Creative Industries
Policy & Evidence Centre
Led by nesta

Discussion Paper 2022/04

Identifying and Analysing UK Fashion Micro-clusters

Building regional Supply chains that foster sustainable approaches and circular economies

Dr Dawn Ellams, Royal College of Art
Prof Susan Postlethwaite, Manchester Metropolitan University
Dr Patrizia Casadei, London School of Economics
Dr Jorge Velez Ospina, University of Sussex, Sussex, United Kingdom

May, 2023
ISBN: 978-1-913095-51-2

This project is part of the Creative Industries Clusters Programme, which is funded by the Industrial Strategy Challenge Fund and delivered by the Arts and Humanities Research Council on behalf of UK Research and Innovation.

Further in-kind support has also been provided by UKFT, Textile Centre of Excellence and Future fashion factory.

Supported by UKRI Arts and Humanities Research Council INDUSTRIAL STRATEGY

About the Creative Industries Policy and Evidence Centre

The Creative Industries Policy and Evidence Centre (PEC) works to support the growth of the UK's Creative Industries through the production of independent and authoritative evidence and policy advice.

Summary

The UK Fashion and Textiles industry contributed almost £20 billion to the UK economy in 2020 and remains a major UK employer with 500,000 jobs supported across design, manufacturing and retail. The covid-19 pandemic and post Brexit landscape exposed the UK industries reliance on long, global supply chains as well as restricting access to skilled workers. In parallel to these events the sector faces further challenges to address sustainability and circular economy agendas and transition to net zero by 2050.

The UK sector is dominated by fashion design and manufacture Micro and SME businesses, though more economically vulnerable than larger businesses, they have demonstrated the ability to be more agile in response to external factors causing supply chain disruptions (such as Brexit and Covid), as well as adapt to more sustainable practices. However, accessing UK supply chain networks, at an appropriate scale and quality to support the growth of these businesses is an increasing challenge.

This paper outlines findings from qualitative research evaluating the benefits to UK based micro and SME fashion businesses from being co-located within regional micro-clusters. It looks at the regional activities being undertaken by fashion firms working within micro-clusters and the challenges they face in the post Brexit & Covid landscape, as well as specific sustainability challenges.

It finds that regional fashion micro-clusters act as localised networks developing and providing access to skills and services for businesses based within them. Recommendations for programme and policy initiatives to support the development of cluster & cross cluster communities to enable wider access to these developing UK supply chain networks are suggested. These include, investment in fashion micro-clusters as innovation hubs as well as supporting the expansion of businesses operating within them into New Markets.

Contents

1.1 Background

The UK Fashion and Textiles industry contributed almost £20 billion to the UK economy in 2020 and remains a major UK employer with 500,000 jobs supported across design, manufacturing and retail (UKFT, 2020). However, the covid-19 pandemic and post Brexit landscape exposed the UK industries reliance on long, global supply chains as well as restricting access to skilled workers. In parallel to these events the sector faces further challenges to address sustainability and circular economy agendas (Environmental Audit Committee, 2019) and transition to net zero by 2050.

The sector is dominated by fashion design and manufacture Micro and SME businesses, who though more economically venerable have demonstrated the ability to be more agile in response to external factors causing supply chain disruptions (such as Brexit and Covid). This paper outlines findings from qualitative research evaluating the benefits to UK Micro and SME firms from being based within fashion micro-clusters. The types of specific and specialised regional activities being undertaken by fashion firms working within micro-clusters is also explored to support understanding of the post Brexit & Covid landscape, as well as specific sustainability challenges faced.

Fashion micro-clusters were identified and interviews conducted with firms based within the regions of London, Manchester and Yorkshire and the Humber. Conclusions of the paper demonstrate the supply chain benefits to firms of being part of a fashion micro-clusters as well as the potential for fashion micro-clusters to act as innovation hubs, for fostering the adoption of more sustainable approaches and circular economies in the industry. Through this research we aim to inform policy developments specifically focussing on driving regional fashion micro-cluster environmental and financial economies

The research was informed by the Creative Industry Policy and Evidence Centre's (PEC) 'Creative Radar' work into identifying and mapping UK creative micro-clusters (Siepel et al., 2020) that builds on previous research into creative clusters. Creative clusters typically identify clusters at city level, where as the Creative Radar report identified creative micro-clusters, these being areas within a creative neighbourhood, town or village.

1.2 Methodology[1]

The research drew upon a **three-step analysis** aimed at 1) identifying and mapping UK fashion micro-clusters, 2) understanding their main dynamics and activities with a focus on selected firms populating these micro-clusters, and 3) emphasising key trends and the main difficulties that are currently affecting micro-clusters, the UK fashion sector and its value chain more generally.

The **first stage of research** involved the **identification and mapping of fashion micro-clusters** by drawing upon data that was originally collected for the Creative Radar Report (Siepel et al., 2020). This was data scraped from the web based on creative business activities as described on their websites. **Apparel and Fashion** was the only sub-sector from the original Creative Radar data set used for this mapping activity. The final sample corresponded to 19,713 **firms and organisations**. A machine-learning clustering algorithm was then employed to identify a range of distances to separate micro-clusters of varying densities from sparser noise. Two different thresholds representing the minimum number of firms - these being 30 and 50 - for each micro-cluster were used to ensure the capture of relevant micro-clusters.

In order to add an extra layer to explore the granularity of clusters, **Orbis data** was also used to identify and map micro-clusters within the selected regions of interest, these being London, Greater Manchester and the Yorkshire and Humber region. These regions were selected due to London being historically an area of high activity for fashion design and manufacture, Greater Manchester being the largest city region in the North to provide a comparison between micro-cluster activities in large cities in the South East and North West, and Yorkshire and Humber being a region with a traditional textile design and manufacturing industry, as well as having an active UKRI Creative Cluster funded project specifically focussing on fashion[2].

For a balanced view and comparability of data, we developed a **rationale for** the selection of micro-clusters to be included in the interview process. The micro-clusters selected were approximately of the same size, located both in

[1] Detailed methodology available in appendix 1.

[2] Future Fashion Factory is a UKRI Creative Cluster funded project led by University of Leeds, the five year project researches and develops advanced digital and textile technologies to transform the industry's agility in the luxury fashion design process, and ability to shift to circular economies.

central cities and peripheral areas, and mainly specialised in manufacturing (with a low share of retailers). Two micro-clusters based within each region were then selected for participation in the interviews using this rational. An industry network of collaborators (i.e., Future Fashion Factory (FFF), UK Fashion & Textiles Association (UKFT), and Textiles Centre of Excellence) supported the research by ensuring links for purposes of identification of lead contacts within the identified firms working within the micro-clusters.
The mapping of UK fashion micro-clusters was then used to support decision making within the second stage of the research. This stage aimed at deep-diving into the dynamics and supply chain activities of fashion micro-clusters through 14 semi-structured interviews conducted with firms located in regions selected during the first stage of research: London, Greater Manchester and Yorkshire and the Humber. More specifically, 6 firms each from London and the Yorkshire and Humber, as well as 2 firms from Greater Manchester were interviewed. Findings from the first stage of the study highlighted some key micro-geographical areas where fashion firms co-locate in the three regions.

In addition to firms' characteristics and type and geography of activities along the value chain, within the **third stage of the research** interview participants were asked about the main benefits of being in a micro-cluster, the importance of proximity to higher education institutions and universities, skills, machinery and automation, Research & Development (R&D) as well as their perception of the industry more generally. Identified themes were used to emphasise key trends and the main difficulties currently affecting fashion micro-clusters and UK value chains more generally.

2. Mapping UK fashion micro- clusters

2.1. Web scraped data

Data on firms scraped from the web was used to identify creative fashion firms based on their activities, as described on their websites, rather than by their Standard Industrial Classification (SIC) codes. While the SIC includes fashion manufacturing and retail codes, fashion design cannot be isolated from both fashion manufacturing and more generic design codes.[3] Figure 1, below outlines the general analytical framework for linking web-scraped data with geographical analysis. A **two-step process** was applied. Firstly, firms were **geocoded** in the web data. Secondly, **micro-clusters** or small groups of firms were identified.

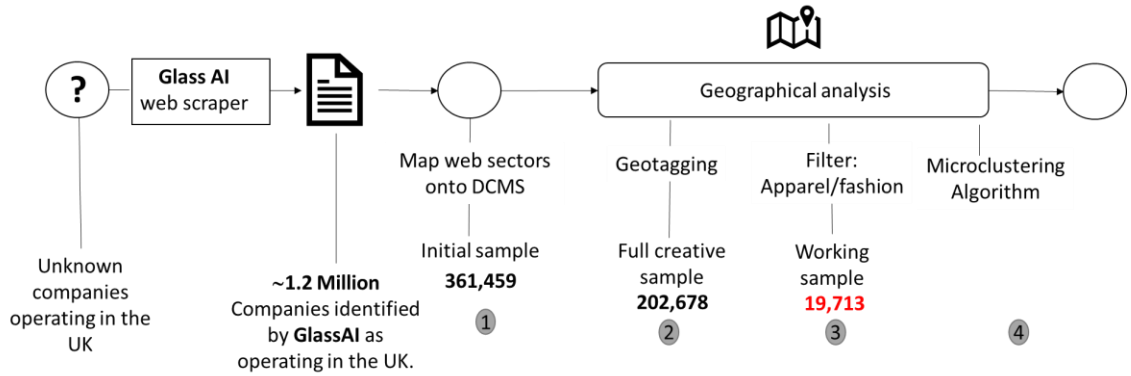


Figure 1. Analytical framework for web-scraped data and spatial analysis

The first step involved using 1,232,585 websites of firms in the UK, whose sectors were inductively classified using an AI algorithm into 109 broad sectors based on firms' self-description published on their websites.[4] These broad sectors were mapped onto standard industrial classifications (DCMS/SIC). Once sectors were identified and the sample of creative firms defined, a filter to include only companies in the **fashion subsector** was applied. Two (web-based) subsectors fall into the DCMS "Design" subsector: Apparel and Fashion and Design. When the sub-sectors were reviewed, the decision to

[3] A substantial body of research has already highlighted the difficulties in the use of the Standard Industrial Classification (SIC) and of its international equivalents to capture specialist activities in the creative industries, such as the designer fashion sector. In fact, there are no dedicated SIC codes associated with fashion design and, according to the latest SIC 2007, it is not possible to separate this element from the broader category 74.10 'Specialised Design Activities' with a reasonable degree of accuracy (Creigh-Tyte, 2005). Moreover, elements of designer fashion may be included in most of the clothing and footwear manufacturing-related codes.

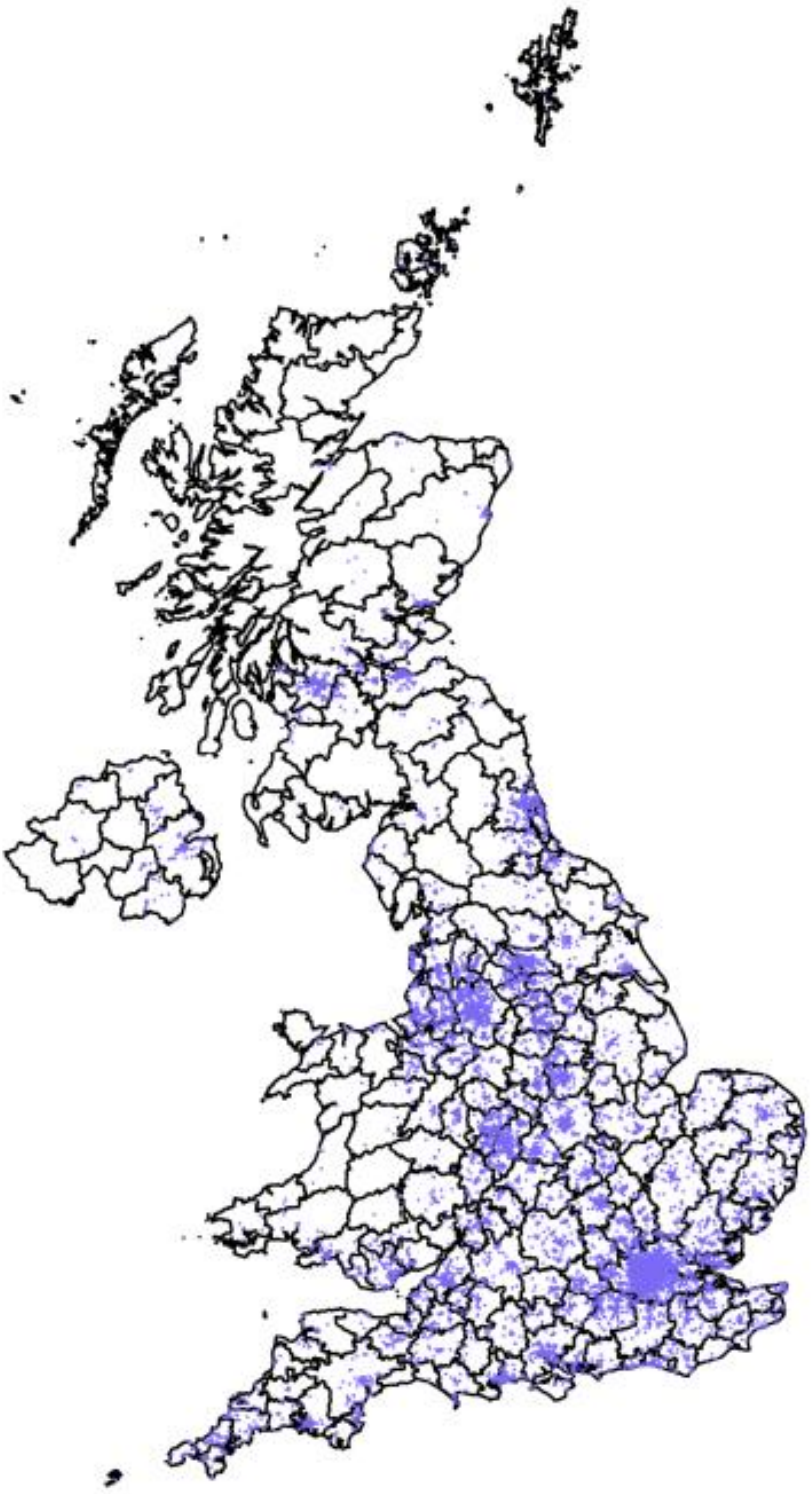
[4] Data was collected by the science startup Glass.ai. Data is crown copyright. Galss.ai does not bear any responsibility for the analysis or interpretation of the data

remove Design was made based on firms in a checked sub-sample being largely furniture, graphic design and marketing based. **Apparel and Fashion** was therefore the only sub-sector from the original Creative Radar data set used to move forward with the mapping activities.

The final sample corresponds to **19,713 firms / organisations.** In addition, 155 companies from Future Fashion Factory (FFF) were also added to the sample to ensure inclusion of firms already identified as being the types of organisations expected within UK fashion micro-clusters. Initially, the aim was to classify firms in the sample into fashion design, manufacturing and retail businesses using keywords from their websites. However, this was challenging due to the same keyword (e.g., production, design, sales) also being used by the three categories of firms in the description of their activities. Moreover, manual classification of firms was not possible within the timeframe of this research project. Therefore, the unclassified sample of firms was used to proceed with. Table 1 reports the distribution of identified firms by UK regions. Figure 2 displays the map of businesses in our sample across the UK. Further tables demonstrating: (i) the top 20 districts by the number of fashion firms - this group accounts for about 28% of all fashion firms in the sample, as well as (ii) the top 20 of the travel to work or commuting zones with the largest number of fashion firms in the sample, can be found in appendix 2.

Table 1. Percentage of apparel and fashion by NUTS-1

NUTS1	No. firms	Percentage
London	4,643	24%
South East (England)	2,543	13%
North West (England)	2,358	12%
South West (England)	1,850	9%
East of England	1,783	9%
East Midlands (England)	1,246	8%
Yorkshire and The Humber	827	7%
West Midlands (England)	476	6%
Scotland	524	5%
North East (England)	563	3%
Wales	509	3%
Northern Ireland	277	1%
Grand Total	19,713	100%



[5]Figure 2. Map of firms in the sample

[5] Map boundaries correspond to Travel to work areas in the UK. Each dot represents a firm in the sample. Total sample= 19,713

2.2. Fashion Micro-cluster Identification

2.2.1 Micro-clusters based on web scraped data

The second stage within the identification approach used the geotagged data **to determine whether a firm was in a micro-cluster** (i.e., small concentration or group of firms that are relatively close to each other). A **density-based clustering method** was implemented to detect areas where firms are concentrated and where their location is based in sparse or empty areas. The clustering method employs a machine-learning clustering algorithm to identify a range of distances to separate clusters of varying densities from sparser noise. The algorithm computes hierarchical estimates and scores the outlierness of each data object, extracting local clusters based on a cluster tree.[6]

The algorithm requires the **minimum number of firms to be stated for a micro-cluster**. Theoretically there is not a clear cut off: some studies in the creative industries have previously used 50 firms as the minimum threshold (see Siepel et al., 2020). To identify the threshold of values of what constitutes the minimum size of a "fashion micro-cluster", **different thresholds were selected and checked for the sensitivity** of the measure. Table 2 provides a count of neighbour firms at different radius.

Table 2. average and median count of firms at different radius

Radius (km)	Average No.	Median count	Minimum	Maximum
1	75	16	1	454
3	301	61	1	1,597
5	703	163	1	2,179
8	1,449	1,263	1	3,153

Note: Hotspot analysis was carried out to estimate the number of neighbours at different distance bands

The threshold should reasonably capture effects at an immediately proximate area. As this is very explorative, **two thresholds were selected** (30 firms and 50 firms within the 1km radius) for experimentation. The first experiment selected **50 firms** as the minimum threshold in correspondence with previous micro-cluster analyses. Figure 3 displays the maps derived from

[6] For further details on the cluster method see Campello et al. (2013).

the analysis, while Table 3 reports the counts of micro-clustered firms for the two experiments.

The threshold of 50 was deemed too high for identifying significant micro-clusters of fashion micro and SME firms. It was observed that **30 firms provided more granularity**, particularly in bigger cities such as London where 17 micro-clusters are identified compared to just one big micro-cluster being recognised when 50 firms is used for the minimum threshold as demonstrated in table 3.

MAP A
(Min Size=50): 45 Micro-clusters
Micro-cluster

MAP B
(Min size=30): 122

Figure 3. Maps of micro-clusters identified using varying minimum firm counts

Table 3. Firm counts and cluster counts by type NUTS-1

	Experiment A (50 firms)				Experiment B (30 firms)			
NUTS1	No. of Clusters	No. firms in clusters	Total firms	Percentage in micro-clusters	No. clusters	No. firms in clusters	Total firms	Percentage in micro-clusters
East Midlands (England)	7	735	1,535	48%	13	427	1,535	28%
East of England	7	450	1,783	25%	14	654	1,783	37%
London	1	2,586	4,643	56%	17	996	4,643	21%
North East (England)	1	229	563	41%	4	171	563	30%
North West (England)	5	1,405	2,358	60%	18	1,070	2,358	45%
Northern Ireland	1	97	277	35%	2	78	277	28%
Scotland	3	524	1,005	52%	7	323	1,005	32%
South East (England)	7	515	2,543	20%	20	1,068	2,543	42%
South West (England)	8	801	1,850	43%	14	933	1,850	50%
Wales	2	188	509	37%	3	93	509	18%
West Midlands (England)	3	476	1,246	38%	9	447	1,246	36%
Yorkshire and The Humber	6	827	1,389	60%	11	513	1,389	37%
Total		8,836	19,713	45%		6,776	19,713	34%

2.3.2 Micro-clusters with web-scraped & Orbis data

The mapping using only scraped web data did not allow the mapping of different typologies of firms in fashion (e.g., fashion design, manufacturing, retail). Moreover, web scraped data does not capture firms without a web presence, which is quite common among small fashion manufacturers. Overall, the use of the scraped web data was found to be particularly challenging for mapping fashion micro-clusters, within an industry mostly represented by micro-sized firms. Due to these limitations, the approach of combining web scraped data with Companies House data sourced through Orbis[7] was explored. As an initial experiment, this approach was used for the London region[8] to enable an understanding for the impact on mapping fashion micro-clusters more easily within the classifications of fashion design, manufacturing and retail. Combining the Orbis data provided an extra layer to explore the granularity of clusters, especially of the manufacturers in big cities (such as London). Using the location and the industry classification improved the micro-clustering analysis. Regarding the SIC codes included, all codes starting with 13, 14 and 15 are classified as manufacturing firms; those beginning with 47 are retailers, while 74.10 refers to design.

2.3.3. Micro-clusters in London

Through the implementation of the micro-clustering algorithm on the London sample, 82 micro-clusters in the London region were identified, covering 12,527 firms (47% of the firms in the sample) (see table 4). The average micro-cluster size is 150 firms. Table 6 shows the number of firms in micro-clusters and the total sample by local authority districts in the London.

[7] Orbis is a commercial dataset covering over 200 million firms across the globe. It provides information on company financials (revenues, employment and assets) and detailed information on firm ownership structure, location and 4-digit industry, among other characteristics. Recent empirical applications include Criscuolo and Timmis (2018), Gopinath et al. (2017), Andrews et al. (2016) and many others.

[8] We used London as an area to test the accuracy of mapping due to the research team having a strong understanding for Design, Manufacture and Retail firms that should be represented within identified fashion micro-clusters.

Table 4. ORBIS: London

Firm type	No. firms	Percentage
Designer	9,100	34%
Manufacturer	5,753	21%
Retailer	11,969	45%
Grand Total	26,822	100%

Table 5. Micro-cluster counts by local authority districts in London

District in London Region	Number of micro-clusters	Firms in micro-clusters	Total sample	Percentage in micro-clusters
Hackney	11	2,006	2,835	71%
Westminster	11	955	2,542	38%
Camden	9	1,981	2,533	78%
Islington	7	1,055	1,679	63%
Barnet	5	490	1,060	46%
Tower Hamlets	6	462	1,046	44%
Newham	6	555	956	58%
Kensington and Chelsea	5	548	918	60%
Southwark	3	329	836	39%
Haringey	4	311	794	39%
Wandsworth	2	228	723	32%
Croydon	3	259	719	36%
Lambeth	5	150	685	22%
Hammersmith and Fulham	2	186	678	27%
Enfield	3	221	662	33%
Ealing	2	274	637	43%
Waltham Forest	3	281	628	45%
Lewisham	2	185	598	31%
Redbridge	1	151	587	26%
Harrow	2	256	571	45%
Brent	4	136	569	24%
City of London	4	216	557	39%
Bromley	3	119	510	23%
Richmond upon Thames	5	252	458	55%
Hillingdon	2	152	431	35%
Greenwich	3	110	430	26%
Merton	2	158	395	40%
Hounslow	3	65	362	18%

Havering	1	90	334	27%
Kingston upon Thames	1	129	299	43%
Bexley	1	140	295	47%
Barking and Dagenham	0	0	265	0%
Sutton	1	77	230	33%
Grand Total	122	12,527	26,822	47%

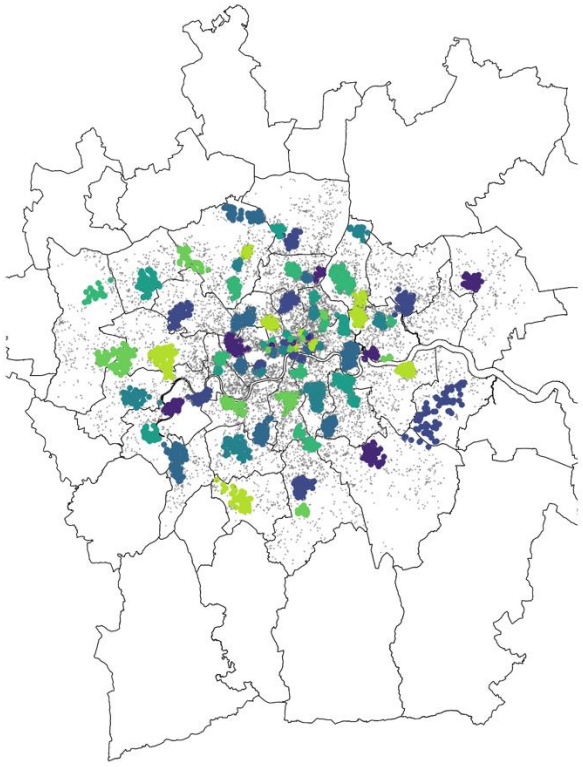


Figure 4. Map of micro-clusters identified in London (Data source: Orbis)

2.3.4. Micro-clusters in Greater Manchester

From the ORBIS data a sample of 4,284 firms, all located in Greater Manchester was extracted (see Table 6). Through the implementation of the micro-clustering algorithm, **25 micro-clusters in the Greater Manchester region** were identified, covering 1,560 firms (37% of the firms in the sample). The average micro-cluster size is 71 firms. Table 7 shows the number of firms in micro-clusters and the total sample by local authority districts in Greater Manchester.

Table 6. ORBIS: Greater Manchester

Firm type	No. firms	Percentage
Designer	973	23%
Manufacturer	1,072	25%
Retailer	2,203	52%
Grand Total	4,248	100%

Table 7. Micro-cluster counts by local authority districts in Greater Manchester

District in Greater Manchester	No. micro-clusters	Firms in micro-clusters	Total sample	Percentage in micro-clusters
Manchester	8	589	1,299	45%
Stockport	2	178	454	39%
Bolton	1	215	394	55%
Trafford	3	105	380	28%
Salford	1	1	313	0%
Bury	2	78	299	26%
Rochdale	2	159	297	54%
Oldham	2	40	281	14%
Wigan	2	108	281	38%
Tameside	2	87	250	35%
Grand Total	25	1,560	4,248	37%

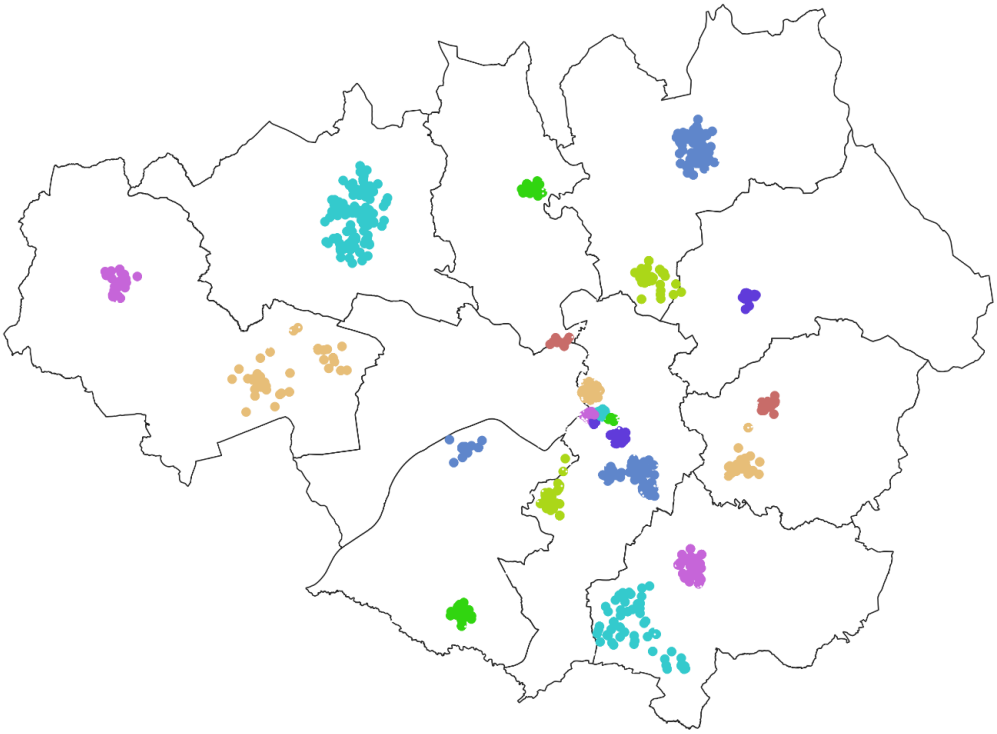


Figure 5. Map of micro-clusters identified in Greater Manchester (Data source: Orbis)

2.3.5. Micro-clusters in the region of Yorkshire and The Humber

Using the ORBIS data, a sample of 6,196 firms in the region of Yorkshire and The Humber was also obtained (see table 8). The clustering algorithm identified 41 micro-clusters, covering 2,121 firms (34% of the firms in the sample). The average micro-cluster size is 57 firms. Table 9 shows the number of firms in micro-clusters and the total sample by local authority districts in the region.

Table 8. ORBIS: Yorkshire and the Humber

Firm type	No. firms	Percentage
Designer	1,679	27%
Manufacturer	1,395	23%
Retailer	3,122	50%
Grand Total	6,196	100%

Table 9. Micro-cluster counts by local authority districts in Yorkshire and Humber region

Districts in Yorkshire and the Humber	No. micro-clusters	Firms in micro-clusters	Total sample	Percentage in micro-clusters
Leeds	7	390	1,080	36%
Bradford	5	262	720	36%
Kirklees	4	313	705	44%
Sheffield	3	186	625	30%
Wakefield	2	119	346	34%
East Riding of Yorkshire	3	109	326	33%
Calderdale	2	89	309	29%
Harrogate	1	76	291	26%
Doncaster	2	68	270	25%
York	2	99	236	42%
Rotherham	2	84	194	43%
Kingston upon Hull, City of	2	60	191	31%
Barnsley	2	59	175	34%
North East Lincolnshire	1	69	135	51%
North Lincolnshire	1	54	120	45%
Scarborough	1	50	109	46%
Hambleton	0	0	104	0%
Craven	1	34	86	40%
Selby	0	0	72	0%
Richmondshire	0	0	51	0%
Ryedale	0	0	51	0%
Grand Total	41	2,121	6,196	34%

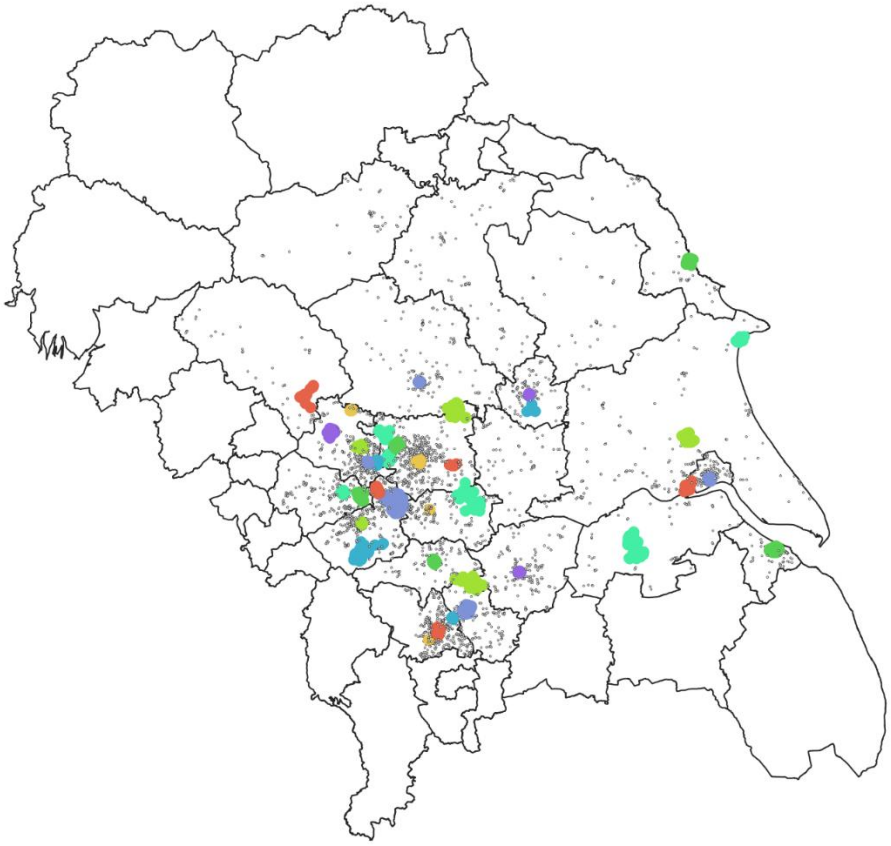


Figure 6. Map of Micro-clusters identified in Yorkshire and The Humber (Data source: Orbis)

3. Clustering in the UK fashion sector: The perception of firms within micro-clusters

3.1. Respondent characteristics

Semi-structured interviews were conducted with **14 firms** from selected micro-clusters in the three regions of interest. Engaging participants for interview was challenging due to targeting micro and SME businesses which at the time of the study were emerging from Covid lockdowns. The planned sample of interviews for each micro-cluster was achieved in two regions with 6 firms both from London and the Yorkshire and the Humber, however only 2 firms from the northern areas of Greater Manchester were interviewed. The sample included 8 manufacturers (of which 2 were textile mills), 5 design firms, and 1 retailer. Most firms interviewed positioned themselves (on a self-evident basis) in the high-end market, with the few remaining businesses working in the specialist, middle and low-middle end markets.

The sample was mostly represented by **micro-sized firms with fewer than 10 employees (10 firms)**, with 3 small-sized firms with less than 50 employees and 1 medium-sized business with more than 50 employees. 11 of firms are **young businesses** established in the 2010s, with 1 company set up in the 2000s and 2 firms before the 1990s. Firms in the sample are highly varied and involved in the production of **different types of products** including swimwear, workwear, bridalwear, accessories, knitwear, silk and jersey garments, as well as in **diverse types of processes** such as design, pattern, cutting, prototyping, sampling, print, embroidery, alteration and textile recycling. Nearly 86% of respondents in the sample **produce everything in the UK**, with 4 businesses mostly relying upon regional production, 2 companies mainly working with local suppliers within the micro-cluster, and 3 firms manufacturing everything in-house. Around 80% of firms have mainly UK customers, with 5 companies mostly selling to customers within the region and 3 businesses within the micro-cluster.

3.2. The benefits of being in a micro-cluster

Over time, a large body of scholarly research has explored the highly agglomerative nature of fashion and the tendency of firms in the industry to co-locate within clusters (e.g., Aage and Belussi, 2008; Casadei, 2018; Jansson and Power, 2010; Weller, 2006). These firms benefit from traditional forms of agglomeration economies – for example the access to resources

such as creative talent and manufacturing, infrastructure and services, skilled labour pools, or specialized suppliers for the generation of economies of scale (Scott, 1996; 2002; Wenting et al., 2011). However, inter-firm linkages, face-to-face interactions, open exchange of information and local social ties have been also deemed key elements of the clustering of fashion businesses (Hauge et al., 2009; Rantisi, 2004a; Williams and Currid-Halkett, 2011).

One question of the interview process concerned the main benefits of being within a micro-cluster. Many respondents mentioned the **proximity to suppliers, production facilities, specialised companies as well as services** as being among the main advantages. Firms emphasised how the entire **production process can be streamlined and sped up** thanks to the **availability of a pool of expertise and knowledge**, with firms specialised in different production phases that can collaborate on the manufacturing of a final product. Indeed, businesses struggling to perform some steps of the production process – for example because of capacity issues – can easily rely on other firms nearby. Proximity helps firms **monitor the production process and minimise the levels of mistakes** because of the possibility of frequently visiting manufacturers or suppliers that are co-located in the micro-cluster. In this regard, businesses benefit from **face-to-face interactions, faster problems solving and lack of communication barriers**. Moreover, several respondents highlighted how being in a micro-cluster makes it **easier to recruit skilled staff**.

Being in a micro-cluster also supports the promotion of businesses and the possibility of getting new clients through place-based branding effect as well as word of mouth, with an important cascade effect on smaller and new businesses, which are recommended by larger or more established firms. This is particularly important for sustaining those small firms that focus on **short-run production** and are interested in working with small quantities – a service which is relatively scant but highly desirable in the UK to meet the needs of the large number of micro design firms that populate the industry. Clients approaching one firm can make immediate contacts with other firms nearby enabling firms (specialised in different production phases) co-locating within micro-clusters to share the same client for the production of garments. In this regard, businesses in micro-clusters tend to **nurture and benefit each other**. This can foster the **growth of firms**, particularly the smallest or newest ones that usually struggle more to make a reputation and be known in the industry.

For example, some of the replies were: "When clients want something embroidered on their garments, we would cut a piece and then take it to the embroidery lady upstairs and then she would do an embroidery and bring it

back to us", "The agent can just nip down to my studio and show me some samples really quickly because he is about 10 minutes away, so it really speeds up the process", "It actually makes a difference that we can take like a short bus ride to our factory, talk to someone face to face. It minimizes the levels of mistakes and also we can do small units and not invest too much into stock", "I can just ask someone where I can get this and they can just easily put me in touch with people locally because there is quite a good knowledge pool", "One benefit is the availability of expertise There is that kind of pool of people if you need them".

Another benefit emerging through interviews was the ease in recruiting through being part of a cluster, with a respondent explaining "*it is challenging to recruit if you want very skilled people who have been trained in the textile industry, being in a cluster where there are these people makes it a lot easier to recruit them*". This also means being based with micro-clusters could make firms susceptible to staff being targeted for recruitment by other firms.

Along this line, the idea of **being part of a support network** – where firms can **share knowledge and information** as well as **get advice and feedback on production** – strongly emerged from the interview process. For example, some respondents declared: "*I do not see how you can run a creative business without having that kind of network which feeds off people and it is a supportive network. I think that the more that you promote each other, the word gets out more rather than just making it very insular to your business*", "*There are a couple of other brands who are part of this cluster. So, it has been quite good to share information and understand what is going on with them*", "*I think the support of a cluster is bigger than any kind of supply or service. I think the support is massive*", or "*We are all doing different things obviously, we have liked having local suppliers in there able to just offer me advice or show me different things that I would not be aware of*".

Some of these benefits were emphasised as opposed to the difficulties and complexity of offshoring physical production to another country: "*I think being in a cluster means that you have all the support industry that is built up around that. If we want to send our products out to be finished, maybe using equipment that we do not have internally, then we only have to send it five minutes up the road, as opposed to shipping it to Germany or shipping it somewhere else*", or "*If you take into account how many details you have to say to the company abroad to make your samples, and then the transport of fabrics, how much more difficult is to communicate because of countries on*

different timelines, and then they (clients) can come to us, we can show them what the issue is and then we can sort it out in like 20 minutes".

In this regard, being in a micro-cluster is perceived as a way of **reducing logistic costs and production lead times as well as increasing sustainability**. For example, one of the responses was: "*The advantage is also trying to get materials processed with low carbon emissions, so not moving goods around. In a perfect world it would be in a vertical mill, where all the processes are under one roof. That would reduce lead times and journey times. But we find ourselves in a fairly fragmented industry that has lost its ability to be more efficient. In that sense, it is not easy, but nevertheless, the aim is to get as close to that as we can*". This is in line with a recent stream of research highlighting the significance of clusters in the development of sustainable and circular economies (Bailey-cooper et al., 2022; Harris et al., 2021) What is evident from the responses in these interviews is the requirement of infrastructure investment to develop these cluster economies.

3.2.2. Cross-fertilisation of creativity and innovation: Does it really happen in fashion micro-clusters?

The extant literature on creative and fashion clusters has strongly emphasised their tendency to draw upon a self-reinforcing mechanism, where trust is nurtured in creative local communities to foster collaborations, knowledge exchange, and learning processes (e.g., D'Ovidio, 2010; Rantisi, 2004b). Studies have identified creative inspiration, product and process innovation, cross-fertilization of ideas as the main elements of the spatial clustering of creative industries, which benefit from being part of a "local buzz" where it is possible to interact with a variety and diversity of people (Power and Scott, 2004; Scott, 2002; Storper and Venables, 2004).

In this regard, some participants mentioned the **importance of being part of a community with like-minded people**. For example, some responses explained: "*We are based in London Tottenham, which is the creative community and we find the easiest to talk the same language and express ourselves externally and internally*", or "*The essence of being part of this ecosystem is quite important for fashion because fashion generally is a very close circle and it is already hard to get in, but being in it, in this sense, is really helpful*". Being in a micro-cluster surrounded by a strong support network appears to be particularly important for firms in the fashion industry, which is deemed by most respondents as a **close, highly competitive, and poorly collaborative environment** compared to other creative sectors. In this regard, some firms declared as a generalisation about the industry: "*Fashion is not so*

collaborative and friendly as it seems to people from the outside". "There is not much collaboration going on in the sector", or "*Fashion is very interesting because very competitive, creative but also very business*".

However, several firms shared their **willingness to establish more creativity-related linkages** with firms in the sector. Such increased collaboration would be particularly important for smaller businesses: "*It is quite hard when you are small brand, and you are by yourself, and you have got to rely on your own ideas and not have that kind of back and forth off*". **Innovation-related collaborations are also deemed an important opportunity** for improving products and processes, but only if these collaborations occur with partners/firms with different capabilities and market positions. However, i**ntellectual property (IP) rights** remain a thorny issue that may prevent fashion firms from establishing such collaborative relationships. For example, one of the replies was: "*You cannot really have open dialogues with your competitors around innovation and around products because you are empowering them with information through those discussions. So that is not realistic at all. I think there are opportunities for open innovation, if you can find the right partner if it is a company who is not quite the same as you. But, nevertheless, it always comes back to the same issues around IP*". Some firms emphasised the importance of these collaborations for **fostering the adoption of more sustainable approaches** in the industry. For example, one respondent declared: "*Sustainability is quite a huge and important thing at the moment, and we would love to share our systems, and how we get to this with other practitioners that are interested in it*".

3.2.3. Proximity to colleges & universities: How valuable is it and why?

Over time, scholarly research has shown how the proximity of firms a large variety of forms of knowledge, information, and ideas – which can be found in specialised advance services, institutions, associations, universities, and training centres within clusters – has become a fundamental means of economic growth and development (Currid, 2007; Scott, 2002). In particular, the education system has played a rising fundamental role in the broader fashion industry and within its clusters. It draws upon symbolic knowledge and experience-based learning, and functions as a place where practical skills are provided, tacit knowledge is created and transferred, and where valuable personal networks are built (Rantisi and Leslie, 2015). This type of knowledge requires high levels of interaction with professional communities. Indeed, fashion schools/universities tend to establish strong relationships with firms and actors in the industry and clusters more specifically. Thus, they play a key role in linking fashion design training, knowledge experimentation, and

the industry, being also an important incubator of creative fashion talent available for local firms as well as stimulating creativity, knowledge production and social interaction (Harvey, 2011; Rantisi, 2002).

One of the interview questions was about the importance of proximity to fashion institutions, organisations, and universities within micro-clusters. Several firms mentioned **collaborations with local support bodies** located in the three clusters under investigation. For example, one respondent declared: "*We have had lots of dealings with them, and our research and development grant through Institution X is administered through University X. They have been and still are very important to us*". However, most firms emphasised the **importance of proximity to universities** in sustaining their businesses, micro-clusters, and the local industry more generally. Participants mentioned the possibility of **attending workshops, benefitting from free studios as well as from the symbolic association with universities**. Moreover, they highlighted the opportunity **to get interns as well as clients**. For example, some of the replies were: "*We have loads and loads of connections with universities for lots of different things*", "*Because fashion is a quite closed system, university is the door opening part", "We do have a few students coming talking about the projects or bringing us some samples to do*", or "*We had so many clients who would graduate and then would come to us with another brand, and then we have another client because of that students who used to come to us*". However, such support seems to be mainly dedicated to those people who have studied in a UK fashion university. Additionally, smaller businesses are more unlikely to draw upon interns from local universities because they do not have enough specialised work to offer to design students. In this regard, some respondents said: "*I have noticed that actually if you are not connected to a university, if you do not go to university here, you do not get the support*", "*We do not really work with universities because obviously we are a really small business. So, if design students come here, they are going to be doing a bit of everything*", or "*I think as the business grows, the university will trust us a little bit more and we will work closely with them again*". Moreover, some firms expressed their **expectation for more collaborations with universities**. As an example, one firm declared: "*I think the benefit should be coming from the fact that you have got open access to younger ones that bringing out their creative flair before they have even come out of education, and I do think there should be a load more benefits behind it*".

Overall, respondents – particularly smaller businesses – deemed collaborations with local universities as important for **supporting sustainability and raising consumers' awareness**: "*That base knowledge and support I think*

is massive when you are trying to do something small and sustainable", or "*Education is really important to us and is not just about making stuff and selling stuff. We engage in education because we think that is a good thing in and of itself, but also commercially, how consumers make better choices*".

Moreover, universities can help smaller firms with **R&D, technological innovation, and blue-sky thinking**: "It is very difficult as a small company to be able to do technology push, which is a kind of blue-sky thinking where you basically develop a technology, but you do not have a clear application or market for. Because if you have got a very limited R&D team, you cannot afford to have them spending all their day thinking about it. So, I think that is where universities fit in for a lot of SMEs. They can occupy that role of doing the blue-sky thinking work that can then be applied through industry". However, they also mentioned the difficulties in this type of collaborations around innovation mostly because of IP issues. In this regard, one participant stated: "It still becomes very difficult because you are in a way still discussing with a potential competitor. If a university develops a really interesting process, you think it could be applied to the industry. So you end up paying for development work, but they are retaining the IP on your work. You are paying for something that they are learning from. And it is very difficult to get them to agree to some kind of contract that will basically stop them from using that elsewhere".

Respondents also mentioned the possibility of **accessing testing equipment, labs, and expertise:** "So we are fortunate here, where we are based very close to three very well-known and very good universities that have access to labs with just about every testing that you could possibly want. That is a great thing to have in your doorstep and the associated knowledge that goes along with that".

3.3. Research & Development in fashion micro-clusters

Most respondents specified that they inherently invest in improving products and processes though these activities are not categorised as R&D expenses. Indeed, firms mostly do **self-funded developmental activities without a specific budget**. As an example, some firms declared: "*We are always improving our techniques here, it is always a constant*", "*We are constantly looking for new products to do, looking in new areas to go into, working with different people. We do not sit down and say right we are going to do R&D, or we are going to develop our skills in certain areas, it just becomes part of what we do*", or "*We invest through the people, through the costs of sending*

people to shows, to trade events, to see what the next generation of products look like. So yes, testing new products is an investment".

However, most firms complained about the **lack of R&D grants specifically dedicated to fashion** and **asked for more support around innovation** in the sector: "*No we have not received funding, we have tried, but I think because of what we do is clothing, and the area that we work in is not particularly innovative, there is not a lot of funding for that kind of work*", "*We actually do a lot of research around materials and try to find ways to cut the waste or making circular, but it is all funded by us and we have never came across a funding that was specifically for fashion*", or "*There were a few grants from local councils on circularity and pivoting the business but they were not so fashion-focused, a lot on food for example. It would be great to get some sort of financial aid to push boundaries more with, especially material innovation that it is so financially consuming, time consuming, and also resourceful because you actually need to have those specific labs and specific setups, all these things that are quite hard to find*".

Only few firms declared to have received funding mainly for machinery but also for R&D: "We recently received a government backed grant through the university, but it was mainly for the machinery, it was not necessarily for the research and development side. We received a little bit towards it, but the bulk of it was used for the research and development", or "I probably touched on that when we put in the application for capital expenditure for the machinery. We agreed that we would rewrite that research and development application more closely aligned to research and development, not capital expenditure for the machines, which we did and they accepted that. And so we got that award".

Some **firms complained about collaborations with universities on R&D**, particularly in terms of difficulties in working as a team (with the university leading and the company following rather than the other way around) as well as IP issues and the possibility of investing in an innovation that will not be exclusive to the firm: "*I find a lot of the universities were using us for them to get money, when really what we wanted to do was work as a team with their skill and knowledge to develop a product that was needed in the industry to solve a problem*", "*We are trying to get funding but a lot of times it is difficult because a lot of the knowledge transfer kind of funds you can get for working with universities requires a big investment from the company that is matched. And often if you have not got clarity around the IP of whatever you are developing can be taken to market, that is quite a difficult decision*

to make", or "And it is just a bit frustrating that I am working in the industry, and you get told a lot by academics and people who are not working in the industry, what you can and cannot do. And I think there is a mismatch there for me".

3.4. Strengths and weaknesses of the industry: a perspective of firms within fashion micro-clusters

In one of the questions we asked respondents was about their perception of the industry more generally, with a focus on the advantages and drawbacks of producing in the UK as well as on suggestions for sustaining the sector in the future.

The issue of **lack of skills, trained staff and particularly machinists** emerged repeatedly from all the interviews. The skills gap appears to have been exasperated through Brexit with UK firms unable to access the European Workforce, as well as the last decade's STEM education agenda disrupting the pipeline for younger generations entering the workforce. Specific skills in the areas of innovation, technical intelligence and practical skills are needed with firms eager to recruit from Higher Education and support through apprentice schemes: "*The biggest challenge we have at the moment in manufacturing is recruiting skilled staff. And I know quite a few firms are turning work away because they have not got the capacity*", "*One of the challenges we have is the recruitment of people, recruiting those skills that are no longer easily accessible locally', or "I think there is going to be a bit of a skills shortage in the future and I think that is going to be something that hits the textile industry*".

As a result of the lack of skilled staff, firms also mentioned the difficulties in finding manufacturers with some availability as well as a lack of specialisations in the UK. Moreover, most respondents complained about the type of training provided in the industry, which is focused more on being "glamour" designers rather than machinists – a ageing profession that is now desperately needed in the industry. Hence, firms asked for government support with more technical training in the sector. For example, some of the responses were: "*Young people are not taught to be a machinist. Machinists have to be very technical and very high knowledge. I think the problem is the appreciation of having those skills, because not everyone can be a good machinist, and then how to encourage those people", "The skillset of people coming through education is shocking. You cannot survive in a working world. They just think that they can design something that looks really pretty. And we do just need a lot more training that could be available. Definitely the skillset is a big thing for us and within my cluster, everybody speaks about*

it and there is absolutely no chance to hire new people at the moment", or "*Because there is a lot of domains in fashion that have quite high level of skill required. It is very difficult to find people with experience and pattern making, and also new students. They like the glamour side of the fashion. So they are not that attracted to the manufacturing side. So if there was a program or something for them to learn this side*".

Unsurprisingly, several respondents emphasised how **Brexit has made it even more difficult to find skilled people in the industry**. Some firms stated: "*Brexit affected our staff. Most of our people that are East European are having difficulties in coming through. So we are having issues with hiring new people with experience. I think what would be great is some support around that, or new training programs for people that are already in the UK. I think what is important is to find a way to attract students and young people into the manufacturing side*", or "*Brexit has made a massive impact on the skillset, which the manufacturing industry was dependent on. And I am struggling to grow my team, even though I have the orders, I do not have the people to deliver, so I am having to say no to orders. And that means designers are forced to look out of the UK to find these orders and that has a direct impact on our country's GDP. We are not self-sufficient on skills right now. If the UK government puts training programs in place right now, we should be fine by 2030, perhaps or maybe 2025*". This is in line with previous scholarly research emphasising the effects of Brexit on the sector and its skilled workforce (e.g., Casadei and Iammarino, 2021).

Other firms mentioned the **pandemic and a recent reshoring trend in the sector as additional factors worsening the already extant issue of skillset**: "*We had machinists coming from Eastern Europe but during Covid some of them went back home, and never came back. So, we feel there is a shortage of staff. We are constantly looking for machinist to fulfil the places*", or "*And because of the pandemic, I think the skillset has suddenly died, and the people that did not know what they could do, the people that did really have a background into the industry, have retired or given up because it is too hard to cover everything*" or "*I think the issue for the industry at the moment is the amount of reshoring that has happened, and the lack of machinists is because no one is training up machinists. We struggled to get apprenticeships in because people just did not want to do the job. So, I do not quite know how you fix that, because I think there are a lot of really good small manufacturers out there. But again, as a small designer I cannot access them because they are so busy*".

As concerns the **sector more generally**, several firms emphasised a generally **negative people sentiment towards the industry** – particularly the manufacturing side of it. However, they also highlighted a **negative narrative that has been constantly built around UK fashion**, which is however **appreciated both globally and in the UK**. In this regard, respondents complained about a **lack of government support** and asked for **help in enhancing and promoting the image of the sector** as well as **its skilled workforce**: "*I think manufacturing and fashion production in the UK is not seen as a good and progressive industry, it is not seen as high quality, that is how it is perceived. I do not know how you change the perception of that because there has been sort of drummed out of the industry that is not something you should go into because it is low-paid and you work in a sweatshop. It is not like that anymore, it is a really good job, it is really interesting, you do a lot of different jobs*", "*Everything in the press is negative. It is about textiles sweatshops, sweatshops, sweatshops, but you know, I think people still globally think as UK as quality, you know, top end stuff that comes out of here*", "We are very creative as a country, but we do not believe in manufacturing, that is the problem with this country", "*I think most people who come to try dresses, they are unaware of where the dresses come from. And so for me to be able to say it was made in the UK and they do actually appreciate that*", or **"***I think they should support Made in Britain more, because when I travel abroad, made in Britain has a very good reputation – people will respect the value of the product that we produce here. We could be just a side with Italy or France. I mean a lot of talent is here and I think they should be promoted more by the government. They do not do anything. So they do not take it as a serious thing*".

On the positive side, some firms highlighted the **heritage and tradition of the UK fashion textile sector**: "The main advantage is the amount of history, heritage in this area because there is such a massive skill base in, we have learned from generation to generation, and how to weave clothes and it is got just such a big history on spinning, weaving in this area. It is just the locality of it". Moreover, several respondents emphasised the **lack of communication barriers and opportunities for a more sustainable type of production** as benefits of UK fashion manufacturing: "Being able to manufacture here in the UK is the communication side for the clients. There is no communication barrier. And the economical and sustainable is really hot in the UK, and we can make it to be sustainable and economical in terms of being able to slow produce and minimum orders rather than having to constantly have this waste going on". As concerns the design side of the industry, one firm emphasised the presence in the UK of **many independent small fashion**

designers producing unique and original collections and the willingness to rely on and support those businesses: "The independent designers are much better at creating something a bit unique and unusual that kind of push the boundaries a bit more. It works really well for me to connect with smaller independent brands. So, the whole ethos of me when I opened the shop was to make sure that I used as many kind of UK designers and companies as possible".

On the negative side, several firms mentioned that they are constantly struggling to deal with **high production costs** and to keep down the price for customers. For example, some of the responses were: "*I think the difference between us and other overseas factories, is that we are a lot more expensive. We have overheads, we have minimum wage to stick to and, you know, with inflation as well it is constantly going up, but I think the biggest battle for us is to keep costs down for the clients for the customers*", or "*I am sure if you ask most companies in the textile sector, they will tell you that obviously wages, and all this kind of thing is the biggest challenge for UK manufacturers*". Only one firm (from Manchester) emphasised the **issue of miscommunication and difficulties in finding manufacturers producing in small batches**. It was noted that Manchester appeared through the mapping activity to be the less established cluster, a Manchester based designer expressing this opinion, in caparison to the more positive responses from firms based within micro-clusters in the London & Yorkshire Humber regions may indicate communication across designers and manufactures within more established micro-clusters has been developed through the cluster relationships.

In this regard, it also suggested the creation of a no-fee organisation linking small designers with small manufactures: "We did look into UK manufacturing and the problem is miscommunication. Once you get a sample approved, a lot of the time it is not what you have agreed to, or they have changed the fabric. I would say the other problem is the minimum orders. So, if you go to a UK factory, they will ask you for 100 minimum per style. And it is just risky when you are a small business, and you are not sure if that products are going to sell. It would be great if there was an organization that was a little bit more helpful for British brands looking for small runs and small UK manufacturing".

With respect to funding, most respondents highlighted the **need of more financial help in sustaining the growth of firms – particularly the smaller ones**. For example, one participant declared: "*I have been searching for funding for about six years. There is no one out there to the extent I want it. I need that investment I cannot do it alone. We have had to stop at certain points in*

the business, to stop the growth, to stop getting any bigger, to stop taking on new clients, and to stop doing this. I think in terms of what the government can do more is see where the gaps are and really invest into those smaller people".

Several firms complained that some of the **available funding are dedicated to wholesalers** – who are currently struggling to survive in the UK because of low margins – **or new young designers** at the beginning of their career who then disappear from the UK fashion scene. For example, some of the responses were: "*There was some funding coming through the Institution X, but it was focused towards people who are doing wholesale. And we do not do wholesale because there is no way I can produce something here in the UK, with the sustainable fabrics, do something interesting, and have any kind of margin. It is just impossible. It is why we have our online and we do pop up shops*", or "*So there is this quite problematic thing in London fashion scene were setting up brands will get funding, upfront by big money, and then a few years down the line you never hear about these brands, and I always question like, was it the brand mistake, what went wrong, you know, because it is like 200/300k investments*".

Other respondents asked for more funding for expanding into new markets abroad, attending tradeshows and creating online platforms linking small designers and manufacturers: "*I think funding is a key one for me. I am really interested in and trying to get into selling overseas. The Japanese market is a market I would really like to sell the products to. I just would not know how to approach that. This an area where I would like help with*", "*We went to Paris like three times and it was all funded by ourselves on the side of making the products, we got a support Institution X to find the showrooms but the way the support works you can only go to select showrooms and these showrooms are run by sales agents that do not take your onboarding unless you sign a year-long contract with them*", or "*It is very difficult to find manufacturers. I have been trying for about two years to get funding for us to set a platform, which links small designers with small manufacturers. We know there is a need, because we have so many inquiries every week, but we cannot do them all. I cannot do it without the funding because I cannot do a website*". In a broader perspective, fundings were also asked to invest more generally in sustainability and make the UK a world leader in environmentally and socially responsible production: "*I think we could be leaders in re-processing of garments, in a different way to how it is normally done. It is like taking a garment, and then making it into something else. The UK could be a*

world leader in sustainability, and we could do that with the university if the invested in this area".

4. Conclusions: Building regional Supply chains that foster sustainable approaches and circular economies

4.1 Summary of Key Findings

This report outlines findings from qualitative research evaluating the benefits to UK fashion design and manufacture Micro and SME firms based within micro-clusters specifically located across the London, Greater Manchester, Yorkshire & the Humber regions.

The research found that **being part of a fashion micro-cluster** benefits firms due to proximity to suppliers, production facilities, specialised companies as well as services and skills. The streamlining of production processes within supply chains is enabled due to the availability across firms specialised in different production phases that can collaborate on the manufacturing of a final product. Co-location also provides firms with a means of **reducing logistic costs and production lead times as well as increasing sustainability.** These advantages also provide **potential for fashion micro-clusters to act as innovation hubs for fostering the adoption of more sustainable approaches and circular economies** in the industry.

Innovation-related collaborations across firms based within micro-clusters are deemed an important opportunity by firms for fostering the adoption of more sustainable approaches for improving products and processes, but only if these collaborations occur with partners/firms with different capabilities and market positions. Intellectual property (IP) rights due to a lack of understanding and support in establishing IP within collaborations is currently perceived to be a key barrier to some fashion firms in establishing such collaborative relationships.

Proximity to universities was highlighted as essential in sustaining businesses, micro-clusters, and the local industry more generally due to the opportunities of **attending workshops, benefitting from free studios as well as from accessing testing equipment, labs, and expertise.** Universities were also deemed vital in supporting smaller firms with **R&D, technological innovation, and blue-sky thinking** as well as important for **supporting sustainability challenges.**

The specific, specialised activities being undertaken by fashion firms working within the identified micro-clusters were all highly varied and involved in the production of **different types of products** including swimwear, workwear, bridalwear, accessories, knitwear, silk and jersey garments, as well as in **diverse types of processes** such as design, pattern, cutting, prototyping, sampling, print, embroidery, alteration and textile recycling. Nearly 86% of respondents in the sample **produce everything in the UK**, with 4 businesses mostly relying upon regional production, 2 companies mainly working with local suppliers within the micro-cluster, and 3 firms manufacturing everything in-house.

A **shortage of skills, particularly machinists** appears to have been exasperated by Brexit with UK firms unable to access the European Workforce, as well as the last decade's STEM education agenda disrupting the pipeline for younger generations. Specific skills in the areas of innovation, technical intelligence and practical skills are needed with firms eager to recruit from Higher Education and support skills development through apprentice schemes. A **positive narrative around careers in the sector to promote the opportunities available** as well as **its skilled workforce** is required.

4.2 Reflections on the Methodology

This research is intended as an **explorative study** to investigate **new trends and possible areas of research**. The analyses used had **some limitations** and so is deemed as an explorative test to lay the foundations if a **larger and more in-depth study on the topic is to be conducted in the future.**
The identification and mapping of micro-clusters using **web scraped data did not provide an accurate representation of real micro-agglomerations** of fashion firms in the UK. Prior knowledge of the sector, particularly in the regions under investigation, informed the understanding that the micro-clusters identified, both through the web-scraped and Orbis data did not exactly match with actually existing agglomerations of firms. Indeed, some important and well-known micro-clusters did not emerge from the analysis. This is mainly due to the limitation of data that we used. In terms of the web-scraped data, this is collected from the web and therefore only available for those firms with an online presence. The UK fashion sector is mostly represented by micro firms, which might not be large enough and organised

enough to have a website. Fashion manufacturers are even less likely to have a website. Moreover, the data did not allow the mapping of different typologies of firms in fashion (e.g., fashion design, manufacturing, retail). In order to partially overcome these limitations, we also identified and mapped micro-clusters using Orbis data. This enabled a partial classification of firms based on SIC codes (to date it is not possible to exactly identify fashion design firms), they do not represent the entire population of UK fashion firms. Moreover, information of the geographical location of firms is only available for some firms and this further restricts the sample of businesses to be geographically identified and mapped. The use of more data (e.g., NOMIS, ONS or UKDS data) may enable **a higher-quality identification and mapping of UK fashion micro-clusters**. However, for this study the use of Glass data combined with Orbis provided the means for identification & categorisation of that enabled the study to be undertaken.

The interview process involved a small number of firms. With an improved mapping of the UK fashion sector, the sample of firms to be interviewed could be expanded or other methodologies (e.g., surveys) also used to explore the perception of firms within micro-clusters on agglomeration benefits, value chain creation as well as key trends and difficulties in the sector. A more in-depth study would help identify new and clearer policy directions for sustaining the sector and its micro-clusters in the future. Government support is particularly key for an industry which is now struggling to deal with the effects of the pandemic, Brexit, and war-related disruptions along the value chain. No evidence of cross cluster collaboration was identified within the study, due to the difficulties and complexities emphasised in offshoring production to other countries, and with these challenges likely to remain / grow, it would be interesting to specifically explore the current links & potential for firms to link with other firms, still in the UK but outside of local clusters.

4.3 Summary of Policy Considerations

Based on the findings from this research, the following considerations for local and regional policy makers are provided. While these considerations are informed by the insights gained from Micro and SME firms based within the micro-clusters specifically located across the London, Greater Manchester, Yorkshire & the Humber regions they are likely to correlate across and be relevant to other local and regional policy makers across the UK were fashion micro-clustered are located.

Development of cluster & cross cluster community networks to develop supply chains

Independent small fashion designers producing unique and original collections within the UK face difficulties in finding manufacturers producing small batch production. Firms within micro-clusters are able to connect with each other to share contacts, knowledge and information as well as get advice and feedback on production. These benefits were emphasised as opposed to the difficulties and complexity of offshoring physical production to another country. However, development of micro-cluster communities is informal and largely reliant on firms' proximity to each other and word of mouth networking. Although there are national trade events which provide networking opportunities these can be expensive to attend and not specifically targeted at Micro and SME fashion design & manufacturers. Local and regional networking initiatives with the goal of fostering cluster and cross cluster supply chain networks would unlock access to fashion supply chain processes available across different regional micro-clusters within the UK, economically benefitting fashion firms located in those regions.
Policy recommendation: The funding for and creation of no-fee organisations to facilitate frequent and accessible regional networking to develop regional fashion micro-cluster economies through linking small designers with small manufactures within and across micro-clusters.

Developing local and regional mechanisms to provide support for intellectual property (IP)

Innovation-related collaborations across firms based within micro-clusters are deemed an important opportunity by firms for fostering the adoption of more sustainable approaches for improving products and processes. However, establishing IP within micro-cluster collaborations that are often across firms and sectors as well as involve colleges/universities is complex and a lack of understanding or access to support for IP by firms based within fashion micro-clusters is resulting in a barrier to establishing collaborations. The key concerns are around the understanding of various frameworks for the development of Intellectual Property and any resulting revenue streams.
Policy recommendation: Formation and funding for regional IP support schemes.

Investment in fashion micro-clusters as innovation hubs for sustainability & circularity

Fashion Micro-clusters have potential to behave as innovation hubs through linking with local colleges, universities and cross sector/cluster collaborations across supply chains. Specifically in fostering the adoption of more sustainable approaches in the industry. Accessing funding to support these linkages is challenging to firms who appear to struggle to identify appropriate support and funding schemes as well as navigate the complex application and administrative processes linked to funding grants. More targeted and accessible support, specifically to fund the types of local and regional design-led R&D activities being undertaken within these fashion micro-clusters is needed, to enable the development of innovative design-led activities within and across micro-clusters.
Policy recommendation: Creating schemes to support the development and funding of local and regional design-led R&D activities.

Support for Expansion of Micro-clusters into New Markets

Firms within micro-clusters struggle to expand into new markets and specifically with exporting goods. They do not have the knowledge or funds to access overseas markets through attendance at trade shows. Some support to attend trade shows is currently available but this is limited to select showrooms and requires firms to commit to a 12 month sales contract which is problematic due to the challenges in sourcing short run manufacturing. Linking support for expansion into new markets within one of the UK fashion and textile organisations, for example, UKFT or British Fashion Council or as a continuation of the Creative Cluster programmes such as Future Fashion Factory (within the recently funded creative demonstrators programme), would also support the parallel required growth r in production required for expansion into new markets.

Policy recommendation: Funding to support attendance at tradeshows and the creation of an online platform linking small designers and manufacturers to sit in parallel to these schemes

References

Aage, T. and Belussi, F. (2008) From fashion to design: Creative networks in industrial districts. *Industry and Innovation*, 15 (5): 475-491.

Andrews, D., Criscuolo, C. and Gal, P. (2016). The global productivity slowdown, technology divergence and public policy: a firm level perspective. *Brookings Institution Hutchins Center Working Paper*, *24*.

Bailey-Cooper, N., Bartlett, S., Dubé, S., 2022, Initial Findings from Phase 2 of the Institute of Positive Fashion's Circular Fashion Ecosystem Project, British Fashion Council,

Bettiol, M. and Micelli, S. (2014) The hidden side of design: The relevance of artisanship. *Design Issues*, 30(1): 7-18.

Campello, R. J., Moulavi, D. and Sander, J. (2013). Density-based clustering based on hierarchical density estimates. In *Pacific-Asia conference on knowledge discovery and data mining* (pp. 160-172). Springer, Berlin, Heidelberg.

Casadei, P. (2018) Unpicking the fashion city: theoretical issues and ideal types. An empirical analysis of London. PhD dissertation, Department of Economics and Management, Doctoral School of the Social Sciences, University of Trento.

Casadei, P., Gilbert, D. and Lazzeretti, L. (2020) Urban fashion formations in twenty-first century: Weberian ideal types as a heuristic device to unravel the fashion city. *International Journal of Urban and Regional Research*, 45(5): 879-896.

Casadei, P. and Iammarino, S. (2021) Trade policy shocks in the UK textile and apparel value chain. Firm perceptions of Brexit uncertainty. *Journal of International Business Policy,* 4(2): 262-285.

Creigh-Tyte, A. (2005) Measuring creativity: a case study in the UK's designer fashion sector. *Cultural Trends*, 14(2), pp. 157-183. ISSN (print) 0954-8963

Criscuolo, C. and J. Timmis (2018), "GVCS and centrality: Mapping key hubs, spokes and the periphery", *OECD Productivity Working Papers*, No. 12, OECD Publishing, Paris.

Currid, E. (2007) *The Warhol Economy: How fashion, art, and music drive New York City*. Princeton, NJ and Woodstock: Princeton University Press.

D'Ovidio, M. (2010) Fashion and the City. Social interaction and creativity in London and Milan. In: S. Vicari (ed.) *Brand-building: the Creative City. A Critical Look at Current Concepts and Practices*. Firenze: Firenze University Press, pp. 113-136.

D'Ovidio, M. (2016) The creative city does not exist. Critical essays on the creative and cultural economy of cities. Milano: Ledizioni.

Environmental Audit Committee. (2019), *Fixing fashion: clothing consumption and sustainability Sixteenth Report of Session 2017–19, Online: https://publications.parliament.uk/pa/cm201719/cmselect/cmenvaud/1952/full-report.html#content, accessed March 2021*.

Gopinath, G., Kalemli-Özcan, Ş., Karabarbounis, L. and Villegas-Sanchez, C. (2017). Capital allocation and productivity in South Europe. *The Quarterly Journal of Economics*, 132(4): 1915-1967.

Harris, J., Begum, L., & Vecchi, A., 2021, Business of Fashion, Textiles & Technology: Mapping the UK Fashion, Textiles and Technology Ecosystem, University of the Arts London

Harvey, N. (2011) *Synergy between fashion design education and fashion districts*. Design Education Forum of Southern Africa. Available at: http://www.defsa.org.za/papers/synergy-between-fashion-design [accessed 3rd August 2022]

Hauge, A., Malmberg, A. and Power D. (2009) The spaces and places of Swedish fashion. *European Planning Studies*, 17(4): 529-547.

Lazzeretti, L, Capone, F and Casadei, P. (2017) The role of fashion for tourism: Florence as a manufacturing fashion city and beyond. In: N Bellini and C Pasquinelli (eds.) *Tourism in the City: Towards an Integrative Agenda on Urban Tourism*, Cham: Springer, pp. 207-220.

Jansson, J. and Power, D. (2010) Fashioning a global city: Global city brand channels in the fashion and design industries. *Regional Studies*, 44(7): 889-904.

McRobbie, A. (1998) British fashion design. Rag trade or image industry?. London: Routledge.

Power, D. and Scott, A. (2004) *Cultural Industries and the Production of Culture*. London: Routledge.

UKFT. (2020) *UKFT'S Compendium of industry statistics and analysis 2020, Online:* www.ukft.org/business-advice/industry-reports-and-stats/, accessed March 2022

Rantisi, N.M. (2002) The local innovation system as a source of 'variety': Openness and adaptability in New York City's Garment District. *Regional Studies*, 36(6): 587-602.

Rantisi, N.M. (2004a) The ascendance of New York fashion. *International Journal of Urban and Regional Research*, 28(1): 86-106.

Rantisi, N.M. (2004b) The designer in the city and the city in the designer. In: D. Power and A. Scott (eds.) *Cultural Industries and the Production of Culture*. London: Routledge, pp. 91-109.

Rantisi, N.M. and Leslie, D. (2015) Significance of higher education institutions as cultural intermediaries: The case of the Ecole Nationale De Cirque in Montreal, Canada. *Regional Studies*, 49(3): 404-417.

Rieple, A. and Gornostaeva, G. (2014) Fashion design in London: The positioning of independent designers within the fashion field. *Archives of Design Research*, 27(3): 37-47.

Robinson, P.K. and Hsieh, L. (2016) Reshoring: a strategic renewal of luxury clothing supply chains. *Operations Management Research*, 9(3-4): 89-101.

Scott, A. (1996) The craft, fashion, and cultural-products industries of Los Angeles: Competitive dynamics and policy dilemmas in a multi-sectorial image-producing complex. *Annals of the Associations of American Geographers*, 86(2): 306-323.

Scott, A. (2000) The cultural economy of Paris'. *International Journal of Urban and Regional Research,* 24: 567-582.

Scott, A. (2002) Competitive dynamics of Southern California's clothing industry: The widening global connection and its local ramifications. *Urban Studies*, 39(8): 1287-1306.

Scott, A. (2010) Cultural economy and the creative field of the city. *Geografiska Annaler: SeriesB, Human Geography*, 92(2): 115-130.

Scott, A. (2014) Beyond the creative city: Cognitive-cultural capitalism and the new urbanism. *Regional Studies*, 24(4): 565-578.

Siepel, J., Camerani, R., Masucci, M, Velez-Ospina, J.A., Casadei, P and Bloom, M (2020). Creative industries Radar: Mapping the UK's creative clusters and microclusters. Policy report PEC.

Storper, M and Venables, A.J. (2004) Buzz: Face-to-face contact and the urban economy. *Journal of Economic Geography*, 4(4): 351-370.

Weller, S. (2006) Fashion as viscous knowledge: Fashion's role in shaping trans-national garment production. *Journal of Economic Geography*, 7(1): 39-66.

Wenting, R., Atzema, O. and Frenken, K. (2011) Urban amenities and agglomeration economies? The locational behaviour and economic success of Dutch fashion design entrepreneurs. *Urban Studies*, 48(7): 1333-1352.

Williams, S. and Currid-Halkett, E. (2011) The emergence of Los Angeles as a fashion hub: A comparative spatial analysis of the New York and Los Angeles fashion industries. *Urban Studies*, 48(14): 3043-3066.

Appendix 1

Expanded Methodology

The research drew upon a **three-step analysis** aimed at 1) identifying and mapping UK fashion micro-clusters, 2) understanding their main dynamics and activities with a focus on selected firms populating these micro-clusters, and 3) emphasising key trends and the main difficulties that are currently affecting micro-clusters, the UK fashion sector and its value chain more generally.

The **first stage of research** involved the **identification and mapping of fashion micro-clusters** by drawing upon data that was originally collected for the Creative Radar Report (Siepel et al., 2021). This was data scraped from the web based on creative business activities as described on their websites. **Apparel and Fashion** was the only sub-sector from the original creative radar data set used for this mapping activity. The final sample corresponded to 19,713 **company/organisations**. A machine-learning clustering algorithm was then employed to identify a range of distances to separate micro0clusters of varying densities from sparser noise. Two different thresholds representing the minimum number of firms - these being 30 and 50 - for each micro-cluster were used to ensure the capture of relevant micro-clusters. In order to add an extra layer to explore the granularity of clusters, **Orbis data** was also used to identify and map micro-clusters within selected regions of interest, these being London, Greater Manchester and the Yorkshire and Humber region. These regions were selected due to London being historically an area of high activity for fashion Design and Manufacture, Manchester being the largest city in the North to provide a comparison of northern and southern based micro-cluster activities, and Yorkshire and Humber being a region with a traditional textile design and manufacture industry, as well as an active UKRI Creative Cluster funded project specifically focussing on fashion[9].

The mapping of UK fashion micro-clusters was then used to support decision making within **the second stage of the research**. This stage aimed at **deep-diving into the dynamics and supply chain activities of fashion micro-clusters** through 14 semi-structured interviews conducted with **firms** located in regions

[9] Future Fashion Factory is a UKRI Creative Cluster funded project led by University of Leeds, the five year project researches and develops advanced digital and textile technologies to transform the industry's agility in the luxury fashion design process, and ability to shift to circular economies.

selected during the first stage of research: **London, Greater Manchester and the Yorkshire and Humber**. More specifically, findings from the first stage of the study highlighted some key micro-geographical areas where fashion firms co-locate in the three regions. For a balanced view and comparability of data, we developed a **rationale for** the selection of micro-clusters to be included in the interview process. The micro-clusters selected were approximately of the same size, located both in central cities and peripheral areas, and mainly specialised in manufacturing (with a low share of retailers). Two micro-clusters based within each region were then selected for participation in the interviews using this rational.

An industry network of collaborators (i.e., Future Fashion Factory (FFF), UK Fashion & Textiles Association (UKFT), and Textiles Centre of Excellence) supported the research by ensuring links with identified firms working within the micro-clusters. These links supported invitations to firms to participate with the research. Interview invitations were sent to 84 firms from the selected micro-clusters, achieving a response rate of 17%. 14 semi-structured interviews with an approximately thirty-minute duration were conducted. Six of these were with firms in London, six with firms in Yorkshire and Humber and two with firms in Greater Manchester – where difficulties in identifying well-balanced micro-clusters (with a large share of manufacturers) was encountered; being from the data used identifying that this area mainly specialised in fashion retail.

Interviews were recorded, fully transcribed, coded and examined according to a set of key themes within **the third stage of the research**. In addition to firms' characteristics and type and geography of activities along the value chain, respondents were asked about the main benefits of being in a micro-cluster, the importance of proximity to institutions and universities, skills, machinery and automation, Research & Development (R&D) as well as their perception of the industry more generally. Identified themes were used to emphasise key trends and the main difficulties currently affecting micro-clusters, the UK fashion sector and its value chain more generally.

Finally, a **workshop with key stakeholders** of the UK fashion sector was organised to understand the policy landscape and explore opportunities for value creation within the supply chain of fashion micro-clusters.

Appendix 2

Web scrapped data tables

Table to show; Top 20 local authority districts by sample size

	District	No. firms	Percentage
1	Westminster	924	4.7%
2	Camden	385	2.0%
3	Kensington and Chelsea	369	1.9%
4	Manchester	322	1.6%
5	Hackney	294	1.5%
6	Islington	281	1.4%
7	Cornwall	275	1.4%
8	Leeds	275	1.4%
9	Tower Hamlets	257	1.3%
10	Birmingham	252	1.3%
11	City of Edinburgh	226	1.1%
12	Cheshire East	211	1.1%
13	Glasgow City	192	1.0%
14	Bournemouth, Christchurch and Poole	187	0.9%
15	Brighton and Hove	176	0.9%
16	Hammersmith and Fulham	162	0.8%
17	Sheffield	162	0.8%
18	Bristol, City of	160	0.8%
19	Leicester	155	0.8%
20	Barnet	152	0.8%

Table to show; TOP 20 Travel to Work Areas (TTWAs)

	TTWA	No. firms	Percentage
1	London	4578	23%
2	Manchester	1099	6%
3	Birmingham	422	2%
4	Leicester	370	2%
5	Slough and Heathrow	370	2%
6	Nottingham	311	2%
7	Glasgow	286	1%
8	Newcastle	260	1%
9	Leeds	258	1%
10	Edinburgh	248	1%
11	Bristol	244	1%
12	Guildford and Aldershot	239	1%
13	Luton	223	1%
14	Sheffield	218	1%
15	Liverpool	206	1%
16	Southampton	195	1%
17	Cambridge	193	1%
18	Warrington and Wigan	190	1%
19	Brighton	184	1%
20	Cardiff	183	1%