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In the flexible working era: the micro-location choices of co-working spaces

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ABSTRACT
Would physical location become less essential when work and communication are not limited to a fixed space? We explore the question with the micro-location choices of co-working spaces (CWSs) in London. The empirical results show that the CWS tends to choose districts with more 'teleworkable' jobs and a high reliance on tacit knowledge in local industries. CWS also tends to be located where start-up firms co-locate, echoing the different influences of knowledge spillover in firms' life cycles. The study highlights how CWS facilitates businesses in a digitised and more collaborative economy, carrying implications for business empowerment and local urban patterns.

KEYWORDS
location choice; micro-geography; flexible work; co-working space; agglomeration economies; knowledge spillover

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1. INTRODUCTION

Digital technology and the value creation process of knowledge-intensive industries are reshaping the local economy development and spatial pattern. The trend is even more significant after the 2020 global pandemic when the compulsory working from home leads to the 'new geography of jobs' (Florida et al., 2023). The physical fixed-desk office is not the only communication and information diffusion platform. As modern cities rely heavily on high-tech and knowledge-intensive services industries, the local business areas are exposed mainly to the shock of remote working. The rapid transition leaves the traditional office space vacant, and the slump in people's visits causes further recessions of nearby service businesses (Althoff et al., 2020), reflecting a vulnerable industry system with the current office-centre urban pattern.

Despite the concern about business clusters withering and 'hollow city', studies suggest that on-site in-person engagements are not easily substituted by cyber connections (Kapasi & Galloway, 2015). As the tacit, less codified knowledge relies on face-to-face interaction, industry sectors rooted in the tacit knowledge still benefit from the agglomeration economics at a physical location (Claussen et al., 2012; Coll-Martínez & Méndez-Ortega, 2020; Isaksen, 2004). Besides, the reliance on in-person engagement varies among job professions despite the industry they belong to, where some studies evaluate the job that could work remotely (Blinder, 2009; Blinder & Krueger, 2013; De Fraja et al., 2021a; Dingel & Neiman, 2020). It leads to the crucial questions on how the evolving hybrid working practice reshapes the 'traditional' space accommodating knowledge-intensive activities, namely office, and how the change is reflected in the urban pattern and built environment.

Our study aims to enhance this discussion by investigating the location choice of co-working spaces (CWSs) using London as an empirical case. Unlike individual designated spaces, CWS encourages people and businesses to work in a collaborative environment through the sharing space, allowing users to work in flexible locations while benefiting from meeting up with peers in a third place (Lescarret et al., 2022). The space subscription model offers more flexible leasing contracts than the traditional fixed-term long lease. While CWS filled the office market gap for start-ups and freelancers, with the substantial change in remote working, the flexibility appeals to a wider range of industries and workers. Thus, the urban distribution of CWS sheds light on the driving effects of agglomeration economies at the micro-geography level in the 'digital' working environment.

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The business mode of CWSs can accommodate multiple businesses in one shared space, followed by qualifications, resources and competencies. Such combinations coincide with the fact that the demand for agglomeration externalities varies among firms. As one of the global cities, London enjoys the benefits of agglomeration with a high proportion of knowledge-intensive industries and skilled labour. Accordingly, it remains one of the top hotspots for CWS demand across Europe, and the market shows significant interest despite the pandemic's impacts (Savills, 2019; Workthere, 2022). As more businesses change their office presence to adapt to remote working, it is worth exploring the micro-geographical factors driving the location decision of CWSs in light of the transforming local labour market features and local industry distribution.

Using CWS location data in London during the period 2015–22, our analysis investigates the micro-location choices of CWSs at the postcode district level in London. The results reveal a significant location trend in districts with a higher proportion of teleworkable jobs. Further, CWS tends to be located where start-up firms congregate, echoing that the influences of knowledge spillover differ among firms' life cycles. Besides, compared with the areas with more knowledge-intensive industries but highly codified tasks and routines, namely the information and communication technology (ICT) industry, CWSs tend to be located in districts with a higher concentration of industries relying on tacit knowledge and in-person interactions, such as in the case of culture and creative industries (CCI). As a result, the location pattern of the CWS mirrors the transformation of knowledge-intensive industry structure and the urban pattern change in a city.

Our paper contributes to several strands of the literature, including the location choice in micro-geography, urban implications under the hybrid working trends and office space transformation. First, we complement empirical studies about local industry patterns at a micro-geographical level. While existing studies on regional productivity underline the importance of within-country heterogeneity (e.g., Ottaviano, 2011), heterogeneous patterns are embedded within the city. More recent studies have moved toward a micro-geography approach, which emphasises the importance of 'zooming in' to a much smaller scale to properly investigate location advantages (Andersson et al., 2019; Lavoratori et al., 2020; Lavoratori & Castellani, 2021; Mudambi et al., 2018). CWSs are expected to nurture the working environment in the micro-system that grows mutually with the local knowledge-intensive sectors. Hence, we expect this study to contribute pioneering empirical evidence showcasing the spatial pattern of CWSs.

Second, our study addresses a crucial post-pandemic discussion, that is, the functionality of physical working space when the teleworking regime questions the need for 'offices'. Our findings highlight the importance of knowledge nature in spillovers and the reliance on physical location to different extents. Further, we use occupation-based measures (Dingel & Neiman, 2020; Mongey et al., 2021) to understand the strong connection between CWSs' presence and flexible working potential. Previous studies explored the flexible working pattern on urban density (Liu & Su, 2021), productivity (Bloom et al., 2022, 2023; Emanuel & Harrington, 2023; Fernald & Li, 2021) and innovation (Atkin et al., 2022). However, demand for suitable working space beyond the home or a traditional office remains for various in-person engagements (Lescarret et al., 2022; Van Nieuwerburgh, 2023). Our study contributes to this discourse by evaluating the necessity for shared physical spaces, as evidenced by their urban implications in micro-location choices.

The rest of the paper is structured as follows. The next section discusses the literature and develops the hypotheses. After mapping the local working pattern with the CWS location, the empirical analysis tests the hypotheses using a conditional logit model and illustrates the results. The last section concludes with policy implications and further research directions.

2. THE FLEXIBLE WORKING PHENOMENON AND LOCATION CHOICE: A REVIEW AND HYPOTHESES

2.1. Rising CWSs in the new economy

Compared with the traditional manufacturing process, the flourishing tertiary and quaternary industries prefer a more collaborative environment that boosts creative activities (Mariotti et al., 2017; Merkel, 2019). As a result, businesses in these sectors seek flexibility in office use to embrace the new working mode and optimise the cost. However, a substantial group of the participants are start-ups and freelancers who are less competitive as long-term office tenants; meanwhile, their needs for office space are different (Bednář et al., 2023). Many studies critically evaluate how CWSs facilitate business communication and encourage innovation and entrepreneurship within the shared space.

CWSs operate the office with wider tenant inclusion and flexible leasing terms, cultivating the community 'vibe' among office users (Castilho & Quandt, 2017; Moriset, 2013; URS, 2014). Some previous studies underscore the functions of CWSs as the 'third place' from home or fixed office to facilitate people's social and informal interaction (Lescarret et al., 2022; Moriset, 2013), thus acting as 'serendipity accelerators' in boosting the creative and digital economy. Though Moriset questions the growth sustainability of CWSs at the time, more recent discussions accentuate the merits of collaboration in person and unintentional engagement in knowledge/value creation (Florida et al., 2023; Lescarret et al., 2022; Van Nieuwerburgh, 2023). The space attracts think-alike participants in the same sector and facilitates their communication, encouraging knowledge-sharing and collective learning (Bednář et al., 2023). Moreover, the inclusive environment dissolves the barriers across industries or businesses, gearing knowledge-sharing across different sectors and creating synergy among various businesses and stakeholders (Bednář et al., 2023; Weijs-Perrée et al., 2020).

Besides, the influence or information exchange can be made with 'informal urban practices' (Merkel, 2019) or social learning in the community network that does not necessarily need explicit verbal communication (Bednář et al., 2023; Waters-Lynch & Potts, 2017). The environment is formed in the space–community–co-worker nexus. Collaborative learning formed in CWSs occurs at corporate, community and individual levels, consolidating the knowledge-sharing network (Castilho & Quandt, 2017; Bednář et al., 2023) even beyond CWS users' working environment (Eriksson & Lengyel, 2019). The evidence highlights the unique roles of CWSs in facilitating knowledge spillover and collaboration.

2.2. Agglomeration economies in micro-geography: the nature of knowledge and firms' life cycle

External agglomeration economies remain crucial determinants in the attractiveness of a location. Agglomeration economies can be defined as the benefits of geographical concentration or co-location of economic activities and actors in a specific place. It enhances the competitiveness of a specific area, influencing the location decisions of both domestic and international firms and fostering new business formation (Arauzo-Carod, 2021; Cantwell & Piscitello, 2005; McCann & Van Oort, 2019; Rosenthal & Strange, 2003). The literature distinguishes between two agglomeration types, that is, specialisation versus diversification (see Beaudry & Schiffauerova, 2009; and Rosenthal & Strange, 2004, for an extensive discussion). Intra-industry ('specialisation') agglomeration economies involve firms from the same industry clustering geographically, benefiting from a specialised local labour market and specialised supplier networks, and the emergence of industry-specific knowledge spillovers (Marshall, 1890, 2009). Inter-industry ('diversification') agglomerations refer to the geographical concentration of firms operating in different industries. It fosters a diverse environment that encourages cross-industry idea exchange, skill combinations, and non-incremental innovation (Jacobs, 1969; Harrison et al., 1996).

The geographical proximity of diverse industrial contexts allows for the copying, modifying and recombining of practices across industries, fostering a rich economic structure with varied industries, professionals and competencies. This diversity benefits service providers by broadening their market reach. Meanwhile, some regions exhibit specialisation-related agglomeration due to the prevalence of specific industries, noticeable also in knowledge-intensive sectors (Cooke, 2002). The importance of geographical proximity is amplified in industries relying on face-to-face interactions and the sharing of ideas (Andersson et al., 2019; Van Soest et al., 2006). Different industries perceive distinct needs for geographical proximity based on the nature of the knowledge generated and shared within the industry (Bathelt et al., 2004; Gertler, 2003; Howells, 2002; Maskell & Malmberg, 1999).

Polanyi (1958) categorises the knowledge type based on the extent of formalisation and the requirement for physical presence in knowledge creation. He differentiates between explicit (or codified) knowledge and tacit knowledge. As the concept further develops, Howells (2002) defines codified knowledge as the knowledge that pertains to know-how that can be conveyed through formal, structured language without the need for 'direct experience of the knowledge' being acquired. It can be communicated via designs, manuals, patents, or pharmaceutical formulation. By contrast, 'tacit knowledge concerns direct experience that is not codifiable via artefacts. Thus, it represents disembodied know-how that is acquired via the informal take-up of learned behaviour and procedures. Indeed, some tacit knowing is associated with learning without awareness' (Howells, 2002, p. 872).

Therefore, face-to-face interactions become pivotal for tacit knowledge that is hard to codify in the form of formal meetings and informal unintentional conversations (Asheim & Gertler, 2006; Torre & Rallet, 2005). As knowledge tacitness varies across industries, so does the nature of the knowledge (Storper & Venables, 2004). This is particularly true in the case of the creative and cultural industry, which prioritises localised networking and repeated face-to-face contact to boost creativity (Arzaghi & Henderson, 2008; Claussen et al., 2012; Storper & Venables, 2004). On the contrary, when industries rely more on codified knowledge, rational processes, and relatively more standardised routines, the knowledge can be easily transferred across locations; thus, geographical proximity is less critical in the case of the ICT industry (Asheim & Coenen, 2006; Isaksen, 2004). Online platforms hence work as a more efficient knowledge exchange alternative to a traditional 'physical' workplace.

Furthermore, agglomeration and geographical proximity needs are heterogeneous across firms, and one source of heterogeneity is the life cycle stage of the firm (Duranton & Puga, 2001; Lavoratori & Castellani, 2021; Neffke et al., 2011). More mature firms have already developed their products and found their optimal production process, thus they are more interested in cost-saving and generating economies of scale. In contrast, firms at the early stages of their life cycle (i.e., entrepreneurial, younger and start-up firms) are in their learning stage, so they need 'to experiment to realise their full potential' (Duranton & Puga, 2001, p. 1455). Diverse, dynamic and more flexible environments can help these entities in searching, boosting innovation processes to develop new ideas. As a result, a higher presence of start-up firms in a given area can represent a location driver for CWS providers.

Finally, empirical studies have underlined the decay effect of agglomeration economies, where specialisation economies present a stronger spatial decay effect as their benefits decline with the increase in the distance among economic actors and dissipate in a few squared kilometres (Andersson & Larsson, 2022; Lavoratori & Castellani, 2021; Rosenthal & Strange, 2003). It highlights the need for a micro-geographical approach in studying agglomeration and location decisions within a city at a finer level of analysis (Rammer et al., 2020).

2.3. The impact of flexible working on industry dynamics within the city

The need for physical proximity in the office reduces as the repercussions of the transition to working from home adopted since the COVID-19 pandemic, which is expected to be a new norm of working pattern in the city (Atkin et al., 2022; Emanuel et al., 2023; Hansen et al., 2023). With the digital facilities and cloud-based networks (Moriset, 2013), well-educated, high-skilled workers, especially those in managerial and professional occupations, are more likely to 'telework' (Adams-Prassl et al., 2020; Bartik et al., 2020; Dingel & Neiman, 2020; Mattana et al., 2020), while some jobs can only be on-site (Corradini et al., 2022; De Fraja et al., 2021b). Consequently, it changes the projected physical space demand and the spatial concentration of workplaces in central districts, with more profound impacts revealed in bigger and global cities that specialised in high-intelligence, remote work types (Althoff et al., 2020, 2022; Gupta et al., 2022).

Although working from home can boost employee productivity (Beckmann et al., 2017; Bloom et al., 2015; Rupietta & Beckmann, 2018), the lack of interactions with co-workers restricts the knowledge exchange and amplifies social isolation, resulting in worsened individual and group performances (Sparrowe et al., 2001) and well-being (Schifano et al., 2021). The effect is even more severe for entrepreneurs and self-employed workers (Kapasi & Galloway, 2015).

Nevertheless, the need for knowledge exchange on-site in a shared working space remains less explored under the substantial remote working shift. The physical proximity and social interaction between skilled workers in large cities facilitate the interchange of knowledge and the learning of new skills and feedback from each other (Akcigit et al., 2018; Atkin et al., 2022; Baum-Snow et al., 2024; Charlot & Duranton, 2004; Emanuel et al., 2023; Glaeser, 1999; Jaffe et al., 1993; Jarosch et al., 2021; Wheaton & Lewis, 2002), which is phenomenally important in large cities and industry clusters (Ellison et al., 2010). As discussed in section 2.1, the knowledge and information spillover could be very localised because they arise mainly through face-to-face contact, and workplace inclusion helps build trust and contact (Arzaghi & Henderson, 2008; Carlino & Kerr, 2015; Rosenthal & Strange, 2020). Location factors remain crucial in flexible working schemes. Yet, it needs a better understanding of which industries and intelligence groups – driven by the tacit knowledge need, dependence on the community and work–life balance – rely more on on-site engagement over the long term.

2.4. Hypothesis development

The transforming working style change in different knowledge-intensive sectors leads to several research hypotheses about the CWS location pattern, summarised in Table 1.

The choice of working in CWSs depends on the 'teleworkability' of the job. Those businesses with a higher proportion of teleworkable jobs would adopt the shared working space to maximise face-to-face interaction and optimise operating costs. Hypothesis 1 (H1) indicates the positive relation between the location choice of CWSs and the teleworkable measure of the local industries.

Table 1. Summary of the research hypotheses.

Hypotheses hierarchy	Hypotheses	Indicator	Expected sign
H1: Teleworkable job type	'Teleworkable' job types prefer more flexible working spaces	Employees that are 'teleworkable' among all in the local district; as a % of total local employee	+
H2: Knowledge spillover demand from start-up firms	Starting firms need knowledge spillover over larger and more established firms. Younger and small–medium firms also need higher flexibility in leasing contracts	% of start-up firms % of SME	+ +
H3a: Agglomeration economies, ICT and CCI specialisation	Type of knowledge matters: When the knowledge is more codified, proximity is less critical; thus, agglomeration economies are less important as location drivers (ICT). Physical proximity is crucial to industries that rely on creativity, face-to-face interaction and tacit knowledge (CCI)	Number of employees in the ICT industry (in log) Number of employees in the CCI industry (in log)	–/n.s. +
H3b: Agglomeration economies and industrial diversity	Industrial diversity facilitates the cross-fertilisation of ideas through continuous interactions of different skills and professionalism	Entropy index	+

Note: n.s., Not significant.

Further, the reliance on a sharing environment depends on the size and maturity of firms, that is, mature firms have established their own team for knowledge-creation activities (Duranton & Puga, 2001; Suire, 2019). H2 expects the firm scale and life cycle would impact their demand for the co-working environment, hence the location choice of the CWSs.

Finally, H3a predicts the reliance on tacit knowledge, and H3b addresses a diverse business environment on CWSs. As discussed, office users relying more on tacit knowledge (Arzaghi & Henderson, 2008; Claussen et al., 2012) would look for collaborative working space. Conversely, if the knowledge can be easily shared and reproduced outside of the physical environment, that is, codified knowledge (Asheim & Coenen, 2006; Isaksen, 2004; Johns & Hall, 2020), the reliance on a sharing space and in-person communication would be less crucial. Aside from the specialisation-related cluster, a local economy boosted by higher diversity would also demand a collaborative working environment.

3. EMPIRICAL STRATEGY: DATA, METHODOLOGY AND VARIABLES

3.1. Data

The study mainly relies on three data sources. First, we obtain the location and leasing information of the CWSs in Greater London via the flexible desks data of CoworkIntel. The time covers the new leasing events from 2015 to 2022, including the COVID-19 pandemic and the early recovery. The sample contains 881 CWS leasing locations from 292 co-working operators. Using the information on the postcodes of CWS leasing, the dependent variable is the choice of the CWS location among 260 postcode districts in the Greater London area. The leasing start time of the records is used as the year of the location event.

Second, we employ Fame from Bureau van Dijk (BvD) to compute the main explanatory variables capturing the different forms of agglomeration economies. The dataset covers every single registered company in the UK. We collect detailed firm-level data over the period 2014–21 based on a total sample of 550,718 active firms in London with a known postcode and a non-missing number of employees in the selected years. With the postcodes of the companies obtained, we can compute the main variables about local industry patterns and the share of small or start-up firms.

Third, we measure the feasibility of working remotely at the industry level by adopting the teleworkable indicator at the occupational level developed by Dingel and Neiman (2020) with the changes in occupation composition within the sector using the Quarterly Labour Force Survey from 2014 to 2021. We adopt the feasibility of working at home for each occupation of Dingel and Neiman (2020) for the UK Standard Occupation Classification (SOC).[1] We further compute the average value of teleworkable indicator at the four-digit NACE Rev. 2 industries.[2] The same method has been applied in parallel studies (Corradini et al., 2022; De Fraja et al., 2021b). We manually check the industry description to ensure the teleworkable indicator matches the real pattern of work from home.

We use UK postcode districts as the micro-geographical unit level. Each postcode, an alphanumeric code six to eight characters long, is divided into outward (postcode area and district) and inward codes. A postcode district, formed by an area code plus one or two digits, typically represents a city section. We use the 260 postcode districts[3] of the London metropolis to assess the location choices. The mean size of the postcode district is 6.11 km^2, with the size ranging from 0.85 to 47 km^2. According to the 2011 Census, the average number of usual residents (aged 16–74) is 23,000 across the London postcode districts. They are located in both the Inner London and Outer London areas. Figure 1 shows all the postcode districts in the sample and Inner London particularly, with the grey scale or dots showing the concentration of CWS.

3.2. Methodology: location choice model

To assess the factors influencing the location decisions, a conditional logit model (CLM) (McFadden, 1974) is employed in line with previous studies (e.g., Basile et al., 2008). The CLM is based on a logistic regression where the dependent variable is a binary choice while the data occur in groups, representing the location choice set available for each location decision event. Thus, the model explains the extent to which a given alternative (choice) is more likely to be chosen, conditional on the other available alternatives in the choice set. The CLM assumes that for a location event i, company f will choose district d, which yields the highest profit among all possible alternatives, as a function of observed location characteristics (Z_d). More formally:

$$Pr_{ifd*} = \frac{\exp(\beta Z_{id*})}{\sum_{d=1}^{D-1}\exp(\beta Z_{id})}, \quad \forall d \neq d^*(d = 1, \ .., \ D-1)$$

where d^* is the location chosen (i.e., postcode district), and $d = 1, 2, \ldots, D-1$ are the alternative locations (i.e., all other possible postcode districts). Our location choice set comprises the postcode district areas within Greater London. Each observation captures the establishment of a new CWS as a one-time event throughout the period. The model incorporates alternative-specific variables (Train, 2003); hence, the explanatory variables are characteristics varying across locations. Standard errors are clustered by the co-working operators since each operator can have more than one location event in the period; this also controls the CWS brand tiers to an extent.

3.3. Variables

The dependent variable is the location choice for establishing a new CWS i (the decision event) by the operator f in a given district d in London. The variable assumes a value of 1 for the chosen district and zero for all other alternative locations.

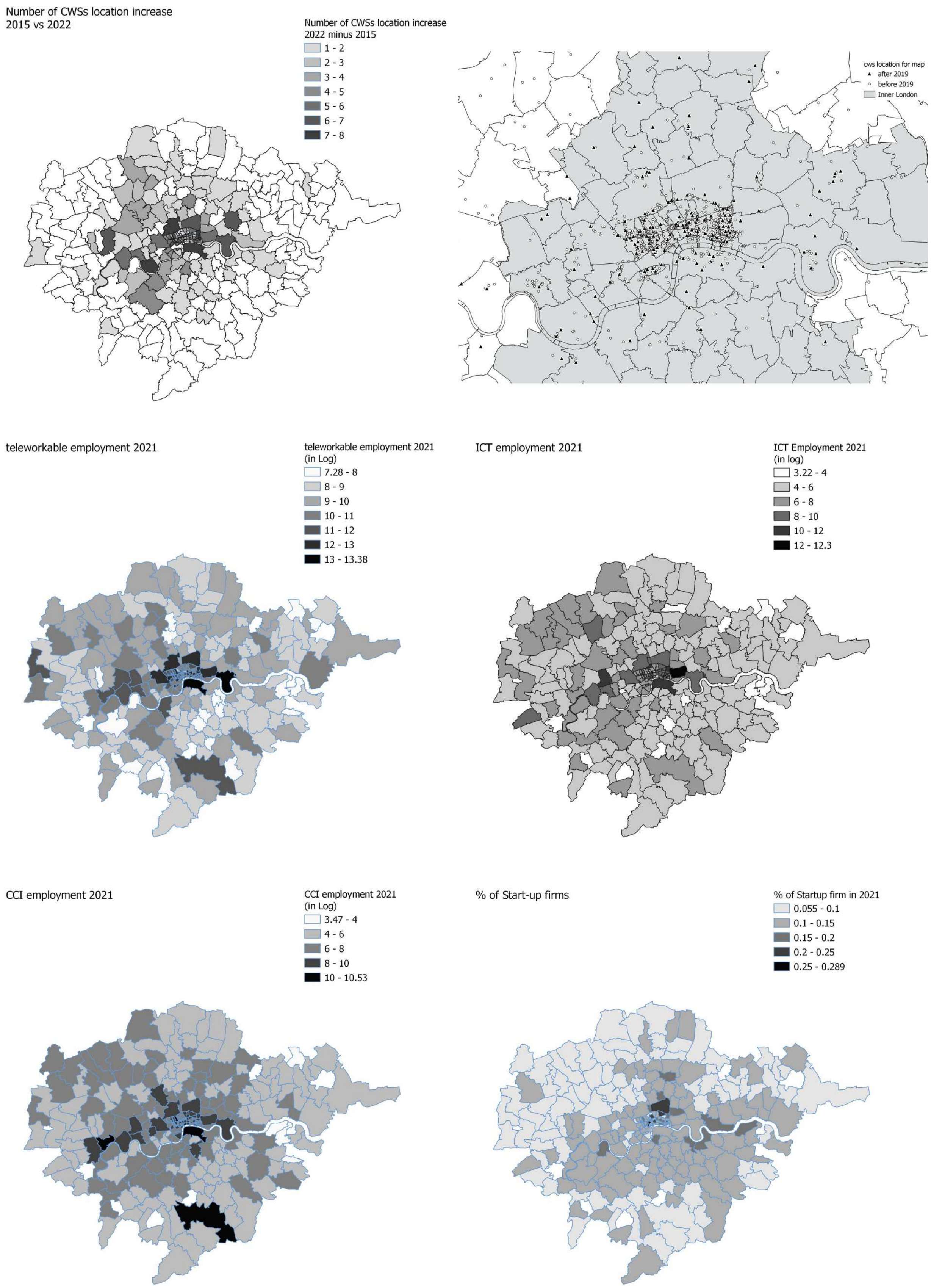

Figure 1. Co-working space (CWS) locations and (lagged) local indicators.

To test H1, we follow the approach discussed above and use data on the number of employees from Fame to capture the presence of teleworkable employees at the postcode district level. We derive the share of employees in teleworkable industries in the postcode district (*telework_share*), where an industry is classified as a teleworkable industry if its teleworkable indicator is higher than the median value each year.

Further, for H2, we generate indicators for start-ups and small and medium enterprises (SMEs). The share of start-ups among all firms within the postcode district (*share Startups*) measures the entrepreneurial activities in the district. Firms are identified as start-ups if registered for fewer than three years (Calvino et al., 2015; Criscuolo et al., 2014; Khurana & Farhat, 2021). The age of the company is computed as the difference between the date of incorporation and time $t-1$, that is, the year before the respective CWS establishment. We particularly focus on the start-up firms operating in knowledge-intensive service sectors classified by Eurostat (2023),[4] as these firms are expected to rely closely on the collaborative atmosphere of CWS.

To compute the share of SMEs in the postcode district (*share SMEs*), we classify a company as a large firm if it has a staff headcount (number of employees) greater than 250, 50–250 employees as a medium firm, and fewer than 50 employees as a small firm, following the Eurostat classification. We observe that the majority of firms are classified as small (about 98%), where more than 25% of the distribution is composed of firms with one employee.

Finally, to test H3, data from Fame are computed to measure the specialisation and diversification agglomeration economies in each postcode district. We follow previous studies on agglomeration economies and compute specialisation agglomerations using the number of employees in specific industries (e.g., Andersson & Larsson, 2022; Martin et al., 2011). We select industries that encapsulate different types of knowledge – codified versus tacit, following the discussion in section 2.2 and hypothesis development in section 2.4. Starting with industries with a high level of codifiability, we identify ICT-related industries using the two- and three-digit NACE Rev. 2 codes of the company and the classification provided by Eurostat. Specifically, we focus on ICT service industries, in detail codes 46.5, 58.2, 61, 62, 63.1 and 95.[5] We compute ICT-related agglomerations as the number of employees in the postcode district employed in companies operating in ICT industries (*ICT_empl*). Likewise, we proxy the industry with a high tacit component with culture and creative industries (*CCI_empl*) using the four-digit NACE Rev. 2 codes and the classification developed by Power (2011). Table 2 lists the selected NACE codes and related descriptions.

We adopt the entropy index as the proxy of diversification economies (*Industrial_diversity*) at the postcode district level (Jacquemin & Berry, 1979), more formally:

$$Industry\ Diversity_{dt} = \sum_{i=1}^{n} x_i \ln(1/x_i)$$

where x_i is the industry share of the economic activity (in this case, employment) in a given postcode district d, that is, the proportion of employment of the postcode district employed in industry i, n is the number of industries

Table 2. NACE Rev. 2 codes used to identify the information and communication technology (ICT) and cultural and creative industries.

Code	Description
ICT industries	
46.5	Wholesale of information and communication equipment
58.2	Software publishing
61	Telecommunications
62	Computer programming, consultancy and related activities
63.1	Data processing, hosting and related activities; web portals
95.1	Repair of computers and communication equipment
Cultural and creative industries	
18.11	Printers of daily newspapers
18.12	Other printers
18.13	Pre-press and pre-media industry
18.14	Bookbinding industry
18.20	Industry for the reproduction of recorded media
32.20	Industry for musical instruments
47.61	Bookshops
47.62	Specialised stores for newspapers and stationery
47.63	Retail sale of music and video recordings in specialised stores
58.11	Book publishers
58.13	Newspaper publishers
58.14	Publishers of journals and periodicals
58.19	Other publishers
58.21	Publishers of computer games
58.29	Other software publishers
59.11	Motion picture, video and television programme production companies
59.12	Motion picture, video and television programme post-production companies
59.13	Motion picture, video and television programme distribution companies
59.14	Motion picture projection companies
59.20	Sound recording studios and music publishers
60.10	Radio broadcasting companies
60.20	Television programming and broadcasting companies
63.12	Web portals
62.01	Computer programming companies
63.91	News agencies
71.11	Architect's offices
73.11	Advertising agencies etc.
73.12	Media representation services
74.10	Specialised design activities

(*Continued*)

Table 2. Continued.

Code	Description
74.20	Photographers and photographic laboratories
74.30	Translation and interpretation activities
77.22	Renting of video tapes and disks
85.52	Cultural education
90.01	Performing artists and producers of artistic and literary works
90.02	Support companies to performing arts
90.03	Artists, writers, journalists and others
90.04	Theatre and concert hall companies, etc.
91.01	Libraries and archives
91.02	Museums
91.03	Institutions for the preservation of historical sites and buildings and similar visitor attractions

Sources: Authors' elaboration from Power (2011); and Eurostat. For further information, see https://ec.europa.eu/eurostat/cache/metadata/en/isoc_se_esms.htm.

in each postcode district (time t), and ln is the natural logarithm operator.

These variables represent demand-side variables expected to correlate with the location of CWS as discussed in the hypotheses development.

We control for other location factors capturing the different district characteristics and endowments (Andersson & Larsson, 2022; Arauzo-Carod, 2021; Arauzo-Carod & Viladecans-Marsal, 2009; Cissé et al., 2020). We first control for the economic activities and population in the postcode district. The total number of employees (in the natural log, *Tot no. empl*) from Fame is measured at the postcode district area; this can positively relate to CWS locations. The size of the geographical area (km^2) is computed from Pope (2017).

The main explanatory variables are based on employees and firms working in a given district. Nevertheless, we control for other characteristics of the residents. The (residential) population density is controlled as the number of residents in the district divided by the area size (*pop. Density*). It is worth noting that the size of the area and population density are negatively correlated, as a higher amount of population and business activities are concentrated in Inner London, while Outer London has a significant proportion of the 'Green Belt'. Hence, a larger area tends to have a lower urban density and is more likely in Outer London. We also control for the number of people who work and live in the same postcode district (*No. of Resi-Work;* population survey in Census 2011).

Moreover, factors influencing office market supply are considered. To control for urban connectivity and infrastructure, we calculate the distance between the centroids of postcode district polygons to Heathrow airport polygons. We use tube station location data from the Transport for London open database at each postcode district. We control the technological development of the area using the 2016–22 average broadband speed from the Consumer Data Research Centre. Locations with better infrastructure are more likely to attract new businesses. Meanwhile, the available empty stock and other CWS competitors could also affect the location choice of CWS; hence, control variables include the office vacancy rate from CoStar (2022).

Considering that the presence of previous CWSs can attract new CWSs, for each lease event, we compute a binary variable indicating the presence (1) or absence (0) of other CWSs in a district from the cumulated number of CWS located in the district, excluding the focal CWS. The CWSs in the London sample tend to be concentrated in a few key districts only – similar to Mariotti et al. (2017) within Milan. Section 3.4 further demonstrates the distribution, with maps shown in Figure 1.

Table 3 summarises the description of all variables and sources. Time-varying explanatory variables use a one-year lag, including values from the year preceding the CWS location decision. It mitigates the endogeneity issues as the new business will not affect the existing environment immediately (Cissé et al., 2020; Wang et al., 2023).

3.4. CWS location and local indicators in maps

Figure 1 maps the CWS locations and the local indicators at the postcode district level, echoing some primary expectations. The CWS sites significantly concentrate in Central London, home to the creative industry and professional service sectors. Meanwhile, city regeneration at the Southbank or City fringe provides new development space. CWSs also show up on the high streets of some Outer London boroughs.

London's location patterns reflect shifts in office demand within knowledge-intensive sectors and spatial usage transformations, benefitting from agglomeration economies even during economic fluctuations (GLA Economics, 2018, 2020). Despite economic challenges, the ICT and CCI industries see job growth (National On-line Manpower Information System (NOMIS), 2022), with a notable increase in CCI employment across Greater London, particularly in Southbank and the Isle of Dogs. CCI's numerous small, independent businesses (Pratt, 2006) have distinct workspace needs and affordability compared with traditional services. Job numbers in flexible working vary across the metropolis, with a higher concentration of start-ups in Central and North London, aligning with the micro-environmental drivers for CWSs outlined in our hypotheses.

4. EMPIRICAL RESULTS

Table 4 provides the descriptive statistics and correlation matrix. Most variables do not exhibit high pairwise correlation coefficients, with some exceptions. In particular, the correlation between the number of CCI and ICT employees in the district is around 0.7, which may raise concerns about possible multicollinearity problems among the main explanatory variables.

Table 3. Description of variables and source.

Variable	Description	Source
DV: *CWS location choice*	Location decision among postcode districts in London; dummy = 1 if the firm chooses district *d*, 0 otherwise	CoworkIntel
Share Teleworkable	Share of employees in teleworkable industries as the ratio between the number of employees in teleworkable industries and the total number of employees in the postcode district. Teleworkable industry is defined when its teleworkable ratio is higher than the median of the teleworkable ratio of that industry (*t* – 1)	UK Labour Force Survey Fame; Dingel and Neiman (2020)
Share SMEs	Share of small and medium-sized enterprises (SMEs), computed as the number of SMEs in a given postcode district divided by the number of total firms in that postcode district (*t* – 1)	Fame
Share Start-ups	Share of start-ups (firms younger than three years) in knowledge-intensive sectors as the number of start-up firms in a given postcode district divided by the number of total firms in that postcode district (*t* – 1)	Fame
ICT empl (log)	Number of employees employed in information and communication technology (ICT)-related industries as a measure of specialisation of certain types of ICT activities (*t* – 1)	Fame
CCI empl (log)	Number of employees employed in culture and creative industries as a measure of specialisation of certain types of knowledge-intensive activities (*t* – 1)	Fame
Industrial diversity	Industrial diversity, measured as the entropy (inverse) measure of industry concentration as the proportion of economic activity in each industry – in this paper, employment (*t* – 1)	Fame
Distance to Heathrow	Distance to Heathrow (log) from the postcode district	Google Maps
No. tube stations	Number of tube stations (log) in the postcode district	Transport for London
Internet Infrastructure	Broadband (download) speed in the postcode district (aggregated from the Output Area (OA) level) (*t* – 1)	Consumer Data Research Centre
Pop. density	Number of residents divided by the size of the postcode district (log). The population is derived from the 2011 Census, with the number of usual residents between 16 and 74 years old	Census
Area size, sq. km	Land area (km^2; log) of the postcode district	Pope (2017)
No. of ResiWork (log)	Number of people who work and live in the same postcode district (aggregated from OA level)	Census 2011 population survey
Tot no. empl	Total number of employees as a measure of economic size and activity of the area (*t* – 1)	Fame
Other CWS	Presence of other co-working spaces (CWSs) in the postcode district; dummy = 1 if other CWS are located in the district, 0 otherwise	CoworkIntel
Vacancy Rate	Average vacancy rate in London office submarkets (*t* – 1)	CoStar

To ensure accuracy, we introduced the measures individually in the estimations, finding no significant deviations from our baseline. Further, Lindner et al. (2019) warn that omitting correlated (but relevant) variables can cause estimation bias and spurious correlation due to standard error deflation, a greater concern than multicollinearity. They advise retaining variables in the model to avoid spurious results, even if it inflates standard errors, ensuring no overestimation of a variable's significance. Hence, the main results keep the CCI and ICT indicators in the same estimations. Table 5 presents the main empirical results of the CLM. Models 1–3 report the estimates when explanatory variables are added in sets, while model 4 includes all. Across the results, all the control variables are consistent with expected signs.

First, the indicators for H1 show that the concentration of industries with a large proportion of teleworkable employees is positively associated with the location decision of CWSs. The shared physical space is needed for collaboration and feedback (Atkin et al., 2022;

Table 4. Descriptive statistics and correlation matrix.

	Variable	Obs.	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	DV: *CWS choice*	225,536	0.004	0.062	1															
2	*Share telework*	225,536	0.550	0.228	0.021	1														
3	*Share start-ups*	225,536	0.102	0.048	0.007	0.188	1													
4	*Share SMEs*	225,536	0.958	0.054	−0.024	−0.029	0.175	1												
5	*ICT empl*	225,536	4.595	2.686	0.057	0.259	0.199	−0.065	1											
6	*CCI empl*	225,536	5.163	2.662	0.058	0.189	0.125	−0.064	0.736	1										
7	*Industrial diversity*	225,536	2.531	0.856	0.003	0.003	0.074	0.395	0.330	0.288	1									
8	*Distance to Heathrow*	225,536	9.943	0.587	0.006	0.039	0.083	0.089	−0.111	−0.047	0.011	1								
9	*No. tube stations*	225,536	0.990	0.621	−0.001	−0.056	−0.080	0.142	−0.042	0.008	0.151	0.047	1							
10	*Internet*	225,536	34.856	15.176	−0.033	0.018	−0.006	0.158	−0.170	−0.255	0.041	−0.100	0.093	1						
11	*Pop. density*	225,536	8.221	1.055	−0.001	−0.205	−0.045	0.167	−0.172	0.010	0.073	−0.022	0.229	−0.167	1					
12	*Area size (km^2)*	225,536	1.609	0.884	−0.046	−0.248	−0.128	0.196	−0.336	−0.448	0.129	−0.116	0.473	0.382	−0.016	1				
13	*No. of ResiWork*	225,536	3.559	1.677	−0.031	−0.199	−0.109	0.172	−0.268	−0.287	0.133	−0.188	0.378	0.263	0.255	0.609	1			
14	*Tot no. empl*	225,536	9.028	1.858	0.067	0.078	0.045	−0.313	0.759	0.780	0.016	−0.089	−0.073	−0.350	−0.130	−0.420	−0.363	1		
15	*Other CWSs*	225,536	0.454	0.498	0.057	0.157	0.096	−0.123	0.478	0.540	0.103	0.024	−0.056	−0.273	0.063	−0.523	−0.284	0.568	1	
16	*Vacancy rate*	225,536	0.046	0.030	0.022	0.198	0.067	−0.216	0.353	0.266	−0.034	−0.272	−0.063	−0.166	−0.202	−0.180	−0.171	0.345	0.229	1

Table 5. Main empirical results: co-working space (CWS) location decision in Greater London at the postcode district level: conditional logit estimations.

	Hypothesis	Teleworkable Model 1	Start-ups and SMEs Model 2	Agglomeration economies Model 3	All variables Model 4
DV: *CWS location choice*					
Share teleworkable	H1	0.4809***			0.2698*
SE		(0.1516)			(0.1602)
p-value		([0.0015])			([0.0921])
Share start-ups	H2		2.2849**		2.3120**
			(0.9998)		(1.0385)
			([0.0223])		([0.0260])
Share SMEs	H2		2.2905**		2.3523**
			(0.9830)		(1.0749)
			([0.0198])		([0.0286])
ICT empl	H3a			0.0528	0.031
				(0.0335)	(0.0332)
				([0.1152])	([0.3504])
CCI empl	H3a			0.0761**	0.0623*
				(0.0342)	(0.0333)
				([0.0261])	([0.0615])
Industrial diversity	H3b			0.3879***	0.4231***
				(0.0764)	(0.0770)
				([0.0000])	([0.0000])
Control variables					
Distance to Heathrow		0.1181	0.0985	0.0745	0.0197
		(0.1444)	(0.1513)	(0.1613)	(0.1617)
		([0.4133])	([0.5147])	([0.6441])	([0.9031])
No. tube stations		0.4221***	0.4843***	0.3416***	0.3335***
		(0.0876)	(0.0806)	(0.0898)	(0.0919)
		([0.0000])	([0.0000])	([0.0001])	([0.0003])
Internet		0.0016	0.0012	0.001	0.0006
		(0.0047)	(0.0048)	(0.0057)	(0.0058)
		([0.7360])	([0.7967])	([0.8664])	([0.9221])
Pop. Density		0.0486	0.0161	0.0394	0.0345
		(0.0403)	(0.0364)	(0.0375)	(0.0362)
		([0.2271])	([0.6578])	([0.2936])	([0.3398])
Area size (km^2)		−0.4714***	−0.5180***	−0.4029***	−0.3916***
		(0.0855)	(0.0843)	(0.0900)	(0.0936)
		([0.0000])	([0.0000])	([0.0000])	([0.0000])
No. ResiWork		0.0568	0.0650*	0.0142	0.0189
		(0.0408)	(0.0403)	(0.0408)	(0.0400)
		([0.1640])	([0.1063])	([0.7277])	([0.6371])
Tot. no. empl		0.3800***	0.4009***	0.3665***	0.4288***
		(0.0346)	(0.0368)	(0.0638)	(0.0629)
		([0.0000])	([0.0000])	([0.0000])	([0.0000])
Other CWSs		1.2771***	1.2658***	1.0491***	1.0354***
		(0.1399)	(0.1417)	(0.1459)	(0.1489)
		([0.0000])	([0.0000])	([0.0000])	([0.0000])

(*Continued*)

Table 5. Continued.

	Hypothesis	Teleworkable Model 1	Start-ups and SMEs Model 2	Agglomeration economies Model 3	All variables Model 4
Vacancy rate		−1.6931	−0.8239	−1.5498	−1.9761
		(1.7061)	(1.6890)	(1.5974)	(1.6842)
		([0.3210])	([0.6257])	([0.3320])	([0.2407])
Observations		225,536	225,536	225,536	225,536
Providers		292	292	292	292
Pseudo-R^2		0.1285	0.1284	0.1372	0.1384
Log-likelihood		−4257.407	−4257.95	−4214.862	−4209.177
Chi^2		635.65***	631.196***	680.326***	735.735***

Note: The dependent variable (DV) is location choices at the postcode district level in Greater London. ( ) for clustered standard error, [( )] for p-value, ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Emanuel et al., 2023). It strengthens the function of face-to-face interaction in a shared space, which is more condensed in the city and driven by the needs of people who gain the most from meetings. During pre-pandemic, firms start to switch from the traditional fixed-term contract with fixed space to more flexible leasing contracts to facilitate new norms of working. Hence, it is expected that the adaptation of flexible working of local industries will influence the location choice of CWSs.

Results corresponding to H2 are the same as expected. The percentage of start-up firms in knowledge-intensive service industries has a significant positive effect on the CWS location choice, likewise the percentage of SMEs. CWS provides more flexible leasing to businesses with smaller sizes. Furthermore, the start-up firms in the growing stages can be more vulnerable, whereas the 'general' SMEs, though on smaller scales, have established better profiles. Two reasons can explain this effect: first, start-up entities lack the credibility of renting offices with traditional long-term leasing, while CWSs provide shorter leasing options. Second, compared with the more established firms with their team for knowledge-creation activities, the start-ups benefit more from the agglomeration externalities of clustering and knowledge-sharing environment in CWSs in their development stage (Duranton & Puga, 2001; Suire, 2019), reflected as a more significant co-location impact.

Finally, the proxies of ICT and CCI industry clusters review the impacts of different knowledge natures (H3a). While the estimates for ICT do not show a significant effect, the estimates of the CCI industry are significant in the results and across specifications, though the significance level drops when all explanatory variables are added (significance at 10%). As discussed, the knowledge-intensive industries have different dependences on the on-site knowledge spillover benefits generated in the local cluster, thus distinct needs for geographical proximity (Asheim & Gertler, 2006; Claussen et al., 2012; Isaksen, 2004; Torre & Rallet, 2005). ICT industries rely more on codified knowledge and relatively more standardised routines, with information transferred across online platforms more efficiently (e.g., Growe, 2019). On the other hand, more face-to-face engagement and tacit knowledge are fundamental to CCI (Arzaghi & Henderson, 2008). As indicated in section 2.2, the geographical proximity of people and the resulting knowledge spillover are hard to substitute in project-based and design works. Evidence from the advertising sector (Pratt, 2006) and film industry (Chapain & Stachowiak, 2017) indicate the importance of the micro-location clusters in London Soho as engaging with peers and business partners in person, while sharing the related production factors rooted in local, for example, access to finance or digital technology. Such a working and engagement style would exploit the advantages of CWS against the traditional office or distanced working.

Meanwhile, the estimates of the industrial diversity index remain positive and significant (H3b). The result echoes the importance of cross-fertilisation of ideas and agglomeration economies driving the location choice of CWS in the postcode district. The diversity indicates the agglomeration of business types, job profiles and labour intelligence locally, with greater potential for knowledge exchange and innovation in specific environments. CWS is designed for a collaborative working environment across businesses and individuals. The micro-environment also benefits the CWS with a more resilient user composition.

As robustness checks, we explore the different impacts before and after the 2020 pandemic. Empirical results are consistent with the long-term pre-COVID period, whereas there are no clear patterns in the post-pandemic period and no seeming deviations from the pre-COVID pattern. It is worth noting that the CWSs subsample after 2020 remains a relatively smaller sample with embedded economic uncertainties. In the sample, the new CWSs established during the period 2020–22 are at 60 per year with a decreasing trend over the years, while the new CWSs captured in the sample before 2020 are over 100 per year. This could be related to national/international economic trends and uncertainty during the pandemic and subsequent years.

Figure 1 shows new CWSs in both Inner London CBD and residential areas, indicating the office market is still adjusting to the lockdown impact and companies' strategies may take longer to adjust.[6]

5. IMPLICATIONS

Growing interests in regional studies draw on the regional development priorities after the pandemic, calling for exploration of how regional policy and planning can be tailored to global cities known for their high population density, productivity and social interaction (Bailey et al., 2021; Bourdin & Levratto, 2024; McCann et al., 2021). The higher mobility of individuals and widespread adoption of flexible working schemes stimulate the debates around geographical proximity, challenging the agglomeration literature's assumptions (Brechis & Lissoni, 2009; Neffke et al., 2011; Storper & Venables, 2004). Our study showcases the implications with co-working service operators, given their role of facilitating face-to-face interactions during formal and informal in-person meetings among individuals from diverse industries, job profiles, and backgrounds, potentially catalysing innovation.

The post-pandemic landscape has solidified flexible working as a staple in the modern work routine, which broadens people's residency choices from 'where is close to work' to 'where is preferred to work'. As a result, the increasing demand for CWSs over traditional office spaces offers an opportunity for policymakers involved in smart city planning and governance to strategically consider the location, design, and development of these spaces within urban environments. With the potential being recognised, it has become more common for CWS to be included in urban regeneration or revitalisation projects to attract visitors, particularly in some deprived or underdeveloped areas. Yet, understanding the location characteristics that drive the location of CWS is crucial for informing tailored incentive policies.

Our empirical findings provide insights for policy formulation by examining micro-location factors influencing the attraction of CWS and, therefore, the city development and built environment in the longer term. Sectors adopting large-scale flexible working for employees could drive substantial demand in CWS, together with a higher presence of start-ups and small firms, and knowledge-intensive sectors relying on tacit knowledge.

The importance of geographical proximity highlights the persistent demands on space for in-person engagement to nurture tacit knowledge spillover. CWS facilitates the clustering of tacit knowledge-intensive industries, underscoring policy awareness of distinct location factors to enhance knowledge collaboration (West & Bogers, 2014; Hsieh et al., 2018) and spillovers (Audretsch & Feldman, 1996; Acs et al., 2009), thereby contributing to the economic growth and innovation (Balland et al., 2015; Bathelt et al., 2004). The presence of CWSs within the micro-location represents an additional factor that policymakers should consider to stimulate innovation, thereby aiding economic growth.

Assessing CWS' reliance on small businesses and the creativity industry also addresses how the built environment empowers innovation and entrepreneurship in a digital and sharing economy. Questions on 'office occupation' (Florida et al., 2023; Van Nieuwerburgh, 2023) intend to redefine traditional office leasing with passive management to fit the flexible and collaborative working regime. Creativity and innovation are spurred by geographical (and social) proximity in co-working environments, fostering face-to-face interactions among professionals from diverse industries, roles, and backgrounds. Despite mixed findings on user engagement in CWS (Johns & Hall, 2020; Lescarret et al., 2022), they highlight the need for adaptable, accessible, and efficient future workplaces. Efforts have been made between local councils and public institutions, such as the Culture & Commerce Taskforce in London (Creative Land Trust, 2021). CWS that fosters inclusive environments promotes collaboration between cultural and commercial sectors, leveraging their unique position in the evolving workspace landscape.

6. CONCLUSIONS

Digitisation in knowledge-intensive industries unbinds skilled labour from the fixed-seat office and thus changes the urban pattern of cities. While remote working has become popular during the COVID-19 pandemic, substantial changes have occurred in the office sector even earlier. In this study, we empirically assess the location choices of CWSs within a city and the relationship with the capacity of remote working, firms' life cycle and the nature of knowledge. With the CWS sample in London, the empirical finding reveals the heterogeneity at the micro-location level. Notably, a higher proportion of 'teleworkable' jobs, the clustering of the tacit knowledge-intensive industries, and higher industrial diversity in the local postcode districts attract CWSs. The number of start-up firms in the local area also attracts the location choice of CWSs. The results are robust when controlling urban density, office vacancy rate and local infrastructure.

Our findings show the association between CWS and teleworking distribution, highlighting that CWS serves as a 'third space' from home-working (Lescarret et al., 2022). Yet questions remain whether CWS locations should align with (typically central) business clusters or residential zones dense with skilled labour (Shaw, 2023). Our analysis controls for population density and residential work–life integration based on census data. However, tracking longitudinal changes in labourers' residential choices warrants further research to explore dynamic inter- and intracity shifts when data becomes available. Furthermore, in the undisclosed attempts, though we observe more CWSs emerging in Inner London post-pandemic, the statistical result for the period 2020–22 does not reveal a definitive pattern. The data obtained from 2015 covers mid-term economic changes and early post-pandemic trends, setting the stage for future research with longitudinal data on deeper urban impact.

Meanwhile, this study aims to enhance the empirical study in agile working from individual cases and interviews with CWS leasing/registering records on a larger scale. It is also acknowledged that the data measuring office user experience and indoor activities remains sparse. Establishing a data track would help understand the exchange of tacit knowledge among the users and their network formation. Reliable data on space usage in CWS is crucial not only for the necessary changes in office service and market practices but also for the structural change of the town centre, which is worth further studies.

We selected London for the diverse urban patterns and a high concentration of CWSs, which exemplifies a typical 'global city' with extensive connections, a cosmopolitan environment, advanced services, international networking and a skilled workforce for innovation (Bathelt et al., 2004; Sassen, 1991; Taylor, 2001). The traits foster a robust demand for working spaces, energising local economic activities and entrepreneurship. The transition experience of London also serves as a good example of global cities characterised by high population density, productivity and social interaction during the pandemic. However, when applying the implication to other cities, the regional cities and towns with simpler structures and functions may not yield identical conclusions. Moreover, the polarisation observed in knowledge-intensive activities and entrepreneurship between cities (e.g., the North–South divide in the UK) necessitates further research to assess the heterogeneities between global and regional urban centres.

Finally, our study investigates the factors driving the location decision of new CWSs, capturing different forms of agglomerations and working arrangements. However, an interesting extension of the study could delve into the investigation of the development of the industry taking into account its economic output. For instance, following the study on the office industry, measures of rental revenues, the number of square feet leased, floor areas, seat capacities, or actual attendance could be interesting outcomes to be considered for the co-working industry. Exploring these aspects may yield valuable insights for policymakers and managers.

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DATA AVAILABILITY STATEMENT

Part of the research data adopted by this study are provided by CoStar and Instant Offices/CoworkIntel. Restrictions apply to the availability of these data, which were used under licence for this study. Data access is subject to the permission of CoStar and CoworkIntel. All robust check results are available from the authors upon request.

DISCLOSURE STATEMENT

No conflict of interest is declared for this study.

ETHICS STATEMENT

The research was approved by Northumbria University (ref. no. 2023-2433-4429). The study is based on secondary data, while no human participant is involved in the research.

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NOTES

1. Considering the changes of UK SOC in the Labour Force Survey in 2021, we developed one based on the latest coding index for UK SOC 2020 in the absence of a ready-made crosswalk (Office for National Statistics (ONS), 2020).
2. NACE (Statistical Classification of Economic Activities in the European Community) is the acronym used to designate the various statistical classifications of economic activities developed since 1970 in the European Union. It is derived from International Standard Industrial Classification (ISIC), in the sense that it is more detailed than ISIC. ISIC and NACE have the same items at the highest levels, where NACE is more detailed at lower levels.
3. Postcode areas include: Inner London: E, EC, N, NW, SE, SW, W and WC; and Outer London: BR, CR, DA, EN, HA, IG, KT, RM, SM, TW, UB and WD. Due to missing values for some important variables, the final number of districts in the sample is 256. Thus, the final number of observations is 225,536 (881 CWS*256 postcode districts).
4. Knowledge-intensive services are NACE Rev.2 codes: 50, 51, 58, 59, 60, 61, 62, 63, 64, 65, 66, 69, 70, 71, 72, 73, 74, 75, 78, 80, 75, 84, 85, 86, 87, 88, 89, 90, 91, 92 and 93. For additional details, see Eurostat (2023).
5. As a robustness check, we tried both measures with sectors in ICT-related manufacturing industries (NACE codes 26.1, 26.2, 26.3, 26.4 and 26.8) and without. Results remain unchanged in both scenarios. The reported exclude ICT-related manufacturing industries from the main measure. In detail, 26.1 (Manufacture of electronic components and boards), 26.2 (Manufacture of computers and peripheral equipment), 26.3 (Manufacture of communication equipment), 26.4 (Manufacture of consumer

electronics), and 26.8 (Manufacture of magnetic and optical media).
6. All robustness estimated results are available from the authors upon request.

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REFERENCES

Acs, Z. J., Braunerhjelm, P., Audretsch, D. B., & Carlsson, B. (2009). The knowledge spillover theory of entrepreneurship. *Small Business Economics*, *32*, 15–30.

Adams-Prassl, A., Boneva, T., Golin, M., & Rauh C. (2020). Work that can be done from home: Evidence on variation within and across occupations and industries. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3631584

Akcigit, U., Caicedo, S., Miguelez, E., Stantcheva, S., & Sterzi, V. (2018). *Dancing with the stars: Innovation through interactions* (No. w24466). National Bureau of Economic Research (NBER).

Althoff, L., Eckert, F., Ganapati, S., & Walsh C. (2020). The city paradox: Skilled services and remote work. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3744597

Althoff, L., Eckert, F., Ganapati, S., & Walsh C. (2022). The geography of remote work. *Regional Science and Urban Economics*, *93*, 103770. https://doi.org/10.1016/j.regsciurbeco.2022.103770

Andersson, M., & Larsson, J. P. (2022). Mysteries of the trade? Skill-specific local agglomeration economies. *Regional Studies*, *56*(9), 1538–1553. https://doi.org/10.1080/00343404.2021.1954611

Andersson, M., Larsson, J. P., & Wernberg, J. (2019). The economic microgeography of diversity and specialisation externalities – Firm-level evidence from Swedish cities. *Research Policy*, *48*(6), 1385–1398. https://doi.org/10.1016/j.respol.2019.02.003

Arauzo-Carod, J.-M. (2021). Location determinants of high-tech firms: An intra-urban approach. *Industry and Innovation*, *28* (10), 1225–1248. https://doi.org/10.1080/13662716.2021.1929868

Arauzo-Carod, J.-M., & Viladecans-Marsal, E. (2009). Industrial location at the intra-metropolitan level: The role of agglomeration economies. *Regional Studies*, *43*(4), 545–558. https://doi.org/10.1080/00343400701874172

Arzaghi, M., & Henderson, J. V. (2008). Networking off Madison avenue. *Review of Economic Studies*, *75*(4), 1011–1038. https://doi.org/10.1111/j.1467-937X.2008.00499.x

Asheim, B. T., & Coenen, L. (2006). Contextualising regional innovation systems in a globalising learning economy: On knowledge bases and institutional frameworks. *The Journal of Technology Transfer*, *31*(1), 163–173. https://doi.org/10.1007/s10961-005-5028-0

Asheim, B. T., & Gertler, M. S. (2006). *The geography of innovation: Regional innovation systems*. Oxford University Press.

Atkin, D., Chen, M. K., & Popov, A. (2022). *The returns to face-to-face interactions: Knowledge spillovers in Silicon Valley* (No. w30147). National Bureau of Economic Research (NBER).

Audretsch, D. B., & Feldman, M. P. (1996). R&D spillovers and the geography of innovation and production. *American Economic Review*, *86*(3), 630-640.

Bailey, D., Crescenzi, R., Roller, E., Anguelovski, I., Datta, A., & Harrison, J. (2021). Regions in COVID-19 recovery. *Regional Studies*, *55*(12), 1955–1965. https://doi.org/10.1080/00343404.2021.2003768

Balland, P. A., Boschma, R., & Frenken, K. (2015). Proximity and innovation: From statics to dynamics. *Regional Studies*, *49*(6), 907–920. https://doi.org/10.1080/00343404.2014.883598

Bartik, A., Cullen, Z., Glaeser, E., Luca, M., & Stanton, C. (2020). *What jobs are being done at home during the Covid-19 crisis? Evidence from firm-level surveys* (w27422). National Bureau of Economic Research (NBER).

Basile, R., Castellani, D., & Zanfei, A. (2008). Location choices of multinational firms in Europe: The role of EU cohesion policy. *Journal of International Economics*, *74*(2), 328–340. https://doi.org/10.1016/j.jinteco.2007.08.006

Bathelt, H., Malmberg, A., & Maskell, P. (2004). Clusters and knowledge: Local buzz, global pipelines and the process of knowledge creation. *Progress in Human Geography*, *28*(1), 31–56. https://doi.org/10.1191/0309132504ph469oa

Baum-Snow, N., Gendron-Carrier, N., & Pavan, R. (2024). Local productivity spillovers. *American Economic Review*, *114*(4), 1030–1069.

Beaudry, C., & Schiffauerova, A. (2009). Who's right, Marshall or Jacobs? The localization versus urbanization debate. *Research Policy*, *38*(2), 318–337. https://doi.org/10.1016/j.respol.2008.11.010

Beckmann, M., Cornelissen, T., & Kräkel, M. (2017). Self-managed working time and employee effort: Theory and evidence. *Journal of Economic Behavior & Organization*, *133*, 285–302. https://doi.org/10.1016/j.jebo.2016.11.013

Bednář, P., Danko, L., & Smékalová, L. (2023). Coworking spaces and creative communities: Making resilient coworking spaces through knowledge sharing and collective learning. *European Planning Studies*, *31*(3), 490–507. https://doi.org/10.1080/09654313.2021.1944065

Blinder, A.S. (2009). How many US jobs might be offshorable? *World Economics*, *10*(2), 41–78.

Blinder, A. S., & Krueger, A. B. (2013). Alternative measures of-offshorability: A survey approach. *Journal of Labor Economics*, *31*(S1), S97–S128. https://doi.org/10.1086/669061

Bloom, N., Bunn, P., Mizen, P., Smietanka, P., & Thwaites, G. (2023). The impact of COVID-19 on productivity. *Review of Economics and Statistics*, pp.1û45. https://doi.org/10.1162/rest_a_01298

Bloom, N., Han, R., & Liang, J. (2022). *How hybrid working from home works out* (No. w30292). National Bureau of Economic Research (NBER).

Bloom, N., Liang, J., Roberts, J., & Ying, Z. J. (2015). Does working from home work? Evidence from a Chinese experiment. *The Quarterly Journal of Economics*, *130*(1), 165–218. https://doi.org/10.1093/qje/qju032

Bourdin, S., & Levratto, N. (2024). The spatial footprint of COVID-19 and local policy answers. *Regional Studies*, *58*(2), 255–262. https://doi.org/10.1080/00343404.2023.2242411

Brechis, S., & Lissoni, F. (2009). Mobility of skilled workers and co-invention networks: An anatomy of localized knowledge flows. *Journal of Economic Geography*, *9*(4), 439–468. https://doi.org/10.1093/jeg/lbp008

Calvino, F., Criscuolo, C., & Menon, C. (2015). *Cross-country evidence on start-up dynamics*. OECD. http://doi.org/10.1787/5jrxtkb9mxtb-en

Cantwell, J., & Piscitello, L. (2005). Recent location of foreign-owned research and development activities by large multinational corporations in the European regions: The role of spillovers and externalities. *Regional Studies*, *39*(1), 1–16. https://doi.org/10.1080/0034340052000320824

Carlino, G., & Kerr, W. R. (2015). Agglomeration and innovation. In Duranton, G., Henderson, J. V., & Strange, W.C. (Eds.), *Handbook of regional and urban economics* (pp. 349–404). Elsevier.

Castilho, M. F., & Quandt, C. O. (2017). Collaborative capability in coworking spaces: Convenience sharing or community building? *Technology Innovation Management Review*, *7*(12), 32–42. https://doi.org/10.22215/timreview/1126

Chapain, C., & Stachowiak, K. (2017). Innovation dynamics in the film industry: The case of the soho cluster in London. In C. Chapain, & T. Stryjakiewicz (Eds.), *Creative industries in Europe: Drivers of new sectoral and spatial dynamics* (pp. 65–94). Springer.

Charlot, S., & Duranton, G. (2004). Communication externalities in cities. *Journal of Urban Economics*, *56*(3), 581–613. https://doi.org/10.1016/j.jue.2004.08.001

Cissé, I., Dubé, J., & Brunelle, C. (2020). New business location: How local characteristics influence individual location decision? *The Annals of Regional Science*, *64*(1), 185–214. https://doi.org/10.1007/s00168-019-00968-1

Claussen, J., Falck, O., & Grohsjean, T. (2012). The strength of direct ties: Evidence from the electronic game industry. *International Journal of Industrial Organization*, *30*(2), 223–230. https://doi.org/10.1016/j.ijindorg.2011.09.004

Coll-Martínez, E., & Méndez-Ortega, C. (2020). Agglomeration and coagglomeration of coworking spaces and creative industries in the city. *European Planning Studies*, 1–22. https://doi.org/10.1080/09654313.2020.1847256

Cooke, P. (2002). *Knowledge economies*. Routledge.

Corradini, C., Matheson, J., & Vanino, E. (2022). How important is neighbourhood labour structure in the spread of COVID-19? Within-city evidence from England. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.4190452

CoStar. (2022). *CoStar markets & submarkets data*. https://www.costar.com/

Creative Land Trust. (2021). *Culture and commerce: Fuelling creative renewal*. https://creativelandtrust.org/wp-content/uploads/2020/09/full-report-culture-and-commerce-fuelling-creative-renewal.pdf

Criscuolo, C., Gal, P. N., & Menon, C. (2014). *The dynamics of employment growth: New evidence from 18 countries* (No. 14). OECD.

De Fraja, G., Matheson, J., Mizen, P., et al. (2021a). COVID reallocation of spending: The effect of remote working on the retail and hospitality sector. *SSRN 3982122*.

De Fraja, G., Matheson, J., & Rockey, J. (2021b). Zoomshock: The geography and local labour market consequences of working from home. *Covid Economics*, *64*, 1–41.

Dingel, J. I., & Neiman, B. (2020). How many jobs can be done at home? *Journal of Public Economics*, *189*, 104235. https://doi.org/10.1016/j.jpubeco.2020.104235

Duranton, G., & Puga, D. (2001). Nursery cities: Urban diversity, process innovation, and the life cycle of products. *American Economic Review*, *91*(5), 1454–1477. https://doi.org/10.1257/aer.91.5.1454

Ellison, G., Glaeser, E. L., & Kerr, W. R. (2010). What causes industry agglomeration? Evidence from coagglomeration patterns. *American Economic Review*, *100*(3), 1195–1213. https://doi.org/10.1257/aer.100.3.1195

Emanuel, N., & Harrington, E. (2023). *Working remotely? Selection, treatment, and the market for remote work* (FRB of New York Staff Report No. 1061, June)

Emanuel, N., Harrington, E., & Pallais, A. (2023). *The power of proximity* (Working Paper). Standford.

Eriksson, R. H., & Lengyel, B. (2019). Co-worker networks and agglomeration externalities. *Economic Geography*, *95*(1), 65–89.

Eurostat. (2023). *Glossary: Knowledge-intensive services (KIS)*. https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Knowledge-intensive_services_(KIS)

Fernald, J., & Li, H. (2021). *February. The impact of COVID on potential output*. Federal Reserve Bank of San Francisco.

Florida, R., Rodríguez-Pose, A., & Storper, M. (2023). Cities in a post-COVID world. *Urban Studies*, *60*, 1509–1531. https://doi.org/10.1177/00420980211018072

Gertler, M. S. (2003). Tacit knowledge and the economic geography of context, or the undefinable tacitness of being (there). *Journal of Economic Geography*, *3*(1), 75–99. https://doi.org/10.1093/jeg/3.1.75

GLA Economics. (2018). *The mayor's economic development strategy for London*. Greater London City. https://www.london.gov.uk/sites/default/files/economic-development-strategy-2018_1.pdf

GLA Economics. (2020). *The evidence base for London's local industrial strategy* (pp. 52–56). Greater London City. https://www.london.gov.uk/sites/default/files/lis-evidence-base-final.pdf

Glaeser, E. L. (1999). Learning in cities. *Journal of Urban Economics*, *46*(2), 254–277. https://doi.org/10.1006/juec.1998.2121

Growe, A. (2019). Developing trust in face-to-face interaction of knowledge-intensive business services (KIBS). *Regional Studies*, *53*(5), 720–730. https://doi.org/10.1080/00343404.2018.1473567

Gupta, A., Mittal, V., & Van Nieuwerburgh, S. (2022). *Work from home and the office real estate apocalypse* (No. w30526). National Bureau of Economic Research (NBER).

Hansen, S., Lambert, P. J., Bloom, N., Davis, S. J., Sadun, R., & Taska, B. (2023). *Remote work across jobs, companies, and space* (Technical Report). National Bureau of Economic Research (NBER).

Harrison, B., Kelley, M. R., & Gant, J. (1996). Specialization versus diversity in local economies: The implications for innovative private-sector behaviour. *Cityscape: A Journal of Policy Development and Research*, *2*, 61–93.

Howells, J. R. L. (2002). Tacit knowledge, innovation and economic geography. *Urban Studies*, *39*(5–6), 871–884. https://doi.org/10.1080/00420980220128354

Hsieh, C.-S., Konig, M. D., Liu, X., & Zimmermann, C. (2018). *Superstar economists: Coauthorship networks and research output* (CEPR Discussion Paper No. DP13239, October). https://ssrn.com/abstract=3266432

Isaksen, A. (2004). Knowledge-based clusters and urban location: The clustering of software consultancy in Oslo. *Urban Studies*, *41*(5–6), 1157–1174. https://doi.org/10.1080/00420980410001675797

Jacobs, J. (1969). *The economy of cities*. Vintage.

Jacquemin, A. P., & Berry, C. H. (1979). Entropy measure of diversification and corporate growth. *The Journal of Industrial Economics*, *27*(4), 359. https://doi.org/10.2307/2097958

Jaffe, A. B., Trajtenberg, M., & Henderson, R. (1993). Geographic localisation of knowledge spillovers as evidenced by patent citations. *The Quarterly Journal of Economics*, *108*(3), 577–598. https://doi.org/10.2307/2118401

Jarosch, G., Oberfield, E., & Rossi-Hansberg, E. (2021). Learning from coworkers. *Econometrica*, *89*(2), 647–676. https://doi.org/10.3982/ECTA16915

Johns, J., & Hall, S. M. (2020). 'I have so little time […] I got shit I need to do': Critical perspectives on making and sharing in Manchester's FabLab. *Environment and Planning A: Economy and Space*, *52*(7), 1292–1312. https://doi.org/10.1177/0308518X19897918

Kapasi, I., & Galloway, L. (2015). Work–life balance in home-based businesses: A UK study. *The International Journal of Entrepreneurship and Innovation*, *16*(1), 33–42. https://doi.org/10.5367/ijei.2015.0170

Khurana, I., & Farhat, J. (2021). The timing of diversification and startup firms' survival: A resource-based perspective. *Industry and Innovation*, *28*(10), 1249–1269. https://doi.org/10.1080/13662716.2021.1976624

Lavoratori, K., & Castellani, D. (2021). Too close for comfort? Microgeography of agglomeration economies in the United

Kingdom. *Journal of Regional Science*, *61*(5), 1002–1028. https://doi.org/10.1111/jors.12531

Lavoratori, K., Mariotti, S., & Piscitello, L. (2020). The role of geographical and temporary proximity in MNEs' location and intra-firm co-location choices. *Regional Studies*, *54*(10), 1442–1456. https://doi.org/10.1080/00343404.2020.1732901

Lescarret, C., Lemercier, C., & Le Floch, V. (2022). Coworking spaces vs. Home: Does employees' experience of the negative aspects of working from home predict their intention to telework in a coworking space? *Frontiers in Psychology*, *13*, 1079691. https://doi.org/10.3389/fpsyg.2022.1079691

Lindner, T., Puck, J., & Verbeke, A. (2019). Misconceptions about multicollinearity in international business research: Identification, consequences, and remedies. *Journal of International Business Studies*, *51*(3), 283–298. https://doi.org/10.1057/s41267-019-00257-1

Liu, S., & Su, Y. (2022). The effect of working from home on the agglomeration economies of cities: Evidence from advertised wages. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.4109630

Mariotti, I., Pacchi, C., & Di Vita, S. (2017). Coworking spaces in Milan: ICTs, proximity, and urban effects. *Journal of Urban Technology*, *24*(3), 47–66. https://doi.org/10.1080/10630732.2017.1311556

Marshall, A. (1890). *Principles of economics*. Macmillan.

Marshall, A. (2009). *Principles of economics: Unabridged eighth edition*. Cosimo.

Martin, P., Mayer, T., & Mayneris, F. (2011). Spatial concentration and plant-level productivity in France. *Journal of Urban Economics*, *69*(2), 182–195. https://doi.org/10.1016/j.jue.2010.09.002

Maskell, P., & Malmberg, A. (1999). Localised learning and industrial competitiveness. *Cambridge Journal of Economics*, *23*(2), 167–185. https://doi.org/10.1093/cje/23.2.167

Mattana, E., Smeets, V., & Warzynski, F. (2020). Changing skill structure and COVID-19. *Covid Economics*, *45*, 1–30.

McCann, P., Ortega-Argilés, R., Sevinc, D., & Cepeda-Zorrilla, M. (2021). Rebalancing UK regional and industrial policy post-Brexit and post-COVID-19: Lessons learned and priorities for the future. *Regional Studies*, 1–13. https://doi.org/10.1080/00343404.2021.1922663

McCann, P., & Van Oort, F. (2019). Theories of agglomeration and regional economic growth: A historical review. In *Handbook of regional growth and development theories* (pp. 6–23). Edward Elgar.

McFadden, D. (1974). Conditional logit analysis of qualitative choice behavior. In P. Zarembka (Ed.), *Frontiers in econometrics* (pp. 105–142). Academic Press.

Merkel, J. (2019). 'Freelance isn't free.' Coworking as a critical urban practice to cope with informality in creative labour markets. *Urban Studies*, *56*(3), 526–547. https://doi.org/10.1177/0042098018782374

Mongey, S., Pilossoph, L., & Weinberg, A. (2021). Which workers bear the burden of social distancing? *The Journal of Economic Inequality*, *19*(3), 509–526. https://doi.org/10.1007/s10888-021-09487-6

Moriset, B. (2013). Building new places of the creative economy. The rise of coworking spaces. Paper presented at the 2nd Geography of Innovation International Conference 2014, Utrecht University.

Mudambi, R., Li, L., Ma, X., Makino, S., Qian, G., & Boschma, R. (2018). Zoom in, zoom out: Geographic scale and multinational activity. *Journal of International Business Studies*, *49*(8), 929–941. https://doi.org/10.1057/s41267-018-0158-4

Neffke, F., Henning, M., Boschma, R., Lundquist, K. J., & Olander, L. O. (2011). The dynamics of agglomeration externalities along the life cycle of industries. *Regional Studies*, *45*(1), 49–65. https://doi.org/10.1080/00343401003596307

National On-line Manpower Information System (NOMIS). (2022). *Workforce jobs by industry section (SIC 2007) – Seasonally adjusted – time series*.

Office for National Statistics (ONS). (2020). *SOC 2020 volume 2: The coding index and coding rules and conventions*. https://www.ons.gov.uk/methodology/classificationsandstandards/standardoccupationalclassificationsoc/soc2020/soc2020volume2codingrulesandconventions

Ottaviano, G. I. P. (2011). 'New' new economic geography: Firm heterogeneity and agglomeration economies. *Journal of Economic Geography*, *11*(2), 231–240. https://doi.org/10.1093/jeg/lbq041

Polanyi, M. (1958). *Personal knowledge: Towards a post-critical philosophy*. Routledge & Kegan Paul.

Pope, A. (2017). *GB postcode area, sector, district*. University of Edinburgh.

Power, D. (2011). *The European cluster observatory: Priority sector report: Creative and cultural industries*. EUR-OP.

Pratt, A. C. (2006). Advertising and creativity, a governance approach: A case study of creative agencies in London. *Environment and Planning A: Economy and Space*, *38*(10), 1883–1899. https://doi.org/10.1068/a38261

Rammer, C., Kinne, J., & Blind, K. (2020). Knowledge proximity and firm innovation: A microgeographic analysis for Berlin. *Urban Studies*, *57*(5), 996–1014. https://doi.org/10.1177/0042098018820241

Rosenthal, S. S., & Strange, W. C. (2003). Geography, industrial organization, and agglomeration. *Review of Economics and Statistics*, *85*(2), 377–393. https://doi.org/10.1162/003465303765299882

Rosenthal, S. S., & Strange, W. C. (2004). Evidence on the nature and sources of agglomeration economies. In J. V. Henderson, & J. F. Thisse (Eds.), *Handbook of regional and urban economics* (pp. 2119–2171). Elsevier.

Rosenthal, S. S., & Strange, W. C. (2020). How close Is close? The spatial reach of agglomeration economies. *Journal of Economic Perspectives*, *34*(3), 27–49. https://doi.org/10.1257/jep.34.3.27

Rupietta, K., & Beckmann, M. (2018). Working from home. *Schmalenbach Bus Review*, *70*(1), 25–55. https://doi.org/10.1007/s41464-017-0043-x

Sassen, S. (1991). *The global city*. Princeton University Press.

Savills. (2019). *European commercial – March 2019 | Flexible office space*. Savills. https://pdf.euro.savills.co.uk/european/european-investments/march-19-spotlight-european-flexible-offices.pdf

Schifano, S., Clark, A. E., Greiff, S., Vögele, C., & d'Ambrosio, C. (2021). Well-being and working from home during COVID-19. *Information Technology & People*, *36*(5), 1851–1869.

Shaw, D. (2023). Work near home: The co-working hubs for locals. BBC News. https://www.bbc.co.uk/news/business-67334476

Sparrowe, R. T., Liden, R. C., Wayne, S. J., & Kraimer, M. L. (2001). Social networks and the performance of individuals and groups. *Academy of Management Journal*, *44*(2), 316–325. https://doi.org/10.5465/3069458

Storper, M., & Venables, A. J. (2004). Buzz: Face-to-face contact and the urban economy. *Journal of Economic Geography*, *4*(4), 351–370. https://doi.org/10.1093/jnlecg/lbh027

Suire, R. (2019). Innovating by bricolage: How do firms diversify through knowledge interactions with FabLabs? *Regional Studies*, *53*(7), 939–950. https://doi.org/10.1080/00343404.2018.1522431

Taylor, P. J. (2001). Specification of the world city network. *Geographical Analysis*, *33*(2), 191–194. https://doi.org/10.1111/j.1538-4632.2001.tb00443.x

Torre, A., & Rallet, A. (2005). Proximity and localisation. *Regional Studies*, *39*(1), 47–59. https://doi.org/10.1080/0034340052000320842

Train, K. E. (2003). *Discrete choice methods with simulation*. Cambridge University Press.

URS. (2014). *Supporting places of work: Incubators, accelerators and coworking spaces*. https://www.london.gov.uk/sites/default/files/supporting_places_of_work_-_iacs.pdf

Van Nieuwerburgh, S. (2023). The remote work revolution: Impact on real estate values and the urban environment: 2023 AREUEA presidential address. *Real Estate Economics*, *51*(1), 7–48. https://doi.org/10.1111/1540-6229.12422

Van Soest, D. P., Gerking, S., & Van Oort, F. G. (2006). Spatial impacts of agglomeration externalities. *Journal of Regional Science*, *46*(5), 881–899. https://doi.org/10.1111/j.1467-9787.2006.00488.x

Wang, Y., Ascani, A., & Castaldi, C. (2023). Location choices of Chinese greenfield investments across EU regions: The role of industry and country-of-origin agglomerations. *Regional Studies*, *57*(9), 1714–1730. https://doi.org/10.1080/00343404.2022.2142542

Waters-Lynch, J., & Potts, J. (2017). The social economy of coworking spaces: A focal point model of coordination. *Review of Social Economy*, *75*(4), 417–433. https://doi.org/10.1080/00346764.2016.1269938

West, J., & Bogers, M. (2014). Leveraging external sources of innovation: A review of research on open innovation. *Journal of Product Innovation Management*, *31*(4), 814–831.

Weijs-Perrée, M., Appel-Meulenbroek, H., Gauger, F., Pfnür, A., & Orel, M. (2020). Differences in user preferences across European coworking spaces. In Kämpf-Dern, A., & Will-Zocholl, M. (Eds.), *2nd Transdisciplinary Workplace Research conference: TWR network* (pp. 14–25).

Wheaton, W. C., & Lewis, M. J. (2002). Urban wages and labor market agglomeration. *Journal of Urban Economics*, *51*(3), 542–562. https://doi.org/10.1006/juec.2001.2257

Workthere. (2022). *The Workthere Flexmark 3.0*. Savills. https://www.workthere.com/media/zwfosyhv/workthere-flexmark-3-0-final.pdf