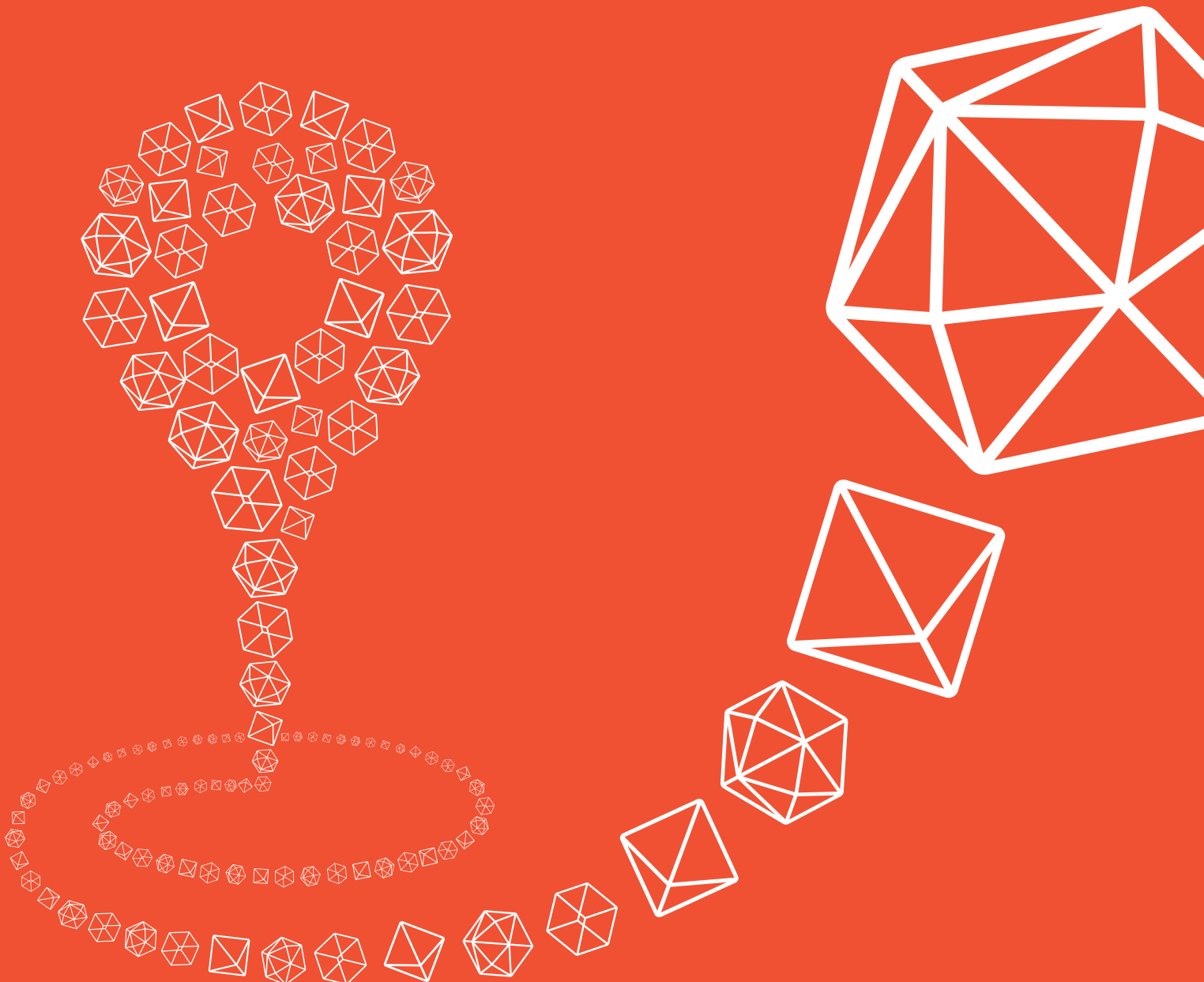


The geography of creativity

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Executive summary

Although there is an increasing recognition of the positive role that creative industries play in innovation and growth, there is little evidence on the spatial dimension of this impact. An ongoing NESTA project employs economic geography techniques to address this gap, with the aim of improving our understanding of the mechanisms through which creative industries contribute to regional innovative performance, and to inform the development of policies to support these linkages.

In this interim report, we present the results of the first stage of this research. We map the presence of creative firms across Britain as a first step towards establishing their impact on regional innovation at a second stage of the project.

Our mapping effort is informed by the influential concept of 'industrial clusters'. We define a cluster as a geographical agglomeration of firms from the same sector that collaborate and compete with each other, and have links with other actors in the location (such as universities). This geographical proximity is a source of externalities that do not simply benefit individual firms, but the whole sector. These externalities, usually referred to as 'agglomeration economies' occur as a consequence of complementarities between firms located in the same place (for example, when they draw on the same specialised pools of labour, or when knowledge spillovers take place between them). We also present the concept of 'urbanisation economies', which occur when positive spillovers take place between firms operating in different sectors that are located in the same place.

There is evidence showing that creative industries also tend to cluster in certain

places, and benefit from 'agglomeration' and 'urbanisation' economies when they do. However, very few studies to date have looked at the geographical patterns of distribution adopting a national level of analysis. This is one gap that this report sets out to address for Great Britain.

We carry out our mapping following two operational definitions used to produce estimates of the economic performance of the creative industries. These are the official definitions used by the Department of Culture, Media and Sports (DCMS) and an experimental definition developed for the DCMS by Frontier Economics. The Frontier Economics definition classifies businesses into different stages of a 'creative value chain' for every sector, beginning with those activities which are more arguably creative (for example, 'writing' in the case of the Publishing sector), and finishing with those related to the production of complementary inputs (in the case of the publishing sector, book binding and the manufacture of paper), as well as retail.

We map the creative industries across Great Britain in three stages, where we progressively increase the geographical level of resolution. We go from large aggregates (Regions) to Travel To Work Areas (which capture local labour markets) and Middle Layer Super Output Areas (which are small geographies with a similar population size).

We use the Annual Business Inquiry (ABI) and the Inter Departmental Business Register (IDBR) as data sources, focussing on the geographical distribution of firms from different sectors across the UK. This helps us identify agglomerations of firms from the same sector in a given place. We use two indicators

of agglomeration to detect the potential presence of a creative cluster in a given place. They are the absolute number of firms in that location and location quotients, which measure the level of sector specialisation in that location compared with the national average.

Our initial findings, at the regional level of analysis using both the official DCMS and the Frontier Economics definitions of the creative industries, show, as expected, a strong degree of concentration of creative activities in London, and, to a lesser extent, the Greater South East. This is particularly the case for those stages of the value chain that are more intrinsically creative according to the Frontier Economics definition. We find strong evidence of a 'regional division of labour' in Great Britain, with London concentrating on 'core' creative activities, and other regions specialising in the production of other inputs (such as, for example, raw materials) that feed into the creative process.

Increasing the level of geographical resolution to Travel To Work Areas leads to the identification of places with a strong agglomeration of different creative sectors which are not visible at the Regional level. These 'creative hubs' include Manchester, Bristol, Edinburgh, Brighton, Cambridge, Oxford, Cambridge, Wycombe-Slough, Bath and Guildford. We also identify other places that specialise in a single creative sector.

When we adopt the highest level of geographical resolution (that is, Middle Layer Super Output Areas) we find small 'creative pockets' scattered across Great Britain. This dispersion is present even for those activities which are more intrinsically creative according to the Frontier Economics definition of the creative industries.

Our mapping methodology has produced for the first time a rich and multi-layered picture of the geography of creativity in Great Britain. Although London has a predominant position in most creative sectors, and especially in the most intrinsically creative stages of the value chain, there are other places across Great Britain with strong creative presence. At the highest level of resolution, we find a rich variety of creative activities scattered across Great Britain.

These findings are not contradictory, but complementary. Although London and a few 'other creative hubs' contain the most visible and economically important creative

agglomerations, they do not have a monopoly on creativity in Great Britain. There are many other places where the creative industries are present, and might play an economically significant role. Determining whether this is the case, and improving our understanding of the defining features and evolution of these smaller 'creative pockets' could yield important policy implications.

In addition to mapping the British creative industries, we also use correlation techniques to identify statistically significant patterns in the way in which creative sectors co-locate with each other, and to explore similarities and divergences in the creative specialisation profiles of different places across the UK.

We find that two broad sub-sets of creative industries tend to co-locate. The first sub-set includes Advertising, Designer Fashion and Software, Computer Games and Electronic Publishing. The second sub-set includes Music and the Performing Arts, Video, Film and Photography, Publishing, and Radio and TV. The co-location findings for the second sub-set are weaker than for the first one.

This finding, which supports the idea that there are synergies between certain creative sectors, has potentially significant implications for policymakers tasked with supporting the creative industries in their areas. It suggests that those strategies that harness complementarities between creative sectors might be more effective than those that adopt an 'undifferentiated' approach attempting to target all creative industries at the same time. More research is needed to determine which are the drivers behind the co-location patterns that we have identified – something we will explore in the next phase of NESTA's research.

Our analysis of the specialisation profiles of different cities across Great Britain also yields interesting results. We have identified significant similarities between the ranking of creative industries in some of those cities located in the North of England, Yorkshire and the Midlands. There appears to be a degree of convergence between the specialisation profiles of cities such as Leeds, Birmingham and Liverpool. On the other hand, cities across the South appear to be more diversified, that is, different from each other.

Although these particular results need to be interpreted cautiously, given the relatively small number of observations, they have potentially significant policy implications. The similarities

that we have identified could be interpreted as evidence of similarities in regional comparative advantage, perhaps reflecting common difficulties faced by Northern cities sharing a strong industrial base as they undertake their transition to a 'knowledge' or 'creative' economy. They might also be a consequence of excessively similar, 'spatially blind' strategies to support creative industry development in these different cities. Establishing which is the case is an important issue, for both theory and practice.

Acknowledgements

We wish to thank Hasan Bakhshi for his thoughtful comments and suggestions. The members of the Steering Group for the 'Creative Clusters and Innovation' Project have also provided invaluable comments and feedback that informed the design of our methodology. Any errors and omissions are our own.

NESTA is the National Endowment for Science, Technology and the Arts.

Our aim is to transform the UK's capacity for innovation. We invest in early-stage companies, inform innovation policy and encourage a culture that helps innovation to flourish.

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Part 1: Introduction

We have a better understanding of the nature of the creative industries and their quantitative trends as a result of work sponsored by the Department for Culture Media and Sport (DCMS). These range from the *Mapping Documents* (1998, 2001) to the annual *Creative Industries Economic Estimates Statistical Bulletin*. The DCMS's measurement efforts have helped develop a strong evidence base for policymaking in the creative area. More recently, NESTA and researchers at the Queensland University of Technology have mapped where creative labour is employed in the UK, both inside and outside the creative industries (Higgs et al, 2008).

But an aggregated perspective is not enough. If we are to make better sense of the creative industries' contribution to the UK economy, and develop policies to maximise that contribution, we need to investigate their regional and local impact. The important role that regional and local bodies play in the implementation of policies to support the Creative industries underscores the importance of this exercise.

It has long been recognised that innovation happens in specific places. Firms that cluster together have been found, in some cases, to benefit from agglomeration and external economies (Bellandi, 2003, 2009; and Porter, 1990) and/or in other cases from diversity (Jacobs, 1969). There is also evidence that co-located firms develop relationships conducive to the accumulation of trust and the communication of tacit knowledge (Dei Ottati, 2003; Gertler, 2008). These clusters can shape the evolution of the regions where they are located, making them more competitive and innovative.

Creative industries form clusters too. Yet despite a growing literature on this phenomenon, there is little empirical and theoretical research into the role that these creative clusters play in regional innovation. Formulating effective policies to augment the positive impact of creative clusters in the UK will require a better understanding of where they are, how they emerge and how they impact on the broader economy (DCMS, 2008).

This report forms an interim output from a NESTA research project that addresses these fundamental questions. In it, we explore the distribution of creative industries across the UK – the geography of creativity. Our aim is to identify agglomerations of businesses that indicate the potential presence of creative clusters, and to identify regional and sectoral patterns in those agglomerations.

We will analyse the connectivity between these creative clusters and regional innovation in a second stage of the project, drawing on the Community Innovation Survey.

At a third stage of the project, we will undertake a selected number of case studies where we will examine the direction of this relationship and the mechanisms by which creative clusters impact on innovative performance in regions and cities. The use of qualitative techniques will enable us to incorporate in our analysis relational dynamics and institutional features of creative industries' local production systems that might be difficult to capture in quantitative terms (Pratt, 2004).

In order to ensure the robustness of our mapping effort, we rely on the two main definitions of the creative industries currently in use in the UK: the definition followed by

the DCMS in the production of its official estimates, and another, experimental, one recently developed by Frontier Economics. We carry out our analysis at three different geographical levels of analysis: Regions, Travel To Work Areas (which capture local labour markets), and Middle Layer Super Output Areas (high resolution geographies with similar population sizes). Adopting a regional level of analysis allows us to identify aggregated patterns of agglomeration, which we examine in further detail at the level of Travel To Work Areas and Middle Layer Super Output Areas.

In Section 2, we review the literature on industrial and creative clusters, highlighting some findings relevant to our research. In Section 3, we describe the methodology, data, indicators and geographical levels of analysis that we have adopted to map creative clusters across the UK, presenting our findings in Section 4. In Section 5, we undertake correlation analyses to explore patterns of co-location between different creative sub-sectors, as well as to establish the similarities and differences between the creative specialisation profiles of cities across Great Britain. Section 6 contains the conclusions of the report and next steps for our research.

There are four appendices in this report. The first one presents the DCMS operational definitions of the creative industries. The second and third ones respectively present the Frontier Economic model of the creative industries and the classification it proposes. The fourth appendix contains the maps that we have produced during our analysis.

Part 2: Literature review: on clusters and creative clustering

2.1 Why clustering?

a. Definitions

A rich literature on industrial clusters has flourished over the last three decades. Seminal papers by Piore and Sabel (1984), Porter (1990), Becattini *et al.* (1990), Markusen (1996), Storper (1995) and Martin and Sunley (2003) have improved our understanding of the regional dimensions of innovation. These researchers have also influenced the economic development policy agenda, where clusters are increasingly acknowledged as an important contributor to competitiveness and growth (Lisbon Agenda, 2000). In the UK, the Department of Trade and Industry's (DTI) landmark cluster mapping effort (DTI, 2001) was followed by the publication of a set of policy guidelines to support cluster development (DTI, 2002).

Porter's influential definition characterises clusters as *"Geographic concentrations of interconnected companies, specialised suppliers, service providers, firms in related industries, and associated institutions (for example universities, standards agencies, and trade associations) in particular fields that compete but also co-operate"* (Porter, 1998:199). Clusters can encompass systems of socio-economic and informal relations across firms and specialised local institutions (Saxenian, 1994), underpinned by communities of people working and living in the same place (Lange *et al.*, 2008). According to De Propris and Driffield (2005), clusters are places endowed with a 'specialised institutional thickness'. They are agglomerations of firms engaged in relationships with each other, and other actors such as universities or public support bodies.

Cluster definitions have proliferated as the use of the concept has become widespread. Although this diversity is evidence of the popularity of 'clusters' as a conceptual framework to explain spatial dynamics of innovation and growth, it also demonstrates the intrinsic 'fuzziness' of the concept (Martin and Sunley, 2003). For example some of the definitions that have been put forward focus on the link between firm size and governance (De Propris, 2001), on the innovation processes that are at work (Camagni 1991) or the degree of firm 'embeddedness' in a place (that is, the strength of their relationships with other local actors and institutions, see Bellandi and Sforzi, 2003).

Gordon and McCann (2000), Simmie and Sennett (1999) and Belussi and Arcangeli (1998) have proposed typologies based on detailed analyses of specific clusters. More recently Asheim *et al.* (2006) have presented a comprehensive survey of some of the classifications that have emerged in the US and Europe. Each looks at a specific aspect like governance, knowledge processes or company size.

Iammarino and McCann (2006) also advocate a more sophisticated understanding of clusters and their evolution, using a transaction costs approach. According to them, transaction costs, this is, the relative costs of undertaking transactions in the market, lead to the creation of different types of relationships between firms, and the emergence of three main types of cluster (pure agglomeration, industrial complex, and social network) with different governance structure and kinds of benefits for participants. They argue that differences between clusters reflect their diverse paths of evolution.

b. Cluster externalities

Industrial clusters emerge in environments where production processes are vertically disintegrated, and many firms participate in the value chain. Firms tend to congregate around markets for specialised production inputs, including labour and natural resources. This geographical concentration of complementary firms initiates processes of knowledge creation (learning and innovation) and knowledge transfer (diffusion and synergies), as ideas and knowledge, often embodied in a mobile labour force, spread between them, or spark new enterprises, such as spin-out firms (Klepper, 2008).

Repeated exchanges and interactions between firms and institutions result in an accumulation of trust that reduces transaction costs and favours further linkages. These benefits from geographical proximity, usually defined as 'agglomeration economies', generate efficiency gains that are not internal to the firm (such as scale and scope economies) but internal to the system of firms. External and agglomeration economies do not simply benefit individual firms, but all the firms in the cluster. Alfred Marshall (1923: 284) wrote in relation to industrial districts that in such complex socio-economic systems there is an 'industrial atmosphere', where 'knowledge and information are in the air' (Belussi and Caldari, 2008).

While the concept of agglomeration economies captures the benefits derived from the complementarities between firms specialised in the same sector, proponents of the 'urbanisation economies' framework present an alternative view of the way in which beneficial externalities take place between firms in geographical proximity to each other (Jacobs, 1969).

According to this perspective, it is the close location of diverse industrial sectors (rather than specialisation in the same sector), which explains higher productivity and longer-term growth in some places rather than others (Audrechst and Feldman, 1996). This diversity, it is argued, favours cross-pollination of ideas, technologies and knowledge between diverse sectors, which is a source of radical innovation. This is set in contrast with specialised clusters that favour more incremental, 'exploitative' types of innovation. Although the recent Manchester Independent Economic Review (MIER) contends that the benefits from specialised clusters are greatly overstated, and supports the urbanisation thesis (MIER,

2009a), the controversy between supporters of 'Marshall' and 'Jacobs' economies is far from resolved (Beaudry and Schifffauerova, 2009).

More recently, proponents of the 'related variety' concept have argued that beneficial externalities are more important in geographical areas where diverse sectors are able to develop intense relationships, (Asheim et al. (2007), Cooke (2007) and Boschma and lammarino, (2007)). In these cases, '*knowledge spillovers and the absorptive capacity between industries are high in the lateral dimension*' (Cooke, 2007: 7). They take place around a 'theme', rather than around a sector.

This new stream of research presents a more nuanced view of the benefits brought by 'specialisation' and 'diversity'. According to its proponents, variety is indeed a source of competitive advantage for the firms located in a place, but only insofar as the diverse sectors that are located together draw on complementary capabilities and resources. This means that different types of industries will produce different spillovers (and through different mechanisms) depending on the nature of their activities and inter-linkages (Boschma and lammarino, 2007).

2.2 Creativity and creative industries

The previous discussion has shown the acknowledgement, by both academics and policymakers, of the importance of geographical patterns of industrial concentration for regional development and growth. In the last decade, the discourse on economic development and competitiveness has increasingly emphasised creativity and 'soft forms of innovation' (Stoneman, 2009) as engines of growth. Naturally, this has been associated with increasing interest on the impact of the creative industries on innovation and growth (UNCTAD, 2008). Before examining the geographical dimensions of this impact, we discuss briefly existing definitions of creativity and the creative industries, which as we will show, impact on the mapping effort we undertake in section 4.

Creativity has been defined in a number of ways. According to Margaret Boden, it is "*the ability to come up with ideas and artefacts that are new, surprising and valuable.*" (Boden, 2003:1). The influential Cox Review of Creativity in Business defines it as "*the generation of new ideas – either new ways of*

looking at existing problems, or of seeing new opportunities, perhaps by exploiting emerging technologies or changes in markets” (HMT, 2005, p. 3). In more provocative terms, Florida (2002, p.31) suggests that “creative work is often downright subversive, since it disrupts existing patterns of thought and life” (p.31).

The diversity of definitions of creativity and related concepts demonstrates the complex multi-disciplinary nature of these constructs (UN, 2004; Garhnam, 2005; Hartley, 2005; Wiesand and Söndermann, 2005; KEA, 2006, 2009; UNESCO, 2006; EC, 2007; Galloway and Dunlop, 2007; O’Connor, 2008; UNCTAD, 2008). As UNCTAD (2008: 4) points out: “There is no unique definition of the ‘creative economy’. This is a subjective concept that is still being shaped.”

In the UK, the debate on the role of creativity and the creative industries in the economy has been driven by the Department for Culture Media and Sport (DCMS). The DCMS took an early and crucial decision to distinguish between cultural and creative industries (the former encompassing more traditionally ‘artistic’, often not commercially motivated activities), and to prioritise creative industries as instruments of economic development, urban regeneration and regional industrial diversification.

This shift from cultural to creative industries began with the *Creative Industries Mapping* document (DCMS, 1998). Here, the creative industries were defined as those industries that “are based on individual creativity, skill and talent. They also have the potential to create wealth and jobs through developing and exploiting intellectual property. The creative industries include: Advertising, Architecture, Arts and antique markets, Computer and video games, Crafts, Design, Designer Fashion, Film and video, Music, Performing arts, Publishing, Software, Television and Radio.” This definition excluded the heritage sector, archives, museums, libraries, tourism and sport although they remain part of the DCMS remit.

The pioneering status of this definition has made it common currency across the international policymaking and academic communities. Studies on creative industries from Italy, Spain, to China, and Singapore use it as a starting point (see, for instance, RSA International Conference Proceedings, April 2009; Wiesand and Söndermann, 2005; EC, 2007; UNCTAD, 2008).

2.3 Creative clusters

a. Definitions

There are fewer analyses of creative clusters than of industrial clusters. However, there is some evidence suggesting that creative industries are as likely to cluster geographically as any other industry (Lazaretti et al, 2008).

Several definitions for creative clusters have emerged, mirroring the diversity of cluster concepts more generally. The DCMS defines creative clusters as ‘groups of competing and co-operating businesses that enhance demand for specialist labour and supply networks in a particular location. Such infrastructure depends not only upon the vitality of the creative sector itself, it is also underpinned by public policy and significant public investment’ (DCMS, 2006: p.56).

De Propris (2008) defines a creative cluster as a place that brings together: a) a community of ‘creative people’ (Florida, 2002) who share an interest in novelty but not necessarily in the same subject; b) a catalysing place where people, relationships, ideas and talents can spark each other; c) an environment that offers diversity, stimuli and freedom of expression; and finally d) a thick, open and ever changing network of inter-personal exchanges that nurture individuals’ uniqueness and identity.

b. Creative Cluster externalities

Creative clustering can create benefits for businesses in the form of the previously mentioned agglomeration and urbanisation economies.

b.i. Agglomeration economies

Agglomeration economies occur when a critical mass of sector specific socio-economic and institutional activities take place in a particular place (Malmberg and Maskell, 2002).

The most relevant benefits associated with creative localisation include:

- *Pooled specialised labour market*, which are particularly relevant for those creative industries where activities are organised in self-contained projects with bespoke teams who work together for a limited period of time (Pratt, 2006). Specific characteristics of these creative outputs (e.g. a film or a theatrical performance) require different tasks and skill sets. For this reason, talents are often accessed through project-based short contracts and freelancing, and managed by so-called creative entrepreneurs

or managers (Sedita, 2008). The pooling of specialised labour in certain places reduces search and screening costs. Managers of creative projects are thus able to find the skills they need easily, and creative professionals enjoy higher levels of job stability as a result (Florida, 2002).

- *Knowledge spillovers* are difficult to quantify. As Krugman (1991: 53) points out, 'knowledge flows are invisible, they leave no paper trail by which they may be marked and tracked.' They manifest themselves as positive externalities that emerge when businesses communicate and exchange goods and services with each other. Frontier Economics (2007) use the term 'network spillovers' to refer to the way in which the presence of a collective of companies in a place (especially in the arts, performing arts, film, music and designer fashion sectors) can offer mutual stimulation of ideas, making the place more attractive for other firms. Bakhshi *et al.* (2008) find evidence that creative businesses stimulate innovation in the wider economy through their supply chain relationships with businesses in other sectors. But they do not explore the role of co-location and place.
- *Sustained relationships between individuals and firms* in a cluster lead to the build up of trust and social capital. The recurrence of interactions between businesses in a cluster reduces the costs of searching for the right partner, and uncertainty in subsequent transactions. The accumulation of 'social capital' makes interaction and collaboration between members of the cluster easier (MIER, 2009b; De Propriis, 2008). The fear of exclusion from this beneficial web of exchanges creates incentives for trustworthy, co-operative behaviours. The social networks that emerge in clusters can also enhance participants' access to valuable and often tacit information about available talent or new commercial opportunities (Storper and Venables, 2002, Lorenzen and Frederiksen, 2008; Belussi and Sedita, 2008).
- An institutional thickening might result from the agglomeration of firms specialised in a particular sector. This is linked to the emergence of an infrastructure of specialised public and private actors who provide a wide range of services to support the activities of the firms in the cluster. These might include education and training institutions, private lobbying organisations, government funded

development agencies or chambers of commerce (Lorenzen and Frederiksen, 2008).

bii. Urbanisation economies

Creative industries have also been argued to thrive in environments with a presence of diverse sectors (Lorenzen and Frederiksen 2008; Jacobs, 1969, 1984). Although the emphasis that this stream of research places on cities as sites of creativity and innovation is analogous to that present in modern analyses of the 'creative class' pioneered by Richard Florida (2002), these two frameworks articulate different mechanisms through which the creative industries impact on innovation and growth. The former focuses on the way in which geographical proximity between diverse sectors facilitates the transmission of knowledge, ideas and technologies which might be 'old' to a sector but 'new' to another (that is, on the previously discussed 'urbanisation economies'). The creative recombination of these factors is a source of innovation.

On the other hand, in his influential work, Florida argues that 'creative professionals' (including managers, researchers and scientists) tend to be attracted to cities or communities sharing a rich cultural life and tolerance for alternative lifestyles. While urbanisation economies occur through knowledge spillovers across sector boundaries in the same area, the creative class hypothesis tends to see 'diversity' as a 'magnet' for wealthy knowledge professionals and the innovative firms that require their services.

2.4 Studies on creative places

There is an increasing number of case studies on creative places, using a 'creative cluster' framework, as well as other constructs such as 'cultural quarters' (Roodhouse, 2006) or creative cities (Florida, 2008 Evans *et al.*, 2006). These studies highlight different ways in which the geographical concentration of creative businesses and professionals generate externalities (agglomeration and urbanisation economies) that improve the creative potential of the places where they are located.

Wu (2005) analyses the emergence of creative clusters (in particular, software, multimedia, video games, design, fashion, publishing and biotech) in the urban environment focusing on the relationship between such industries and a city's universities and innovative institutions.

Kebir and Crevoisier, (2008) argue that the Swiss watch-making cluster defines the cultural identity of the place and its community; indeed the authors refer to it as the 'cultural resource' that shapes the path of regional economic development.

In their analysis of the Verona performing music cluster, Belussi and Sedita (2008) contend that creative goods, such as the performance of an opera, can be understood as collective goods whose production requires the integration of complementary resources. For this reason they tend to be the output of 'a network of activities' (p.239). The co-location of participants in these networks makes external economies and increasing returns possible in a similar way to manufacturing clusters. According to these authors, geographical proximity supports 'the creativity of artistic performers through relational overlapping and inter-firm or social networks' (p.241).

There have also been recent German case studies on the film industry cluster in Potsdam (Kratke, 2002), the Cologne media cluster (Mossig, 2004) and the Leipzig media cluster (Bathelt, 2002). Lange *et al.* (2008) have also looked at Berlin as a creative city. Turok (2003) has examined the Scottish film cluster. These case studies have touched on the structure and governance of relationships inside these clusters, the mix of formal and informal relationships between firms, the drivers of new firm start-ups and the role of government intervention.

Wenting (2008) argues that the development of the fashion designer cluster in Paris was driven by the emergence of start-ups and knowledge spillovers between firms. Crewe (1996) describes the complex organisational networks that encouraged the grouping of fashion services firms in the Lace Market in Nottingham.

In their analysis of five creative sectors in New York and Los Angeles, Currid and Williams (2006) find that the creative industries they look at have clustered and developed over time following different paths. However, they have tended to locate close to each other on the basis of differences and similarities between the infrastructures they require to operate, as well as overlaps in their social and economic networks. This finding supports the existence of specificities and complementarities between creative sectors that influence their clustering patterns. We address this issue in section 5 below, where we analyse the co-location

patterns of different creative sectors within the UK.

There is also an extensive literature on Hollywood including Scott (2002), Coe (2001) and De Propriis (2008) which present it as a hybrid cluster with strong local agglomeration economies, but also powerful global connections. There are other studies that have looked into the international dimensions of creative places, including Power and Hallencreutz (2007) in the case of the music industry, and Nachum and Keeble (2003) in the media sector. The latter research finds that firms in the Central London media cluster balance their local relationships with wider links that go beyond it.

The creative industries in London have in fact been examined in several studies. For example, Grabher (2002) and Pratt (2006) have looked into the advertising sector. The Greater London Authority has undertaken a number of 'audits' of the creative industries in the capital. GLA (2004) analyses the size and employment in the sector, as well as its role as a driver of growth. One important finding of this research is that creative industries in the capital employ a proportionally higher number of people in 'creative occupations' than it is the case in other regions in the UK (see also Knell and Oakley, 2007). Freeman (2007) focuses on the inter-linkages between London's creative industries and the private (particularly financial) sector, which consumes many of its products and services.

Studies of creative clustering at higher levels of analysis are few and far between. One recent exception is Lazzeretti *et al.* (2008), who look at the geographical concentration of creative industries in Italy and Spain. Their main finding is that creative industries in these countries tend to concentrate in certain places, particularly cities. They also find that different areas present divergences in their patterns of specialisation in specific creative sectors – some have a strong presence of what the authors define as 'traditional creative industries' (Publishing, Architecture or Music), while others focus on 'non-traditional creative industries' (software, advertising and Research and Development). They argue for more analyses at the national level, a gap addressed in our research.

Part 3: Methodology

Having set out the main concepts that underpin our mapping effort, in this section we move on to describe how we have undertaken it. We present the operational definitions of the creative industries, our data sources, the geographical levels of analysis at which we carry out our mapping, and the indicators that we use to identify the potential presence of creative clusters at each of them.

3.1 Operational definitions of the creative industries

In 1998, the DCMS formulated an operational classification of the creative industries based on the Standard Industrial Classification (SIC) 4 codes (which allocate businesses to specific sectors). This operational definition, still in use in the annual statistical estimates that the DCMS produces for the creative industries (DCMS, 2009), scales the total number of businesses in a given SIC in order to estimate the total number of creative businesses in a particular creative sector. For example, 25 per cent of firms in the SIC-4 code 74.20 'Architecture and engineering activities and related technical consultancy (74.20)' are estimated to be firms in the 'Architecture' creative sector (see Appendix 1 for a full list of creative sectors and their associated SIC-4 codes). The DCMS recommends using these proportions at the national level, as the proportion of creative businesses in every SIC code is unlikely to remain constant for different localities and regions.

More recently, through its Creative Economy Programme, the DCMS has been exploring a new classification scheme. Frontier Economics has developed a new definition that is

currently being discussed between the DCMS, policymakers and creative practitioners. This operational definition uses more disaggregated SIC-5 codes with the goal of achieving a more fine-grained representation of each creative sector and its activities. For every sector, different activities are classified in 'layers', which can be interpreted as stages in a creative value chain, with content creation at the 'core' and other functions such as distribution and production of complementary outputs in the 'periphery' (DCMS, 2007b, see Appendix 2 for a figure of the Frontier Economics model and Appendix 3 for a full list of creative sectors, their constituting layers and the SIC-5 codes associated to them).

1. **Layer one** includes the potentially more intrinsically creative activities at the top of each supply chain. For example, composition for the Music industry, programming for the Computer Games industry and writing for the Publishing industry.
2. **Layer two** includes those activities which directly support layer one activities in the supply chain, including, for example, casting for the Performing Arts industry.
3. **Layer three** includes the manufacture of the hardware which directly supports the creative process – for example, the manufacture of television cameras and other hardware directly used in creating television programmes.
4. **Layer four** includes the manufacture and wholesale of raw materials and the manufacture of hardware used in the consumption of Creative Industry products

such as arcade machines for Computer Games.

5. **Layer five** represents potentially the least obviously creative activities in a creative industry such as the sale of DVD players for the music industry, and games consoles for the computer games industry.

This approach, inspired by the work of Australian cultural economist David Throsby, is aligned with other international models of the sector (UNCTAD, 2008; O'Connor; 2008), and has also been adopted by KEA (2006) and Andari *et al.* (2007) in their respective analyses of creative industries in Europe and the UK.

It is worth mentioning that not all creative sectors incorporate all of the five layers; for example, Arts and Antiques only includes Layers 2, 3 and 4 (Frontier Economics, 2008).

One significant distinction between the DCMS and Frontier Economics definitions is that while the former focuses on the arguably most 'creative part' of the industries, the latter also includes manufacturing functions, the production of complementary goods and more downstream functions, such as wholesale and retailing. Consequently, the Frontier Economics definition could be expected to produce larger aggregate estimates of the size of the creative industries. Another important difference between the DCMS and Frontier Economics definition is that the latter does not apply any scaling to the number of firms in the SIC-5 codes. This is justified by the higher level of granularity of these codes.

In this paper, we use both the official DCMS and the Frontier Economics classifications. There are three reasons for this. First, it is not yet clear whether the Frontier Economics definition will become the standard one in the future. Carrying out parallel analyses that use both classifications ensures that our research balances continuity and relevance. Second, we hope that our analysis will help establish whether these two different definitions produce distinctive results, thus contributing to the ongoing debate about their relative validity. Third, using these two definitions allows us to triangulate our results, and establish more robustly the presence of potential creative clusters across the UK.

Two of the eleven creative sectors ('Design' and 'Crafts') are not captured by any SIC-4 codes according to the DCMS definition, so – as in the official GVA estimates – we have

not been able to include them in the analysis presented in this report. We will, however, seek to consider these sectors in the qualitative part of our project.

3.2 Data Sources

The data that we use has been extracted from two sources: the Annual Business Inquiry (ABI) for the SIC-4 data and The Inter Departmental Business Register (IDBR) for the SIC-5 data.

The ABI is an annual survey of UK firms conducted by the Office for National Statistics (ONS). ABI estimates cover all UK businesses registered for Value Added Tax (VAT) and/or Pay As you Earn (PAYE), classified according to the 1992 or 2003 Standard Industrial Classification. The ABI obtains details on these businesses from the IDBR. The survey sample is chosen randomly from 77,000 registered businesses (2005 inquiry). The inquiry results are grossed up to the register population, so that they relate to all active UK businesses on the register for the sectors covered. ABI results are thus based on a sample whereas IDBR data are the parameters from the total population of registered businesses.

One limitation of ABI/IDBR is that they only provide data for businesses that are registered for VAT purposes. In 2009, this applies to those with an annual turnover of at least £68,000. It is thus impossible to capture information on freelancers, very small businesses or community and voluntary creative workers/people. The Department for Business, Innovation and Skills estimates that the total number of businesses in the UK is 4.4 million, of which the IDBR holds records for 2.1 million units representing nearly 99 per cent of UK economic activity. We acknowledge that the use of ABI/IDBR to calculate the agglomerations of creative industries might underestimate the presence of those featuring a larger proportion of freelancers and micro-businesses. For example, firms between 1 and 9 employees make the most significant contributions to turnover and employment in the Designer Fashion, Film Video and Photography and Music and the Performing Arts sectors (Frontier Economics, 2009).

Bearing this in mind, past studies of these creative sectors' clustering patterns carried out by Lorenzen and Maskell (2004) for music, Lorenzen (2007) for Video, Film and Photography, and Crewe (1996) for Designer

Fashion do nevertheless show that freelancers and small businesses tend to locate in geographical proximity to larger players. We would therefore expect smaller actors, not necessarily captured in the IDBR database, to congregate in areas where larger-size firms are present. We nevertheless advise caution in the interpretation of our results, particularly for the previously mentioned creative sectors.

ONS has been providing ABI data on number of firms, firm size and number of employees (full-time and part-time) at 4-digit SIC codes for very detailed geographical levels of analysis since 2005. Similar information can be produced using IDBR for 5-digit SIC codes. In our paper, we use firm data for the latest available dataset, which is 2007 for the ABI and 2008 for the IDBR.¹

3.3 Geographical levels of analysis

We analyse creative firm agglomeration at three geographical levels:

1. Regions are defined in line with the Government Office Regional Borders: these are nine in England. In addition, we consider the Scottish and Welsh Nations;
2. Travel To Work Areas (TTWAs) are collections of electoral wards where at least 75 per cent of the resident economically active population work in the area and where at least 75 per cent of local employees live in the area. According to the ONS, there were 243 TTWAs within the United Kingdom in 2007.² TTWAs represent self-contained local labour markets mirroring local commuting patterns. These areas are particularly appropriate to study industrial clusters because they embody not only an agglomeration of firms but a local labour market; TTWAs have been previously used in the analysis of clustering of the creative industries in Italy and in Spain carried out by Lazzeretti *et al.* (2008), as well as studies of path dependence and innovation (Simmie *et al.*, 2008) and agglomeration economies (MIER, 2009a) in the UK city regions.
3. Super Output Areas (SOAs) are geographically smaller areas than regions and TTWAs. They capture areas with comparable population sizes. They were introduced in 2004 by the ONS as a more consistent and stable entity than electoral

wards. There are currently two layers of super output area used by the statistical authorities: lower and middle layer super output areas (MSOAs). We use MSOAs, of which there are 7,193 across England, Scotland and Wales. MSOAs have a minimum size of 5,000 residents (i.e. 2,000 households) and have an average of 7,500 inhabitants. Because MSOAs are drawn on the basis of population size, geographically they appear much larger in rural areas than in urban areas. This is worth bearing in mind during our discussion of the maps of creative clusters at the MSOAs level.

We carry out our analysis at these three levels to compensate for the relative weakness that each would present on its own. For instance, analyses at the regional and TTWAs levels can average out significant clusters located in specific places inside of them. On the other hand, MSOAs are so disaggregated and fine-grained that small spikes in the number of firms located in them might create the impression of a cluster, when such spike is merely a random event; in fact, this high level of disaggregation can create some 'noise' in our maps, usually referred to as 'dartboard effect' (Ellison and Glaeser, 1997). Using these three geographical levels at the same time allows us to triangulate the findings of our mapping effort, improving their robustness.

3.4 Agglomeration indicators

We use standard location quotients (LQ) as an indicator of industrial agglomeration in a given geographical unit of analysis. It is defined mathematically as:

$$LQ = \left(\frac{F_{CSSOA}}{F_{SOA}} \right) / \left(\frac{F_{CSGB}}{F_{GB}} \right) > 1$$

where, Fcs, SOA stands for the number of creative firms in a given SOA, FSOA stands for the total number of firms for all sector in that SOA, Fcs, GB stands for the total number of creative firms in Great Britain, and FGB stands for the total number of firms in Britain.

The LQ measures, for a given unit of geographical analysis, whether there is an agglomeration of creative firms which is larger than the national average. If the LQ is greater than 1, this means that the agglomeration is greater than the national average, which indicates relative specialisation in that sector

1. Given that the high level of granularity in some of these data might raise privacy issues they were made available to the Birmingham research team by the ONS under a confidentiality agreement.

2. <http://www.statistics.gov.uk/geography/ttwa.asp>

for that unit of geographical analysis. At more granular levels of analysis (particularly MSOAs), we establish a higher threshold as indicative of specialisation (this is, when the LQ is greater than 2), in order to reduce the risk of distortions created by random spikes in the number of creative firms (Lazzeretti et al, 2008).³

We use 'number of firms' as a measure of specialisation because we want to establish the presence of creative clusters in a geographical area, rather than measure the aggregate number of creative employees or creative professionals (see Clifton (2008) for an example of this kind of analysis). This is aligned with the focus of established cluster definitions on the presence of groups of firms in a place as evidence of potential clustering.

The use of LQs as indicators of creative cluster presence does, however, present its own limitations. LQs capture the relevance of an industry within the broader economy of a particular place irrespective of the absolute number of firms actually present. This means that a small number of firms might appear relevant for a local economy where the total number of firms from all sectors is small. Conversely, LQs can hide agglomerations of creative firms in areas with a larger than average number of firms from all sectors (Lazzeretti et al, 2008). To address this issue, we complement our LQ analysis with a measure of the absolute number of firms in each of the nine creative sectors at the TTWA level. This will enable us to identify areas where, in spite of low location quotients, there is a high number of creative firms which might be indicative of cluster presence.

3. We have undertaken some exploratory analyses of the distribution of creative sectors across UK MSOAs according to their LQ, finding that the proportion of MSOAs with location quotients higher than 2 vary between 15% and 5.5% depending on the sector. This seems to support the adoption of this value as a threshold for creative sector agglomeration.

Part 4: Mapping

Having set out the conceptual underpinnings of our mapping effort, and described the data and methodology that we rely on, in this section we present the results of our mapping. We do this in three stages, adopting progressively higher levels of resolution.

First, we analyse creative agglomerations in the English Regions, and the Scottish and Welsh Nations. We calculate location quotients for all the creative sectors in these places following both the DCMS and Frontier Economics definitions of the creative industries.

We then focus on creative business agglomerations at the TTWA level for Great Britain according to the DCMS definition. We use two indicators of agglomeration (location quotients and absolute number of firms).

Finally, we adopt the highest level of resolution (MSOA level). We map agglomerations of creative sectors at this geographical level across England and Wales using Location Quotients according to the DCMS and Frontier Economics definitions of the creative industries.

We include a selection of maps in the main body of this section to illustrate some of our key findings. The rest of the maps, compiled at the three levels of geographical analysis for all sectors can be found in Appendix 4.

4.1 Regional profiles

We begin by looking into the distribution of firms by creative sector across the English regions, Wales, and Scotland, using the official DCMS and Frontier Economics definitions of the creative industries for the most recent

available years (2007 in the case of the DCMS definition, and 2008 for the Frontier Economics Definition).

When we use the DCMS definition of the creative industries, we find that London displays a high concentration of creative firms in almost all sectors, particularly Advertising, Designer Fashion, Video, Film and Photography, Music and the Performing Arts, Publishing and Radio and TV (see Table 1, where we highlight LQs higher than 1 and 2). Some sectors like Publishing, Advertising and Software, Computer Games and Electronic Publishing are concentrated in a few regions (mostly in London and the South/South East) while others like Architecture and Arts/Antiques are more evenly distributed across the English Regions, Wales and Scotland.

Adopting The Frontier Economics definition gives us a much more finely grained view of the distribution of creative activities across Great Britain, unearthing strong patterns of creative specialisation that are not visible when using the official DCMS definitions. The results are presented in Table 2.

The key finding is that London specialises in the most intrinsically creative activities for all sectors (that is, layers 1 and 2 of the creative value chain). The capital presents higher than average levels of creative specialisation in the first layer of the Frontier Economics definition for all creative sectors. We find that even Architecture, which did not seem to be agglomerated in London according to the DCMS definition, does actually concentrate in the capital, but only in its most creative layer (architectural design).

In contrast, most regions outside London that do in fact present levels of positive creative specialisation tend to host activities involving the manufacture of intermediate inputs, or equipment for consuming creative content (that is, they specialise in layers 3 to 5 of the sector's value chain).

Table 1: Location quotients by creative sectors and by regions – 2007 – DCMS definition

Industry	North East	North West	Yorkshire & The Humber	East Midlands	West Midlands	East	London	South East	South West	Wales	Scotland	England and Wales	Great Britain
Advertising	0.69	1.18	0.74	0.72	0.76	0.91	1.77	1.06	0.8	0.42	0.55	1.03	1
Architecture	1.39	1.07	0.86	0.93	0.97	1.04	0.81	1.06	0.96	0.75	1.42	0.97	1
Arts and Antiques	1.09	1.05	1.09	0.98	1.03	0.97	0.82	0.95	1.15	1.1	1.08	0.99	1
Designer Fashion	0.64	1.15	0.77	2.73	0.98	0.55	1.73	0.39	0.55	0.48	0.76	1.02	1
Video, Film and Photography	0.55	0.57	0.56	0.49	0.5	0.71	2.68	0.94	0.77	0.55	0.69	1.02	1
Music and the Visual and Performing Arts	0.55	0.62	0.59	0.59	0.55	0.82	2.36	1	0.88	0.73	0.6	1.03	1
Publishing	0.51	0.62	0.65	0.7	0.66	1.06	1.82	1.13	1.07	0.64	0.75	1.02	1
Software, Computer Games and Electronic Publishing	0.71	0.97	0.64	0.73	0.81	1.09	1.31	1.41	0.87	0.52	0.75	1.02	1
Radio and TV	0.38	0.53	0.36	0.3	0.43	0.56	3.05	0.9	0.74	0.96	0.56	1.03	1
Total Creative Industries	0.91	0.94	0.79	0.82	0.84	0.97	1.37	1.09	0.95	0.75	0.94	1	1
Whole Economy exc. Agri. & Prim.	1	1	1	1	1	1	1	1	1	1	1	1	1

Source: JCIS/ABI (2007)

Table 2: Location quotient by creative sectors and by regions – 2008 – Frontier Economics

	North East	North West	Yorkshire & The Humber	East Midlands	West Midlands	East	London	South East	South West	Wales	Scotland	Great Britain
Advertising	0.73	1.04	0.76	0.71	0.79	0.93	1.75	1.08	0.83	0.45	0.58	1
L1- planning advertising campaigns	0.7	0.95	0.79	0.68	0.74	0.97	1.77	1.11	0.9	0.45	0.54	1
L5- Other advertising activities	0.8	1.21	0.72	0.78	0.9	0.85	1.71	1.02	0.7	0.43	0.66	1
Architecture	1	0.99	1.04	1.06	1	1.17	0.75	1.05	1.1	1	1.03	1
L1- architectural design & urban planning	0.83	0.78	0.85	0.76	0.8	0.88	1.49	0.96	1	0.76	1.3	1
L2- Engineering advice & design	1.45	1.15	0.81	0.95	0.97	1.01	0.73	1.05	0.94	0.71	1.6	1
L3- Scientific Surveying (e.g. geological), construction, real estate	0.95	0.93	1.04	1.04	0.95	1.19	0.83	1.04	1.16	1.1	0.9	1
L4- Sale of construction materials	0.96	1.02	1.1	1.12	1.07	1.2	0.63	1.06	1.09	0.98	1	1
Arts, Antiques and Craft Activities	0.83	0.91	1.14	1.09	1.38	0.95	1.06	0.88	1.03	0.85	0.77	1
L2- Exhibitions & fairs, antiques	0.61	0.55	0.78	0.8	0.87	0.84	1.78	1.03	1.07	0.65	0.88	1
L3- Manufacture of jewellery, metal products, pottery	0.98	1	1.28	1.28	1.75	0.98	0.6	0.82	1.06	1.06	0.8	1
L4- Wholesale of craft products	0.68	0.95	1.09	0.92	1.06	0.97	1.43	0.91	0.96	0.61	0.65	1
Designer Fashion	0.97	1.11	1.05	1.19	0.94	0.82	1.33	0.79	0.85	0.86	0.93	1
L1- Fashion, interior & graphic design	0.74	0.7	0.82	0.89	0.74	0.95	1.83	1.07	0.84	0.54	0.66	1
L3- Manufacture of clothing	0.66	1.13	0.77	2.67	1.1	0.53	1.7	0.39	0.54	0.54	0.74	1
L4- Manufacture of textiles and fabrics	0.47	1.48	1.19	1.65	0.78	0.71	1.71	0.54	0.57	0.49	0.63	1
L5- Retail sale of clothes	1.26	1.13	1.12	0.95	1.04	0.85	0.97	0.84	0.98	1.13	1.16	1
Video, Film and Photography	0.67	0.65	0.68	0.57	0.58	0.78	2.34	0.97	0.8	0.6	0.7	1
L1- Specialist photography, production of films & documentaries, post-production	0.49	0.57	0.52	0.46	0.45	0.69	2.76	0.97	0.77	0.54	0.58	1
L2- Portrait photos	0.69	0.86	0.91	0.68	0.68	0.94	1.9	0.98	0.69	0.63	0.8	1
L3- Film distribution, camera & film manufacture	1.08	0.79	1.02	0.83	0.87	1	1.43	0.99	0.88	0.67	0.94	1
L5- Cinemas	0.95	0.92	0.9	0.55	0.79	0.76	1.4	0.83	1.26	1.38	1.19	1
Music and performing Arts	0.55	0.6	0.59	0.57	0.55	0.83	2.35	1.02	0.88	0.74	0.57	1
L1- Live theatrical presentation, artistic interpretation	0.4	0.47	0.48	0.43	0.45	0.79	2.7	1.06	0.85	0.59	0.47	1
L2- Casting, theatres and concert halls, music publishing	0.56	0.58	0.45	0.59	0.58	0.71	2.65	0.9	0.76	0.63	0.65	1
L3- Sale of musical instruments, sound recording	0.68	0.74	0.82	0.71	0.64	0.95	2.08	0.99	0.79	0.63	0.53	1
L4- Wholesale of records	0.59	0.51	0.59	0.64	0.52	1.4	2.44	1.05	0.49	0.21	0.37	1
L5- Other recreational activities	1.25	1.18	0.92	1.1	0.99	0.88	0.57	0.91	1.28	1.83	1.15	1

	North East	North West	Yorkshire & The Humber	East Midlands	West Midlands	East	London	South East	South West	Wales	Scotland	Great Britain
Publishing	0.81	1.01	0.8	0.93	0.99	1.03	1.2	1.1	0.97	0.88	0.74	1
L1- Journalism & news syndicates	0.54	0.67	0.54	0.76	0.58	1.01	2.19	0.94	0.67	0.59	0.96	1
L2- Publishing	0.61	0.62	0.66	0.74	0.7	1	1.64	1.16	1.16	0.68	0.85	1
L3- Bookbinding, printing	0.72	0.99	0.76	0.95	1	1.06	1.22	1.15	0.98	0.85	0.63	1
L4- Manufacture of paper and ink	0.62	1.8	1.25	1.21	1	1.11	0.57	0.76	0.82	1.13	1.04	1
L5- Retail sale of books, newsagents etc.	1.34	1.25	1.08	0.91	1.05	0.84	0.94	0.81	0.92	1.12	1.27	1
Software and Computer Games	0.56	0.81	0.7	0.79	0.84	1.13	1.31	1.4	0.93	0.59	0.7	1
L1- Manufacture of video games, software development & consultancy	0.49	0.72	0.63	0.75	0.82	1.16	1.47	1.46	0.83	0.49	0.67	1
L2- Other computer related work	0.58	0.96	0.74	0.79	0.86	1.03	1.14	1.39	1.16	0.7	0.62	1
L3- Hardware consultancy	0.68	0.75	0.84	0.99	0.8	1.29	1.18	1.38	0.9	0.6	0.59	1
L4- Wholesale of hardware and software	0.66	0.9	1.01	0.94	0.99	1.2	1.08	1.23	0.86	0.62	0.77	1
L5- Retail sale	1.07	1.09	1.08	0.96	0.96	1.05	0.62	1.02	1.16	1.18	1.31	1
Radio and TV	0.72	0.85	0.77	0.8	0.83	0.94	1.63	0.97	0.91	0.98	0.79	1
L1- Radio & TV production and broadcast	0.36	0.54	0.36	0.34	0.44	0.56	2.99	0.9	0.74	0.99	0.56	1
L3- Transmitters and TV cameras	0.42	0.98	0.68	0.55	1.21	1.26	0.7	1.5	1.12	1.23	0.7	1
L4- Wholesale and manufacture of TV & cameras	0.79	0.93	0.92	0.95	1.01	1.23	1.11	1.13	0.91	0.73	0.73	1
L5- Retail sale	0.97	1.04	1	1.08	1.02	1.07	0.92	0.94	1.04	1.07	0.99	1
All Creative industries	0.85	0.94	0.91	0.96	0.94	1.07	1.13	1.08	1	0.86	0.87	1
Layer 1	0.56	0.69	0.63	0.67	0.71	0.98	1.86	1.23	0.84	0.55	0.69	1
Layer 2	0.97	0.99	0.76	0.84	0.88	0.98	1.13	1.17	1.02	0.69	1.07	1
Layer 3	0.85	0.95	0.93	1.03	1	1.11	1.02	1.07	1.06	0.97	0.78	1
Layer 4	0.9	1.04	1.1	1.14	1.05	1.16	0.76	1.03	1.04	0.92	0.95	1
Layer 5	1.23	1.15	1.08	0.96	1.03	0.89	0.9	0.86	1.01	1.17	1.19	1

Source: JCIS/ABI (2008)

Table 3: The concentration of creative sectors by region- comparison between DCMS and Frontier Economics definitions

Industry	DCMS definition	Frontier Economics definition
Advertising	Very highly concentrated in London, with significant presence in the North West and, to a lesser extent, in the South East.	Largely concentrated in London with some concentration in the North West at Layer 5: ranging from leasing of advertising time to handing out free samples. Some presence in the South East in both layers.
Architecture	Evenly distributed, with a larger degree of concentration in Scotland and the North East.	Evenly distributed overall. London presents high levels of concentration at layer 1: design and planning. Scotland also concentrates on Layer 1 and 2. The North East and North West presents concentration at layer 2: Engineering for construction projects.
Arts and Antiques	Very evenly distributed across Great Britain with stronger concentration in the South West, Scotland, Yorkshire and the Humber and the North East.	Very evenly distributed across Great Britain. The West Midlands present particularly high levels of concentration in Layer 3 (manufacturing of crafts). The East Midlands and Yorkshire and the Humber also concentrate in this layer.
Designer Fashion	Very highly concentrated in London and the East Midlands, with some concentration in the North West.	Very highly concentrated in London, particularly in layers 1 (fashion, interior and graphic design), 3 (manufacturing of clothing) and 4 (manufacturing of textiles and fabrics). High concentration of layer 3 in the East Midlands (manufacturing of clothing) and, to a lesser extent, the North West and Yorkshire and the Humber.
Video, Film and Photography	Very highly concentrated in London.	Very highly concentrated in London for all layers.
Music and the Visual and Performing Arts	Very highly concentrated in London.	Very highly concentrated in London for all layers. Some presence of layer 1 activities (live theatrical presentation and artistic interpretation) in the South East. Concentration of layer 4 (wholesale of records) in the East. Layer 5 (other recreational activities) dispersed across the country.
Publishing	Highly concentrated in London, with some concentration in the East, South East and South West.	Highly concentrated in London (mostly in Layer 1: Journalism and Press, and Layer 2: publishing houses). Also present in the East (layers 3 and 4), South East (Layers 2 and 3) and South West (Layer 2). The North West, Yorkshire and the Humber and the West Midlands presents high levels of concentration in Layer 4: manufacture of paper.
Software, Computer Games and Electronic Publishing	Highly concentrated in the South East and London, and, to a lesser degree, in the East.	Higher levels of concentration in London and the South East, and, to a lesser degree, in the East. For all of them, the concentration occurs across almost all layers (from development activities to wholesale).
Radio and TV	Extremely concentrated in London.	Highly concentrated in London (in Layer 1: Radio and TV production and broadcast), concentration in East and South East for layers 3 and 4 (manufacture of TV cameras and TV sets).

There are exceptions to London's almost universal dominance of 'core creative activities' in the case of the South-East of England, where we also identify a strong concentration of firms in layer 1 activities at the aggregate level. This is particularly the case for Advertising, Music and the Performing Arts and Software and Computer Games. The East of England also presents a clear specialisation in layer 1 activities in Software, Computer Games and Electronic Publishing. Only one area further up north shows significant levels of specialisation in layer 1 activities, Scotland in Architecture.

Our analysis using the Frontier Economics definition supports the idea of a regional division of creative labour between London and other regions in some sectors. For example, in the case of Designer Fashion, London specialises in fashion design and the manufacturing of textiles, while clothes are manufactured in the East Midlands.

In the Radio and TV sector, we find that while London produces Radio & TV shows, the South East manufactures the cameras and TV sets. In Publishing, writing and publishing is concentrated in London, the South East and the South West, while paper is produced in the North West, Yorkshire and the Humber, and the East Midlands.

4.2 Travel To Work Area mapping

As we pointed out previously, indicators of agglomeration calculated for large territories (such as regions) might 'average out' significant creative concentrations in smaller zones within them, thus hiding the presence of potential creative clusters. In order to address this issue, in this sub-section we increase the level of resolution in our analysis, by focussing on the TTWA level.

For every sector, we have produced two maps depicting creative agglomerations across Great Britain TTWAs according to two indicators, location quotients and absolute number of firms in the sector. These indicators have been calculated according to the DCMS definition of the creative industries using ABI data from the most recent available year, 2007. Those maps not included in the body of this section are available in Appendix 4.

Maps 1 and 2 in the main body of this section illustrate the rationale for adopting this dual

approach. They show the agglomeration of 'Photography, Video and Film' firms across the UK in terms of the location quotient (Map 2) and total number of firms (Map 2) for every TTWA.

Using LQs allows us to control for the total population of firms in a given TTWA, and gives us a measure of how specialised in that sector is the TTWA in comparison with the country average. When we calculate them we find that the sector is particularly concentrated in very few TTWAs, namely, London, Brighton and Wycombe-Slough, all of which have a proportion of 'Photography, Video and Film' firms that is at least twice as large as the British average. In contrast, when we measure the total number of 'Photography, Video and Film' firms by TTWA, we find more of them in larger cities such as Manchester and Birmingham, which was to be expected. Comparing both results would seem to indicate that although these two cities have large number of 'Photography, Video and Film' firms, the sector does not play as strong an economic role as it does in other places.

We compare sector agglomerations according to each indicator in table 4. Although our results confirm London as the UK's creative powerhouse, with all creative sectors (with the exception of Architecture and Arts and Antiques), presenting strong levels of concentration in the capital, at this more detailed level of analysis we have also been able to identify other creative 'hubs' across the UK. These are places where several creative sectors concentrate at the same time. They include:

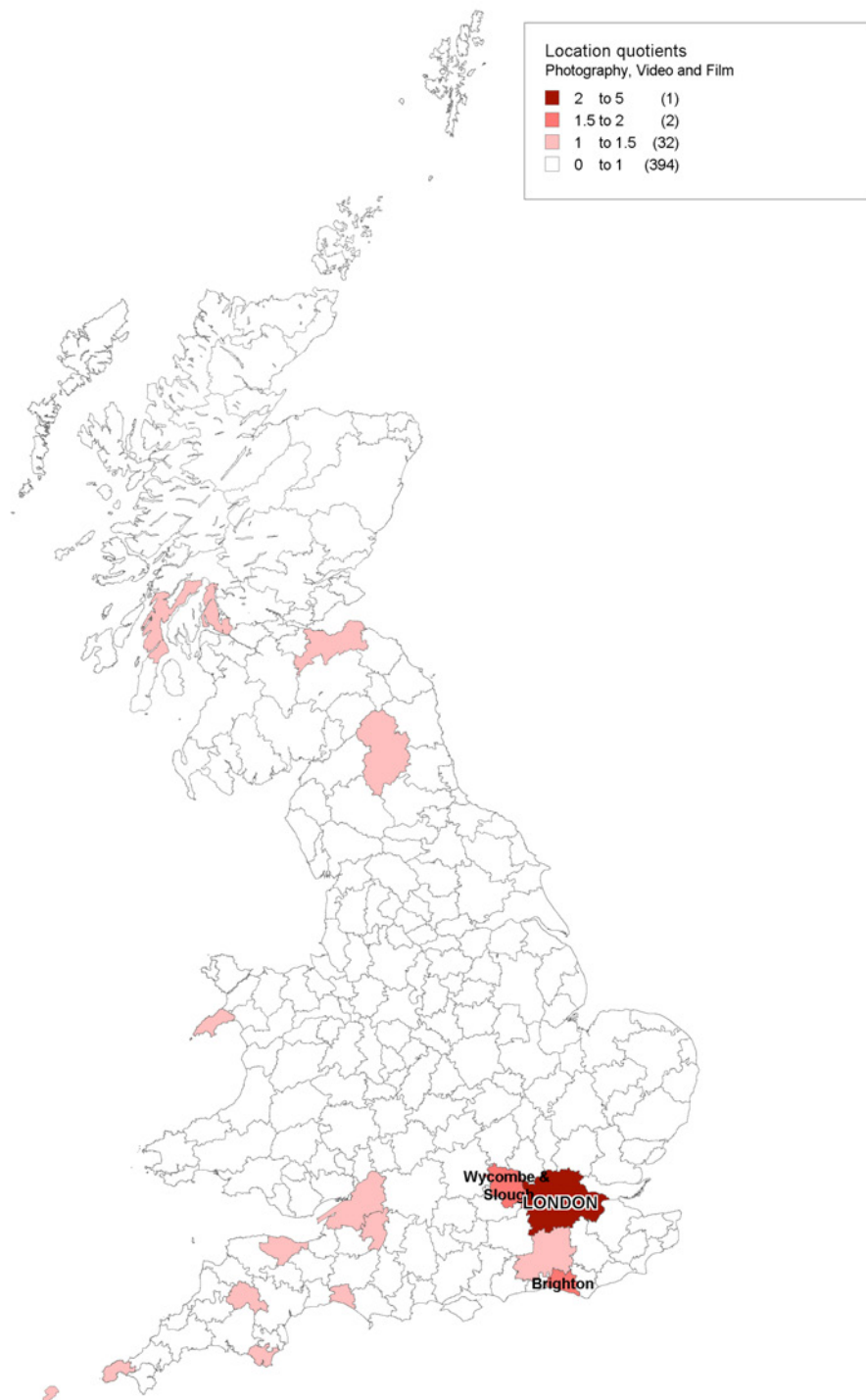
- **Bristol:** specialising in Architecture, Video, Film and Photography, Software, Computer Games and Electronic Publishing, and Radio and TV.
- **Bath:** specialising in Advertising, Architecture, Designer Fashion, Video, Film and Photography, Music and the Performing Arts, Publishing, and Radio and TV.
- **Edinburgh:** Specialised in Advertising, Architecture, Arts and Antiques, Video, Film and Photography, Publishing, and Software, Computer Games and Electronic Publishing.
- **Manchester:** specialising in Advertising, Architecture, Software, Computer Games and Electronic Publishing, and Radio and TV.

- **Brighton:** specialising in Arts and Antiques, Designer Fashion, Video, Film and Photography, Music and the Performing Arts, Publishing, Software, Computer Games and Electronic Publishing, and Radio and TV.
- **Oxford:** specialising in Architecture, Designer Fashion, Music and the Performing Arts, Publishing and Software, Computer Games and Electronic Publishing.
- **Wycombe and Slough:** specialising in Advertising, Designer Fashion, Video, Film and Photography, Music and the Performing Arts, Software, Computer Games and Electronic Publishing, and Radio and TV.
- **Cambridge:** specialising in Architecture, Designer Fashion, Publishing, and Software, Computer Games and Electronic Publishing.
- **Guildford:** specialising in Advertising, Architecture, Designer Fashion and Software, Computer Games and Electronic Publishing.

The TTWA analysis has also helped us to identify areas with strong levels of agglomeration in a single creative sector. Amongst these more specialised clusters we find Blackpool and Turnbridge Wells (Advertising), Aberdeen (Architecture), Whitby (Arts and Antiques), and Milton Keynes (Software, Computer Games and Electronic Publishing). Cardiff shows a strong agglomeration of Radio & TV firms, probably linked to the presence of the BBC Regional Offices in this city.

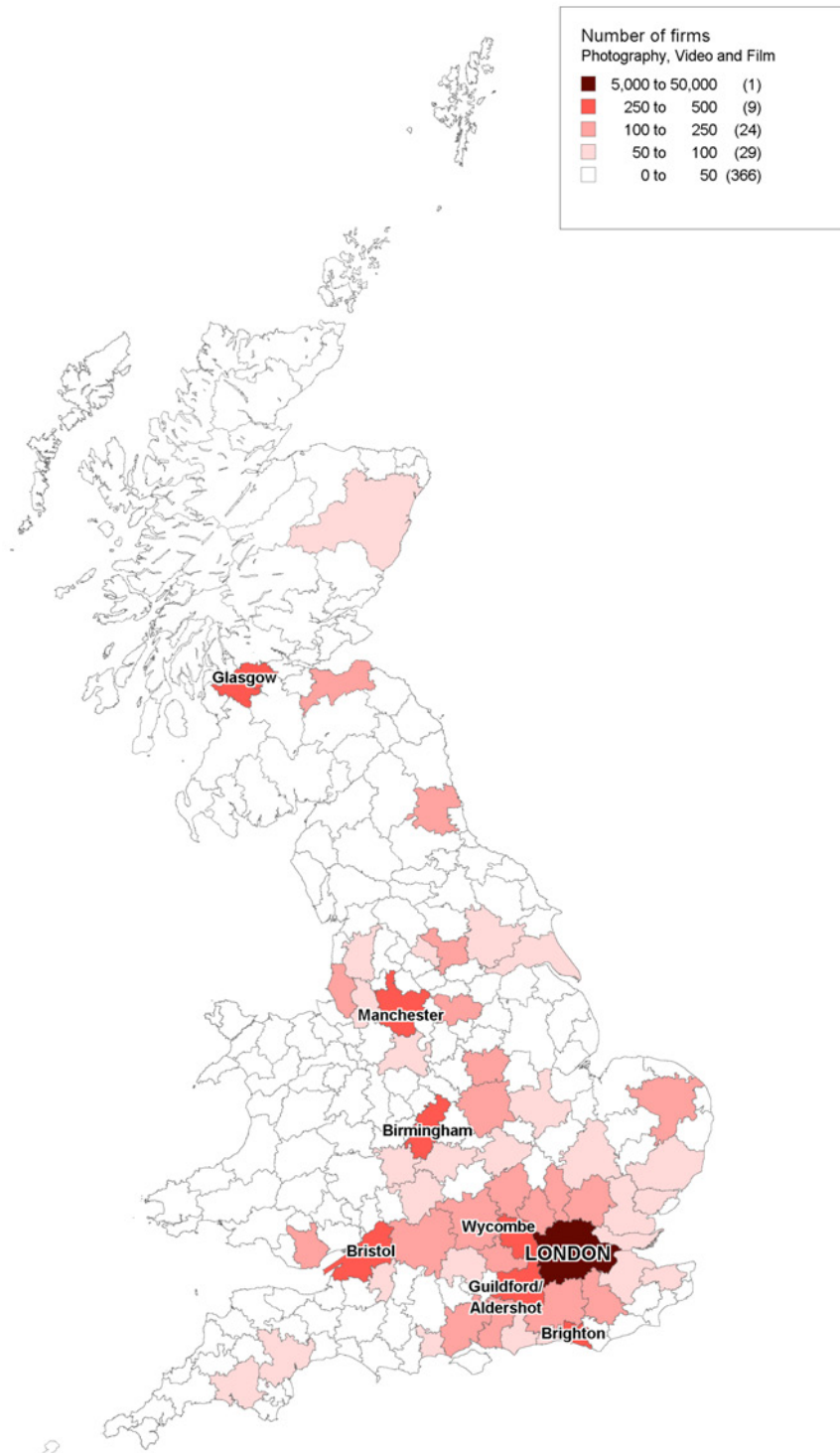
We also detect some sector specific patterns of concentration. The Arts and Antiques sector is very evenly distributed across the country (see map 3). This is possibly a consequence of the way the sector operates, with a strong focus on retailing which tends to be more evenly distributed across the British geography. Map 4 shows how Architecture seems to concentrate around construction and engineering 'hotspots' such as Aberdeen, Middlesborough or Whitehaven. For Radio and TV, agglomerations are present in those areas with BBC regional offices and Scottish Gaelic radio stations (see map 5). Finally, although our maps for total number of firms for the Software, Computer Games and Electronic Publishing sector show a high level of dispersion for this sector across the UK, when we use LQs we are able to identify an area with high levels of concentration around Cambridge's Silicon Fen, Guildford and Wycombe and Slough (compare Maps 6 and 7).

Map 1: Photography, Video and Film – Location Quotients by TTWA (DCMS Definition) – 2007



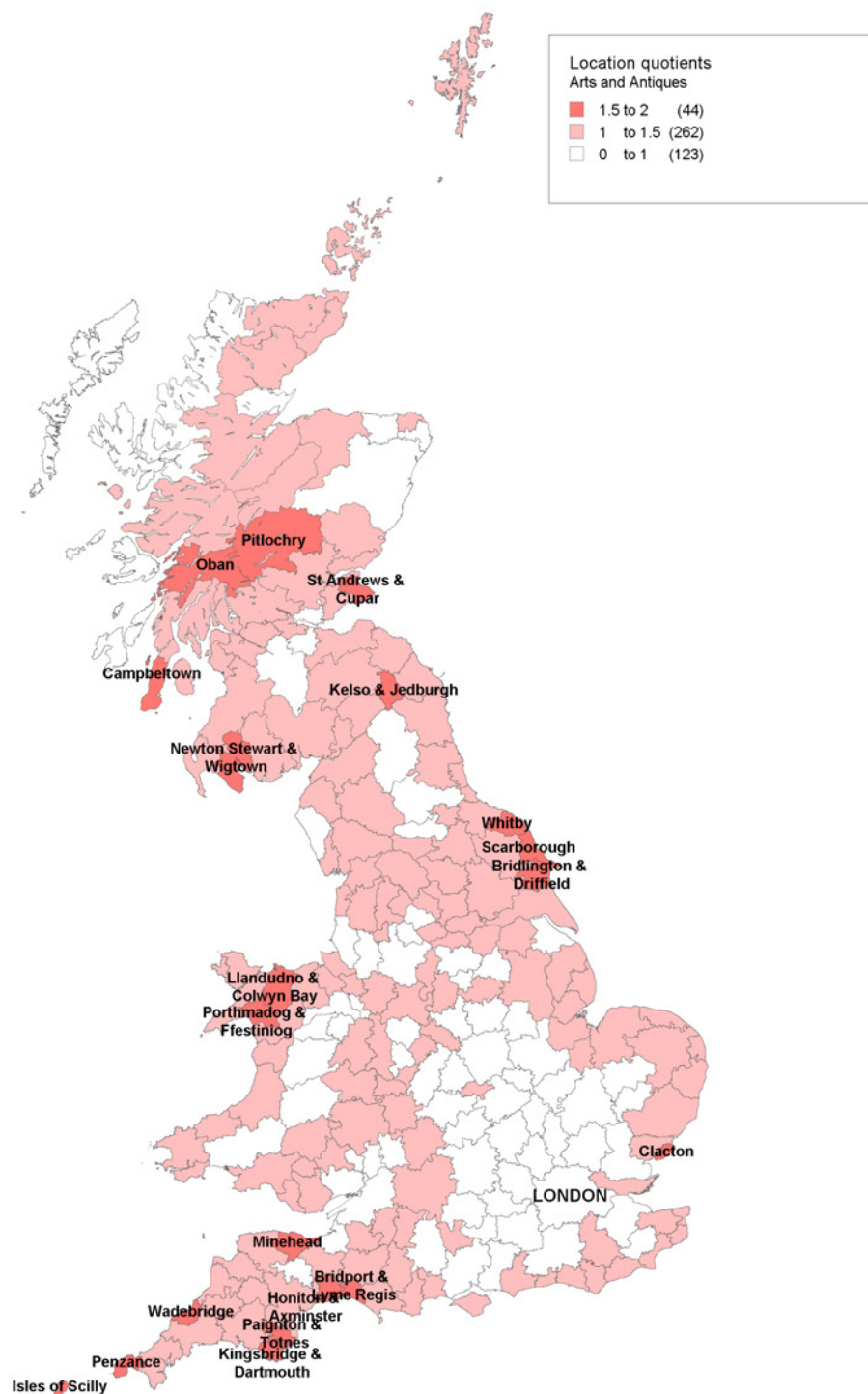
Source: JCIS/ABI (2007)

Map 2: Photography, Video and Film – Number of Firms by TTWA (DCMS Definition) – 2007



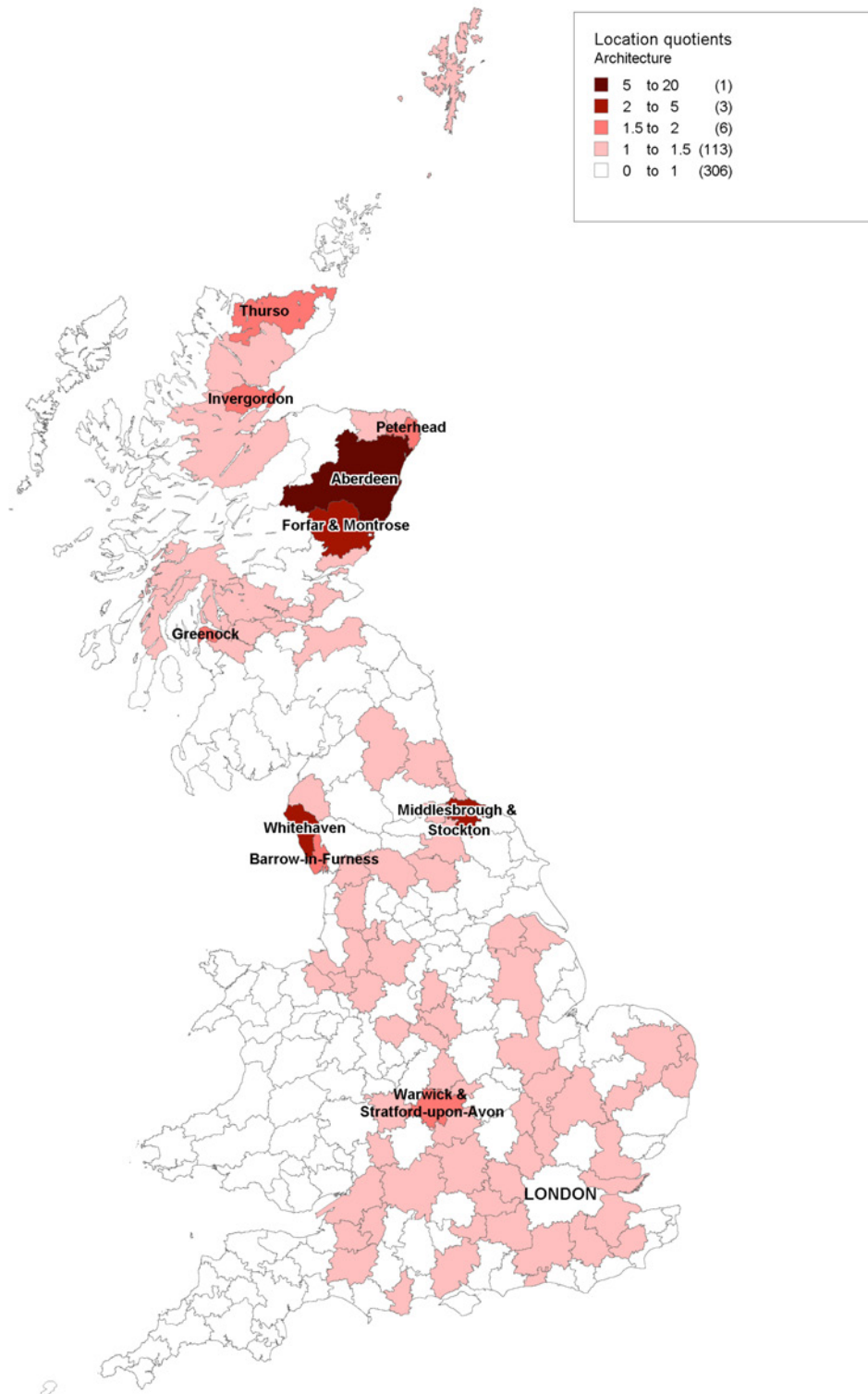
Source: JCIS/ABI (2007)

Map 3: Arts and Antiques – Location Quotients by TTWA (DCMS Definition) – 2007



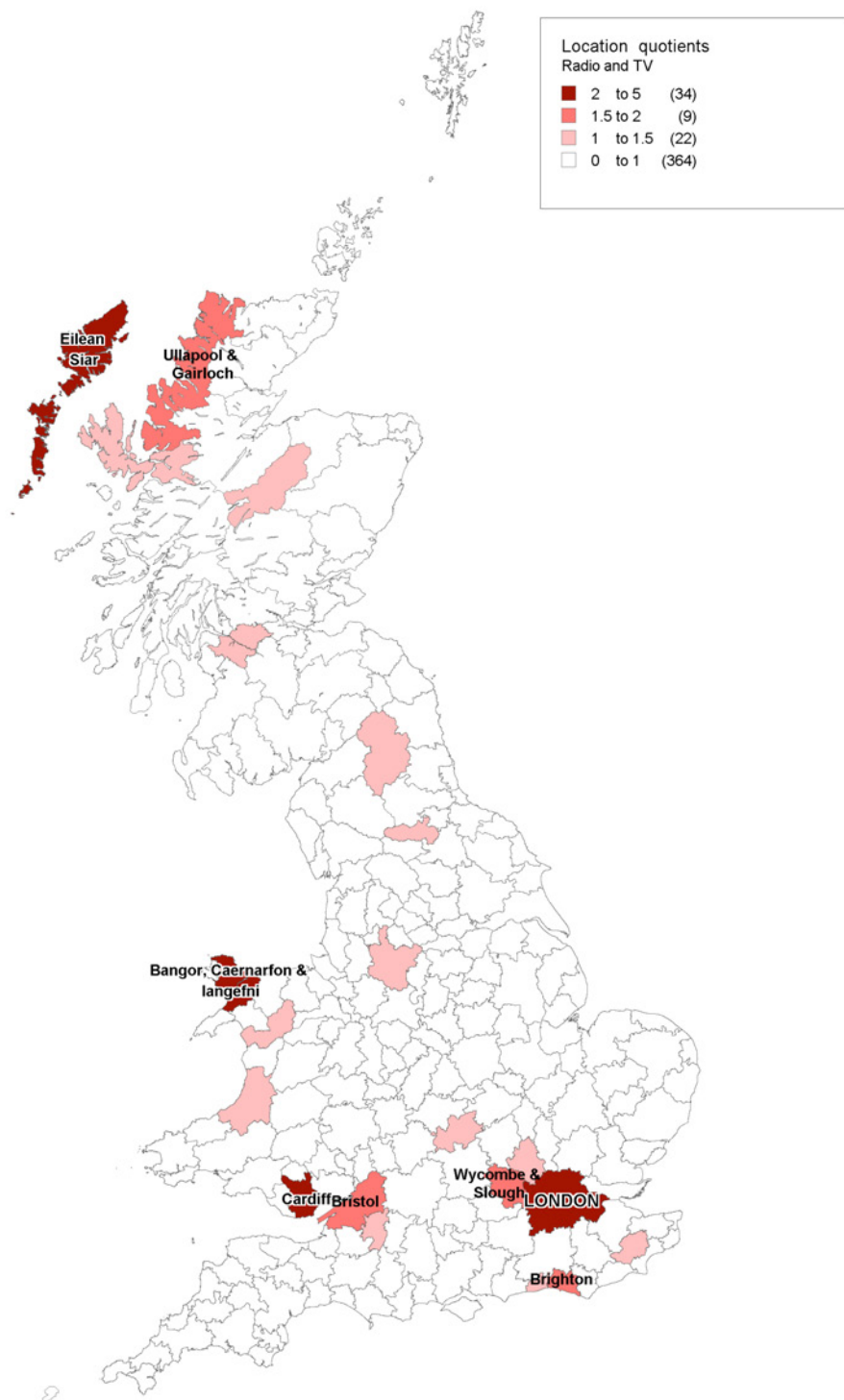
Source: JCIS/ABI (2007)

Map 4: Architecture – Location Quotients by TTWA (DCMS Definition) – 2007.



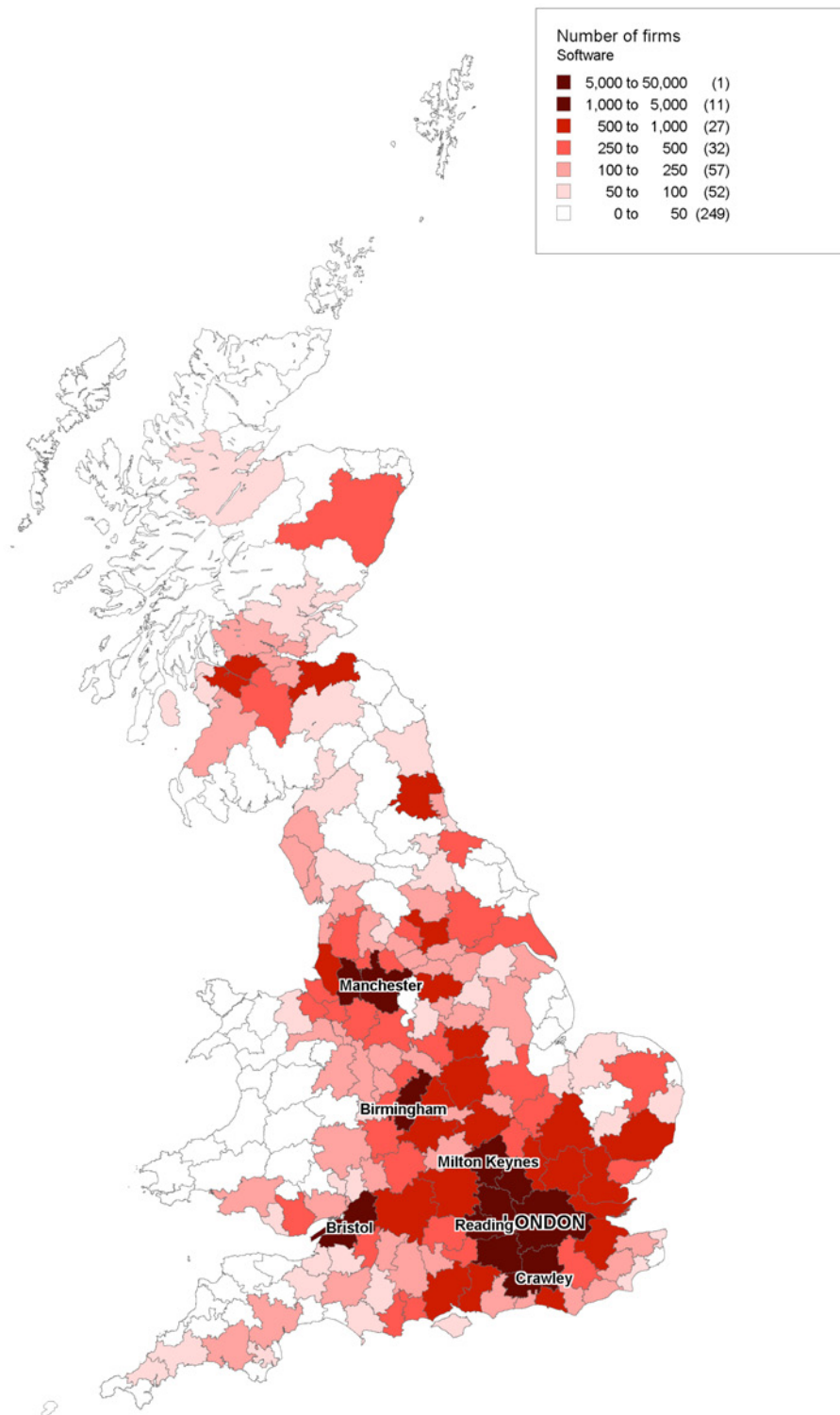
Source: JCIS/ABI (2007)

Map 5: Radio and TV – Location Quotients by TTWA (DCMS Definition) – 2007



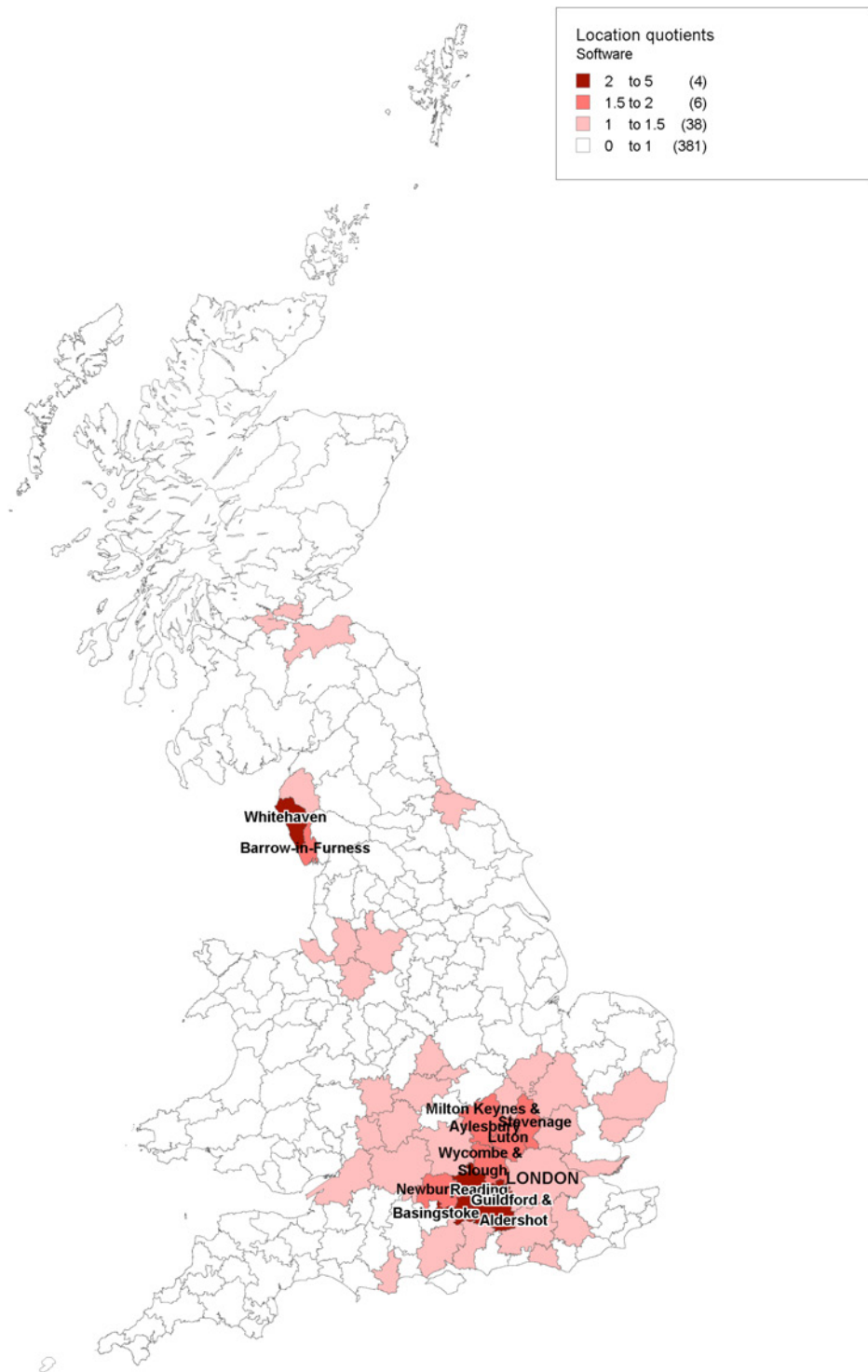
Source: JCIS/ABI (2007)

Map 6: Software, Computer Games and Electronic Publishing – Number of Firms by TTWA (DCMS Definition) – 2007.



Source: JCIS/ABI (2007)

Map 7: Software, Computer Games and Electronic Publishing – Location Quotients by TTWA (DCMS Definition) – 2007



Source: JCIS/ABI (2007)

Table 4: Summary of mapping results

Industry	DCMS Definition TTWA Level (Absolute number of firms)	DCMS Definition TTWA Level (LQ)
Advertising	Large number of firms in London and Manchester	South of London (from St. Albans to Tunbridge Wells and Guildford), a south belt around Manchester and Birmingham and its south counties, Warwickshire and Worcestershire. Higher than average agglomeration in Harrogate and Ripon and Blackpool
Architecture	Evenly distributed, with large numbers of firms in the larger cities	Concentrated in hot construction spots such as Aberdeen, Whitehaven and Middlesbrough and Stockton
Arts and Antiques	Very evenly distributed across the country, in both urban and rural areas	Very evenly distributed across the UK
Designer Fashion	Evenly distributed, with larger number of firms in London, the South East, Birmingham, Manchester and Cardiff	Strong concentration in the Midlands, North London and around Manchester, as well as Portsmouth
Photography, Video and Film	Large number of firms in London, Manchester, Birmingham, Brighton, Bristol and Glasgow	Very highly concentrated in London and its surrounding area (towards Oxford and Guildford, as well as Slough and Wycombe), and Brighton, Bristol and Bath.
Music and the Visual and Performing Arts	Evenly distributed, with larger number of firms in London, Manchester, Bristol and Brighton	London, Brighton, Bath and the South West of England (Isle of Scilly, Penzance, Bridport and Lyme Regis)
Publishing	Very large number of firms in London, its surroundings, Cambridge, Oxford, Bristol and Bath, Manchester, Glasgow and Edinburgh	Strong concentration in Oxford, Bath and Minehead. Significant specialisation in London, Cambridge, Peterborough, Ludlow and the North of Scotland.
Software, Computer Games and Electronic Publishing	Evenly distributed across the country, large number of firms in London and its surroundings, Birmingham, Manchester, Milton Keynes and Bristol	Clustering around the West of London, around a triangle Oxford-Cambridge-Reading and Between Blackpool and Manchester.
Radio and TV	Large numbers of firms around London, Manchester, Cardiff, Bristol, Glasgow and Manchester. Significant presence in the South-West of London	Very strong level of concentration with high agglomeration in London and its surrounding areas (Wycombe and Slough), Brighton, Bristol, Cardiff and the North of Wales and Scotland

4. <https://mail.nesta.org.uk/exchweb/bin/redir.asp?URL=http://www.ons.gov.uk/about-statistics/geography/products/geog-products-area/names-codes/soa/index.html>

4.3 Middle layer super output area mapping

In this sub-section we analyse creative agglomerations at the most detailed level of geographical resolution (MSOA) according to the Official DCMS Definition (data for 2007)

and the Frontier Economics one (data for 2008). Data at the MSOA level of analysis are not available for Scotland, so while our regional and TTWA analyses cover England, Wales and Scotland, the MSOA analysis only includes England and Wales.⁴

Mapping creative sectors at such a high level of resolution allows us to examine in further detail some of the findings obtained at the regional and TTWA levels. In the case of large urban areas such as London, we are able to map the distribution of creative activities in specific quarters or neighborhoods. This high resolution also makes it possible for us to identify smaller peripheral or rural 'creative hot spots' that stayed hidden at more aggregated levels of analysis.

The set of maps based on the DCMS definition only highlight those MSOAs with a LQ larger than 2. As we mentioned in the methodology section, this has the purpose of reducing the levels of statistical noise that become common at such a disaggregated level of analysis.

By undertaking the analysis at a higher level of resolution than TTWAs, we have produced a more detailed picture of the distribution of creative sectors across England and Wales. We are able to validate some of the findings of our analysis at the TTWA level, such as the apparent lack of creative agglomerations of Video, Film and Photography firms in Manchester or Birmingham, which was highlighted in sub-section 4.2 (see Map 8). This level of resolution also makes it possible for us to identify what seem to be significant creative agglomerations which were not visible before: this is the case, for example, for a number of MSOAs specialising in Video, Film and Photography, and Radio and TV on the Eastern Coast around Norwich and Ipswich (see Maps 9 and 10 below).

When we look at the maps compiled according to the Frontier Economics definition of the creative industries, we find 'pockets' of creative specialisation scattered across much of England and Wales. This is the case even for those creative activities that are more intrinsically creative, (corresponding to Layer 1 in the Frontier Economics Definition). When we consider those layers in the Frontier Economics definition of the creative industries that incorporate wholesale, retail and distribution, the UK's geography of creativity becomes extremely blurry (see for example Maps 10 and 11, which depict the agglomeration of creative activities in the Designer Fashion and Music and Performing Arts sectors).

These findings adds nuances to the picture of the UK's Geography of Creativity that emerged at more aggregated levels of analysis, and which showed an almost absolute concentration of 'core' creative

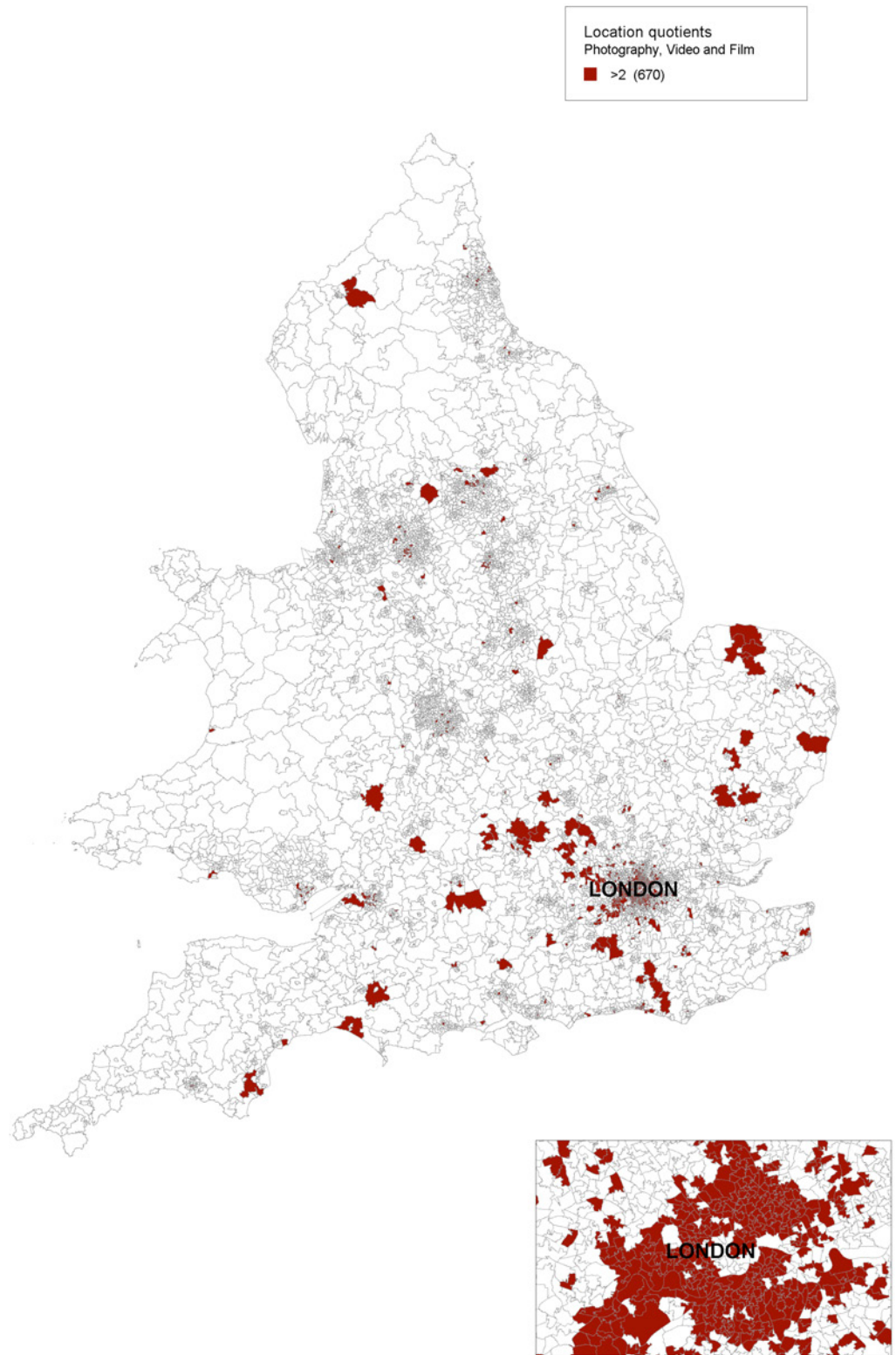
activities in London. These two findings are, complementary, rather than contradictory: they illustrate the distribution of creative activities at different geographical levels. The more aggregated analyses capture those areas of Great Britain where creative sectors concentrate more strongly – they are the national hubs for these sectors. But at the highest resolution we are able to identify smaller 'creative pockets' that might be economically significant in their areas, even if they are not necessarily so from a national perspective.

In the maps depicting creative sector agglomerations according to the Frontier Economics definition (see maps 10-13, and Appendix 4), we highlight not only those MSOAs with a LQ larger than 2 in one 'layer' or stage of the creative value chain, but also those that present simultaneous specialisation in several layers. This allows us to identify places where different stages of the value chain of the same sector are located together, which may be indicative of clustering brought about by linkages and interactions between firms engaged in complementary activities.

For London MSOAs, we find a relatively high degree of overlap between creative layers in most sectors (see as an illustration Map 11, for the Music Industry and Performing Arts). Architecture (see map 12) is an exception to this trend– as our analyses at the regional level already indicated, in this sector, London specialises in Layer 1 (architectural design) activities, while MSOAs in other parts of the UK focus on other layers (e.g. engineering and construction sites).

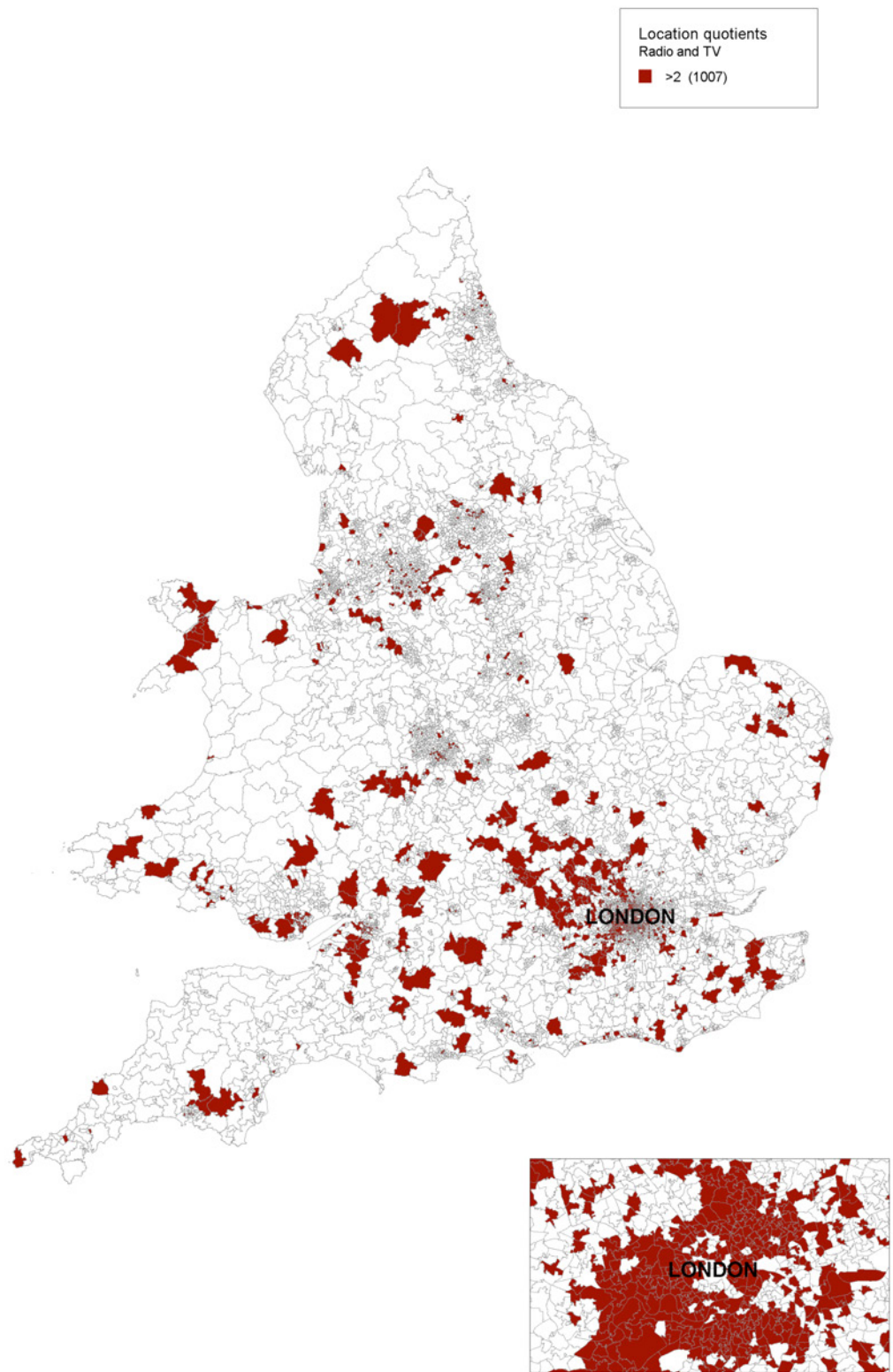
We also detect overlaps between creative layers in other places: this is the case of Designer Fashion in the Birmingham and Manchester areas (see for example map 10), and of Music and the Performing Arts in the South East (see Map 10). Map 13 illustrates the significant overlaps between different creative layers of the Software, Computer Games and Electronic Publishing sector in the East and South East (including Cambridge, Oxford, Bristol and Milton Keynes). This result is further evidence of the presence of a strong cluster in this area. In the case of this creative sector, we also find an interesting absence of specialisation in most Central London MSOAs.

Map 8: Photography, Video and Film – Location Quotients >2 by MSOA (DCMS Definition) – 2007



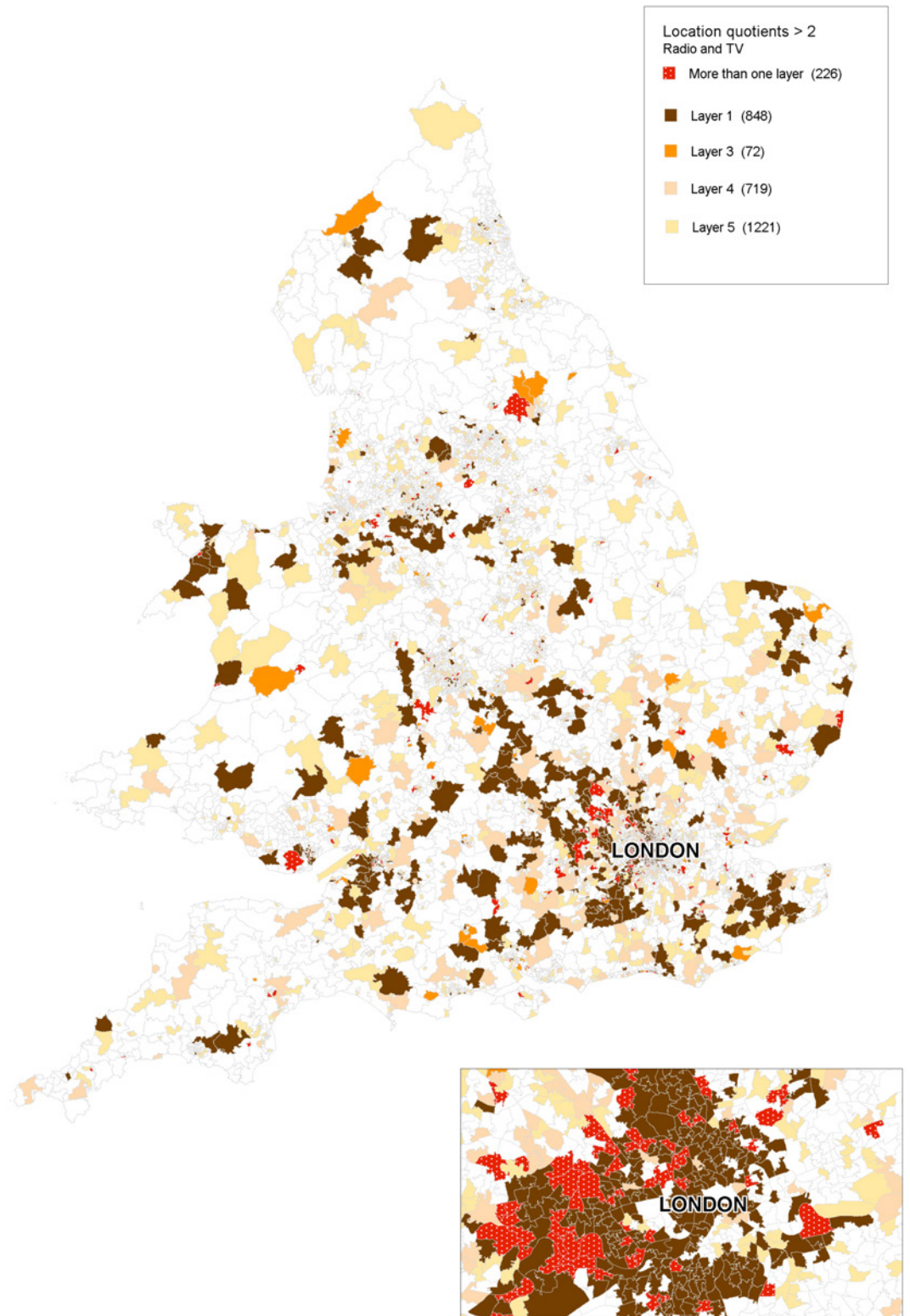
Source: JCIS/ABI (2007)

Map 9: Radio and TV: Firms' Location Quotients >2 by MSOA (DCMS Definition) – 2007



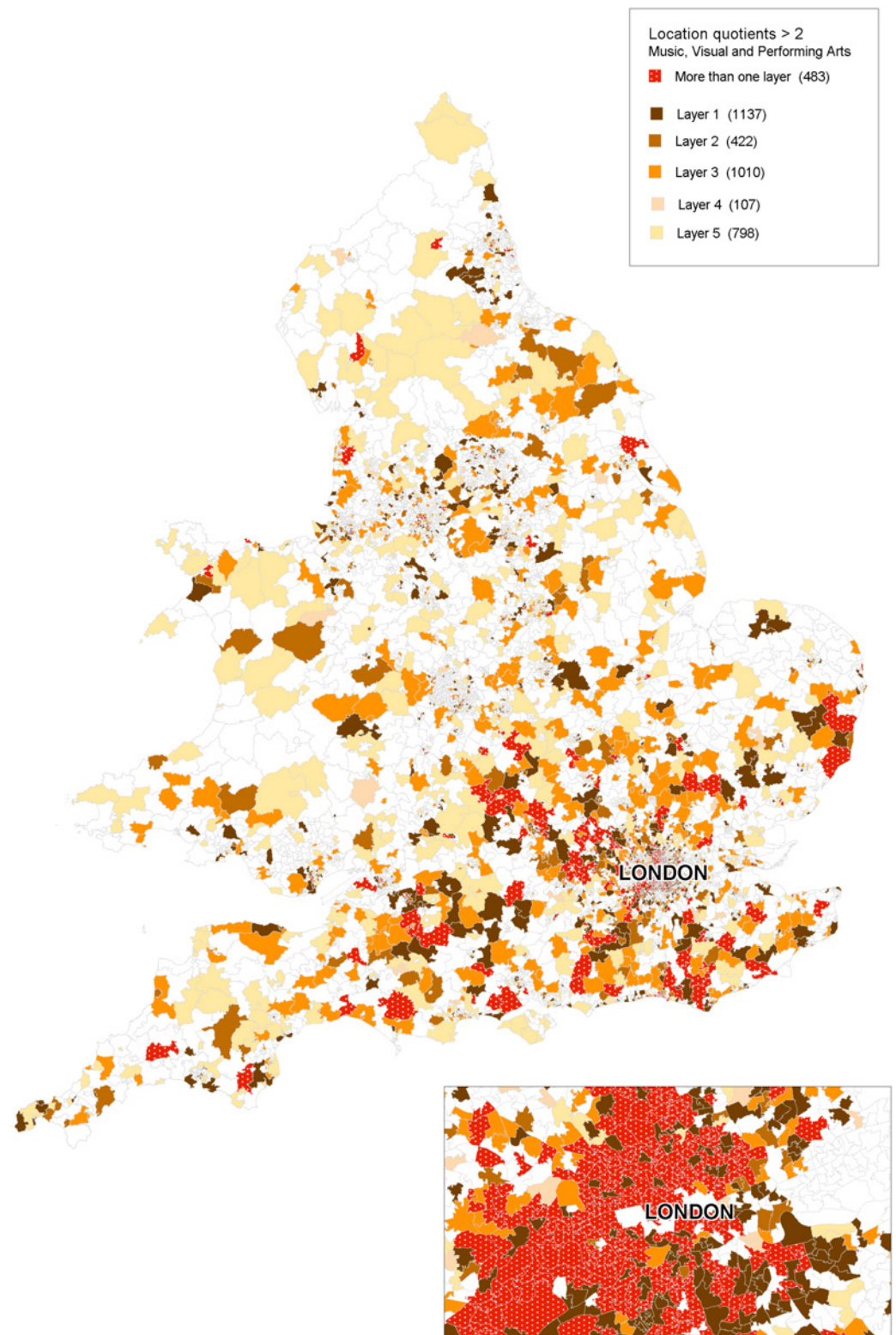
Source: JCIS/ABI (2007)

Map 10: Designer Fashion: Firms' Location Quotients >2 by MSOA (Frontiers Economics Definition) – 2008



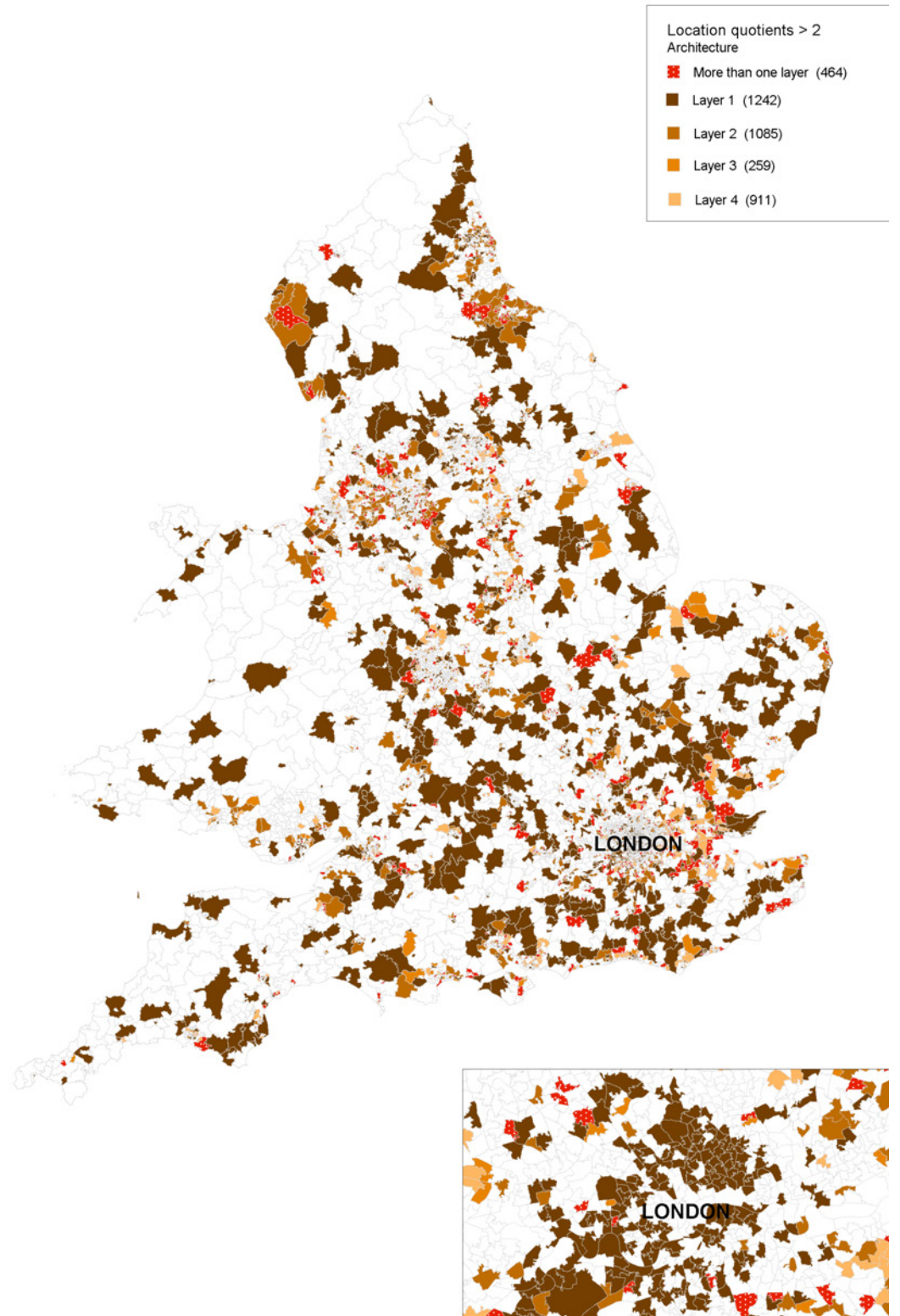
Source: JCIS/IDBR (2008)

Map 11: Music, Visual and Performing Arts: Firms' Location Quotients >2 by MSOA (Frontiers Economics Definition) – 2008



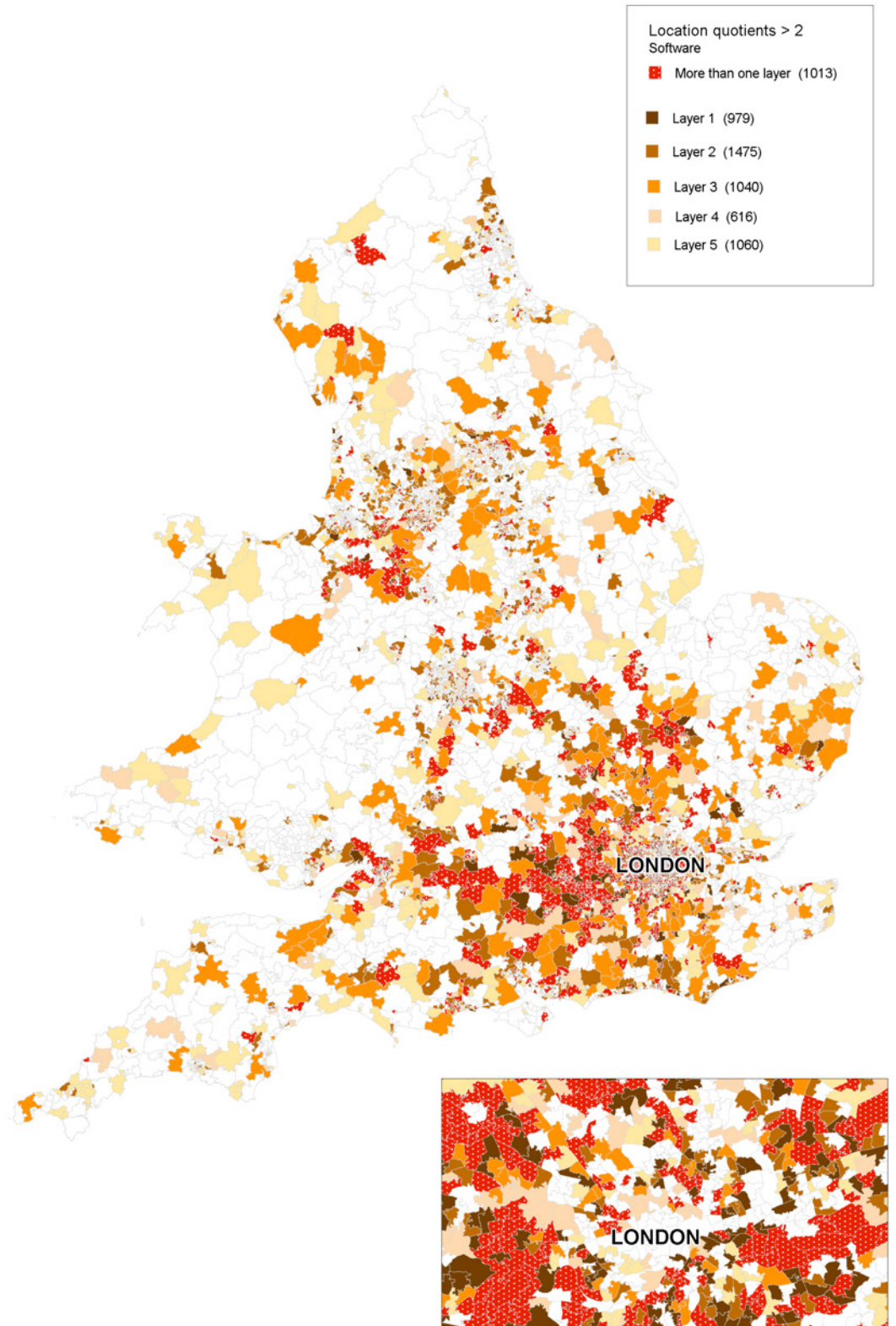
Source: JCIS/IDBR (2008)

Map 12: Achitecture: Firms' Location Quotients >2 by MSOA (Frontiers Economics Definition) – 2008



Source: JCIS/IDBR (2008)

Map 13: Software, Computer Games and Electronic Publishing: Firms' Location Quotients >2 by MSOA (Frontiers Economics Definition) – 2008



Source: JCIS/IDBR (2008)

Part 5: Correlation analysis

5. Pearson coefficients measure whether two variables vary at the same time for a group, and in what direction, while Spearman coefficients measure whether individual observations in a group are ranked in a similar order according to the two variables.

In the previous section, we have mapped creative sectors at increasingly higher levels of resolution. This effort has produced some important results that we now examine in further detail using correlation analysis.

First, we have found that different creative sectors seem to locate close to one another; a vivid example of this is London and other creative hubs that we have identified in Section 4.2. Second, there seems to be a divide between the patterns of creative specialisation in Northern and Southern areas. While London and the surrounding regions present a high concentration of ‘core creative’ activities, they tend to be rarer in the Midlands and Northern areas.

The use of correlation techniques allows us to establish the extent to which these preliminary findings are statistically significant: that is, whether they constitute robust evidence of underlying patterns in the way creative sectors co-locate, and of differences in the specialisation profiles of places across Great Britain.

5.1 Sector co-location

We analyse patterns of creative sector co-location by correlating the location quotients of different creative sectors at the TTWA level. Doing this enables us to establish the extent to which the location quotients of specific creative sectors vary together across the population of TTWAs.

The purpose of this exercise is to identify instances of simultaneous specialisation (or diversification) between the creative sectors

in a given area. Positive and significant correlation coefficients between sector ‘a’ and sector ‘b’ would indicate that both sectors tend to co-locate in the same TTWAs: places that show a strong presence of one of these sectors, would be expected to show a strong presence of the other.

In contrast, negative and significant correlation coefficients would indicate that those locations where one of the sector tends to agglomerate strongly, show weak agglomeration of the other.

The strength of these co-location patterns are indicated by the value of the correlation coefficient.

The first iteration of our correlation analysis (using both Pearson and Spearman coefficients) showed strong levels of correlation between most creative sectors.⁷ This can be explained by the tendency of creative industries to locate in urban areas (with the exception of Arts and Antiques), or by biases in the location quotients calculated for large urban areas, where large industrial agglomerations would reduce the LQ of all creative sectors creating an illusory image of correlation.

We take stock of this potential source of spurious correlations by undertaking a partial correlation analysis where we control for the total number of firms in a TTWA – this makes it possible for us to extricate those simultaneous variations in LQs that could be explained by the size of a place, from other more genuine variations between them. Once we do this, a clearer picture emerges. Table 6 presents the partial correlations between location quotients for creative sectors in all of the UK TTWAs

controlling for total number of firms in every TTWA. We have colour-coded the statistically significant coefficients (at a 1 per cent level of significance) in this Table, using orange for positive and blue for negative correlations.

We find some interesting patterns of creative sector co-location. On the one hand, sectors like Advertising, Music, Visual and Performing Arts and Software tend to co-locate with a variety of other creative sectors. We find particularly strong patterns of correlation between what seem to be two 'types' of creative sector. They are, on the one hand, Advertising, Software, Computer Games and Electronic Publishing and Designer Fashion and on the other, Music and Publishing, Radio and TV, and Video, Film and Photography. The constituents of these groups seem to be found near to each other, although it is worth noting that the patterns of co-location are stronger in the case of the former group.

Additionally, we find that Software, Computer Games and Electronic Publishing and Architecture seem to be often present in the same TTWAs.

We also find some negative correlations, suggesting that some sectors tend not to be present in the same places. Specialisation in Arts and Antiques appears negatively correlated with specialisation in Architecture, Software, Computer games and Electronic publishing, and with Fashion Design. This means that firms from the Arts and Antiques sector tend to locate in areas that do not specialise in Software, Architecture and/or Design Fashion.

We should be cautious in interpreting these results, given the relatively basic techniques used to calculate them. It is however worth highlighting that those creative sectors that Lazzarretti *et al.* (2008) respectively define as 'non-traditional creative sectors' (including Advertising and Software) and 'traditional creative sectors' (Music, Video, Photography and Film, Publishing, and Radio and TV) seem to be located 'together' according to our data. In this context, the inclusion of 'Business Activities not elsewhere classified', which potentially includes graphic design activities, as part of Fashion Design in its DCMS definition, might have influenced the co-location of this sector with Advertising, Software, Computer Games and Electronic Publishing.

5.2 Creative specialisation across cities

We have also examined the patterns of creative specialisation across TTWAs in order to establish whether there are any similarities or differences between the cities located in different regions of Great Britain.

In order to do so, for every TTWA (usually surrounding a larger city), we have ranked the 9 creative sectors' in order of importance according to their LQ. We then compare the similarity of these rankings between TTWAs using simple correlation techniques. Our results for a selection of TTWAs are presented in Table 7. We consider correlation coefficients significant at 1 per cent and 5 per cent levels. In this analysis, a positive correlation coefficient indicates that the ranking in the pair of TTWAs considered is similar, therefore indicating a similar degree of creative specialisation. On the contrary, a negative coefficient indicates the opposite- a reverse order in the ranking of the LQs, and therefore, opposite patterns of specialisation. This means that a creative sector that is more important in a TTWA is less important in the other, and vice versa.

The results of this analysis need to be interpreted with caution. Differently from the previous correlation analysis, which compared samples including 234 observations each, the pairings between TTWA rely on only 9 observations (the location quotient for the 9 creative sectors in each TTWA) – a very small number for statistical purposes.

Bearing in mind these caveats, it is, nevertheless, interesting to note that our analysis indicates similarities between the specialisation profiles of several cities in the Northern regions, Yorkshire and the Midlands, including Liverpool, Newcastle, Sheffield, Leeds and Birmingham. However, Manchester's creative specialisation profile is not significantly similar to any of these other cities. As shown in our mapping findings before, Manchester hosts a strong presence of Advertising, Radio and TV, and Software, Computer Games and Electronic Publishing, sectors which otherwise tend to concentrate in London and the Southern regions (see also MIER, 2009a).

The similarities in creative specialisation seem to be less accentuated for cities in the English southern regions except for Cambridge and Oxford, which share a strong presence of Publishing and Software, Computer Games and Electronic Publishing. Guildford and Milton

Keynes also present similar specialisation profiles, with a strong presence of Software, Computer Games and Electronic Publishing, and Designer Fashion.

London diverges significantly from most other cities, as shown by the negative correlations between its specialisation profile and those of other TTWAs, particularly those in the North. Brighton exhibits a similar pattern of differentiation.

Our findings have not shown any significant divergences between creative specialisation ranking across the various British nations. It is interesting to note that some Scottish TTWAs, particularly Aberdeen, have similar specialisation profiles to those in the North of England (such as their strength in Architecture).

Table 6: Partial correlations between LQ for creative sub-sectors at the TTWA level

		Advertising	Architecture	Art and Antiques	Designer Fashion	Music and the Performing Arts	Publishing	Radio and TV	Software, Computer games and e-Publishing	Video, Film and Photography
Advertising	Correlation		0.086	-0.146	0.508	0.211	0.212	0.115	0.424	0.239
	Significance (2-tailed)		0.194	0.027	0.000	0.001	0.001	0.082	0.000	0.000
	df		229	229	229	229	229	229	229	229
Architecture	Correlation			-0.299	0.117	-0.153	-0.050	-0.045	0.436	-0.001
	Significance (2-tailed)			0.000	0.075	0.020	0.452	0.498	0.000	0.991
	df			229	229	229	229	229	229	229
Art and Antiques	Correlation				-0.254	0.154	0.097	-0.103	-0.444	0.126
	Significance (2-tailed)				0.000	0.019	0.140	0.117	0.000	0.055
	df				229	229	229	229	229	229
Designer Fashion	Correlation					0.237	0.195	0.109	0.520	0.187
	Significance (2-tailed)					0.000	0.003	0.100	0.000	0.004
	df					229	229	229	229	229
Music and the Performing Arts	Correlation						0.502	0.404	0.012	0.568
	Significance (2-tailed)						0.000	0.000	0.860	0.000
	df						229	229	229	229
Publishing	Correlation							0.280	0.083	0.376
	Significance (2-tailed)							0.000	0.207	0.000
	df							229	229	229
Radio and TV	Correlation								0.084	0.373
	Significance (2-tailed)								0.204	0.000
	df								229	229
Software, Computer games and E-publishing	Correlation								0.212	
	Significance (2-tailed)									0.001
	df									229
Video, Film and Photography	Correlation									
	Significance (2-tailed)									
	df									

a. Cells contain zero-order (Pearson) correlations.

Table 7: Ranked correlations between specialisation profiles of selected TTWAs

		England														Wales		Scotland	
		Newcastle/ Durham	Liverpool	Manchester	Leeds	Sheffield/ Rotherham	York	Birmingham	Cambridge	London	Brighton	Guildford/ Aldershot	Milton Keynes/ Aylesbury	Oxford	Southampton	Cardiff	Swansea Bay	Aberdeen	Edinburgh
Newcastle/ Durham	Coefficient		0.733*	0.550	0.917**	0.567	0.600	0.500	0.000	-0.633	-0.700*	0.300	0.200	-0.467	0.467	-0.383	0.317	0.617	0.283
	Significance (2-tailed)		0.025	0.125	0.001	0.112	0.088	0.170	10.000	0.067	0.036	0.433	0.606	0.205	0.205	0.308	0.406	0.077	0.460
	N		9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Liverpool	Coefficient			0.367	0.750*	0.950**	0.617	0.817**	0.133	-0.800**	-0.700*	0.183	0.467	-0.333	0.583	-0.133	0.700*	0.633	-0.050
	Significance (2-tailed)			0.332	0.020	0.000	0.077	0.007	0.732	0.010	0.036	0.637	0.205	0.381	0.099	0.732	0.036	0.067	0.898
	N			9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Manchester	Coefficient				0.567	0.233	0.200	0.517	-0.117	-0.267	-0.800**	0.483	0.283	-0.483	0.467	-0.383	-0.083	0.433	-0.017
	Significance (2-tailed)				0.112	0.546	0.606	0.154	0.765	0.488	0.010	0.187	0.460	0.187	0.205	0.308	0.831	0.244	0.966
	N				9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Leeds	Coefficient					0.567	0.700*	0.583	0.050	-0.700*	-0.733*	0.283	0.383	-0.483	0.500	-0.517	0.183	0.650	0.367
	Significance (2-tailed)					0.112	0.036	0.099	0.898	0.036	0.025	0.460	0.308	0.187	0.170	0.154	0.637	0.058	0.332
	N					9	9	9	9	9	9	9	9	9	9	9	9	9	9
Sheffield/ Rotherham	Coefficient						0.567	0.783*	0.250	-0.733*	-0.633	0.183	0.500	-0.183	0.533	-0.083	0.700*	0.533	-0.150
	Significance (2-tailed)						0.112	0.013	0.516	0.025	0.067	0.637	0.170	0.637	0.139	0.831	0.036	0.139	0.700
	N						9	9	9	9	9	9	9	9	9	9	9	9	9
York	Coefficient							0.517	0.550	-0.917**	-0.600	0.250	0.467	0.017	0.700*	-0.417	0.283	0.800**	0.683*
	Significance (2-tailed)							0.154	0.125	0.001	0.088	0.516	0.205	0.966	0.036	0.265	0.460	0.010	0.042
	N							9	9	9	9	9	9	9	9	9	9	9	9
Birmingham	Coefficient								0.100	-0.700*	-0.850**	0.233	0.500	-0.367	0.750*	-0.133	0.533	0.700*	-0.117
	Significance (2-tailed)								0.798	0.036	0.004	0.546	0.170	0.332	0.020	0.732	0.139	0.036	0.765
	N								9	9	9	9	9	9	9	9	9	9	9
Cambridge	Coefficient									-0.517	-0.117	0.667*	0.733*	0.800**	0.583	-0.567	0.083	0.550	0.600
	Significance (2-tailed)									0.154	0.765	0.050	0.025	0.010	0.099	0.112	0.831	0.125	0.088
	N									9	9	9	9	9	9	9	9	9	9
London	Coefficient										0.650	-0.317	-0.567	-0.017	-0.833**	0.300	-0.583	-0.900**	-0.483
	Significance (2-tailed)										0.058	0.406	0.112	0.966	0.005	0.433	0.099	0.001	0.187
	N										9	9	9	9	9	9	9	9	9
Brighton	Coefficient											-0.417	-0.433	0.450	-0.733*	0.383	-0.217	-0.717*	-0.100
	Significance (2-tailed)											0.265	0.244	0.224	0.025	0.308	0.576	0.030	0.798
	N											9	9	9	9	9	9	9	9
Guildford/ Aldershot	Coefficient												0.767*	0.433	0.617	-0.800**	-0.083	0.567	0.350
	Significance (2-tailed)												0.016	0.244	0.077	0.010	0.831	0.112	0.356
	N												9	9	9	9	9	9	9
Milton Keynes/ Aylesbury	Coefficient													0.400	0.667*	-0.717*	0.117	0.617	0.283
	Significance (2-tailed)													0.286	0.050	0.030	0.765	0.077	0.460
	N													9	9	9	9	9	9
Oxford	Correlation Coefficient														0.150	-0.233	-0.017	0.083	0.367
	Significance (2-tailed)														0.700	0.546	0.966	0.831	0.332
	N														9	9	9	9	9
Southampton	Coefficient															-0.417	0.433	0.967**	0.417
	Significance (2-tailed)															0.265	0.244	0.000	0.265
	N															9	9	9	9
Cardiff	Coefficient																0.417	-0.467	-0.583
	Significance (2-tailed)																0.265	0.205	0.099
	N																9	9	9
Swansea Bay	Coefficient																	0.433	-0.217
	Significance (2-tailed)																	0.244	0.576
	N																	9	9
Aberdeen	Coefficient																		0.550
	Significance (2-tailed)																		0.125
	N																		9
Edinburgh	Coefficient																		
	Significance (2-tailed)																		
	N																		

Part 6: Conclusions and tentative policy implications

Having presented the outputs of our mapping effort, co-location analysis and our exploration of the patterns of creative specialisation across different places of Great Britain, we conclude the report discussing some of our key findings, as well as their tentative policy implications. We also outline the next stages of our research.

6.1 A multi-layered geography of creativity

The mapping of creative agglomerations undertaken at the regional level of analysis in Section 4.1 corroborates conventional wisdom regarding London's pre-eminence as the Britain's creative powerhouse.

Our examination using the DCMS definition shows that the capital has strong agglomerations of almost all creative sectors. The contrast between London and other regions and nations across Great Britain becomes even starker when we adopt the Frontier Economics definition of the creative industries. We find that London specialises in the most creative activities of the value chain of all sectors, as identified by Layers 1 and 2 of that definition. Although high levels of creative agglomeration can be found in other regions, particularly the Midlands and the North, they tend to be associated with functions down the creative value chain, such as the production of complementary inputs (such as textiles in the case of Designer Fashion), and distribution and retailing. There are a few noteworthy exceptions to this pattern, namely, the South East and the East, which also specialise in some 'core' creative layers, as well as Scotland, which shows a strong presence of architecture firms.

These results are consistent with the findings of GLA (2004), which show that London has a 'stronger creative intensity' (this is, that a higher proportion of creative professionals working in what we would define as purely 'creative activities') than other places in Great Britain.

Once we increase the level of resolution in our analysis, by focussing on creative agglomerations at the TTWA level in section 4.2, we are able to start identifying other creative hubs across Great Britain. London remains important for almost all creative sectors, but there are other places where a rich variety of creative sectors tend to be found together. It is very possible that urbanisation economies, that is, complementarities and positive spillovers across creative sectors (and perhaps with other sectors in the broader economy) are present in some of these places. The analysis at the TTWA level has also enabled us to identify other locations that seem to specialise in a single creative sector.

Finally, the analysis at the highest resolution MSOA level has produced an intriguing picture of the local creative economy of England and Wales, particularly when we adopt the Frontier Economics definition of the creative industries. Although the MSOA level of analysis still shows a 'red-hot' capital for almost all creative sectors, particularly at the most creative layers, we have also found other pockets of creative activity (including layer 1 activities) scattered across the country for most sectors.

We believe that this finding needs to be interpreted cautiously. As we pointed out in our methodology, random spikes in the number of creative firms in a small area can create an illusion of agglomeration. This risk would

seems particularly significant in the case of the Frontier Economics categories, which fragment the population of creative firms into even smaller groups according to their layer. This might increase the susceptibility to statistical noise of the measures used to identify them. We therefore hesitate, at this point, to call the creative pockets that we have detected ‘creative agglomerations’.

What is nevertheless undeniable is that neither London nor the other creative hubs that we have identified throughout our mapping have a monopoly of creativity in Britain. Even the most intrinsically creative activities occur across all of the country, and might play an economically significant role in their locations. Establishing whether this is the case, and determining the influence that recent policy initiatives to promote the creative industries have had on the emergence of these ‘creative pockets’ are important issues for further research. Answering these questions will also help determine whether anything else should be done to support their activities (for example, by pump-priming incipient creative clusters, or supporting the networking activities of their members).

Our analysis has demonstrated some of the advantages of the Frontier Economics definition of the creative sector. This classification has helped us unearth some patterns in the data, such as the creative division of labour between London and other places in Britain at the regional level of analysis, or the dispersion of layer 1 activities across all of the Great Britain’s geography at the MSOA level, which would have been impossible to detect through the less finely grained DCMS definition. At the same time, the difficulties in interpreting the results of our analysis of creative agglomeration at the MSOA level might raise some concerns regarding the extent to which some of the peripheral layers of the Frontier Economics definition can be meaningfully considered as part of the ‘creative industries’.

6.2 Creative sector co-location

Our analysis of the co-location patterns between different creative sectors has also yielded interesting results. Our main findings coincide with Currid and Williams (2008) and Lazzeretti *et al.* (2008) in other countries which show that certain creative sub-sectors present a significant trend towards co-location.

Comparing our results with those of Currid and Williams (2008) is difficult, since these authors adopt a different classification of creative sectors, focussing on ‘Art’, ‘Design’, ‘Fashion’, ‘Music’, ‘Performing Arts’, ‘Film’ and ‘Independent Artists’. Our analysis does however seem to replicate their finding of a strong pattern of co-location between ‘Music’ and ‘Film’. Comparing with Lazzeretti *et al.* (2008), the patterns identified by our analysis echo the authors’ classification of creative industries inside two categories, ‘traditional’ (Music, video, photography and film, publishing, and radio and TV) and ‘non-traditional’ (Software and advertising).

Although our results support the idea that creative industries are drawn together by inter-sector synergies, we still not know what are the drivers of such processes. The next logical goal is to identify which are the shared competences, resources and characteristics of places that explain co-location of creative sectors.

For example, Currid and Williams (2008) suggest that labour mobility across sector boundaries (e.g. film-makers producing music videos, or musicians creating soundtracks for films), and the use of the same infrastructures by some sectors (e.g. exhibition and performance venues, and studios) could explain such co-location. NESTA’s (2006) classification of creative sectors depending on the different ways in which they create value seems to be a promising point to begin exploring the drivers behind co-location. For example, two of the categories put forward by NESTA (‘Creative Service Providers’, and ‘Creative Content Producers’) present interesting analogies with the two broad sub-sets of creative industries that we have identified above as having co-location tendencies. We intend to explore some of these issues at a later stage of the project.

Our analysis presents potentially important implications for the design of policies aimed at supporting the development of creative industries at the local level, in so far as it suggests that these policies might produce better results when they target complementary sub-sets of the creative industries, as well as those systemic resources, infrastructures and networks that underpin their activities. Targeted strategies of this sort might be more effective than undifferentiated support policies based on the assumption that all creative sectors are homogeneous.

6.3 Creative Specialisation profiles

Finally, our analysis of the correlations between the rankings of creative specialisation in different TTWAs across Great Britain suggests the presence of a North/South divide which was already visible in the results of the regional and TTWA mapping.

With the exception of Manchester, most regions of the North lack a strong presence of the creative industries. Moreover, we observe a certain degree of similarity between the specialisation profiles of several large cities such as Liverpool, Newcastle, Sheffield, Leeds or Birmingham. On the other hand, southern regions show stronger, more diversified creative agglomerations in areas such as Oxford, Cambridge, Bristol, Brighton, Bath or Guildford.

The uniqueness of London is once again underscored by the strong negative correlations between its specialisation profile and those of other places. We find a similar result for Brighton, which presents its own idiosyncratic specialisation profile. The extent to which this could be linked to the fact that this city is as a hotspot for the creative class (as identified in, for example, Clifton, 2008) requires further research.

It is important to determine the reasons for the patterns that we have identified. One possible explanation is that the industrial heritage of the main cities in the Northern regions is the source of path dependences that prevent them from reshaping their local economies (Simmie et al, 2008). Another potential interpretation of our findings is that different places, particularly in the North, have adopted excessively similar, 'spatially blind' strategies (Meadway and Mateos-Garcia, 2009) to support creative sector development, rather than focussing on place-specific sources of competitive advantage.

Although Manchester's success at crafting its own creative development strategy (and narrative) is a potential 'benchmark' for other cities in these regions, policymakers attempting to follow its example might be well advised to do so playing to their cities' competitive strengths, rather than following a standardised template of creative development. It seems that those cities in the South East and East of England with a strong creative presence have managed to develop their own distinctive specialisation profiles, rather than going 'head to head' with London, the Britain's creative power-house.

6.4 Next steps

The identification of potential creative clusters through an analysis of creative businesses' agglomeration patterns is only the first part of our research project. Its ultimate objective is to understand the connections between creative clusters and regional innovative outcomes. In order to do this, we shall adopt a regional innovation approach, which conceptualises innovation as a dynamic process involving co-located key stakeholders (firms, institutions and government) bound together by a system of relationships.

This model of regional innovation is particularly compatible with an analysis of regional growth that pivots around the role of creative clusters. We intend to extract key indicators of innovation inputs and outputs from several sources including the Community Innovation Survey at the regional and sector levels in order to analyse the extent to which the presence of a creative cluster in a given area is associated to differences in innovative performance

This analysis will lead to the selection of four case studies, which we will examine in further detail using qualitative methods with the goal of improving our understanding of those situated, 'soft' dynamics, and mechanisms that are difficult to capture quantitatively. Adopting this approach will also enable us to establish more clearly which is the direction of causality between creative cluster presence and innovative performance in Britain's localities and regions.

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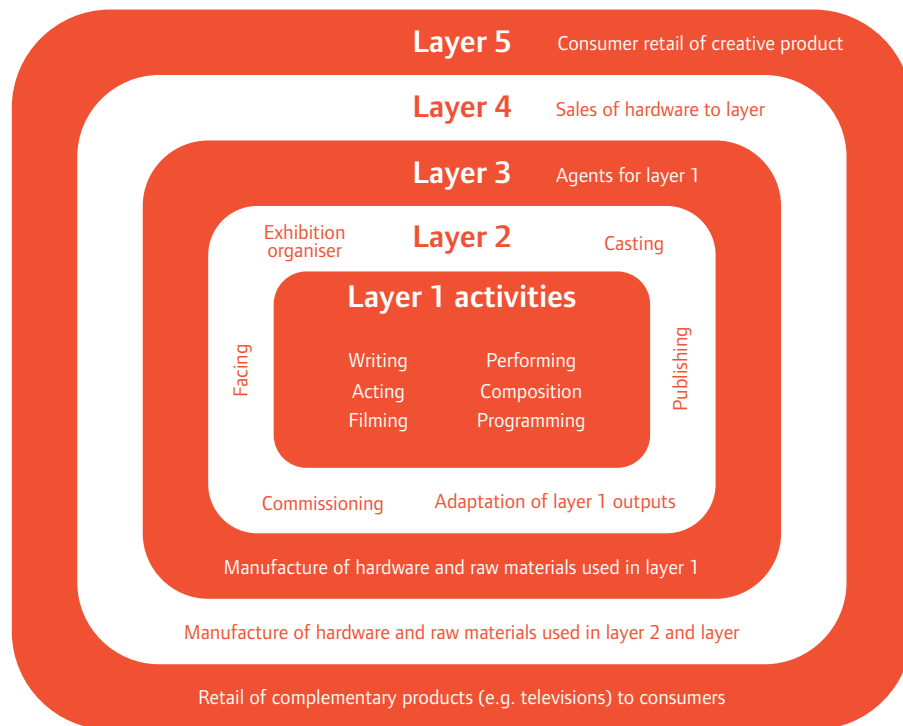
Appendix 1: DCMS classification of the creative industries at 4-digit 2003 SIC codes

Table 8: DCMS classification of the creative industries at 4-digit 2003 SIC codes

Sector	SIC code	SIC definition
Advertising	74.4	Advertising
Architecture	74.2	Architecture and engineering activities and related technical consultancy
Arts and Antiques	52.48	Other retail sale in specialised stores
	52.5	Retail sale of second-hand goods in store
Crafts	ND	
Design	ND	
Designer fashion	17.71	Clothing manufacture
	17.72	
	18.1	
	18.21	
	18.22	
	18.23	
	18.24	
	18.3	
	19.3	
	74.87	Other business activities not elsewhere related
Video, Film & Photography	22.32	Reproduction of video recording
	74.81	Photographic activities
	92.11	Motion picture and video production
	92.12	Motion picture and video distribution
	92.13	Motion picture projection
Music and the Visual & Performing Arts	22.14	Publishing of sound recording
	22.31	Reproduction of sound recording
	92.31	Artistic and literary creation and interpretation
	92.32	Operation of arts facilities
	92.34	Other entertainment activities not elsewhere specified
	92.72	Other recreational activities not elsewhere specified
Publishing	22.11	Publishing of books
	22.12	Publishing of newspapers
	22.13	Publishing of journal and periodicals
	22.15	Other publishing
	92.4	News agency activities
Software, Computer games & electronic publishing	22.33	Reproduction of computer media
	72.21	Publishing of software
	72.22	Other software consultancy and supply
Radio & TV	92.2	Radio and television activities

Appendix 2: The Frontier Economics model of creative industries

Figure 1: The Frontier Economics model of creative industries



Source: DCMS (2007b)

Appendix 3: The Frontier Economics sector classification of creative sectors

Table 9: The Frontier Economics sector classification of creative sectors

Advertising		
Layer 1	74.40/2	Planning, creating and putting in place advertising campaigns
Layer 5	74.40/9	A “catch all” code for advertising, including handing out free samples and aerial advertising
	74.40/1	Selling or leasing advertising space or time
Architecture		
Layer 1	74.20/1	Architectural design and construction supervision
	74.20/2	Urban planning and landscape architecture
Layer 2	74.20/4	Engineering advice and design for construction projects
Layer 3	74.20/6	Scientific consultancy like weather and geological surveying
Layer 4	74.15/3	Construction holding companies and head offices
	70.11	Real estate developers
	45.21/1, 45.21/2, 45.21/3, 45.22, 45.23, 45.24, 45.25	All types of construction work, like residential buildings, bridges, roads, sports facilities, dams and related work like laying foundations and putting up scaffolding.
	74.20/3	Quantity surveying
	51.54	Wholesale of hardware, plumbing and heating equipment and supplies
	51.53	Wholesale of construction materials and sanitary equipment (e.g. toilets and sinks)
	51.13	Agents who sell timber and building materials
	45.41, 45.42, 45.43, 45.44, 45.45	All types of building completion like plastering, painting and glazing, Floor and wall covering and installing swimming pools
	45.31, 45.32, 45.33, 45.34	All types of building installation like electrical work, insulation work and plumbing
Arts, Antiques and Craft activities		
Layer 2	74.87/3	Exhibition and fair organisation
	52.50/1, 52.48/6	Retail sale of antiques and retail sale in commercial art galleries
Layer 3	36.63/9	Catch all SIC code for “other manufacturing” (potentially some craft firms, if they are large enough to be covered by the IDBR)
	36.22, 36.61	Manufacture of jewellery and dinnerware made of precious metals and imitation jewellery
	36.30, 33.50	Making musical instruments and watch & clock making
	28.75, 28.61	Making various metal products like swords but also ship propellers etc. and making cutlery
	27.54, 27.41, 26.82/9	Casting and production of heavy and precious metals and manufacture of mineral products

Layer 4	26.30, 26.25, 26.21, 26.70	Making ceramic tiles, pots, jars, tableware, statuettes etc. and cutting stone for building and ornamental use
	17.51/9, 17.51/2, 17.51/1	Carpet and rug making
	51.47/9	A catch all SIC code that includes the wholesale of floor coverings but also stationary and sportswear etc.
	51.44, 51.47/8	Wholesale of china and of travel and fancy goods
	51.47/3, 51.47/4	Wholesale of jewellery and imitation jewellery

Design Activity

Layer 1	74.20/5	Engineering design for industry
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Designer Fashion

Layer 1	74.87/2	Fashion design but also interior design and graphic design
Layer 3	17.53, 17.71,17.72, 18.10, 18.22/1, 18.22/2, 18.23/1, 18.23/2, 18.24/1, 18.24/3, 18.24/9, 18.30, 19.20, 19.30	Manufacture of clothing items like hats, shoes, outerwear and underwear or accessories like bags and luggage.
Layer 4	17.11, 17.12, 17.13, 17.14, 17.15, 17.16, 17.17, 17.21, 17.22, 17.23, 17.24, 17.25, 17.30, 17.54/1, 17.54/2, 17.54/9, 17.60, 19.10	Manufacture of fibres, textiles, prepared fur and prepared leather
	51.16, 51.24/1, 51.24/9, 51.41, 51.42/1, 51.42/2, 51.42/3, 51.42/9	Wholesale of, and activates of agents involved in the sale of, fabrics, fur and clothing,
Layer 5	52.42/1, 52.42/2, 52.42/3, 52.42/4, 52.43/1	Retail sale of cloths, accessories and footwear

Video, Film and Photography

Layer 1	74.81/3	Specialist photography (e.g. underwater)
	74.81/9	Photos for commercials, fashion, tourism etc.
	92.11/1	Producing films, cartoons and documentaries
	92.11/9	Dubbing, editing, post production etc.
Layer 2	74.81/2	Portrait photos (mainly passport photo companies, although doesn't include photo machines)
Layer 3	92.12	Motion picture distribution
	74.81/4	Film processing
	52.48/2	Retail sale of cameras but also office equipment
	51.47/6	Wholesale of photographic goods
	33.40/3	Manufacture of cameras, projectors etc.
	24.65	Manufacture of unrecorded media (also includes unrecorded media for computers)
	24.64	Manufacture of photographic chemicals
	22.32	Reproduction of DVD's and tapes
Layer 5	92.13	Cinemas

Music and Performing Arts

Layer 1	92.31/1	Live theatrical presentation
	92.31/9	Artistic and literary creation and interpretation
Layer 2	92.72/1	Casting for theatres, motion pictures or television
	92.32	Theatres, concert halls, arts facilities and ticket agencies
	22.14	Music publishing
Layer 3	92.34/9	“Other entertainment activities” code that includes VUE and Tussauds
	51.47/5	Wholesale of musical instruments
	22.31	Reproduction of sound recording
Layer 4	51.43/1	Wholesale of records, CD’s etc. and players
Layer 5	92.72/9	“Other recreational activities” code

Publishing

Layer 1	92.4	Journalists, press photographers and news syndicates
Layer 2	22.13	Publishing journals
	22.12	Publishing newspapers
	22.11	Publishing books
Layer 3	74.87/9	Business activities note covered by other SIC codes, including author’s agents but also consultants etc.
	22.25	Activities like embossing and laminating
	22.24	Pre-press work, like composition and typesetting
	22.23	Bookbinding
	22.22	Printing maps, magazines, music manuscripts, diaries and similar items
	22.21	Printing newspapers
	22.15	Publishing photos, posters, timetables etc.
Layer 4	24.30/2	Manufacture of printing ink
	21.12	Manufacture of paper and paperboard
	21.11	Manufacture of pulp
Layer 4	52.47	Retail sale of books, newspapers and stationery
	52.11/1	Retail sale by newsagents, confectioners etc.

Software and computer games

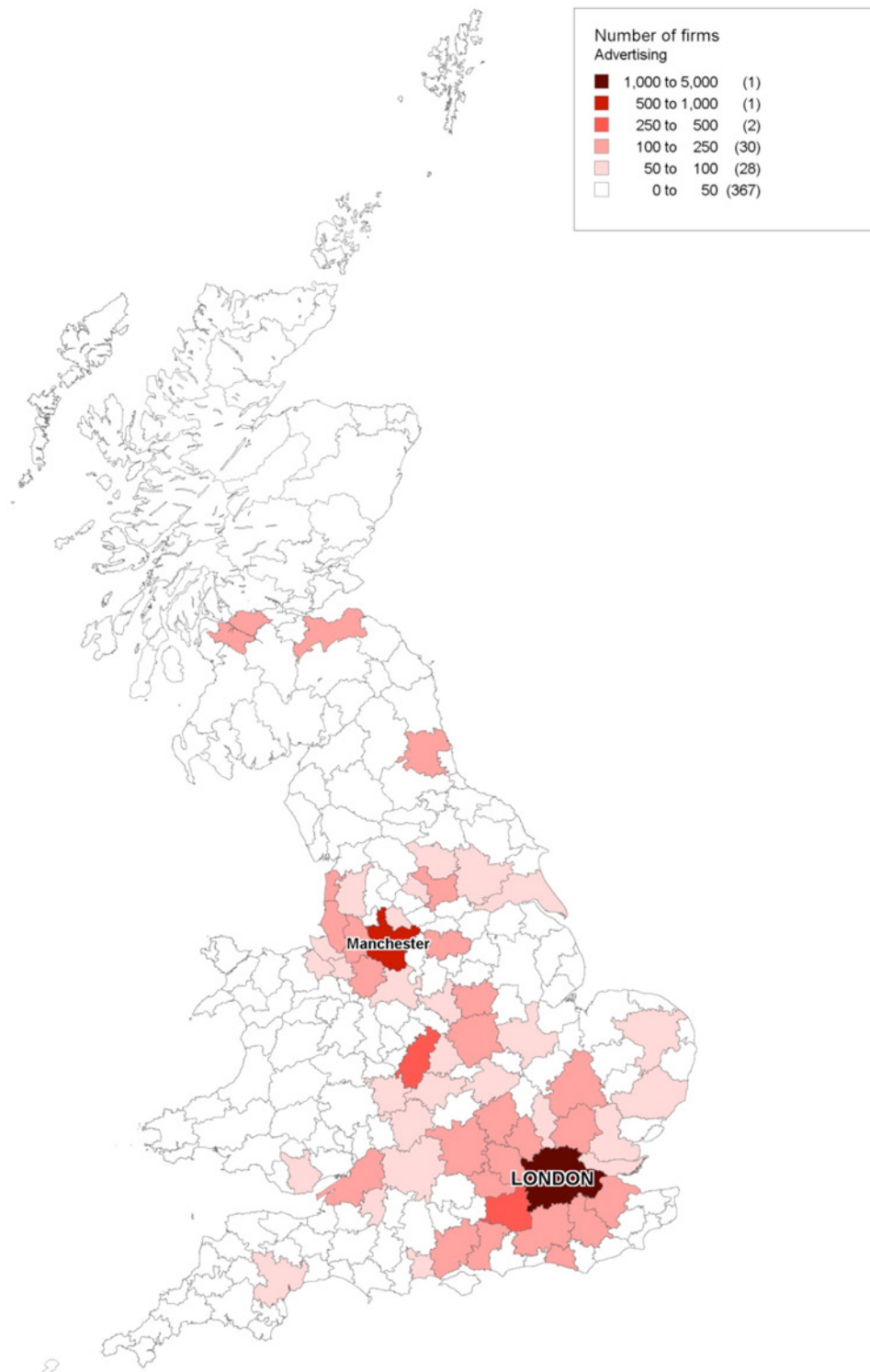
Layer 1	36.50/9	Manufacture of video game machines but also chess sets, dolls, playing cards etc.
	72.21	Development and supply of ready made software "off the shelf"
	72.22	Development of made to order software, software consultancy and web page design
Layer 2	72.6	Computer related work not covered under other SIC codes
Layer 3	72.1	Hardware consultancy
	22.33	Reproduction of software
Layer 4	51.84	Wholesale of computers, peripherals and software
	51.47/7	Wholesale of toys, including video games
	36.50/1	Manufacture of arcade games, including billiards etc.
Layer 5	52.48/5	Retail sale of toys (including video games), spots goods, stamps and coins

Radio and TV

Layer 1	92.20/1	Radio production and broadcast
	92.20/2	Television production and broadcast
Layer 3	32.20/2	Transmitters and television cameras
Layer 4	51.43/9	Wholesale of radios, TV's, lighting equipment and some other appliances
	32.3	Manufacture of TV's, video recorders, camcorders, record decks, microphones and similar goods
Layer 5	52.45	Retail sale of radios, TV's, DVD's, musical instruments and musical scores

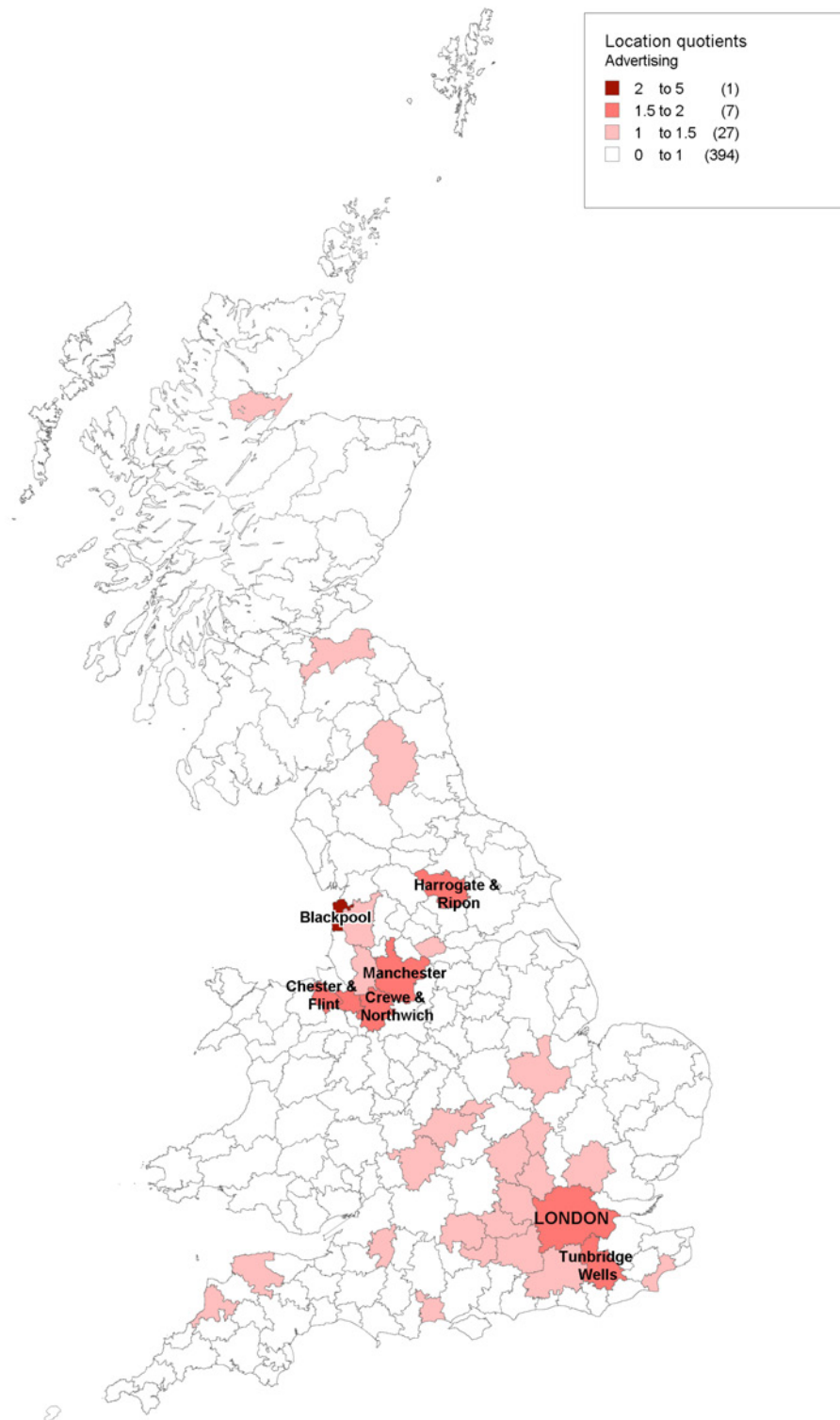
Appendix 4: Maps

Map 14: Advertising: Number of Firms by TTWA (DCMS Definition) – 2007



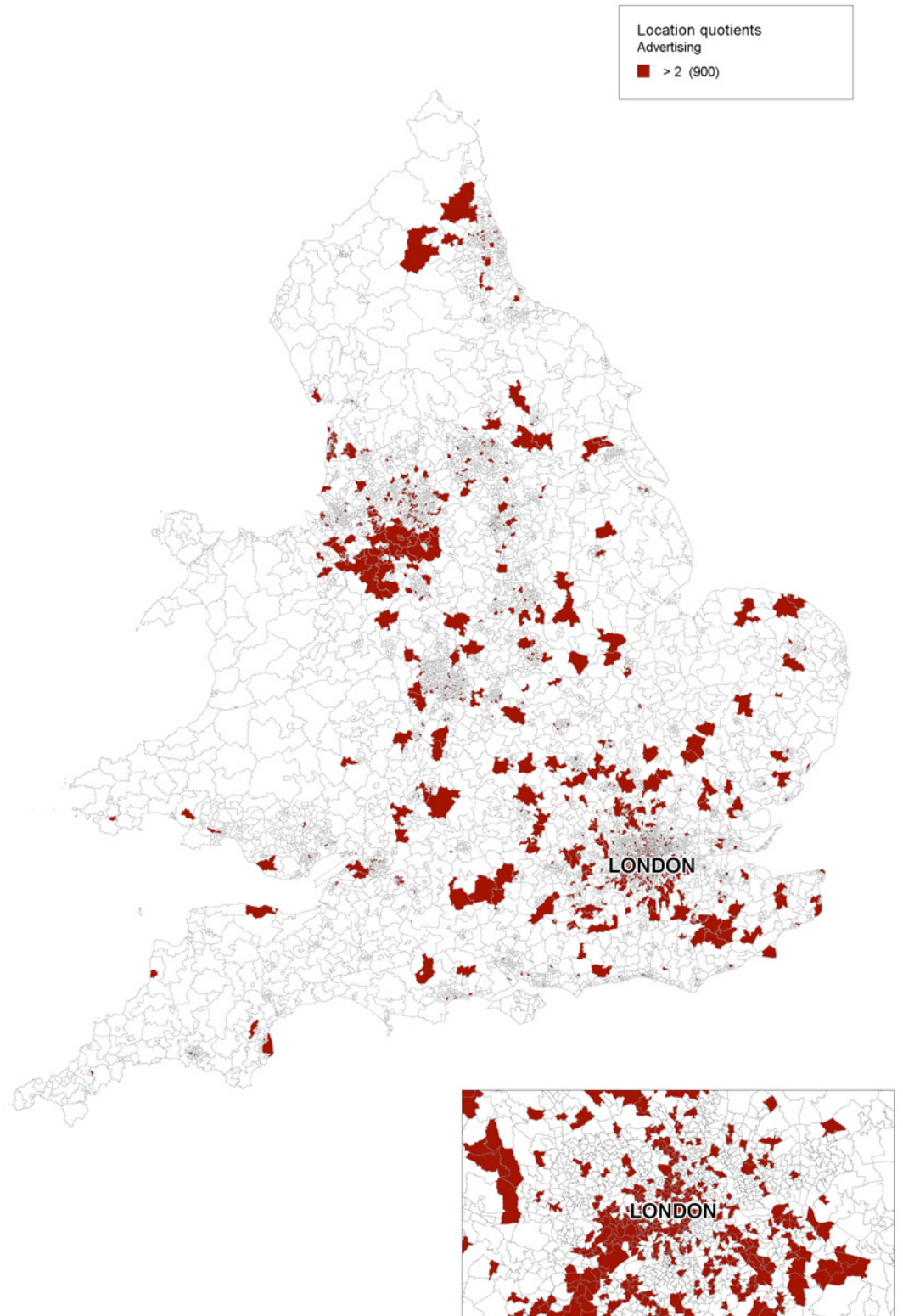
Source: JCIS/ABI (2007)

Map 15: Advertising: Number of Firms by TTWA (DCMS Definition) – 2007



Source: JCIS/ABI (2007)

Map 16: Advertising: Firms' Location Quotients >2 by MSOA (DCMS Definition) – 2007



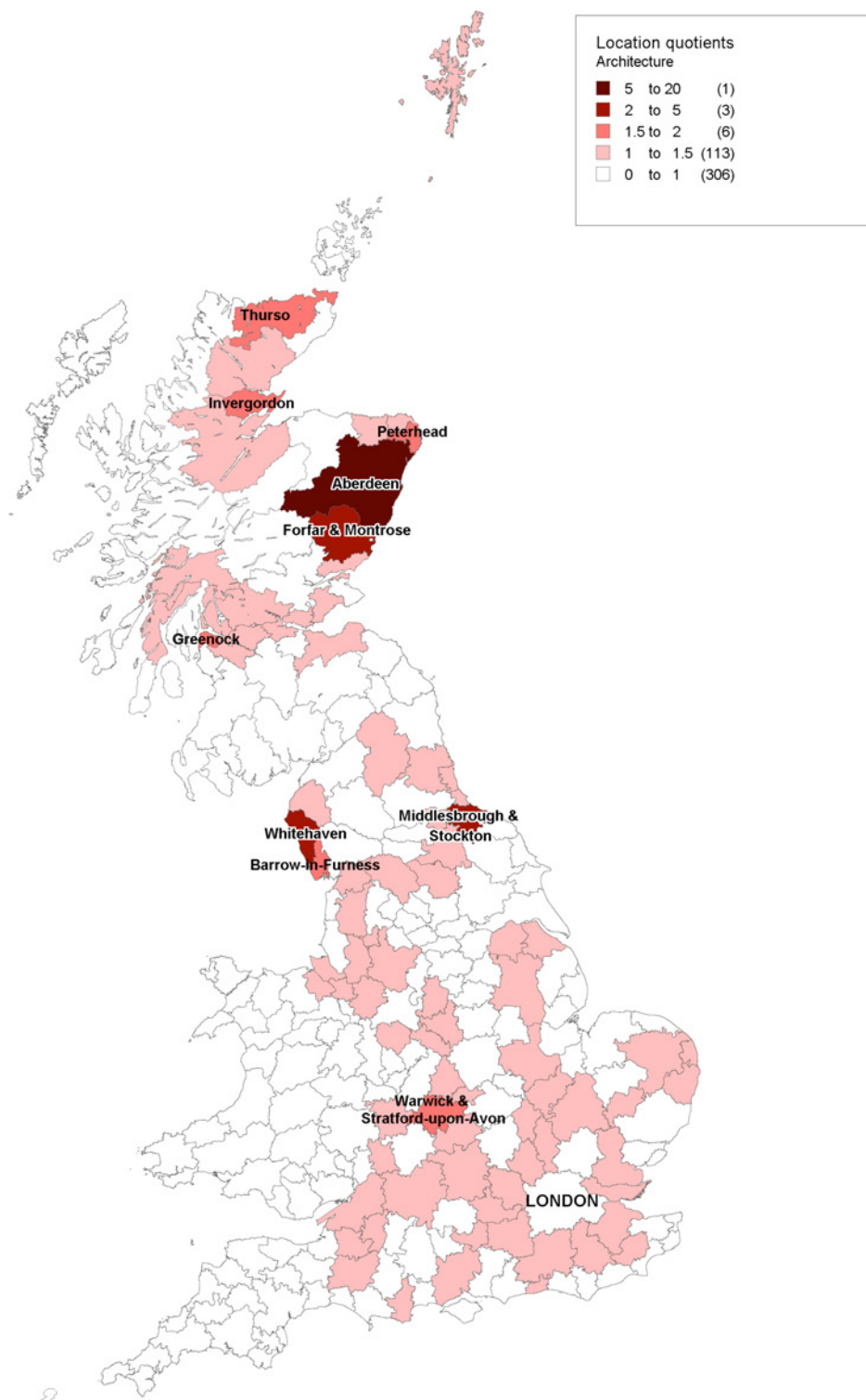
Source: JCIS/ABI (2007)

Map 17: Advertising: Firms' Location Quotients >2 by MSOA (Frontiers Economics Definition) – 2008



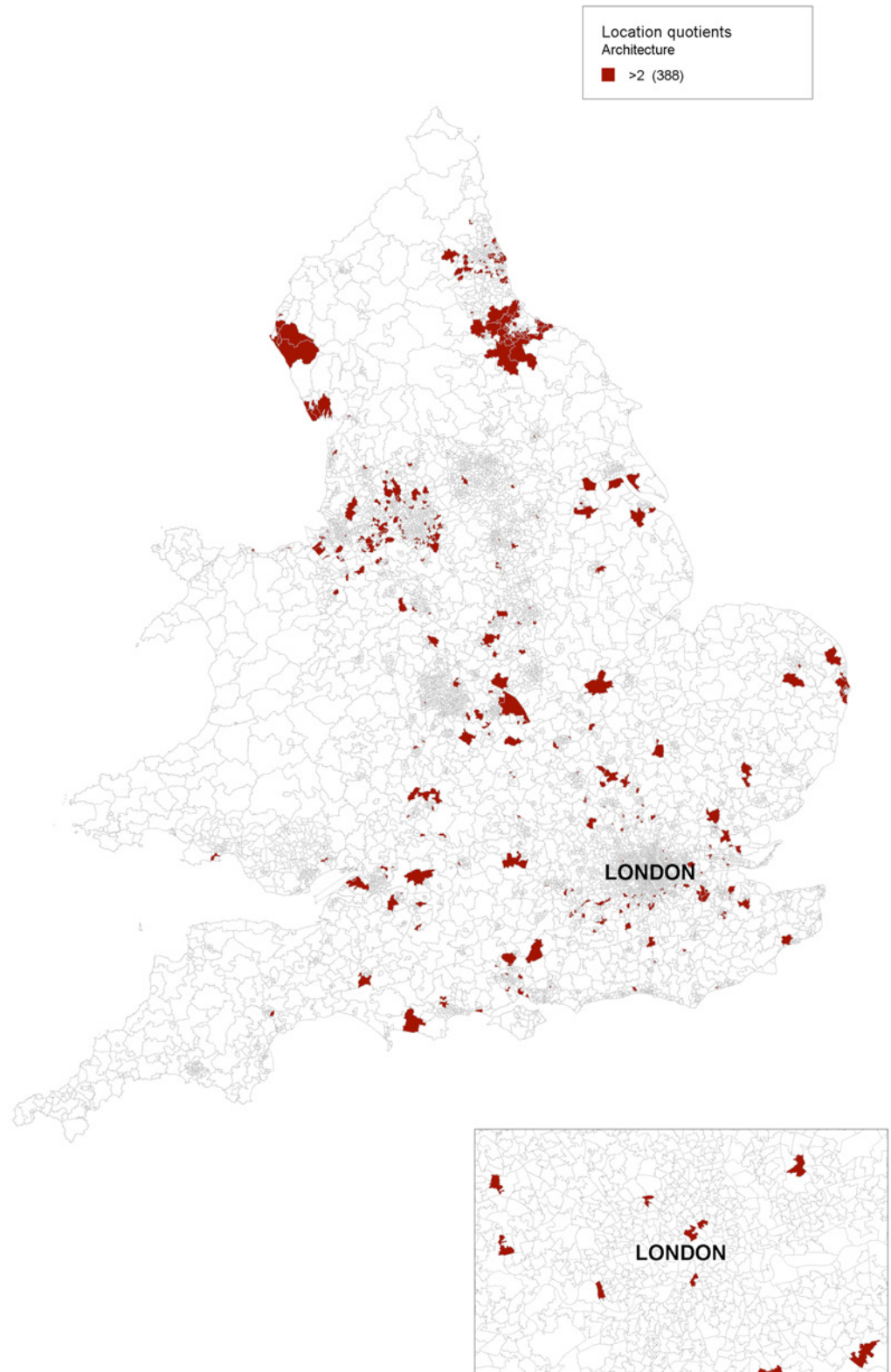
Source: JCIS/IDBR (2008)

Map 18: Architecture: Firms' Location Quotients by TTWA (DCMS Definition) – 2007



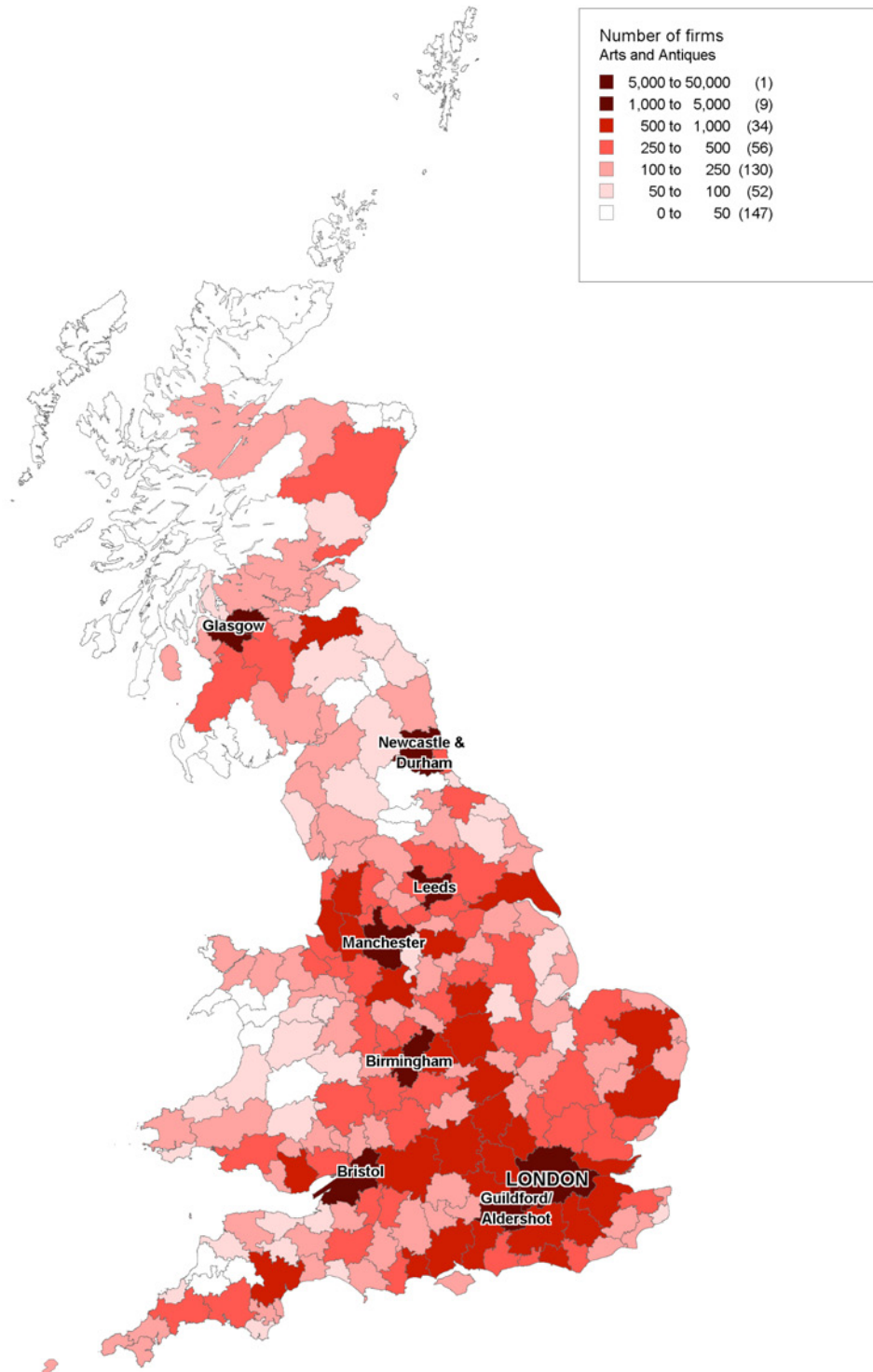
Source: JCIS/ABI (2007)

Map 19: Architecture: Firms' Location Quotients >2 by MSOA (DCMS Definition) – 2007



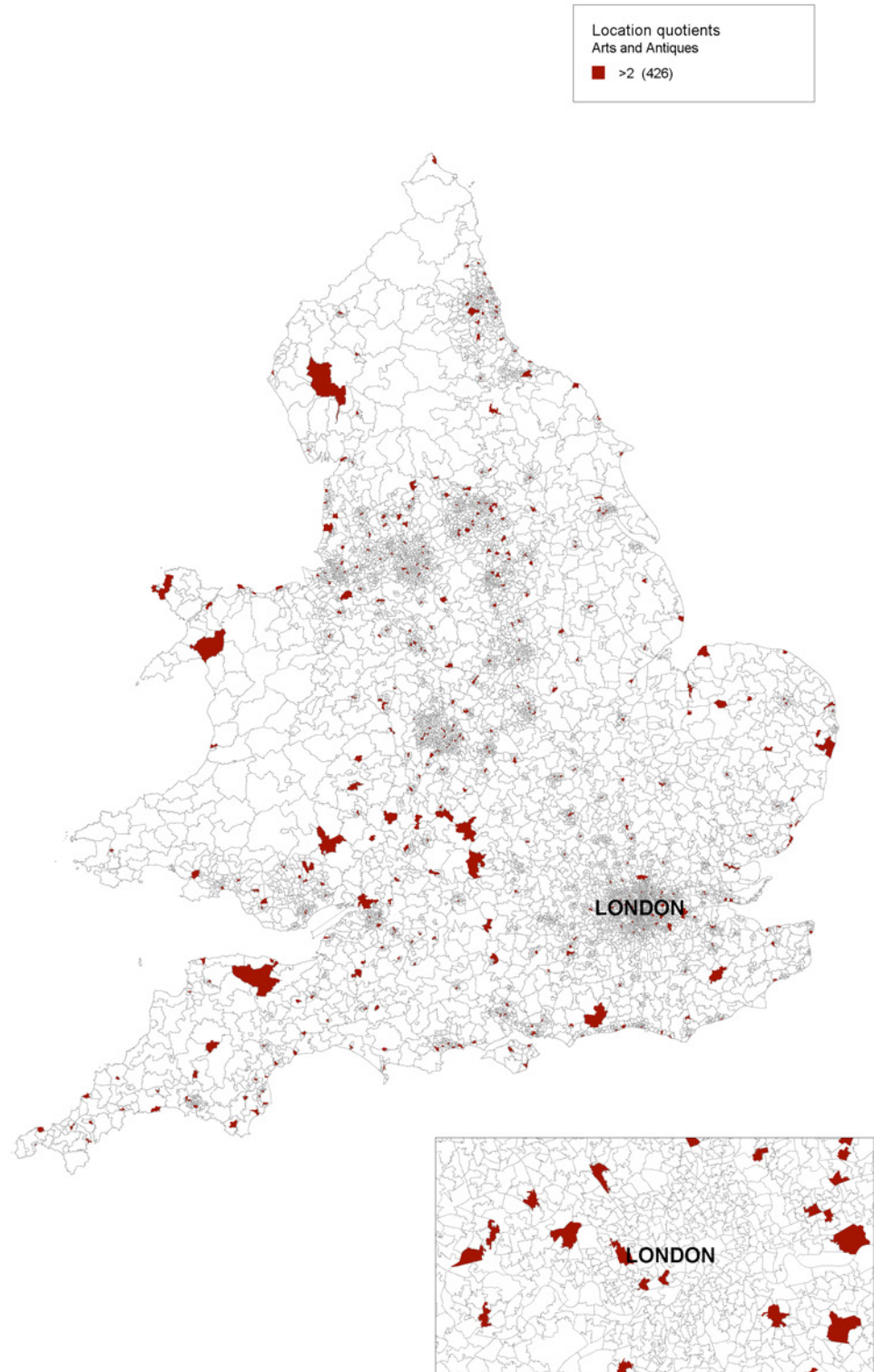
Source: JCIS/ABI (2007)

Map 20: Arts and Antiques: Number of Firms by TTWA (DCMS Definition) – 2007



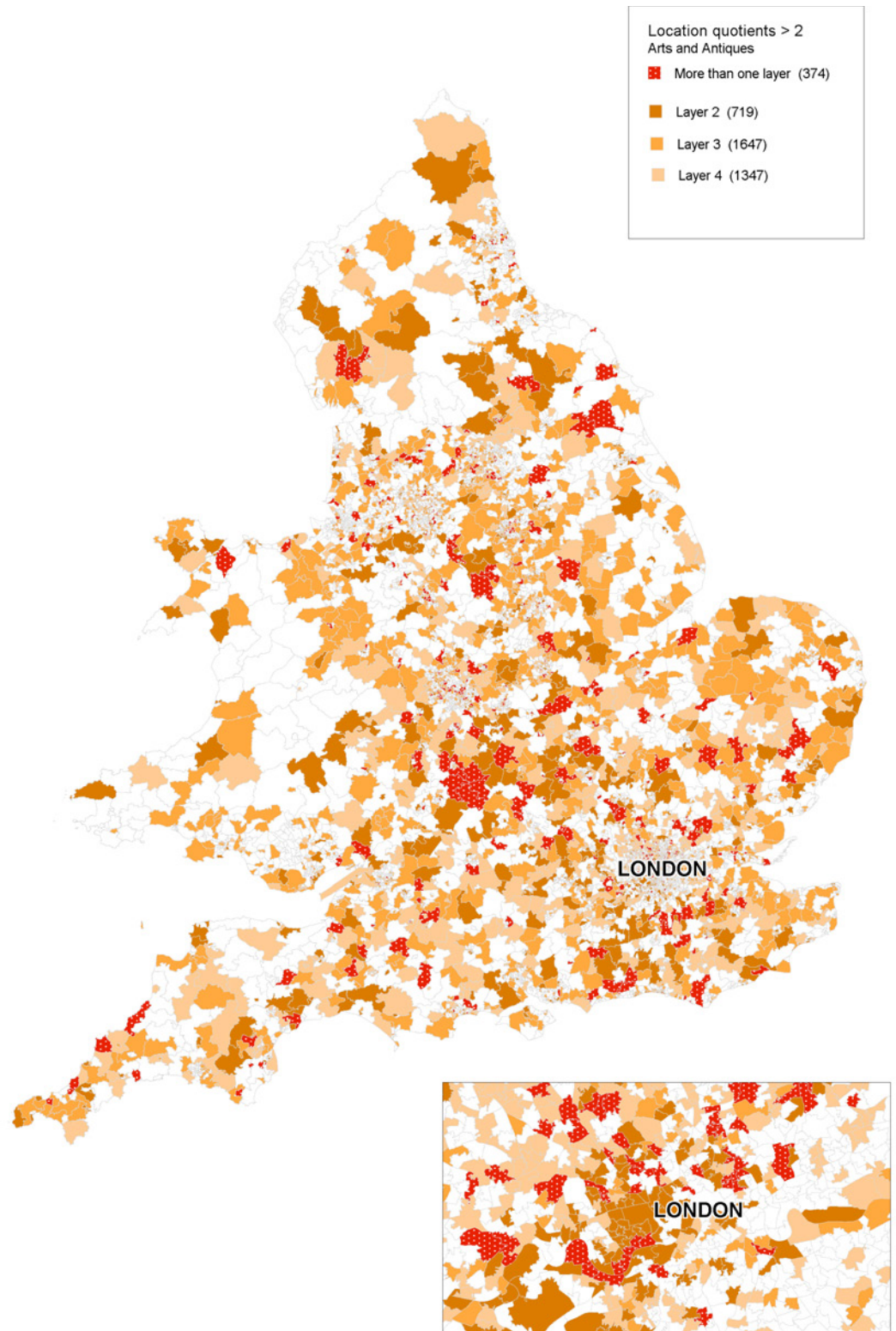
Source: JCIS/ABI (2007)

Map 21: Arts and Antiques: Firms' Location Quotients >2 by MSOA (DCMS Definition) – 2007



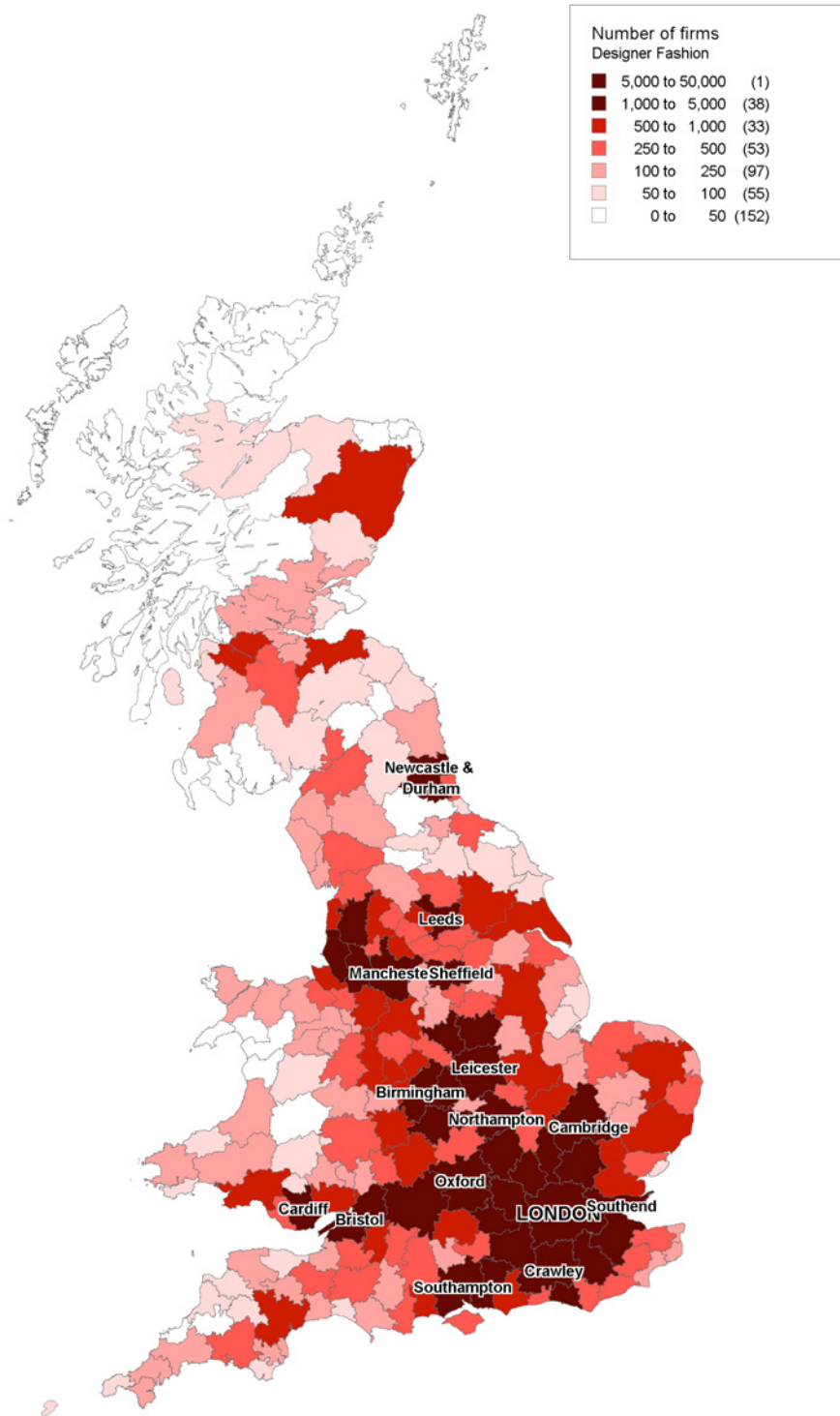
Source: JCIS/ABI (2007)

Map 22: Arts and Antiques: Firms' Location Quotients >2 by MSOA (Frontiers Economics Definition) – 2008



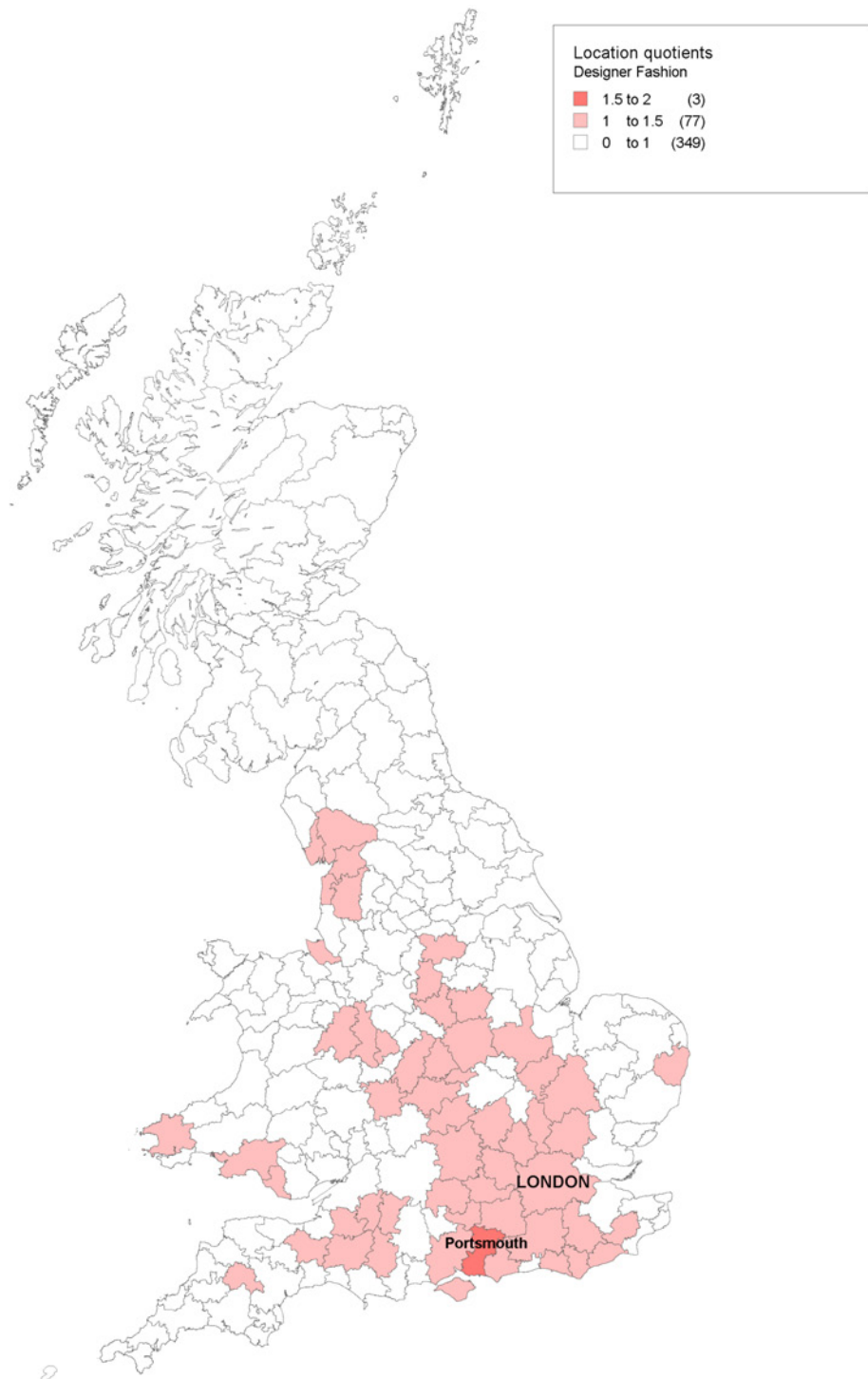
Source: JCIS/IDBR (2008)

Map 23: Designer Fashion: Number of Firms by TTWA (DCMS Definition) – 2007



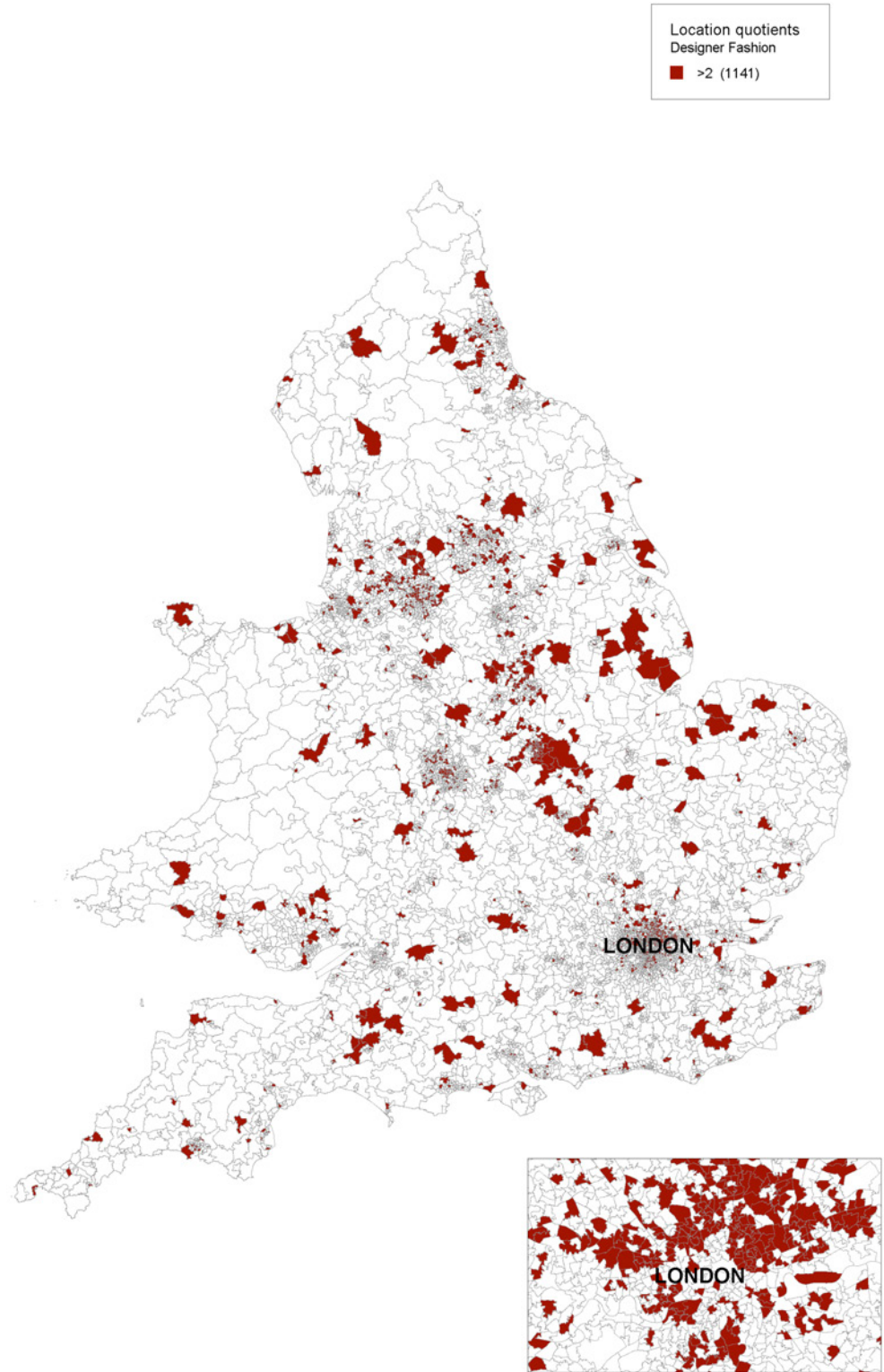
Source: JCIS/ABI (2007)

Map 24: Designer Fashion: Firms' Location Quotients by TTWA (DCMS Definition) – 2007



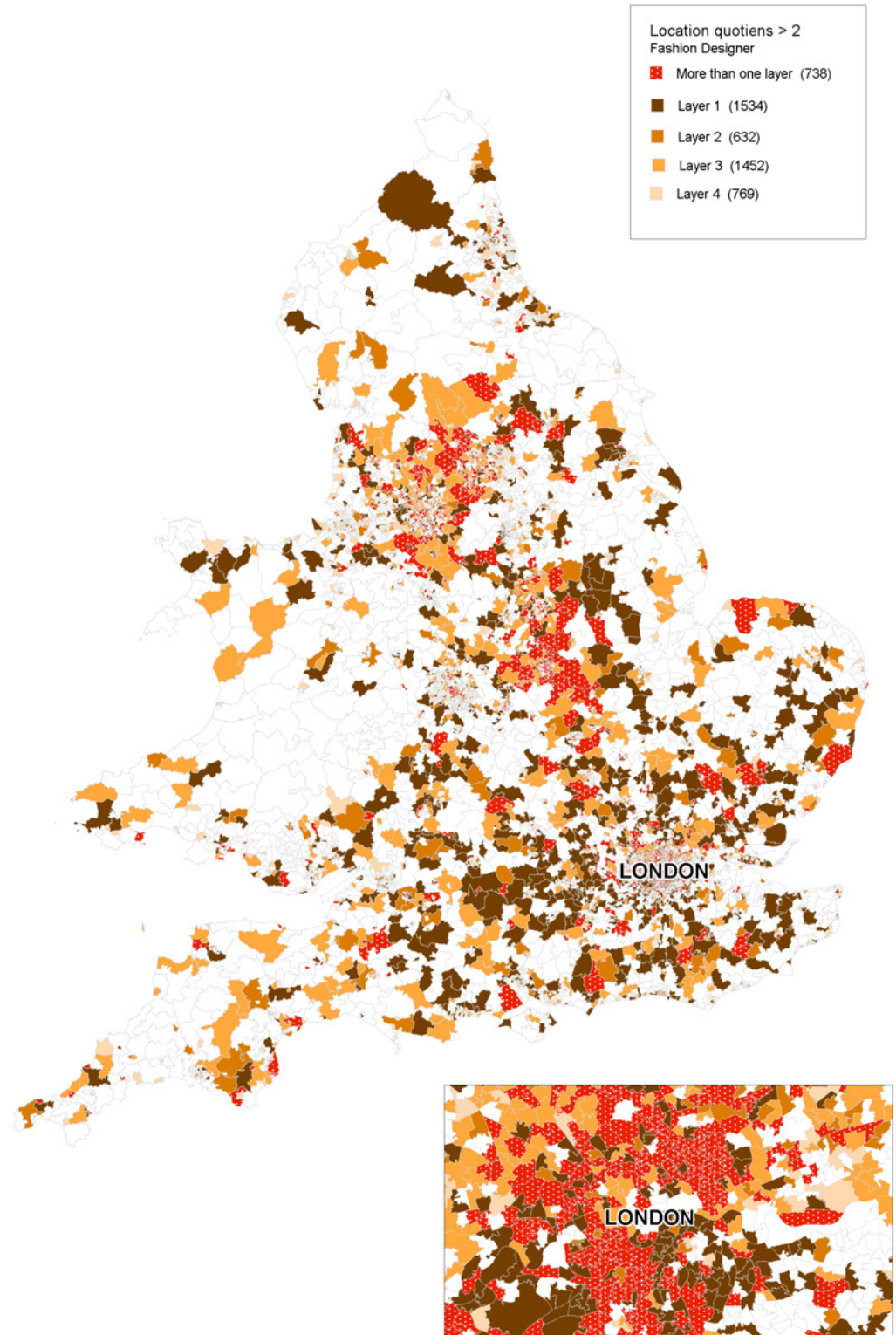
Source: JCIS/ABI (2007)

Map 25: Designer Fashion: Firms' Location Quotients >2 by MSOA (DCMS Definition) – 2007



Source: JCIS/ABI (2007)

Map 26: Designer Fashion: Firms' Location Quotients >2 by MSOA (Frontiers Economics Definition) – 2008



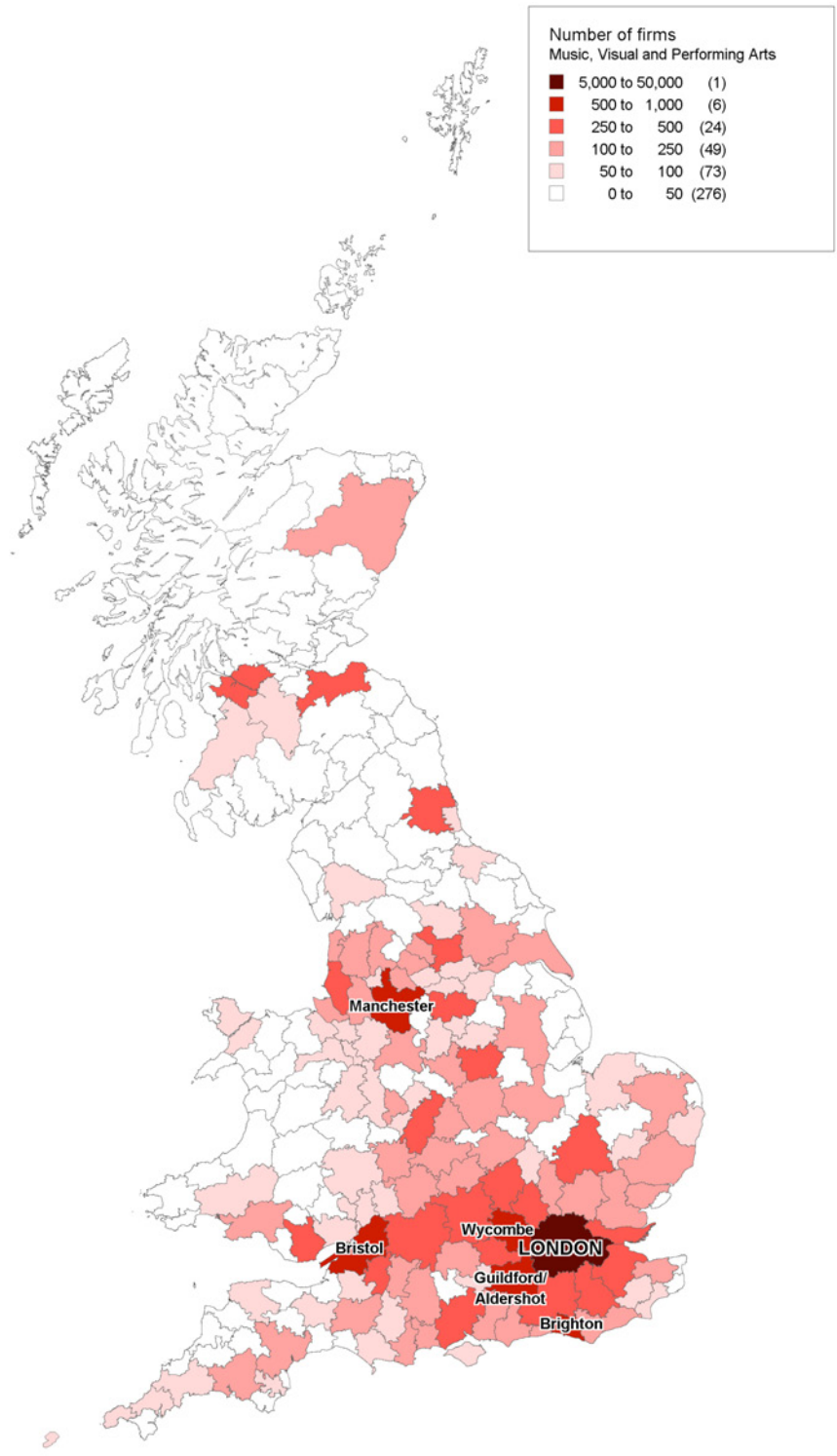
Source: JCIS/IDBR (2008)

Map 27: Photography, Video and Film: Firms' Location Quotients >2 by MSOA (Frontiers Economics Definition) – 2008



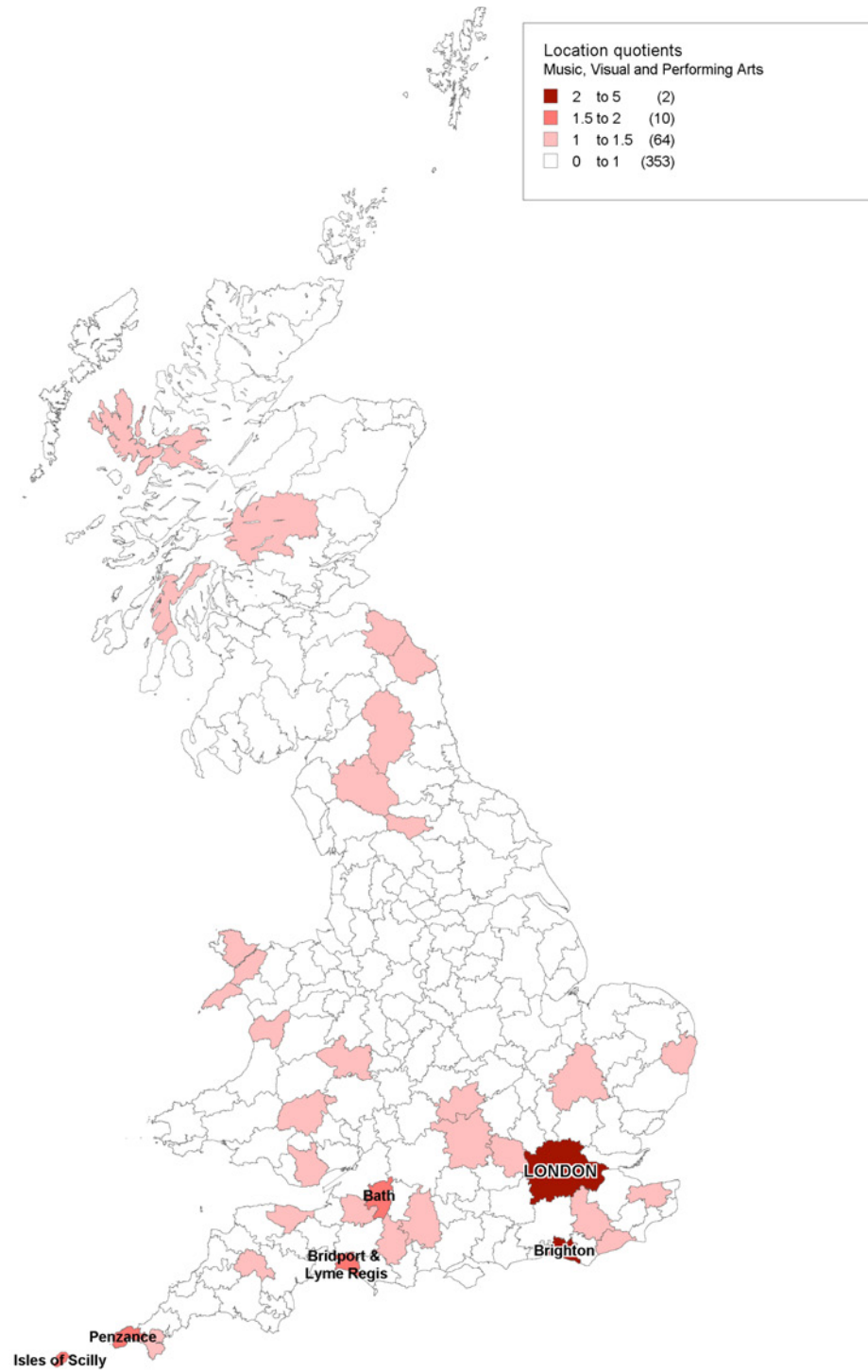
Source: JCIS/IDBR (2008)

Map 28: Music, Visual and Performing Arts: Number of Firms by TTWA (DCMS Definition) – 2007



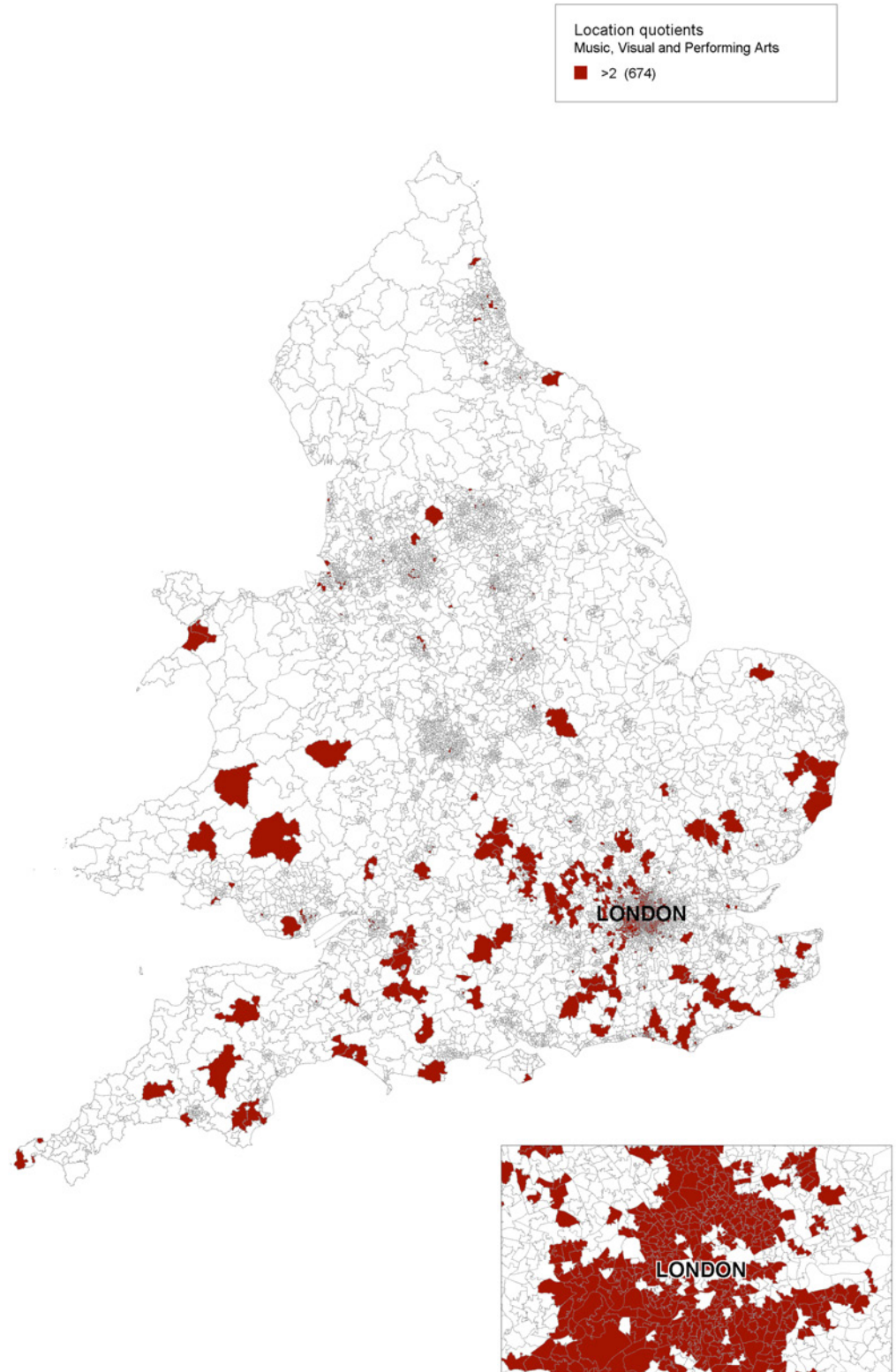
Source: JCIS/ABI (2007)

Map 29: Music, Visual and Performing Arts: Firms' Location Quotients by TTWA (DCMS Definition) – 2007



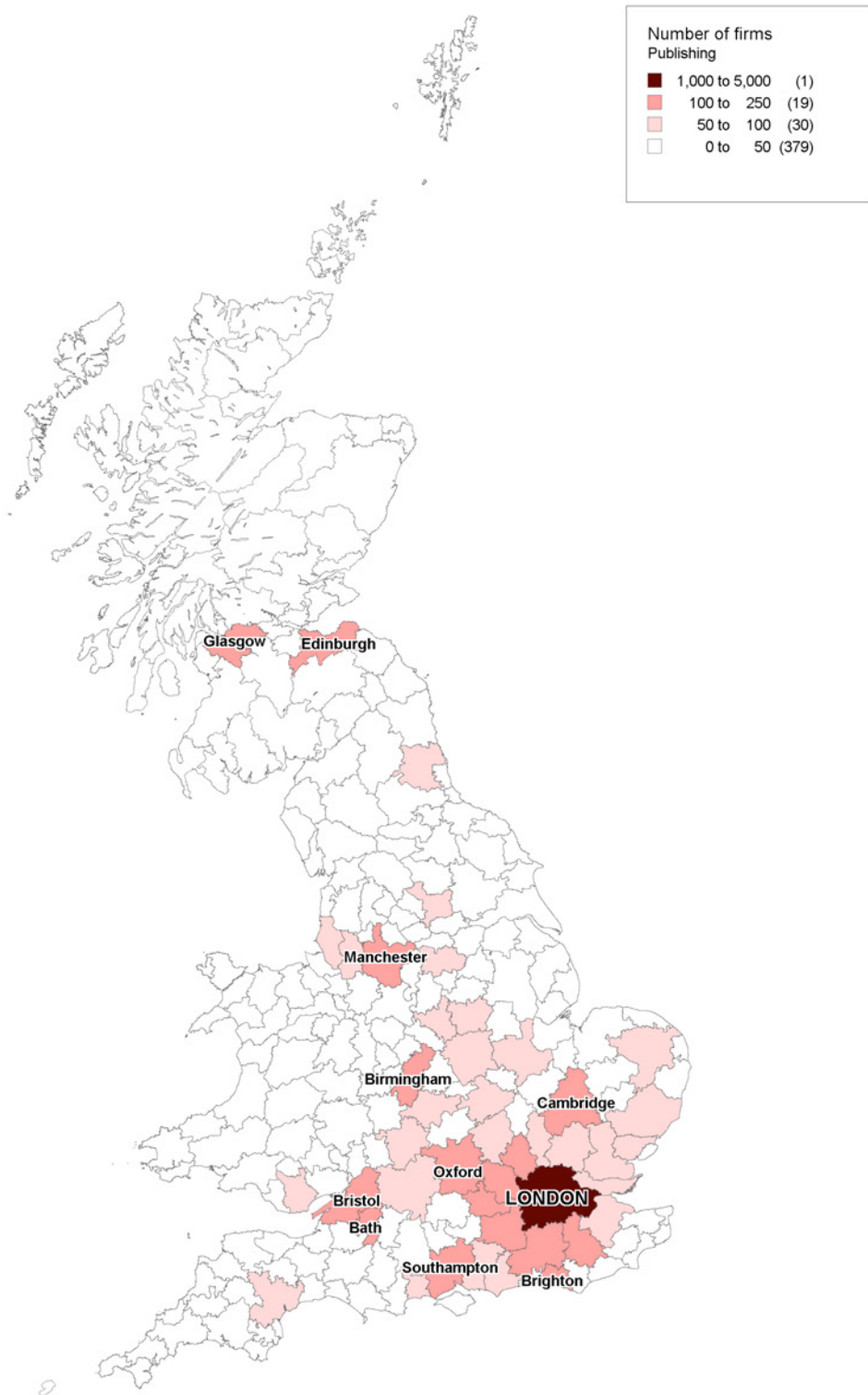
Source: JCIS/ABI (2007)

Map 30: Music, Visual and Performing Arts: Firms' Location Quotients >2 by MSOA (DCMS Definition) – 2007



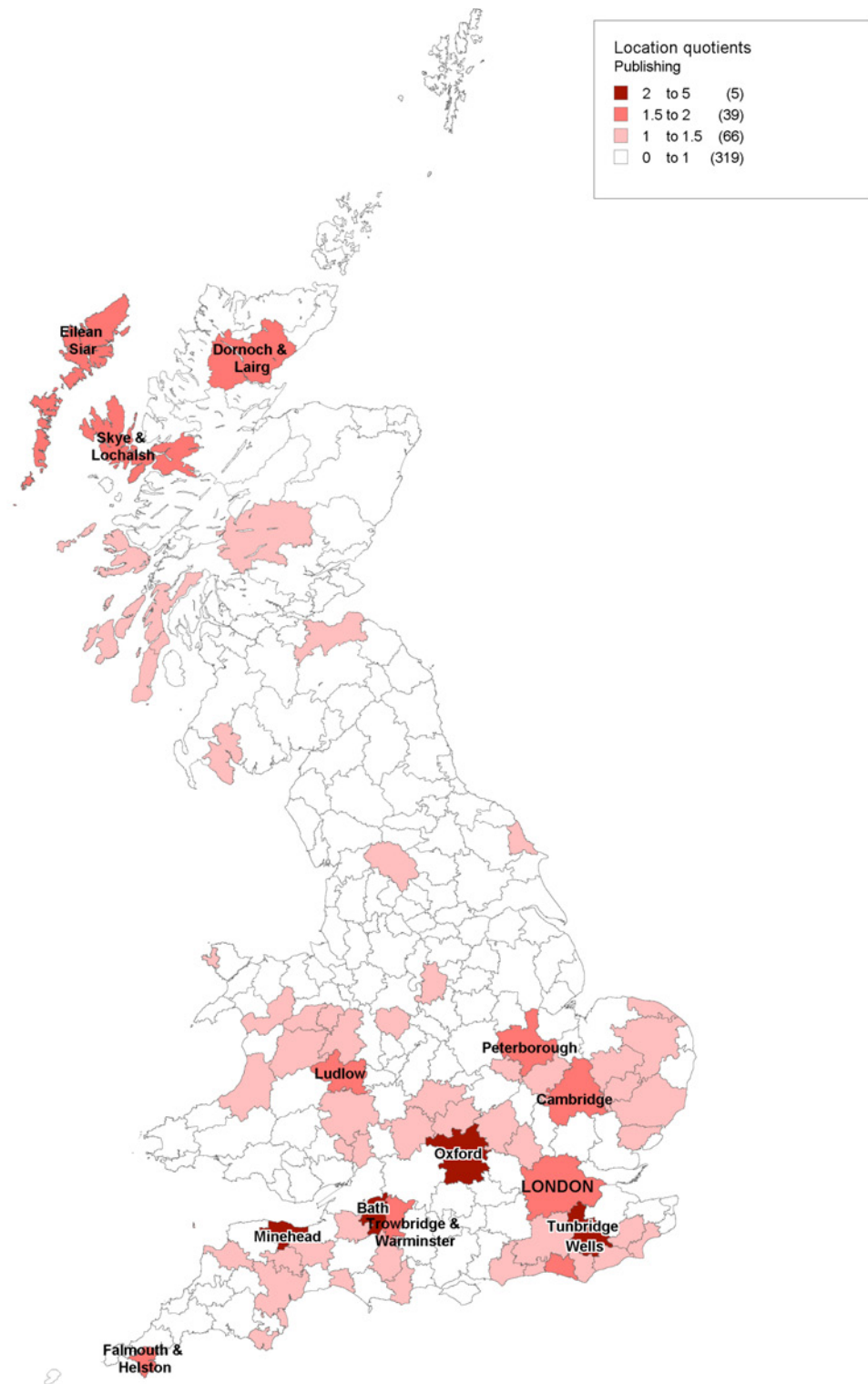
Source: JCIS/ABI (2007)

Map 31: Publishing: Number of Firms by TTWA (DCMS Definition) – 2007



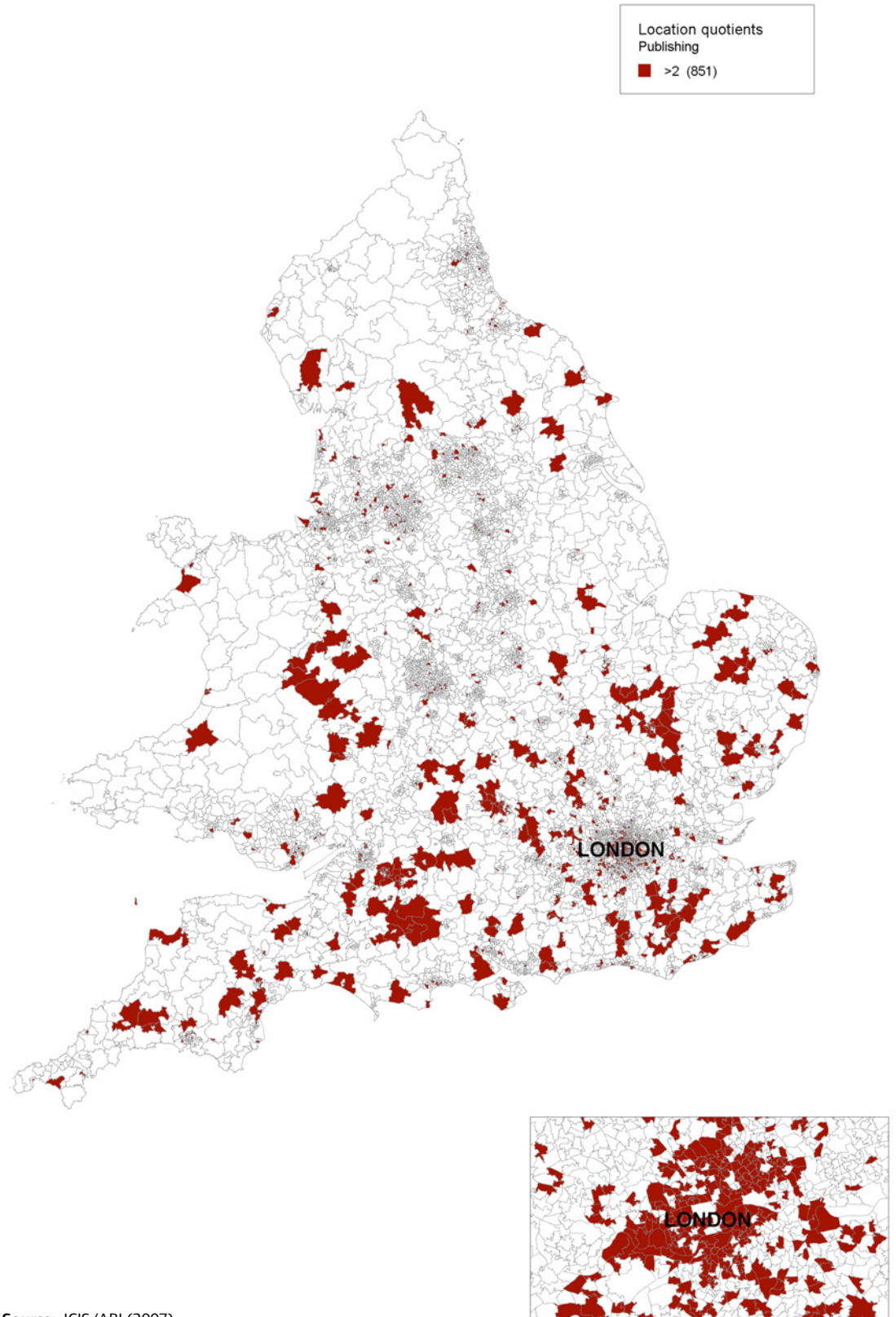
Source: JCIS/ABI (2007)

Map 32: Publishing: Firms' Location Quotients by TTWA (DCMS Definition) – 2007



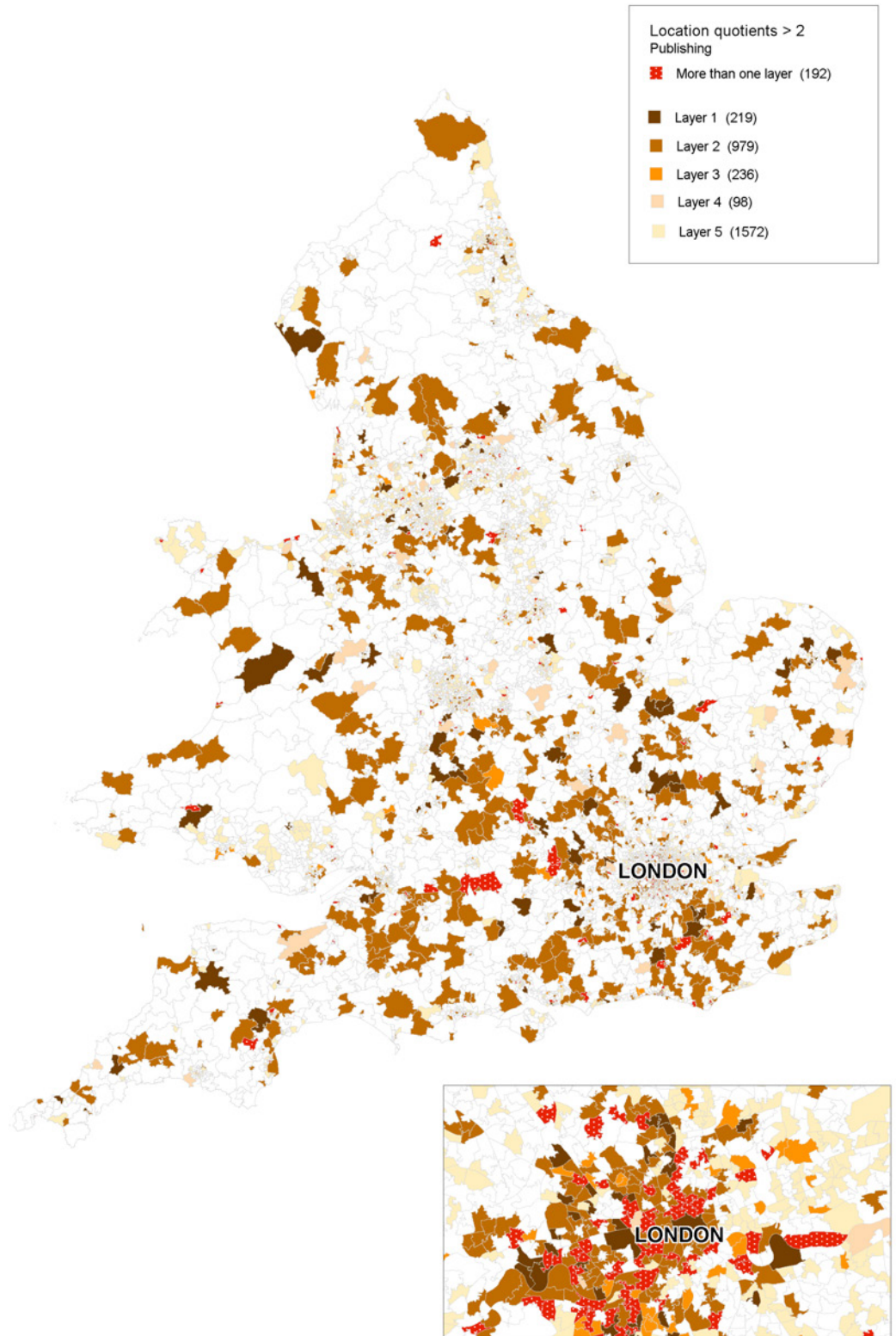
Source: JCIS/ABI (2007)

Map 33: Publishing: Firms' Location Quotients >2 by MSOA (DCMS Definition) – 2007



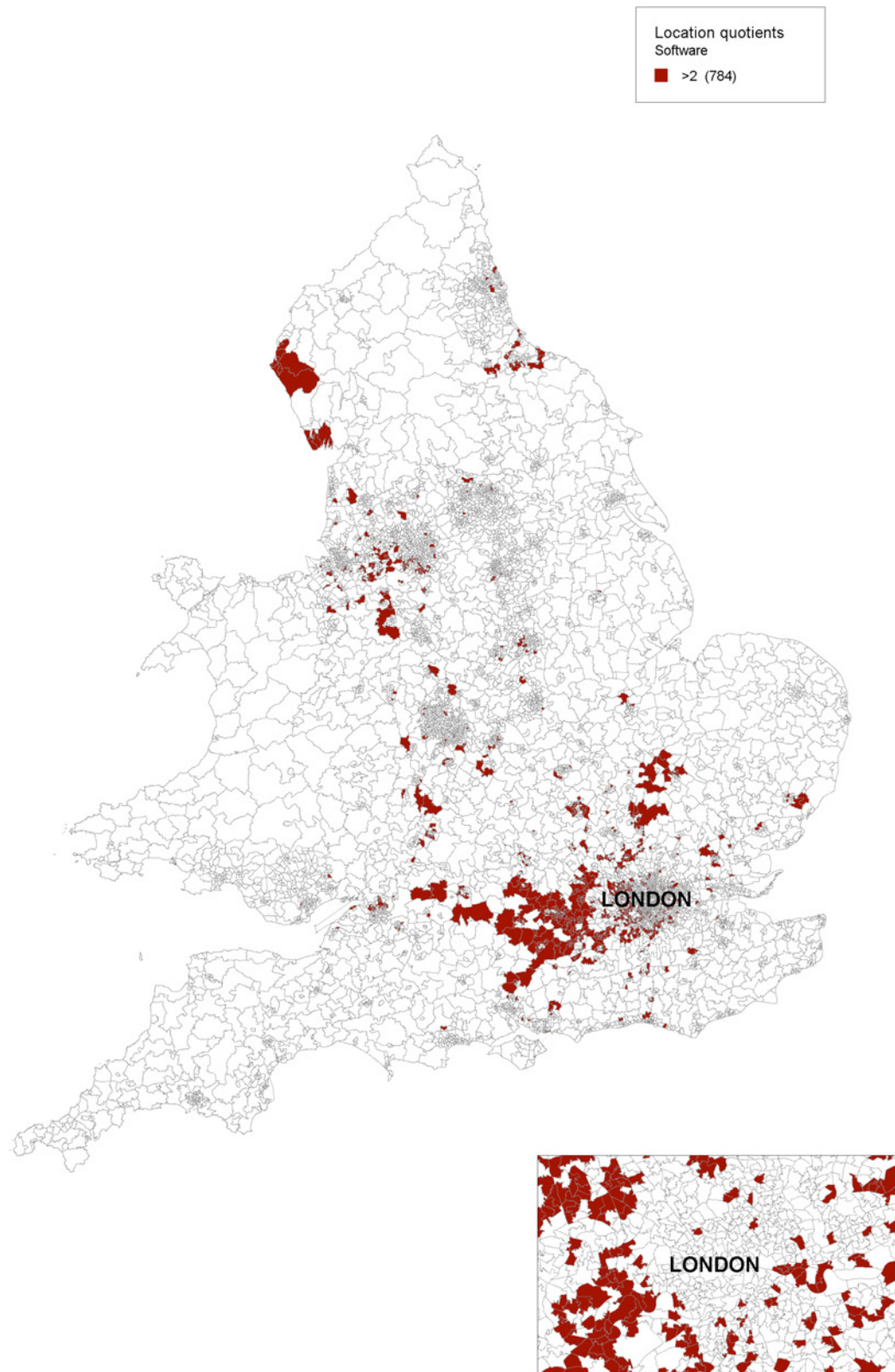
Source: JCIS/ABI (2007)

Map 34: Publishing: Firms' Location Quotients >2 by MSOA (Frontiers Economics Definition) – 2008



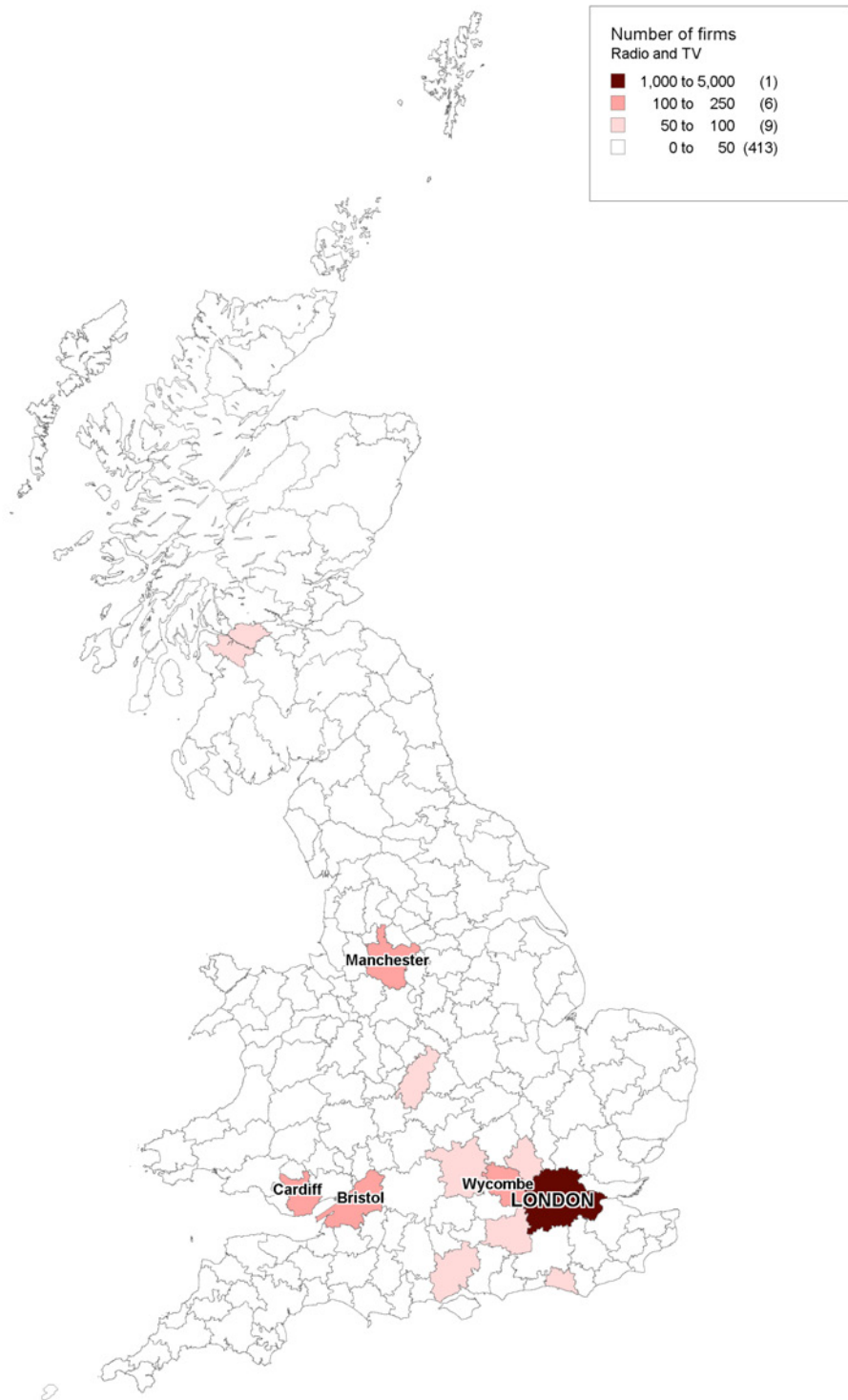
Source: JCIS/IDBR (2008)

Map 35: Software: Firms' Location Quotients >2 by MSOA (DCMS Definition) – 2007



Source: JCIS/ABI (2007)

Map 36: Radio and TV: Number of Firms by TTWA (DCMS Definition) – 2007



Source: JCIS/ABI (2007)

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Published: August 2009
GC/27