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Rethinking Urban Industrial Spaces

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Chapter 12

Making the Future of the City

Insights and Lessons from Athens and Rotterdam

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and Karel Van den Berghe*

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12 Making the Future of the City

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INTRODUCTION: SITUATING CULTURAL MANUFACTURING IN THE CREATIVE ECONOMY

In recent years, advocates of a return to more productive cities have framed urban manufacturing as a necessity for more sustainable and resilient development. At the European level, the New Urban Agenda calls for stimulating “small-scale businesses, low-emission-manufacturing and urban agriculture [...] to reintegrate production into cities and urban areas, enabling and promoting new forms of mixed used neighbourhoods” (European Commission, 2020, p. 5; Novy, 2022). In this vision, city centers are spaces where the “common good” (European Commission, 2020, p. 1) is pursued through the colocation of manufacturing, retail, housing and leisure among others, resulting in diversified urban economies that can support greater resource efficiency and stronger local value chains at times of climate crisis (Antczak et al., 2023; Brandellero & Naclerio, 2025).

The concept of a productive city stands in contrast with a history of de-industrialization and transition to a post-industrial city (Hall, 1997), during which declining and displaced manufacturing activities were replaced by a growing share of service industries, as cities looked to improve their tax base (Harvey, 1990; Zukin, 1982). Echoing the global or world cities literature (Friedmann, 1986; Sassen, 1991), post-industrial cities witnessed the densification of central business districts with corporate headquarters and office complexes, alongside the clustering of advanced producer services such as finance, law, consultancy, and real estate. At the same time, advances in information and telecommunications technologies paved the way for the so-called knowledge economy where cities’ competitive advantage and wealth generation were increasingly framed as stemming from innovation, research, and development, and highly educated human capital, rather than from manufacturing-based activities (Moretti, 2012).

In recent decades, the notion of the creative city has come to epitomize the post-industrial transition in cities, capitalizing on value generation through cultural, artistic, and knowledge-based activities (UNCTAD, 2010, p. 10), and serving to position the arts and cultural sectors as central to urban economic and cultural development policies (Grodach, 2017). Yet such creative city policies were mostly geared toward amenities and urban branding (Grodach, 2017) working alongside “extant ‘neoliberal’ development agendas” (Peck, 2005, p. 740). One of the

outcomes of these developments has been high competition for urban space, particularly in areas formerly occupied by manufacturing (Sprague & Rantisi, 2019; Yoon & Currid-Halkett, 2015), resulting in a paradoxical pressure on the same spaces of cultural and artistic production which were “used” to lure high value used back to the city (Pratt, 2018).

Yet at the same time, flexible specialization has come to define so-called post-Fordist industrial organization, contemporary manufacturing increasingly relies upon customization, small batch production, and innovative design, which favors agglomeration in urban settings (Eisenburger et al., 2019; Scott, 2000). Scholars such as Hatuka and Ben-Joseph (2017) observe a revival of “industrial urbanism” that is supported by advances in technology and changes in local consumption tastes. As Grodach et al. (2017) emphasize, cultural manufacturing must therefore be understood as an integral component of creative industries in cities, challenging overly narrow, service-oriented interpretations of the creative economy.

Debates around the productive city therefore offer a renewed opportunity to reframe the contribution of the creative economy to urban economic development, beyond an emphasis on knowledge and innovation and toward an approach that integrates cultural manufacturing as well (Grodach et al., 2017). More generally, transitioning toward more productive cities calls for a re-engagement with urban industrial land following decades of decline and displacement, and growing intra-industrial gentrification (Ferm, 2023; Grodach & Guerra-Tão, 2024).

This chapter contributes to these discussions by examining the spatial clustering of creative economy sub-sectors in the European port cities of Rotterdam and Athens. We approach the creative economy as the combined set of cultural and creative industries spanning both knowledge-intensive and manufacturing-oriented activities, with particular attention to the position of cultural manufacturing relative to service- and knowledge-based sectors (see also Jansen et al., 2021). Through this comparative lens, the chapter highlights patterns of spatial clustering and sectoral composition, while also exploring potential tensions between manufacturing and non-manufacturing activities within the creative economy. In doing so, it considers whether these spatial patterns can serve as a useful lens for assessing the extent of post-industrialization in cities – a key consideration for advancing productive city agendas.

POSITIONING CREATIVITY AND MANUFACTURING IN ROTTERDAM AND ATHENS

There are two reasons why we choose Rotterdam and Athens as case studies. First, because they are port cities, they contain both an urban knowledge economy and a maritime industrial economy (Van den Berghe et al., 2024). The second reason is that both Rotterdam and Athens have actively embraced post-industrialization as an urban development strategy, but at the same time they have acknowledged the value of (cultural) manufacturing for their urban economies (Custers & Willems, 2024; Gospodini, 2009). This is also evident in their resilient city strategies.

As the largest functioning port in Europe, Rotterdam was relatively behind in transitioning to a post-industrial economy, and urban development in recent years

has been characterized by a focus on “urban port economy, social stratification, and water safety” (Custers & Willems, 2024, p. 10). In the decade 2012–2022, Rotterdam reported the highest levels of growth in the creative industries compared to other large Dutch cities (Rutten et al., 2023). After Amsterdam and Utrecht, Rotterdam reports the third largest number of jobs in the creative and ICT industries in the country (Rutten et al., 2023). Waterfront redevelopment and port transition have been significant developments in the city in recent decades (Jansen et al., 2021). For example, the Makers District (Rotterdam Makers District, 2017), a former dense industrial and food maritime cluster, has profiled itself at the forefront of an urban industrial and residential transition that prioritizes mixed-use, innovation, and circularity (Brandellero & Naclerio, 2025; Jansen et al., 2021).

In Athens, the cultural and creative sector has been identified as a key pillar of the Athens City Resilience Strategy 2030 (ACRS 2030), contributing to a number of its actions in the wake of the Greek economic crisis of 2008 (City of Athens & Resilient Athens, 2017; Palmer, 2018). The creative economy was seen as a source of both employment and income generation for the city, while strengthening the city’s cultural and creative resources was considered integral to its resilience-readiness strategy (Palmer, 2018). The Attica region, and within it the city of Athens, are where the majority of creative industries in the country concentrate (Avdikos et al., 2017). More generally, the ACRS 2030 has placed emphasis on the economic dynamism of urban neighborhoods, social cohesion, and climate change adaptation, but the approach has been critiqued for its fragmentation. The creative industries fit within this strategy by offering opportunities for recovery from the crisis and for development that is “multi-functional and multi-cultural” (City of Athens & Resilient Athens, 2017, p. 26). The creative sector contributes around 5% of the Athens region’s GDP (City of Athens & Resilient Athens, 2017). The ACRS 2030 identified the coupling of vacant retail spaces and creative entrepreneurs as part of the strategy for revitalizing city center neighborhoods in decline (City of Athens & Resilient Athens, 2017). Yet since this strategy was laid out, Athens has seen real estate prices skyrocketing as a result of the expansion of platform-driven short-term rental market and tourism-related gentrification of the city (Pettas et al., 2021). Some areas of the city such as Exarchia, known traditionally for their agglomeration of creative professionals and grassroots political activism, are particularly under commercial pressure to turn into a “theme park” (Pettas et al., 2021, p. 999). As a result, creativity (willingly or inadvertently) “has become a new index for the appropriation of the Athenian districts by leisure, culture and tourist enterprises” (Bolonaki, 2022, p. 192).

METHOD

Data Collection

The data used for this chapter is drawn from the Orbis database, developed by the Bureau van Dijk, a company under the aegis of Mood’s Analytics. Orbis is recognized worldwide as a source for comparable company level data and therefore lends itself to transnationally comparative research. It has been used successfully in the past for the exploration of the role of cultural and creative industries in local

development and regional growth in the European Union (Dellisanti, 2023). Our chapter further explores the potential of Orbis data to provide a fine-grained analysis of creative economic clusters, including cultural manufacturing.

Before accessing Orbis for our data collection, the first step involved selecting relevant NACE codes and categorizing them into sub-sectors of the creative economy. Following the categorization of NACE codes for the creative and cultural industry sectors in Eurostat's Cultural Statistics (Eurostat, 2018) and the Netherlands' Creative Industries Monitor Report (Rutten et al., 2023), we identified four primary categories of the creative economy: Media and entertainment, creative business services, arts and cultural heritage, and ICT.

To this list, we added cultural manufacturing to expand the sectoral boundaries of the creative economy to include production activities (Martin & Grodach, 2022). The NACE codes for cultural manufacturing capture industries that produce material products with high symbolic value, either for final consumption or as inputs to creative and cultural industries. This selection follows the definition and associated NACE codes of cultural manufacturing developed by Martin and Grodach (2022) and Grodach and Guerra-Tão (2024). The full list of selected NACE codes and their sub-sector categorization is provided in Appendix Table 12.1.

Following the identification of relevant NACE codes, we accessed firm-level data from Orbis for the municipalities of Rotterdam and Athens. For Rotterdam, we extracted a dataset comprising 11,792 firm records, for Athens 1099 records, both restricted to firms reporting data for 2022, 2023, or 2024. Firms with older reporting years were excluded, as they could be potentially non-operational in the current period. Each record included postal code, address, and geographic coordinates (latitude and longitude). Coordinates that were missing or incorrectly placed outside the city were reassigned using postal code information to obtain approximate latitude and longitude values or excluded when this was not possible. This resulted in a final dataset of 11,742 firms accurately geolocated in Rotterdam and 1069 in Athens for clustering analysis.

DBSCAN Analysis

After importing the Orbis datasets into QGIS, we conducted a Density-Based Spatial Clustering of Applications with Noise (DBSCAN) analysis to identify spatial agglomerations of firms based on locational proximity and local density thresholds. DBSCAN offers key advantages for clustering analysis: It does not require specifying the number of clusters or imposing spatial grids a priori, enabling the detection of clusters that emerge directly from the spatial configuration of firm locations. The method relies on two main parameters: (a) a distance threshold (ϵ), which defines the maximum distance between points to be considered neighbors and (b) the minimum number of points (minPts) required to form a core cluster. Based on the urban scale of the study areas and iterative parameter testing, we set ϵ to 650 meters and minPts to 5, applying these values consistently across both cities. We implemented DBSCAN both on the full dataset of firms (combining all sectors) and separately for each sub-sector of the creative economy. This disaggregated approach enabled a more nuanced understanding of sector-specific clustering patterns that could be obscured in aggregate analyses.

FINDINGS

Comparative Overview of Firms in the Creative Economy

As shown in [Table 12.1](#), Rotterdam’s creative economy, with 11,742 firms identified in Orbis, exhibits considerable sectoral diversity. The arts and cultural heritage sector accounts for the highest share at 32.3%, followed by ICT (27.4%) and creative business services sector (24.5%). Cultural manufacturing businesses represent the smallest share, at just 3.7%. In contrast, the Athens dataset reflects a smaller overall scale, with 1069 creative economy firms identified in Orbis. Within this, the ICT sector dominates, making up 46% of firms, followed by media and entertainment at 25.8%. Notably, in the Orbis data, cultural manufacturing in Athens surpasses both the arts and cultural heritage and creative business services sectors combined, accounting for 14.3% of the city’s creative economy.

12.1

Overview of retrieved Orbis data, with sectoral composition of creative economy firms in Rotterdam and Athens.

<i>Sub-sector</i>	<i>Rotterdam (count, %)</i>	<i>Athens (count, %)</i>
Arts and cultural heritage	3794 (32.3%)	48 (4.5%)
Creative business services	2878 (24.5%)	276 (9.4%)
Cultural manufacturing	434 (3.7%)	153 (14.3%)
ICT	3219 (27.4%)	492 (46%)
Media and entertainment	1417 (12.1%)	101 (25.8%)
Total	11,742 (100%)	1069 (100%)

Source: Orbis data compiled by authors.

Conducting DBSCAN analysis at the sub-sector level provides additional insights. In the case of Rotterdam, as shown in [Table 12.2](#), firms in sectors such as arts and cultural heritage, creative business services, and ICT are highly concentrated, with more than 95% of firms located within a single dominant cluster. This dominant cluster spans primarily across neighborhoods such as Stadsdriehoek, Blijdorp, and Cool. Rotterdam’s arts and cultural heritage clusters are mostly represented by firms in performing arts, support activities for performing arts, and artistic creation, indicating a strong concentration of firms engaged in live arts. The creative business services clusters illustrate a diverse mix of professional service activities, with firms specializing in design, advertising, and architectural services. ICT firms are highly clustered in Rotterdam’s central business districts, underscoring the significant role of software development, IT consultancy, and related digital services in the city’s core areas. Media and entertainment firms are distributed across ten clusters, but the sector is also highly concentrated in neighborhoods such as Stadsdriehoek and Blijdorp, with about 82% of firms located in the largest cluster. This cluster is characterized by a strong presence of audiovisual and motion picture production firms.

12.2

Clusters by sub-sectors of creative economy, Rotterdam.

<i>Sector</i>	<i>Total number of firms in Orbis</i>	<i>Number of clusters</i>	<i>Firms in largest cluster (count, %)</i>	<i>Top neighborhoods</i>	<i>Top industries</i>
Arts and cultural heritage	3790	6	3686 (97.3%)	Nieuwe Westen, Middelland, Stadsdriehoek	Performing arts and their support activities, artistic creation
Creative business services	2872	6	2781 (96.8%)	Stadsdriehoek, Blijdorp, Cool	Design, advertising, architectural services
Cultural manufacturing	439	15	235 (53.5%)	Spaanse Polder, Schiebroek, Oude Noorden	Manufacture of furniture and outerwear
ICT	3222	7	3089 (95.9%)	Stadsdriehoek, Cool, Cs Kwartier	Software development, IT consultancy
Media and entertainment	1419	10	1165 (82.1%)	Stadsdriehoek, Blijdorp, Nieuwe Westen	Audiovisual and motion picture production

Source: Orbis data compiled by authors.

Whereas in Rotterdam multiple clusters are organized within each sub-sector of its creative services economy, with high firm concentration in the largest cluster, Athens shows a narrower cluster range, with only one to four clusters per sub-sector. As highlighted in [Table 12.3](#), these clusters span across neighborhoods such as Emporiko Kentro, Kolonaki, and Mouseio. These and adjacent inner-city areas such as Psyri, Kerameikos, Metaxourgeio, and Exarcheia characterize the city's core creative pole ([Avdikos, 2014](#) as cited in [Lavanga et al., 2020](#)). The ICT sector in Athens is particularly centralized, with almost 99% of firms concentrated in a single dominant cluster. Closely mirroring those in Rotterdam, ICT firms in Athens focus on software development, IT consultancy, and data processing. Media and entertainment firms form three clusters, but with almost 93% of firms concentrated in the largest cluster, focusing on publishing, motion picture production, and sound recording. Notably, the arts and cultural heritage sector in Athens is both smaller in absolute size and more fragmented, with the largest cluster accounting for only 20.8% of firms, underscoring a weaker spatial anchoring compared to Rotterdam. Although the arts and cultural heritage clusters are small and dispersed, they are dominated by activities related to the operation of arts facilities, performing arts, and cultural education.

12.3

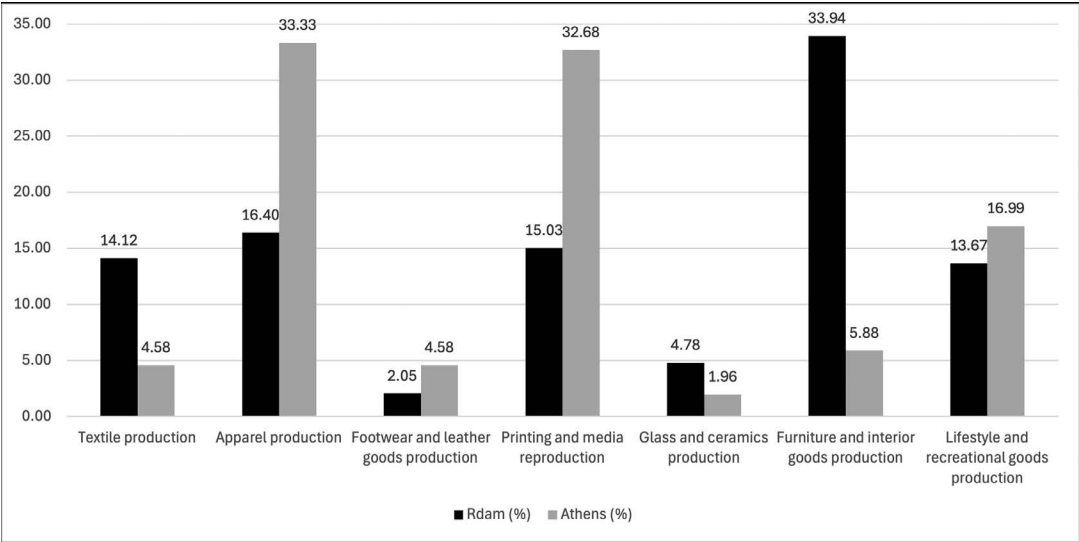
Clusters by sub-sectors of creative economy, Athens.

<i>Sector</i>	<i>Total number of firms in Orbis</i>	<i>Number of clusters</i>	<i>Firms in largest cluster (count, %)</i>	<i>Top neighborhoods</i>	<i>Top industries</i>
Arts and cultural heritage	48	3	10 (20.8%)	Agios Konstantinos – Plateia Vathis, Mouseio, Emporiko Kentro	Performing arts, arts facilities, cultural education
Creative business services	100	3	67 (67%)	Emporiko Kentro, Kolonaki, Kolonaki-Lykavittos	Design, architectural services, translation activities
Cultural manufacturing	153	4	94 (61.4%)	Emporiko Kentro, Kolonaki, Akadimia Platonos	Manufacture of outerwear, other printing, jewelry, and related articles
ICT	492	1	486 (98.8%)	Emporiko Kentro, Kolonaki, Ippokrateio	Software development, IT consultancy, data processing
Media and entertainment	276	3	256 (92.8%)	Exarcheia, Neapoli I, Mouseio	Publishing, motion picture production, sound recording

Source: Orbis data compiled by authors.

Clustering and Composition of Cultural Manufacturing

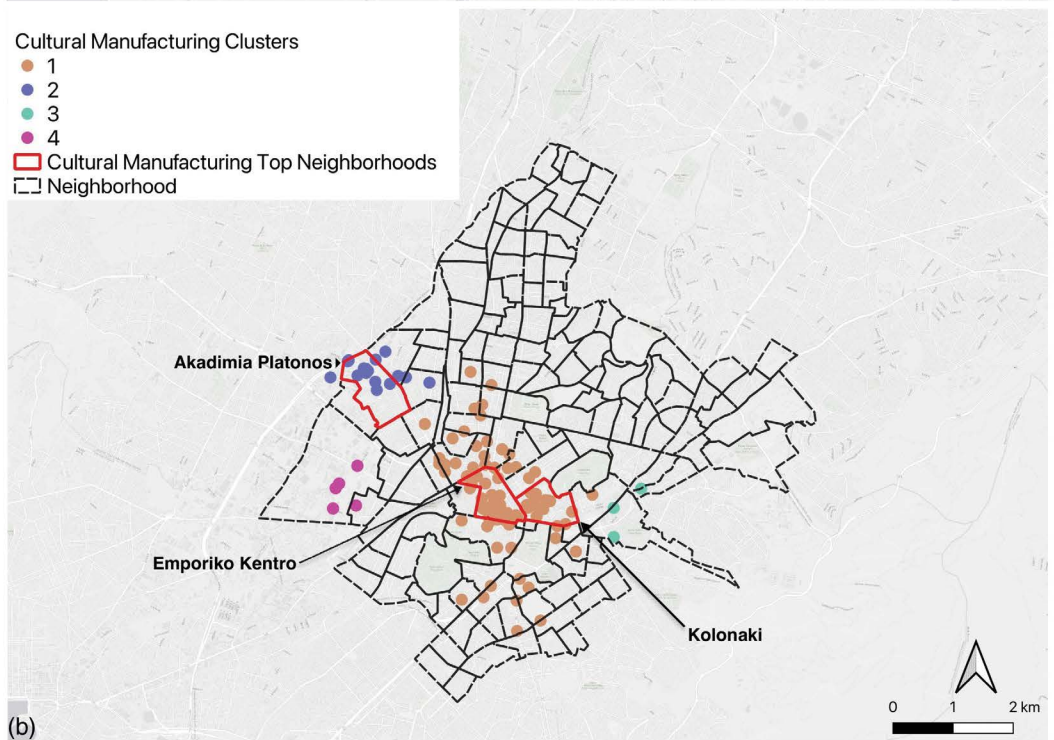
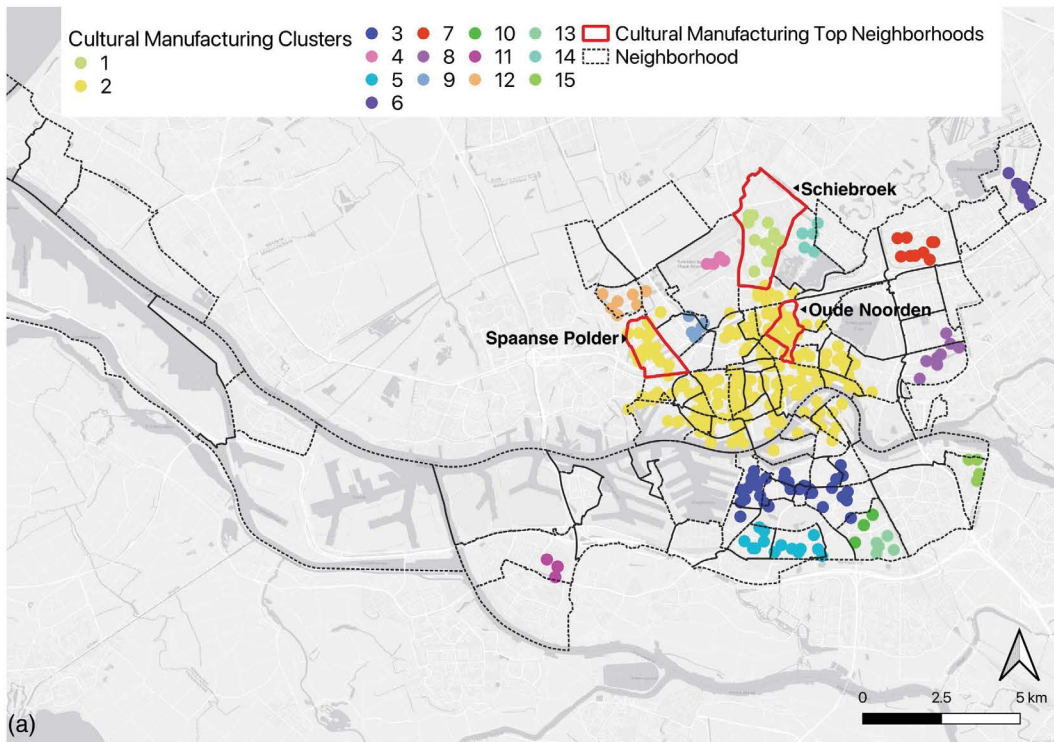
Despite a relatively small share of cultural manufacturing businesses in the overall creative economy of the two cities, focusing on cultural manufacturing provides various details. [Figure 12.1](#) illustrates differences in sectoral specializations in cultural manufacturing across the two cities. Rotterdam exhibits a pronounced concentration in furniture and interior goods production at nearly 34%, alongside notable shares in apparel production (16.40%) and printing and media reproduction (15.03%). In contrast, Athens demonstrates a distinct emphasis on apparel production and printing and media reproduction at around 33%, with secondary concentrations in lifestyle and recreational goods production (16.99%). This distribution underscores the divergent industrial orientations within the cultural manufacturing domain across the two cities.



12.1
Composition
of cultural
manufacturing firms
in Rotterdam and
Athens.
Source: Graph by
authors.

Spatial clustering of cultural manufacturing firms also illustrates distinct characteristics. In Rotterdam, cultural manufacturing stands out for its fragmentation, with 439 firms distributed across 15 clusters, with the largest cluster accounting for only 53.5% of firms (Table 12.2). Cultural manufacturing firms are located in more peripheral and industrial neighborhoods such as Spaanse Polder, Schiebroek, and Oude Noorden, as shown in the top map of Figure 12.2.

In Athens, cultural manufacturing firms are spread across four clusters, with 61.4% of firms located within the largest cluster (Table 12.3). This stands in marked contrast to the more fragmented cultural manufacturing landscape observed in Rotterdam. Cultural manufacturing firms also cluster in neighborhoods such as Emporiko Kentro and Kolonaki, which were noted earlier as Athens’ core creative pole (Avdikos, 2014 as cited in Lavanga et al., 2020). The concentration of multiple sub-sector clusters within these central neighborhoods suggests that firms in Athens’ creative economy, both manufacturing and non-manufacturing, are competing for limited urban space in these dense core areas. Notably, the third most populated neighborhood within the largest cultural manufacturing cluster is Akadimia Platonos, located further west of the inner-city zones (Figure 12.2), which may signal an emerging trend of cultural manufacturing firms relocating outward from the historic center.



12.2
Cultural manufacturing clusters in Rotterdam (a) and Athens (b).
Source: Map created by authors.

SUMMARY AND CONCLUSION

This chapter has explored the relation between production and the creative city by examining the spatial clustering of manufacturing and non-manufacturing activities in the creative economy of Athens and Rotterdam. Both port cities have a strong industrial history; they embraced post-industrialization, but at the same time they also acknowledged the importance of production processes. The broad picture of our results echoes previous research on the locational attributes of cultural manufacturing, where knowledge- and service-oriented creative economy sectors concentrate in city centers, while cultural manufacturing activities persist both in central locations and in peripheral areas ([Martin & Grodach, 2022](#)). At the same time, our comparison of Rotterdam and Athens shows divergences in these spatial patterns, potentially reflecting broader differences in political-economic trajectories, land use regimes, and urban development pressures.

Rotterdam exemplifies a polycentric urban geography where the dominant sectors of the creative economy – ICT, media, and creative business services – are co-located within central and well-connected neighborhoods. These sectors benefit from proximity to the urban core, aligning with a post-industrial vision of a knowledge-intensive city. Cultural manufacturing, in contrast, is spatially peripheral and fragmented, yet it persists with prominence in furniture and interior goods production. They concentrate in areas such as the Spaanse Polder and Schiebroek. Though the Makers District policy agenda is promoting mixed-use and acknowledges the importance of cultural manufacturing, the question is to what extent this will be restricted to designated areas (for example, the Merwe-Vierhaven area) or it will confirm the pattern within Rotterdam where cultural manufacturing is only modestly integrated into Rotterdam's urban development logic, prioritizing high-value, low-nuisance (cultural economy) activities compatible with residential and commercial land use.

Athens, by contrast, presents a more centralized and compact creative economy. The dominant creative clusters are located in the city center, where cultural manufacturing firms exhibit a higher degree of spatial integration than in Rotterdam. This may reflect both the material constraints of Athens's urban form and a relatively embedded artisanal production tradition, especially in apparel production and printing activities. Production and more knowledge-based creative activities appear to be more integrated in the city center. However, at the same time, this centralization of creative manufacturing remains vulnerable to dynamics of commercialization and displacement ([Ferm et al., 2021](#)).

Our research demonstrates the value of comparative, micro-economic analyses by using harmonized datasets such as Orbis and clustering methods. By making the creative economy more detailed and nuanced, it is possible to use it as a lens to monitor spatial patterns within urban regions across the globe. At the same time, there are limitations. The big difference in the data points of creative economy companies in Rotterdam and Athens could be because of a lack of structural monitoring in Greece, or that many of the existing companies are informal. Moreover, while we zoomed in on the municipal boundaries in both cities, we note that particularly in the case of Athens this limits our grasp of port area transitions, which fall outside the

selected administrative boundary. This may reflect a limitation of the Orbis datasets, in which the filter used to categorize firms by city applies municipal boundaries of varying scale (a broader boundary in the case of Rotterdam and a narrower one in Athens). These are avenues for further research to understand better the different phases of (post) post-industrial urban development.

From a policy perspective, the patterns of colocation of the creative economy's manufacturing and non-manufacturing activities in these two cities carry several implications. First, the persistence of cultural manufacturing in both cities, albeit following different spatial patterns, highlights the importance of context-specific policies, rather than a one-size-fits-all model of Productive City development. Tailored policies inevitably raise tailored policy questions. In Rotterdam, where cultural manufacturing is mostly located in peripheral neighborhoods, a key question becomes whether planning should actively support mixed-use central areas that co-locate manufacturing and service functions, or whether reinforcing peripheral production zones, such as the Makers District, is more appropriate. In Athens, the more centralized locational pattern of cultural manufacturing with other creative sub-sectors raises a key issue regarding their vulnerability to displacement pressures and whether safeguarding measures are needed.

The second implication for Productive City policies is the recognition and support of complementarities between manufacturing and non-manufacturing activities in the creative economy. In Rotterdam, our data shows that although cultural manufacturing represents a small share of the city's creative economy, its concentration in furniture and interior goods production activities demonstrates potential synergies with the city's architectural design and service activities. The question for policy is whether their complementarities could be best facilitated through greater geographical proximity, or whether alternative forms of relational coordination (for instance, via contractual arrangements or digital platforms) can allow peripheral and fragmented clusters to remain resilient. In Athens, the prominence of apparel production and media reproduction activities points to potential linkages between the city's design and media sectors. Productive City policies, therefore, require a nuanced understanding of which complementarities might emerge in particular contexts, and whether spatial clustering or institutional mechanisms provide the most effective means of supporting them.

Third, Productive City policies can play a pivotal role in advancing sustainable transitions within the creative economy. If creative city strategies prioritized consumption-oriented and entertainment-driven amenities, the integration of cultural manufacturing into Productive City policy frameworks open possibilities for supporting sustainable material flows and circular value retention activities such as reuse and repair. In the case of Rotterdam, for instance, strengthening the linkage between interior goods producers and architectural designers could promote knowledge exchange and innovation in sustainable use of construction materials. Similarly, the concentration of apparel producers in Athens presents opportunities for sustainable upgrading of production processes and for sustainable design innovations. Hence, Productive City policies can further account for the material dimensions of the creative economy and consider infrastructural requirements that accompany them, including material

storage and sorting facilities, as well as spaces that enable interaction and knowledge exchange between manufacturing and non-manufacturing sectors.

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APPENDIX TABLE 12.1

"NACE codes used for Orbis firm selection" at <https://doi.org/10.5281/zenodo.17418889>.

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