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Source: *Annals of the Association of American Geographers*, Vol. 98, No. 2 (Jun., 2008), pp. 414-434

Published by: Taylor & Francis, Ltd. on behalf of the Association of American Geographers

Stable URL: <http://www.jstor.org/stable/25515128>

Accessed: 24-07-2016 13:45 UTC

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Patterns of Knowledge: The Geography of Advanced Services and the Case of Art and Culture

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Much emphasis has been placed on the importance of agglomeration economies as a backbone to urban and regional growth. Case study research points out that particular cities and regions have a competitive advantage in industrial activity over others, yet we have little by way of a satisfactory means of formally studying the geography of these industrial patterns to demonstrate how the specific case studies fit into a larger pattern of agglomeration that can be applied to more than one place. Is the agglomeration itself in fact exhibiting statistically robust and significant patterns? What do the patterns look like and how do they differ by region? Using geographic information systems to analyze spatial autocorrelation and “hot spots” of industries, we compare the ten most populous metropolitan statistical areas across several “advanced” service sectors (professional, management, media, finance, art and culture, engineering and high technology). We find that much of the qualitative evidence on industrial clustering is evocative of broader macro patterns that are both similar and dissimilar across industries and geographies. Our results indicate that there are three spatial typologies of growth in the advanced services within U.S. urban regions. These typologies allow us to intimate qualities of place in general and of places specifically that drive the agglomeration of advanced services. New York City’s art and culture and media industries represent key examples of geographically unique cases within advanced services that are explained relative to existing literature regarding the importance of density and cross-fertilization across industrial fields. **Key Words:** *advanced services, agglomeration economies, knowledge industries.*

聚集经济作为城市与区域增长的骨干已成为许多研究的重点。案例研究指出，某些城市和区域占据工业活动的竞争优势。但我们却缺乏有效探讨产业模式地理学的方式来展示如何将具体研究案例纳入一个能够应用在超逾单一地方的更大聚集模式。聚集本身是否展示统计强劲和显著的模式？这些模式看起来如何？它们是怎么样因地区而异？利用地理信息系统来分析产业的空间自相关性和热点，我们比较了处在十个人口最多的大都市统计区域里的“先进”服务行业领域（专业，管理，媒体，金融，文化艺术，工程和高科技）。我们发现，绝大部分产业聚集的定性证据会让人联想到更广泛的宏观格局。而这些格局在各种行业与地域会有相同和不相同之处。我们的研究结果表明，在美国城市地区的先进服务业有三种增长的空间类型。这些类型能让我们了解是什么样的一般与特定地点素质在推动先进服务业的聚集。纽约市的文化艺术以及媒体产业代表了先进服务业当中拥有独特地理性质的例子。他们可被有关不同产业领域密度和交互育度的现有研究来解释。

关键词：先进服务，聚集经济，知识产业。

Se ha puesto mucho énfasis en la importancia de las economías de aglomeración como la columna vertebral del crecimiento urbano y regional. La investigación de casos indica que ciertas ciudades y regiones tienen una ventaja competitiva en actividad industrial sobre otras; sin embargo, no contamos con medios satisfactorios para estudiar formalmente la geografía de estos patrones industriales a fin de demostrar como los casos específicos encajan en un patrón mayor de aglomeración que se pueda aplicar a más de un lugar. ¿Está, de hecho, la aglomeración misma exhibiendo patrones estadísticamente significativos y sólidos? ¿Cómo son los patrones y cuál es su diferencia por región? Mediante el uso de sistemas de información geográfica para analizar la autocorrelación espacial y los “puntos calientes” de las industrias, comparamos las diez áreas estadísticas metropolitanas más pobladas en varios sectores de servicios “avanzados” (profesionales, administrativos, medios publicitarios, finanzas, arte y cultura, ingeniería y alta tecnología). Hemos encontrado que mucha de la evidencia cualitativa en aglomeración industrial es evocativa de macropatrones más amplios que son tanto similares como diferentes en las industrias y geografías. Nuestros resultados indican que hay tres tipologías espaciales de crecimiento en los servicios avanzados dentro de las regiones urbanas de Estados Unidos. Estas tipologías nos permiten relacionar las cualidades del lugar en general y las de los lugares que específicamente impulsan la aglomeración de servicios avanzados. El arte y la cultura y las industrias de los medios publicitarios de la ciudad de Nueva York representan ejemplos claves de casos geográficamente únicos dentro de servicios avanzados que se explican en la literatura existente respecto a la importancia de la densidad y de la transfertilización entre campos industriales. **Palabras claves:** *servicios avanzados, economías de aglomeración, industrias del conocimiento.*

There is that Marshallian ([1890] 1961) something “in the air” that propels and sustains particular industrial geographies to grow, and there is, conversely, that lack of something that prohibits or limits the chances for other places to attain economic success. That “something” has long been remarked on by scholars ranging from urban planning to economic development to “geographical economics” to economic geography.¹ It is the *raison d'être*, so to speak, of agglomeration economies ranging from high technology to the fashion industry to film. Scholars have pointed to the path-dependent or historical influence that allows for such agglomerations to occur (Scott 1993, 2000; Glaeser 2005); their ability to gain “lock in” (Scott 2000) at a “historical moment” that catalyzes dominance in a particular industry. Things are indeed set in motion at that moment in history—whether they be rapid innovations in semiconductors and microprocessors in Silicon Valley (Saxenian 1994) or the establishment of *American Vogue* in New York City (Rantisi 2004)—creating a sort of cumulative advantage. The initial advantage given by a historical moment catalyzes a region to continue to attract more labor pools, resources, and firms, thus leading to more innovation within the industry, more advantage, yet more labor pools and firms, and so forth, creating what Richard Merton (1968) eloquently termed a “Matthew Effect.” Or, as Molotch (2002) points out, places reinforce their dominance in the dictating of how particular “stuff” is made, despite (maybe even in spite of) the cost factors, such as congestion, that would encourage production to be located somewhere else. The “place” becomes the justification for the product’s existence. As Molotch (2002, 684) puts it with regard to particular luxury goods that “although more expensive than they would be if made elsewhere, would not be the same if made elsewhere.”

Many explorations of agglomeration economies focus on a narrative of attaining a competitive advantage, which leads to the initial presence of agglomeration in particular places and then reinforces its own significance. Particular cities and regions, it seems clear, have a competitive advantage in industrial activity over others. New York City (fashion, finance, art), Los Angeles (film, media, and electronics), Northern California (winemaking; Porter 1998), or the Third Italy (shoemaking; Piore and Sabel 1984; Storper 1997) are considered central nodes in the postindustrial economy. We are told anecdotally by researchers of this new marketplace where agglomeration economies occur and how the benefits or spillovers of such

agglomeration (i.e., innovation, efficiency, etc.) are formalized. These many case studies drawing broadly the same conclusions (clustering is a good thing) allow us to believe in the robustness and meaningfulness of agglomeration. The evidence is compelling and it has informed policymakers, geographers, and developers alike in their efforts to gain a deeper understanding of what is “in the air,” and of the real significance of the colocation of firms, labor, and resources.

On the other hand, we have little by way of formalizing the actual patterning of the agglomeration, how the case study fits into the larger geography of agglomeration that can be applied to more than one place. We argue, though, that much of the anecdotal and case study evidence on industrial clustering is evocative of broader macro patterns that can be differentiated across industries and geographies. This macro patterning of cluster geography in U.S. advanced services demonstrates both the common qualities of place in general and the specificity of unique places. By employing a spatial analytic perspective, we can systematically relate the patterns of industrial agglomeration to the places that create those patterns and to the localized studies of industrial geography.

Using geographic information systems (GIS) to analyze spatial autocorrelation and “hot spots” of industries, we compare the ten most populous metropolitan statistical areas (MSAs) across several sectors, confirming and questioning several of the conclusions in the economic geography literature.² Our analysis of these metropolitan areas is twofold. To determine the regional patterns of development for an industry, we analyze spatial patterns first within the central city alone and then within the urban region as a whole. We perform this analysis for six industries across all ten metropolitan regions. Our results indicate that there are three spatial typologies of growth in advanced services within U.S. urban regions. We discuss these three types as well as the industries, metropolitan regions, and cities most closely related to each of them. Finally, as a means of bridging the qualitative and quantitative research done on agglomeration economies, we explore the significantly unique and dense clustering patterns that our results indicate for cultural and media industries within New York City. We draw on previous research to explain and discuss the implications of these unique spatial patterns for geographers, developers, and policymakers.

Certainly, to an extent, the proposed effort to understand the macro patterns of advanced service geography is the sort of generalized effort that gets geographical

economists into trouble. Places are unique, and economic and social outcomes are specific. Economic geographers have long known of the clustering of industry and the intangible results of colocation in places. The literature is vast and articulate on the benefits of such geographical relationships. The actual formal (and quantified) pattern of industrial clustering, however, has been touched on only briefly, primarily with regard to high technology (see, e.g., Audretsch and Feldman 1996; Strumsky, Lobo, and Fleming 2005; Ó hUallacháin and Leslie 2005). It has also been explored in the relationship between technological patents (a proxy for innovation) and the concentration of other industrial and demographic characteristics including the relationship between the gay population and high technology (Florida and Gates 2001); innovation and diversity (Florida and Lee 2001); creativity, bohemia, and economic growth (Florida 2002a, 2002b); and economic growth and human capital (Lucas 1988; Glaeser 2003a).

What we are still untangling is whether (anecdotal, case study, and ethnographic research aside) agglomeration exhibits statistically robust and significant patterns across and within different geographical conditions. More specifically, what are those patterns, what do they look like physically, where are they, and what are the implications of such concentrations? Is the qualitative evidence of agglomeration suggestive of broader patterns of advanced industrial configuration and are such patterns exhibited in different geographies and across different industries? In other words, can we establish a balance between the overgeneralized world of geographical economics and place-specific economic geography, allowing us to see both the nuances of place and the broader patterns of how particular industries cluster?

Being “Where It’s At”: Clusters and the New Economic Geography

With the collapse of the manufacturing economy across the United States and Europe, and the subsequent economic crisis of the mid-twentieth century, geographers and economists alike became unsure of exactly what is “in the air.” The search since then has been for a systematic understanding of the rapid transformation of where innovation milieus were beginning to locate. Silicon Valley trumped Boston’s Route 128, the Southern California industrial corridor became a more viable economic engine than the city of Los Angeles, and the region, not the city, became

the economic juggernaut. With the decline of central cities as the primary engines of the world economy, the new scale at which to understand economic geography appeared not only vaster but also less reliant on the traditional metropolitan categories. These new localized economies are not inherently urban (although they can reside in cities), but exhibit efficiency, innovational rewards, and positive spillovers for the firms and labor pools that locate in a particular place in a particular “local” industry (Weber 1929; Losch 1939; Hoover and Vernon 1962; Mills and Hamilton 1994; Martin 1999).

Part of this geographical transformation is a function of the broader sea change that the global economy has witnessed in its metamorphosis from an industrial to postindustrial or Fordist to post-Fordist economic structure, relying less on manual labor and more on human capital (and face-to-face interaction), marked by rapidly changing technologies and mercurial consumer tastes that require product differentiation at an accelerated pace (D. Bell 1973; Piore and Sabel 1984; Scott 1993, 2000; Castells and Hall 1994; Florida 2002b). Scott (1993, 25–27) argues, “As post-Fordist flexible production organization has made increasing headway in modern capitalism, many new industrial districts are beginning to materialize. . . . The contemporary world economy can be seen as a mosaic of regional agglomerations (marked by localized transactional networks) embedded in far flung systems of national and international transacting.” Thus, the larger geographic patterns, especially as they relate to specific places, of national and international post-Fordist flexible production organization are a critical companion to the study of “localized transactional networks” in understanding present-day economic geography. This is particularly the case for efforts to understand increasingly uneven economic development patterns. Some places appear significantly more adept than others at capturing the Teflon-like competitive advantage, where it has become almost impossible to usurp a region’s dominance in film, high-technology, finance, wine, and so forth, once that advantage is locked in. Despite what some macroeconomists and the popular media may say about the ability for less fortunate regions eventually to catch up, thus equalizing the playing field, we know better, or we would not be studying uneven development and geographical advantages in the first place (see Martin 1999 for a discussion of the view of economists, and Friedman 2005 as an example of the popular media view).

The new economic geography is in part a response to new ways that firms have to engage with the marketplace. In responding to consumer tastes and

establishing greater product differentiation, economies of scope trump those of scale, and innovations have to be churned out rapidly to keep up with both local and global competitors. The new economic geography reflects the new way of doing business in a global economy. One of the seminal contributions to formalizing these dynamics is that of Porter's *clusters*, which he defines as "geographical concentrations of interconnected companies and institutions in a particular field" (1998, 78). Porter argues that the clustering of firms allows for greater outsourcing of production, greater possibilities for innovation, and increased product differentiation. Piore and Sabel (1984) made this point in their groundbreaking discussion of flexible specialization. For Porter and for Piore and Sabel, the external milieu (that which occurs outside the firm; e.g., firm-to-firm and firm-to-supplier relationships) is often more crucial to the success of a firm than internal firm relations. In essence, they describe the social and economic benefits of agglomeration economies that propel firms and human capital of a similar ilk to locate next to one another, despite high rent, congestion, or other negative externalities (see also Lucas 1988; Glaeser 1998, 2003a, 2003b; Thompson 1965). As Lucas inquires, "What can people be paying Manhattan or downtown Chicago rents for if not for being near other people?" (1988, 38–39).

Clusters and industrial agglomerations offer both economies of scale and scope, along with intangible social benefits not achieved unless the firm or the worker is actually there. These benefits reinforce local clusters and are also inherently place-specific in that they are not feasible across distance, a point that Saxenian (1994) and Glaeser (1998) have also made. Storper (1997) refers to such informal and intangible relationships as "untraded interdependencies" that, although not easily grasped in concrete terms, maintain the social and informal economic ties within a regional agglomeration as essential elements to its productivity and innovation capacity. More recently, Gertler (2003, 75) has tackled the "undefinable tactiness of being (there)," where he outlines the long-standing fascination that geographers have in unearthing what it is about locating within a particular agglomeration that is significant, above and beyond the obvious and tangible reasons of efficiency, labor pools, jobs, and so forth.

Clusters not only allow for sharing local information, but also for outsourcing as part and parcel of the production process, which in turn allows for greater diffusion of risk in developing products. By distributing the different aspects of product development, individual firms are less likely to go bust if the product fails (Jacobs 1969;

Piore and Sabel 1984; Scott 2000). Fundamentally, the crucial significance of these agglomeration economies (i.e., why they matter for capital production processes) is their ability to be sites of continual innovation or, as Romer (1986, 1990, 1994) has put it, their ability to establish "increasing returns" and "endogenous growth." The continual production of new and advanced goods and services means that an industrial agglomeration remains at the forefront of innovation within an industry. These relationships—the sharing of information, resources, risks, and production processes—allow particular places to become sites of "perpetual innovation" (Castells and Hall 1994), fueling a type of high-speed "creative destruction" (Schumpeter 1942, 81–86) that allows advanced service industrial agglomerations to continually replace old versions of products and services with more advanced and in-demand goods and technologies. It becomes increasingly clear that geographies able to cultivate such industrial clusters are easily the winners in a post-Fordist economy, placing them as primary drivers of uneven development and accumulation of capital and fueling the spread of agglomeration economies across global geographies (Massey 1984; Harvey 1985, 1996; Sassen 1991, 2000; Savage and Warde 1993).

Understanding Agglomeration Through a Spatial Analytic Approach: Methods and Data

In reference to the methodological turns within agglomeration studies, Martin points out that by the end of the 1990s, "Geographers became more interested in real economic landscapes, with all their complex histories and local contexts and particularities, and less entranced by abstract models of hypothetical space economies" (1999, 81). Our spatial analysis seeks to bridge this suggested methodological divide between particularities or abstractions (see also Cumbers and MacKinnon 2004; Wolfe and Gertler 2004; Duranton and Storper 2006 for more on this discussion). This methodological middle ground is achieved through the ability of spatial analytic techniques to identify with geographic precision both the similarities across cases that imply the existence of spatial typologies of regional agglomeration and the uniqueness of cases that do not comply with the dominant spatial patterns. Thus, a detailed analysis of the "actual" geography of advanced services, it is suggested, complements existing approaches to the study of industrial clustering by examining the

larger patterns of agglomeration across regions even while highlighting the uniqueness of anomalous places and industries. With this approach, it is not a question of either particularities or abstractions of place, but rather of the connection between the two.

This study examines the clustering tendencies of six advanced service industries within ten U.S. consolidated metropolitan statistical areas (CMSAs).³ The purely spatial analytic approach utilized in the first part of the analysis examines the "actual" geography of regional innovation systems by mapping degree and type of advanced service clusters and identifying similarities and differences across regions and industries. This approach is not meant to supplant, but rather to complement, the case study and interview-based analyses of industrial clusters that seek to unearth the root causes for the creation and success of regional processes of firm localization (see, e.g., Castells and Hall 1994; Saxenian 1994; and Porter 1998 among others cited earlier). Neither is it meant to replace the utility of other statistical methods that contextualize location patterns relative to national employment and innovation variables (Porter 1998; Scott 2005) or of economic models based on assumed conditions that establish the common rules of industrial clustering (Krugman 1991; Fujita, Krugman, and Venables 1999; Fujita and Thisse 2002). Each of these methods has its place in addressing a specific stratum of understanding in the study of industrial agglomerations. The spatial analytic approach offered here is a new mesolevel lens by which to view the broader phenomenon of agglomeration. The advantage of this approach is that it incorporates the substantive foci of several existing methods and does so without requiring an arbitrary delineation of variables (e.g., number of employees required to make a cluster) or any aggregation of spatial and employment categories (as is often the case with common statistical measures).

Defining Advanced Service Industries

Industry locations are examined within six advanced service sectors: engineering and high tech, art and culture, media, management, financial, and professional. These sectors reflect the main areas of focus within the existing literature on industrial agglomeration and the postindustrial service economy, a sample of which is reviewed briefly in this section. The specific industries included within each sector for the analysis that follows are chosen from the most recent (2004) six-digit North American Industry Classification System (NAICS) data. The NAICS codes selected correspond

to industries that substantially employ advanced service workers, defined as professional workers with high levels of training, education, and job-specific skills.⁴

High-technology and engineering agglomerations have perhaps been given the most attention in the study of advanced service agglomerations (Oakey 1985; Scott 1993; Castells and Hall 1994; Saxenian 1994; Audretsch and Feldman 1996; Strumsky, Lobo, and Fleming 2005). Going back to 1956, Solow, although not directly dealing with technology and geography, argues that the "residual" that accounts for economic growth is technological innovation. More directly, Castells and Hall (1994) and Saxenian (1994) offer two landmark studies of this sector, both noting the important benefits of informal information exchange within dense technological milieus. As well, the role of innovation within high-technology agglomerations has been essential to literature on engineering and high-technology clusters (see, e.g., Ó hUallacháin and Leslie 2005; Strumsky, Lobo, and Fleming 2005).

Finance and high-level professional service agglomerations have been examined with regard to their dominance in "global cities" (Beaverstock, Smith, and Taylor 1999; Castells 2000; Friedmann 1995; Knox and Taylor 1995; Sassen 1991). Similarly, Sassen (1991) and Castells (2000) have remarked on the importance of strategic clusters of "managerial elite" or "command and control" in world cities. Professional services, ranging from law to finance to medicine, have also been given some attention with regard to the patterns by which they tend to cluster (Vernon 1960; Hoover and Vernon 1962; Sassen 2000; Nelson 2003).

Recently, there has also been a flurry of interest in the where and why of artistic and cultural production (Christopherson and Storper 1986; Molotch 1996, 2002; Caves 2000; Scott 2000, 2005; Florida 2002a, 2002b; Rantisi 2002a, 2002b, 2004; Markusen and King 2003; Coe and Johns 2004; Power and Scott 2004; Markusen and Schrock 2006; Currid 2007). Some have pointed to their tendency to locate in urban areas due to conducive and open social and economic environments (Molotch 1996; Florida 2000, 2002b; Markusen and King 2003; Currid 2007). Others have looked at art and culture production as a component of a consumption agglomeration that attracts high-skill human capital (Glaeser 2000; Clark 2004). Still others have looked at the larger industrial production system that enables the creation of art and culture for the global marketplace and the ability for culture to brand place and vice versa (see particularly Molotch 1996, 2002; Scott 2000; Rantisi 2002a, 2002b, 2004; and Power and Scott

2004). Like Markusen and King (2003) and Markusen and Schrock (2006), we examine industries that primarily produce art (i.e., music, art media, dance), design, and cultural goods and services. In his work closely related to the study of art and culture geographies, Grabher (2001) points to the dense “ecologies of creativity” in London’s advertising industry cluster. Although we look at them separately, we believe that art and culture and media (i.e., television, magazine, radio, advertising) can be viewed as symbiotic industries, as Hirsch (1972) and Markusen and King (2003) have pointed out.

Defining Clusters

Clusters are defined purely with concern for spatial location within this study. For the purposes of this analysis, a cluster is a contiguous area where several zip codes (the data are reported at the zip code level) that contain a relatively high number (greater than the mean of all other zip codes in the city or region being examined) of organizations within a given industry occur next to each other. Such methodology is sometimes referred to as a hot spot analysis. The zip code resolution of the data used means that these clusters are more informative at the regional than the municipal level and they are treated as such within this study, but can inform analyses at both levels.

Clusters are identified through a three-tiered method of spatial analysis meant to draw out several aspects (both general and specific) of advanced service spatial patterning.⁵ The first tier utilizes the General Moran’s I statistical measure⁶ to gauge spatial autocorrelation among zip codes of advanced service industries for each city and region examined. This measure demonstrates the general tendency of an industry to collocate by identifying the level of spatial clustering on a scale of -1 to 1, where -1 indicates a dispersed pattern, 1 indicates a clustered pattern, and 0 indicates randomness. This scaled result allows the industries to be compared across different urban regions, but does not tell us anything about the nature of the observed patterns. Most important, this first level of generalized spatial autocorrelation, although useful for its comparative quality, remains ambiguous because it could identify clustering tendencies of zip codes with many of a given industry (hot spots) or of zip codes with few of a given industry (cold spots).

To discern what types of values (hot spots or cold spots) the Moran’s I analysis is identifying, the second tier of the spatial analysis employs the Getis Ord General G-statistic (G-statistic). The G-statistic iden-

tifies spatial clusters of statistically significant high (hot spot) or low (cold spot) attribute values, and allows for the identification of which type of value is clustering. The combination of the first two tiers of analysis allows us to identify the statistically significant degree to which a high or low number of similar businesses will locate near one another and it scales that probability to make it comparable across metropolitan regions. Where high clustering of high values occurs, at least one district of several zip codes in size (i.e., a hot spot for that industry) should exist. Our particular interest is in examining this high number or hot spot clustering, as such clusters represent the effect and presence of localization economies. Simply put, a spatial hot spot for an industry, identified through the G-statistic and scaled in degree of clustering for comparison across metropolitan regions through Moran’s I, is interpreted here as an area where that industry forms a cluster.

In the third tier of the analysis we map the statistically significant industry clusters by interpolating the G-statistic* (a slight variation on the Gedis Ord General G used previously).⁷ The result is a series of map images that display the “advanced service topography” of a region. A qualitative review of these images along with the quantified degree and type of spatial autocorrelation findings described earlier allows us to discern patterns of industrial agglomeration across regions and industries. It also allows us to identify outliers within these patterns that can serve as exemplary place-specific case studies. Employing the case of art and culture in New York City, we use existing literature and previous work to discuss the ways in which the qualitative research on art and culture can inform our spatial patterns and vice versa.

Region, Not City: The Multinodal Tendency of Advanced Services

Advanced services clearly tend to cluster in statistically significant ways. Nearly all advanced service industries show a positive and significant Moran’s I result at the regional scale, signifying a clustered spatial pattern and affirming much of the agglomeration and economic geography literature.⁸ Table 1 shows the degree of clustering averaged for each industry across all ten cities. What is aggregated away in Table 1, however, is the fact that the industries studied often do not show a clustered spatial pattern within central cities (as opposed to within regions), which results in the lower average Moran’s I for central cities. This means that large advanced service districts generally always occur

Table 1. Moran's I result for all industries analyzed averaged across ten largest metropolitan statistical areas

Industry	Moran's I: Region	Moran's I: Central city
Art and culture	0.140	0.096
Media	0.132	0.0749
Engineering and high tech	0.090	0.091
Management	0.088	0.069
Financial	0.075	0.044
Professional	0.045	0.029

within metropolitan regions but do not always occur within the city proper. For example, New York City, Chicago, and Philadelphia demonstrate statistically significant clustering within central city districts for all of the sectors studied (Moran's I is greater than zero and statistically significant for these cases), but Detroit and Miami have almost all negative Moran's I results within their central city boundaries, showing almost no sign of particularly developed advanced service districts in the city proper⁹ (these cities also show relatively low results for all industries at the regional level). This means that New York, Chicago, and Philadelphia have managed to retain large advanced service clusters within the city limits even while new clusters have grown outside the limits, but Miami and Detroit have not (if those clusters even existed within these cities in the first place).

The results so far present an opportunity to categorize two divergent types of regional advanced service growth in U.S. cities: region-led dispersed growth versus central-city-led concentrated growth. In clarifying these categories through examination of the G-statistic maps, we find a third useful category, that of the specialist city, which can be characterized as either region-led or central-city-led in terms of growth of advanced service districts, but shows specifically high clustering levels for only one or two industries and is characterized by relatively low clustering levels for all others. Perhaps the archetypal example of a specialist city is Los Angeles as a region-led specialist in art and culture and media. All ten of the cities examined are classified by growth type in Table 2.¹⁰

The finding that there are three general types of regional growth for advanced services in postindustrial urban geographies—region-led, specialist, and central-city-led—must be coupled with another important finding with regard to the geography of advanced services: The most common pattern for advanced service industrial agglomeration in the cities examined is a polynucleated one. For the most part, multiple hot

Table 2. Typologies of advanced service agglomeration patterns

Region-led	Central-city-led	Specialist
Miami	Chicago	Boston
Detroit	New York City	Dallas
	Philadelphia	Los Angeles
		Washington, DC
		Houston

spots of similar intensity are spread throughout the regions examined (New York City's art and culture and media industries are important exceptions to this rule and are discussed in detail later; see Figures 1 and 2). Geographically speaking, then, advanced services tend overwhelmingly toward the polyarchic regional structure with multiple dominant nodes shown in Figure 2 as opposed to a strict hierarchy of regional nodes. Further, this polyarchic structure may or may not include the central city as a dominant node, mostly depending on which of the three types of regions is being examined.

Central-City-Led Concentrated Places

Although many cities and regions have gone the way of dispersed industry throughout the metropolitan area, two of the studied regions remain acutely dependent on their central cities. If Detroit and Miami exemplify a pattern type wherein the surrounding region supplants the central city as the primary location of advanced service clustering, Chicago and New York represent the opposite, where advanced service clustering is led by central-city growth patterns. Within these central cities, all advanced service sectors retain relatively large and heavily concentrated clusters (based on maps and Moran's I results). For example, in Chicago, which showed the most clustered overall growth patterns of any city examined, financial institutions are more clustered than anywhere else and the most in the central city (Moran's I region = 0.19 and central city = 0.30). This pattern occurs despite the zip code level resolution of the data, demonstrating that the central city clusters are relatively large. The same is true of the city's engineering and high tech and management industries (Moran's I region = 0.17 and 0.18 and central city = 0.31 and 0.37, respectively). Chicago is second and third of all regions and central cities, respectively, in terms of media sector clustering (Moran's I region = 0.17, central city = 0.14) and is in the upper middle of the field for art and culture and professional. In the

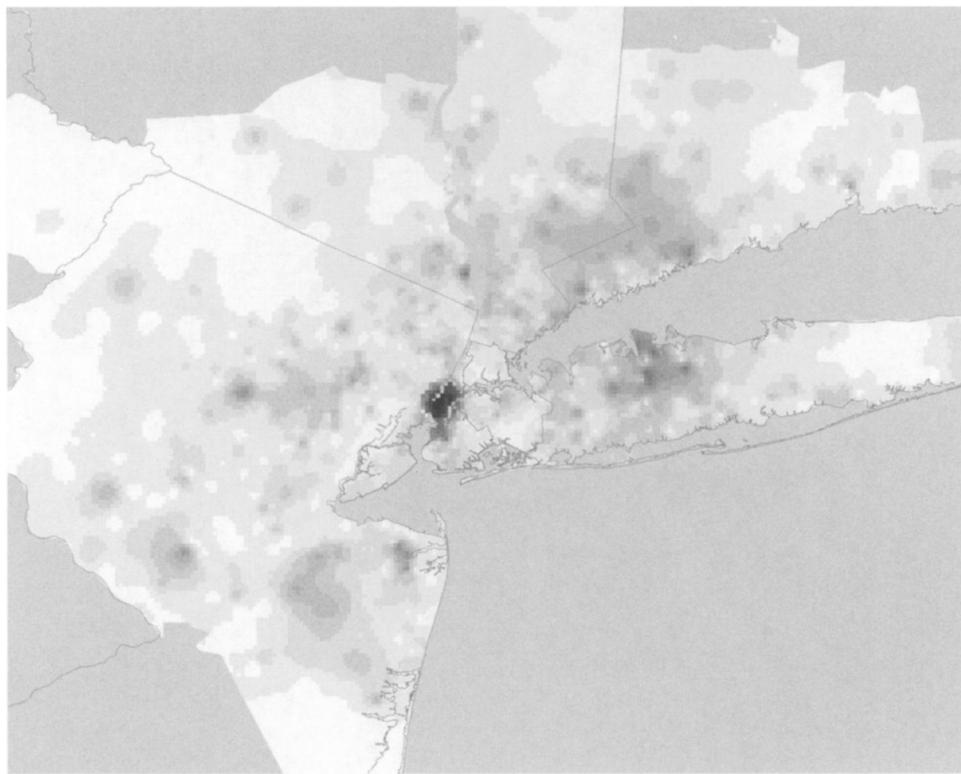


Figure 1. Interpolated map of hot spots of art and culture industry clusters in the New York City region, with New York City proper in the center. The art and culture industry clearly shows a single regional center in Manhattan and thus is exemplary of what is meant by a mononucleated cluster pattern. Of all industries in all regions examined, the mononucleated structure was very rare, mostly only occurring in art and culture and media. Source: U.S. Bureau of Labor Statistics (2004).

aggregate, advanced service industries cluster at the zip code level more in Chicago's central city than in any other city or region examined.

That said, the dependency of finance, management, high technology, and professional services on agglomeration within the central city relative to the broader metropolitan region appears more nuanced even in these central-city-led regions than what has been put forth in some of the “global city” literature (e.g., Sassen 1991, 2000; Castells 2000). Financial and professional services do not necessarily drive primarily central city growth as has been suggested in previous literature (Beaverstock, Smith, and Taylor 1999; Sassen 1991). These industries, in fact, exhibit the lowest clustering tendencies of all advanced services (lowest average Moran's I) and highest tendency toward a multinodal regional pattern (as displayed in the G-statistic maps; see Figure 3 as an example). Indeed, central cities do still operate as one of the primary places within this pattern, but we are also seeing a strong tendency toward multinodal regions and the advanced services most associated with the “global city” are leading this tendency.

The full effect of this polyarchic geography of advanced services on the long-standing conviction that knowledge-intensive industries require the central city (Jacobs 1969; Sassen 1991, 2000; Glaeser 1998, 2003b) remains to be sorted out. Certainly, though, with respect to the advanced service economy, global cities with dominant clusters outside of the central city are perhaps best described as global regions. This regional pattern of advanced services was observed as early as Mumford's (1937) study and later corroborated by Fishman (1990) and by much of the new industrial district literature (Piore and Sabel 1984, among others). This dominant polyarchic pattern may explain the failure of some economic development efforts to lure and retain financial and professional service industries within the central city: These industries are increasingly more concerned with the generic benefits of localization than with the specific benefits of urbanization per se. The central city of the most established downtowns is holding its ground within the geography of advanced services, but it is not finance or engineering and high tech that allows this to happen. Rather, the art and culture and media industries seem to be the glue that is slowing the polynucleated

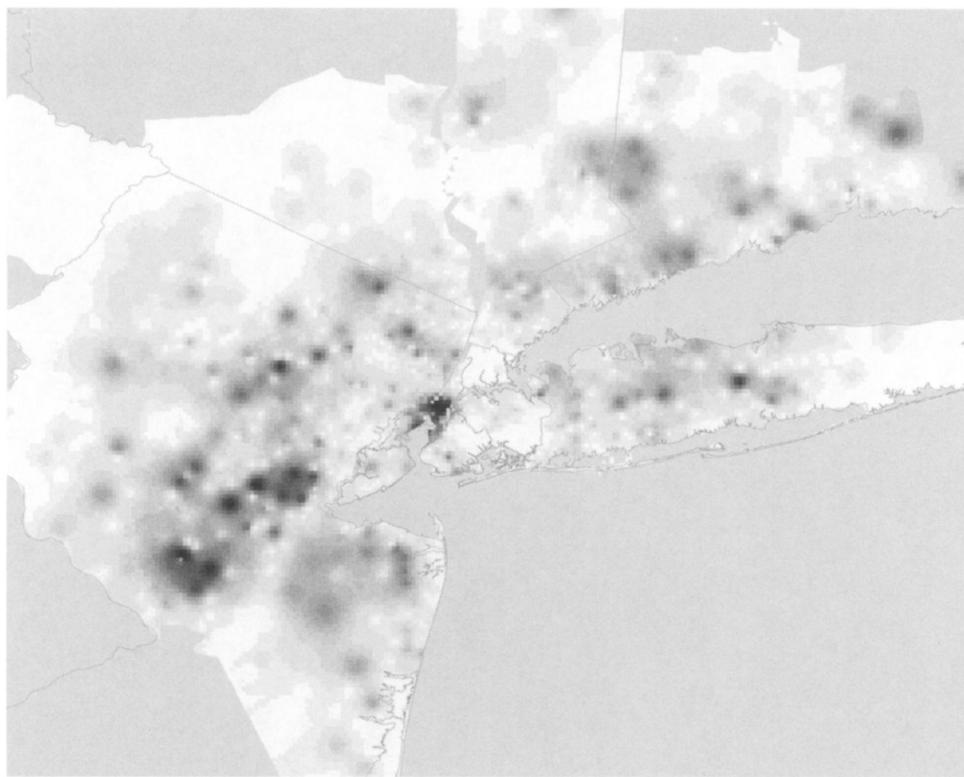


Figure 2. Interpolated map of hot spots of engineering and high-tech industry clusters in the New York City region, with New York City proper in the center. The engineering and high-tech industry clearly shows multiple centers throughout the region and thus is exemplary of what is meant by a polynucleated cluster pattern. Source: U.S. Bureau of Labor Statistics (2004).

tendencies of finance and engineering and high tech in older established regions. We suggest that the presence of art and culture may actually draw or encourage the central-city formation of other advanced industries, as cultural industries are often viewed as an amenity that other high-human-capital employees seek out (Glaeser 2000; Florida 2002b; Clark 2004). This amenity of art and culture clustering seems crucial to central-city-led urban regions and is the scarcest in the region-led cities described later—a fundamental divide between the two geographic types.

Region-Led Dispersed Places

Although all advanced services do tend to cluster within regions, areas such as Miami and Detroit have seen the central city supplanted as the primary geography of advanced service clustering in favor of relative dispersion throughout the region. These region-led growth patterns are indicative of the changing nature of the industries examined, the dispersed residential patterns of these regions, and the lure of less expensive suburban locales for finance, law, and other services (Center for an Urban Future 2001, 2003). Region-led

dispersed patterns are characterized by low overall levels of clustering in all industries and where clusters do occur the dominant ones tend to be outside of the central city. This fact is confirmed when the regional hot spots for each industry are mapped. The important fact for these regions is that these forces generate uneven patterns of growth and it is clear that in at least some cases these patterns exclude the central city. This fact exacerbates the well-known state of conflicted mutual dependence between the broader metropolitan regions and their associated central cities. These patterns are likely to be a strong determining factor in everything from the types of possible regional governing coalitions supporting local economic interests to the ideologies that guide economic development policy and the types of transportation networks and housing policies that are favored. In the final section of this article we expand on this point.

Table 1 and the analysis of the G-statistic maps of region-led cities highlight the fact that the pattern and relation of advanced services are essential for economic development actors in cities to consider. The high salaries often associated with the finance and engineering and high-tech sectors make them industries

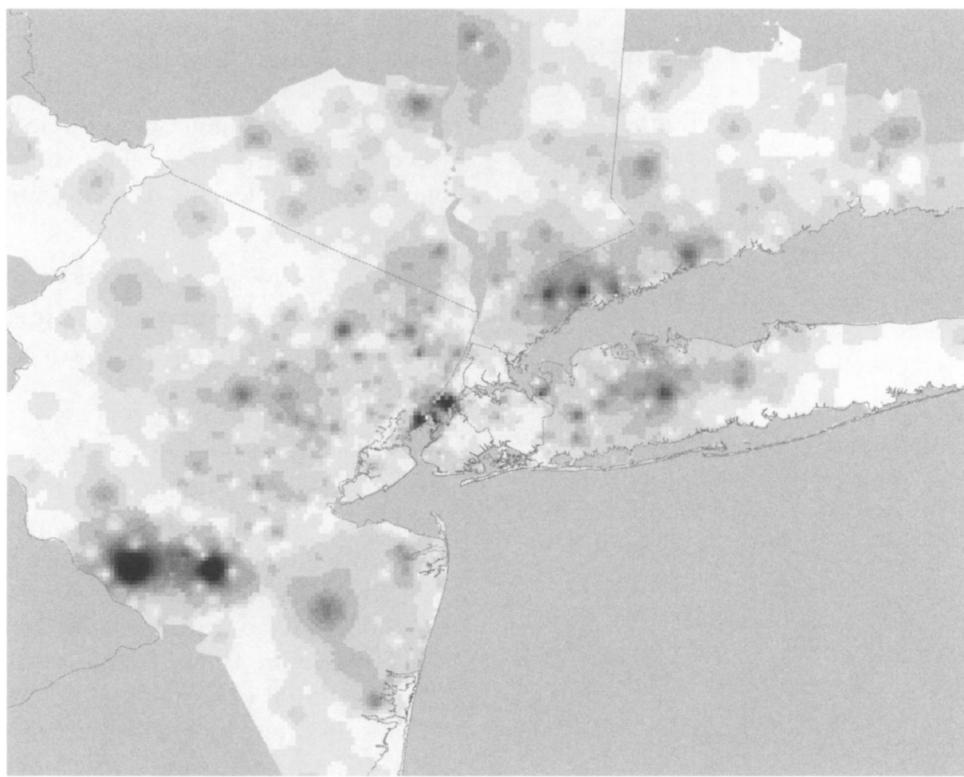


Figure 3. Interpolated map of hot spots of financial industry clusters in the New York City region, with New York City proper in the center. Industry clearly shows multiple centers throughout the region and thus is a polynucleated cluster pattern. This industry, along with that of engineering and high tech, is an acute driver of the regionalization of advanced services. Source: U.S. Bureau of Labor Statistics (2004).

much sought after by metropolitan economic development agencies, often enabling them to command capital and financial subsidies from localities (Center for an Urban Future 2001). The results here, however, demonstrate perhaps the most important issue for places contemplating large exemptions for these industries: The finance sector shows the second lowest average Moran's I of all of the advanced services, demonstrating a relatively low tendency to cluster. Although the engineering and high-tech industry shows a somewhat stronger clustering pattern, there is a relatively low tendency for both industries to form dominant nodes in the central city.¹¹ Thus, because these sectors can alter the placement of large quantities of resources and exhibit a high degree of mobility outside of city centers, central cities often appear to lose out in the uneven growth of finance and engineering and high tech (see Figures 1–3). This makes it essential for local economic development policymakers to have an awareness of the type of geography they are operating within as the potential to shape the industrial geography of advanced services within a globalized economic system requires a nuanced understanding of how these industries have already, in fact, shaped the region. A region-led city with low levels of

art and culture or other amenity clustering are unlikely to have much ability to use narrowly targeted tax incentives to energize downtown economies, as the benefits of urbanization are not high enough in these regions to lure industries away from the generic localization benefits available at a lower cost outside of the city limits.

Specialist Places

Most geographies studied do not rely clearly on either the resources of the region or the central city, but rather seem to play specialist roles for certain industries. These areas encourage high levels of clustering for these industries (either within the region or the central city), but display low levels of clustering in all other advanced services. There are several examples of this type of region in addition to that of Los Angeles offered earlier. Boston displays the second most clustered pattern for the financial and engineering and high-tech industries in the central city (Moran's I = 0.17 and 0.16, respectively), showing development of large central districts for these industries, but has relatively low and sometimes negative (i.e., dispersed) results for all other industries. Similarly, Dallas, like Los Angeles, is a region-led

specialist. It shows the second highest regional Moran's I for art and culture (0.19) and the third highest for media and engineering and high tech (0.16 and 0.14, respectively), but is relatively low in all other sectors. Specialist regions do display activity for all sectors but "specialize" in enabling the development of substantial districts for only a few. The largest issue faced by these urban regions is perhaps the threat that such heavy reliance on a few industries could collapse entire regional networks if those industries experience a decline. Winners in this mode of regional growth can quickly become losers.

The dominant polynucleated structure of regional advanced service geographies is an essential variable that forces regions into one of these three categories. Essentially, competition from firms is always present between metropolitan regions, but also varies within regions, resulting in different types of advanced service growth patterns and different geographic relationships across industries. In the language of uneven development, this polyarchic geographic pattern heightens the ability of firms to shift the location of economic activities quickly, speeding up profit-making mechanisms based on investments in the built environment. The polynucleated structure implies both (and simultaneously) competition and collaboration within a region due to the operation of localized networks, as Porter (1998) and Saxenian (1994) have similarly argued, but it leaves urban governments with a high need for updated and continual flows of knowledge about how activity has shifted within the region to understand how public benefit might best be derived from that activity. The demand for spatial analysis augmented by continuous data collection that can provide this knowledge, then, is heightened by the growth of rapidly moving production strategies.

The characteristics we observe across the compared places, coupled with the qualitative literature on spatial clustering patterns, point to three essential variables driving advanced service geography that shape urban regions and that can be inferred to varying degrees from the methods employed here: (1) the characteristics of specific industries that imply (and require) certain spatial patterns (i.e., a more dispersed and polynucleated pattern for finance than for other advanced services); (2) the relationship between industries (e.g., art and culture and media serving as the "glue" of established central cities that, in turn, may enable places to draw the more dispersed advanced industries, like the financial industry, to central cities rich in cultural amenities); and (3) the characteristics

of place that are conducive to more concentrated industries that seek out place-specific dynamics and, in turn, drive a more concentrated industrial pattern. It is in the effort to understand the intersection of these three variables that the qualitative research serves as an important complement to quantitative and statistical analysis.

Bridging the Macro and Micro: The Case of Art and Culture in New York City

Art and cultural production is an ideal case for bridging the qualitative findings of previous research with the quantitative findings of the spatial analysis reported earlier. Studies of this industry exemplify how case study research might inform the broader patterns of industrial agglomeration. The unique spatial requirements of this industry have often been noted, offering the opportunity to inquire if the qualitative difference between art and cultural industries and other advanced service industries corresponds with a quantitative difference in the concentration and distribution of clustering between these industries. The results of the spatial analysis indeed confirm this claim for all cities; art and culture has the highest average Moran's I for both central city and urban region, making it a primary driver of central-city-led and specialist geographies, but nowhere is this tendency more clear than in New York City, where the cultural economy exhibits the most robust clustering pattern of all advanced service industries in all places studied (it has the highest Moran's I value at 0.23; Table 3). Art and culture in New York City is the most spatially dependent on the urban core (hot spots only occur in the central city), and the most statistically significant agglomeration, and it shows no tendencies to "go suburban."

Table 3. Art and culture Moran's I values: All regions

City	Moran's I for art and culture
New York	0.23
Los Angeles	0.20
Houston	0.20
Dallas	0.19
Chicago	0.17
Washington, DC	0.17
Philadelphia	0.09
Boston	0.09
Detroit	0.07
Miami	0.05

Table 4. Regional Moran's I results for all industries in New York City

Industry	Moran's I for New York City region
Art and culture	0.23
Media	0.20
Engineering and high tech	0.16
Management	0.11
Financial	0.08
Professional	0.08

Note: G-statistic confirmed that this clustering is of high values (i.e., hotspot clustering) for all industries.

This relatively pronounced clustered pattern of art and cultural industries stands out as a geographically unique case that can illuminate some of the dynamics driving the regional growth typologies already described, but must be explained through an examination of the specifics of place in addition to the broader geographic analysis. Art and culture is a lead indicator of the central-city-led clustered growth in New York and, along with media industries in the New York region, shows the greatest degree of overall clustering of high values, as indicated by the Moran's I (see Table 4) and as demonstrated by the G-statistic.¹² Art and culture in New York City has the highest z scores relative to all other regions and all other sectors examined for both the Moran's I and the G-statistic, indicating that the findings for this industry are especially robust.

Further corroborating the literature linking art and culture to media, the art and culture and media industries in New York City are also spatially unique in terms of the level of clustering they demonstrate in the central city relative to the other cities examined (see Table 3). Looking at the central city findings only (as opposed to regional findings reported earlier), New York stands out as an extreme case of art and culture clustering. Moran's I for New York City proper is 0.22, the next highest central city is Dallas with a 0.15 Moran's I, and the average for all metropolitan areas is 0.096. Of note, the media industry in New York City proper has precisely the same level of clustering (Moran's I = 0.22) as art and culture, which can likely be traced to a symbiotic relationship between these two industries, or, as Hirsch (1972) puts it, media represent the "institutional subsystem" for cultural production.

These industries not only have dense, nonrandom clustering (all G-statistics indicate that high values cluster and z scores confirm statistical significance) but the way in which they cluster is highly unique: Only art and culture and media industries have mononucleated

spatial patterns (Figure 1). The maps of these hot spots show that generally art and culture and media in New York City are the only industries where one hot spot occurs within a region (finance in Chicago is a borderline exception). This result tells us something unique about New York City. Although it is a general trend for art and culture industries to have relatively few hot spots of production within a region, only in New York City is the central city actually the regional center of cultural production.

This mono- versus polynucleated spatial structure for an industry is an important aspect to understand when considering the means by which advanced service economic activity is produced and reproduced in urban regions. Polynucleated industries (within the New York City region these include financial, professional, management, and engineering and high tech and across all cities are the dominant spatial form of advanced services) may maintain large clusters in central cities, but they also show a preference and ability to cluster in other areas within the region, indicating the general decline of the central city as the major node of doing business across several advanced service industries (Center for an Urban Future 2001, 2003). Mononucleated industries, on the other hand, show a preference for clustering only in the central city. To use Martin's (1999) terminology, dispersion does not "prevail over economics" for the art and culture and media industry in the New York City region, but it does so elsewhere and for other industries.

Although New York is the only mononucleated art and culture city, it is paradigmatic of the trend within the art and culture industries to be more clustered and less polynucleated than other industries across most metropolitan places. They tend to have fewer hot spots, and focus most of their economic activity within just one or a few nodes. These results tell us several things. First, the clustering of art and culture in New York City proper (Manhattan primarily, and some parts of Brooklyn and Queens) flies in the face of the standard geographical economics view that dictates that rent, capital, and congestion should direct people and firms to the most cost-effective locales (e.g., Krugman 1991). In fact, art and culture, not traditionally considered a high-revenue or high-paying industry (like, say, finance) remains acutely loyal to New York City despite high costs of living, congestion, high rents, and thick competition for space and attention. Of all the places looked at, one would expect that due to these negative externalities, New York City would be the first place from which this industry would disperse to less

expensive suburban locations, and yet it does quite the opposite. Why is this?

We argue that it is the social and economic nature of art and culture that leads it to cluster in this way, and it revolves around the following four characteristics, all documented in the literature: (1) Cultural production's diverse network or "motley crew" (Caves 2000) of labor, resources, and firms that cross-fertilize across industries; (2) the social and subjective nature of creative production, innovation, and valorization; (3) the highly sophisticated networks of media necessary to distribute both value and information about cultural products; and (4) the intrinsic nature of "place in product" (Molotch 2002) that brands and validates culture as part and parcel of the place in which it is produced. Although art and culture has not been probed in the case study literature as much as high-technology and professional services, some recent work informs these unique spatial results. We discuss each of these in turn and how these qualitative explorations inform our spatial results.

The Creative "Motley Crew"

The literature on cultural agglomeration notes that the vertically disintegrated production systems and dense flexible specialization found in high-technology districts is also present within the culture industries of film and music (Christopherson and Storper 1986; Faulkner and Anderson 1987; Caves 2000; Scott 2000, 2005; Coe and Johns 2004). Christopherson and Storper (1996) argue that despite the scattering of the film industry throughout the world, there is still a deeply vertically disintegrated network of suppliers, labor, and studios clustering within Los Angeles. In his detailed look at the Hollywood film industry, Scott (2005) unearths why the motion picture industry not only concentrated in Hollywood, but also how it has managed to sustain this advantage. Scott points to the highly sophisticated agglomeration of the film industry in Los Angeles, noting that the clustering gives way to extraordinary accumulation of capital and labor (thus reinforcing over and over again the advantage that Hollywood has over other regions). He writes, "Along with Silicon Valley and the business and financial clusters of New York and the City of London, Hollywood must surely rank as one of the most highly developed agglomerations of pro-activity anywhere" (Scott 2005, 1). Faulkner and Anderson (1987) argue that the dense social networks within Hollywood enable the various participants (producers, directors, actors) to use recurrent

social ties to recombine to produce new projects and decrease uncertainty and risk. Rantisi (2004) points out a similar confluence of activities, institutions, and skills in her discussion of New York's fashion industry, where she argues that it was the convergence of top fashion magazines, fashion institutions of education, and with designers and critics that allowed for the "ascendance of New York fashion." Caves (2000) makes this point more generally in his discussion of the *motley crew* quality of creative industries, referring to the need for a vast array of skills and resources necessary for production. He notes that cultural production exhibits the same characteristics and mechanisms that defined Marshallian industrial districts and Porter's clustering models.

Other research has pointed to New York City's dominance in cultural industries over all other metropolitan areas in the United States, but not just in one type of cultural production. Instead, cultural hubs (particularly New York and Los Angeles) are home to a diverse compilation of different creative industries and occupations that often cross-fertilize, sharing skills, resources, and ideas (Markusen and Schrock 2006). As such, cultural agglomerations often possess high concentrations of different types of cultural workers, firms, and industries, as our aggregate results on the clustering of art and culture affirm. It is because of the dense linkages, and desire to cluster, that we witness art and culture as the most clustered advanced service industries across all metropolitan areas. Not only do art and culture tend to cluster the most, but they also cluster with the least polynucleated regional structure (i.e., fewest dominant hot spots in a region), further emphasizing cultural firms' desire for proximity.

The Social Context of Cultural Production

Artistic and cultural products, like technology and finance, possess the unyielding and rapid need to innovate, thus being what Schoales (2006) calls "alpha-clusters." Yet, unlike other types of industrial products, they are inherently taste driven, and thus subjective, which means that their value is not necessarily constructed by how well they perform as much as it is by how much people "like it," aesthetically speaking. Much of the cultural agglomeration research, particularly the pioneering work done by Molotch (1996, 2002) and Scott (2000, 2005), has been primarily focused on the industrial location of culture and the ensuing implications. Our work builds on theirs but we approach the topic from a different angle. We believe that something more nuanced is going on—even under the radar—that

illuminates why we see the extreme agglomeration in New York City. Drawing from Martin's (1999) point that nuances in place create different types of social and economic outcomes (and vice versa), New York City has something to offer the cultural economy that uniquely satisfies creative firms and people, thus further solidifying the city's position as a global center of cultural production.

There is perhaps no industry more dependent on the social milieu of its place than that of art and culture. Cultural geographers such as Stump (1998), T. Bell (1998), and Carney (1998) have noted the intrinsic link between the local social scene and cultural production. As Stump notes, "[T]he broader geographical context within which a new musical trend emerges must not only possess the general traits needed to support cultural innovation; it must also contain a sufficient variety of specific locales" (1998, 2). Fundamentally, the subjective nature of cultural production creates a different way of doing business that relies heavily on an ongoing social environment that works in tandem with the economic production system (Becker 1982; Caves 2000). Put another way, much of the value of culture stems from people assigning it value and as such cultural production requires social engagement and face-to-face contact more than any other industry. The cultural economy is more acutely dependent on not just the industrial but also the social (from gallery openings to industry parties to informal run-ins) being in the same space (Currid 2007).

The social environment is also where firms are most efficient in finding labor pools and skill sets. As one musician explained, "[You] run into them [people who provide economic opportunity] anywhere: record labels, shopping, studio recordings to get projects that turn into money" (Currid 2007, 81).

In essence, the dense agglomeration patterns we observe within the cultural economy are such because they need to be. The cultural economy operates in a "hypersocialized," disintegrated production system and all stages along the process locate in the same place because they are inherently dependent on the social milieu for more than just informal trading of ideas, but actually as a center for exchanging resources, skill sets, and the evaluation of goods and services. In other words, it is not just that galleries locate in one place, but also the art schools, auction houses, art dealers, museums, curators, and media that report on shows and openings and critique artists, as well. Of course the artists must also reside there to actually be in touch with these cultural gatekeepers, as it is in the spontaneity and informal so-

cial dynamics that much of their initial business appears to be catalyzed.

These social dynamics partially explain the mononucleated tendencies of cultural agglomerations. The exaggerated desire (and need) for cultural producers and firms to be constantly bumping up against one another driven by the nature of cultural products means that a regional network would be far too dispersed to create the essential dense social scenes that allow for creative production and creative workers to "get a job" and advance their careers. The density of New York's cultural agglomeration (as articulated by Rantisi 2004; Markusen and Schrock 2006) further reinforces the positive spillovers of agglomeration (and New York's lock-in), allowing for even greater possibilities for career advancement, cross-fertilization, and so forth.

The Media Production System

Due to art and culture's subjective nature, the ephemeral status of fads, and the acutely capricious tastes and interests of consumers, the long-standing reputation of a good is a function of where it is from and is reinforced by the local networks that create value for subjective goods and distribute this value to the mass market. As such, agglomeration of cultural production may in fact be a function not only of ease of information diffusion and transmission, and of efficiency of sharing diverse resources and labor pools, but may also be the mechanism by which culture attains value in the subjective sense, and the channels that provide this value. Quite simply, cultural agglomerations are not just an efficient trading site of information (tacit or otherwise), resources, and skill sets; they also operate as the value market for cultural goods and for creating the "buzz," through the simultaneous agglomeration of other related industries ranging from media to cultural gatekeepers. We find that the unique characteristics of cultural production lend to even denser agglomeration than other industries that, although they rely on the informal exchange of tacit information and vertical disintegration, are also able to rely on the marketplace (not just gatekeepers) to gain value. Cultural agglomerations often possess every level of the production, distribution, and valorization system, which is reflected in the diversity of firms and industries within the cluster, along with the strong presence of the media within the same place. Rantisi (2004) notes that New York's dominance in fashion was a result not only of designers and stores locating in the city, but also the clustering of

the fashion media industry that reported on New York designers and fashions to a global audience.

The importance of the distribution network has been shown by Leslie and Rantisi (2006) with regard to the role of culture institutions, Hirsch (1972) in the significance of media in valorizing cultural goods, and Molotch (1996, 2002) and Scott (1996, 2000, 2005) in their discussion of the cross-fertilization of industries within a cultural agglomeration. Nowhere is this phenomenon clearer than in the branding and valorizing of culture through media outlets. The media's sophisticated valorization and distribution network perpetuates the need for dense clustering, part of this necessity being a function of the ways in which cultural goods are evaluated and reported through a social context. In New York City, for example, social events from Fashion Week after parties to art openings are reported in detail, documenting who was there, what they were wearing, and the cultural product being debuted. The social context becomes an important place to report on both the cultural goods and the cultural producers in attendance, and both the goods and the people depend on this reportage to drum up buzz and legitimacy (Currid 2007).

As Scott (1996, 308) puts it, "Any localized network or complex of industrial producers can be seen as a structured set of real activities and potential opportunities." With art and culture it is the network of "contact men" who create an integrated system for cultivating trends and buzz surrounding goods (Hirsch 1972). As Hirsch (1972, 650) elaborates, "Entrepreneurial organizations in cultural industries require competent intelligence agents and representatives to actively monitor developments at their input and output boundaries. Inability to locate and successfully market new cultural items leads to organizational failure." These people and systems Hirsch refers to, when at their most effective, locate in the same place. The symbiotic relationship between media and cultural clustering is affirmed by media's mononucleated spatial pattern in New York City and its high Moran's I and G-statistic results.

"Place in Product"

An extension of these dynamics is that the agglomeration of culture and media for the aforementioned reasons also establishes the legitimacy of the agglomeration economy. In other words, the agglomeration brands the "place in product" (Molotch 2002). Art and culture often attain their cachet or value from the place in which they are produced (Molotch 1996; Scott 2000). In his elegant synthesis of "LA as design prod-

uct," Molotch (1996) notes that the agglomeration of cultural industrial activity in Los Angeles develops the region as a brand in itself, reinforcing the demand and desire for more workers, firms, and resources to agglomerate, thereby strengthening the place's brand. Scott (1996), Molotch (2002), and Rantisi (2004) note that agglomeration creates a situation whereby a particular cultural good is synonymous with a particular place; cultural value is linked to where that culture is produced.

Our spatial results point toward this tendency through three discrete measures. First, the mononucleated spatial pattern indicates that art, culture, and media are not only happening in the same region; they are happening in the same place—the central city. This further indicates the significant and concentrated clustering within the region. Second, New York, as a central-city led region with highest concentrations in art, culture, and media, more than any other metropolitan area indicates that these industries are most notably New York-based, a point further backed up in other analyses of New York's competitive advantage in creative industries (Currid 2006; Markusen and Schrock 2006). Finally, the degree to which art and culture and media are concentrated as reflected in the Moran's I (not only are these industries most clustered in New York, but they are the most clustered industries across all analyses) and the actual number of firms (as measured by the G-statistics) indicate that when it comes to art and culture and media, New York is "where it's at," and culture emerging from this context is branded as such.

On the Ground: The Place-Specific Advantage of New York City

The literature on art and culture informs and explains the spatial patterning of our research—the economic need for the highest levels of clustering, the role of the social and the media, and the tendency toward density in all of these realms. How exactly does this happen on the ground in real time and real life? In other words, this analysis shows us the macro picture, and the qualitative literature explains generalized dynamics of the cultural economy, but what exactly is going on just by "being there," so to speak, that perpetuates New York City's cultural cluster? Part of New York City's advantage is its "walkable" built environment. Many cultural workers get jobs and attain publicity, editorial write-ups, and so forth through literally running into curators, editors, and others on the streets of New York. The buzz around

a product, whether a new album, a fashion movement, or some other entity, is often generated within the social milieu surrounding the cultural economy. For example, it is a well-known tale that Hedi Slimane, the designer for the Parisian fashion house Dior Homme, has been inspired by and has incorporated hairstyles and runway designs that he discovered at underground art and music parties in New York City (Horyn 2006). The artist who does the cover images for the New York-based music band the Beastie Boys met the band and got the job through playing basketball with them. He also pointed out that without actually residing in the same place as the cultural economy, he was unable to advance his career. It was the social and economic clustering of cultural firms and labor pools that allowed him to proceed. Or, as one fashion designer explained, “informal social networks are probably the most powerful driver, pretty much everyone we work with we have a personal relationship with” (Currid 2007, 81).

What is essential for us is that such mechanisms occur within particular geographical contexts. Such acute physical clustering of the cultural economy also allows for New York to become a “global tastemaker” within this niche. Not only do certain products become associated with New York as a place in product, but New York begins to dictate how culture is produced and which cultural products have value across the globe. Culture comes to New York City to be evaluated in its dense and highly sophisticated cluster of specialized producers, skills, and gatekeepers.

Using the case of New York City to ground these different methodological approaches allows us to combine economic, geographic, and ethnographic research on the study of agglomeration and place. These dynamics—spatial, social, and economic—inform us broadly and specifically about the nature of the relationship between place and production and also (and perhaps more important) the way in which particular geographies attain a competitive lock-in that is almost impossible to usurp. In a recent study, cultural producers argued that they must be located within the spatially delimited geography of New York City to be successful, despite the high cost of living, congestion, and intense competition for space and attention associated with living there. Cultural producers identified three key spatially bound social processes: cross-fertilization across different creative industries, decreased transaction costs, and informal networking that allowed them to attain new jobs and projects (Currid 2007). Cultural producers argued that their social lives in New York were essential to their career mobilization, through both

running into gatekeepers who would help publicize their work (e.g., editors, curators) and by getting ad hoc jobs through acquaintances. They also argued that being in a dense agglomeration of lots of different types of cultural industries provided myriad different possibilities to use their artistic skills in different ways. Perhaps most important, the agglomeration of these like-minded people and firms meant that much of this happened quickly and efficiently, by running into people on the subway or at a nightclub or art opening, thereby reducing transaction costs that would occur if they were located in a different city. Or as one graphic designer noted, firms do not bother picking up the phone to call someone who lives in another city when they can just as easily run into someone in New York and hire them instantly. He made the choice to move from California to New York City for this reason (Currid 2007, 84–85).

The Lay of the Land: Spatial Patterns as Research and Development Tool

The confluence of these different threads of research also informs how policy and development initiatives can be further tailored to optimize regional agglomeration benefits. Knowing that advanced service firms exhibit nonrandom tendencies to collocate with similar firms tells us not only that there is a reason, but also that we might be able to figure out what that reason is. Understanding the “lay of the land” of the actual geography of advanced services quite literally allows actors within regions and cities to recognize not only their strengths and weaknesses, but how their local economic dynamics play out spatially and across industries within a globalized system of production. Fundamentally, this analysis allows for a relational understanding of economic development in the postindustrial economy. It recognizes that industries with different spatial needs coexist in regions and that the relations between them are mediated through place. As much as an industry’s agglomeration pattern is influenced by the character of the place in which it resides, the boundaries of an economic region are shaped by industrial location. Place, then, both determines industrial patterns and is constituted by those patterns.

Research thus far has made great strides in understanding some aspects of postindustrial economic geography, but the interrelation between industries and place and among industries themselves remains as a complex field of inquiry that is not yet settled. The method presented here takes us forward in the effort

to understand these interrelations. It allows us to see patterns within and across regions and to further conceptualize how these patterns are formed. This is an important step that enables the gap between microlevel and macrolevel research to be bridged. Future research must go further in establishing the causation behind these patterns and the extent to which different industries' location decisions impact one another and shape broader agglomeration patterns.

Spatial analysis allows us to ascertain not only a region's industrial competitive advantage, but also how exactly this industry behaves and where specifically to direct resources and support. Conversely, it illuminates why some policy initiatives are fundamentally not effective, demonstrating that narrow policies focused primarily on trying to redirect a region-oriented industry toward the central city will not generate economic stability. To effectively shape the economic geography of a region, policymakers must have a broader understanding of the geographic system formed by relations between industries and place—industries such as finance may be acutely influenced by the presence or absence of other industries such as art and culture. These dynamics should be taken into account in the long-term formulation of economic development policy. Industrial development policy must be aware of the full scope of the spatial patterns that industries demonstrate, especially in the current economy that relies on flexibility and mobility. After observing the spatial pattern that finance exhibits, it is no surprise that policy initiatives that seek to retain the industry solely in the central city through direct subsidy alone fail. The same can also be said of central-city retention policies directed toward professional services. A systemic understanding of the relations between industries and places is required.

In the case of art and culture, our approach also begins to create a bridge between cultural and economic geography. Cultural geographers have long understood the importance of the social as an intricate part of place making, geographical differentiation, and place-specific innovation (e.g., Stump 1998; Rantisi 2002a, 2002b, 2004). Most cultural geography, however, does not focus on the methodological approaches employed by economic geography and only recently has economic geography focused on culture (e.g., Rantisi 2002a, 2002b, 2004; Scott 2005). Our analysis of art and culture in New York City creates a link between these two perspectives, using statistical methods to quantify some of the intangible social dynamics that propel agglomerations to occur in the first place.

Part of understanding regional and urban industrial patterns has been done in the dozens of studies that use ethnographic and case study methods, as addressed in the literature throughout this article (e.g., Saxenian 1994; Storper 1997, among others). One task of this article has been to merge our quantitative findings on industrial agglomeration with the existing qualitative work to form a bridge between the macro and micro explanations that have been offered for such spatial patterning. There are several different typologies for advanced industries outlined in this article. Different regions and different industries have more or less dependence on the central city, and others tend to disperse across the region. Our detailed examination of the art and culture industry only begins the process of matching observed patterns with case study findings, which must take a different line of reasoning for the different industries. Cultural production exhibits unique tendencies in its geographical clustering and New York City is the most critical example of these dynamics that highlights the importance of understanding economic geography as a system of large- and small-scale relations. As previously discussed, there are industry-specific characteristics within the cultural industries that make them more likely than other industries to cluster: cross-fertilization, the role of the media distribution system, and the spontaneous and social way in which jobs are attained, gatekeepers are accessed, and collaborations are formed. Although media and art and culture are separate sectors, media can be seen as the professionalized application of creative and cultural resources and as a central player in "distributing" culture to the mass market and as such can be involved in the broader discussion of cultural economies. What these results indicate is that agglomeration is of central importance in the production and distribution of cultural goods and services, whether public relations and advertising (as Grabher 2001 has pointed out), or art and fashion design, and much of this has to do with its social life being an important intersection of economics and creativity. Put another way, the social and economic functions of cultural industries are, to borrow Granovetter's (1985) term, "embedded" within one another and within the regional socioeconomic structure. It is the dense neighborhoods of mixed use (living, working, socializing; Jacobs 1961), and the strong emphasis on cultural neighborhoods (Chelsea for art galleries, the Garment District, etc.) that allow New York to possess the characteristics amenable to both economic and social transactions. Many of the mechanisms discussed earlier rely on the spontaneity of running into like-minded people, and thus the physical

agglomeration and the ease of interaction within an agglomeration is what allows these processes of cross-fertilization, networking, and low transaction costs to accessing gatekeepers, jobs, and labor pools to occur. That the city's geography is both dense and walkable (as opposed to automobile-oriented like Los Angeles) might make these mechanisms unique to New York. Future research on other cities will illuminate whether these processes are specific to New York or to cultural production more generally.

Although art and cultural and media industries tend to exhibit the densest types of clustering, this research is significant to the broader discussion of how industries, firms, and labor operate and interact in a postindustrial, post-Fordist, globalized economy. It shows the potential for mesolevel research of this type that retains the central importance of place, but also considers place as it relates to industrial systems developing over time to synthesize key elements of the vast research that has been done on clustered economic growth. The polynucleated pattern identified indicates that postindustrial industries operate across large regional networks, and as such policies targeting these sectors must look not only at a specific node but at how that node is related to and fits in the aggregate web of industrial production. Polynucleation, although not an entirely new type of industrial formation, is increasingly prevalent in industries that once were predominantly city-centered. This rising trend across a wide range of industries implies a new type of economic development strategy involving actors, institutions, and governance on a multitude of levels, and across a wider geography. Indeed, to understand the true economic dynamics of a place, a full-scale regional assessment is necessary for most industries. It cannot be boiled down to just the city proper. We might also consider how specializations develop within particular geographies. Although path dependency partially explains the way in which some regions possess particular clusters over others, it is also useful to see how such specializations sustain themselves and how their spatial pattern might inform this exploration.

Broadly speaking, this article also points to ways in which qualitative and quantitative research can inform one another. We are aware that the case studies have implications farther than the places in which they are conducted, that agglomeration economies exhibit patterns across broader geographies, and that there are nuances to such clustering, whether looking on the neighborhood, city, regional, or national level. Qualitatively, we can explain why firms and labor pools would be motivated to form such agglomerations. The intersec-

tion of spatial analysis with case studies can be a useful tool in understanding not just where clusters occur and the spatial pattern (whether poly- or mononucleated, highly concentrated or less so), but also in understanding what characteristics industries seek out in these robust agglomerations, and why some places appear more able (or more willing) to cultivate those traits. In this respect, this research sheds light on policymaking directed toward the different advanced services, explaining at least partially why certain industrial attraction and retention approaches are successful or not, for example the extensive tax incentives used to attract finance or law firms that have failed largely in New York (see Center for an Urban Future 2001 for a detailed analysis of the failure of New York City initiatives to retain finance in the central city). The analysis here may be useful in future industrial targeting and development.

This research and the previous research on which it builds most saliently points out that despite advances (from technology to transportation) that would perhaps eliminate the need for colocation, knowledge-driven industries tend to continue to cluster in the same geographies. These clusters form not just to share resources and labor pools, but the uncodified, tacit (often informal) knowledge, dense competition, and highly sophisticated distribution of information, product knowledge, and, for some cultural industries, the "buzz" that perpetuates innovation, market demand, new divisions of labor, and greater economic growth. Such destiny is not happenstance, but indeed a conscious decision on the part of firms, the individuals who run them, and the labor pools that power them. This research provides some possible insights toward future policymaking in industrial attraction and retention. This article further affirms that clustering of industries and people produces significant agglomeration effects that are both attractive to industries and in turn crucial to many forms of regional and metropolitan productivity. That Marshallian "something in the air" is the tacit knowledge, efficient trading of skills and jobs, and instantaneous access to dense agglomeration of labor pools and industries that occur by colocation in the same place, and thus this "something" can be observed quite visibly in the patterns it exhibits in real places.

Acknowledgments

We wish to thank Richard Florida, Sarah Williams of Columbia University's Spatial Information Design Lab, Audrey Kobayashi, and the anonymous reviewers for their careful review of this article and their invaluable

suggestions for improvement. Any errors and omissions are our own.

Notes

1. Please see Martin (1999) for an astute, scathing, and witty criticism of geographical economics or "new economic geography," which he argues is not new at all. In fact, as Martin points out, geographers have been doing their job for decades, and economists have just recently jumped on the bandwagon with "new ideas" that have long been a mainstay (been there, disproved that) in economic geography.
2. Although our sample size is small, we use these cities (those with a population over one million) as an exploratory proxy in understanding patterns of metropolitan growth. We believe this work to be preliminary, and future work should consider a wider sample of metropolitan areas and their central cities.
3. The process for selecting the cities for this study involved (1) ranking all U.S. MSAs by population according to 2000 U.S. Census figures, (2) selecting the ten highest population MSAs, and (3) identifying the zip codes of the CMSA for the selected cities. The CMSA is defined as a metropolitan region that has a population of one million or more and also has separate component areas (primary metropolitan statistical areas [PMSAs]) meeting statistical criteria and supported by local opinion as being a part of the region. This area was selected as being the most sensible census geography that coincides with an urban region for the purposes of this study. The associated zip codes for the central city as identified by the U.S. Census were also identified.
4. The question has been raised as to why Detroit, a less agglomerated region, was chosen as a region of analysis as opposed to the San Francisco–San Jose regions, world renowned for their high-technology agglomeration. Our selection of metropolitan regions was strictly on the basis of the ten largest cities by population size and in this respect Detroit was tenth, whereas San Francisco's MSA is ranked twelfth and San Jose is ranked thirtieth. Given our findings, we believe it makes sense to expand this analysis to more cities selected on various criteria.
5. The industry groupings used in this study differ from the NAICS categorizations because the goal of this research is to specifically separate cultural industries from other advanced service industries, a priority that the NAICS coding system does not necessarily share. For example, art dealers are located within the NAICS retail sector, not in arts, entertainment, and recreation. The NAICS industry categories that were selected from include: information; finance and insurance; professional, scientific, and technical; management of companies and enterprises; educational services; health care and social assistance; and arts, entertainment, and recreation. All applicable industries from these categories were tabulated to create the six advanced services industry groupings used in this study. See Appendix for detailed listing of industries included in the six sectors.
6. Although this approach was developed independently, the first two tiers of the method used here are supported by Arbia (2001), who also suggests the addition of an aspatial measure of correlation (a good suggestion that has been fairly well covered by other researchers). Our method supplants the aspatial measure with a qualitative analysis of cluster maps to understand the nuance of the observed patterns.
7. The Moran's I is a common measure of spatial autocorrelation and the ability to calculate it for interval data associated with contiguous polygon shapefiles is built into the ArcInfo software package. This software function was used to calculate the values reported. The formula on which these calculations are based is available on request.
8. The interpolations result from calculating the centroid of each zip code and interpolating the G*-statistic value (using ArcGIS software) of each centroid across a grid with the cell size and grid area held constant for each city and for all measurements. The grid of interpolated values was then visualized using thirty equal-interval class breaks for all measurements. The G-statistic formula is available on request.
9. The financial and engineering and high-tech sectors in Miami are the only exceptions to this—they have negative Moran's I results, indicating a random spatial pattern of industry locations. It is important to note that this ranking only takes into account data from the ten central cities and their associated regions examined in this study, but given the size of the regions used, it is fairly certain that these results are exemplary of U.S. patterns.
10. It should be noted that these are not always bright lines as it is a matter of degree that determines which of the categories developed a city falls in. Rather, these are useful reference points for considering the spatial behavior of advanced services.
11. All G-Statistic maps are available upon request.
12. All G-statistic and additional Moran's I results are available upon request.

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