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THE IMPACT OF DIGITAL MICROBUSINESSES ON LOCAL ECONOMIC OUTCOMES IN THE UK

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Contents

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EXECUTIVE SUMMARY

The microbusiness sector in the UK has experienced significant growth over the last two decades. The number of microbusinesses which employ 0-9 people – excluding the owner – has increased from 3.5 million in 2000 to 5.2 million today[1]. In contrast, other business sizes have seen minimal growth or a decline during the same period. As a result, microbusinesses now contribute to 32% (8.7 million employees) of private sector employment and 19% of total economic output (£808 billion) [2].

In the past decade, the integration of digital technologies has proven to be exceptionally crucial for microbusinesses in the UK. According to the 2020 "Transformation with Tech" report from Lloyds Bank[3], over 2.7 million microbusinesses in the UK would have faced closure during the pandemic if they had not embraced digital technology. Furthermore, evidence indicates that microbusinesses that invested in digital tools during the pandemic achieved better sales outcomes and fewer job losses compared to those that did not utilise digital tools.

Data on microbusinesses is generally scarce because these businesses often have limited resources and may not prioritise data collection and reporting. Some of them may be exempt from certain reporting requirements, further reducing data availability. Furthermore, there is no publicly available data source in the UK that categorises microbusinesses as digital. As a result, microbusinesses, especially digital ones, are often overlooked in the public debate and the crucial role that they play in the economy is rarely acknowledged by policymakers and researchers.

Using a new and unique dataset on the density of digital microbusinesses across the UK offered by GoDaddy through its Venture Forward research initiative, this study contributes to closing the knowledge gap on the importance of digital microbusinesses to local economies. It does so by studying the association between digital microbusiness density and key measures of local economic and labour market performance, including (i) jobs density, (ii) median annual pay, and (iii) GDP. Our regression analysis provides valuable insights into the relationships and correlations among the variables considered. Digital microbusinesses are associated with a higher number of jobs available for each resident, higher annual pay for residents, and an increase in general economic activity, as measured by GDP. It is essential to note that while our analysis provides valuable insights into correlations and relationships among the variables, it does not establish any causal relationships.

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1 https://www.gov.uk/government/statistics/business-population-estimates-2022

2 https://researchbriefings.files.parliament.uk/documents/SN06152/SN06152.pdf

3 https://www.lloydsbankinggroup.com/assets/pdfs/media/press-releases/2020-press-releases/lloyds-bank/transformation-with-tech-report-release.pdf

Table 1 Summary of regression results

Outcome variable	Measure of microbusiness density	Coefficient	Model
Jobs density	Change in the share of digital microbusinesses per resident between 2020 and 2021	+ 6.5***	Baseline model
Jobs density	Change in the share of digital microbusinesses per resident between 2020 and 2021	+ 5.7***	Excluding the City of London and Westminster
Median annual pay	Log of the absolute number of digital microbusinesses per resident	+ £1,386***	Baseline model
GDP	Share of digital microbusinesses per 100 resident	+ £36,731***	Baseline model
GDP	Share of digital microbusinesses per 100 resident	+ £17,720***	Excluding the City of London and Westminster

Source: Frontier Economics analysis of GoDaddy proprietary dataset and UK public data (see Annex)
*Note: *** denotes statistical significance at 1% level.*

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1 Introduction

The microbusiness sector in the UK has experienced significant growth over the last two decades. The number of microbusinesses which employ 0-9 people – excluding the owner – has increased from 3.5 million in 2000 to 5.2 million today[4]. In contrast, other business sizes have seen minimal growth or a decline during the same period. As a result, microbusinesses now contribute to 32% (8.7 million employees) of private sector employment and 19% of total economic output (£808 billion)[5].

In the past decade, the integration of digital technologies has proven to be exceptionally crucial for microbusinesses in the UK. According to the 2020 "Transformation with Tech" report from Lloyds Bank[6], over 2.7 million microbusinesses in the UK would have faced closure during the pandemic if they had not embraced digital technology. Furthermore, evidence indicates that microbusinesses that invested in digital tools during the pandemic achieved better sales outcomes and fewer job losses compared to those that did not utilise digital tools.

According to a recent report from the ILO[7], several productivity gains can be attributed to digitalisation in the context of microbusinesses, mainly through the following mechanisms:

- Increased access to information and an improved ability to communicate;
- Ability to trade more easily and across greater distances with both customers and supply chain partners;
- Ability to use a greater variety of financial services;
- Fundamentally new ways of doing business (digital transformation) or entirely new digital applications and products brought to the market (digital entrepreneurship).

Despite these advantages, not all microbusinesses have fully harnessed the opportunities offered by digital technology, resulting in a persisting digitalisation gap.

Several studies have explored the importance of microbusinesses to several economic outcomes.

4 https://www.gov.uk/government/statistics/business-population-estimates-2022

5 https://researchbriefings.files.parliament.uk/documents/SN06152/SN06152.pdf

6 https://www.lloydsbankinggroup.com/assets/pdfs/media/press-releases/2020-press-releases/lloyds-bank/transformation-with-tech-report-release.pdf

7 https://www.ilo.org/wcmsp5/groups/public/---ed_emp/---emp_ent/---ifp_seed/documents/publication/wcms_808632.pdf

Relevant evidence from academic literature

Impact of microbusinesses on innovation

According to Edminston (2007) and Robbins et al. (2000) smaller businesses demonstrate superior efficiency at innovation. This means they produce more innovation for a given amount of research and development (R&D) than larger firms. Furthermore, Robbins et al. (2000) show that the constant innovation and experimentation of small businesses lead to a dynamic cycle of business start-ups and closures, which is essential to the efficient allocation of limited resources.

Impact of microbusinesses on local and regional employment growth

Supporters of small-scale business development also emphasise their role in fostering local and regional employment growth. Through their capacity to hire workers from the secondary labour market, which includes individuals with lower educational backgrounds, women, immigrants and others, small businesses can be viewed as a strategy for reducing poverty (Robbins et al., 2000). Furthermore, by employing individuals from this secondary labour force, smaller enterprises contribute to providing experience and on-the-job training to a wider segment of the population, thus enhancing the employability of many for other businesses (Shaffer, 2006).

Role of microbusinesses in providing insulation against the effects of recessions

Another advantage of small businesses, as suggested by Robbins et al. (2000), is their ability to act as a buffer against the adverse impacts of economic recessions. They note that during economic downturns when large corporations lay off employees, a significant number of displaced workers either establish their own small businesses or find employment within the small business sector. Similarly, Goetz (2002) posits that the increase in self-employment in rural areas may be a response to job losses resulting from globalisation and labour-saving technological advancements during the 1980s. Additionally, Atasoy et al. (2007) have found that microbusinesses exert a positive and substantial economic influence on communities across New England.

However, very little research has explored the contribution of microbusinesses to economic growth in the UK, with even fewer studies focusing on the importance of digital microbusinesses specifically. Data on microbusinesses is generally scarce, making it challenging to conduct research on their role in the economy. These businesses often have limited resources and may not prioritise data collection and reporting. Some of them may also be exempt from specific reporting requirements, further reducing data availability. Additionally, there is no publicly available data source in the UK that categorises microbusinesses as digital. As a result, microbusinesses, especially digital ones, are often overlooked in the public debate

and the crucial role that they play in the economy is rarely acknowledged by policymakers and researchers.

GoDaddy is the world's largest services platform for entrepreneurs, supporting more than 20 million customers around the world, and more than 60,000 customers in the UK. GoDaddy supports businesses by giving them all the tools they need to grow online. Frontier Economics was commissioned by GoDaddy to produce an independent piece of research to provide new evidence on the relationship between digital microbusinesses and economic and labour market performance at the local level in the UK.

Using a new and unique dataset on the density of digital microbusinesses across the UK offered by GoDaddy through its Venture Forward research initiative, this study contributes to closing the knowledge gap on the importance of digital microbusinesses to local economies by studying the association between digital microbusiness density and the following measures of local economic and labour market performance: (i) jobs density; (ii) median annual pay; (iii) GDP.

2 Data

We built a cross-section dataset including information on macroeconomic indicators and sociodemographic variables, alongside digital microbusiness density for 2021, when the latest census was taken in the UK. Most of the variables from publicly available sources were available at parliamentary constituency level. However, some variables (e.g. GDP) were only available at the local authority level[8]. Our proxy of digital microbusiness density is based on GoDaddy proprietary data and is calculated as the number of digital microbusinesses per 1,000 residents in each geographic unit. The three outcome variables used in the regression analysis (jobs density, median annual pay and GDP), as well as the control variables incorporated in the regression models were sourced from UK publicly available datasets from the following sources:

- **Annual Population Survey (APS)** – it is a continuous household survey, with a sample size of approximately 320,000 respondents, covering the UK. The topics covered include employment and unemployment, as well as housing, ethnicity, religion, health and education.
- **Annual Survey of Hours and Earnings (ASHE)** – it is a survey carried out in April each year based on a sample of employee jobs taken from HM Revenue and Customs Pay As You Earn (PAYE) records. The survey collects information on earnings, hours worked, and other employees' characteristics, such as age, sex, occupation, and industry. It is the most comprehensive source of information on the structure and distribution of earnings in the UK.
- **Census** – it takes place every 10 years. It gives a picture of all the people and households in England and Wales.
- **Ofcom data** – this is the data on broadband coverage that underpins the Connected Nations report[9] released by Ofcom.

We employed a linear regression analysis to estimate the relationships between digital microbusiness density and economic and labour market outcomes at the local level. Depending on the regression specification, different scales of digital microbusiness density have been used to facilitate the interpretation of the regression results. Whenever possible, the analysis was conducted at parliamentary constituency level. However, when the data of interest was not granular enough, the analysis was conducted at the local authority level. The dataset also comprises variables on the residents' age and level of education, as well as their type of occupation and the industry they work in, which were employed as regression controls.

[8] There are 320 local authorities and 650 parliamentary constituencies in the UK. Therefore, a breakdown of the UK in parliamentary constituencies is more granular than a breakdown into local authorities.

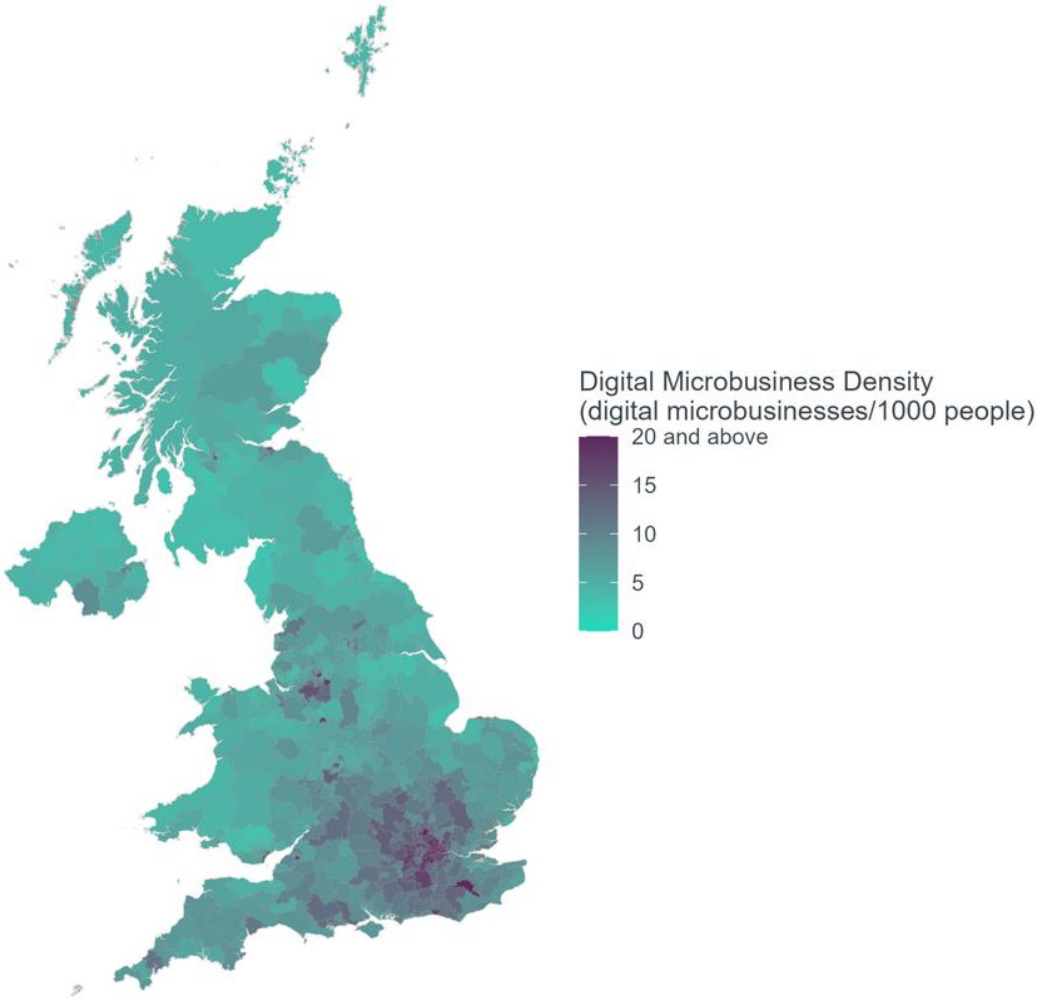
[9] https://www.ofcom.org.uk/research-and-data/multi-sector-research/infrastructure-research/summer-2023

3 Results

3.1 Descriptive statistics

Microbusinesses constitute 90% of all businesses in England. Among these micro enterprises, 79% have workforces ranging from 0 to 4 individuals, excluding the owner. This sector contributes substantially to the UK economy, accounting for 33% of total employment, which corresponds to approximately nine million workers, and collectively generating 21% of the country's economic turnover[10]. Among all regions in the UK, London boasts the highest proportion of microbusinesses, with 91% of its enterprises employing up to nine individuals – excluding the owner – while the North East exhibits the lowest percentage at 88%.

Figure 1 Digital microbusiness density by parliamentary constituency in the UK



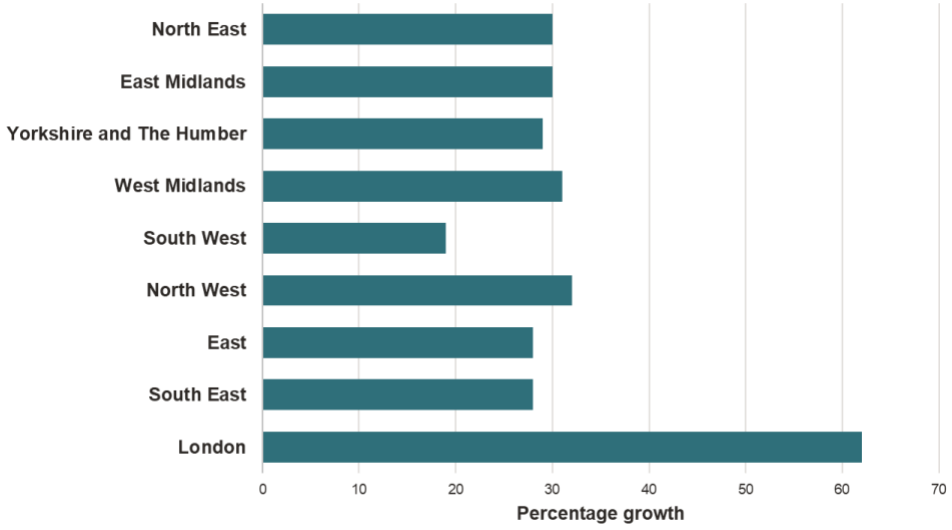
Source: Frontier Economics analysis of GoDaddy proprietary dataset

[10] https://www.local.gov.uk/publications/how-well-do-you-know-your-microbusinesses#introduction

Our measure of microbusiness density ranges between 2.3 and 39 microbusinesses per 1,000 residents for 99% of all the parliamentary constituencies, with an average density across the country of 8.7. The maximum density observed is 129 digital microbusinesses per 1,000 residents registered in the Cities of London and Westminster which stand out as outliers.

In the last ten years, microbusinesses have exhibited a more rapid growth rate compared to other types of enterprises. Microbusinesses witnessed a significant 34% surge between 2010 and 2020, with the next highest increase observed among medium-sized enterprises, which recorded a 28% expansion within the same timeframe. London also stands out for the most substantial increase in the number of microbusinesses between 2010 and 2020, with a remarkable 62% growth rate. This is nearly double the growth rate of the next leading region, the North West, which experienced a 32% increase, as illustrated in Figure 2. The notable variations in growth rates between regions may be attributed to the apparent upsurge in professional services, such as accountancy firms, in urban hubs like London, along with the proliferation of the gig economy. In contrast, regions dominated by larger businesses in traditional sectors witnessed more modest growth[11].

Figure 2 Percentage growth of microbusinesses by region – 2010 to 2020



Source: *https://www.local.gov.uk/publications/how-well-do-you-know-your-microbusinesses#introduction*
Note: *Nomis data 2010 - 2020*

[11] https://www.local.gov.uk/publications/how-well-do-you-know-your-microbusinesses#introduction

The data shows a positive unconditional correlation[12] of digital microbusiness density with various metrics of economic performance. For some metrics of economic performance, the correlation with digital microbusiness density is significantly affected by the presence of outliers[13]. For instance, any metric representing a measurement per capita is significantly impacted by outliers like the Cities of London and Westminster – one of the parliamentary constituencies with the highest GDP in the UK but one of the lowest resident population.

Figure 3 and Figure 4 show how the correlation between digital microbusiness density and jobs density across parliamentary constituencies in 2021 changes depending on whether or not we include outliers.

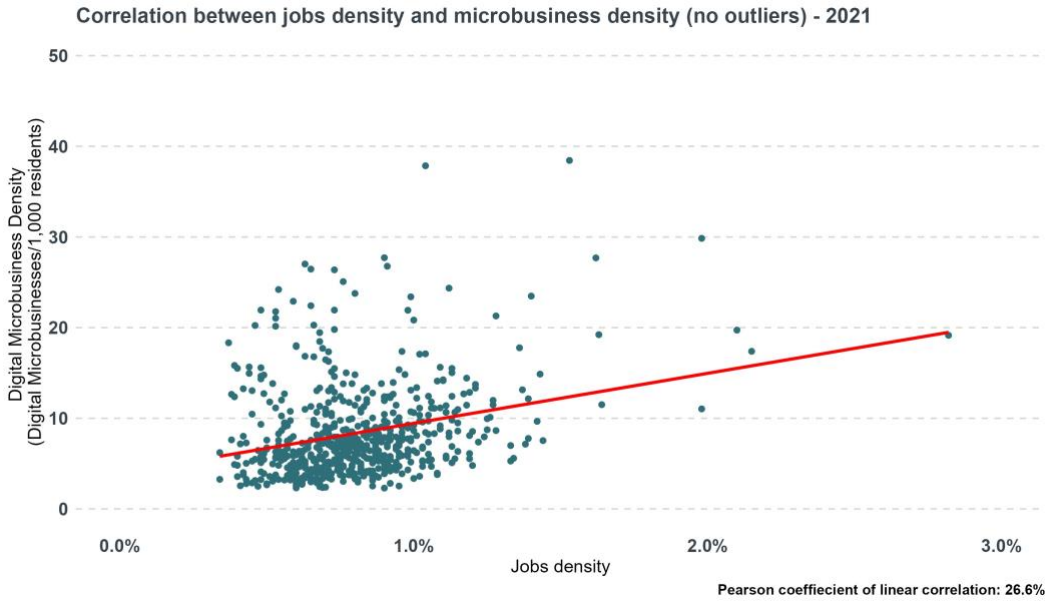
Figure 5 shows the correlation between digital microbusiness density and the median annual pay of full-time workers across parliamentary constituencies in 2021, while Figure 6 shows the correlation between digital microbusiness density and GDP per capita across local authorities in 2021.

We took the necessary step of excluding outliers from the regression analysis whenever it was appropriate to do so.

[12] Correlation is a statistical measure that quantifies the extent to which two or more variables change together or are related to each other. It assesses the strength and direction of the relationship between variables.

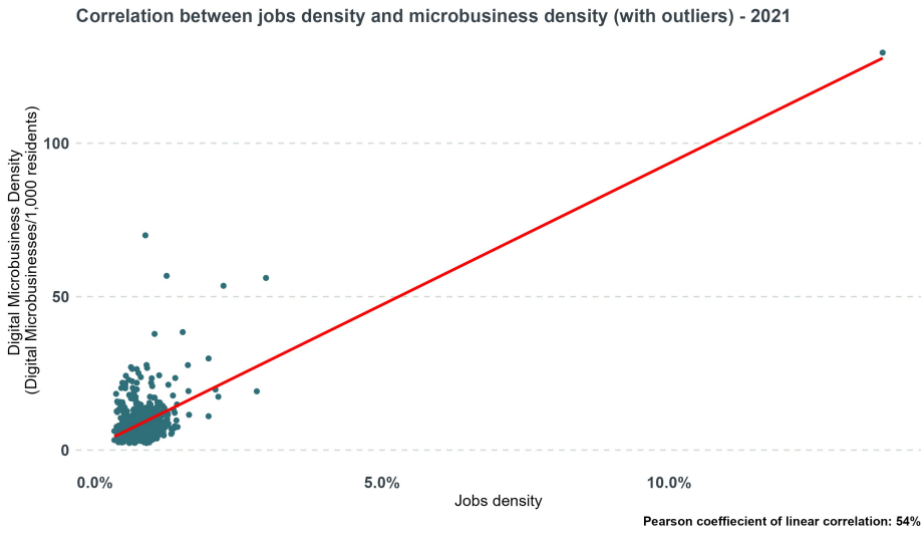
[13] An outlier is an observation or data point that significantly deviates from the rest of the data in a dataset. It is an unusual or exceptional value that falls well outside the typical range of values in a dataset. Outliers can be the result of errors in data collection, measurement, or entry, or they can represent genuine, rare occurrences that may carry valuable information or insights. Identifying and handling outliers is an important aspect of data analysis and statistics, as they can have a significant impact on the results and interpretations of analyses.

Figure 3 Correlation between jobs density and digital microbusiness density across parliamentary constituencies in 2021 excluding outliers



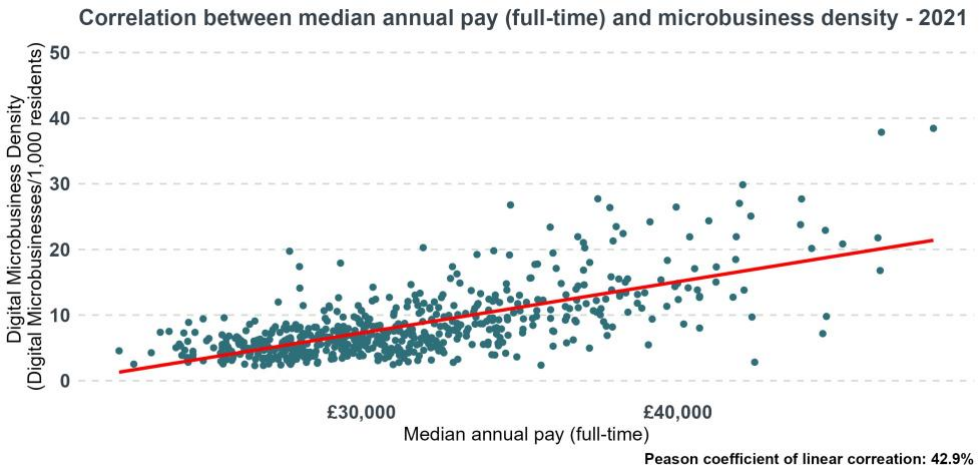
Source: Frontier Economics analysis of GoDaddy proprietary data and UK public datasets (see Annex)

Figure 4 Correlation between jobs density and digital microbusiness density across parliamentary constituencies in 2021 including outliers



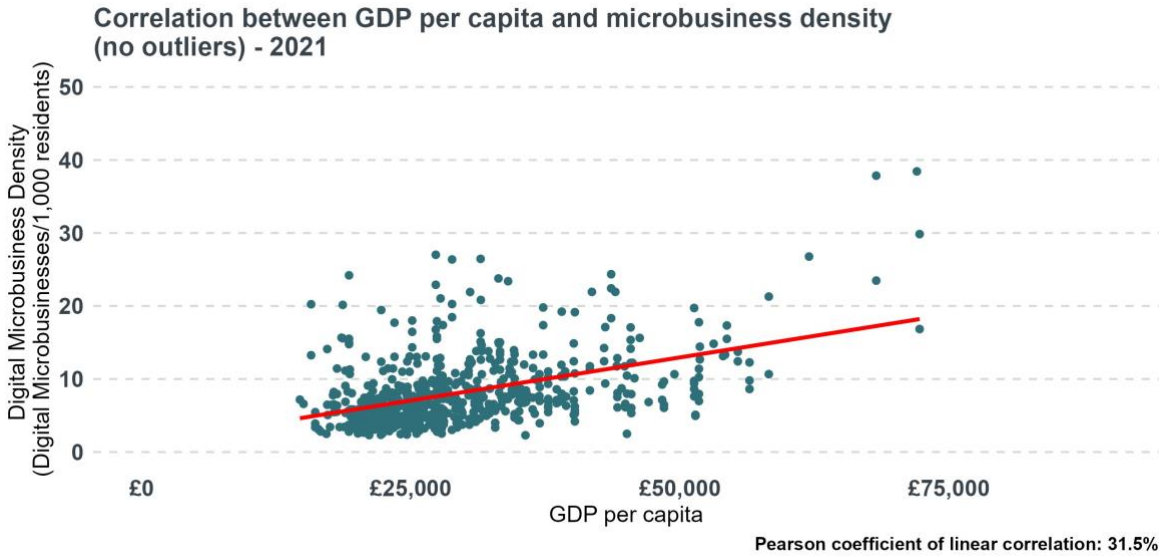
Source: Frontier Economics analysis of GoDaddy proprietary data and UK public datasets (see Annex)

Figure 5 Correlation between median annual pay of full-time workers and digital microbusiness density across parliamentary constituencies in 2021



Source: Frontier Economics analysis of GoDaddy proprietary data and UK public datasets (see Annex)

Figure 6 Correlation between GDP per capita and digital microbusiness density across local authorities in 2021 excluding outliers



Source: Frontier Economics analysis of GoDaddy proprietary data and UK public datasets (see Annex)

3.2 Key findings[14]

3.2.1 Jobs density

Regression analysis reveals that an increase in microbusiness density between 2020 and 2021 is associated with higher jobs density in 2021. In particular, a one-unit higher variation in the ratio between the number of digital microbusinesses and the resident population between 2020 and 2021 – corresponding to having one additional digital microbusiness per person from 2020 to 2021 – is associated with an increase of approximately 7 jobs per resident population in 2021, holding all other factors constant. This is equivalent to saying that every additional microbusiness is associated to 7 new jobs on a parliamentary constituency level. These findings remain consistent when the City of London and Westminster is excluded from the analysis.

This result evidences that the creation of a new microbusiness has larger implications than the pure direct employment within the business, as an average of 7 additional jobs for each new microbusiness would be difficult to justify. Rather, it implies indirect job creation linked with an increased demand for products and services from suppliers, which leads these suppliers to hire more people. Additionally, the consumption of goods and services offered by these new microbusinesses boosts disposable income in that area, further stimulating job growth.

It is worth noting that the R-squared value, which measures the goodness of fit of the model, decreases from approximately 83% to 18% when the City of London and Westminster is removed from the dataset. This indicates that a substantial portion of the variation observed can be attributed to the City of London and Westminster.

See Figure 7 in Annex for more detail.

3.2.2 Median annual pay

Regression analysis shows that a higher microbusiness density in 2020 is associated with a higher median annual pay in 2021. In particular, a ten percent increase in the ratio between the number of digital microbusinesses and the resident population in 2020 – corresponding to a ten percent increase in the number of active digital microbusinesses in 2020 – is linked to an approximately £138 increase in median annual pay for full-time workers in 2021, everything else being equal. This represents a share of 8.2% of the £1,685 average year-on-year increase in median annual pay in 2021 across parliamentary constituencies.

[14] The results of each regression are presented as the effect on the outcome variable of an increase in digital microbusiness density that is scaled depending on the model specification utilised for the specific regression. See the regression output tables in the Annex for more detail.

Additionally, the availability of Super-Fast Broadband also plays a role in supporting income, with the model showing a positive and statistically significant association between Super-Fast Broadband availability and median annual pay.

See Figure 8 in Annex for more detail.

3.2.3 GDP

Regression analysis shows that a higher digital microbusiness density in 2020 is associated with a higher GDP in 2021. In particular, having 10 additional digital microbusinesses per 1,000 residents in 2020 is associated with an approximate increase of £37,000 in GDP for 2021, all other factors remaining constant.

However, when the analysis excludes the City of London and Westminster, the local authorities with the highest GDP per capita in the UK, the influence of digital microbusiness density on GDP appears notably weaker. By removing these local authorities from the analysis, the coefficient representing the impact of digital microbusiness density on GDP decreases from approximately £37,000 to roughly £18,000. This highlights the substantial influence of the City of London and Westminster in explaining a significant portion of the variation in the relationship between digital microbusiness density and GDP.

See Figure 9 in Annex for more detail.

3.3 Limitations and opportunities for further research

While this analysis offers valuable insights into the relationships and correlations among all the variables considered, it does not establish any causal relationships.

Additionally, it is important to consider that the measure of digital microbusiness density used in this study is based on the counts of GoDaddy customers and might therefore not be an accurate proxy of actual digital microbusiness density. For example, it remains unclear whether an uptick in the number of GoDaddy customers is indicative of a genuine rise in digital microbusiness within a given geographic area, or if it primarily reflects the acquisition of new clients who may have switched from a competitor. More broadly, a rise in this metric could signify either an expansion in GoDaddy's market presence or a surge in entrepreneurial activity within the specific geographic area. Because the former does not necessarily imply a rise in the number of digital microbusinesses in the area, any observed correlations in the data could potentially be coincidental and not indicative of a causal link between digital microbusinesses and economic outcomes.

Key recommendations for further research would be:

- Developing the regression analysis to establish an identification strategy capable of establishing a causal relationship between digital microbusiness density and economic and labour market performance at a regional or local level.

- Using a proxy for digital microbusiness density based on overall digital microbusiness counts (not limited to GoDaddy customer counts) for each geographic unit, potentially utilising industry-specific data from the UK business counts in the Inter-Departmental Business Register (IDBR)[15].
- Creating a more comprehensive microbusiness density index for the UK, similar to the Microbusiness Activity Index for the US developed by UCLA Anderson Forecast[16]. This index should reflect dimensions of microbusiness activity not captured by a simple ratio between the count of microbusinesses and the resident population.

3.3.1 The heterogeneous effect of microbusinesses based on an area's relative deprivation

In a first attempt to explore potential avenues for future research, we examined whether microbusinesses have a stronger impact on job availability in the most deprived areas of the UK. If that was the case, not only would microbusinesses play a key role in contributing to the UK economy as a whole, but they would also support the Levelling Up agenda by reducing economic disparities among the different UK regions.

To investigate this, we included a variable in our regression that measures the relative deprivation of parliamentary constituencies in the UK.

Regression results suggest that a one-unit increase in the count of digital microbusiness in 2020 is associated with a 0.002 increase in the number of jobs per resident population in 2021, holding all other factors constant. While the least deprived constituencies have a higher availability of jobs per resident at baseline, indicated by the positive effect of the index of multiple deprivation (IMD) coefficient, the impact of an increase in the number of microbusinesses on jobs per resident is more pronounced for the most deprived constituencies, as shown by the negative effect of the interaction between the count of microbusinesses and the IMD variable.

However, it is essential to note a significant limitation to our findings. The data for the IMD variable was obtained from doogal.co.uk, which is not an official source. While these results may be indicative of a potentially stronger effect of microbusinesses on labour market outcomes in the more deprived areas of the UK, they should be interpreted with caution and further corroborated by the use of more sound and reliable data sources.

[15] https://www.ons.gov.uk/aboutus/whatwedo/paidservices/interdepartmentalbusinessregisteridbr

[16] https://www.godaddy.com/ventureforward/explore-the-data/microbusiness-index/

4 Conclusion

Our regression analysis provides valuable insights into the relationships and correlations among the variables considered. Digital microbusinesses are associated with a higher number of jobs available for each resident, higher annual pay for residents, and an increase in general economic activity, as measured by GDP. These findings suggest that digital microbusinesses play a role in fostering economic growth at the local level.

It is essential to note that while our analysis provides valuable insights into correlations and relationships among the variables, it does not establish any causal relationships. Additionally, the measure of digital microbusiness density used in this study, based on GoDaddy customer counts, may not be a precise proxy for actual digital microbusiness density. Whether an increase in GoDaddy customers reflects a genuine rise in digital microbusinesses or other factors remains a subject for further investigation.

In light of these findings, future research recommendations include developing a robust identification strategy to establish causal relationships, using more comprehensive data sources, and exploring additional dimensions of digital microbusiness activity to gain a deeper understanding of the dynamics at play in regional and local economies.

Table 2 Summary of regression results

Outcome variable	Measure of microbusiness density	Coefficient	Model
Jobs density	Change in the share of microbusinesses per resident between 2020 and 2021	+ 6.5***	Baseline model
Jobs density	Change in the share of microbusinesses per resident between 2020 and 2021	+ 5.7***	Excluding the City of London and Westminster
Median annual pay	Log of the absolute number of microbusinesses per resident	+ £1,386***	Baseline model

Outcome variable	Measure of microbusiness density	Coefficient	Model
GDP	Share of microbusinesses per 100 residents	+ £36,731***	Baseline model
GDP	Share of microbusinesses per 100 residents	+ £17,720***	Excluding the City of London and Westminster

Source: Frontier Economics analysis of GoDaddy proprietary dataset and UK public data (see Annex)
*Note: *** denotes statistical significance at 1% level*

Annex

Figure 7 Regression of jobs density in 2021 on the absolute change in digital microbusiness density between 2020 and 2021

	Model 1 b/se	Model 2 b/se
md_abs_var_20202021	6.538***	5.700***
	(1.46)	(1.44)
Level 2 qualificat~s	0.015	0.019*
	(0.01)	(0.01)
Level 3 qualificat~s	0.025***	0.023***
	(0.01)	(0.01)
Level 4 qualificat~e	0.009***	0.007**
	(0.00)	(0.00)
GDP per head - cur~£	0.000***	0.000***
	(0.00)	(0.00)
Constant	-0.195	-0.257
	(0.22)	(0.21)
R-squared	0.830	0.180
DFreedom	549	548

* p<0.05, ** p<0.01, *** p<0.001

Source: *Frontier Economics analysis of GoDaddy proprietary dataset and UK public data (see Annex)*
Note: *Model 2 excludes the City of London and Westminster*

Figure 8 Regression of median annual pay for full-time workers in 2021 on the logarithm of the absolute level of digital microbusiness density in 2020

	Model 1 b/se
md_abs_2020_log	**1385.794***** **(400.23)**
SFBB availability ~)	**109.832**** **(34.87)**
Age034	**-0.025**** **(0.01)**
Age3554	**0.038*** **(0.02)**
Level 4 qualificat~e	**214.799***** **(28.45)**
Self employed..64)	**102.332**** **(39.31)**
% all in empl.. 1:~i	**253.140***** **(32.57)**
% all in empl.. 2:~O	**148.580***** **(19.31)**
H: Transport and s~e	**495.594***** **(98.29)**
Constant	**13112.041**** **(4704.89)**
R-squared	**0.674**
DFreedom	**520**

* p<0.05, ** p<0.01, *** p<0.001

Source: Frontier Economics analysis of GoDaddy proprietary data and UK public datasets (see Annex)

Figure 9 Regression of GDP in 2021 on the percentage level of digital microbusiness density in 2020

	Model 1 b/se	Model 2 b/se
md_pct_2020	36730.661***	17719.682***
	(9555.76)	(3541.88)
Works mainly from ~e	-337.285*	-42.715
	(164.93)	(68.36)
K: Financial and i~v	1258.148*	440.622**
	(538.84)	(153.69)
L: Real estate act~s	-4154.158*	-3329.327***
	(1737.74)	(667.18)
N: Administrative ~e	-1321.392*	-134.098
	(655.26)	(264.84)
Level 4 qualificat~e	296.934	138.457*
	(155.34)	(66.48)
(sum) population	0.023***	0.026***
	(0.00)	(0.00)
Constant	4840.188	-1020.063
	(2663.34)	(1650.46)
R-squared	0.623	0.616
DFreedom	264	262

* p<0.05, ** p<0.01, *** p<0.001

Source: Frontier Economics analysis of GoDaddy proprietary data and UK public datasets (see Annex)
Note: Model 2 excludes the City of London and Westminster

Table 3 Breakdown of the variables contained in the final dataset

Variable	Source	Description
count	GoDaddy proprietary data	Number of GoDaddy's customers in a given parliamentary constituency
md	GoDaddy proprietary data	Number of GoDaddy's customers per 100 people in a given parliamentary constituency
medianannualpayFT	Annual Survey of Hours and Earnings	Median annual pay for full-time workers

Variable	Source	Description
medhrlypayFT	Annual Survey of Hours and Earnings	Median hourly pay for full-time workers
medhoursworkedFT	Annual Survey of Hours and Earnings	Median hours pay for full-time workers
MeanannualpayFullTime	Annual Survey of Hours and Earnings	Mean annual pay for full-time workers
MeanhourlypayFullTime	Annual Survey of Hours and Earnings	Mean hourly pay for full-time workers
MeanhoursworkedFullTime	Annual Survey of Hours and Earnings	Mean hours pay for full-time workers
GVAcurrentbasicpricesM	Office for National Statistics	Nominal GVA (£ millions)
GDPcurrentmarketpricesM	Office for National Statistics	Nominal GDP (£ millions)
jobsdensity	Job density	Number of jobs per resident aged 16-64
totaljobs	Job density	Total number of jobs
emplrate	Annual Population Survey	Employment rate for those aged 16-64
unemplrate	Annual Population Survey	Unemployment rate for those aged 16-64
Employees1664	Annual Population Survey	Share of those aged 16-64 who are employees
Selfemployed1664	Annual Population Survey	Share of those aged 16-64 who are self-employed
Economicactivityrate1664	Annual Population Survey	Economic activity rate for those aged 16-64
Economicallyinactive1664	Annual Population Survey	Share of those aged 16-64 who are economically inactive
Economicallyinactivewantinga	Annual Population Survey	Share of the economically inactive who want a job
Economicallyinactivenotwantin	Annual Population Survey	Share of the economically inactive who do not want a job
Ethnicminorityemploymentrate	Annual Population Survey	Employment rate for those aged 16-64 who are from an ethnic minority

Variable	Source	Description
Ethnicminorityunemploymentrat	Annual Population Survey	Unemployment rate for those aged 16-64 who are from an ethnic minority
Economicallyinactiveethnicmin	Annual Population Survey	Share of ethnic minority aged 16-64 who are economically inactive
share_of_managers	Annual Population Survey	Share of those in employment who are managers and senior officials
share_in_professional_occup	Annual Population Survey	Share of those in employment who work in professional occupations
share_in_associate_profess_occup	Annual Population Survey	Share of those in employment who work in associate professions and tech occupations
share_in_admin_secretarial_occup	Annual Population Survey	Share of those in employment who work in administrative and secretarial occupations
share_in_skilled_trade_occup	Annual Population Survey	Share of those in employment who work in skilled trade occupations
share_in_personal_service_occup	Annual Population Survey	Share of those in employment who work in personal service occupations
share_in_sales_customserv_occup	Annual Population Survey	Share of those in employment who work in sales and customer service occupations
share_in_process_plant_machine	Annual Population Survey	Share of those in employment who work in process, plant and machine operatives
share_in_elementary_occup	Annual Population Survey	Share of those in employment who work in elementary occupations
share_in_agriculture	Census	Share of workers in the agriculture, forestry and fishing industry
share_in_mining	Census	Share of workers in the mining and quarrying industry
share_of_manufacturing	Census	Share of workers in the manufacturing industry
share_in_electricity_energy_gas	Census	Share of workers in the electricity, gas, steam and air conditioning supply industry

Variable	Source	Description
share_in_water_supply_sewerage	Census	Share of workers in the water supply, sewerage, waste management and remediation activities industry
share_in_construction	Census	Share of workers in the construction industry
share_in_trade_repair_motor_vehi	Census	Share of workers in the wholesale and retail trade and repair of motor vehicles and motorcycles industry
share_in_transport_storage	Census	Share of workers in the transport and storage industry
share_in_accommodation_food	Census	Share of workers in the accommodation and food service activities industry
share_in_information_communica	Census	Share of workers in the information and communication industry
share_in_finance_insurance	Census	Share of workers in the financial and insurance activities industry
share_in_real_estate	Census	Share of workers in the real estate activities industry
share_in_science_technical_indu	Census	Share of workers in the professional, scientific and technical activities industry
share_in_admin_support	Census	Share of workers in the administrative and support service activities industry
share_in_public_admin	Census	Share of workers in the public administration
share_in_education	Census	Share of workers in the education industry
share_in_health_social_work	Census	Share of workers in the human health and social work activities industry
share_in_other_industries	Census	Share of workers in other industries
withnoqualificationsNVQ	Annual Population Survey	Share of those aged 16-64 with no NVQ qualifications

Variable	Source	Description
withNVQ1aged1664	Annual Population Survey	Share of those aged 16-64 with NVQ1 qualifications
withNVQ2aged1664	Annual Population Survey	Share of those aged 16-64 with NVQ2 qualifications
withNVQ3aged1664	Annual Population Survey	Share of those aged 16-64 with NVQ3 qualifications
withNVQ4aged1664	Annual Population Survey	Share of those aged 16-64 with NVQ4 qualifications
withotherqualifications NVQ	Annual Population Survey	Share of those aged 16-64 with other NVQ qualifications
Noqualifications	Census	The share of residents with no qualifications
Level2qualifications	Census	The share of residents whose highest qualification is an intermediate diploma
Apprenticeship	Census	The share of residents whose highest qualification is an apprenticeship qualification
Level3qualifications	Census	The share of residents whose highest qualification is a high school diploma
Level4qualificationsor above	Census	The share of residents whose highest qualification is a bachelor degree or higher
Otherqualifications	Census	The share of residents with vocational, work-related or other qualifications
distance_to_work_upto2km	Census	The share of workers for whom the distance to the workplace is less than 2km
distance_to_work_upto5km	Census	The share of workers for whom the distance to the workplace is less than 5km
distance_to_work_upto10km	Census	The share of workers for whom the distance to the workplace is less than 10km

Variable	Source	Description
distance_to_work_upto20km	Census	The share of workers for whom the distance to the workplace is less than 20km
distance_to_work_upto30km	Census	The share of workers for whom the distance to the workplace is less than 30km
distance_to_work_upto40km	Census	The share of workers for whom the distance to the workplace is less than 40km
distance_to_work_upto60km	Census	The share of workers for whom the distance to the workplace is less than 60km
distance_to_work_beyond60km	Census	The share of workers for whom the distance to the workplace is greater than 60km
Worksmainlyfromhome	Census	The share of workers who mainly work from home
Worksmainlyatanoffshoreinst	Census	The share of workers who mainly work at an offshore premise
Age034	Population Estimates/Projections	The share of population aged 0 to 34
Age3554	Population Estimates/Projections	The share of population aged 35 to 54
Age55andabove	Population Estimates/Projections	The share of population aged 55 and above
SFBBavailabilitypremises	Ofcom	Share of premises with Super-Fast broadband
UFBB100Mbitsavailability	Ofcom	Share of premises with Ultra-Fast broadband
FullFibreavailabilitypremi	Ofcom	Share of premise with Full Fibre availability
Gigabitavailabilitypremises	Ofcom	Share of premises with Gigabit availability
unabletoreceive2Mbits	Ofcom	Share of premise unable to receive 2Mbit/s

Variable	Source	Description
unabletoreceive5Mbits	Ofcom	Share of premise unable to receive 5Mbit/s
unabletoreceive10Mbits	Ofcom	Share of premise unable to receive 10Mbit/s
unabletoreceive30Mbits	Ofcom	Share of premise unable to receive 30Mbit/s
belowtheUSO	Ofcom	Share of premises below the Universal Service Obligation
withNGA	Ofcom	Share of premises with Next Generation Access
abletoreceiveBBfromFWA	Ofcom	Share of premises able to receive broadband from Fixed Wireless Access
with2Mbitsspeed	Ofcom	Share of premises with < 2Mbit/s speed
with25Mbitsspeed	Ofcom	Share of premises with > 2 and < 5Mbit/s speed
with510Mbitsspeed	Ofcom	Share of premises with > 5 and < 10 Mbit/s speed
with1030Mbitsspeed	Ofcom	Share of premises with > 10 and < 30 Mbit/s speed
with30300Mbitsspeed	Ofcom	Share of premises with > 30 and < 300 Mbit/s speed
with300Mbitsspeed	Ofcom	Share of premises with > 300 Mbit/s speed