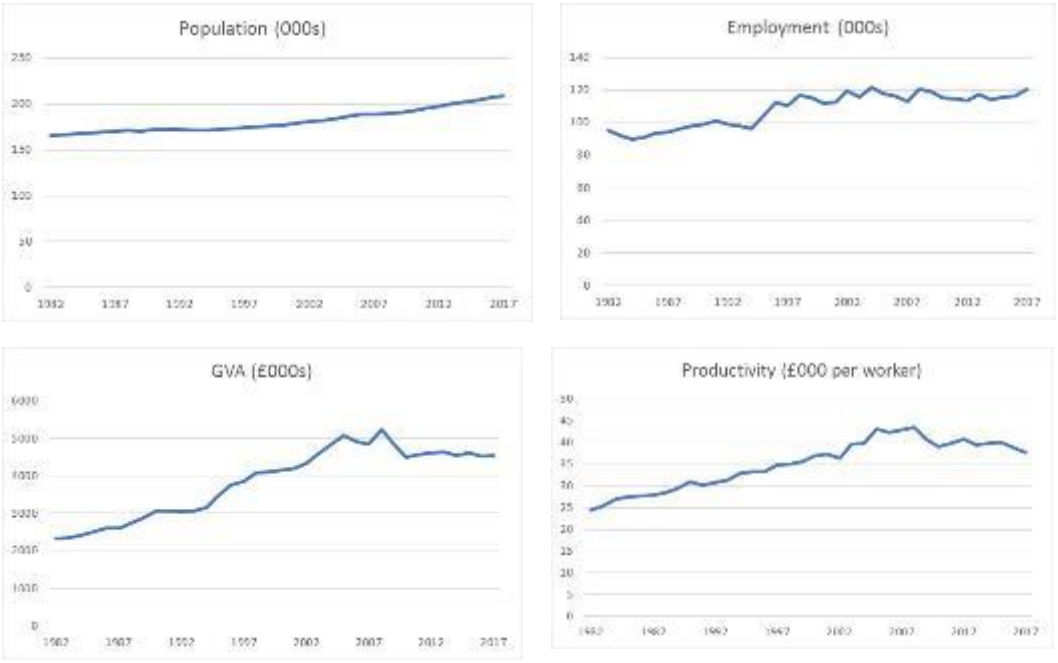
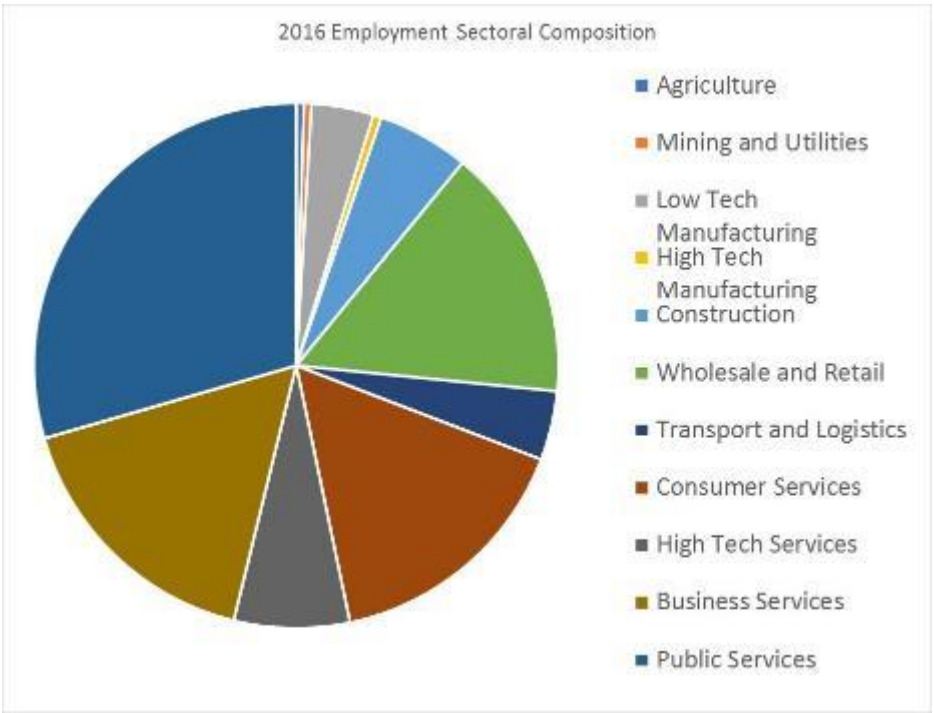


Figure 6.6.3. Timeseries graphs of population, employment, GVA and Productivity for York

The largest sectors by employment as of 2016 are in consumer services and public services. There is also a high level of wholesale and retail and business services in the area.

Figure 6.6.4. Sectoral Composition of York



Regional Property Market

The York property market comprises the historic city of York and several key surrounding towns such as Harrogate, Selby and Scarborough. It's industrial market, consisting of 30 million sqft of stock, is four times larger than its office market. Due to an extensive area of national park – the North York Moors - industrial property is concentrated along the central corridor, close to the A1. This strategic location is especially good for distribution companies serving Yorkshire and the Humber, the North West, and the North East regions. Major occupiers include Nestle, Debenhams and Sainsbury's on the industrial side, while Aviva, NFU and Hiscox are among notable office occupiers located in the area.

Net absorption for office space surged in 2017 and, combined with common office-to-residential conversions, there was a sharp fall in vacancy rates. Average rents recovered strongly during 2014-17.

Figure 6.6.6 presents office net absorption, net deliveries and vacancy rates in the York, Selby property submarket, which in contrast to York market has higher vacancy rates at 25%. This indicates that the CPD was completed during a period of negative absorption, with only modest take up and minor vacancy decreases in the subsequent years, suggesting a slow property market.

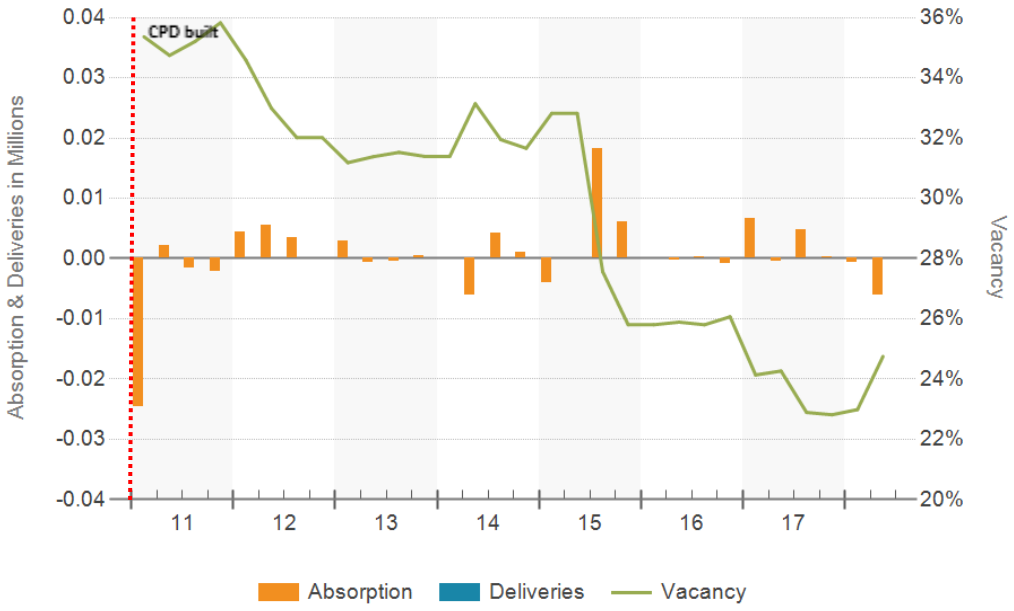


Figure. 6.6.6 Net Absorption, Net Deliveries and Vacancy

Source: CoStar, 2018

York has the second-smallest office market in the wider Yorkshire and the Humber region, and is less than one fifth of the size of the Leeds market. The stock mostly consists of historic properties, with only 3 properties greater than 50,000 sqft built this century. Furthermore, the development pipeline is very quiet. **Figure 6.6.7** shows that there is no new office space under construction in the 10-mile radius from the subject property. Similarly, in the Outer York submarket there are no offices under construction and no properties larger than 25,000 sqft have been built since the financial crisis in 2008.

Figure. 6.6.7 Properties Under Construction and due for completion in next 4 Quarters within 10 mile radius of the site. Source: CoStar, 2018

6.6.4 Occupation of the Site

Ownership and Leasing Activity

The new CPD units were built in 2010 by York City Council. The ambition for the site was to provide accommodation for small businesses, start-ups and local entrepreneurs. It was built to replace a demolished workshop for start-ups at another location.

The Council, which owns the land, had organised a competition for development of the property, in return for a long lease at peppercorn rent. The development is currently fully let with the most recent transactions taking place in 2017, with Bright Beginnings Childcare Agency being the biggest employer (50 people).

The CPD property has performed well compared to the wider York 2-4 Star market which currently operates with a vacancy of 3.5% and achieves asking rents of £11.99 psqft. Asking rents for the new CPD are £21 psqft for office space and £17.50 for studios. There is no further time series information on CoStar for this property.

The Clifton Moor trading estate shows more subdued performance. The vacancy rate for the 52 offices we have records for is 7.2%, which is higher than the York average, but the asking rents are at £11.36, only minimally lower than the York average. This suggests that the location and current stock on the estate, while still in demand, it is not a first choice for occupiers.

According to the local agents a reason for subdued performance of the wider estate might be related to high levels of traffic on the circular road which serves the estate. The road is single lane in each direction and tends to be congested.

Quality of Offer

The new CPD introduces a new quality commercial space to the estate, featuring eco-friendly materials and building technologies. The amenities provided on site - the roof terrace, internal courtyard and community spaces offer a high quality working environment and opportunities for tenant

Tenants

The new CPD units are leased by a variety of tenants, from one/two people enterprises providing consultancy services, to small-medium engineering or business services companies. The building accommodates start-ups, entrepreneurs and small local enterprises such as a cookery school.

The wider Business Park includes a mix of uses and tenants. Leisure and retail operators are mostly located in the north part of the estate, close to the circular road. Wholesalers, workshops and manufacturing occupy the centre of the site, while offices are mostly located on the south edge, benefiting from the proximity to the city centre. Table 5.1 presents an overview of existing tenants in the CPD development.

Company Name	Employment	Industry Type
Active 8 Learning	9	Personal Services
Angelcare - York	4	
Bluebird Care York	5	Medical
Brewd Company Ltd	3	
Bright Beginnings Childcare Agency	50	
Bright Five Ltd	5	Computers/Data Processing
Corebrand	15	Business Services
Dementia Forward	8	
Digital Invoicing Ltd	2	Accountants
Domestic Divas York Ltd	18	
Electric City	2	Engineers/Architects
Enviroscope Consulting	2	Business Services
Flynn's	1	
Fusion Design	0	Business Services
Get the World Moving	0	Business Services
Holland Brown Architects	2	Business Services
I Q Engineers Ltd	16	Agri/Mining/Utilities
Ken Robinson Associates	4	Communications
Kip McGrath York North	2	
Mann Creative	2	
Mary Ratcliffe Curative Hypnotherapy	1	
Moray Mackay Architecture	1	
Ocean Corals Ltd	4	Retailers/Wholesalers
One to One	4	

Company Name	Employment	Industry Type
Pole Position Aerial Fitness	1	
Production Values	2	Real Estate
Qualia Ltd	2	
Red Publications Ltd	7	Communications
The Fern Osteopathic Practice	2	
Thomas Dick York Ltd	2	
Topaz York	1	
United Furnishings & Home Accessories	2	
Wildwood Ventures Ltd	0	Communications
Wiles Ltd	4	Business Services
Yorcloud Ltd	3	
York Eco Business Centre	2	Personal Services
York People First 2000	1	Personal Services

Figure 6.6.8 – List of CPD Tenants

Source: CoStar, 2018

6.6.5 Economic Impact

The table below shows that before the development, in 2006, the postcode had 6 local units, 20 workers, with an average of 3 workers per local unit, an annual turnover of £118,000 per local unit and average productivity per worker of £35,000. In 2011, at the opening of the York Eco Business Centre, there were 16 local units within the postcode, employing 45 workers, the same average number of workers per local unit and a £195,000 turnover per unit, implying a labour productivity rate of £69,000 per worker per annum. In the 5 following years, the number of local units increased to 41, average size of the local units increased, with an average of 6 workers and £619,000 per unit, and a labour productivity rate of £97,000 per worker per annum. Local units and employment have expanded, alongside a rise in productivity.

Postcode YO30 4AG	2006 (pre-development)	2011 (year following development)	2016 (post-development)
Number of Local Units	6	16	41
Total Number of Employees	20	45	262
Employees/local unit	3	3	6
Annual Turnover (£000s) per local unit	118	195	619
Average Productivity (£000s per worker)	35	69	97

Figure 6.6.9 Table showing key statistics for the YO30 4AG postcode, where the CPD is located

Figure 6.6.10 shows noticeably strong growths in the number of local units at the CPD itself while all the outer areas experience more stable growth over time.

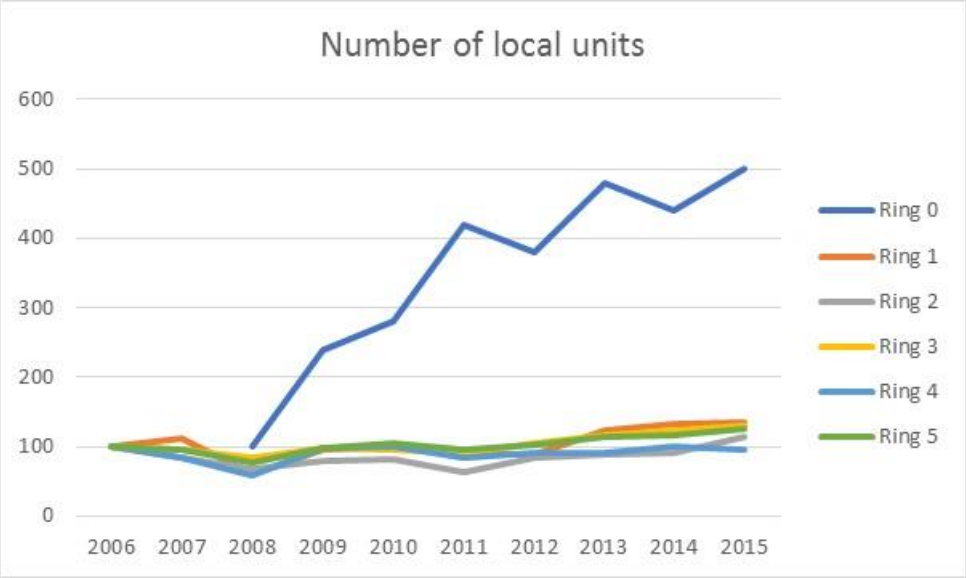


Figure 6.6.10. Growth of number of local units in York

Similar to the growth of number of local units, the growth of employee and the growth turnover per local unit are significantly strong at the CPD itself compared to all the surrounding areas.

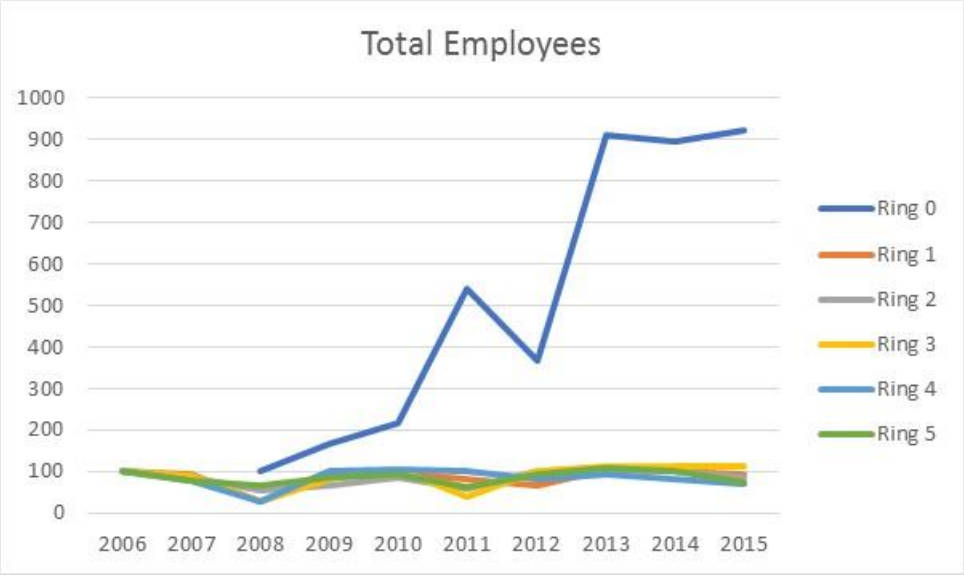


Figure 6.6.11. Growth of total employees in York

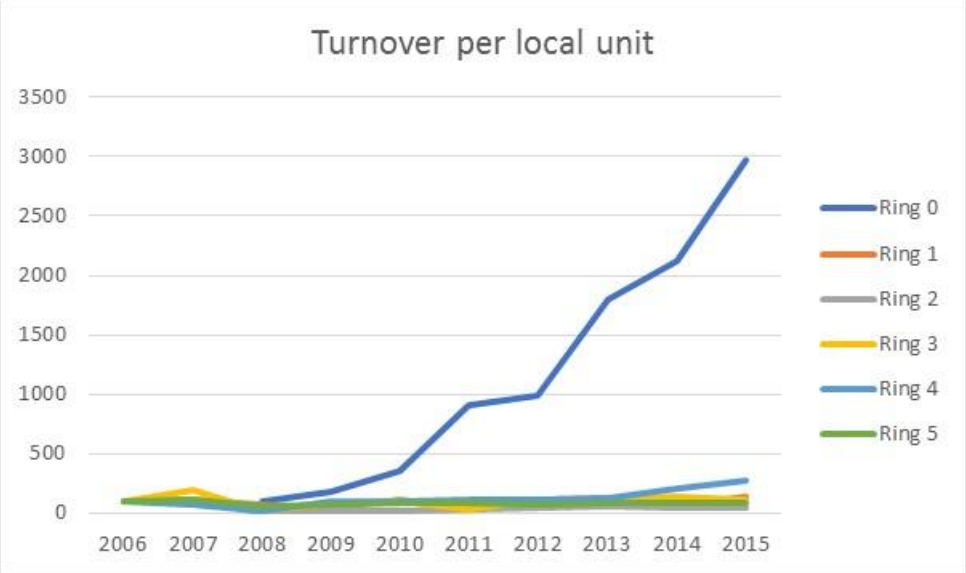


Figure 6.6.12. Growth of turnover per local unit in York

The CPD itself also experience stronger growth in productivity compared to the outer areas in earlier years although from 2014 to 2015, the area within 3-4 km from the CPD shows a stronger growth in productivity compared to the CPD.

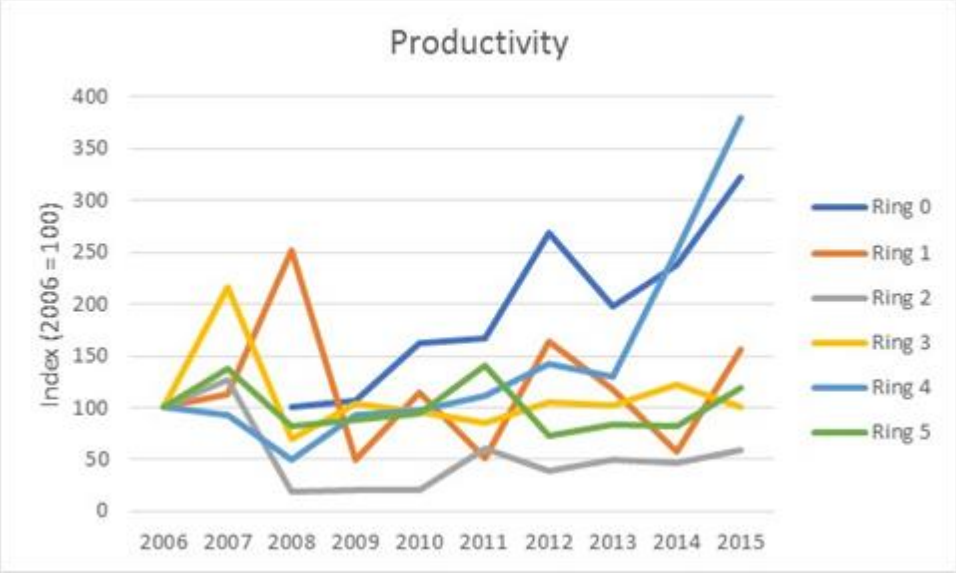


Figure 6.6.13. Productivity growth in York

6.6.6 Lessons Learnt

York Eco business Centre was developed as a showcase for sustainable features, delivering small business spaces for local entrepreneurs. While it was initially intended to replace demolished workshop units, it provided mostly office space, which was already in abundance in the area. However, compared to the wider estate it provided more modern units with a suite of additional facilities such as roof terrace and communal spaces. According to the owner, these facilities managed to attract a creative and innovative business community. This claim is supported by the analysis showing an increase in productivity, number of business units and employment per unit.

On the property side, the building has stable rents and low vacancy rates while the wider estate has not performed as well. This is due to an aging stock and poor infrastructure.

Key factors contributing to the success of the development are:

- Council-led development featuring sustainable solutions and addressing an identified need for small business units
- Developed by a public-private partnership
- High quality of the design with a courtyard and communal spaces creating working environment supporting interaction
- Site protected by local policies.

6.7 Case Study 6: Dalziel Building

6.7.1 Introduction

The Dalziel building is an office location within the town of Motherwell, 13 miles to the east of Glasgow. It is an representative of the category *Single Site Commercial Space* located in a town centre.

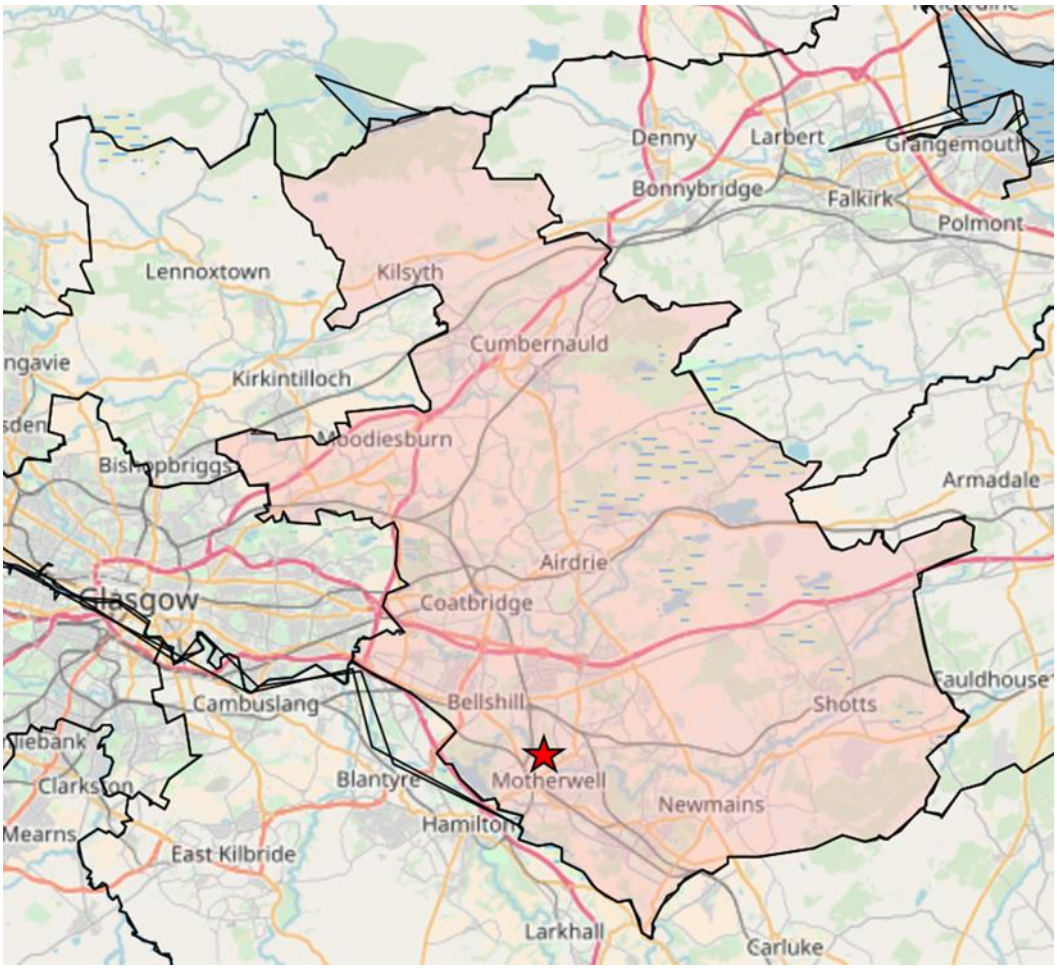


Figure 6.7.1 Map of the area showing the location of the Dalziel Building within North Lanarkshire

6.7.2 The Development

Location

Dalziel Building is located off Scott Street, adjacent to the A721, in Motherwell. The town is in North Lanarkshire, Scotland, south east of Glasgow. The building is located in the town centre, in proximity to the Motherwell Railway Station and Brandon Shopping Centre. The site has good strategic road access, connecting through A721 to M74 or A723 to M8 offering links to Glasgow, Edinburgh and the South of Scotland.

Dalziel Building is a four storey, 3-Star rated office building of steel construction built in 2008 to provide a total of 54,614 sqft of gross internal area (GIA). Figure 1.6 shows the location of the new CPD.

Figure 6.7.5 Site Location and New Commercial Property Development. Source: CoStar, 2018

Figure 6.7.6 Dalziel Building. Source: CoStar, 2018

Surrounding Area

The surrounding area is mainly commercial, with the shopping centre located to the south of the CPD and main railway station to the west. The site is within Motherwell Town Centre boundaries, designated as Strategic Business Centre in the North Lanarkshire Local Plan 2012, offering support for office, service, education, and cultural facilities.

6.7.3 Local Economy

The table below shows a number of key indicators for North Lanarkshire, with UK figures shown for comparison purposes

Key Stats, 2016	North Lanarkshire	UK
Population Density	722.1	270.7
Firm Density	15.3	10.5
Employment Rate	77.6	77.7
% of population with NVQ4 or above	32.8	38.0
Average Wage	26922.0	28195.0

Figure 6.7.2. Table showing key economic indicators for North Lanarkshire

The graphs below show the growth of population, employment, GVA and productivity over the past 35 years. Population declined from 1982 to 2002, but then experienced strong growth until 2012. Growth has slowed since then. Employment experienced two slumps, around 1993 and 2012, but has recovered since. Productivity has grown steadily from around £23,000 per worker in 1982 to around £45,000 per worker in 2017.

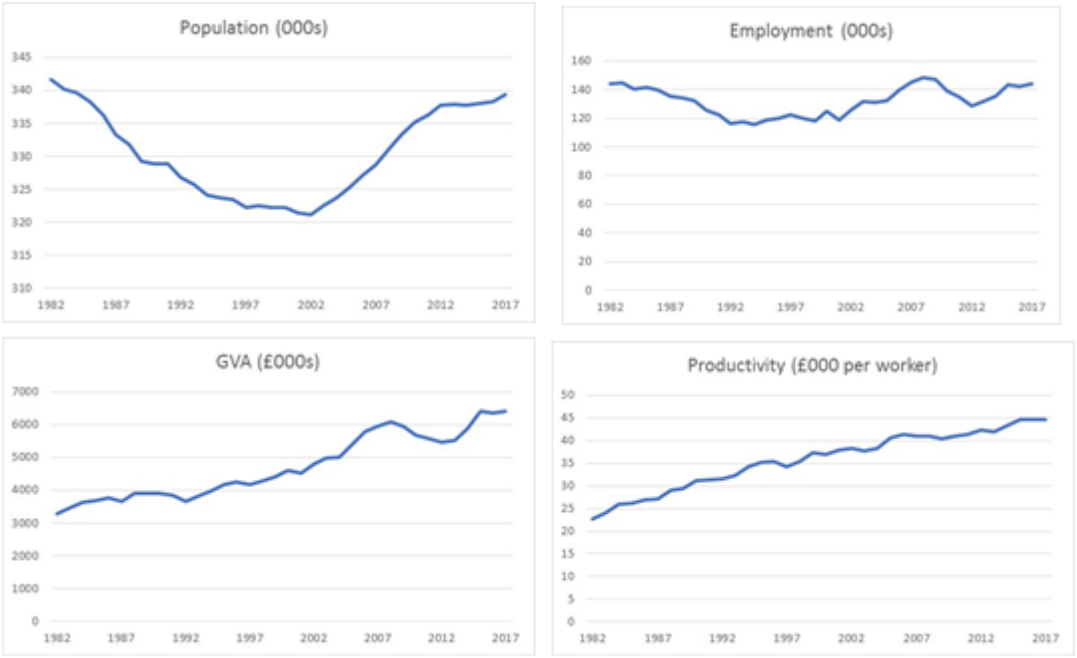


Figure 6.7.3. Timeseries graphs of population, employment, GVA and Productivity for North Lanarkshire

The largest sectors by employment as of 2016 are wholesale and retail and public services. There is also a high level of business services in the area.

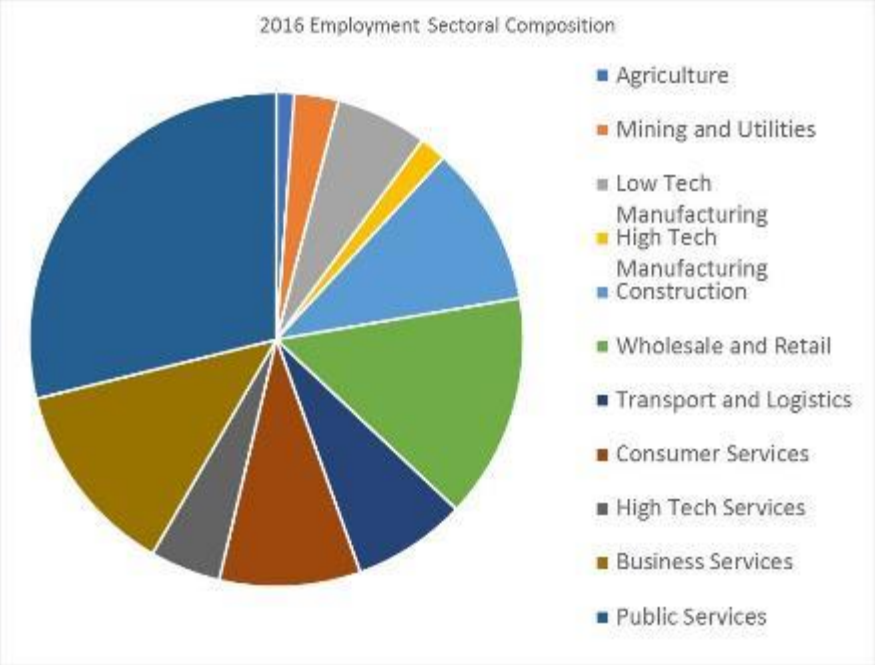


Figure 6.7.4. Sectoral Composition of North Lanarkshire

Regional Property Market

North Lanarkshire is one of Glasgow's three largest submarkets, comprising the towns of Motherwell, Bellshill and Cumbernauld. Key office occupiers include North Lanarkshire Council, Scottish Water, Network Rail, and Balfour Beatty. The new office delivery rates in the submarket over the last 10 years have been higher than in other submarkets. This rapid expansion sent vacancy rates above 20% and affected average rents, which remain below their 2007 peak.

As investment weakened in 2017, the development pipeline in the region is fairly static. Glasgow experienced a return of speculative investment in the city centre, with three schemes delivered in 2015. In the 10-mile radius from the subject property there is one building under construction, in the south of Glasgow - Red Tree Shawfield building, delivering 28,740 sqft of 4-Star office accommodation. However, there are no deliveries in the North Lanarkshire submarket and with the vacancy rate so high it is unlikely that much will be built over the next few years.

Figure 6.7.7 – Properties Under Construction and due for completion in next 4 Quarters within 10 mile of the site Source: CoStar, 2018

Figure 6.7.8 presents the net absorption, net deliveries of new stock, and vacancy levels across the North Lanarkshire sub market. This indicates that vacancy rates have been on a downward trend since 2011, reaching a low of around 22.5% in the last quarter of 2017. This is the result of high delivery rates and modest net absorption. The long-term forecast is for a continued drop in vacancies due to positive net absorption and reduced delivery rates. This also indicates that the CPD was completed during a period of significant deliveries to the property market, resulting in high vacancy rates. Absorption, or market demand, did not follow, with negative absorption in 2011, resulting in vacancy remaining high until 2014. Vacancy rates in the area remain high.

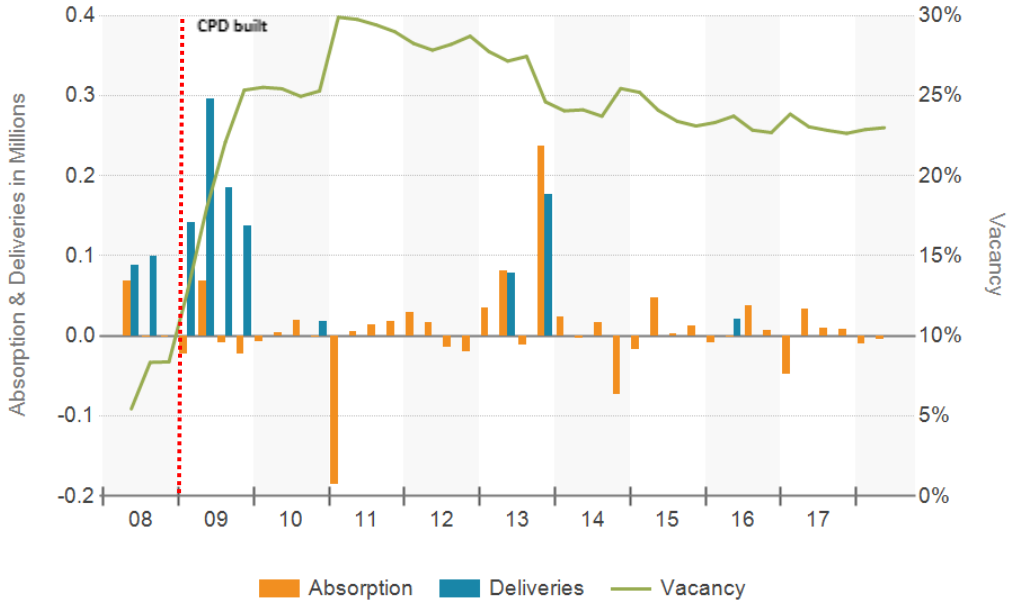


Figure 6.7.8 – Net Absorption, Net Deliveries and Vacancy
Source: CoStar, 2018

6.7.4 Occupation of the Site

Ownership and Leasing Activity

The new CPD units were built in 2008 by North Lanarkshire Council to invigorate the town centre. The building has added high quality business premises, offering 53 offices ranging from 150 to 1,250 sqft. The development currently has 9 available office spaces, and its availability rate accounts for 10% of total building area. The most recent transactions, taking place in March and January 2018, were to a mental health charity and STRT Ltd, taking up 1,266 sqft of office space.

The CPD property has performed well compared to its peer properties in the North Lanarkshire 2-4 Star market located within a 3-mile radius of the subject property. There are 17 peer properties, operating at an average vacancy rate of 39% and average asking rents of £12.50 psqft. The new CPD average asking rent (£12.02) is the fifth highest, and its vacancy is one of the lowest in the peer group.

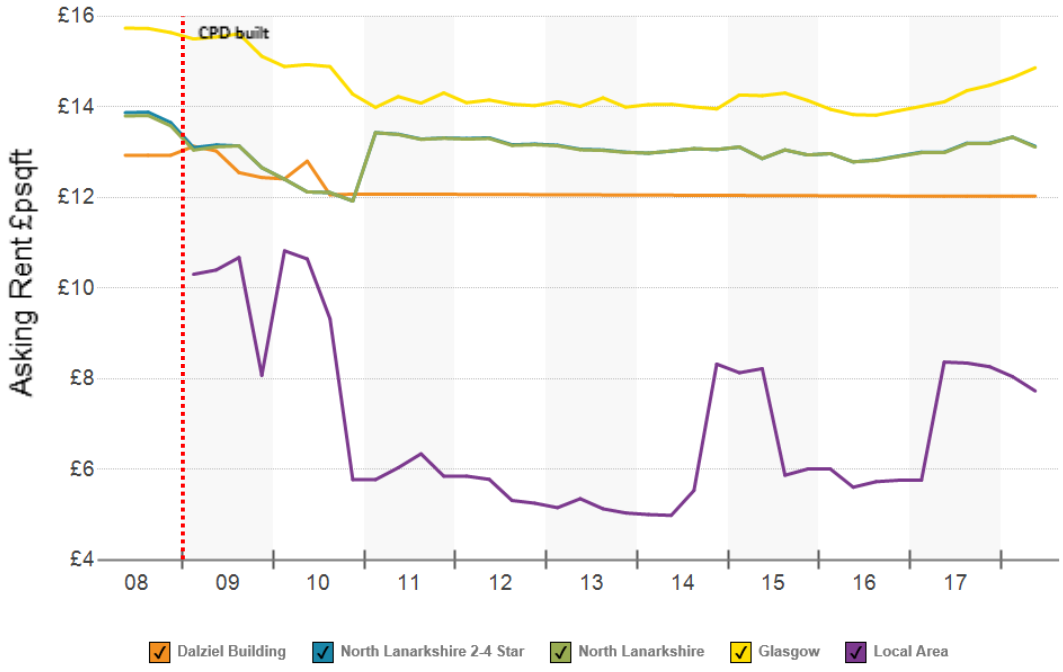


Figure 6.9 Asking Rents

Source: CoStar 2018

Quality of Offer

The main attraction of the new CPD is its location within the town centre and with good access to both Glasgow and Edinburg. The CPD has added a new high quality business space and a conference venue to the town centre. A variety of services provided for the tenants at competitive cost makes it an attractive contribution to the local offer.

The Council's ambition is to transform the part of the town centre where the CPD is located from a retail dependant quarter to a business and cultural zone. The Dalziel Building is one of the first initiatives to achieve this goal.

Tenants

The new CPD units are leased to multiple tenants, with North Lanarkshire Council occupying part of the buildings. The majority of tenants are in personal and business services, but there are some real estate, medical and retailers in the building. **Table 6.7.9** presents an overview of key existing tenants in the CPD development.

Company Name	SF Occupied	Move Date	Industry Type
STRT Ltd	1,266	16/01/2018	
Mr James Cummings & Mr Gary Cocoran	1,033	26/08/2015	
Turbine Marketing Ltd	837	31/07/2013	Agri/Mining/Utilities
Beauty Kitchen Ltd	809	18/10/2017	Retailers/Wholesalers
Bermont Ltd	778	28/02/2014	Personal Services
SACRO	775	14/08/2013	Government
I-Power Systems Ltd	506	31/07/2013	Agri/Mining/Utilities
SAS Interior Contracts Ltd	437	28/06/2017	Retailers/Wholesalers
William Watson & Co Accountants Ltd	391	28/09/2010	
Health Management Ltd	273	22/05/2014	Personal Services
Motherwell Education Centre	269	28/08/2013	Personal Services
Carewatch Care Services Ltd	268	11/08/2017	Personal Services
Forgewood (Holdings) Ltd	155	28/02/2014	Personal Services

Table 6.7.9 – List of Tenants Source: CoStar, 2018

6.7.5 Economic Impacts

The table below shows that in the years preceding the development, in 2006 the postcode had 3 local units, 14 workers, with an average of 5 workers per local unit, an annual turnover of £365,000 per local unit and average productivity per worker of £78,000. In 2011, at the opening of the Dalziel Building, there were 16 local units, 50 workers, an average of 3 workers per local unit and an annual turnover of £372,000 per local unit, implying average productivity per worker of £119,000. At this point, there were not any significant changes to the annual turnover per local unit. In the following 5 years, the number of local units remained unchanged, but the number of workers increased to 437, with an average of 27 workers per local unit, implying that local units are hiring more workers and produce an annual turnover of £2,465,000 per local unit. However, average productivity per worker fell to £90,000 per worker.

Postcode ML1 1PN	2006 (pre-development)	2011 (year following development)	2016 (post-development)
Number of Local Units	3	16	16
Total Number of Employees	14	50	437
Employees/local unit	5	3	27
Annual Turnover (£000s) per local unit	365	372	2465
Average Productivity (£000s per worker)	78	119	90

Figure 6.7.10 Table showing key statistics for the ML1 1PN postcode, where the CPD is located

The growth of number of local units in Dalziel is substantially higher than the surrounding area. However, between 2012-2013 the number of local units in Dalziel decreases substantially but quickly picks up in the following year. The area from 1-5km around the CPD experiences a more stable growth, although the level of growth in ring zero is so comparatively high, that growth rings 1-5 are unable to be seen on the same graph.

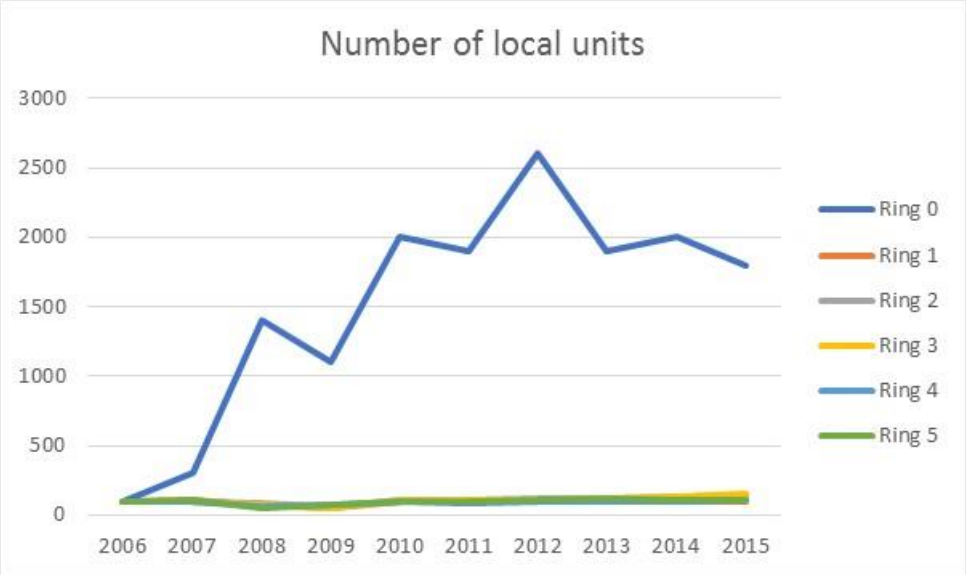


Figure 6.7.11. Growth of number of local units in Dalziel

The similar trend in the growth of number of local units also applied to the growth of number of employees in Dalziel.

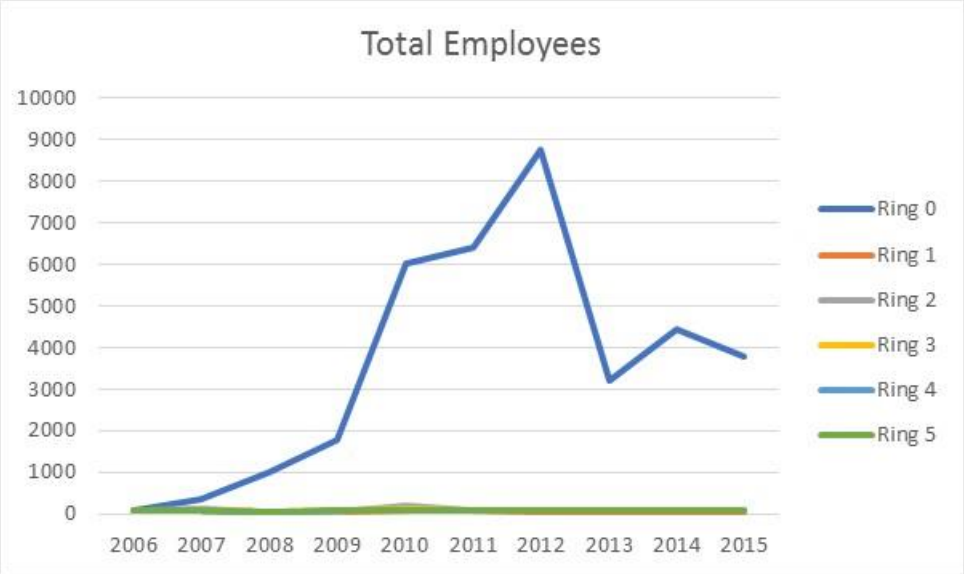


Figure 6.7.12. Growth of total employees in Dalziel

The overall growth in turnover per local unit in Dalziel is considerably strong although it tends to fluctuate from year to year.

Figure 6.7.13. Growth of turnover per local unit in Dalziel

Productivity growth in Dalziel is also higher than the surrounding areas, however, as one might expect, not as much compared to the case of number of local units, total employees and turnover per local units.

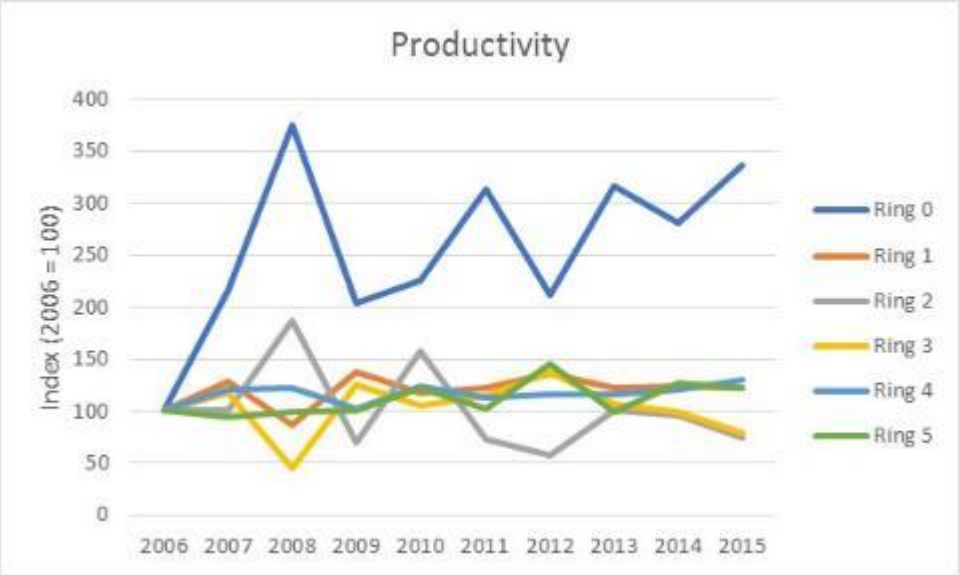


Figure 6.7.14. Productivity growth in Dalziel

6.7.6 Lessons Learnt

The office building was built by the Council to reinvigorate the town centre, which lost part of its retail offer. This was due to many out-of-town additions in business parks surrounding the town. These locations proved to be difficult due to poor public transport availability. Bringing significant numbers of office workers into the city centre is thought to have the additional benefit of increasing demand for local services and retail outlets. The Dalziel building provided office space close to transport nodes and town centre attractions, making it much more attractive space for many businesses. The vacancy rates in the building are therefore lower than in the wider area, however this might also be partly due to the slightly lower than market average rents offered by the landlord.

As a result, businesses in the postcode area have expanded at a faster pace and with stronger growth in turnover than the surrounding areas. Productivity growth was also strong, suggesting that productive and innovative tenants have been attracted to this location and have thrived since moving in. Key success factors include:

- Central, strategic location made an attractive place to work and set up business
- Council led development, designed to reinvigorate the town centre
- High quality, versatile units with rentable meeting rooms and a conference centre

6.8 Case Study 7: The Advanced Manufacturing Park

6.8.1 Introduction

The Advanced Manufacturing Park (AMP) is located in the district of Rotherham, just 5 miles east of the city of Sheffield. It is a representative of the category *Private Industrial Estate within an Enterprise Zone.*

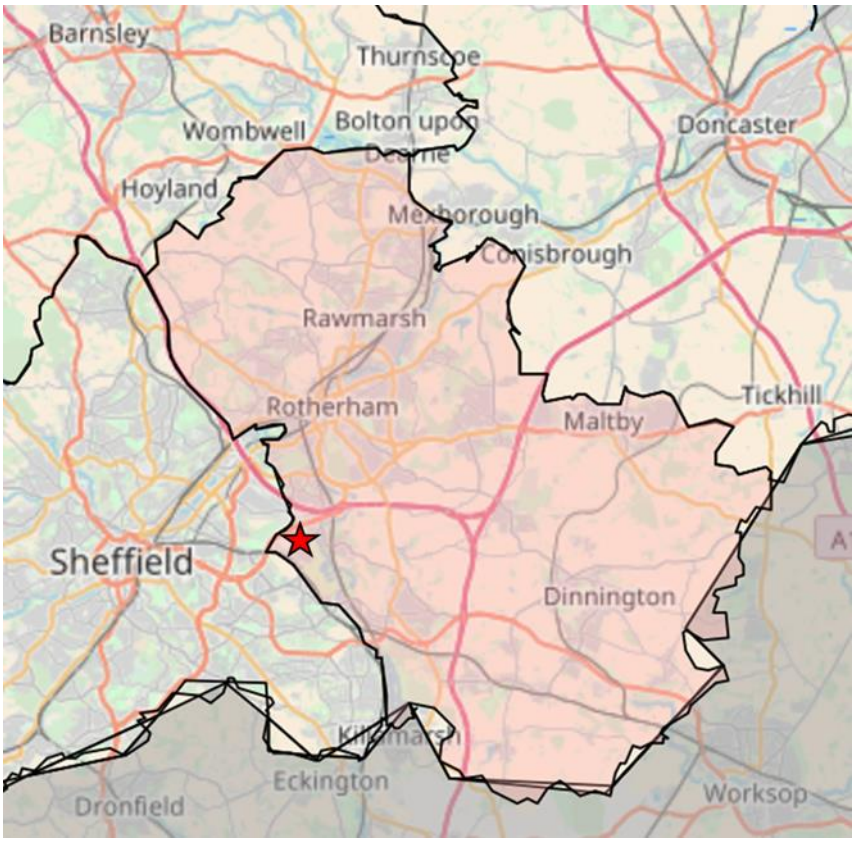


Figure 6.8.1. Map showing location of the Advanced Manufacturing Park within the district of Rotherham

6.8.2 The Development

The Advanced Manufacturing Park is located off Brunel Way, on the Rotherham-Sheffield border in South Yorkshire. It is part of Sheffield City Region Enterprise Zone, which stretches along the M1 corridor. The Park is located 6 km (3.8 miles) east of Sheffield city centre and has good strategic road access, with the A630 connecting to Junction 33 of the M1.

The location is still under development, with development plots offering options for large scale premises. It occupies land on the former opencast colliery at Waverley. The new CPD discussed here is on the site at AMP known as Evolution Units 1-10. These 3-Star rated industrial warehouse units, ranging from 2,500 to 27,000 sqft, are of steel frame construction of a single storey. They were built in 2008 to provide a total of 90,459 sqft of gross internal area (GIA). Figure 7.1 shows the location of the new CPD units.

Figure 6.8.5 Site Location and New Commercial Property Development
Source: CoStar, 2018

Figure 6.8.6 New CPD units
Source: CoStar, 2018

Surrounding Area

The surrounding area consists of new industrial estates, development plots and greenfield land. To the east of the AMP lies a residential neighbourhood – Waverley - developed as part of a wider masterplan, and to the west, on the other side of the A630, a golf course.

6.8.3 Local Economy

The table below shows a number of key indicators for Rotherham, with UK figures shown for comparison purposes.

Key Stats, 2016	Rotherham	UK
Population Density	914.9	270.7

Firm Density	23.8	10.5
Employment Rate	72.4	77.7
% of population with NVQ4 or above	25.2	38.0
Average Wage	24839.0	28195.0

Figure 6.8.2. Table showing key economic indicators for Rotherham

The graphs below show the growth of population, employment, GVA and productivity over the past 35 years. Population growth had been in a declining trend from 1982 to 2002; but it has been rising strongly since then. Employment growth faltered around 1994 but then increased until 2008. It then recovered from 2014 onwards. Productivity has grown steadily from around £26,000 per worker in 1982 to around £38,000 per worker in 2017; although no strong growth can be seen since 2005.

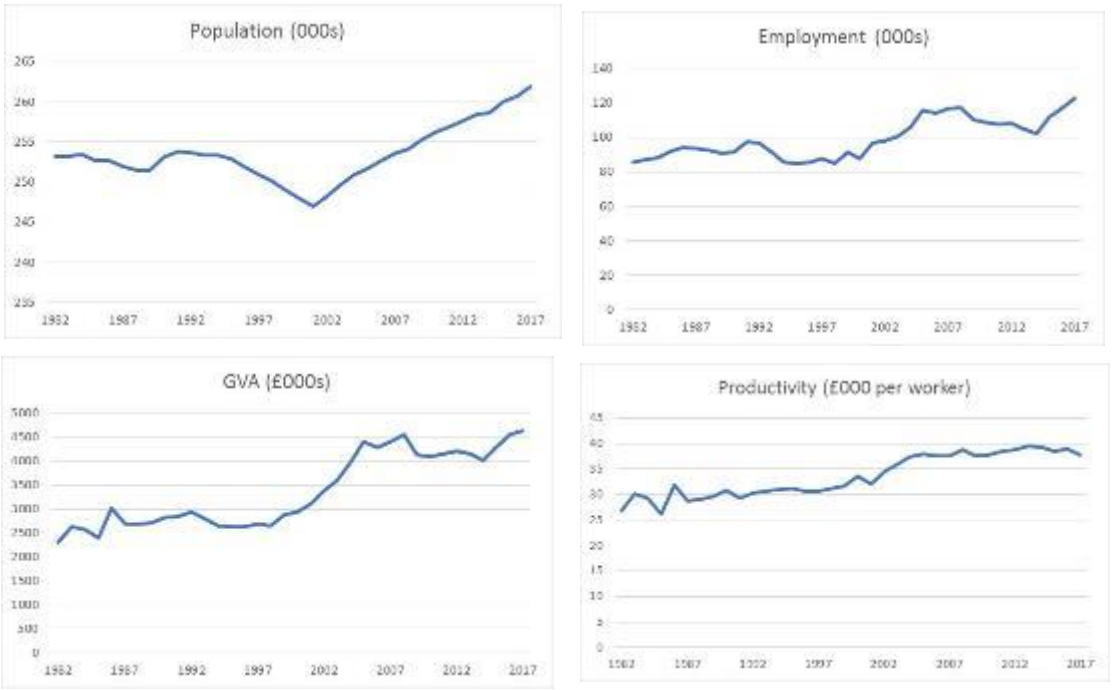


Figure 6.8.3. Timeseries graphs of population, employment, GVA and Productivity for Rotherham

The largest sectors by employment as of 2016 are business and public services. There is also a high level of wholesale and retail services in the area.

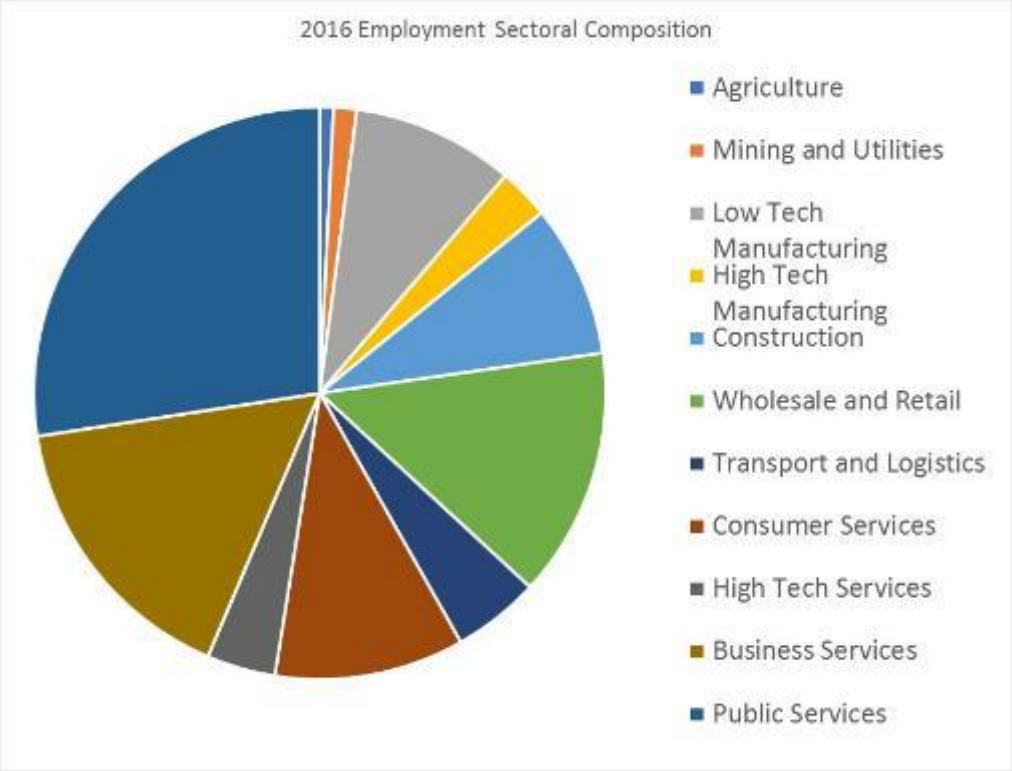


Figure 6.8.4. Sectoral Composition of Rotherham

Regional Property Market

The Sheffield market, due to its location and good connections with the M1 and A1 motorways, is a warehouse and distribution hub, with several key firms such as Great Bear Distribution, Marks and Spencer and Next opening new distribution centres in the area. Industrial vacancies have fallen sharply during 2012-15 as a result of positive net absorption and relatively weak supply. Average rents have recovered since 2012, supported by a surge of occupier demand, making Sheffield the most expensive industrial market in Yorkshire and the Humber.

The development pipeline was relatively subdued until picking up momentum in 2016. Much of this new space is concentrated at iPort and G Park in Doncaster. The next phase of units at AMP – R-evolution totalling 55,750 sqft are expected to be delivered in 2018. Figure 7.7 presents the location of the eleven properties under construction and due for completion over the next 4 Quarters within a 15 mile radius. This represents 1.9% of total inventory, and has achieved 69% pre-lease.

Figure 6.8.7 – Properties Under Construction and due for completion in next 4 Quarters within 15 miles of the site

Source: CoStar, 2018

Figure 6.8.8 presents the net absorption, net deliveries of new stock, and vacancy levels across the property submarket. This indicates that vacancy rates have dropped significantly since 2009 to a low of around 2%. In the long-term, this trend is predicted to reverse due to good delivery rates expected in 2018 and 2019.

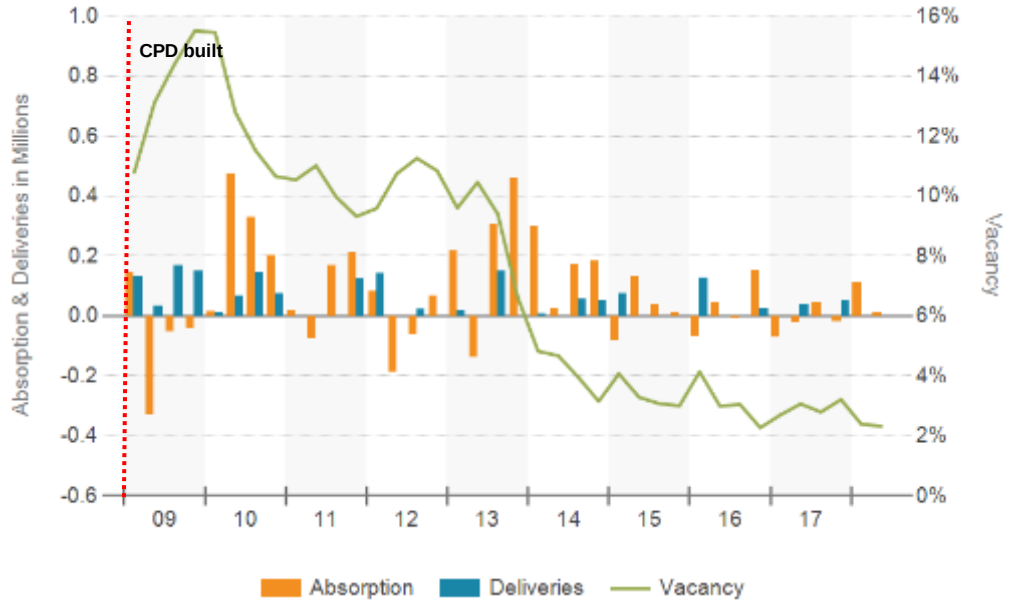


Figure 6.8.8 – Net Absorption, Net Deliveries and Vacancy

Source: CoStar, 2018

6.8.4 Occupation of the Site

Ownership and Leasing Activity

The vision for the technology park was been created by a joint venture of Yorkshire Forward (the, now defunct, regional development agency) and UK Coal, prompted by decline in South Yorkshire's traditional industries of coal and steel. The region benefits from established skills and expertise in advanced manufacturing and materials research expertise, backed by the two Sheffield Universities. The AMP harnesses the region's skills and potential, providing a new location for engineering, innovation, research and advanced manufacturing.

Enterprises currently located at the AMP include Nuclear AMRC, The Advanced Manufacturing Research Centre, a Boeing / University of Sheffield partnership, Rolls-Royce, Nikken Kosakusho Europe Limited, Performance Engineered Solutions, and TWI Technology Centre.

Haworth Estates (owner of the land) announced the sale of Evolution in December 2012 for £96.60 psqft to Cornerstone – the real estate advisory and investment company. The development is currently fully let with the most recent transactions for Unit 7, taking place in December 2016, for £6.94 psqft.

The CPD property has performed well compared to the wider Sheffield 2-4 Star market which currently operates with a vacancy of 3.5% and achieves asking rents of £4.61 psqft, compared to £6.94 psqft expected for the new CPD. As indicated in **Figure 7.9,** asking rents for the new CPD are at an average of £6.94 since the third quarter of 2015, while vacancy rates are at 0% since 2013.

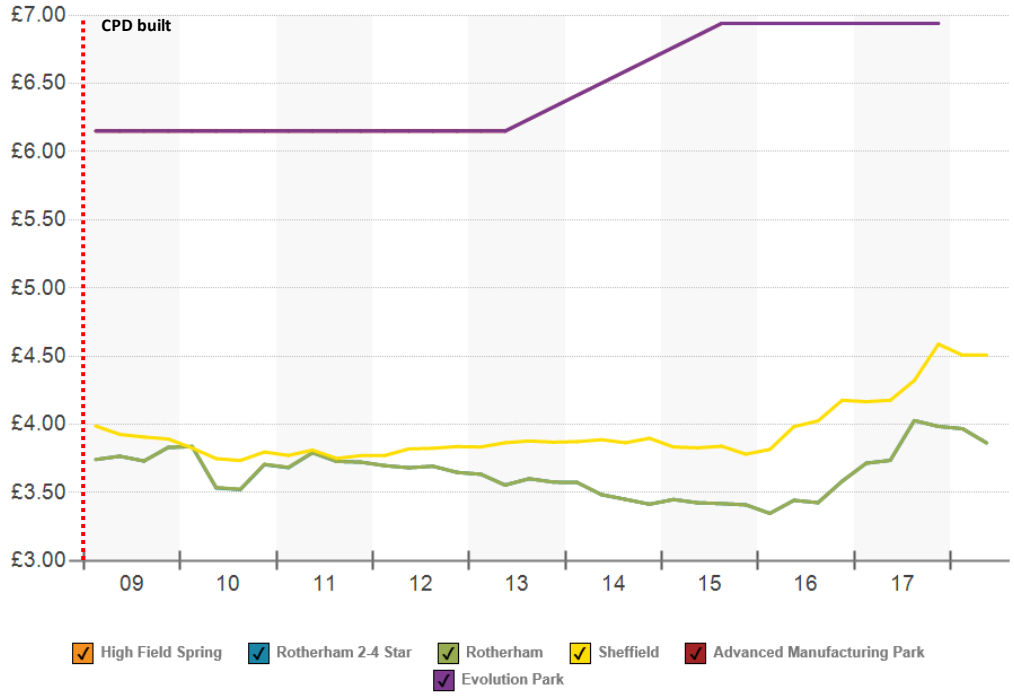


Figure 6.8.9 – Asking Rents.Source: CoStar, 2018

Quality of Offer

The AMP has a dynamic business community internationally renowned for cutting-edge manufacturing, developing aerospace, Formula One and advanced manufacturing research. The Park offers collaboration and supply chain opportunities with R&D and production companies.

A wide range of property and development opportunities are offered at the AMP, from small office and workshop space, through medium-sized hybrid &light industrial units, to larger custom built Design & Build options.

The location of the park is strategic, in proximity to M1 and within the Sheffield City region. There are six international airports within a 90-minute drive of Sheffield, as well as good accessibility to the UK via mainline rail and motorway networks.

Tenants

The new CPD units are leased by technology companies providing precision engineering, with the largest space occupied by Sarcled Ltd, fabricating technology products for the metals industry. Nearly a hundred companies presently have a base at the wider AMP, including a mix of advanced manufacturing with research and auto trades (Rolls Royce). There are also government and other services at the site. **Figure 6.8.10** presents an overview of existing tenants in the CPD development and across the rest of the AMP[19].

Company Name	SF Occupied	Move Date	Industry Type
New CPD Tenants			
Arrow Technical Services Ltd	3107		
Carbolite plc	3475	01/11/2011	
Iidea Ltd	3107	01/03/2012	Manufacturing
Sandvik Coromant	13978		
Sarcled Ltd	27082	01/07/2015	Manufacturing
Xeros Cleaning	10002	01/07/2015	Personal Services
Other AMP Tenants			
Addition Design	1095	10/07/2017	Business Services
AMP Technology Centre	47790		
Design Prototyping and Testing Centre			
Knowlege Transfer Centre			
Liebher	2418	18/04/2011	
Metalysis	22000	25/05/2016	Manufacturing
Nuclear AMRC			
Rolls Royce	185786		
Rotherham Metropolitan Borough Council	30000	01/11/2014	Government
Tan Delta Systems			
Waldeck Associates Ltd			
Xeros	3034	01/03/2008	Personal Services

Figure 6.8.10 – List of Tenants. Source: CoStar, 2018

6.8.5 Economic Benefits

The table below shows that in the years preceding the development, in 2006 the postcode had 2 local units, 55 workers, an average of 28 workers per local unit, and an annual turnover of £2,375,000 per local unit, implying an average productivity of £86,000 per worker. In 2011, at the opening of Evolution @ The Advanced Manufacturing Park, there were 14 local units and 168 workers, an average of 28 workers per local unit within that postcode. They produced a lower

[19] CoStar only provides partial data on tenants for commercial property.

annual turnover of £1,171,000 per local unit, implying an average productivity of £98,000 per worker. In the 5 following years, there were 22 local units and 360 workers. Local units are expanding and hiring more workers, and average productivity per worker increased to £196,000, bringing a much higher annual turnover per local unit of £3,215,000.

Postcode S60 5WG	2006 (pre-development)	2011 (year following development)	2016 (post-development)
Number of Local Units	2	14	22
Total Number of Employees	55	168	360
Employees/local unit	28	12	16
Annual Turnover (£000s) per local unit	2375	1171	3215
Average Productivity (£000s per worker)	86	98	196

Figure 6.8.10 Table showing key statistics for the S60 5WG postcode, where the CPD is located

The growth trend of number of local units in Rotherham is very different to the surrounding areas. It experiences a strong growth from 2009 onwards while the growth in the outer areas fluctuate in the same period.

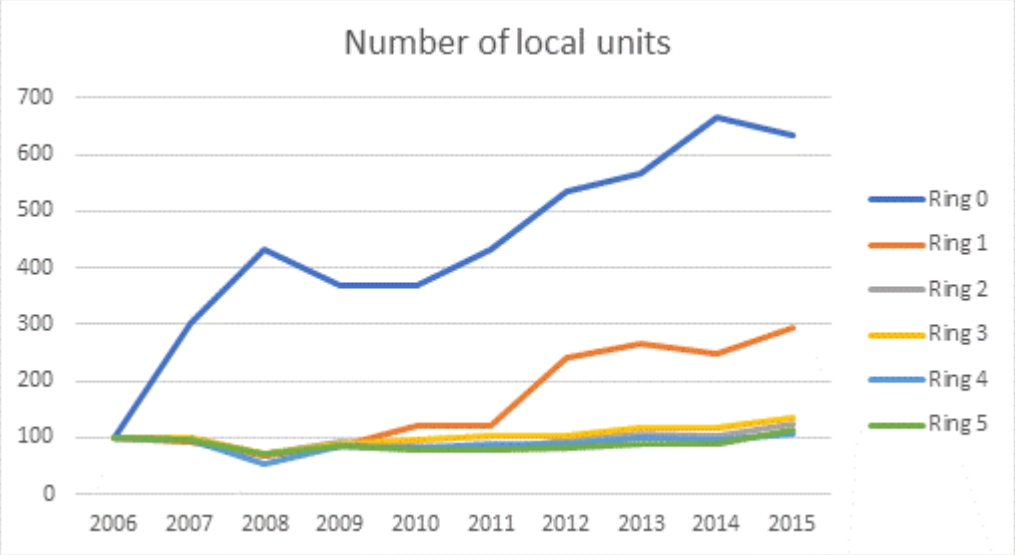


Figure 6.8.11. Growth of number of local units in Rotherham

The total of employees in Rotherham grows at a steady rate before sharply increase from 2014-2015

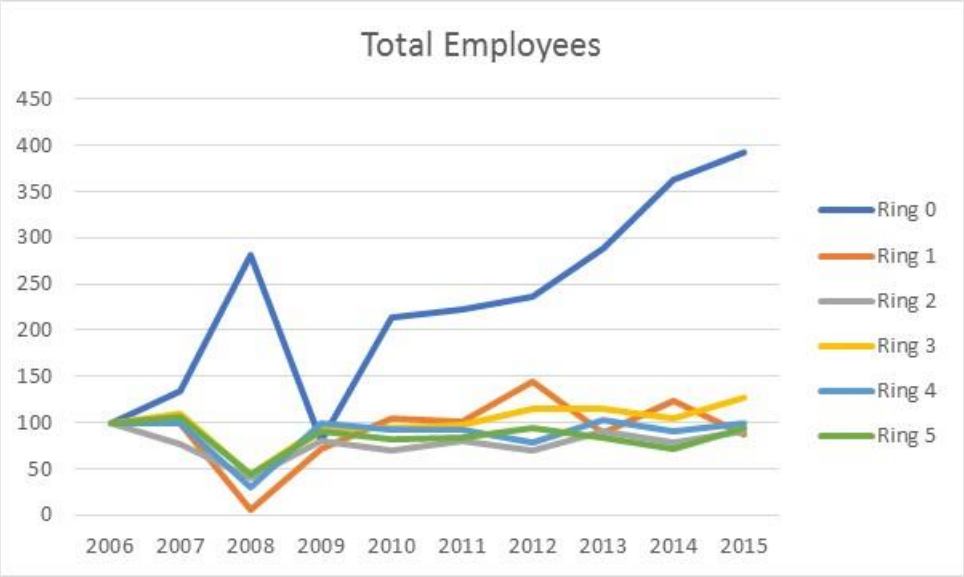


Figure 6.8.12. Growth of total employees in Rotherham

Turnover per local unit in Rotherham grows at considerably higher rate than all the surrounding areas.

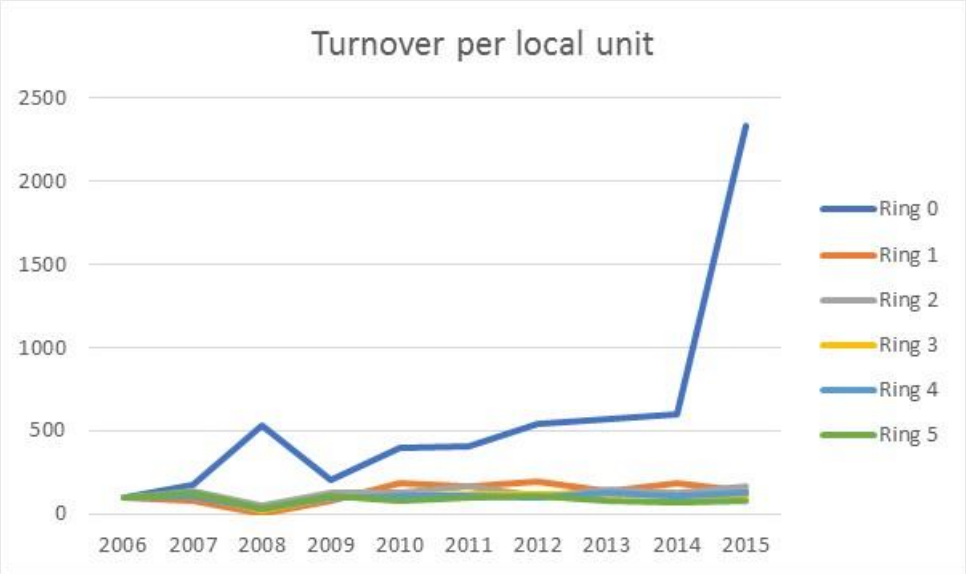


Figure 6.8.13. Growth of turnover per local unit in Rotherham

The growth in productivity in Rotherham is relatively higher than the outer areas. It fluctuates from year to year between 2009-2014 before shooting up from 2014 to 2015.

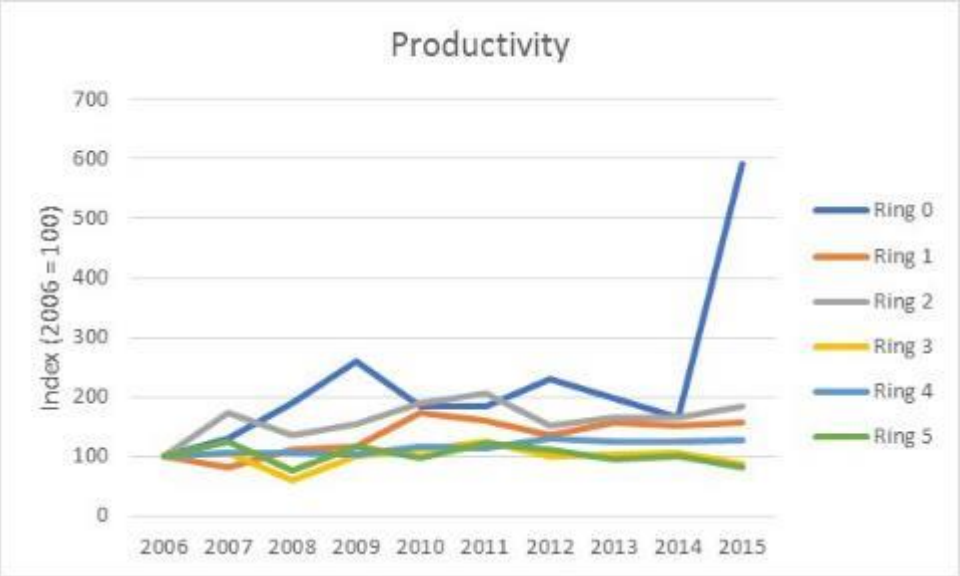


Figure 6.8.14. Productivity growth in Rotherham

6.8.6 Lessons Learnt

The Evolution Development was an addition to the AMP technology park in the Sheffield City Region Enterprise Zone, with good strategic road location, and already a home for internationally renowned precision manufacturers. The park is still under development and new units are expected to be ready for occupation in September 2018.

The rents in the new CPD are higher than in the surrounding area but the demand is strong and there are currently no vacancies. This would suggest that the tenants still benefit from the location and the benefits offset higher rents.

The postcode area has experienced a growth in number of business units and total number of employees, but reduced size of units. The turnover has decreased initially but it recovered to a level higher than predevelopment levels, showing faster growth than surrounding areas. The productivity has doubled.

Key success factors include:

- Location within the Enterprise Zone
- Dynamic business community benefiting from a sectoral focus, providing agglomeration and knowledge spillover effects
- Good location in terms of strategic road access
- Area benefiting from good skill base, expertise in advanced manufacturing and materials research expertise

6.9 Case Study 8: Llangefni Trading Park

6.9.1 Introduction

Llangefni Trading Park is located south east of Llangefni, on the Isle of Anglesey off the north west coast of Wales. Anglesey is the main shipping port between Britain and the Republic of Ireland. It is a representative of the category *Private Industrial Estate*.

Figure 6.9.1. Map showing the location of Llangefni Trading Park within Anglesey

6.9.2 The Development

Location

Llangefni Industrial Estate is located off Industrial Estate Road in Llangefni, the county town of Anglesey in North Wales. Llangefni is the second largest settlement on the Isle of Anglesey. The estate is located close to the town centre and has relatively good strategic road access, with the A5114 connecting to Junction 6 of the A55, which is a dual carriageway connecting the Port of Holyhead across North Wales to Chester and the M56/M53.

New Commercial Property Development has taken place on the site at Unit 4. This 3-Star rated light industrial/business unit is of steel construction of two storeys, constructed in 2010 to provide a total of 5,000 sqft of net internal area (NIA). **Figure 8.5** shows the location of the new CPD unit.

Figure 6.9.5 – Site Location and New Commercial Property Development
Source: CoStar, 2018

Figure 6.9.6 New CPD units on Llangefni Industrial Estate
Source: CoStar, 2018

Surrounding area

The surrounding area is mainly industrial, with retail warehouses (Lidl, Aldi) located to the north of the estate. Residential areas are separated from the estate by open green land.

Llangefni Industrial Estate is designated as one of Anglesey's Enterprise Zone sites with potential for new housing and employment development.

6.9.3 Local Economy

The table below shows a number of key indicators for Anglesey, with UK figures shown for comparison purposes

Key Stats, 2016	Anglesey	UK
Population Density	98.0	270.7
Firm Density	3.5	10.5

Employment Rate	75.0	77.7
% of population with NVQ4 or above	35.1	38.0
Average Wage	24075.0	28195.0

Figure 8.2. Table showing key economic indicators for Anglesey

The graphs below show the growth of population, employment, GVA and productivity over the past 35 years. Population increased to around 70,000 from 1982 to 1989; but then fell to around 67,700 by 1998. It started to recover from around 2005 onwards, to over 70,000, but only sustained that until 2015. Employment has increased in general from 1982 to 2017, with a notable change in trend in 1990. Productivity has grown steadily from around £30,000 per worker in 1982 to around £49,000 per worker in 2008; but decreased to 40,000 by 2017.

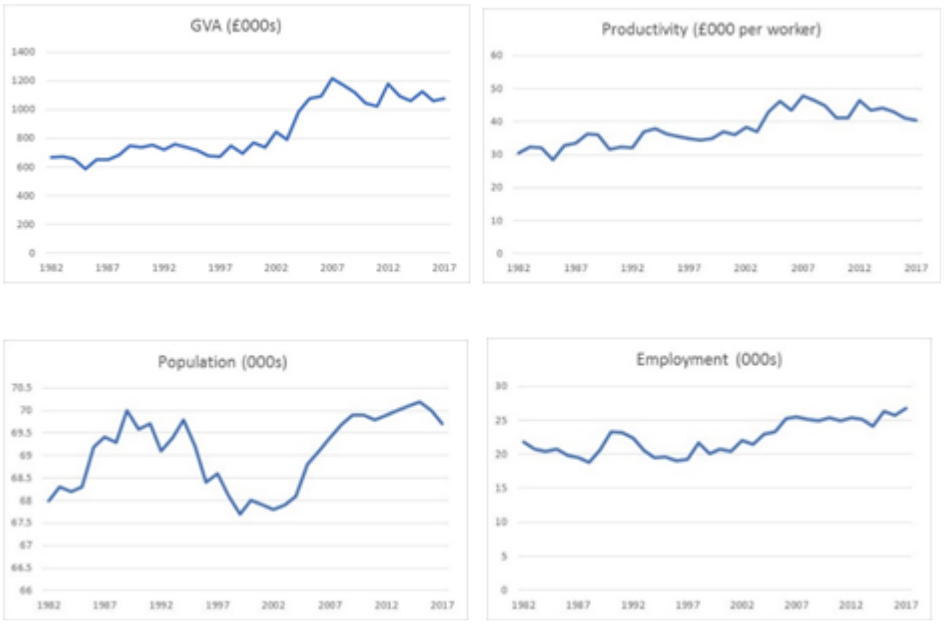


Figure 6.9.3. Timeseries graphs of population, employment, GVA and Productivity for Anglesey

The largest sectors by employment as of 2016 are consumer and public services. There is also a high level of wholesale and retail services in the area.

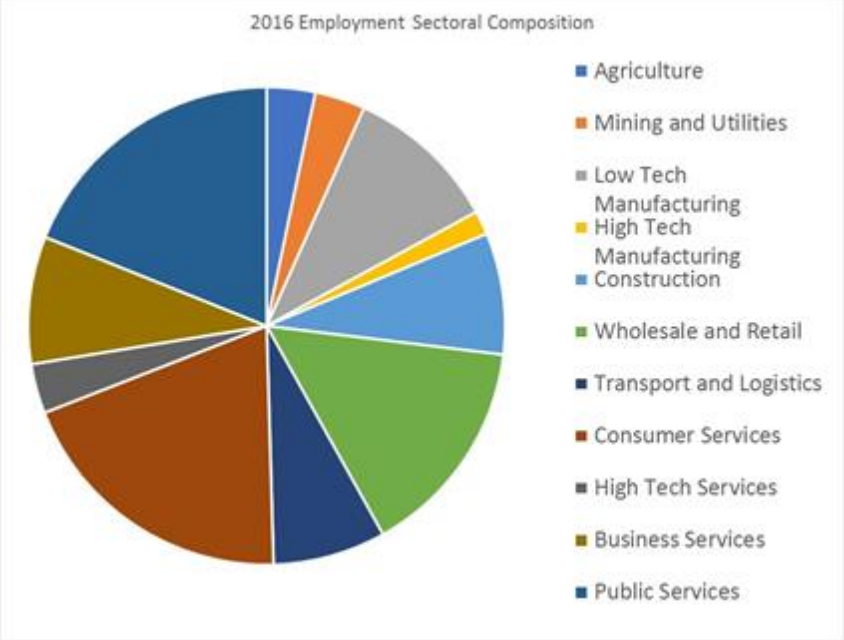


Figure 6.9.4. Sectoral Composition of Anglesey

Regional Property Market

The total industrial market in the North Wales region is one of the smallest in the UK, with less than 30 million sqft of inventory. Its office market is even smaller, amounting to 5 million sqft. Logistics account for half of the stock, with historic positive net absorption. Strong demand has pulled vacancy rates down to below the national average. This has driven strong rental growth, particularly for specialised properties.

There have been few deliveries since 2017 and more than 300,000 sqft demolished in the beginning of 2018. Currently there are a number of units under construction in the region. **Figure 6.9.7** presents the location of the one property that has been completed in the last four quarters, delivering 800 sqft, in the 30-mile radius from the subject property.

Figure 6.9.7 – Properties Under Construction and due for completion in next 4 Quarters within 30 miles of the site
Source: CoStar, 2018

Figure 6.9.8 presents the net absorption, net deliveries of new stock, and vacancy levels across the submarket area. This indicates that vacancy rates have dropped significantly since 2010 to a low of around 4.5% in the last quarter of 2017. This is the result of high net absorption from 2012 to 2014. Historically low delivery rates are expected to increase, and the long-term forecast is for modestly growing vacancy levels. As indicated the CPD was developed and followed by a period of negative net absorption in the market which resulted in high vacancy, however this has been followed by a sustained period of take up which has reduced vacancy across the area.

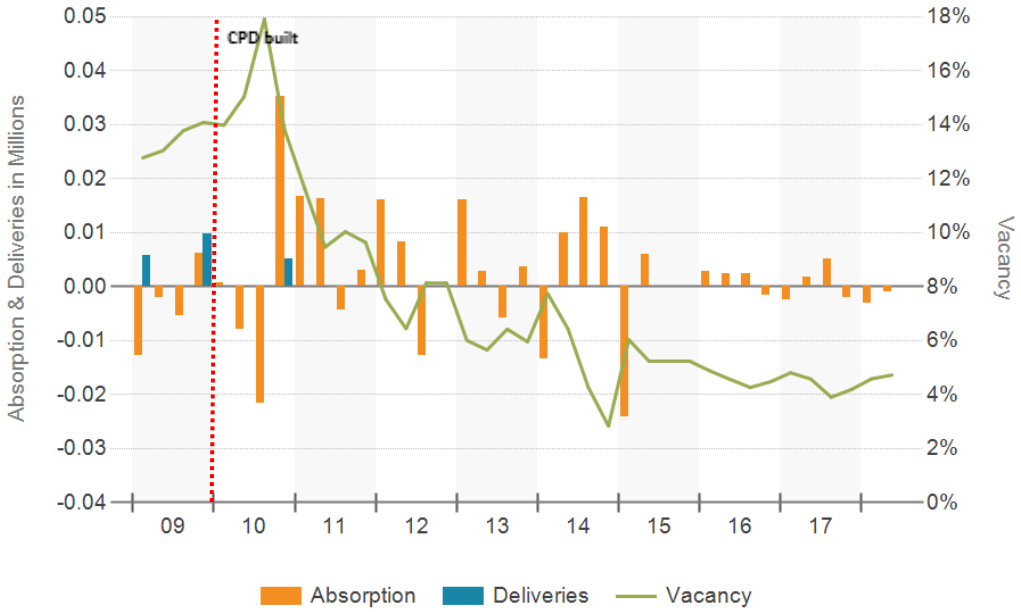


Figure 6.9.8 – Net Absorption, Net Deliveries and Vacancy.
Source: CoStar, 2018

6.9.4 Occupation of the site

Ownership and leasing activity

The new CPD units on site are owned by Planehouse Ltd, which is an independent property management company. The development is currently fully let with the most recent transactions taking place in 2014 and 2011, for £3.50 psqft, with Lucas Oil Products taking up a major leasehold.

The CPD property has performed relatively well compared to its submarket area - Lower North Wales 2-4 Star market - which currently operates with a vacancy of 7.5% and achieves asking rents of £4.45 psqft. The surrounding estate also performed well as its asking rents are at £8.75 and the vacancy rate is at 5.6%.

Figure 6.9.9 shows average asking rents for the peer properties and in the region.

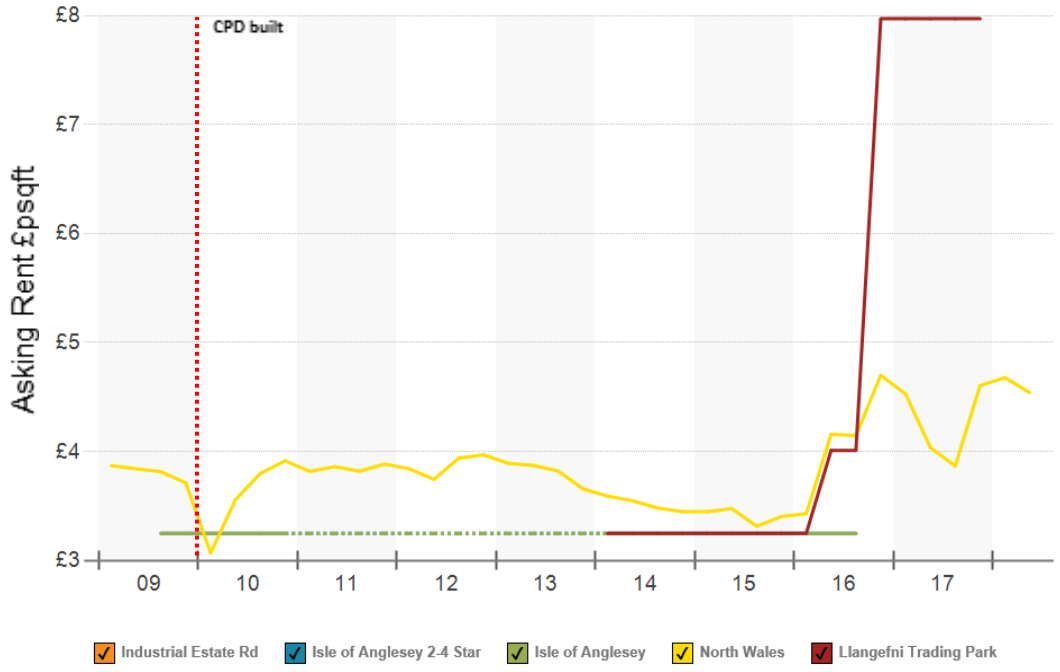


Figure 6.9.9 – Average Asking Rents for Peer Properties and the Region
Source: CoStar, 2018

Figure 6.9.10 compares vacancy rates of the CPD with the peer properties and the wider region.

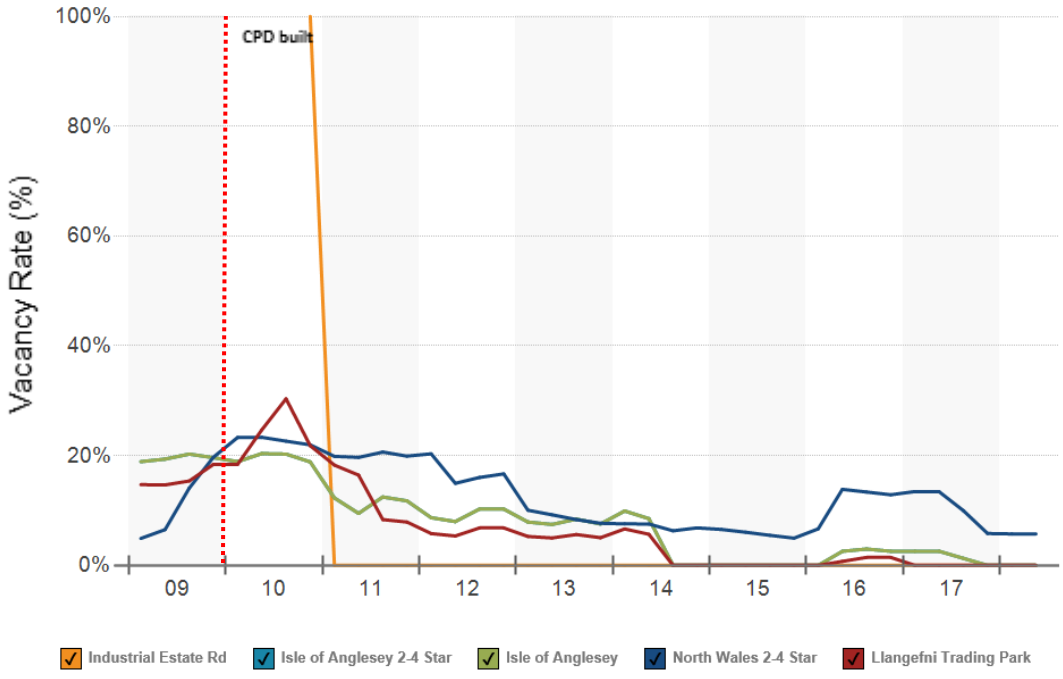


Figure 6.9.10 – Vacancy Rates
Source: CoStar, 2018

Quality of Offer

The new CPD forms part of an industrial land extension which is located further back and not directly of the main road. The layout of the site is highly functional with an access road, ample loading bay and an adjacent parking. The CPD has been constructed to good but basic specification and offers new, affordable and well located business space.

Tenants

The new CPD units are leased by Lucas Oil Products and an undisclosed tenant. The wider industrial estate, with a mix of office and light industrial uses, provides accommodation to manufacturers, retailers/ wholesalers and service providers. Tenants are likely to benefit from the proximity to the town centre and good vehicular access to the A55. **Table 8.11** presents an overview of existing tenants in the CPD development and across the rest of the Industrial Estate[20].

Company Name	SF Occupied	Move Date	Industry Type
New CPD Tenants			
Lucas Oil Products	10000	01/12/2009	
Undisclosed	9757	01/03/2011	
Other Llangefni Industrial Estate Tenants			
Boulting Group Ltd	1625	10/02/2017	Engineers/Architects
Britannia Computer Services			
C L Jones			
C. L. Jones Ltd	16906	19/11/2014	Retailers/Wholesalers
Crosscare Exports			
Faun Trackway Ltd			
Horizon Group Plc	1625	31/03/2017	Manufacturing
Isle of Anglesey County Council - Economic Departm			
Meithrinfa Ser Bach			

Figure 6.9.11 – List of Tenants Source: CoStar, 2018

6.9.5 Economic Impact

The table below shows that in the years preceding the development, in 2006 the postcode had 12 local units, 205 workers, an average of 17 workers per local unit, bringing an annual turnover of £1,196,000 per local unit, implying an average productivity of £70,000 per worker. In 2011, at the opening of Unit 4, there were 14 local units, 263 workers, and an average of 19 workers per local unit within that postcode. They produced a much higher annual turnover of £2,788,000 per local unit, implying an average productivity of £149,000 per worker. In the following 5 years, there is 1 more local unit and less total workers. Although there was not much expansion in size of local units, average productivity per worker increased to £225,000, bringing a much higher annual turnover per local unit of £3,786,000.

Postcode LL77 7JA	2006 (pre-development)	2011 (year following development)	2016 (post-development)
Number of Local Units	12	14	15

[20] CoStar only provides partial data on tenants for commercial property.

Postcode LL77 7JA	2006 (pre-development)	2011 (year following development)	2016 (post-development)
Total Number of Employees	205	263	252
Employees/local unit	17	19	17
Annual Turnover (£000s) per local unit	1196	2788	3786
Average Productivity (£000s per worker)	70	149	225

Figure 6.9.12 Table showing key statistics for the LL77 7JA postcode, where the CPD is located

The number of local units in Llangefni and the surrounding areas fluctuates wildly in all years.

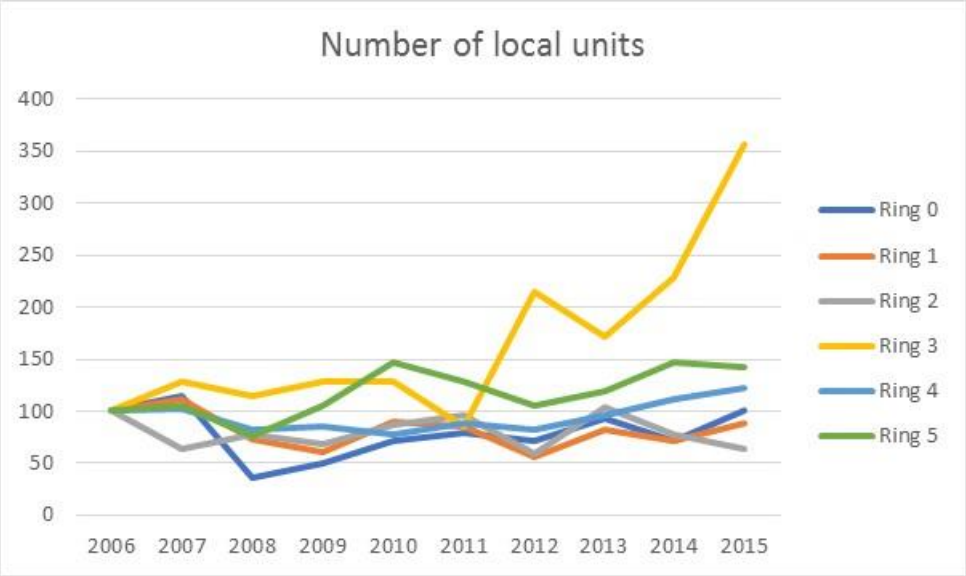


Figure 6.9.13. Growth of number of local units in Llangefni

Total employees in Llangefni and in most of the surrounding areas becomes more stable from 2011 onwards after a period of fluctuation. The exception is the growth of total employees in the area within 2-3 km from Llangefni where it peaks in 2012 and fluctuates again. Total employees' growth in Llangefni is lower than in the area within 2-3 km from itself after 2011.

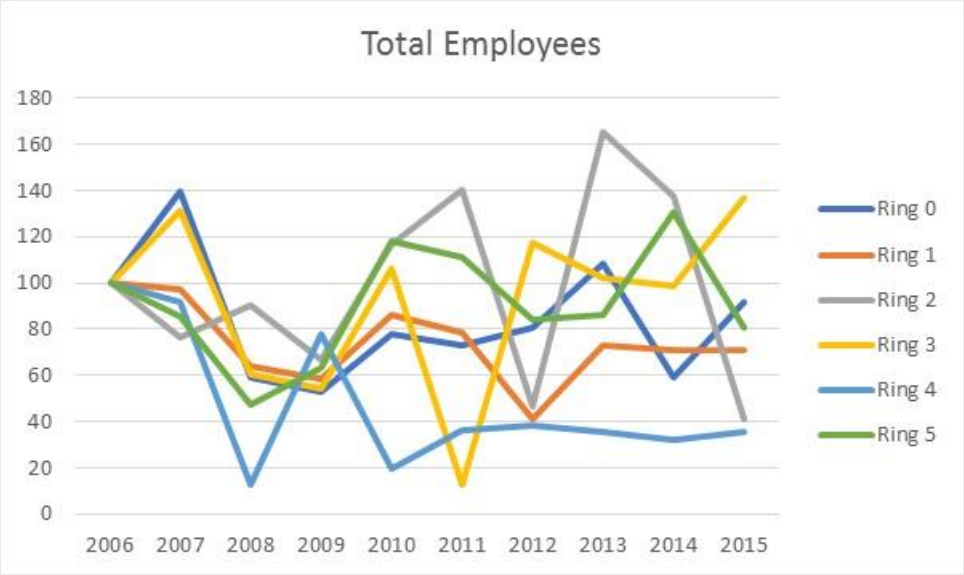


Figure 6.9.14. Growth of total employees in Llangefni

Growth in turnover per local unit in Llangefni is lower compared to most of the surround areas. Similar to the trend in growth of total employees, area within 2-3 km from Llangefni experience the highest growth in the most recent years.

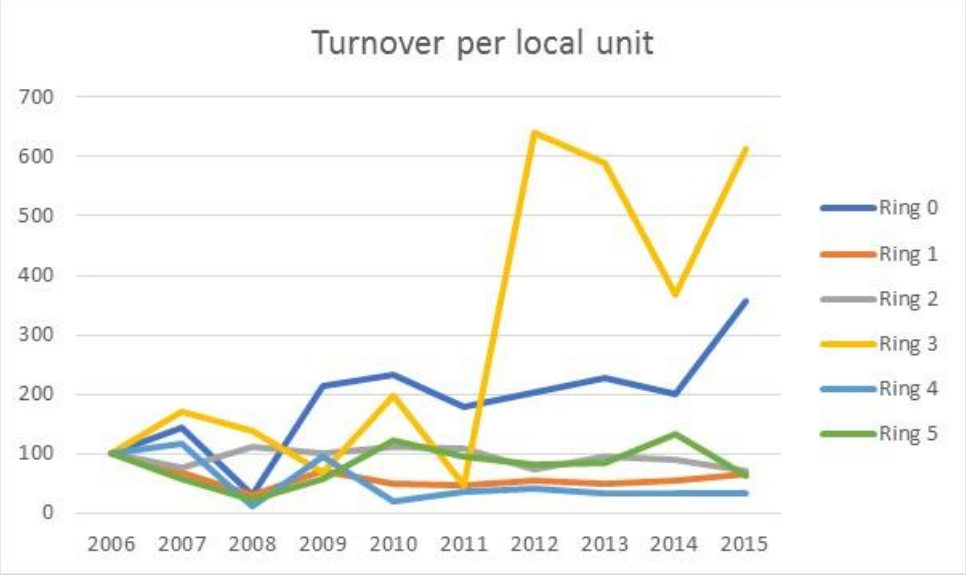


Figure 6.9.15. Growth of turnover per local unit in Llangefni

Productivity growth in Llangefni peaked in 2009 then followed a decreasing trend before picked up again from 2013 onwards. The growth in productivity for the area within 2-3 km from Llangefni is also stronger compared to Llangefni and other areas.

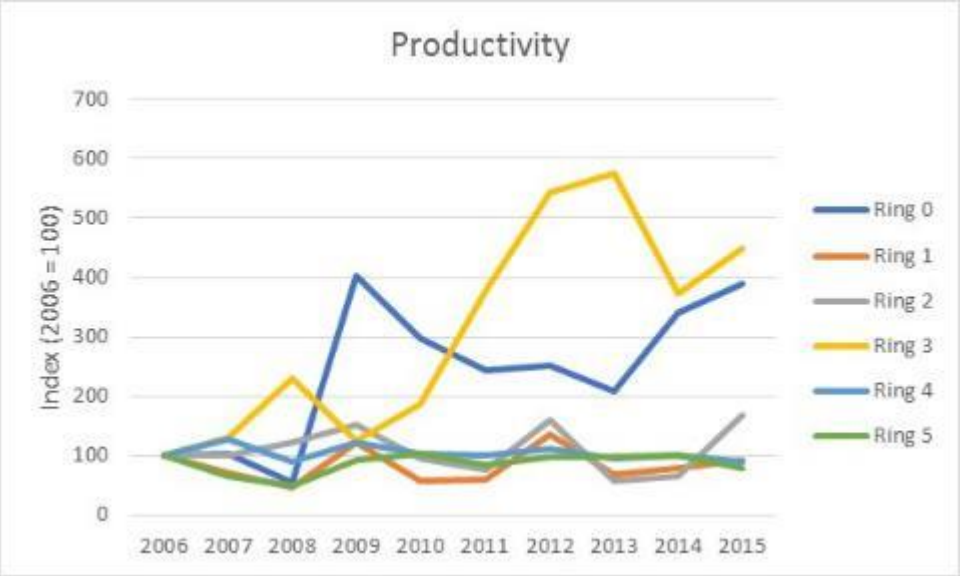


Figure 6.9.16. Productivity growth in Llangefni

6.9.6 Lessons Learnt

The new CPD has been added to a trading estate occupied by wholesalers, manufacturers and service providers. The location, close to the town centre, allows good service of the local market. Due to relatively good road connections, and the proximity of the Holyhead ferry port to Ireland, the estate is also well placed to serve as a distribution base. Since the completion the units have been occupied and have experienced rising rents. This has been driven by the limited supply compared to demand in the area.

The new buildings have been built speculatively what would suggest investors' confidence in the market and its performance. The CDP provides units of average quality, which are in demand among a medium class of tenants.

The postcode area has seen slight increases in number of local units and employees. Compared to a wider area the local growth in turnover is slower but productivity has grown substantially. Key good performance factors include:

- Good location to service local market with good strategic road access
- High demand for industrial units
- Site within the Anglesey Enterprise Zone
- Site protected by local policies.

6.10 Case Study Summary

The following table provides a summary of the key indicators relating to the impacts of the CPD's on productivity and employment, as well as the property markets.

This indicates that:

- An increase in business space coincided with an increase in the number of local business and employees. However, these economic benefits are not solely related to the amount of floorspace developed
    - The largest increase in business and employees was observed for the Worksop Turbine Innovation Centre which delivered the 5th highest amount of floorspace. Llangefni Trade Park observed the smallest growth and delivered the smallest volume of floorspace
    - Dawlish Business Park was the only area which observed a decrease in employees. This is likely due to the weak growth observed in the wider sub-area
- For 4 of the CPD's the number of firms grew at a faster rate compared to employment, resulting in a decrease in the ratio of employees to local units. This suggests that these CPD's supported small start-up firms
    - The greatest change in number of employees per firm was at the Leyton Industrial Estate, which delivered 80 small units for start-up businesses. This was similar to the Evolution CPD which delivered a wide range of unit sizes
- Business turnover was impacted in the first year of occupation for three CPD's. This may have been caused by the costs of relocating, or due to set-up costs, however within 5 years turnover had increased for all firms
- We would not anticipate that CPD's, of a scale included in the case studies, would have a significant impact on property market in the sub-area. There are many factors influencing asking rents, but they were generally higher for the new CPD's compared to the wider sub-market
    - Dalziel Building and Llangefni Trade Park were the only two CPD's offering lower rents compared to the wider sub-areas. This may be due to the relative merits of these locations, or the intentions of the landlord, rather than a reflection of the quality and success of the development
- Asking rents increased following the opening of the CPD, generally beating the market rates
    - With the exception of Worksop Turbine Innovation Centre where rents have decreased. However despite this, rents remain above those in the sub-region, suggesting the site may have been overpriced when it originally came onto the market
- Of the 8 case studies, 6 had no vacancy, with all but one CPD performing better in terms of vacancy compared to the wider sub-area
    - Leyton Industrial Estate was the only CPD with higher vacancy compared to the sub-market. It is expected that this is due to the number of units provided onsite (80).

Figure 6.11.1 Case Study Summary Matrix

	CPD details			Number of local units		Total number of employees		Employees/ local unit		Annual turnover per local unit		Average productivity (per worker)		Current asking rents		Asking rents 5 years post development		Current vacancy rates	
	Year	Type	Floorspace (sqm)	year following development	5 years post-development	year following development	5 years post-development	year following development	5 years post-development	year following development	5 years post-development	year following development	5 years post-development	in the CPD	Difference in current asking rents between CPD and sub-area	new CPD postcode	property sub-market area	in the CPD	Difference in current vacancy rates between CPD and sub-area
Dawlish Business Park (Teignbridge, Devon)	2011	Industrial	10,165	⇧ 35%	⇧ 24%	⇩ -11%	⇩ -30%	⇩ -35%	⇩ -44%	⇩ -20%	⇧ 1%	⇧ 22%	⇧ 79%	⇧ £ 5.9	⇧ £ 0.5	0.0%	⇩ -1.8%	⇧ 0.0%	⇧ -2.4%
Worksop Turbine Innovation Centre (Bassetlaw, Nottinghamshire)	2005	Office	22,666	2.9k%	3.8k%	68.2k%	27.6k%	2.2k%	⇧ 600%	68.8k%	57k%	3k%	8k%	⇧ £ 10.5	⇧ £ 0.8	⇩ -23.0%	⇧ 2.3%	⇧ 0.0%	⇧ -12.5%
Chesterford Park Science Village (Uttlesford, Essex)	2011	Industrial	27,988	⇧ 150%	⇧ 100%	⇧ 481%	⇧ 260%	⇧ 129%	⇧ 79%	1.1k%	1.4k%	⇧ 410%	⇧ 765%	⇧ £ 37.0	⇧ £ 25.0	⇧ 15.8%	⇩ -3.8%	⇧ 0.0%	⇧ -3.0%
Leyton Industrial Estate (Waltham Forest)	2013	Industrial	50,400	⇧ 700%	1.3k%	⇧ 219%	⇧ 562%	⇩ -64%	⇩ -55%	⇩ -7%	⇧ 51%	⇧ 132%	⇧ 220%	⇧ £ 17.5	⇧ £ 2.5	⇧ 15.8%	⇧ 75.0%	⇩ 2.2%	⇩ 1%
York Eco Business Centre (York)	2010	Office	13,270	⇧ 167%	⇧ 583%	⇧ 125%	1.2k%	0%	⇧ 100%	⇧ 65%	⇧ 425%	⇧ 97%	⇧ 177%	⇧ £ 21.0	⇧ £ 9.0	⇩ -8.1%	⇧ 1.7%	⇧ 0.0%	⇧ -3.5%
Dalziel Building (Motherwell, North Lanarkshire, Scotland)	2008	Office	54,614	⇧ 433%	⇧ 433%	⇧ 257%	3k%	⇩ -40%	⇧ 440%	⇧ 2%	⇧ 575%	⇧ 53%	⇧ 15%	⇩ £ 12.0	⇩ -£ 0.5	⇧ 1.2%	⇩ -9.7%	⇧ 10.0%	⇧ -29.0%
Evolution (Rotherham, South Yorkshire)	2008	Industrial	90,459	⇧ 600%	1k%	⇧ 205%	⇧ 555%	⇩ -57%	⇩ -43%	⇩ -51%	⇧ 35%	⇧ 14%	⇧ 128%	⇧ £ 6.9	⇧ £ 2.3	⇧ 12.8%	⇩ -17.3%	⇧ 0.0%	⇧ -3.5%
Llangefni (Isle of Anglesey, Wales)	2010	Light Industrial	5,000	⇧ 17%	⇧ 25%	⇧ 28%	⇧ 23%	⇧ 12%	0%	⇧ 133%	⇧ 217%	⇧ 113%	⇧ 221%	⇩ £ 3.5	⇩ -£ 1.0	N/A	0.0%	⇧ 0.0%	⇧ -7.5%

6.11 CPD Tenant Interviews

In order to provide further insight into the impact of new CPD's on business activity, interviews were conducted with tenants of case study sites. The interviews aimed to understand tenants experience of being located at the CPD and included three main questions:

- Where were you based previously?
- Why did you choose to move to the new CPD?
- What are the benefits of moving to the new CPD and what is your experience so far?

In total 139 tenants where contacted with 33 responses, equivalent to a 24% response rate, with 24 responses providing useful content. For some case study CPD's no responses where received, and the level of detail provided by each response varied.

The following table provides a summary of key stakeholder responses. Note that the responses provided below are notes from interviewers and do not reflect verbatim responses. The CPD case study which each respondent relates to has not been provided to protect the identity of the tenant.

In summary the stakeholder interviews revealed the following:

- For 15 tenants (45%) the CPD was their first commercial premises, suggesting that the CPD's support the formation of new businesses
- The main reason for moving to the CPD was due to location and accessibility in terms of proximity to workforce (approx. 60%). Other reasons included the unique facilities offered at the site, similar companies, cost effectiveness, good access and parking, and security
- Benefits of the CPD's include agglomeration economies, access to support services and amenities as well as good access to suppliers and customers
- Issues with CPD's include location and access to workforce, or issues with landlords and management
- A number of tenants have outgrown the CPD and moved on to larger space.

Figure 6.10.1 Tennant Interview Responses

Q1 Where have you been based previously?	Q2 Why did you chose to move to the new CPD ?	Q3 What are the benefits of moving to the new CPD and what is your experience so far?
We were a startup company, formed in 2012	Price, location close to Cambridge, laboratory space with fume hoods, other scientific companies on site, central facility on site with cafeteria, meeting rooms etc., pleasant surroundings of Science Park.	Enabled us to form a company using the Scientific company incubator which is the Science Village. Now looking to move to a larger facility as the company has grown beyond the current development. Have been very pleased with the park, although concerned with current lack of available laboratory space in the Cambridge area.

Q1 Where have you been based previously?	Q2 Why did you chose to move to the new CPD ?	Q3 What are the benefits of moving to the new CPD and what is your experience so far?
Nowhere else - first location	Other like-minded companies around	Good local facilities but too far from Cambridge for the employees that don't drive
Nowhere else	Already working for an established business which was going to close down making them redundant so opened own business.	Combination of retail and showroom. Lots of storage More cost effective - centre of town is too expensive or not large enough Delivery easier as no restrictions on loading etc Lots of parking No competition for 10 miles Very happy where they are and planning to stay for the forseeable future
Nowhere else - first location	Owner lives in Dawlish and has a lot of connections	Happy in the park
Based elsewhere in the area	It was a property that was available. Was not dissatisfied with the previous location.	Accessibility and proximity to the town
Nowhere else - first location	Owner lived in area for twenty years	Accessibility to suppliers and customers, products manufactured in the west country then shipped off to places like London. Park has good links to the motorway
Based in town in a house	Needed more space to accommodate increase in demand	A more commercial location which gets more specialised business. Other benefits are parking and space.
Nowhere else - first location	Location is good and it is convenient as they have several clients nearby	Location, access to clients and cost - it is cheaper than city centre.
Nowhere else - first location	Location - the employees live around there	Accessibility for employees
Was part of another company and then separated so needed a new location	Convenient for commute and wanted a managed office with a reception for safety reasons	All bills are included (telephone etc)
Nowhere else - first location	5 mins from home, car parking, café, networking with other tenants	Tenants are now clients and on site business support
Moved due to issues with landlords, lost power	Location close to where they live - 10 mins from home, price and facilities	see previous

Q1 Where have you been based previously?	Q2 Why did you chose to move to the new CPD ?	Q3 What are the benefits of moving to the new CPD and what is your experience so far?
Nowhere else - first location	Local for staff	Good canteen, friendly tenants and good management team
Nowhere else	Closer to business and clients, 24 - hour access and security and 9-5 reception	Customer Awareness
Grew out of previous location	Facilities, training rooms, location	Benefits of being located with other businesses, reception desk means they don't need to have their own reception
Second location	Legacy - 14 years ago started as part of York Business Advise Centre when it was in a different location. They got subsidised rent, business support etc. and then they moved	Proximity to other small businesses that they now work with, professional location with reception, message taking etc, location good for customers but less good for employees that come from all over
Home based previously	Good price, short tenancies and nice offices	Attractive location geographically
Nowhere else - first location	Central, good facilities compared with other council buildings	Mail collection, good parking, handy for ring road, inexpensive meeting rooms, used to have a café, nice place to be
First location	Location, price, facilities	See previous
Moved from somewhere else	Close to where they were before - continuity, space, price	Better rooms than before, competitive price
Nowhere else - first location	Owners home town, handy for travel	Good links to motorways
Nowhere else - first location	Bought a company that was situated there	Good location and nice facilities
Sheffield city centre	Business park was a good opportunity to come somewhere new with good facilities at a reasonable cost	Other businesses they work with
Nowhere else - first location	Owner lives in the housing estate nearby and business partner loved the prestige associated with being located close to Rolls Royce and Mclaren.	Collaboration with other businesses, good and ample parking

6.12 Case Study Conclusions

The aim of the case studies was to bring together data on the economic impacts of the CPD and the property market, and to provide greater insight into how CPD's impacts are delivered at the site level.

Key characteristics of the case study CPD's include:

- Most CPD's are serving local markets, however a number provide unique facilities to accommodate demand across the region (eg. lab space at Science Parks)
- Many CPD's provide fairly generic facilities, with flexible space that can be used by a range of industries
- Some CPD's offer a number of units of varying sizes to accommodate various levels of demand and accommodate business start ups
- Some CPD's also offer integrated services to support business or amenities which are valued by the workforce (eg. café, gym etc)
- CPD's are generally of higher quality than the existing stock in the wider estate and therefore demand higher rents
- The most successful CPD's are on the periphery of town centres, with good strategic road access, and provide good parking and transport facilities for workers
- CPD's are generally developed in markets which are characterised as supply, rather than demand constrained
- Public sector interventions have been successful in either establishing a CPD which supports business start-ups, or to ensure advanced and high value-added facilities remain viable
- Public sector backed schemes also generally fill a gap in local market demand and provide accommodation which is easy to access for a diverse range of businesses. This type of accommodation may not be delivered by the market alone
- Most CPD's are part of established employment locations and supported by local policy or Enterprise Zone status.

A summary of the key impacts of the CPD's include:

- An increase in business space coincided with an increase in the number of local business and employees. However, these economic benefits are not solely related to the amount of floorspace developed
- For four of the CPD's the number of firms grew at a faster rate compared to employment, resulting in a decrease in the ratio of employees to local units. This suggests that these CPD's supported small start-up firms
- Business turnover was impacted in the first year of occupation for three CPD's. This may have been caused by the costs of relocating, or due to set-up costs, however within five years turnover had increased for all firms

- We would not anticipate that CPD's, of a scale included in the case studies, would have a significant impact on property market in the sub-area. There are many factors influencing asking rents, but they were generally higher for the new CPD's compared to the wider sub-market
- Asking rents increased following the opening of the CPD, generally beating the market rates
- Of the 8 case studies, 6 had no vacancy, with all but one CPD performing better in terms of vacancy compared to the wider sub-area

A summary of the key benefits for tenants occupying the CPD's include:

- For 15 tenants (45%) the CPD was their first commercial premises, suggesting that the CPD's support the formation of new businesses
- The main reason for moving to the CPD was due to location and accessibility in terms of proximity to workforce (approx. 60%). Other reasons included the unique facilities offered at the site, similar companies, cost effectiveness, good access and parking, and security
- Benefits of the CPD's include agglomeration economies, access to support services and amenities as well as good access to suppliers and customers
- Issues with CPD's include in some cases limited access to workforce, or issues with landlords and management
- A number of tenants have outgrown the CPD and moved on to larger space.

In summary the case study CPD sites have been generally very successful. They meet a diverse range of demands from businesses, from start-ups to major corporations in high value sectors. This also demonstrates that schemes that have been backed through public sector spending have either been focusing at resolving a market failure, usually in the form of high quality flexible space for start-ups or supporting highly successful ventures which accommodate high value-added industries (eg. Science Parks). From a commercial property perspective, the CPD's generally outperform the wider property market in terms of rents and vacancies and therefore represent strong investments.

7 Conclusions and Recommendations

7.1 Impact on local units of moving to new CPDs

Hypothesis 1 looked at the impact on employment, turnover and productivity of firms moving to new commercial property developments

This analysis found:

- Positive impacts on employees and turnover of firms moving to a new CPD compared to another property were detected across many of the models estimated.
- These impacts tend to build over time, though with much of the impact realised over the first year since moving. For all treated local units moving over 2008-12, the impact one year after moving was estimated at 11% and 14% for employees and turnover respectively. At four years after moving the estimated impacts were 15% and 18% respectively.
- There is little evidence for productivity impacts of moving to a new CPD. Very few statistically significant productivity impacts were detected over the full set of estimates (only weakly significant positive effects for two regions).
- Conducting the analysis on local units by move year revealed stronger impacts on firms moving over 2007-10, though positive and significant impacts on employees and turnover were found across all sample segments by move-year.
- A strong correlation was found between how soon local units moved to new CPDs after they opened and the local unit's productivity in the year before the move. Local units moving in the years closer to the opening of the new CPDs had higher productivity relative to local units moving into the CPDs in later years.
- Given this correlation, the stronger impacts on employees and turnover in earlier move years appears to be linked to the higher productivity of the local units moving in these years relative to those moving in later years.
- Splitting the sample by sector revealed that the impacts were particularly strong for knowledge-intensive service local units, while for manufacturing local units there were few impacts.
- The manufacturing local units in the study sample mainly operate in medium-tech and low-tech manufacturing sectors, and hence average productivity of these local units was markedly lower in the year before moving than that of the KIS services, again suggesting that initial productivity levels are linked to the size of the employee and turnover impacts from moving to a new CPD.
- For the productivity-based groups, the strongest impacts were on those with the highest productivity already, though, again, positive impacts on employees and turnover were found for all groups.
- The regional results were more varied, with some regions experiencing little impact, and some experiencing particularly large impacts. For two regional sample

segments, Yorkshire and the Humber and the North West, positive and statistically significant effects on productivity were estimated, though at only the 10% significance level.

7.2 Impact on the local areas around newly opened CPDs

Hypothesis 2 looked at the impact of commercial property developments on local unit total employees, turnover and productivity (proxied by turnover/employees) in the surrounding area, and on wages and occupational mix of workers working there.

The local unit analysis was initially conducted using data aggregated across all local units in local areas. It found:

- Evidence for displacement effects on total employee growth and turnover growth in the surrounding areas following the opening of new CPDs.
- These effects were concentrated on the 0-1km ring and 1-2km rings around the CPDs, with few displacement effects detected further away.
- The findings also suggest that turnover and employee growth displacement effects were most frequent in the three years following the opening of the CPDs, while in the later years displacement effects were far less frequent.
- There were fewer productivity growth impacts picked up in the estimation, though one model found several positive productivity growth impacts in the 0-1km and 1-2km rings around the CPD. Again, the outer rings saw little impact.
- The strongest impacts on employee growth, turnover growth and productivity growth were estimated at incubator sites and science/research parks. This was not accompanied by displacement, whereas for offices, which also saw a strong uplift in productivity growth, displacement was found to occur in the inner two rings.
- The regional analysis yielded mixed results, with a relatively low number of statistically significant effects detected. Further analysis (with more detailed regional data) would be required to draw strong conclusions at the regional level.

In addition, the analysis was conducted using only local units in the sample that were operating within a 5km radius of the new CPDs in the year before opening of the CPD, excluding any local units that moved to the CPD in any year over the study period. The key findings from this analysis were:

- Negative impacts were estimated on total employee and turnover growth across local units active in the area in the year before the CPD opening. These impacts were concentrated in the inner two 1km rings around the CPD, and to a lesser extent in the third 1km ring.
- Nevertheless, positive impacts on productivity growth were estimated in the inner three 1km rings.
- Local units in the top quartile of the productivity distribution saw markedly lower negative impacts on employee and turnover growth in the inner three 1km rings

than local units in the second quartile and those in the bottom half of the productivity distribution.
- On the other hand, the local units in the top quartile of the productivity distribution saw slightly smaller productivity impacts than those in the second quartile and the bottom half of the productivity distribution.
- Comparing the size of the negative impacts on employee/turnover growth on the whole area to those on local units already located in the area before the opening of the CPD, the latter impacts are markedly stronger.
- Thus, it appears that the negative employee/turnover growth impacts on local units already located in the area were increasingly offset by growth of local units that moved to or were born in the area after the CPD opening.
- At the regional level, the findings are broadly in line with the whole sample estimates, with negative impacts on employee growth and turnover growth together with positive impacts on productivity growth detected in the inner rings. However, these findings are not present across regions and there is no clear pattern between the estimated impacts across outcome variables and regions.
- Segmenting by CPD category found that areas around incubator, industrial and offices saw negative impacts on employee growth, while only areas around offices saw any statistically significant impacts on turnover growth. On productivity growth, positive and statistically significant impacts are present in the inner three rings for industrial CPDs, and for incubators in the 2-3km ring.

Further analysis for Hypothesis 2 looked at the impact of commercial property developments on wages, and also on the share of high level occupations, in the surrounding area

This further analysis used data from the Annual Survey of Hours and Earnings (ASHE), which is a sample survey and so has much less coverage than the administrative data from the IDBR (as used above).

- The analysis using ASHE data did not find many significant impacts on average wages or average normalised wages (i.e. average of wages relative to average wages in a specific sector and occupation) on the CPDs themselves. For the model estimated across all CPDs over time periods starting in 2006, the only period that shows significant growth in both average wages and average normalised wage is 2006-2012.
- The analysis on normalised wages yields only two statistically significant effects, one for Incubators and one for Science/ Research parks. However, both are in the area surrounding the CPD postcodes rather than the CPDs themselves (2-3 km and 0-1 km respectively).
- Positive impacts on the occupational mix were estimated in all five rings around the incubators over 2006-16, indicating a shift in the occupational mix towards higher skilled professions, not only on the incubators themselves but in the surrounding area.

- On the other hand, displacement effects on the occupational mix were found to occur in the inner three rings surrounding Office CPD sites.
- The regional analysis provides mixed results, with a relatively low number of significant impacts at the CPDs themselves for both normalised wages and change in the share of high level occupations.
- For both the regional analysis and type of CPDs analysis, the sample sizes for each category is relatively small compared to the overall analysis, which might be the reason for the mixed regression results.

7.3 Case studies

Eight case studies were undertaken to add further insight to the statistical analysis. The case studies discuss the various factors contributing to the success or otherwise of the CPDs studied. Each case study provides information on the local economy, the regional economy and occupation of the site itself.

As the case study CPDs are new, the quality of space provided tends to be high, and this, together with good transport links, provides significant benefits to those firms moving in. The case study CPDs tend to be in areas with high demand for space relative to supply, and some are in areas with a good skills base. An increase in business space coincided with an increase in the number of local business and employees. However, these economic benefits are not solely related to the amount of floorspace developed. Higher quality developments were seen to be more likely to attract high-value firms with the potential to grow productivity.

For four of the CPD's the number of firms grew at a faster rate compared to employment, resulting in a decrease in the ratio of employees to local units. This suggests that these CPD's supported small start-up firms. This was particularly visible for sites that provided additional business support and guidance. Business turnover was impacted in the first year of occupation for three CPD's. This may have been caused by the costs of relocating, or due to set-up costs, however within five years turnover had increased for all firms.

The case studies suggest that CPDs with a specific sectoral focus tended to see the highest growth in productivity and, if correctly targeted, the lowest vacancy rates. Insight from the survey data suggests that the ability to interact with similar firms plays a major role in this. This finding is further supported by the econometric analysis.

7.4 Recommendations for Future Analysis

Having developed the CPD and firm-level databases and undertaken the analysis of the hypotheses described above, below we make some recommendations for future analysis

Impact of local units moving to a new CPD:

- To try to isolate the impact on local units of moving to a new CPD, this study constructed a control group by: 1) limiting the control group to local units which also moved location in that year, and; 2) using Propensity Score Matching (PSM) to match each of the treated local units to similar control local units. This approach was the best identified given the data available, but in future studies (and evaluations in particular) it would be beneficial to collect data on local units which considered moving to a new CPD, but ultimately didn't for reasons unrelated to their performance. For example, if data were available for local units who applied to move to an incubator site but were rejected for reasons unrelated to their performance (for example because the site was already full), these local units might form a better counterfactual against which the impact of the incubator could be measured. Collecting this data would require a coordinated effort to monitor such decisions as they are made, and therefore would need to be considered in advance of future interventions/evaluations.

- Another recommendation for future analysis would be to estimate the impact of moving to different categories of new CDP. This analysis was out of the scope of this study due to data limitations. Within the analytical framework of this study, we compare the impact of moving to new CPDs against moving to other types of property. To extend the analysis to different categories, we would thus need to compare the impact of moving to new CPDs in each category with moving to other types of property in each category. This would require further data on the types of property that local units in the control group move to. Alternatively, the impact of moving to different categories of CPD could be explored by constructing a control group of local units which considered moving to a CPD, but didn't move (as described in the first recommendation above).

Impact on the local areas around newly opened CPDs:

- The concentric rings estimations using the IDBR demonstrated how the approach can be applied to investigate impacts of CPD openings on local unit employees, turnover and productivity. Future studies using this approach could focus on particular regions or property types depending on the research question. Given the extensive geographical and business coverage of the IDBR, it is possible to apply the method to areas across the UK, provided data are available on the properties of interest.

- The wage analysis was limited by the size and scope of the ASHE dataset, which only covers a 1% sample of employee jobs (whereas the IDBR covers 99% of all businesses). In future, analysis of wage impacts might be improved by a more comprehensive wage dataset. A potential dataset identified by BEIS during this project is the HMRC PAYE dataset; further study would be required to assess the viability of using this dataset for a concentric rings-based analysis.

Appendix A: Literature review

A.1 Introduction

This chapter presents the literature review carried out to inform the Impacts of New Commercial Property Developments study being undertaken by Cambridge Econometrics (CE) and Savills for the Department for Business, Energy & Industrial Strategy (BEIS). The study has been commissioned to fill a gap in the evidence base by investigating the impacts of commercial property development on local labour markets in general, and productivity more specifically.

In reviewing the existing literature, the aim has been to: (a) find existing evidence on the impact of commercial properties, with which we might compare (as far as this is possible) the results of the analysis to be undertaken in Phase 2, and; (b) review the various methodologies (especially econometric) used, so as to inform the methodology for this study.

The three key objectives of the overall study are:

4. To produce estimates on the impact on firm turnover and employee wages from new commercial properties.

5. To explore the role of new commercial property for driving local economic growth, local labour markets, and productivity more generally, by testing over different spatial units.

6. To support on-going work on the impact of accelerators and incubators in the UK economy.

The overall research will provide evidence on whether there are any impacts on local labour markets and productivity, as well as further positive external benefits as a result of new developments.

This chapter begins with a section (1.2) describing the development of a typology of business premises and support provisions, to categorise the commercial property developments to be analysed in the study. Section 1.3 then provides a Brief history of recent government intervention in land and property markets, while Section 1.4 sets out a Logic chain of land and property-based government regeneration initiatives. Section 1.5 presents an Overview of approaches to measuring the impact of land and property-based initiatives, and Section 1.5 presents a discussion of the literature on Estimates of the economic impact of land and property-based initiatives other than Enterprise Zones. Section 1.7 presents a discussion of the literature on Estimates of the economic impact of Enterprise Zones, and Section 1.8 discusses a number of Studies on other aspects of local

economic development policy. Section 1.9 brings together the conclusions of the literature review.

A.2 Typology of business premises and support provisions

The first task of the literature review was to draw up a typology of the various types of business premises and support mechanisms in place in the UK. This will be used to categorise the commercial property developments to be analysed in the study. The output of this task, including recommendations for how to treat each type of site is shown in Table 1 below. The final typology is:

- Incubator
- Science/Research Park
- Industrial
- Light Industrial
- Office

The typology will be used during the econometric analysis in Phase 2, to try and distinguish between the impacts of different types of commercial property development.

Table 0-1: Typology of business premises and support provisions

Type	Definition	Key Facts	Recommendation
Incubator	• Open-ended duration (exit usually based on the stage of the company, rather than a specific time frame) • Typically rent/fee-based • Focus on physical space over services • Admissions on ad-hoc basis (not cohort-based) • Provision of services including mentorship, entrepreneurial training	**205 in UK** An older concept, but significant increase in past 50 years 3450 new businesses supported per year (~6900 in total) 16% offer direct funding Average residency just under 2 years 55% have a sectoral focus Top 5 sectors: • Digital • Life sciences • Engineering & Manufacturing • Health & Wellbeing • Energy & Environment More on incubators	Treat Incubators as a Distinct Category within our Analysis

	• Often provide technical facilities such as laboratory equipment • Selective admission (but typically less so than accelerators)	BEIS houses a directory of UK incubators/accelerators, complete with location	
Accelerator	Fixed duration programme (usually between three and twelve months) • Typically growth-based (payment via equity rather than fees) • Often provide seed funding • Focus on services over physical space • Admission in cohorts • Provision of startup services (e.g. mentorship, entrepreneurial training) • Highly selective	**163 in UK** Reasonably recent innovation: first UK accelerator in 2007 3660 business supported per year 61% offer direct funding Average programme length 6 months 70% have a sectoral focus Top 5 sectors of focus: • Digital • Social Enterprise • B2B Health & Wellbeing • Fintech More on accelerators	Accelerators don't necessarily correspond to specific sites therefore cannot be considered as a category. However the presence of an accelerator programme in a particularly geography needs to be accounted for
Co-working Space / Maker Space	Co-working Spaces physical workspaces, usually providing basic office services and available on highly flexible terms, and sometimes reserved for individuals and young, growing companies.	There are 18 coworking spaces within the UK listed in the incubator directory. A separate directory of makerspaces can be found here, that lists 97 makerspace sites.	Could potentially be combined as a separate category, although the limited sample size may require a category merge with incubators.

	Makerspaces are facilities for digital design and fabrication. They are predominantly membership organisations that provide both formal courses and informal help to users		
Innovation Hub	• Organisational form/meeting point/work space/research centre providing subject-matter expertise on technology trends, knowledge and strategic innovation management, and industry-specific insights • Self-organising, adaptive and collaborative community facilitating innovators and entrepreneurs e.g. to launch start-ups • Some established organisations set up in-house innovation hubs to boost and exploit entrepreneurship both from within and from outside e.g. E&Y, Accenture, Cambridge University	Aim to convene like-minded people from diverse backgrounds and knowledge with complementary attributes. An example is when coders, business people and investors join forces in tech hubs to develop and launch software innovations Hubs sometimes house incubators e.g. the i-Hub houses the Imperial White City Incubator Hubs do not create innovation but enable/facilitate innovators and entrepreneurs Hubs are non-hierarchical to allow cross-pollination of creativity and ideas and increase chances for serendipity results Hubs emphasise adaptation of local content while at the same time seeing themselves as part of a global entrepreneurship movement Top sectors of focus: • Digital/IT • Fintech • Social enterprise • Biomedical sciences • Agri-tech	There is no specific list of innovation hubs – the term is more of a branding choice than a separate entity. Categorise under incubators.

	• Funding is often external and tends to influence who is selected • Sometimes there is interaction between hubs and accelerators such as shared space • Focus on finding solutions to existing problems via collaboration		
Research Park	• Dedicated centres often housing multiple SMEs engaged in R&D and commercialising science and technology • Similar to science parks (see next)	Many double as science parks (there is large crossover, so perhaps these categories should be combined) and there about 123 as of 2017 (UKSPA, page 13) Top sectors of focus: • Engineering • Biomedical/Health science • Computing/digital/IT	Merge with science parks to form "UKSPA member" category. Risk – there may be an overlap between UKSPA members and incubators
Science Park (SP)	• Organisation managed by specialised professionals, whose main aim is to increase the wealth of its community by promoting the culture of innovation and the competitiveness of its associated businesses and knowledge-based institutions • SP is a strategically planned, purpose built work area located near	Many SPs are linked to universities and their focus reflects university strengths Other SP designations: university research park, science and technology park SPs carry out original R&D or commercialise research from other sources such as universities) SPs have access to qualified R&D personnel in the areas they identify with and can market their high-value products and services	See research park

	university, government and private research bodies engaged in a particular field • A collection of R&D intensive mainly SMEs (but also established firms) focussing on science and technology • SPs aim to "promote the economic development and competitiveness of cities and regions by creating new business, adding value to companies, and creating new knowledge-based jobs" (IASP)	Have long-term growth plans are often backed by powerful bodies e.g. universities, funding agencies or political bodies They sometimes begin/operate as a collaboration between public and private bodies and often access land from local councils among other facilitation Are an interface between academia and industry, as reflected by their often highly qualified work-force Top sectors of focus: • Science & technology	
Business Park	• BP: an area of land with many office buildings housing commercial activities that are not necessarily largescale industry • BPs are thematic areas of autonomous buildings arranged around communal services and located near access points of the metropolitan road network	They vary in the type and size of firms they house which range from low-tech to high-tech companies Some BPs also house operations of established firms/bodies that may not be high-tech for example, Oxford BP has Harley-Davidson, Oxfam, Royal Mail and HMRC, among tenants There is no clear source for the total number business parks in the UK. Our best estimate is ~1300 Some BPs are supported by the responsible local authorities through land/space provision and financial incentives to (some) firms	Merge with Industrial Estate to form a single category of "Business/Industrial Park", and segregate out by sector specificity if this proves to be possible from the data/ gives sufficient and appropriate sample sizes

		Tend to be less focussed on cutting-edge R&D firms/start-ups that are found in science/research parks Top sectors of focus: • IT • Communication & media • Science & technology • Transport	
Industrial Estate/ Industrial Park	• area zoned and planned for use in industrial development • aka trading estate • All UK trade and industrial parks are listed in this database: 1,035 trade parks and 5,420 industrial parks, although its accuracy is undetermined	Can be thought of as a 'heavier' version of a business/office park with offices and light industry, as opposed to heavy industry Can be similar to science parks in some cases Do not all engage in high-tech activities. Some are engaged in low-tech trades e.g. plumbing and building services Top sectors of focus: • Biotechnology • Advanced manufacturing • Trading services	See Business Park
Single Site Commercial Space	A large commercial development in which multiple firms are housed within a single building or complex, often in a city centre location	Statistically, these facilities make up the majority of commercial property developments, and range from modest two-storey buildings with just a handful of small occupants, to multi-storey tower blocks housing dozens of tenants, and providing similar levels of total employment space to a small business park	We may need to treat single site developments within a business park separately to single site developments within a city-centre location.
Enterprise Zone (EZ)	• EZs: designated areas in England in 2012 by the UK Govt to support businesses to grow	EZ have supported the success of 635 business since April 2012 and attracted about 24,000 jobs	Like Accelerators, Enterprise Zones do not necessarily correspond to a specific site, but instead can cover spatial areas of different sizes, including

	• EZ allow businesses (mainly new/young and expanding) to access govt support such as tax breaks • EZ leverage govt support to allow firms to access private funding and FDI into the UK	There were 24 EZs in England in 2012 that have since increased to 48 £2.4bn in private investment attracted since over April 2012 – March 2016 EZs offer tax and business rates incentives to businesses Top sectors of focus: • Automotive • Aerospace • Pharmaceuticals • Renewable energy Some EZ data available	multiple business parks/incubator sites etc. Therefore they do not make for a suitable category, but their presence should be accounted for

A.3 Brief history of recent government intervention in land and property markets

Government intervention in the land and property markets has been a dominant feature of regeneration activity for over seventy years. Most significant urban policy instruments of the last four decades have had some form of land and property dimension, from the Enterprise Zones and first Urban Development Corporations (UDCs) of the early 1980s through to the Urban Regeneration Companies (1999) and the second round of UDCs that began in 2004/05. Land and property-based regeneration also featured heavily in regeneration projects financed through the Single Regeneration Budget (SRB) (from 1994), particularly in Rounds 1 and 2. Under the SRB, a UK government fund for programmes aimed at improving local people's lives in deprived areas, £8.2bn were spent on hundreds of projects. They were also represented extensively in the activity of the Regional Development Agencies. Tyler et al. (2013) identified around £760 million of regeneration expenditure focused on industrial and commercial property in 2009-2011.

Beyond the regeneration spend focused through Area Based Initiatives (ABIs), other funding instruments were also available to local authorities and private sector developers to encourage land reclamation and property development. Key examples in post-war Britain were Derelict Land Grant (managed by DCLG's predecessor, the former Department of the Environment (1982 to 1994) and Urban Development Grant (from 1982) and Urban Regeneration Grant (from 1987) which were merged into City Grant in 1988.

Through much of the period 1985-2010 specific Government agencies also had a remit to stimulate property markets and bring about regeneration. English Estates, the forerunner

to English Partnerships (now Homes and Communities Agency (HCA)) played an instrumental role in creating serviced sites across the country in the 1980s and early 1990s. In 1993, English Partnerships was created as the Government's Urban Regeneration Agency building on English Estates and subsuming responsibility for Derelict Land Grant from DoE as well as establishing its own grant-making powers through a Land Reclamation Programme and interventions such as the Partnership Investment Programme. Land Reclamation Programme projects transferred to the RDAs on their formation in 1999, but English Partnerships retained overall funding responsibility for the National Coalfields Programme. It had a Service Level Agreement with RDAs to remediate over 100 sites since 1999. HCA has maintained an extensive land reclamation remit through its Property and Regeneration Programme.

Enterprise Zones originated in the United Kingdom in the early 1980s. Successive British Governments have continued to use the policy and since 2011 there have been over fifty designated. The new wave of UK zones started in a difficult macroeconomic environment, with the Banking Crisis of 2008 still constraining business investment. The financial crisis largely stopped speculative property-led development and investment in the UK and the Enterprise Zones suffered accordingly. The Enterprise Zone policy has also been used in many countries around the world. In the USA at the present time there are around 3,500 separate zones in 40 different States. There are also Enterprise Zones in France and elsewhere in Europe. They are finding increased favour in the Far East.

The state incentivises firms with labour and tax incentives to operate in these zones. Economic theory suggests that the effect of fiscal incentives on a zone's employment and wages depends on the elasticity of supply of factors of production to the zone as well as the elasticity of demand for what the zone produces. Enterprise zones (EZ) fall under locally targeted programmes that started being implemented in the 1980s to kick-start sub-national economic development. In the UK, the EZ was designed to promote economic activity in non-occupied areas with little or no industry. US state-level EZ strategy tended to be organised around community revitalisation programmes, targeting areas with high unemployment and poverty rates, for example.

It has been recognised for nearly a century in the UK that the public sector has a key role to play in the provision of small workspaces in those parts of the country where economic returns are languishing. For most other land and property activity, private sector finance has typically provided support for infrastructure investment and construction costs. Funding instruments for land and property have changed several times throughout the last three decades but a central focus has been on the role of the public-sector policy instruments to help lever resources from the private sector. Evaluation evidence has showed that the ability to do so has varied from project to project and place to place.

A.4 Logic chain of land and property-based government regeneration initiatives

General logic chain

Regeneration activities undertaken under the general banner of land and property activity have included land reclamation, site servicing and the facilitation of new industrial and commercial floorspace, whether directly by the public sector or in conjunction with the private sector. These activities have sought to regenerate run-down areas by removing blight, enabling brownfield land and greenfield sites to come forward for development and accommodating industrial and commercial floorspace and business activity. Ultimately this accommodates new or existing businesses and the creation or retention of jobs which in turn supports GVA. Indirect benefits arise from the provision of industrial and commercial property linked to (perhaps) transport and environmental improvements. The scale of the indirect benefits is usually highly project specific. An original policy focus in the late 1990s on land and property intervention to support industrial and commercial developments evolved to include more mixed-use approaches, bringing residential developments back into town and city centres.

Figure 1 presents a summary logic chain for the land and property activity category. The logic chain is primarily concerned with how government can help to overcome a market failure - notably developers will not invest in site development and provide speculative property without some level of incentive, which can be provided by the public sector. A typical route through the logic chain involves funding site development (overcoming a market failure) through clearing and making ready land (activities) to creating a certain level of developed land which has direct employment effects (outputs) and leads to

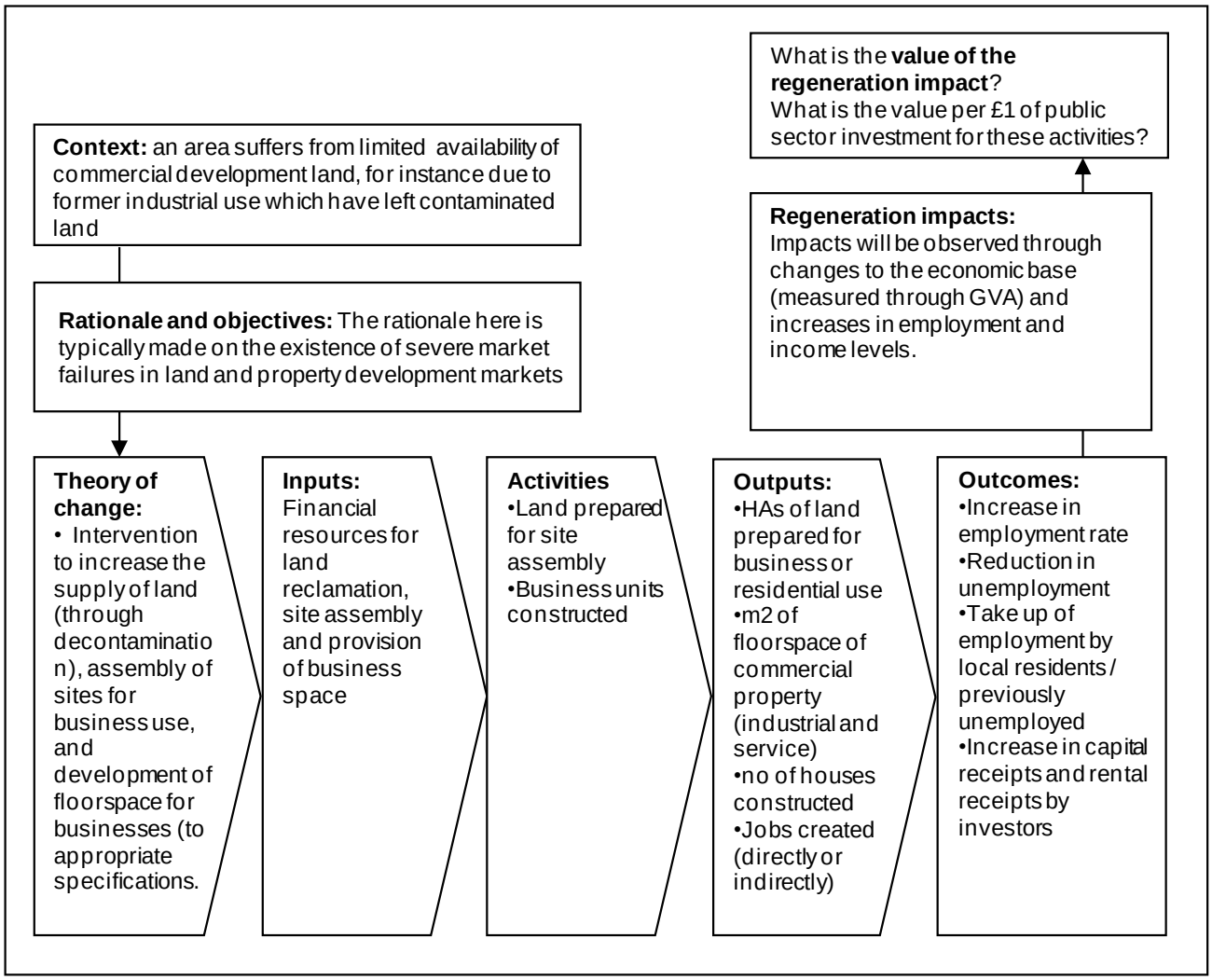


Figure 0-1: Summary logic chain for industrial and commercial property

outcomes in the form of business activity and employment.

Theory of change for Enterprise Zones

The original objective of UK Enterprise Zone policy was to generate net additional economic activity in the designated areas by stimulating the workings of their property markets (DoE, 1980). The idea being that the policy incentives (e.g. tax credits) would correct market failures by removing property market constraints associated with externalities (e.g. land clean-up costs), information deficiencies, uncertainty and investor risk aversion. If these market failures were overcome then the necessary conditions for

sustained significant unassisted private sector development existed. The public sector intervention thus 'levers' in private sector investment with the Zone acting as a catalyst for local economic development and the stimulation of enterprise.

More recently, the objective has been to use zones to assist areas with economic restructuring by encouraging investment in high value added, knowledge-based industries (DCLG, 2011). In some zones the emphasis is on encouraging the growth of Knowledge Intensive Business Services whilst in others it is the promotion of Advanced Manufacturing and Energy related activity. In 2014 the UK Government announced a pilot scheme involving four University Enterprise Zones where the emphasis is on 'encouraging high tech firms to locate near to universities' (HC, 2016) and thus help build local innovation systems. Other business support establishments such as accelerators and incubators have a much shorter history.

Policy instruments within Enterprise Zones

The precise incentives available to companies on Enterprise Zones have varied through time and across countries. But in the UK there have been two common elements. The first has been exemption from local authority taxes or rates with Industrial and commercial property (including retail) in Enterprise Zones being exempt from local authority rates (but not from water service charges). The second has been that activity on the zones was exempt from, or at least allowed greater flexibility with respect to, the standard Town and Country Planning regime.

Other policy instruments have included Enhanced Capital Allowances. In the original British zones this meant that capital expenditure on industrial and commercial buildings (including hotels) but excluding the cost of land at the rate of 100% could be offset against corporation tax (income tax in the case of the self-employed). In more recent zones the capital allowances have been for investment in plant and machinery. In other countries, notably the US and France, zone incentives often include offsets against labour taxes. There is also provision for speedier administration and 'inward processing relief' relating to customs procedures. In the more recent British Zones there is enhanced high speed broadband provision.

A.5 Overview of approaches to measuring the impact of land and property-based initiatives

Assessing the economic impacts of land and property-based initiatives at the local level has, until recently[21], mainly focused on the total ("gross") employment accommodated in industrial and commercial property and assessing the additionality of the public sector's intervention and the extent to which the employment can be regarded as additional. As Tyler et al. (2013) show, valuation has then typically been achieved by using

[21] See *The DCLG Appraisal Guide* (2016), DCLG, in which Land Value Uplift (LVU) is now the preferred approach..

GVA/employment ratios derived from ONS data (e.g. Regional Accounts and the Business Register and Employment Survey) and applying this to net employment outputs to express the value in GVA terms (there may also be second order benefits, for instance around improvements to quality of life or environmental benefits, although to a large extent these may be captured in the main economic measures). As Tyler et al. (2013) remarked, standard monitoring and evaluation exercises have tended to simply add up the achievements of a given programme (e.g. hectares of land reclaimed; square metres of industrial or commercial floorspace constructed or refurbished). There has often been little analysis of input to output relationships in terms of land and property development, with an exception being research that has sought to capture uplift in land values that arise from changes in land use designation (Department for Transport, WebTAG 3.16D, 2010).

As Tyler et al. (2013) discuss, there has been research that estimated the impact of land and property-based activity on land and property prices, often using hedonic prices. Particular emphasis has been given to Enterprise Zones and this is reviewed below.

Valuation approaches have included hedonic analysis or hedonic price models, use of the Delphi Technique or similar qualitative collation of experts' opinions about the impact of a particular regeneration activity on the property market. Other methods such as cost-benefit analysis, tracking of property investment returns and vacancy chain analysis. A typical study is that by Bond (2001). He examined the residual "stigma" associated with remediated contaminated land and the value penalty that it imposes. A rather different approach was adopted by Adair et al. (2003), in their research to develop a "total returns index" designed to measure the investment performance of commercial property in regeneration areas. This index was not designed as a means of assessing the overall performance of regeneration schemes or policies, but as a contribution to the limited knowledge base amongst property professionals about the risks and returns associated with brownfield site investments. They placed a particular focus on enabling comparisons with already established benchmarks. In this sense its relevance is limited to a rather narrow segment of this market. The results indicated that over the long-term, investment returns for regeneration property had outperformed national benchmarks, albeit only marginally. This pattern was apparent across each of the three main sectors of the commercial property investment market (retail, office and industrial), but notably in the retail sector. By contrast, investment returns in the office sector, although exceeding the national benchmark, were not appreciably different. A helpful study by Adair et al. (2005) raised some pertinent concerns about the valuation of urban redevelopment land.

A.6 Estimates of the economic impact of land and property-based initiatives other than Enterprise Zones

Most of the research into the impact of land and property-based policies on local economic regeneration has focused on the contribution they can make to local employment and, in particular, the extent to which the contribution is ‘additional’ to the local area. There is little

evidence on the impact on local productivity (hence the need for the current study) or any other non-employment related effects other than that related to effects on local property markets that is discussed more extensively in the next section.

One of the most extensive reviews of the impact of land and property-based initiatives (albeit based upon self-reported impact data, with the inherent limitations which that brings) was the PWC Impact Evaluation of the Regional Development Agencies (PWC, 2008). PWC found that the RDAs spent approximately £3.6bn on a range of interventions designed to promote regeneration through physical infrastructure including bringing land back into use, improving public realm and promoting image and tourism in the regions. They reviewed 82 evaluations where the RDA expenditure was of the order of £2bn. The research (PWC, 2008) indicated that the initiatives had created or safeguarded almost 55,000 jobs, of which 45% are estimated to be additional at the regional level. Over 650 hectares of land have been remediated, of which 73% are estimated to be additional. Some 400 businesses have been created, of which 65% are estimated to be additional. They argued that significant future potential outputs were anticipated. Their overall conclusion was 'the impact on regional GVA (based on the net achieved jobs created and safeguarded where identified in the interventions evaluated) is £5,167m, based on an investment of £1,558m, a return on investment of £3.30 of GVA for every £1 spent. If future potential jobs are included, then the estimated impact on GVA increases to £8,808m, a return on investment of £8 of GVA for every £1 spent' (PWC, 2008). They also observed that there 'there does not appear to be a clear relationship between value for money and either the scale of the intervention, its additionality or its performance against objectives' (PWC, 2008).

A further study of the local economic impact of the land and property-based regeneration initiatives funded by SRB was undertaken by Rhodes et al. (2007). Their research concluded that the net additional local benefits of SRB based on such initiatives was of the order of 13.19 additional net sq. metres created for every £20,000 of net additional public expenditure in the target area and 11.82 in the local economy Rhodes et al. (2007).

More recently, Gibbons et al (2017) also sought to study the local economic impacts of property-led initiatives financed under SRB. They argue that; 'We find that subsidising the development of commercial space through the SRB created some additional workplace employment in the targeted places (although we can only partially assess to what extent these were displaced from further afield). However, despite the increase of new local jobs, we find no evidence that these jobs went to local people or improved the employment outcomes of local residents'. The study also concludes that these projects were not a cost-efficient mechanism to improve local employment. The methodology employed by Gibbons et al (2017), both in determining the samples for analysis (through a concentric rings approach) and in the econometric methods employed, will be used to inform the current study.

As well as Enterprise Zones, commercial property in the UK takes many forms (and serves various types of business), including incubators, accelerators, co-working/maker spaces, innovation hubs, research parks, science parks, business parks, industrial estates and parks, single site commercial spaces. Many of these entities share some characteristics in the type of activities they engage in and thus, the type of facilities and commercial properties they occupy. Incubators, in particular, provide a safe haven for companies in the early stages of their lifecycle.

Literature on incubators

Kirby (2004) analyses entrepreneurship education and the role of incubators and science parks as enterprise labs. He argues that incubators can be seen as enterprise teaching labs where three critical aspects of enterprise education can be provided: education about; for, and; through enterprise. Using a case study from the University of Surrey, the author argues that incubators are a better environment for people to learn entrepreneurship than say, in business schools. Kirby (2004) argues that using incubators this way allows students to complete the learning cycle, moving from 'classroom observation and reflection' to the incubator where real tests of concepts and ideas can be carried out under more realistic conditions. This shift from passive to active learning, Kirby (2004) argues, allows participants to experience the 'activist' and 'pragmatist' learning style which tends to suit successful entrepreneurs better than the 'reflector/theorist' classroom style. This line of reasoning that looks at incubators not only as commercial environments but also as areas of learning entrepreneurship suggests that a study of incubator spaces could explore whether the current commercial property occupied by incubators is suitable for this dual purpose.

Bergek and Norrman (2008) construct a framework to identify models of best practice for incubators. This theoretical study compares incubator outcomes against their set goals. Bergek and Norrman (2008) argue that there is no single model of incubator best practice. Rather, the incubator model employed should be designed to meet the goals and surrounding context of the incubator and that it must be internally consistent. In other words, best practice identification requires a holistic approach. When it comes to comparing incubator models, Bergek and Norrman (2008) advise that comparisons only be made between similar incubators, for example, based on their goals. Furthermore, outcome indicators should be chosen to correspond with these goals. To differentiate incubators, the authors do so based on the incubator's selection criteria, business support and mediation – how the incubator connects its members to each other and to the outside world. One aspect in which this study differs from others is its focus on an incubator's goals when assessing the incubator's performance – whether it is successful or not. The fact that there are multiple incubator models suggests that a study of incubator spaces should explore whether the commercial property on offer appropriately caters to all the various incubator models.

Dee et al. (2011) review the impact of business incubation on new ventures with high-growth potential. Their goal for the literature review was to identify incubation models with

the greatest impact on the goal of building high-growth, innovative firms out of their tenants, but also on the overall economy. They find that the UK has 300 business incubators (at the time the report was produced) supporting about 12,000 businesses (UK Business Incubation, UKBI). About 60% of incubators have outreach programmes supporting businesses not resident in the incubator. Incubators are found to strongly encourage peer-to-peer networking and address multiple needs of new ventures, thus helping to establish an entrepreneurial support infrastructure. Incubation can impact new ventures via accelerating the entrepreneurial process, often providing subsidised business support and facilities to incubatees at critical times. Some incubators continue support to tenants beyond the incubation period and incubator environment. Incubators count rent as one of their main income sources, thus policies that promote manageable business rent rates would support the incubation sector.

Al-Mubaraki and Busler (2010) looks at business incubator models in the UK and the US, analysing their objectives, operations and success. SWOT analysis is applied to two case studies, one in each country, to characterise the workings of business incubation in these areas. The study identifies the US as one of the pioneers in business incubation with the US incubators growing from about 100 to 1,800 over 1980-2010. The UK's British Steel Industry (BSI) entity set up in 1975 to create jobs in steel closure was one of the early incubator-type ventures in Europe. There were at least 7,000 incubators globally as of 2010, showing the increasing use of incubators as economic development tools around the world. Business incubators are found to promote the commercialisation and adoption of new technology originating from the R&D community and channel funding and business advice to innovators and entrepreneurs seeking to commercialise their inventions. Among some of the issues facing business incubators are difficulty in hiring qualified incubator managers, limited resources for projects and the threat of falling public sector support in the aftermath of the 2007 financial crisis. However, the paper also finds that big business is adapting and is increasingly using the business incubator network to access new technologies as part of its investment strategy.

The What Works Centre for Local Economic Growth: Toolkit on Incubators (2017) reviewed seven evaluations that met their evidence standards, and found mixed results. There is some evidence that incubators may increase participating firm employment and sales, but also some evidence that incubators may decrease firm survival. This latter impact, which on the face of it appears to be a negative impact, is likely to be due to incubators helping firms to more quickly gauge the quality of their business idea, and so encourage them to drop bad ideas sooner than they otherwise would have. Incubators with an affiliation to a university may also have a positive effect on survival and revenue and employment.

Literature on accelerators

As of 2014 there were 300-2,000 accelerators globally, with numbers said to have risen since 2014. Heterogeneity between accelerator programmes, including programme objectives, explains some of the heterogeneity in outcomes. In addition to providing seed

capital, accelerators also tend to provide working space, networking and mentorship access to members. The authors also find that only a small proportion of accelerator graduates successfully achieve exit from their founders, with the low rate in part attributed to the relative newness of accelerators in 2014. The much shorter lifetime duration of accelerator programmes compared to incubators and science/business parks suggests that this class of business support might require different facilities. In this context, the current study might consider issues related to providing temporary commercial property facilities to the accelerator sector.

Isabelle (2013) focusses on accelerators and incubators in Canada and the US. She argues that because technology entrepreneurs rarely succeed in isolation, where they cannot access established business ecosystems, incubators and accelerators provide an alternative support structure to access vital resources necessary to turn their ideas into profitable ventures. She analyses data from surveys and identifies five key factors affecting a technology entrepreneur's choice of incubator or accelerator: 1) stage of venture, 2) fit with incubator's mission, 3) selection and graduation policy, 4) available services, and 5) incubator ability to meet an entrepreneur's needs. Isabelle (2013) finds that few incubator and accelerator services are geared towards supporting entrepreneurs' efforts to internationalise their ventures. Also, most incubators focus on ICT and other short time-to-market sectors, neglecting longer time-to-market sectors such as life sciences. She finds, in agreement with most research on the topic, that ventures graduating from incubator programmes have survival rates higher than non-incubated ventures. This relatively higher survival rate of incubators and accelerators suggests an opportunity to offer commercial property that helps to optimise the output from accelerators and incubators.

Cohen and Hochberg (2014) examine aspects of seed accelerator programmes as a model of assistance to entrepreneurs seeking to transform their ideas and innovations into profitable ventures. Focus is placed on characteristics that differentiate the accelerator model from other business start-up support models such as incubators and co-working environments, and the importance of their design to the success of their graduates and the local entrepreneurship ecosystems. This study uses a mixed theory-empirical approach that attempts to define accelerators as distinct programmes from those with similar or related goals. Accelerator programmes have a much more limited duration compared to other business support setups. The empirical element presents statistics on accelerator outcomes such as graduation rates of participants.

The What Works Centre for Local Economic Growth: Toolkit on Accelerators (2017) reviewed ten evaluations that met their evidence standards. The results are mixed, with some evidence that accelerators may increase participating firm employment.

Literature on other business support installations e.g. science and technology parks, business park

The Phan review (2005) looks into problems with extant literature on science parks and incubators in terms of science parks and incubators themselves, the enterprises located upon science parks and incubators, the entrepreneurs and teams of entrepreneurs involved in these enterprises and at the systemic level. The theoretical study argues that science parks and incubators are important links in the entrepreneurial value chain at the national or environmental level. With reference to multiple theories, incubation is viewed as an accelerated way to institutionalize new ventures and may constitute a means to create resource buffers to absorb uncertainty. The incubating relationship could be modelled as a way for venture capitalists to monitor entrepreneurial effort. There are also concerns about the notion that incubation is a form of individual mentorship between the incubator and science park managers and the entrepreneur or entrepreneurial team. Therefore, theoretical questions and approaches are myriad and limited only by a researcher's imagination and analytical tools.

Link and Scott (2007) look at the economics of university research parks. Noting that these installations are increasingly accessing private and public investment, they argue that research parks are playing a more prominent role in R&D and the transfer of knowledge and technology spillovers to the wider economy. Their international evidence on the proliferation and growth of university science/research/technology parks highlights their role in the innovation ecosystem which underpins economic growth. These parks enhance the two-way flow of knowledge between firms and universities which encourages innovation. Their growth in number and in importance in an increasingly knowledge-based economy calls for focussed analysis on how they can be best facilitated in terms of access to the right infrastructure such as commercial properties. In the current study, we might expect the impact of science/research parks to be greater than other types of commercial property development.

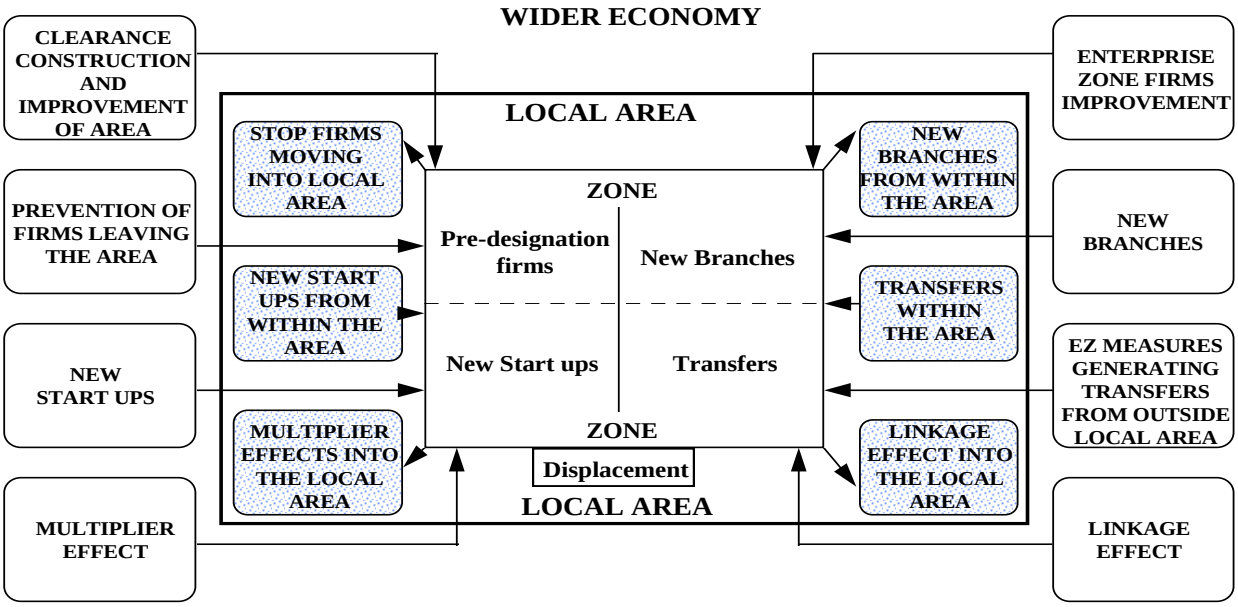
A.7 Estimates of the economic impact of Enterprise Zones

There is much interest around the world in what Enterprise Zone policies can achieve and there is significant literature looking at their impact - particularly in the US and France - more so than for any other type of targeted development. Most of the research has been on the impact on employment and the local property market.

An evaluation of the performance of the Enterprise Zones was undertaken in 1987 (Department of the Environment, 1987). Some £3bn of investment (2010-11 prices) went into the original twenty-two zones (excluding the Isle of Dogs) between 1981 and 1993. By 1990 about 2,700 hectares (6,700 acres) of land had been developed, with 6 million square metres of floorspace built containing 5,000 companies that employed 126,000 people. The original zones had a ten-year life span and by the end of their designated period around 80% of the available land had been developed.

The average employment on the Zones was 37.2 per hectare, but it was higher in the high opportunity, low need Zone locations at 43.3 per hectare. It was lower in the relatively lower economic opportunity zones at 24.3 per hectare. These estimates are based on the gross area of the zone and since some of the total land available is used for landscaping, access and supporting infrastructure the estimates per hectare are around 20% higher if this element is removed. Thus, an average Zone generated 45 jobs per hectare. Around 52% of all zone floorspace was industrial.

It is necessary to consider where the businesses attracted to the Enterprise Zone came from and whether it was additional to the local area. The local area in the original British zones was broadly a ten-mile radius around the zone sites but the precise definition depended on the nature of the local economic settlement pattern. The type of possible interactions between on and off zones is summarised below. It also shows that there can be economic benefits created through supply chain ("linkage") and income multiplier effects.



Source: Second Interim Evaluation of the Enterprise Zones, HMSO, 1995.

Figure 0-2: Understanding the Sources of Economic Benefits from Enterprise Zone policy

The evidence for the first British Enterprise Zones was that 58,000 (46%) of the 126,000 employment on the Zones was additional to the local area after allowing for deadweight, displacement, and short-term income multipliers effects. Thus, approximately one out of every two jobs on the Zones were additional to the local area of which the Zone was a part. Additionality was highest for manufacturing and lowest for retailing and distribution activity. Tyler (2015) in his report for the British Government in 2012 found that the cost per job created in the local area was placed at around £17,000 per job. Whilst the cost per job was within an acceptable range, it was the case that the policy did tend to displace local economic activity - a phenomenon referred to as 'boundary hopping'. On the basis of

these results Tyler estimated that the largest of the new zone sites in England that had relatively good access to market opportunity and relatively low need in terms of land remediation might be capable of generating some 6,500 jobs at build-out with around 50% of these additional to the local area.

Papke (1993) summarises the theory and empirical evidence on early enterprise zone performance in the US and the UK. He argues that EZs are a valid tool to evaluate the effectiveness of tax incentives as economic policy for development. He finds that capital incentives to businesses are likely to encourage investment in EZs. However, it is not clear whether this is new or relocation of existing firms. The US data looked at suggests that start-ups account for 25% of new EZ business. Capital incentives may kick-start economic activity in depressed areas, but this might be at the expense of surrounding areas. Notably, the chances for local improvement in economic terms rise when zones are small relative to the overall economy. Although Papke (1993) uses unemployment as the measure of labour market impact, whereas the current study will look at employment and productivity, the methodology, and discussion of control groups, could be used to inform this study.

A recent study by the UK What Works Centre (2016) reviews a range of evaluation studies for EZs and other economic area based initiatives. It seeks to establish causal impact of an estimate of the difference that can be expected between the outcome for areas that benefit from support and average outcome they would otherwise have experienced. The methodology used is to review existing literature and evidence and score each study on the quality of method implementation, then draw conclusions based on their findings. In the empirical study, the preponderance of evidence relates to US EZs, US Empowerment Zones and French EZs. Most of the reviews show positive impacts on zone employment, but that the impact on zone employment is weakest for US EZs and better for US Empowerment Zones. It also finds positive effects on unemployment, poverty, wage and number of businesses. Most of the report's coverage and findings are in line with similar studies.

Evidence on the impact of Enterprise Zones outside the UK

Research into the economic impact of zones elsewhere in the world point to mixed effects. Some evaluations report positive net additional gains. Others are more negative. The recent study by the UK What Works Centre (2016), discussed above, finds that roughly half of the USA and French studies find positive effects on employment. There is also evidence of positive effects on business.

Bondonio and Greenbaum (2007) exploit the variation in US enterprise zones to estimate the impact of spatially-targeted tax incentives on several dimensions of economic growth. They argue that mean impact analyses of EZ policies are inadequate at capturing the breadth of effects of local tax incentives on economic growth. Instead, they look at disaggregated gross flows for new, existing and vanishing establishments in the area of concern. Their results show that impacts of local tax incentives have more complex

dynamics compared to what is implied by mean impact estimates. Put differently, simple mean impact estimates do not capture all the dynamics that follow from these incentives. Specific policy recommendations, through incentives, are found to lead to specific outcomes for economic growth. There are similarities with other papers on coverage and findings. In line with much of the literature, EZ policies are found to have a positive impact on employment, sales, and capital expenditures accounted for by new establishments, for example. This emphasis on variety in outcomes in this this study reinforces the need for evaluation studies to take into account relevant variables that reflect the full impact of commercial property on economic activity.

Busso and Kline (2008) employs an empirical approach to investigate whether local economic development programmes work. The hypothesis is that government intervention via grants to neighbourhoods granted Empowerment Zone (EZ) status in the US has positive effects on local employment and housing markets. By comparing local labour market and housing market outcomes between accepted and rejected neighbourhoods for Empowerment Zone designation, they find that EZ designated areas saw improvement in their labour markets and increases in rent compared to areas whose applications for EZ status were rejected. Access to outside funds leveraged by EZ designation as well as the tying of business tax credit incentives to the requirement to employ local residents contributed to the observed local employment gains. EZ areas also underwent demographic composition changes in the form of gentrification, but to a limited extent. Busso and Kline (2008) also found that EZ policies were more likely to have a bigger impact in deprived areas compared to economically well-off areas. This study shares similarities with other papers, notably the use of tax credits to incentivise investment and kick-start economic activity. In addition, the study also evaluates the EZ policy of using the welfare system to subsidise some consumption in the demarcated area. The EZ programme was a hybrid interventionist social welfare and economic development policy designed to revitalise distressed urban communities. To the extent that local businesses in EZ designated areas need property to operate from, this paper can contribute to our understanding of property market dynamics in such areas.

Neumark and Kolko (2010) ask whether EZs create jobs and proceed to answer this question by using geographic mapping methods to analyse establishment-level data from California's EZ programme. Results from the analysis indicates that EZs do not increase employment. In addition, there is no evidence that employment shifts towards the lower-wage workers targeted by the EZ incentive, leaving the authors unable to reject the hypothesis that the programme does not achieve its goal of increasing employment. Also found is that the EZ programme reduces the number of establishments, which when combined with resulting employment dynamics suggests that establishments are growing bigger. This, it is argued, is possibly because smaller firms struggle (compared to larger firms) to claim EZ benefits due to the administrative burden. The authors also document cases where EZ expanded to areas where businesses planned to relocate/grow, making the EZ the effect of, rather than the cause of employment growth. The GIS methodology of the study, making use of 'shapefiles' for the Enterprise Zones, is interesting, but not one

that can be repeated in the current study, due to the range of different types and size of commercial property development that are being studied.

Ham et al. (2011) uses evidence from US state and federal Enterprise Zones and Empowerment Zones to argue that government can improve local labour markets. Subsidies and tax credits, including property taxes in some cases, to businesses in EZs are used to encourage employment growth in disadvantaged labour markets. Regression analysis is used to show that EZ programmes at all government levels are found to have positive and statistically significant impacts on the labour market with respect to unemployment rate, poverty rate, and employment. Also found are significant spillover effects to neighbouring tracts of the EZ. Contrary to some of the studies on US EZs, this study finds that overall, EZ programmes significantly have a positive effect on labour markets, hence their argument that these labour market interventions are efficient.

Bondonio and Engeberg (1999) analyse the impact of selected US EZ programmes on local employment. Using regression analysis, they carry out a comparative evaluation of how various EZs performed, testing the hypothesis that tax, monetary and other business incentives induce businesses to join EZs. Bondonio and Engeberg (1999) find that EZs do not have a significant impact on local employment in areas surrounding the EZ. However, employment rises within the EZ. They also find that a programme's impact does not depend on the monetary size of incentives such as tax breaks. They argue that EZ programmes that promote new and sector-specific start-ups might drive away existing older firms by pricing them out of the property market, for example. This tends to lead to high business turnover which may have a negative impact on employment in the area, with employment falling or not rising as much as it should. On the other hand, the focussed approach of EZ programmes might result in efficiency and productivity gains for local businesses. The finding in Bondonio and Engeberg (1999) of the limited impact of the size of the monetary incentive seems to contradict findings by Bartik (1991) and Peters and Fisher (2002).

Peters and Fisher (2002) studies the effectiveness of EZs, which are used in most states to target economic development policies on impoverished areas. They ask whether tax incentives are big enough to incentivise firms to be based into zones, whether these incentives lead to new jobs, and how costly the incentives are. Analysing case studies with a micro-simulation model, TAIMez, which measures how each EZ incentive improves a firm's return on investment in a new facility, the study finds the incentives were generally insufficient and funds gained from them could be easily wiped out by small increases in wages. On whether EZ lead to new jobs, the study finds that very few jobs are created by EZ incentives and that these jobs are often taken by non-disadvantaged workers not necessarily from the EZ. On cost of EZ incentives, the study finds revenue gain of $18,000 and loss of $6,600 for each job receiving incentives unnecessarily. This amounts to a net gain of $11,400 in revenue for the sub-national government over a 20-year period for each job induced to locate locally by the EZ policy. This study broadly agrees with other studies that local tax incentives have only a modest effect on local growth and often employment.

O'Keefe (2004) analyses the effectiveness of EZs by looking at job creation in California's EZs. She uses the propensity score matching model in the empirical study that compares developments in different EZs. O'Keefe (2004) finds that the EZ programme led to economic development in the most deprived areas of California in the 1990s: EZs that received business tax incentives saw rising employment (by 2% - 3% each year) compared to similar areas. However, earnings in EZs did not necessarily rise more than in matched areas. Compared to the control group, EZs were found to be effective. O'Keefe (2004) argues that prior studies that compare EZ employment to employment in dissimilar areas are likely to have underestimated the impact of the programme. This reinforces the need in this study to carefully consider that the characteristics of the areas and firms in the chosen control groups compared to the treatment group.

Busso et al. (2013) is an empirical study which uses spatial equilibrium modelling to investigate the efficiency of the Empowerment Zone (EZ) programme in bringing about economic changes. Their hypothesis is that place-based policy is effective in bringing about change in economic outcomes. Using rejected and future applications to the EZ programme as controls, they find that EZ classification increased employment in EZ neighbourhoods and led to wage increases for local workers and that this happens without corresponding rises in population or the local cost of living. Although the authors evidence of some increases in rental prices, EZ classification is credited with the transfer of incomes to a small spatially concentrated labour force. These labour market improvements are in line with findings in Busso et al. (2008).

Hanson and Rohlin (2013) undertake empirical analysis on US Empowerment zone data to estimate the extent of spillover effects from the Empowerment Zone programme on neighbouring and economically similar areas. As stated above, EZs are characterised by incentives (e.g., taxes and grants) to businesses in economically deprived areas within US cities. They argue that the EZ programme is responsible for negative spillovers, especially in retail and services industries, with firms re-locating inside EZs access benefits, identified as a main part of this effect. They find that areas bordering EZs experience a fall in the number of business establishments compared to areas bordering rejected EZ applicants. This suggests that EZ designation negatively impacts the business establishment count in the area just outside the EZ area. The authors find that for most estimates, spillovers more than offset the positive effects from the EZ programme. Because of their findings, the authors suggest that spillovers ought to part of the consideration when policy makers decide upon targeted redevelopment programmes.

Givord et al. (2012) is another France-based study evaluating the impact of France's equivalent of EZs on economic activity. This publicly-funded place-based programme exempts businesses from certain taxes for at least five years. Data on treatment areas and business performance is analysed to determine the impact of these programmes on economic variables of interest such as employment and business count. Overall, the authors find that the tax-exemption programme had a significant effect on economic activity, but effects were heterogeneous across industries with services to business

benefiting most. Both business creation and employment increased but no significant effect was recorded for companies that were already located within treated areas prior to the programme. In addition, there is evidence of negative spillovers on areas neighbouring treated areas, with EZ presence depressing the location (i.e. number) of businesses in the area just outside the EZ. The authors further argue that some of the potential benefits from the programme are offset by the increased competition coming via new businesses. EZs also bring about increased employment but not necessarily for local residents. These results are broadly in line with results from on US EZ analyses.

Gobillon et al. (2012) uses the French enterprise zone programme to investigate whether unemployed workers benefit from enterprise zones, as measured by their propensity to find a job. The French EZ programme granted partial wage tax exemption to firms which hired at least 20% of their workers locally. Empirical estimates of the programme's effect on unemployment duration show that EZ schemes had a significant but small impact on the rate at which the unemployed find a job – with only a 3% increase. Furthermore, this effect is localised and significant only in the short-term, lasting for three years at most following the policy. The authors argue that despite the programme's ability to "pick winners", it was still cost-ineffective. These results agree with Ham et al. (2011) but are in contrast with Neumark and Kolko's (2010) findings of no impact.

Mayer (2012) studies the impact of the French EZ programme on establishments' location decisions. Empirical analysis of micro-geographic data is undertaken using a difference-in-difference approach which combines both spatial and time dimensions. Short-term focussed results from the analysis show that the French EZ programme has a positive and sizable effect on location choices. However, as found by some of the studies based on EZs in the US and the UK, this study also found that French EZ policy mostly generates displacement effects, with firms re-locating from untreated to within treated zone. Also, the impact is heterogeneous across zones, firms and industry. Certain tax incentives to businesses to encourage them to locate in EZs (property tax, for example) could have distortionary effects in the commercial property market, a potential point of interest for our study.

Property market effects

To understand how the incentives available on British Enterprise Zones have affected local property markets it is helpful to consider the four main property agents involved. These are the occupiers (tenants), investors, developers and landowners, as shown in Figure 3. The evaluation evidence shows that a significant proportion of financial gain associated with the tax incentives on the Zones goes to investors and developers. The financial benefit to tenants is relatively low because of incidence effects whereby the removal of property taxes on properties on the Enterprise Zone led to higher rentals (Bromley et al, 1985, Erikson and Syms, 1988). The evidence from the national evaluation of the Enterprise Zones in the United Kingdom is that up to 100% of the benefits of rate relief may be capitalised into rents, but the degree of capitalisation can vary considerably according to the zone location and also through the lifetime of the zone and it is perhaps more typical to

see rental internalisation much lower than this at around 40%. The first and second round zones in the United Kingdom combined rate relief with capital allowances that enabled 100% first year tax offset on investment in property. In these earlier zones investors and developers were the principal beneficiaries of the capital allowance incentive and, whilst the position varied by zone, perhaps 85-90% of the benefit went to either the investor or developer, with the developer benefiting to the greatest extent.

A more recent study by Bond, Gardiner and Tyler (2013) show that a large part, if not all, of the property tax savings associated with a large regeneration package such as an Employment Zone appears to be captured in higher rents charged by landlords. The average capitalisation effect obtained was not significantly different from 100%, implying that most of the local tax exemption benefits accrue to the owners of the property. This is an important finding that should be considered carefully by policy makers if they wish to use tax-based incentives to stimulate local economic development.

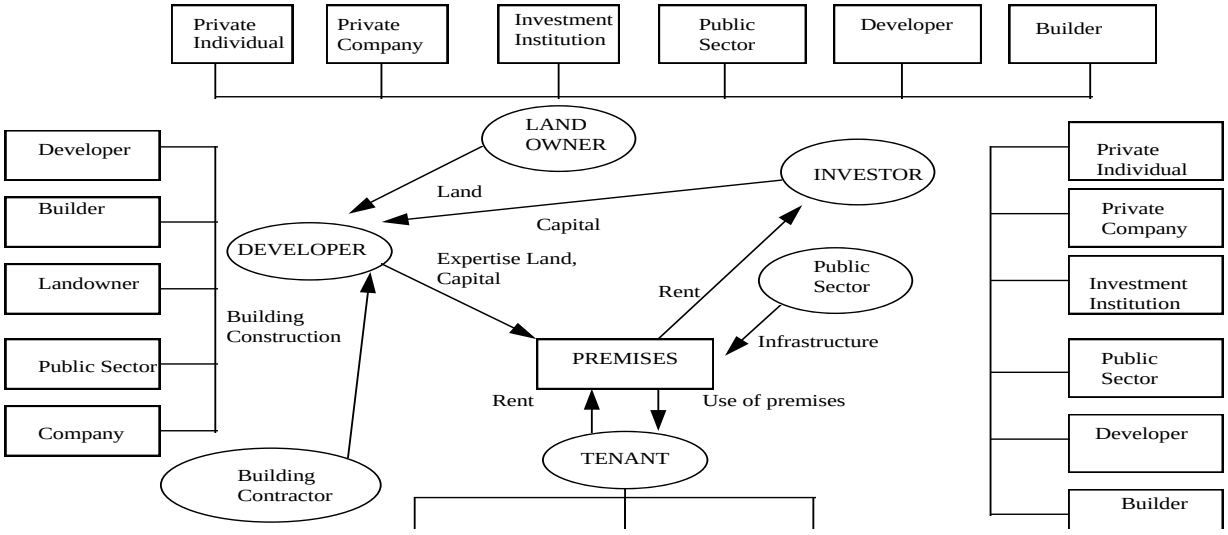


Figure 0-3: Property market participation.

Sustainability

The evaluation evidence on Enterprise Zone policy in the UK is that it can provide a significant boost to the process of regeneration in local areas. It does this by increasing confidence, enhancing the rate of economic return and facilitating new property and infrastructure. Most companies who invest in Enterprise Zones intend to stay because the location they have chosen meets their operational needs. Importantly, on the UK Zones it appeared that following the end of the life of the original Enterprise Zone incentives most of the companies that had been attracted to the Zone remained. It was also the case that although the original Enterprise Zone policy had not made it a formal requirement for companies receiving the policy assistance, the majority of the people who worked on zones (80%) lived in the local area of which the zone was a part.

Evidence on the performance of the new Enterprise Zones in the UK

There is no evaluation evidence available on the performance of the new wave of UK Enterprise Zones that began in 2011. As discussed above, the new zones started in a difficult macroeconomic environment with the Banking Crisis of 2008 still constraining business investment. The financial crisis largely stopped speculative property-led development and investment in the UK and the Enterprise Zones suffered accordingly. In December 2013 a report from HM Government showed limited progress in them being able to attract new investment and thus jobs. The market has only recently begun to revive, although as is the way with these things, it looks to be coming back quite quickly. However, market conditions aside, it is always the case that local property-led economic development takes time.

Whilst there is no evaluation evidence available, it is possible to refer to recent monitoring data to provide some indication of the recent performance of the British Zones. There was some £2.6bn of private sector investment in the new zones by July 2016. Over 700 businesses have moved to the British Enterprise Zones leading to over 26,000 jobs although it is not yet known how many of these are new to the local area concerned or whether they have been displaced within the local area.

A.8 Studies on other aspects of local economic development policy

Einio and Overman (2016) investigate the impact of the local enterprise growth initiative (LEGI), a UK area-based intervention aimed at increasing employment and entrepreneurial activity in disadvantaged areas in England. The LEGI spent £418m on 30 deprived areas over 2006 – 2011. The authors focus on the spillovers effects of the programme into untreated areas. Regression analysis is applied on panel data at a fine spatial scale. The authors find weak, if any, changes in the number of businesses, suggesting that employment changes are at the intensive margin – probably due to UK commercial property rental contracts typically covering five-year fixed terms. Results also show considerable local displacement effect: employment increases in the treated area close to the treated area boundary but at a cost of employment loss in untreated areas just outside the boundary of the treated area. These differences disappear as you move away from the border. Local displacement effects diminish quickly once the programme is abolished. The presence of displacement effects in this case substantially reduces the net benefit of the programme. This result that area-based interventions may have negative displacement effects on untreated areas is in line with findings in Hanson and Rohlin (2013). The modelling approach in this study (using distance rings) could potentially inform our methodology on the impact of commercial property in an area, as well as possible spillovers.

In an empirical study on who benefits from local economic development policies, Bartik (1991) finds that the resulting local economic growth has a positive effect on the wellbeing of local residents. These policies, such as those implemented via the tax system,

incentivise businesses activity which reduces unemployment by raising the labour force participation rate. However, the increased economic activity does little to improve the local income distribution or conditions for the poor. McGuire (1992) argues that Bartik (1991) assumes, without proof, that local policies are effective in generating growth, and then proceeds to discuss how this local growth impacts residents.

Black et al. (2003) focus on the labour market, carrying out a controlled experiment to determine whether the threat of re-employment, mandatory employment and training is more effective in reducing unemployment insurance claimants with a high probability of remaining unemployed. They observe an early exit from the unemployment insurance programme for the treated group relative to the control group – mean weeks of claiming fall by 2.2 weeks. In addition, mean unemployment receipts fall by $143 while subsequent earnings rise by over $1,000. This study has no direct implication for our work but could be considered as part of a strategy to design a commercial property policy linked to an enterprise zone providing employment training and similar incentives for those in long-term unemployment.

John et al. (2004) focus on whether competitive bidding produces better results. They analyse competitive funding regimes and the political targeting of urban programme schemes. They employ the Tobit model to test the operation of a competitive bidding regime in England over a four-year period. They found that successive rounds did not improve bid quality by much, with much of the observed improvement being in the lower quality bids. Further, the process did not result in systematically rewarding need areas. Indeed, it was found, in some cases, that resources were diverted to ministers' constituencies. These results lead to the government not achieving its announced objectives and suggest that a better mechanism of distributing public funds needs to be used, especially given the wasted resources such as money and time involved in running competitive bidding programmes.

An OECD (2004) report, evaluating local economic and employment development, looks at assessing what works among programmes and policies, especially at the sub-national level. The report evaluates programmes for local economic and employment developments. A number of papers have been reviewed in this report, and it finds that few governments make use of the heterogeneity involved in regionally/locally distinct forms of programme design and implementation. The report's authors comment that some hard-to-measure factors are often critical to programme success, including managerial aptitude, leadership, and sensitivity to community issues. It also pointed out the differences between a textbook solution and in practice when it comes to local policymaking, that policymakers would not have information on marginal costs, instead they would have average costs. In addition, marginal cost varies over time depending on the scale and duration of a programme and the key features of a market. Therefore, it would need a constant cycle of complex evaluation across many programme types, which is effectively unattainable. The report focuses on reviewing different papers by different individuals, they have similar comments and conclusions on policy-rated evaluations.

John and Ward (2005) investigate whether competitive bidding improved bid quality in the UK Single Regeneration Budget programme. This part-theory part-empirical study finds that competition only exists at the margins where bids that would not otherwise get funding may move away from the sort of project they wanted most. Groups that want to undertake projects valuable to the government tend not to compete against each other. Reviewing data from four years of the program shows only limited gains from the bidding process. The selective competition evident in the data is consistent with game theoretic model predictions. There is thus limited benefit in terms of bid quality gained from competitive bidding.

A US EPA (2011) report describes EPA's land clean-up and reuse programmes and outline aspects that have complicated efforts to develop suitable methods for estimating benefits. It carries out benefit-cost and economic impact analyses and summarizes theoretical and empirical literature to provide recommendations for conducting economic analysis of land cleanup and reuse sites and programmes when possible. It finds that land cleanup and reuse efforts have the potential to generate benefits like health risk reductions and improve land productivity to the society. It also estimated cleanup costs are unavoidable and fixed and do no affect many firms, and hat industry output and prices will remain unchanged. By economic impact analysis and econometric models, it finds that there is positive impact on employment opportunities, property values and number of new businesses. The report focuses more on the methodology on carrying out different kinds of analysis when it comes to land cleanup and reuse developments to investigate its impacts rather than showing detailed analysis on impacts. It clarifies differences between analysis and evaluate the difficulty when estimating value of benefits and identifying issues.

Vermeer (2012) explores external benefits in an urban general equilibrium framework for the evaluation of government support for brownfield redevelopment. The empirical application explores the order of magnitude of effects under different assumptions. Household preferences is modelled in a way that demand for housing units in the city is downward sloping and there is heterogeneity in the taste for some unique attribute of the city. It finds that the redevelopment may yield substantial external benefits through the exploitation of urban agglomeration economies and the removal of a nuisance. With elastic demand, development pressure at the urban fringe may increase because of agglomeration economies. The paper covers the impact of a single redevelopment project to an area which is different to other studies that has been reviewed. It focuses more on the welfare to the city brought by the redevelopment project more than the impact on productivity.

Cheshire et al. (2012) take a theoretical approach to analyse the link between the English land use planning system and economic performance. They argue that the UK planning system has economic and social costs including an increase in the volatility observed in the housing market, office rents and house prices. The planning system, they argue, lowers retail productivity and employment in small independent retailers.

Criscuolo et al. (2012) look at the causal effects of an industrial policy. Focussing on UK regional programmes to support manufacturing jobs, they use IV and OLS methods to carry out analysis, finding that 1) a positive treatment effect on employment, investment and net entry but not TFP. Treatment effects are confined to smaller firms, with no effects observed for larger firms such as those over 150 employees. They also find that the policy increases manufacturing employment in the area via significant reduction in unemployment. Based on the cost per job of the programme, the authors argue that in some cases investment subsidies can be cost effective. This is a study focussing on the manufacturing industry in which one of the conditions for grant support is that the funding is spent in part on property in a designated area.

The ONS (2013) report on evaluating the government collects high-quality information on context, expenditure, activities and results and analyses this to expose issues or opportunities. It presents informed options to internal decision-makers, as well as candid assessments of plans and performance externally. The report focuses on impact and cost-effectiveness evaluation relating to government spending, taxation and regulatory interventions. Findings show that the coverage of evaluation evidence is incomplete and the rationale for what the government evaluates is unclear. Evaluations are not always robust enough to identify the impact, and the government fails to use effectively the learning from these evaluations to improve impact and cost-effectiveness. This report did not focus on Enterprise Zones, but brought up the topic of the failure of government using evaluations done to improve the impact and cost-effectiveness of their policies.

Blake et al. (2013) look at the role of commercial property in the UK economy, with emphasis on links to employment, output, taxes, as well as property as a factor of production. Commercial property is used for shops, restaurants and cafes, offices, and industry, among others uses. Their empirical study analyses flows and stocks in the sector. They work from the hypothesis that commercial property has both direct and indirect economic effects on the variables listed above. They find that the commercial property sector generates output but is also a critical factor of production for other sectors accounting for half of the total non-residential capital stock of the UK economy. Commercial property sub-sectors (construction, repair/maintenance, and real estate services) generated £41bn in GVA in 2011 (equal to 3.2% of UK GVA at 2008 prices) and accounted for 2.5% of UK employment. The commercial property sector has a multiplier effect on the rest of the economy similar to the average across the economy. This sector contributes to the Exchequer via VAT, PAYE, Stamp Duty and business rates. Using perpetual inventory method the report finds that net capital stock in commercial property rose at a rate close to GVA over 1986-2010. During the post-2007 downturn, the sector suffered greatly and by more than the economy as a whole. Crucially, the report finds that there is demand for different types of commercial space and that there are important regional differences in the supply and demand of commercial space by type, for example. This report differs from much of the literature reviewed because it focusses on the UK as well as being more focussed on commercial property, a focus of our investigation. As

such, it is a potential source of insights on dynamics in the UK commercial property market.

Gibbons (2015) looks at the value of visual environmental impacts of wind turbines through house prices in England and Wales. Quantitative evidence is provided on the local benefits and costs of wind farm installations. The estimation is carried out within a fixed effects methodology. The study uses hedonic-type property value methods based on a quasi-experimental research design in which price changes in areas where wind turbines become visible are compared to price changes in appropriate comparator areas. The findings indicate that wind farm visibility in an area leads to a fall in local house prices. House prices fall relative to areas close to wind farms but where the wind farms are not visible. Prices reduction is more the closer one is to the wind farm. However, small house price increases are observed in areas outside of wind farm visibility in the 4 – 8 km range. While this study focusses on wind farm siting effects, it can easily be adapted to analyse what how wind farm siting affects commercial property markets.

A.9 Conclusions

To conclude, there is a substantial body of literature investigating the impacts of public sector interventions in land and property markets, both in the UK and abroad. Most of the research has focused on the contribution the interventions can make to local employment and, in particular, the extent to which the contribution is 'additional' to the local area. A large proportion of the literature considers the impact of Enterprise Zones, and their equivalents, in the UK, the US and France.

Impact results from previous studies

Overall, the literature on incubators, accelerators and similar establishments generally finds that these business arrangements constitute a viable route to support innovative entrepreneurs and business during the critical early stages of establishing themselves.

The Enterprise Zone policy has been used extensively in the United Kingdom for nearly forty years and much has been learned about what it can achieve and what influences its relative effectiveness. Economic studies in the UK, USA, France and other countries have shown that displacement can and does occur and it is important to minimise competitive displacement between areas. As a very rough rule, for every two jobs created on an Enterprise Zone one may have been displaced from the local region surrounding it. Displacement of economic activity is reduced when the incentives available encourage sectors that do not compete directly with local sectors. Thus, by way of example, the early UK zones allowed retail investment to be eligible for the package of Enterprise Zone incentives and this led to local displacement of economic activity. The policy was changed to exclude this sector. New Zones in the United Kingdom are targeting Advanced Manufacturing and Knowledge Intensive Businesses where competitive displacement at the local level is less likely.

Many, although by no means all, of the studies tend to show positive impacts of Enterprise Zones on workplace employment in the local area, but the general finding is that at least some, if not all, of the gain in employment in the local area is at the expense of employment elsewhere (displacement).

A study by the Department for the Environment (1987) estimated that, for the first British Enterprise Zones, and taking account of deadweight, displacement and short-term income multipliers, approximately 1 out of every 2 jobs created on the Zones was additional to the local area of which the Zone was a part (approximately within a 10 mile radius of the Zones). This, though, did not take account of displacement from elsewhere in the UK.

Ham et al. (2011) uses evidence from US state and federal Enterprise Zones and Empowerment Zones - and employment. Also found are significant spillover effects to neighbouring tracts of the EZ. Contrary to some of the studies on US EZs, this study finds that overall, EZ programmes significantly have a positive effect on labour markets, hence their argument that these labour market interventions are efficient.

Givord et al. (2012) studies enterprise zones in France and finds evidence of negative spillovers on areas neighbouring treated areas, with EZ presence depressing the location (i.e. number) of businesses in the area just outside the EZ. The authors further argue that some of the potential benefits from the programme are offset by the increased competition coming via new businesses. EZs also bring about increased employment but not necessarily for local residents.

Gobillon et al. (2012) also studies French enterprise zones. Empirical estimates of the programme's effect on unemployment duration show that EZ schemes had a significant but small impact on the rate at which the unemployed find a job – with only a 3% increase.

Mayer (2012) studies the impact of the French EZ programme on establishments' location decisions. Empirical analysis shows that the French EZ programme has a positive and sizable effect on location choices. However, as found by some of the studies based on EZs in the US and the UK, this study also found that French EZ policy mostly generates displacement effects, with firms re-locating from untreated to within treated zone.

In studies that have looked at the impact of policies involving commercial property development on local unemployment rates (e.g. Gibbons et al, 2017), there is little evidence of a benefit to workers who live within the area at which the policy is aimed.

Gibbons et al (2017) also find that 'subsidising the development of commercial space through the Single Regeneration Budget (SRB) created some additional workplace employment in the targeted places (although we can only partially assess to what extent these were displaced from further afield). However, despite the increase of new local jobs, we find no evidence that these jobs went to local people or improved the employment outcomes of local residents'.

The What Works Centre for Local Economic Growth: Incubator Toolkit finds some evidence that incubators may increase participating firm employment and sales, but also some evidence that incubators may decrease firm survival. This latter impact, which on the face of it appears to be a negative impact, is likely to be due to incubators helping firms to more quickly gauge the quality of their business idea, and so encourage them to drop bad ideas sooner than they otherwise would have. Incubators with an affiliation to a university may also have a positive effect on survival and revenue and employment.

Link and Scott (2007) look at the economics of university research parks and we can infer from their discussion that the impact of science/research parks might be greater than other types of commercial property development.

Recent Ministry of Housing, Communities & Local Government (MHCLG, formerly DCLG) guidance on the appraisal of development interventions now recommends that the employment impacts of developments are not monetised, unless there is strong evidence of a supply side effect. The department's preferred approach to appraising development is now to use changes in land values (i.e. Land Value Uplift) to infer the net private impact.

Yet, there are a wide range of impacts associated with commercial property developments, and the aim of the current study is to fill a gap in the evidence base, focusing on the possible impacts of commercial property developments on the labour market, and on productivity in particular.

Methodologies from previous studies

The main ways in which the literature might inform the proposed methods for Phase 2 of the study is through: (a) the choice of econometric methods for the analysis, and; (b) the method for choosing the treatment and control groups for the analysis (and factors that should be taken into account).

The methodology employed by Gibbons et al (2017), both in determining the samples for analysis (through a concentric rings approach) and in the econometric methods employed, will be used to inform the current study.

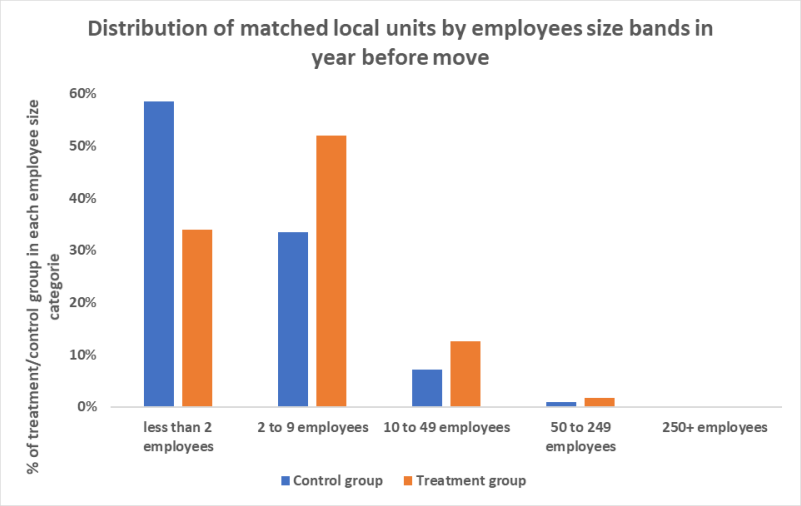
Although Papke (1993) uses unemployment as the measure of labour market impact, whereas the current study will look at employment and productivity, the econometric methodology, and discussion of control groups, could also be used to inform this study.

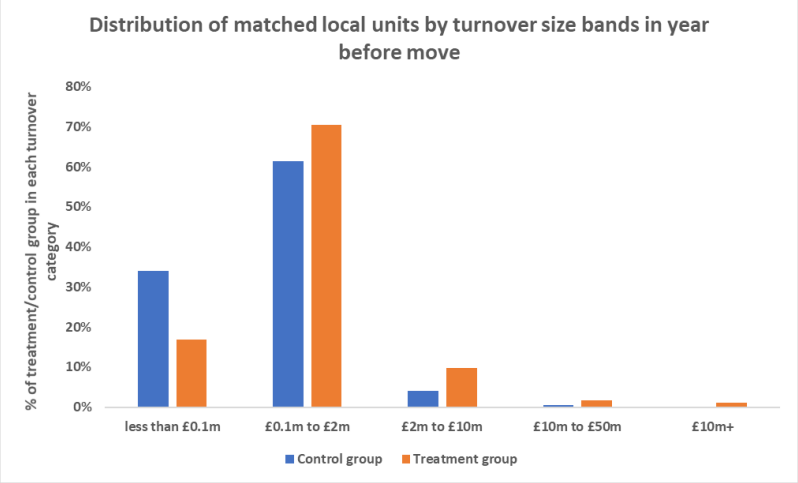
O'Keefe (2004) argues that prior studies that compare EZ employment to employment in dissimilar areas are likely to have underestimated the impact of the programme. This reinforces the need in this study to carefully consider the characteristics of the areas and firms in the chosen control groups compared to the treatment group.

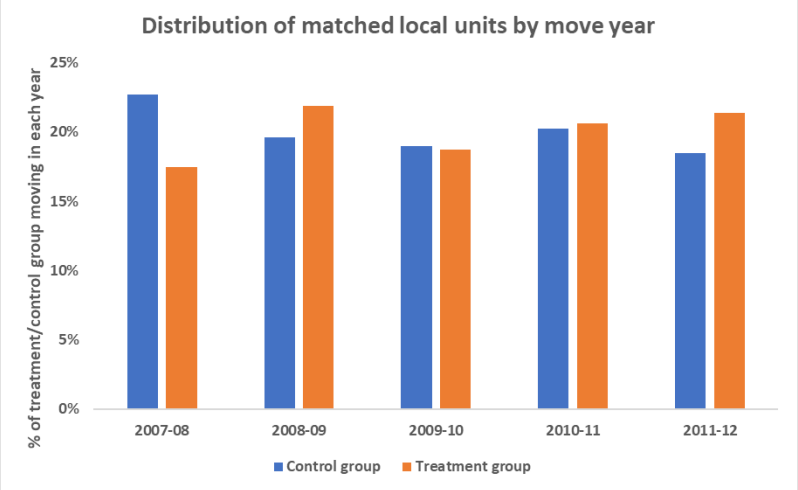
The modelling approach of Einio and Overman (2016), to investigate the impact of the local enterprise growth initiative (LEGI), could also inform our methodology on the impact of commercial property in an area, as well as possible spillovers.

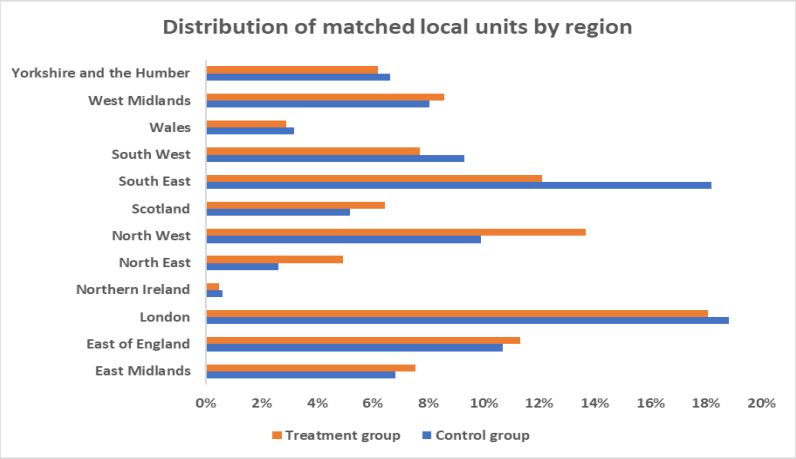
Appendix B: Further Descriptive Statistics

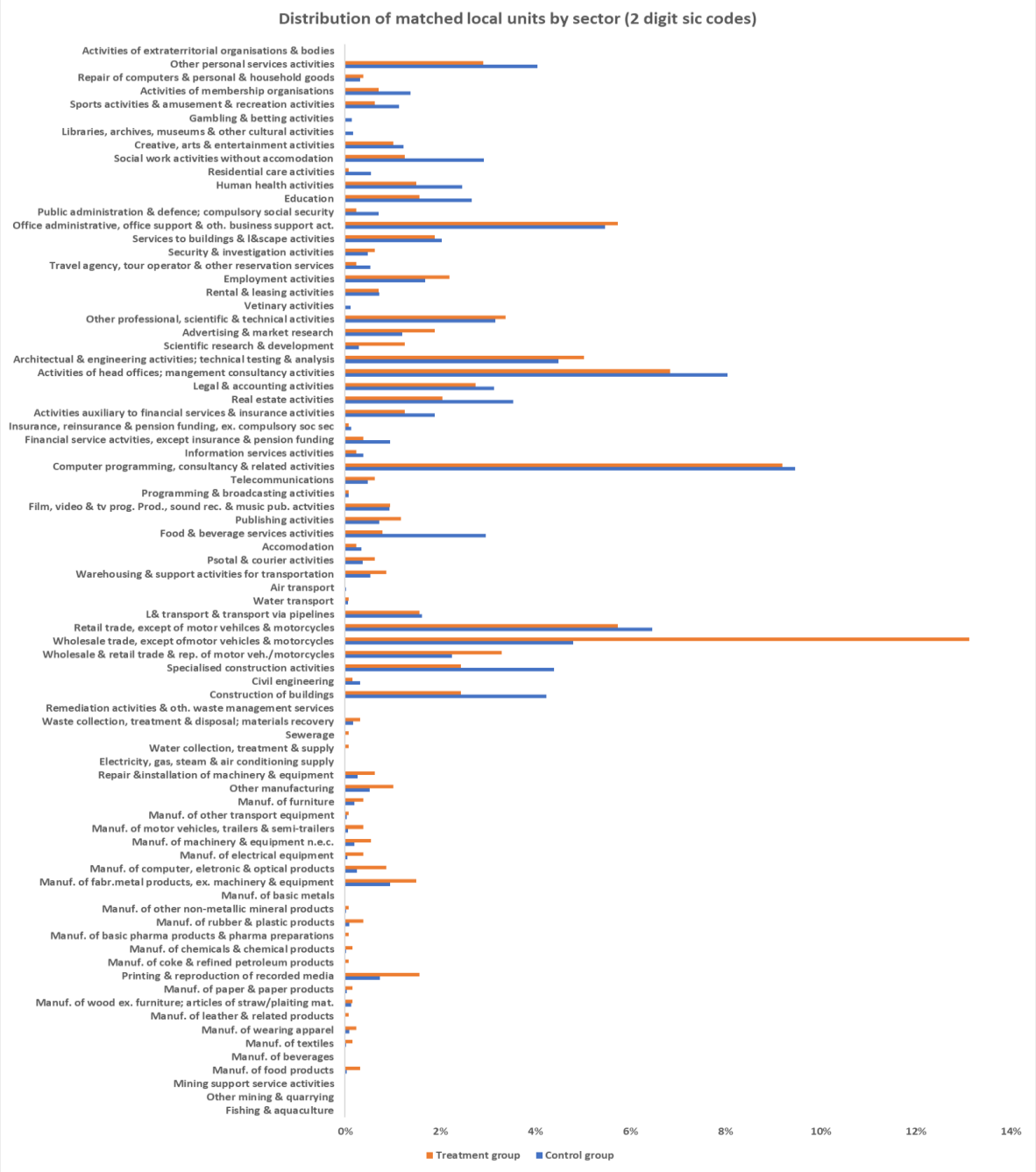
Comparison of covariates in the treated and control group:





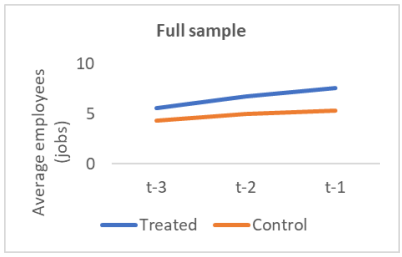


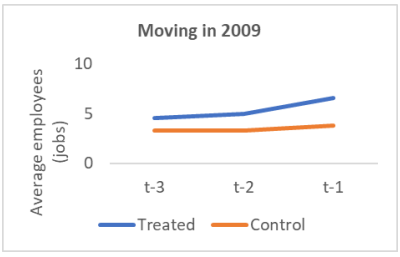

Distribution of matched local units by region
Yorkshire and the Humber
West Midlands
Wales
South West
South East
Scotland
North West
North East
Northern Ireland
London
East of England
East Midlands
0%
2%
4%
6%
8%
10%
12%
14%
16%
18%
20%
Treatment group
Control group

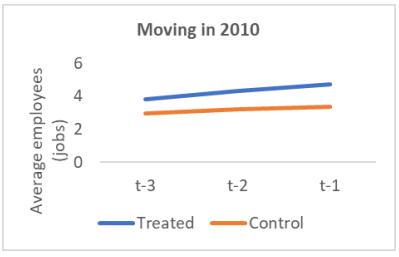

Distribution of matched local units by sector (2 digit sic codes)
Activities of extraterritorial organisations & bodies
Other personal services activities
Repair of computers & personal & household goods
Activities of membership organisations
Sports activities & amusement & recreation activities
Gambling & betting activities
Libraries, archives, museums & other cultural activities
Creative, arts & entertainment activities
Social work activities without accomodation
Residential care activities
Human health activities
Education
Public administration & defence; compulsory social security
Office administrative, office support & oth. business support act.
Services to buildings & l&scape activities
Security & investigation activities
Travel agency, tour operator & other reservation services
Employment activities
Rental & leasing activities
Vetinary activities
Other professional, scientific & technical activities
Advertising & market research
Scientific research & development
Architectual & engineering activities; technical testing & analysis
Activities of head offices; mangement consultancy activities
Legal & accounting activities
Real estate activities
Activities auxiliary to financial services & insurance activities
Insurance, reinsurance & pension funding, ex. compulsory soc sec
Financial service actvities, except insurance & pension funding
Information services activities
Computer programming, consultancy & related activities
Telecommunications
Programming & broadcasting activities
Film, video & tv prog. Prod., sound rec. & music pub. actvities
Publishing activities
Food & beverage services activities
Accomodation
Psotal & courier activities
Warehousing & support activities for transportation
Air transport
Water transport
L& transport & transport via pipelines
Retail trade, except of motor vehilces & motorcycles
Wholesale trade, except ofmotor vehicles & motorcycles
Wholesale & retail trade & rep. of motor veh./motorcycles
Specialised construction activities
Civil engineering
Construction of buildings
Remediation activities & oth. waste management services
Waste collection, treatment & disposal; materials recovery
Sewerage
Water collection, treatment & supply
Electricity, gas, steam & air conditioning supply
Repair &installation of machinery & equipment
Other manufacturing
Manuf. of furniture
Manuf. of other transport equipment
Manuf. of motor vehicles, trailers & semi-trailers
Manuf. of machinery & equipment n.e.c.
Manuf. of electrical equipment
Manuf. of computer, eletronic & optical products
Manuf. of fabr.metal products, ex. machinery & equipment
Manuf. of basic metals
Manuf. of other non-metallic mineral products
Manuf. of rubber & plastic products
Manuf. of basic pharma products & pharma preparations
Manuf. of chemicals & chemical products
Manuf. of coke & refined petroleum products
Printing & reproduction of recorded media
Manuf. of paper & paper products
Manuf. of wood ex. furniture; articles of straw/plaiting mat.
Manuf. of leather & related products
Manuf. of wearing apparel
Manuf. of textiles
Manuf. of beverages
Manuf. of food products
Mining support service activities
Other mining & quarrying
Fishing & aquaculture
0%
2%
4%
6%
8%
10%
12%
14%
Treatment group
Control group

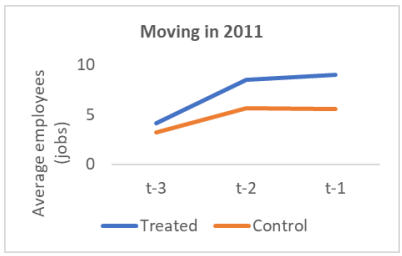
Common trends evidence: comparison of pre-treatment trends in each outcome variable

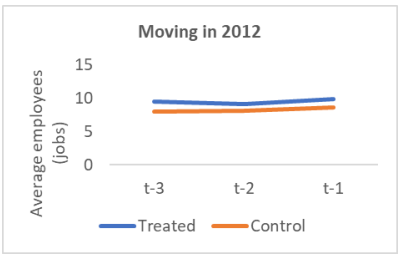
Average employees:

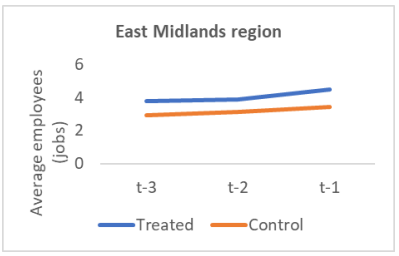


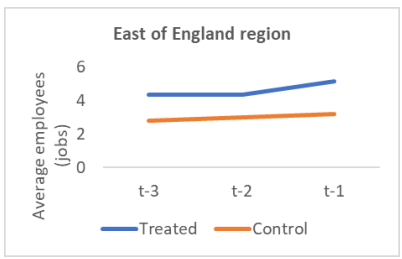


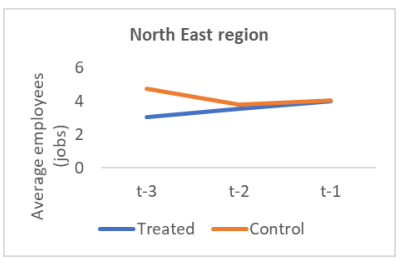


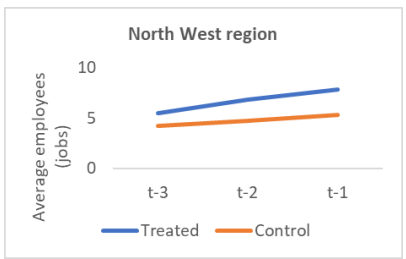


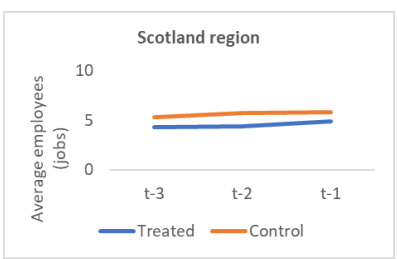


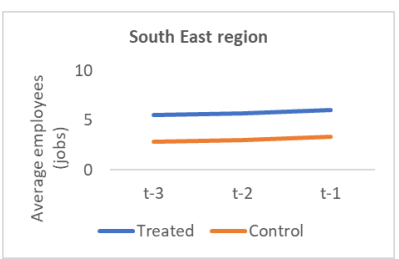


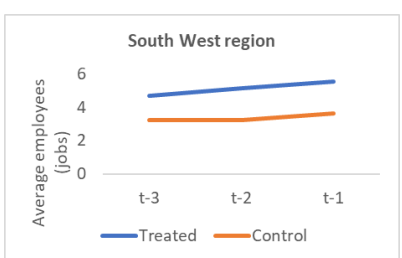


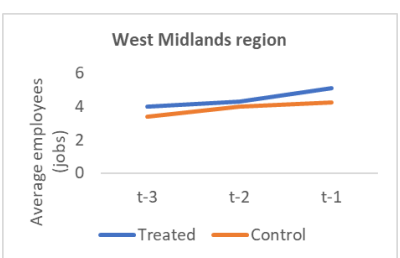


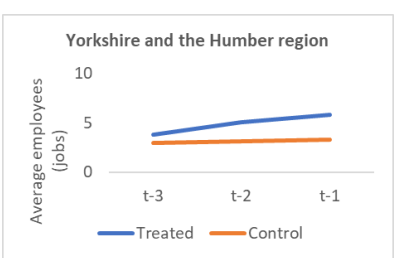


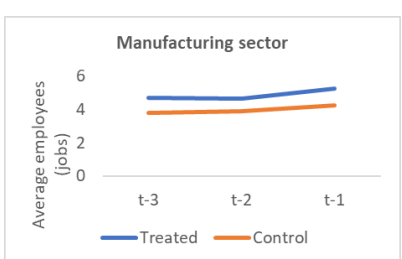


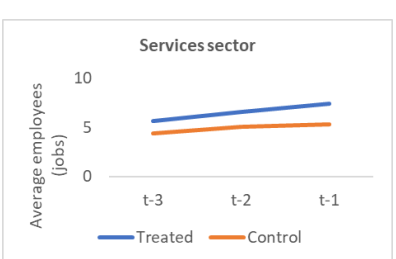


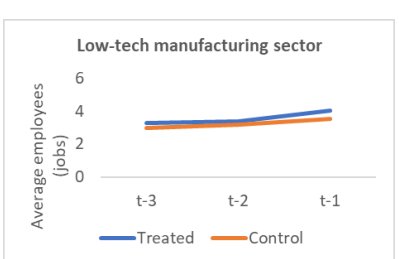


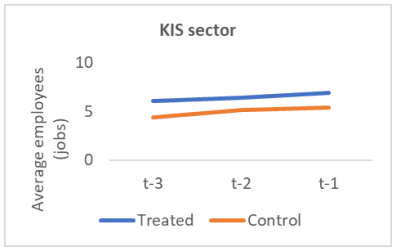


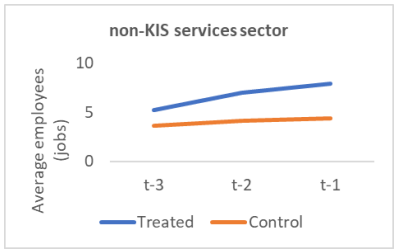


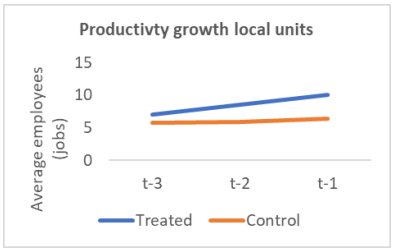


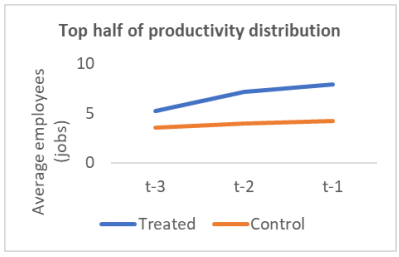


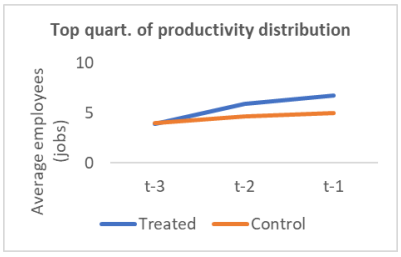




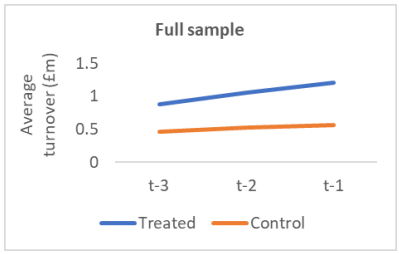


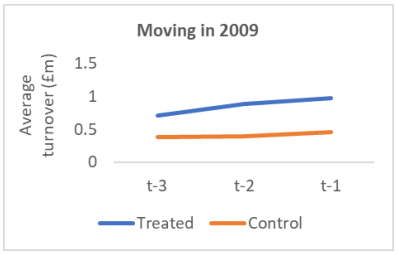


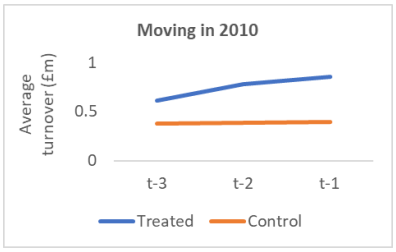


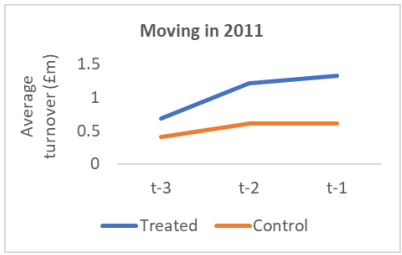


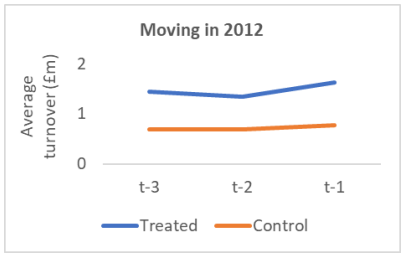
Average turnover:

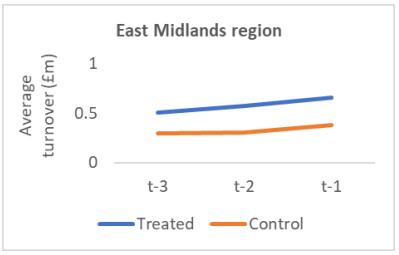


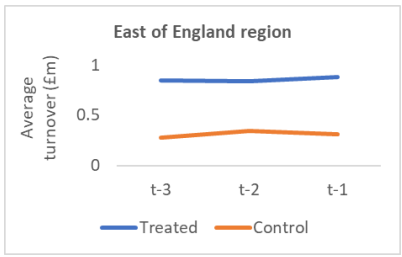


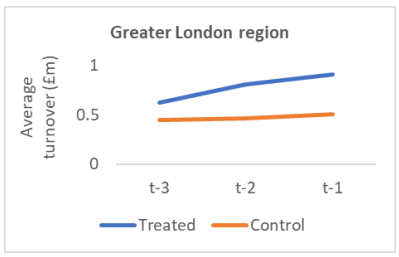


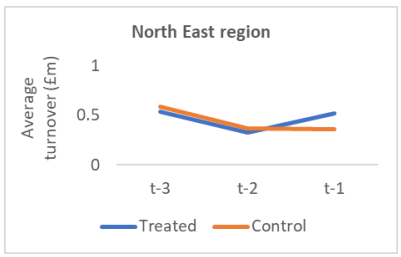


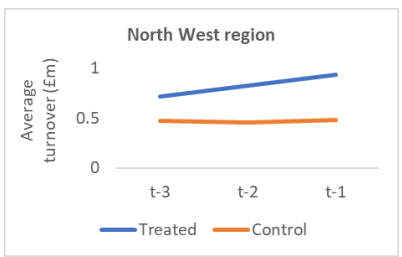


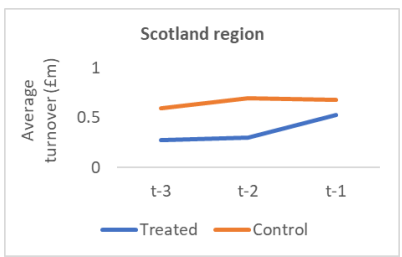


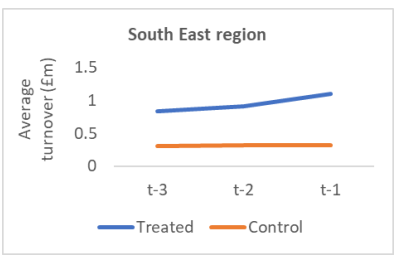


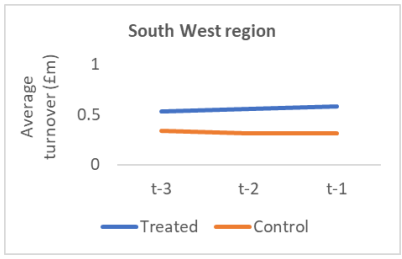


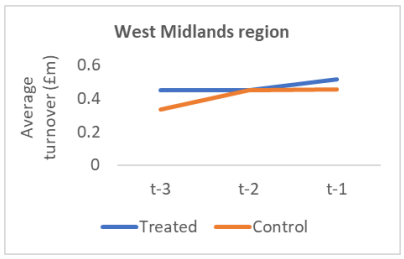


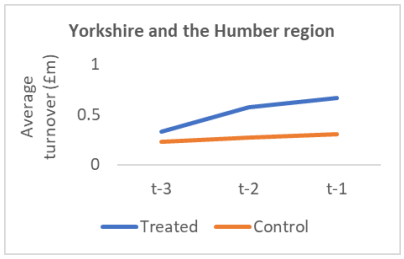


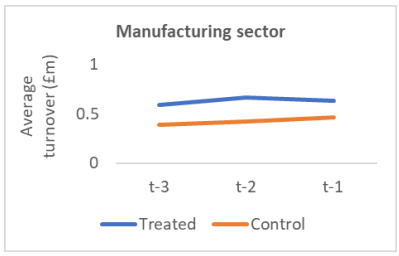


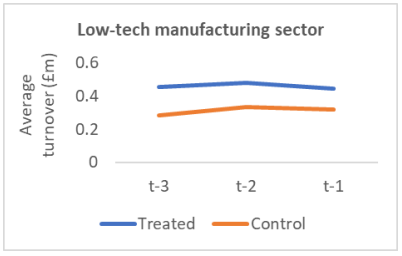


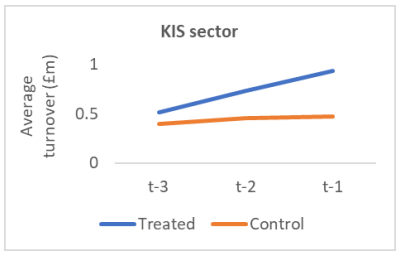


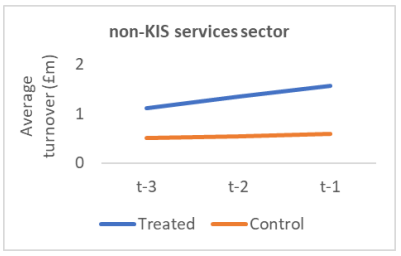


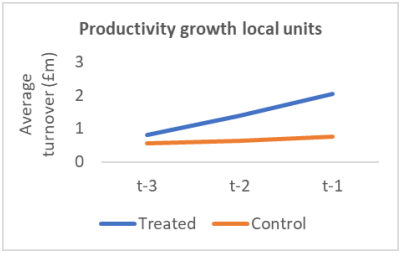


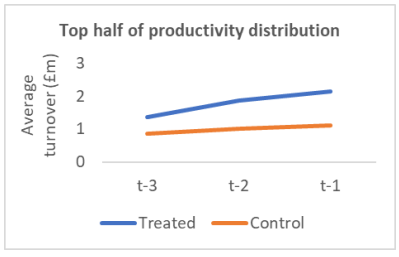


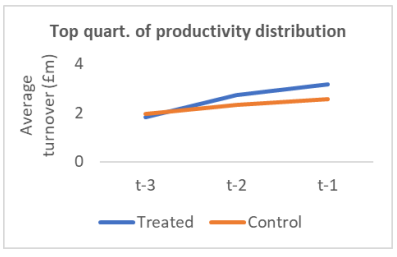




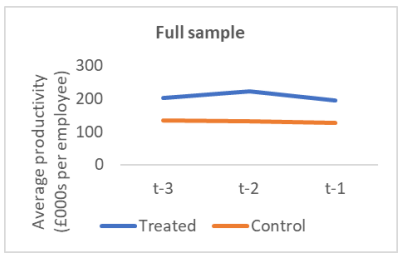


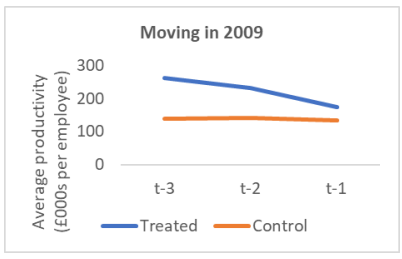


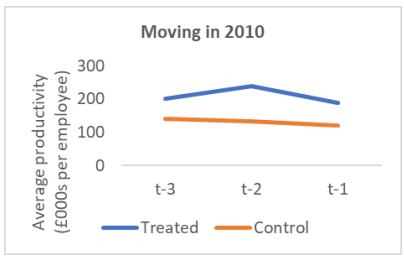


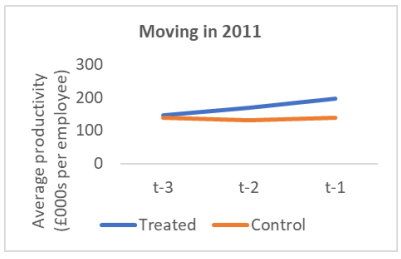


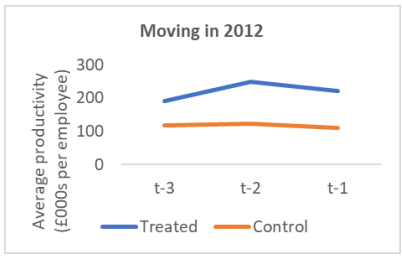
Average productivity:

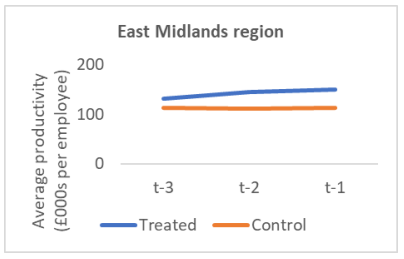


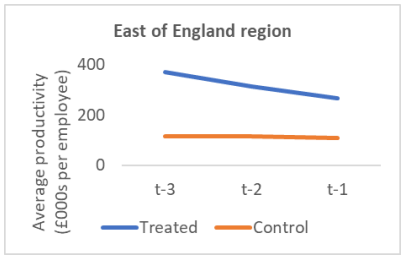


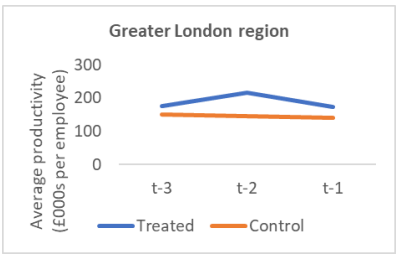


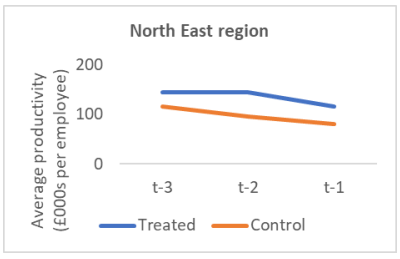


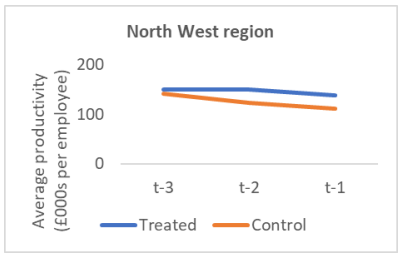


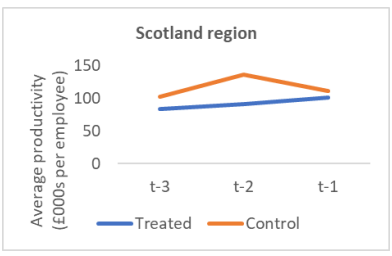


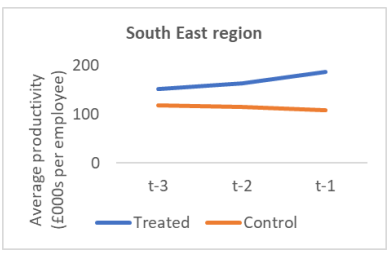

East of England region
Average productivity (£000s per employee)
400
200
0
t-3
t-2
t-1
Treated
Control

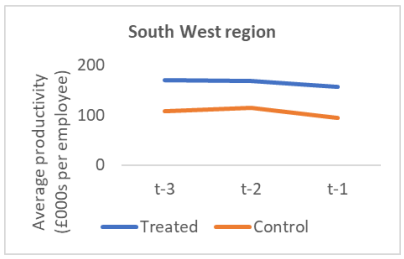

Greater London region
Average productivity (£000s per employee)
300
200
100
0
t-3
t-2
t-1
Treated
Control

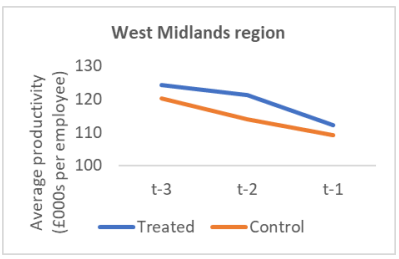

North East region
Average productivity (£000s per employee)
200
100
0
t-3
t-2
t-1
Treated
Control

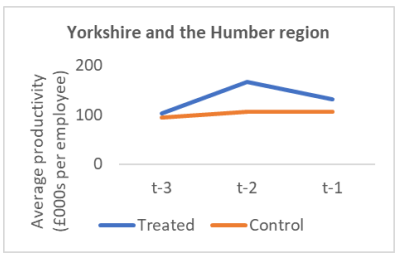

North West region
Average productivity (£000s per employee)
200
100
0
t-3
t-2
t-1
Treated
Control


Scotland region
Average productivity (£000s per employee)
150
100
50
0
t-3
t-2
t-1
Treated
Control


South East region
Average productivity (£000s per employee)
200
100
0
t-3
t-2
t-1
Treated
Control


South West region
Average productivity (£000s per employee)
200
100
0
t-3
t-2
t-1
Treated
Control


West Midlands region
Average productivity (£000s per employee)
130
120
110
100
t-3
t-2
t-1
Treated
Control


Yorkshire and the Humber region
Average productivity (£000s per employee)
200
100
0
t-3
t-2
t-1
Treated
Control

Appendix C: Bibliography

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