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# Geographies of scope: an empirical analysis of entertainment, 1970–2000

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## Abstract

The geographic clustering of economic activity has long been understood in terms of economies of scale across space. This paper introduces the construct of geographies of scope, which we argue is driven by substantial, large-scale geographic concentrations of related skills, inputs and capabilities. We examine this through an empirical analysis of the entertainment industry across US metropolitan areas from 1970 to 2000. Our findings indicate that geographies of scope (or collocation among key related entertainment subsectors and inputs) explain much of the economic geography of entertainment even when scale is controlled for, though our regressions over time suggest the role of scope is decreasing. Furthermore, we find that the entertainment sector as a whole and its key subsectors are significantly concentrated in two superstar cities—New York and Los Angeles—far beyond what their population size (or scale effects) can account for, while the pattern falls off dramatically for other large regions.

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## 1. Introduction

Economists, geographers and regional scientists have long been interested in the relationship between scale economies, clustering and location. Marshall (1920) argued that firms cluster or agglomerate, achieving increasing returns to scale from collocation. Since then there has been a substantial body of research in the Marshallian tradition of agglomeration in general (Krugman 1991, 1998; Porter, 1996; Malmberg and Maskell, 2002) and the entertainment industry more specifically (Storper and Christopherson, 1987; Scott, 1999, 2005).

Jacobs (1969) argued that cities are formed by geographic concentration of diverse activities that operate in addition to scale. She saw cities less in terms of economies of scale or concentrations of similar assets and activities and more terms of industrial diversity and the collocation of *different* assets that learn from one another, both deliberately and by chance. She also drew attention to the distinctiveness of cities

vis-à-vis industrial firms. She argued that while firms specialize and divide labor into more specified and productive uses, cities organize natural, industrial and human inputs to facilitate innovation and production. Therefore in Jacobs' view, cities become the key arena for innovation. Lucas (1988) later refined Jacobs' contributions regarding cities and the collocation of skilled people, casting them in terms of the locational advantages that stem from 'human capital externalities'—essentially the ancillary benefits that come from the collocation of talented, ambitious and entrepreneurial people.

These effects can be sorted into two broad categories. On the one hand, localization effects arise from positive externalities or spillover effects within industries and geographies, as initially described by Marshall (1920) and later by Arrow (1962) and Romer (1986) among others. On the other hand, urbanization effects reflect positive externalities *across* diverse and geographically proximate industries as initially described by Jacobs (Rosenberg, 1963; Jacobs, 1969; Scherer, 1982; Glaeser et al., 1992).

We argue that there exists a third class of spillover effects to spatial proximity, which we dub *geographies of scope*—or, more precisely, geographic economies of scope. Baumol's seminal research (Baumol and Braunstein, 1977; Baumol and Willig, 1986; Baumol, 1997) on economies of scope focused on the firm, envisioning the firm as a horizontal as well as vertical mechanism for increasing efficiency and reducing risk. Economies of scope refers to the efficiency gains and/or cost savings obtained through simultaneous production of many different products by one diversified firm instead of several smaller, more specialized firms.

Our investigation marries Baumol to geography, extending his concept to encompass geographic economies of scope. Economies of scope are not limited by the boundaries of the firm, they also extend across space. Geographic economies of scope are different than simple economic diversity. It is not the collocation of many diverse inputs and capabilities that characterize geographic economies of scope, rather the geographic collocation of *related* capabilities at a sufficient scale to produce high-quality and efficient production at a reduced cost. Geographic economies of scope operate in conjunction with economies of scale. This is similar to conventional firm-level economies of scope, which take place when large firms leverage their marketing, R&D or assembly lines to produce different products. In the same way that conventional economies of scope mean we would expect to find a lower production cost for differentiated products in a larger firm, we would expect geographic economies of scope to set in as cities and regions become larger. Key related inputs and capabilities need to be available at a relatively large scale to generate geographic economies of scope. Thus, we suggest that geographic economies of scope are triggered only in large cities and regions where a certain minimum scale can be reached. Geographies of scope thus occur in spaces which can organize large shared pools of related capabilities, skills and inputs to innovation and production of goods and services. The availability of these large pools of capabilities beyond the boundaries of individual firms reduces the costs and risks for individuals and firms producing novel and/or differential products. This is particularly relevant in creative industries where outcomes are unknown and production is more likely to be de-integrated and organized around short-term projects.

We examine the role of geographic economies of scope in the entertainment industry. This is an appropriate industry through which to do so for several reasons. As Caves (2003) notes, the entertainment industry is characterized by higher risks than more

traditional industries, since demand and final outcomes is more uncertain. Scott (1999) illustrates how the music industry requires not just musicians but also sound engineers, music publishers, talent management agencies and promotion and public relations professionals—many of whom may also provide services to other entertainment industries. Storper (1989) points out that the structure of modern entertainment industries suggests an important role for external economies of scale, due to the increasing need for flexibility and collaboration across the complex as a whole.

Since most entertainment production is unique, project-based and time-constrained, access to necessary skills and knowledge on an as-needed basis becomes crucial. However, given the unknown economic outcomes and relatively short-term length of entertainment projects, integrating these skills and knowledge within the firm unit is not necessarily efficient. Having access to a large pool of related skills and knowledge within the same geographic space therefore becomes a way of reducing the risk of not finding what you need, while avoiding the economic risk (and higher cost) of hiring permanent employees. Geographies of scope are the way to organize and make available these substantial related skills, inputs and capabilities.

We examine this hypothesis using data on the location and collocation of different entertainment industry firms and talent (occupations) from 1970 to 2000. The data cover 244 to 295 US metropolitan areas. We perform a series of partial correlations to explore the collocation relationships of different combinations of variables, where we control for population size. We then perform a multivariate regression analysis, where the entertainment location can be explained by the location of other entertainment sectors. Finally, we generate a series of scatter-graphs to plot which regions over-perform and under-perform for each entertainment variable relative to population size.

The findings of our regression analysis indicate that geographic economies of scope (defined as collocation of key entertainment subsectors) explain the economic geography of entertainment also when population size has been controlled for, although we also find evidence of decreasing significance of scope over time. Furthermore, we find that the geographic distribution of the entertainment industry does not continuously follow the distribution of regional size and scale. The findings of a series of scatter-graphs show that the entertainment sector as a whole and its key subsectors are significantly over-concentrated in two superstar cities—New York and Los Angeles—far beyond what their population size or scale effects can account for, while the pattern falls off dramatically for other large regions. Based on this we suggest that economies of scale are necessary but not sufficient to explain the economic geography of entertainment. The explanation for the additional concentration of the entertainment industry in these two superstar cities, we conclude, stems from the supplemental effects of geographic economies of scope—that is, the synergies that come from close proximity to substantial quantities of closely related skills, inputs and capabilities. In the same way that firm-level economies of scope set in only in large firms; geographic economies of scope take hold only in the largest places.

## 2. Theory and concepts

Marshall (1920) long ago argued that firms cluster or agglomerate, achieving increasing returns to scale from collocation. Drawing upon his seminal contributions, economists

and geographers have advanced more recent theories for why they might. An important line of economic theory and research (Jaffe, 1986; Lucas, 1988; Audretsch and Feldman, 1996) has found that collocation within knowledge-intensive industries stems from knowledge spillovers, which increase the efficiency of both innovation and commercialization. Porter (2000) argues that clusters derive advantages from proximity to common networks, suppliers, markets and related factors. Research on high-technology industries finds that even knowledge-based industries like software (Saxenian, 1994) and biotechnology (Cortright and Mayer, 2001) locate around networks of related firms and entrepreneurial talent, universities, end-users, venture capital and specialized services.

Geography is also a mechanism for organizing economic diversity. Jacobs (1969) initially identified the role of diversity and how cities bring together diverse groups of firms and human talent to spur innovation. Bairoch (1991) provides historical evidence of these kinds of processes. Murphy et al. (1989) present a model that supports the benefits of diverse sectors industrializing simultaneously to generating a 'big push' for less-developed countries. Quigley (1998) provides an excellent overview of relatively recent work in urban economics and concludes that increased size and diversity of cities are *both* strongly associated with increased output, productivity and growth.

Storper and Venables (2004) note that face-to-face contact is, in many ways, a highly efficient form of communication and that the most globalized cities often seem to have the most localized 'buzz'. They conceive this buzz as strongest between certain industries in particular, such as higher education, finance and government—'contact networks for the socialization of elites and the coordination of their joint projects' (Storper and Venables, 2004). Generally speaking, economic geographers and urban economists focus on two underlying reasons for agglomeration or clustering—scale effects and diversity effects.

Urban economists distinguish between urbanization and localization effects. Glaeser et al. (1992) suggest that important knowledge spillovers might occur between rather than within industries, consistent with the theories of Jacobs. Henderson (1997) finds that industrially diverse cities foster innovation, while industrially specialized cities foster more efficient production. Duranton and Puga (2001; 2005) describe systems of cities where both diversified and specialized urban environments are important. Henderson (1997) finds that for capital goods industries, localization externalities are stronger than urbanization externalities. Henderson et al. (1995) note that while diversity is important for attracting new and innovative activities, a history of similar past specialization appears to matter more for retaining mature activities. Diversified locations are more suited to the early stages of a product's life cycle, whereas more specialized places are better for conducting mass production of fully developed products. From this we can infer that diversified locations may be better placed to capitalize on the shift to higher-order, more complex, innovation-driven services, such as the entertainment industry, as a driving force behind economic growth. Industrially diverse geographic locations also benefit from proximity of the sort that enables complex interactions between market supply and demand enabled by face-to-face meetings, networking and information sharing, as in Currid (2007) and Bhidé (2008).

Our argument builds from these contributions but is different. We suggest that in addition to diversity and over and above more conventional economies of scale, agglomeration and clustering effects, there is a cost- and risk-reducing force that we term geographic economies of scope.

The concept of economies of scope derives from Baumol and Braunstein's (1977) seminal work on contestable markets and Panzar and Willig's (1977, 1981) work on economies of scope at the firm level. Related research (Baumol et al., 1982; Baumol and Willig, 1986; Baumol, 1997) focuses on economies of scope within firms and how they affect the costs of producing outputs and goods in combination rather than separately by several smaller firms. Economies of scope can also arise from firms that leverage their R&D or marketing departments to extend the revenue derived from one innovation or idea.

It is important to distinguish between geographic scope economies and simple geographic economic diversity. The latter is based on variety, but firms and actors do not gain the same kind of efficiency or synergy that firms do when they realize economies of scope. Geographic economies of scope occur when locations have sufficiently large concentrations of key related inputs and capabilities, not a wide variety of many, miscellaneous inputs. Collocation thus operates similarly to the internal operations of a large firm leveraging shared R&D, shared marketing or graphic design departments or shared production lines to improve production efficiency and reduce risks and costs. These geographic economies operate together and in concert with economies of scale. For economies of scope to take effect a location must be large enough to have a significant concentration of high-quality related skills, inputs and capabilities. Geographic economies of scope also decrease the risks associated with producing novel, differentiated, non-standard and/or risky goods and services, by organizing key inputs outside as opposed to inside the boundaries of the firm. This type of geographic integration across scope can be a less risky strategy than within-firm integration, unburdening the individual firm from taking on unnecessary costs and risks.

The entertainment industry is a particularly useful lens through which to examine the geographic effects and implications of scope economies. Wolf (1999) defines entertainment to include: film, television, spectator sports, music, casinos and games. He estimated the US entertainment industry to be $480 billion in size in the late 1990s, ahead of health care as a percentage of household spending (5.4% compared with 5.2%) and larger than steel or financial services as the 'driving wheel of the new world economy' (p 4). Vogel (2007) includes movies, music, television programming, broadcasting, publishing, sports, performing arts and music industries. He estimated that Americans spend more than $280 billion annually on legal forms of entertainment, and that global spending on entertainment is close to one trillion dollars. PriceWaterhouseCoopers's (2007) estimate puts the worldwide entertainment industry as large as $2 trillion globally. Maddison (2007) and Vogel (2007) see the growth of the entertainment industry as one of the most prominent parts of the broader shift to the post-industrial (Bell, 1973), knowledge-driven economy (Drucker, 1969, 1993). Thus, we see the entertainment industry as an intriguing case study not just in its own right, but from which to shed light on the dynamics and workings of a broader range of so-called 'creative' industries from software to medicine to engineering.

Entertainment has several key characteristics that make it an interesting case from which to examine geographies of scope. The entertainment industry is a classic creative industry à la Caves (2000), and is characterized by a multiplicative productive function whereby every input is non-substitutable and all must be present for *any* commercially valuable output to result (Caves, 2000). Second, entertainment is a market-driven industry that depends on popular consumption. Third, entertainment is

a '*nobody knows*' industry as Caves describes it. Unlike conventional products, a finished entertainment product must be presented to intended consumers before the producer learns their true reservation price. This implies that entertainment production is related to higher risk than more traditional production and the relatively short product cycle of entertainment products, the relatively low specialization and the constant need for reinvention and creativity in the production of new products demand more new combinations of specialized knowledge and skills across activities than what is needed in production of more standardized products.

Geographic clustering of actors and inputs provides one solution. Empirical research has noted high degrees of clustering in the entertainment industry (Lorenzen and Frederiksen, 2008) and its major segments (see Storper, 1989 on film; Scott, 1999 on music; Bathelt and Gräf, 2008 on broadcasting). Clustering brings together the diverse inputs required to produce entertainment goods and services in highly fragmented and uncertain environments. This includes directly related and indirectly related products and services. Currid (2007) outlines mechanisms by which industries like fashion, art and music interact—in a social network centered on galleries, music venues and fashion shows where people meet, exchange information and refine ideas and other concepts.

Entertainment industries clearly benefit from geographic scale effects in the form of location in and around large markets for demand and consumption of a wide variety of entertainment goods and services. While production of standardized products can more easily disperse to lower-cost locations over the course of the product life cycle (see Vernon and Hoover, 1959; Vernon, 1960), this is much less likely in creative areas where new products must be generated constantly and where network relationships predominate. Creative production systems constantly renew and customize their supply in their initial location by drawing in new producers and forging new teams, partnerships and alliances. Furthermore, the production of entertainment demands a high level of knowledge or skill in a specialized field, a factor that may be locally bounded. The consumption of entertainment is also localized, to a large degree, through networks, values, norms and scenes. Market size also creates a large audience for live performance, which is increasingly important in a variety of entertainment fields. Connolly and Krueger (2005) identify a noticeable shift in the music industry from recorded products toward live performance. This is in line with the broader literature charting the increased role of experiences and amenities in premium locations (Florida, 2002, Clark et al., 2002), a trend that one would expect to increase the importance of complementary inputs and skills at the local level.

It is frequently argued that new technology has simultaneously driven down costs but also lowered barriers to entry in the entertainment industries (see, for example, Théberge, 1997; Goodwin, 2004). The rise of a long-tail like distribution in entertainment (Anderson, 2008) has been seen by economic geographers as potentially diminishing the salience of established entertainment industry clusters, allowing for the rise of new centers as well as more decentralized spatial structure (Venables, 2001). But others like Elberse (2008) and Page and Garland (2009) point out that recent acquisition data suggest tremendous demand for the most popular products is at least stable in the digital era and possibly increasing as a proportion of total demand. As anyone familiar with rank-size distributions knows, a longer tail comes with a fatter head.

The entertainment industry remains considerably hit-driven: the costs from many losses are absorbed by profits from a few big successes. Many of the highest-revenue generating entertainment products—such as blockbuster films, major theatrical shows

or music videos[1] are elaborate productions that depend on inputs spanning a wide variety of entertainment industry segments including film and video, music, acting, dance, choreography, design, fashion and lighting. For all the talk of technology's role in reducing the costs of producing entertainment goods, in many of the most commercial segments of the industry costs are actually rising.[2]

Canterbery and Marvasti (2001) point out that the cost of securing 'star' talent in the film industry has led to rising production costs. And because stars are used most effectively when their presence in a film is aggressively marketed, this has raised production costs as well. Prag and Casavant (1994) find that marketing expenditure is an important determinant of the financial success of a motion picture, and that marketing expenditures are positively related to both production costs and the presence of major stars. De Vany and Walls (1997) point out that the market for motion pictures is highly competitive and that the leading films command a disproportionate share of the market. Survival times (and therefore long-term success) of films in theatres are strongly related to the number of initial bookings, a factor that is heavily influenced by information disseminated through trade channels to exhibitors and distributors.

Bigger projects with higher costs and more complex requirements mean that sufficient scale of skills, capabilities and talents is required in close geographic proximity, but also that integrating these within the same firm unit can only be done at incredibly high cost. Spatial proximity reduces time, cost and risk in the search process for bringing these resources together. If actors and firms are to maximize the productivity of their collaboration, there are gains from locating near other actors and firms. We can assume an increased probability of finding a more diverse set of specialized types of skills in the same location. These wide ranges of diverse but related capabilities are likely to only be found in the largest regions with the size to support them independently and collectively.

Based on conventional economic theory, one would expect scale—that is, market size—to have a dominant first-order effect in shaping the location of the entertainment industries. And one might also expect agglomeration of diverse inputs to play a role. We acknowledge the existence of these forces, but suggest that sufficient minimum scale is required to activate the complementary inputs and capabilities that undergird geographic economies of scope. We thus argue that scope economies play an additional role—over and above the effects of pure economies of scale and agglomeration—in shaping the economic geography of entertainment.

1 Lady Gaga's productions are one such example. Another example, the production of the film *Avatar*, required two separate visual art departments (Anders, 2010), over 100 musicians working for over a year and a half (Vaughan, 2009; Horner, 2009) and 900 digital effects technicians with a wide range of highly specialized expertise (Wakefield, 2009).

2 For example, the price of mounting a Broadway musical has also gone up dramatically in recent decades. Comparing the costs of mounting the same Neil Simon play in 1982 and 2009, Broadway producer Emanuel Azenberg notes that costs have increased at a rate higher than inflation—physical production has gone from $100,000 to $500,000, the director's fee has risen from $25,000 to $100,000 and the cost of an advertisement in the New York Times has increased from $20,000 to $110,000 (Gerard, 2009). At the same time, willingness to take risks on unknown productions has gone down. During the Broadway 'Golden Age' that ended in the 1970s, producers were willing to invest in 'experimental' musicals from more forward-thinking composers like Bernstein, Menotti and Blitzstein. By the late 1990s, however, the avant-garde had disappeared from the scene and successful new musicals fell into three categories: adaptations of well-known films (such as *The Lion King*), pop music 'jukebox' showcases (such as *Mamma Mia*), and the occasional critically acclaimed off-Broadway promotion (such as *Avenue Q*), with the first two categories requiring often massive up-front investments (Farrow, 2008).

We examine this hypothesis using data on the changing location of entertainment industry firms and talent (occupations) from 1970 to 2000. The data cover 244 to 295 US metropolitan areas. On the occupation side, we include: actors and performers, artists, musicians and dancers. On the firm or establishment side, we include: broadcasting and recording industry establishments. We perform a series of partial correlations, to explore the collocation relationships of different combinations of variables. We then perform a multivariate regression analysis to determine to what extent the location of one entertainment sector is affected by the location of other entertainment sectors. Finally, we generate a series of scatter-graphs to examine regions that regions over-perform or under-perform in terms of the entertainment sector as a whole and for each of its key subsectors relative to a key measure of scale-population size.

## 3. Data, variables and methods

We examine geographies of scope through an empirical study of the entertainment sector spanning the period 1970–2000. Specifically we focus on four points in time: 1970, 1980, 1990 and 2000. We use both industry (firm-level) and occupational (employment) variables in our analysis. We draw our key variables from US Census Public Use Micro Sample (PUMS) and County Business Patterns (CBP) datasets. Our measures cover 244 to 295 US metropolitan regions.

### 3.1 Variables

#### *3.1.1 Overall entertainment*

This variable is based on number of employees in the industry encompassing performing arts companies, performing arts, promoters of performing arts and sports events, agents and managers artists, athletes, entertainers and other public figures and independent artists, writers and performers for 1970, 1980, 1990 and 2000. It is expressed as a location quotient and based on data from PUMS.

We also examine a series of more specialized segments of entertainment. Several are based on employment or occupational data and all are expressed as location quotients.

#### *3.1.2 Musicians*

This variable includes employed and self-employed musicians for 1970, 1980, 1990 and 2000, based on data from the US PUMS.

#### *3.1.3 Actors and performers*

This variable includes employed and self-employed actors, entertainers and performers for 1970, 1980, 1990 and 2000, based on data from PUMS.

#### *3.1.4 Dancers*

This variable includes employed and self-employed dancers and choreographers for 1970, 1980, 1990 and 2000, based on data from PUMS.

#### *3.1.5 Broadcasters*

This variable includes the number of employees within the broadcasting industry, for 1970, 1980, 1990 and 2000, based on data from PUMS.

#### *3.1.6 Recording industry*

This variable is for recording industry establishments. It is a firm-level variable. It is worth noting that data for this variable changes somewhat over time. For the years 1977, 1980 and 1990, the variable is based on the SIC code for 'phonographic record makers'. In 2000, however, the variable was changed to 'recording industry' and is now based on the updated NAICS definitions. The data for this variable is from CBP.

### 3.2 Methodology

We use a variety of methods in our empirical analysis. We begin with a correlation analysis between every variable for each year, to help tease out the individual relationships between specific variables. Since we expect to find an overrepresentation of entertainment in larger market places, we only run partial correlations—controlling for population—to rule out the possibility that the relations are driven purely by region size. We then turn to a series of weighted least square regressions, where we use market size (population) as weight variable. We let each entertainment sector be a function of the other entertainment variables at the same point in time, all under the assumption that the location choice of entertainment actors and firms is made with a purpose and that collocation across occupations and industries will take place if there are economic gains doing so. Finally, we present the results of a series of scatter-graphs comparing the geographic concentration of the entertainment sector and its key subsectors to regional population to identify individual places with an over- or under-representation of entertainment given their size or scale.

## 4. Findings

We now turn to the findings of our analysis, beginning with the results of the partial correlations analysis.

### 4.1 Correlation analysis

We perform a series of partial correlations to better gauge the degree to which entertainment industry segments are geographically related to one another, once size in terms of population has been controlled for, to rule out that the possible collocation is driven by access to a larger market place. We run the correlations for 1970, 1980, 1990 and 2000 to see whether or not the geographic collocation across these sub-sectors have become stronger or weaker over time. Let us look at the major changes in the strength of the correlations between 1970 and 2000. Table 1 summarizes the results of the partial correlation analysis controlling for population. (We report the results of the bivariate correlation analysis in the Appendix Table A1).

The top quadrant of Table 1 summarizes the partial correlation findings for 1970. The strongest correlations are between overall entertainment and musicians (0.622), between it and dancers (0.582) and it and broadcasting (0.543). Musicians were also

**Table 1.** Partial correlations controlling for population size

| 1970 | | | | | | |
|---|---|---|---|---|---|---|
| | Overall entertainment | Musicians | Actors and performers | Dancers | Broadcasting | Recording industry (1977) |
| Overall entertainment | 1 | | | | | |
| Musicians | 0.622(**) | 1 | | | | |
| Actors and performers | 0.156(**) | 0.290(**) | 1 | | | |
| Dancers | 0.582(**) | 0.388(**) | 0.308(**) | 1 | | |
| Broadcasting | 0.543(**) | 0.611(**) | 0.401(**) | 0.261(**) | 1 | |
| Recording industry (1977) | 0.064 | 0.117(*) | 0.070 | 0.068 | 0.171(**) | 1 |
| **1980** | | | | | | |
| | Overall entertainment | Musicians | Actors and performers | Dancers | Broadcasting | Recording industry |
| Overall entertainment | 1 | | | | | |
| Musicians | 0.328(**) | 1 | | | | |
| Actors and performers | 0.086 | 0.266(**) | 1 | | | |
| Dancers | 0.533(**) | 0.314(**) | 0.229(**) | 1 | | |
| Broadcasting | 0.020 | 0.092 | 0.437(**) | 0.182 | 1 | |
| Recording industry | 0.008 | 0.282(**) | 0.137(**) | 0.018 | 0.050 | 1 |
| **1990** | | | | | | |
| | Overall entertainment | Musicians | Actors and performers | Dancers | Broadcasting | Recording industry |
| Overall entertainment | 1 | | | | | |
| Musicians | 0.308(**) | 1 | | | | |
| Actors and performers | 0.235(**) | 0.400(**) | 1 | | | |
| Dancers | 0.563(**) | 0.253(**) | 0.278(**) | 1 | | |
| Broadcasting | 0.337(**) | 0.574(**) | 0.339(**) | 0.238(**) | 1 | |
| Recording industry | −0.077 | 0.165(**) | 0.128(**) | 0.012 | −0.038 | 1 |
| **2000** | | | | | | |
| | Overall entertainment | Musicians | Actors and performers | Dancers | Broadcasting | Recording industry |
| Overall entertainment | 1 | | | | | |
| Musicians | 0.422(**) | 1 | | | | |
| Actors and performers | 0.245(**) | 0.147(*) | 1 | | | |
| Dancers | 0.136(*) | 0.048 | 0.284(**) | 1 | | |
| Broadcasting | 0.172(**) | 0.160(**) | 0.130(*) | 0.086 | 1 | |
| Recording industry | 0.404(**) | 0.423(**) | 0.124(*) | −0.044 | 0.070 | 1 |

*Correlation is significant at the 0.05 level (two-tailed).
**Correlation is significant at the 0.01 level (two-tailed).

quite strongly related to actors (0.302) and performers. Actors and performers were strongly related to broadcasting (0.401). The only variable with a significantly different locational distribution pattern is the recording industry, with significantly weaker relationships with the other sectors than any other of our variables.

For 1980, the partial correlations are still significant but somewhat weaker than in 1970. The correlation between overall entertainment and dancers is 0.533, but the correlation between it and musicians has slipped somewhat to 0.328. The correlations between overall entertainment and both actors and performers and broadcasters have become insignificant. Musicians are still significantly related to actors and performers (0.266) and dancers (0.314), but the coefficients are weaker than before. The correlation between musicians and broadcasters has become insignificant. On the other hand, the correlation between musicians and recording industry is now stronger (0.282). The correlations for actors and performers are weaker in 1980 than a decade earlier, but with a slightly stronger relationship to the broadcasting (0.437).

Turning to the results for 1990: The correlation coefficients are approximately at the same level as for 1980. The correlation for overall entertainment is once more significantly related to actors and performers (as in the year 1970) with a coefficient of 0.235, and also with broadcasting (0.337). Musicians also mimic the earlier (1970) pattern, with a significant relation to broadcasting (0.574), but with a weaker relation with the recording industry (0.165). Actors and performers are significantly related to all other entertainment variables and approximately at the same level as in 1980. The relationship between dancers and broadcasting remains significant (0.238).

The bottom quadrant of Table 1 summarizes the partial correlation results for 2000. The correlation between overall entertainment and musicians has become slightly stronger (0.422), and so has the relation between it and actors and performers (0.245), but it is weaker in relation to broadcasting (0.172) and significantly weaker to dancers (0.136) compared with the results in 1990.

Overall, we find stronger correlations in 1970 than in 2000 (with most of those associations weakening by 1980), which may be a sign of diminishing advantages stemming from collocation between different entertainment sectors. In order to further test for the presence of possible geographic scope effects, while still controlling for scale effects, we now turn to a multivariate regression analysis.

### 4.2 Regression analysis

We now move to a multivariate analysis which aims to examine possible geographic scope economies effects based on the collocation patterns of entertainment sectors. For this, we must weight our regression by scale. The heterogeneous population sizes are likely to introduce heteroscedasticity in the data, meaning that OLS standard errors are invalid, which in turn, implies that hypothesis test and confidence intervals are biased. In order to overcome this problem, we run a weighted least square estimation using population as weight variable. The resulting estimates are more efficient and also produce correct standard errors. In principle, we run a regression where each entertainment variable ($i$), in each region ($r$) and for each point in time ($t$) is explained by the geography of the other entertainment variables ($j$) in the same region ($r$) at the same point in time ($t$)

$$\text{Entertainment}_{i,r,t} = f(\text{Entertainment}_{j,r,t})$$

We run each regression to examine to what extent the location of one entertainment segment can be explained by the location of other entertainment segments when scale effects are excluded. We are aware of the fact that these models do not allow us to test for endogeneity, since we only account for collocation at the same point in time. However, earlier work by Florida et al. (2010) for the music industry notes that earlier location patterns explain relatively little of current location patterns.

Our assumption is that collocation will take place if there are economic advantages from doing so. Table 2 shows the key results from the regressions.

Generally speaking, our findings suggest that collocation or geographic scope economies play a significant role in the geography of entertainment. The models for the overall entertainment variable generate R2s of 0.828 in 1970, 0.352 in 1980, 0.377 in 1990 and 0.358 in 2000.

We can see here that the effects from collocation marginally decrease the most between 1970 and 1980. The overall entertainment variable (top left) is highly affected by the collocation of musicians and dancers, which are significant across all four points in time, but with a weaker significance for dancers in year 2000. Actors and performers are significant in the year 1970, significant and negative for 1980, insignificant in 1990, but positive and significant in year 2000. The recording industry goes from being negative and significant in year 1990 to be positive and significant in year 2000. Generally speaking we find consistent evidence of the role of scope economies in the geography of entertainment, though the relative strength of scope economies have declined over time.

We next turn to the models for musicians (top right). The models generated R2 values of 0.493 in 1970, 0.455 in 1980, 0.501 in 1990 and 0.476 in 2000. Musicians are positively and significantly related to overall entertainment for all points in time. Musicians are also, not surprisingly, positively and significantly related with the recording industry location for the years 1980–2000. Broadcasting employment is significantly related to musicians in 1970 and 1990, but not for other years. Actors and performers are positive and significantly related to musicians for the years 1980–1990. Again, we find evidence of the role of geographic scope economies, and in this case, it appears constant over time.

Now we turn to the results for actors and performers (middle left). The models generated R2 values of 0.423 in 1970, 0.234 in 1980, 0.228 in 1990, and 0.157 in 2000. The R2s reflect a marginal decrease, which is similar to that for overall entertainment. The variables most strongly connected with the location of actors and performers are broadcasting (1970–1980) and dancers (1980–2000). Overall entertainment went from insignificant in 1970–1990 to be positive and significant in the year 2000. Musicians were positive and significant for the years 1980–1990.

The results for the regressions for dancers also suggest the role of geographic scope economies (middle right). The R2 values are 0.662 in 1970, 0.419 in 1980, 0.364 in 1990 and 0.108 in 2000. In 1970, more than 60% of the variation in the location of dancers was explained by the collocation of the other entertainment sub-sectors, though this declined significantly by 2000. The variables most related to dancers are overall entertainment and actors and performers.

Turning now to broadcasting (bottom left): The R2s are positive and significant again suggesting the role of geographic economies of scope. The R2 values are 0.538, in 1970, 0.162 in 1980, 0.362 in 1990 and 0.080 in 2000. In the years 1970–1990, broadcasting is related to several of the other entertainment segments: overall

**Table 2.** Population adjusted weighted least square regression results for 1970–2000

| | 1970 | 1980 | 1990 | 2000 | 1970 | 1980 | 1990 | 2000 |
|---|---|---|---|---|---|---|---|---|
| | Overall entertainment | | | | Musicians | | | |
| Constant | 0.003 (0.437) | 0.620*** (4.587) | 0.327*** (3.546) | 0.265*** (3.586) | 0.006 (0.674) | 0.689*** (11.284) | 0.138*** (2.723) | 0.505*** (7.457) |
| Overall entertainment | – | – | – | – | 0.579*** (7.263) | 0.092*** (3.151) | 0.057* (1.774) | 0.289*** (5.116) |
| Musicians | 0.266*** (7.263) | 0.297** (2.359) | 0.190* (1.774) | 0.247*** (4.816) | – | – | – | – |
| Actors and performers | 0.097*** (4.528) | −0.144*** (−3.478) | −0.093 (−1.131) | 0.064*** (2.775) | −0.007 (−0.205) | 0.142*** (5.095) | 0.220*** (5.141) | 0.005 (0.211) |
| Dancers | 0.151*** (18.768) | 0.308*** (8.709) | 0.489*** (10.705) | 0.043* (1.930) | −0.022 (−1.252) | 0.072*** (3.711) | 0.048 (1.630) | 0.019 (0.859) |
| Broadcasting | 0.353*** (10.137) | −0.093 (−0.994) | 0.221** (1.986) | 0.146** (2.362) | 0.123** (2.074) | −0.023 (−0.479) | 0.427*** (7.647) | 0.079 (1.311) |
| Recording industry | −0.034 (0.138) | −0.030 (−0.803) | −0.107*** (−2.843) | 0.196*** (6.003) | 0.000 (0.027) | 0.113*** (5.882) | 0.106*** (5.333) | 0.226*** (8.076) |
| R2 | 0.831 | 0.352 | 0.377 | 0.358 | 0.493 | 0.455 | 0.501 | 0.476 |
| R2 Adj | 0.828 | 0.338 | 0.367 | 0.347 | 0.485 | 0.444 | 0.493 | 0.467 |
| N | 295 | 244 | 295 | 295 | 295 | 244 | 295 | 295 |
| | Actors and performers | | | | Dancers | | | |
| Constant | 0.000 (0.008) | −0.014 (−0.153) | 0.069 (−1.583) | −0.026 (−0.139) | −0.015 (−0.465) | −0.935*** (−3.963) | −0.101 (−1.092) | 0.507** (2.563) |
| Overall entertainment | 0.680*** (4.528) | −0.026 (−0.816) | −0.002 (−0.049) | 0.404*** (2.775) | 3.628*** (18.768) | 0.738*** (8.850) | 0.529*** (9.975) | 0.298* (1.930) |
| Musicians | −0.022 (−0.205) | 0.253*** (3.620) | 0.228*** (3.985) | 0.067 (0.501) | −0.243 (−1.252) | 0.752*** (3.711) | 0.070 (0.616) | 0.017 (0.123) |
| Actors and performers | – | – | – | – | −0.023 (−0.211) | 0.205** (2.183) | 0.373*** (3.716) | 0.277*** (4.633) |
| Dancers | −0.007 (−0.211) | 0.057** (2.409) | 0.117*** (3.794) | 0.249*** (4.633) | – | – | – | – |
| Broadcasting | 0.413*** (3.946) | 0.329*** (6.180) | 0.089 (1.575) | 0.214 (1.366) | −1.581*** (−8.995) | 0.317** (2.081) | −0.014 (−0.127) | 0.132 (0.797) |
| Recording industry | −0.009 (−0.452) | 0.005 (0.171) | 0.038* (1.702) | 0.079 (0.915) | −0.001 (−0.020) | −0.101 (−0.529) | 0.033 (0.773) | −0.176* (−1.935) |
| R2 | 0.423 | 0.234 | 0.228 | 0.157 | 0.662 | 0.419 | 0.364 | 0.108 |
| R2 Adj | 0.413 | 0.218 | 0.215 | 0.142 | 0.656 | 0.406 | 0.353 | 0.093 |
| N | 295 | 244 | 295 | 295 | 295 | 244 | 295 | 295 |
| | Broadcasting | | | | Recording industry | | | |
| Constant | 0.008 (0.654) | 0.985*** (12.259) | 0.460*** (11.149) | 0.756*** (13.662) | 0.282*** (4.094) | −0.001 (−0.006) | 0.402*** (3.189) | 0.039 (0.405) |
| Overall entertainment | 0.571*** (8.341) | −0.027 (−0.666) | 0.061** (1.986) | 0.129** (2.362) | −0.138 (−0.666) | −0.050 (−0.739) | −0.191** (−2.254) | 0.425*** (6.418) |
| Musicians | 0.186*** (3.432) | −0.042 (−0.479) | 0.393*** (7.647) | 0.080 (1.615) | 0.120 (0.687) | 0.492*** (3.316) | 0.579*** (3.763) | 0.083 (1.391) |
| Actors and performers | 0.117*** (4.007) | 0.196*** (5.174) | 0.148*** (3.514) | 0.030 (1.366) | −0.023 (−0.301) | 0.023 (0.171) | 0.401*** (2.851) | 0.049* (1.693) |
| Dancers | −0.100*** −(7.143) | 0.056** (2.081) | −0.004 (−0.128) | 0.017 (0.797) | 0.022 (0.539) | −0.007 (−0.134) | 0.063 (0.773) | −0.061** (−2.246) |
| Broadcasting | – | – | – | – | 0.478** (2.346) | 0.011 (0.094) | −0.427*** (−2.738) | 0.035 (0.436) |
| Recording industry | 0.023* (1.776) | −0.024 (−0.861) | −0.054*** (−2.736) | −0.001 (−0.033) | – | – | – | – |
| R2 | 0.538 | 0.162 | 0.362 | 0.080 | 0.041 | 0.048 | 0.114 | 0.186 |
| R2 Adj | 0.530 | 0.144 | 0.350 | 0.064 | 0.025 | 0.028 | 0.099 | 0.172 |
| N | 295 | 244 | 295 | 295 | 295 | 244 | 295 | 295 |

*t*-values within parentheses
* indicates significance at the 0.1 level, ** at the 0.05 and *** at the 0.01 level.

entertainment, actors and performers, musicians and also to dancers. In year 2000, we find no significant relations with the other entertainment sectors even at a 10% level.

The recording industry (bottom right) shows a different pattern than the other entertainment segments. First, the generated R2s from the recording industry regressions are at a significantly lower level than for the other entertainment groups, ranging from 0.041 to 0.114 in the years 1970–1990. However, the R2 increases to 0.186 in the regression for 2000, indicating that a larger variation of the recording industry location pattern can be explained by collocation of other entertainment. This is the only entertainment variable where we find this kind of increase, suggesting that collocation has increased over time. As we would expect, location of musicians is positive and significant with respect to the recording industry, but only for the years 1980–1990. We also find an increase in the importance of the overall entertainment variable over time. However, broadcasting goes from being positive and significant in 1970, to insignificant in 1980, to negative and significant in 1990, and negative and insignificant in 2000.

Our regressions point to a consistent association among entertainment industry segments, but we note that these associations tend to decline over time. The R2 values were significantly higher in 1970 than 2000 for four out of six sectors: overall entertainment, actors and performers, dancers and broadcasting. Musicians have remained at approximately the same level over time, while recording industry has seen an increase over time. While geographic scope economies continue to exist, the relationships among entertainment industry segments appear to be weakening over time.

### 4.3 Scatter-graphs

We now present the results of a series of scatter-graphs (see Figure 1) which compare each of our key entertainment variables expressed as regional share of national employment to the regional share of national population for the year 2000. The regions above the line are those that ''punch above their weight''—that is, that they have greater concentrations of employment than their population size alone would predict. New York and Los Angeles do this in almost every case. Chicago, notably, is below the line for every variable.

Look first at the scatter-graph for the entertainment sector overall. New York and Los Angeles are above the line of regression in the far right-hand corner of the plot. Compare this with the location of Chicago, which is significantly below the line. The same basic pattern holds for musicians and the recording industry, broadcasting employment and dancers. The scatter-graph for actors and performers is a minor exception, with New York hugging the line. Los Angeles is alone in the upper right-hand corner and Chicago is well beneath it.

Aside from New York and Los Angeles, other large metros have consistently smaller concentrations of entertainment than their population size might predict. Chicago accounts for 3.6% of the population in year 2000, but only 2.6% of overall entertainment, 2.4% of musicians, 1.8% of actors and performers, 2% of dancers, 2.1% of broadcasting and 2.5% of recording industry employment. Philadelphia accounted for 2.3% of the population, but only 1.5% of overall entertainment, 1.5% of musicians, 1.5% of actors and performers, 1.3% of broadcasting employment, 1.7% of dancers and 1.4% of recording industry employment. Most of the nation's largest

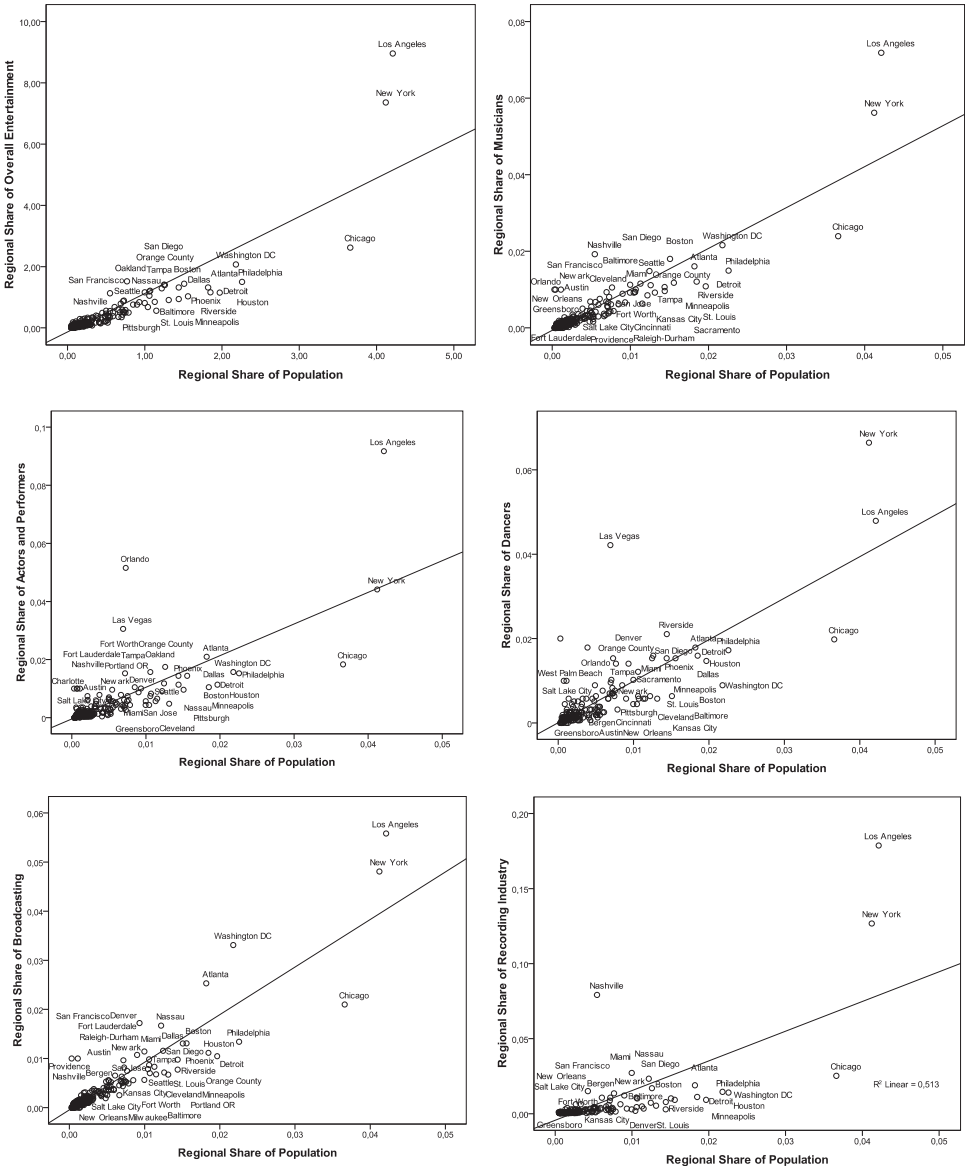


**Figure 1.** Scatter-graphs for year 2000.

metropolitan areas—Washington, Detroit, Houston, Atlanta, Boston and Dallas—also consistently underperform across broadcasting, actors and performers and musicians.

Generally speaking, all forms of entertainment are considerably more concentrated in the New York and Los Angeles than their populations would suggest. This indicates that while market size is of major importance, the effects of size tend to diminish rapidly in locations that are below the very largest population centers or marketplaces. From this we surmise the limits of economies of scale in accounting for the location of entertainment occupations and firms. Note the size of the residual on the

scatter-graphs—that is, the gap between the line of regression and the data points for New York and Los Angeles. The residual for Chicago and other large cities is typically similarly large, but under the fitted line. This gap represents the over- or under-performance of each city based on scale. New York and Los Angeles perform consistently better than their population size would predict, while Chicago and other large metros perform consistently worse. We suggest that the explanation for this unexplained gap comes from economies of scope, the risk-reducing advantage of being near other types of entertainment producers and potential collaborators. New York and Los Angeles support an extraordinarily diverse and varied set of related entertainment inputs jointly located in the same market place.

We also note a secondary effect. In virtually each and every entertainment sub-sector, we find the existence of one or in some cases two specialized locations with extraordinarily high concentrations of entertainers. Looking back at Figure 1, Nashville is significantly above the line for both the recording industry and musicians variables. While the region accounts for 0.55% of the population, in 2000 it is home to 1.9% of musicians and 7.9% of recording industry establishments. Orlando and Las Vegas, with 0.73% and 0.69% of the population are above the line for actors and performers (5.2% and 3.1%, respectively) and Las Vegas for dancers (4.2%). Washington, DC accounts for 2.2% of the population, but 3.3% broadcasting industry employment. Atlanta is home to 1.82% of the population but, as the home of CNN and other broadcasters, accounts for 2.5% of broadcasting employment.

These locations operate as classic specialized clusters. Nashville, for example, has the largest number of venues, recording studios and musical instrument shops needed for commercial recording. Greater Washington, DC has significant assets in broadcasting and media including major newspapers, TV stations and radio networks, stemming from its role as national capital of the United States. But it is also home to think-tanks that house pundits and policy analysts, all ready and willing to share their viewpoints via media appearances. More recently, the region has become a center for documentary filmmaking and home to media outlets like Discovery, as well as media company AOL Inc. and the XM-Sirrius satellite radio network. Las Vegas is a particularly interesting case. As a specialized tourist destination it provides both the market and capacity to have more specialized inputs than its size alone would predict.

## 5. Conclusion

We have argued that geographies of scope—which we defined as significant, large-scale concentrations of key related skills, inputs and capabilities—play a key role in the economic geography of the entertainment sector and of creative industries more broadly. Building from the seminal work of Baumol and his collaborators (Baumol and Braunstein, 1977; Panzar and Willig, 1977, 1981; Baumol et al., 1982; Baumol and Willig, 1986; Baumol, 1997), we noted that, like more conventional economies of scope, geographic economies of scope kick in only after a sufficient scale is reached. We thus distinguished geographies of scope from constructs of geographic clustering and economic diversity, arguing that geographies of scope occur when large concentrations of related skills, inputs and capabilities are present. Thus, geographies of scope operate in concert with, but also over and above the effects of economies of scale to geography. To better understand the role and function of geographies of scope we conducted an

empirical analysis of the entertainment sector covering 244 to 295 US metros from 1970 to 2000. We utilized a variety of statistical techniques—from partial correlations and weighted least square regression analysis that controlled for market size (population) to scatter-graphs—to test our central hypothesis and related propositions.

Overall, our findings shed new light of on the role and importance of geographies of scope. First and foremost, we find both the entertainment sector as a whole and each and every one of its key sub-sectors to be significantly concentrated in New York and Los Angeles, far above what their population size would predict. These two superstar cities dramatically out-perform Chicago and other large cities (including each and every metro over 10 million people) relative to their size. These two cities have the size and the scope to provide the significant concentrations of key inputs, skills and capabilities required to act as powerful hubs for economies of scope. On the consumption side, they have the market size to support a wide array of offerings, an especially important factor since live performance is an increasingly important source of entertainment industry revenue. On the production side, they provide the range of skills and capabilities required to act quickly and complete myriad and varied sorts of entertainment projects.

The findings of the partial correlation analyses suggest a close spatial connection between key entertainment segments, even when controlling for size. That said, the findings of the regressions analysis suggest that while there is significant association among key entertainment industry segments across space, the power of these associations has declined over time. We suggest this is the role of three interrelated factors: (i) rampant technological change in the industry, (ii) which has enabled the attendant decentralization of a number of key entertainment industry functions and the simultaneous rise of specialized niche centers such as Nashville in music and (iii) the ongoing globalization of the entertainment industry.

Taken together, these factors may imply that this finding need not reflect an overarching decline in the power of geographic scope economies, but rather the combination of technological advance and globalization acting in tandem to substantially increase the minimum scale required for scope economies to kick in.

Technological advance has made it possible for technology to compensate for some forms of spatial proximity. The digital revolution enables large working files for print, broadcasting, music and film instantaneously to be transmitted over long distances, dramatically reducing the time cost of working across different locations. For example, even as early as the year 2000, an MP3 could be sent via a broadband connection in seconds, high-quality audio tracks could be sent in minutes and digital video footage could be sent in hours. The rise of new technology also reduces search costs, making it easier for firms to connect with the right skills and knowledge since information is more readily available. Furthermore, transportation costs have also declined both in terms of time and money over recent decades. And, the scale of entertainment projects has grown substantially and many have become so big and so costly that it makes sense to integrate them in a single firm, capturing both economies of scale and scope within firm as cases such as Cirque de Soleil and Disney illustrate. There is a near-consensus in the recent literature that *innovative* industries extract more economic value from positive externalities across diverse industries (scope effects), while mature industries tend to benefit more from Marshall–Arrow–Romer-style externalities or scale effects within industries. Thus declining geographic economies of scope across entertainment industries may simply reflect the industry's maturation of this industry and a marginal shift in firm strategy to internalize more of these scales and scope effects.

Technological change also helps explains the rise of specialized niche centers which capitalize by luring large concentrations of specialized entertainment segments into single locations. A music center like Nashville benefits from proximity of key related inputs, lack of competition from other sectors, lower costs, more affordable space, and ease of getting from place to place. A tourist center like Las Vegas benefits from 'borrowing size'—its entertainment-consuming visitors provide a scale and market size effect greater than Las Vegas' permanent population would suggest. While specialized regions like Nashville and Las Vegas have gained ground in their specific niches, the most innovative and critically acclaimed entertainment activities continue to come from New York and Los Angeles. We may be seeing the evolution of a broader spatial division of labor in entertainment and in other creative fields, where specialized centers do routine activities well and function either as feeders for the core centers or as places where the 'over-the-hill' (or less competitive) go to make a living.

The interplay of technology and globalization is also likely to affect the interplay of geographic scale and scope economies in this industry. Our research has examined the entertainment industry in one country, the United States. But the industry has become massively globalized over the past several decades. London remains a major center for music, film, broadcast and entertainment broadly and reflects characteristics at the top of the urban entertainment hierarchy that are similar to those of New York and Los Angeles. We cannot discern from our analysis to what degree the global entertainment industry may have shifted toward London over this period. There has also been the rise of new global centers for entertainment products. Sweden among other countries has emerged as a major force in popular electronic music. World music has exploded across the globe. India's Bollywood produces the largest volume of films in the world. Peter Jackson relocated his massive film complex from Los Angeles to Wellington New Zealand. As project size and budgets have increased, film projects have been moved to lower cost locations throughout the world to save on costs. This pattern of globalization would appear to both reflect and reinforce the twin forces of increasing minimum scale and attendant economies of scope at the top of the urban entertainment hierarchy and the rise of specialized niche centers in the evolving global spatial division in entertainment.

So from our overall analysis, we conclude that geographies of scope matter, but that they do so only in combination with the effects of economies of scale. We note that it is useful and important to distinguish between these geographies of scope and the more commonly understood constructs of geographic clustering and economic diversity. Scope economies are an important and evolving factor in economic geography, every bit as important to our understanding of the location of economic activity as they are to modern firms. We see our research as an initial and preliminary statement on the role of geographies of scope, and want to encourage further research in economic geography on this important phenomenon.

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## Appendix A

**Table A1.** Bi-variate correlation analysis results

| | 1970 | | | | | |
|---|---|---|---|---|---|---|
| | Overall entertainment | Musicians | Actors and performers | Dancers | Broadcasting | Recording industry (1977) |
| Overall entertainment | 1 | | | | | |
| Musicians | 0.672(**) | 1 | | | | |
| Actors and performers | 0.302(**) | 0.471(**) | 1 | | | |
| Dancers | 0.603(**) | 0.426(**) | 0.359(**) | 1 | | |
| Broadcasting | 0.605(**) | 0.696(**) | 0.555(**) | 0.317(**) | 1 | |
| Recording industry (1977) | 0.129(*) | 0.201(**) | 0.176(**) | −0.107 | 0.248(**) | 1 |
| | 1980 | | | | | |
| | Overall entertainment | Musicians | Actors and performers | Dancers | Broadcasting | Recording industry |
| Overall entertainment | 1 | | | | | |
| Musicians | 0.309(**) | 1 | | | | |
| Actors and performers | 0.065 | 0.352(**) | 1 | | | |
| Dancers | 0.527(**) | 0.320(**) | 0.244(**) | 1 | | |
| Broadcasting | 0.021 | 0.074 | 0.354(**) | 0.182(**) | 1 | |
| Recording industry | 0.004 | 0.322(**) | 0.224(**) | 0.040 | 0.037 | 1 |

(continued)

**Table A1.** Continued

1990

| | Overall entertainment | Musicians | Actors and performers | Dancers | Broadcasting | Recording industry |
|---|---|---|---|---|---|---|
| Overall entertainment | 1 | | | | | |
| Musicians | 0.308(**) | 1 | | | | |
| Actors and performers | 0.224(**) | 0.463(**) | 1 | | | |
| Dancers | 0.559(**) | 0.292(**) | 0.339(**) | 1 | | |
| Broadcasting | 0.339(**) | 0.585(**) | 0.361(**) | 0.260(**) | 1 | |
| Recording industry | −0.012 | 0.083 | −0.047 | −0.065 | −0.009 | 1 |

2000

| | Overall entertainment | Musicians | Actors and performers | Dancers | Broadcasting | Recording industry |
|---|---|---|---|---|---|---|
| Overall entertainment | 1 | | | | | |
| Musicians | 0.461(**) | 1 | | | | |
| Actors and performers | 0.288(**) | 0.177(**) | 1 | | | |
| Dancers | 0.164(**) | 0.067 | 0.295(**) | 1 | | |
| Broadcasting | 0.245(**) | 0.201(**) | 0.164(**) | 0.106 | 1 | |
| Recording industry | 0.479(**) | 0.404(**) | 0.171(**) | −0.009 | 0.140(*) | 1 |

*Correlation is significant at the 0.05 level (two-tailed).
**Correlation is significant at the 0.01 level (two-tailed).