



Who Will Stay and Who Will Go? Related agglomeration and the mortality of professional sports leagues in the United States and Canada, 1871–1997

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Abstract

Professional sports leagues play a major role in our society, but little attention has been given to organizational factors related to league survival. We address this issue by examining the effects of related agglomeration (the extent to which league teams are located near teams from other sports that share the same broad professional sport identity), sport age, market heterogeneity (high variance in the number of teams from other sports in its teams' cities), and within-sport league competition (high niche overlap) on league mortality. Related agglomeration may lead to intensified competition but may also lead to benefits by producing agglomeration economies and by driving the development of regional identities. We propose that the effects of related agglomeration vary over a focal population's life cycle. We also argue that leagues with high market heterogeneity have higher chances of failure, particularly under conditions of high competition. We test our ideas using event history analysis to examine mortality in the entire population history of professional sports leagues in the United States and Canada (which are fundamentally different from leagues in other parts of the world) from the first league founding in 1871 until 1997. We find that leagues in young sports whose teams tend to be located in cities with large numbers of other sports (high related agglomeration) suffer from higher mortality rates while leagues that are in more established sports are less likely to fail under these circumstances. Consistent with prior research, leagues are more likely to fail

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when they experience higher competition (higher niche overlap) with other leagues in their sport, and the effects of competition are exacerbated by high variance in the number of other sports across the leagues' cities (high market heterogeneity). We end by discussing the implications of our results for more common multi-unit organizational forms such as franchises and by considering promising avenues for future research.

Keywords

organizational communities, professional sports leagues, related agglomeration, survival analysis

Introduction

From the English Premier League to the United States' National Football League and beyond, professional sports leagues have captured the attention, time, and money of hundreds of millions of people. Professional sports leagues are also organizations, made up of teams as their constituents. Over time, some leagues are founded and others fail. The purpose of this paper is to analyze factors influencing league mortality in the United States and Canada, with an emphasis on the effects of the co-location of league teams with teams from other sports.

Sports leagues are multi-unit organizations with teams playing in multiple locations, frequently characterized by "related agglomeration," a term which we introduce and define as co-location near related populations that share a broader general identity—in our case, teams from leagues in other sports with the same broad identity of "professional sports league."¹ We chose to study league rather than team mortality for several reasons that will be discussed in more detail later. Leagues are interesting organizational forms in their own right. Unlike most types of organizations, the core activity of the league is games played between league teams. Since teams need one another to play games, a league is characterized by reciprocal interdependence among its teams, a circumstance that Land, Davis, and Blau (1994) have called structured mutualism because of the necessity of cooperation between teams in a league. Team exit is strongly interdependent with league strategy and survival; specifically, leagues frequently exert strong control over team exits, and league failures usually lead to wholesale team exits. So examining league viability not only enhances our understanding of league organizations, but also illuminates crucial constraints for those interested in team survival.

Past research has shown that interdependencies between populations which make up an organizational community can have powerful effects on the organizations and populations contained in them (Barnett, 1990; Barnett & Carroll, 1987; Hannan & Freeman, 1989; Wade, 1996). One important type of community relationship is the extent to which a given population is in the presence of other related populations which have overlapping niches and share a broad overlapping collective identity (Dobrev, Ozdemir, & Teo, 2006). More specifically, while organizations within a population share a narrow, restrictive set of specific identity characteristics that define them as an organizational population, they often also share a broader identity with other populations with whom they are horizontally related. Such relationships are present in many contexts. For example, Dobrev et al. (2006) examine the relationship between banks and financial cooperatives while Hannan and Freeman (1987, 1988) investigate interdependencies between craft and industrial labor unions. While each of these populations has a sharper, more restrictive identity, banks and financial cooperatives share the broader identity of being lenders of financial capital just as craft and industrial unions have a less restrictive identity as labor unions. As Dobrev et al. (2006, p. 580) note, "the presence of 'broader' or 'less-restrictive' identities in the form's identity profile means that organizations from different forms can be represented in relation to each other by way of their shared, less-restrictive identities."

We argue here that the degree to which an organization co-locates near related populations that share a broader general identity can have powerful effects on its life chances. On the one hand, such

related agglomeration might be beneficial for such organizations because they might be able to take advantage of economies of agglomeration such as shared labor markets and infrastructure. Similarly, co-location next to an established population might also conceivably aid in legitimating younger emergent populations that have less of a history (Dobrev et al., 2006; Hannan & Freeman, 1989; Ruef, 2000). On the other hand, populations that share a broad overlapping identity might also negatively affect each other since, by definition, their niches overlap and as a result they will compete for many of the same resources (Baum & Rao, 2004). And, as Dobrev et al. (2006) have shown, the presence of an emergent population next to a more established organizational form with which it shares a more general identity may trigger a “violation by comparison” effect that lowers the life chances of organizations in the emergent population. Essentially, the differences that the less established organizational population exhibits from its more established counterpart are likely to be seen as deviations from the collective identity code or blueprint, and hurt its legitimacy (Dobrev et al., 2006). We add to this literature by showing how the location strategies of multi-unit firms that are members of related populations impact their survival chances.

Our study also contributes to previous research on multi-unit firms (particularly franchises) which has shown that such organizations can gain competitive advantages because of the transfer of knowledge and capabilities between their organizational units (Darr, Argote, & Eppe, 1995; Kalnins, Swaminathan, & Mitchell, 2006; Mitchell, Baum, Banaszak-Holl, Berta, & Bowman, 2002) and through differing location strategies (Lu & Wedig, 2013). Consistent with Sorenson and Sørensen (2001), we suggest that such advantages can be weakened in heterogeneous markets because the imposition of system-wide standards reduces flexibility and is almost certain to conflict with market conditions in some areas. We further argue, however, that the level of competition in a firm’s market is critical and that its effects are exacerbated when multi-unit firms place their units in heterogeneous markets. In this study, we examine the effects of organizations (in our case sports leagues) locating geographically close to related populations (in our case leagues in other sports) and suggest that whether these effects are beneficial or harmful to such organizations depends upon the pattern of their location choices. More specifically, we argue that organizations that are members of newer organizational populations reap the greatest benefits by isolating themselves from populations with whom they share a broader identity, while those in older populations can benefit from interactions with other related populations. We also propose that the effects of competition are exacerbated when leagues employ mixed or inconsistent strategies (locating some of their units in areas with many other related populations and others in more isolated contexts).

Our overarching goal is both to contribute to the literature on the effects of related populations and to the growing literature on the performance of multi-unit firms, particularly franchise organizations, by showing how a multi-unit organization’s pattern of location choices affects its performance. We test our ideas using data on the entire population history of major professional sports leagues in the United States and Canada (henceforth referred to as “American” leagues), which are a franchise organizational form, from the first league founding in 1871 to 1997. These leagues are fundamentally different from leagues in other parts of the world, and these differences and their implications for our theory and analyses are discussed in the next section of this paper.

Professional Sports Leagues in the US and Canada

The origin of professional sports leagues in the US and Canada

In the last half of the nineteenth century, the confluence of industrialization, urbanization, and invention gave rise to what would become a new organizational form, the professional sports league.² The industrial revolution spurred the population growth of cities, where factories could operate most efficiently, setting the stage for the business of sports. According to Betts (1953, p. 232), “Urbanization

brought forth the need for commercialized spectator sports, while industrialization gradually provided the standard of living and leisure time so vital to the support of all forms of recreation.” Technological innovation also played a crucial role: mass production of standardized sporting goods provided reliable and uniform equipment; the electric light revolutionized indoor sports; railroads, streetcars, and later automobiles enabled broader attendance at sporting events; and the telegraph, the penny press, the radio, and the camera promoted sports journalism and led to widespread public access to sporting news (Betts, 1953). By the mid-1870s, the game of baseball had become a national commercial enterprise dependent on business management, gate receipts, statistical performance measures, and the paid labor of players (Goldstein, 1989).

The world’s first professional sports league was the National Association, a baseball league founded in the United States in 1871.³ Teams were based in cities and grounded in local culture and local political ties (Sidlow & Henschen, 1998), and accessible and affordable rail transportation facilitated travel between cities to play games. But the league had a decentralized structure, relying on teams to schedule their own games, and unstable membership, causing some historians to question whether it was a true “major” league. It also had ambiguous criteria for determining the league championship, leading different newspapers across the country to post different league standings. It was succeeded in 1876 by the National League, which included six former National Association teams among its eight members.

The National League overcame some problems of the National Association through stronger centralized management, including centralized scheduling of games, a system for determining a clear-cut league champion, and greater control over rights to players and league membership. Changes in the teams comprising the league were still frequent until after the 1891 season, when the National League merged with the rival American Association and enacted stricter membership controls. Stable league membership brought about by the merger agreement has been viewed as “collusion among owners to protect their status as NL franchisees” (Eckard, 2005, p. 132).⁴

The American professional sports league form

The National League established the model for modern American professional sports major leagues. By 1892, it exhibited a set of characteristics that has come to define the American professional sports league form:⁵

- (1) games between teams in a single sport as the primary activity;
- (2) territorial rights, with team monopolies in metropolitan areas with exceptions subject to league control;
- (3) a fixed roster of teams (“closed cartel”), with league control of team entry, relocation, and change in ownership;
- (4) paid players;
- (5) paid attendance at games;
- (6) a process for determining the league champion; and
- (7) centralized league management.

With rare exceptions, member teams (franchises) are independently owned and managed. The central league office (franchiser) is a joint venture for coordinating league activities, headed by a president or commissioner, and the team owners serve as the board of directors (Noll, 2003). The league controls membership; regulates and coordinates the activities of its teams with respect to issues such as scheduling, roster size, game rules, rule enforcement, and often access to and compensation of players; and in general promotes the financial well-being of its

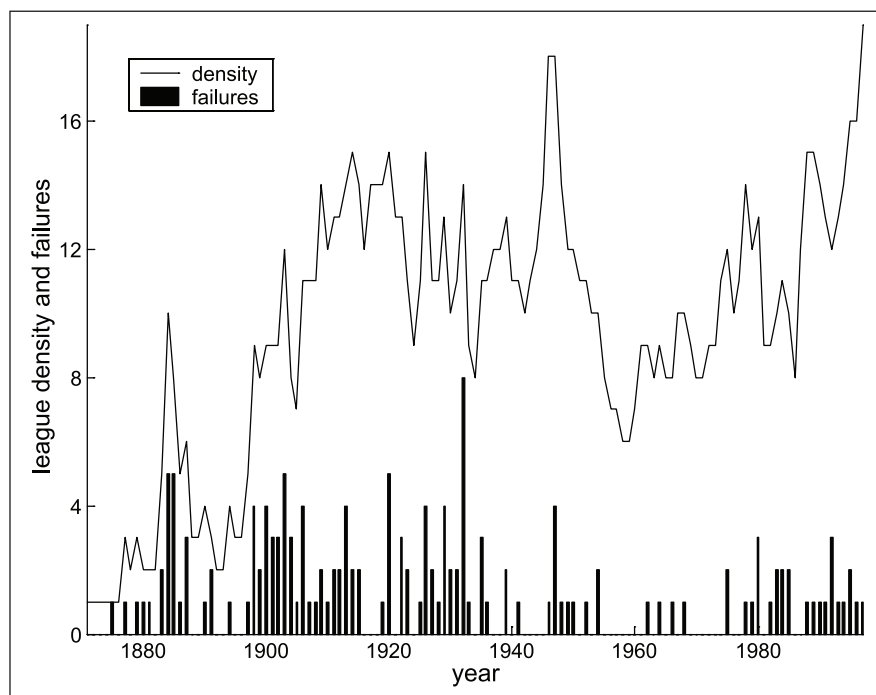


Figure 1. Density and Failures of Professional Sports Leagues Over Time, 1871–1997.

teams and their owners. So although an American professional sports league is essentially a franchise organization, it differs from the typical franchise organization in that the franchises control the franchiser—particularly in controlling team entry, relocation, and change in ownership (leagues typically prevent team exits by finding new owners, sometimes assuming league ownership of a team until a new owner can be found and approved by the current franchises) as well as league management—and the core business is based on interactions (games) between the franchises.

In addition to baseball, professional sports leagues have been established in eight other sports: ice hockey, roller hockey, lacrosse, soccer, football, basketball, softball, and volleyball. The four best-known professional team sports leagues in the United States and Canada are the National Football League (NFL), the National Basketball Association (NBA), the National Hockey League (NHL), and Major League Baseball (MLB). Given the seeming dominance of these leagues in their respective sports, one might expect that sports leagues are very stable organizations. Perhaps surprisingly, populations of professional sports leagues have exhibited a great deal of turbulence over time, with birth, death, and growth processes (including mergers) analogous to those observed in industries and other types of organizational populations. Indeed, from the first league in 1871 until the end of our observation period in 1997, 188 professional sports leagues had been founded in the US and Canada in nine sports, but only 19 survived until 1997 and one failed that year. In addition, within a given sport there have been multiple major leagues which competed for dominance. For instance, over the history of professional sports leagues there have been 36 distinct baseball leagues and 12 football leagues.

Figure 1 shows the number of professional sports leagues in the United States and Canada through 1997. Also included in Figure 1 are the numbers of failures of these leagues by year (from Pollak, 1998).

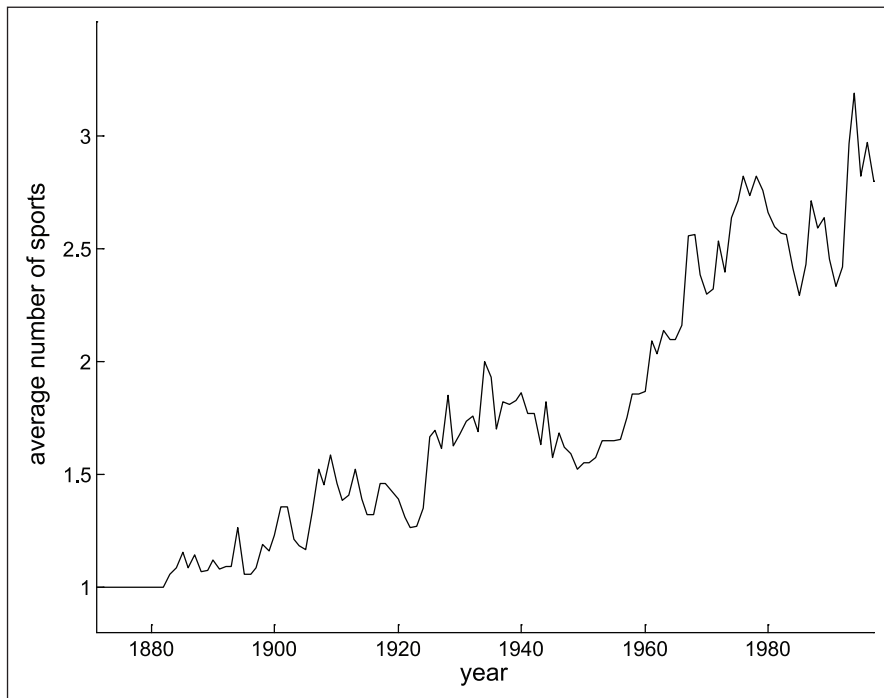


Figure 2. Metropolitan Agglomeration of Professional Sports Over Time.

Most of these leagues have had teams in cities that also had teams from other sports. Figure 2 shows the average number of sports in cities that had professional sports leagues over time. Not surprisingly there is an upward trend over time as more professional sports are established and as leagues expand. However, there is substantial cross-sectional variation among cities. In 1926, for example, the number of sports in cities with leagues present ranged from 1 to 6.

Uniqueness of American professional sports leagues

At this point, it is useful to highlight the differences between American leagues and the nature of professional sports leagues in Europe and most of the rest of the world. Two major differences stand out. First, American leagues have a “closed cartel” structure that differs significantly from the “promotion and relegation” system of most European leagues. That is, teams are inextricably bound to their leagues and, with a few exceptions in the very early histories of American professional sports leagues, teams do not move across leagues as they may in promotion and relegation systems, except in the case of league mergers. This is in stark contrast to professional leagues in most of the rest of the world, which have a different structure, relying on promotion and relegation rather than closed membership, and normally without entry controls or territorial rights for teams (Cain & Haddock, 2005; Noll, 2002). At the end of the season, the best teams in the highest ranking minor league are promoted to the major league, and the worst teams in the major league are relegated to the minor league, typically on the basis of competitive performance. If there are multiple minor leagues, they are arranged hierarchically and the same principle applied at each level. Although entry controls are lacking, new teams must start at the bottom of the hierarchy.

Second, American leagues can fail and frequently do. As noted above, 157 out of 188 leagues failed during our observation period (we considered mergers as censored events rather than failures). The primary reason for league failures is the financial insolvency and subsequent dissolution of enough league teams that an insufficient number of teams remain for meaningful competition. In the modern era, league revenues from television contracts are shared among the teams, so a contributing factor to team insolvency and eventual league failure, particularly for new leagues, is an inadequate level of revenue sharing due to the inability of the league to secure lucrative television contracts. And with the closed cartel structure, the real possibility of failure distinguishes American professional sports leagues from their counterparts in other countries, which are typically isolated from failure by government or national protection or deeply embedded tradition.

Some examples of the failure of American leagues, drawn from American football, are instructive. Two professional football leagues were founded in the 1970s and 1980s to compete with the dominant National Football League (NFL). The first, the World Football League (WFL), was founded in 1974. It failed in mid-season in 1975 due to difficulties retaining players and financial problems of team owners, stemming primarily from the inability of the league to secure television contracts. The second, the United States Football League (USFL), began play in 1983 and failed in 1985 due to major financial problems of team owners. The league filed an antitrust suit against the NFL, led by Donald Trump, the majority owner of one of the USFL teams, the New Jersey Generals. Trump won the suit but was awarded only \$1 in damages (trebled to \$3 because of the antitrust violation). That was the end of the USFL.

Implications for empirical analysis

The foregoing discussion on the uniqueness of American professional sports leagues highlights the importance of analyzing failure at the league level rather than the team level. In Europe and elsewhere, teams can and do fail. In American leagues, team failure is largely under league control except in the very early days of professional sports leagues. Poorly performing teams—usually meaning financial difficulties for team owners—are either replaced by the league with new owners, or the teams relocate, with league approval, to more promising locations. Examples in professional baseball, enabled by the advent of jet travel, include relocations to the West Coast by the Brooklyn Dodgers to Los Angeles, the New York Giants to San Francisco, and the Kansas City Athletics (formerly the Philadelphia Athletics) to Oakland. Each change was approved by the league (i.e., a vote of team owners in the league) and the teams remained members of the same league.

An alternative approach would be to study team failure. Although team failure is an interesting topic, in the context of American professional sports, team failure is heavily influenced by league strategy and policy, since leagues control team entry, relocation, and frequently exit (for example, by temporarily assuming team control until new owners can be found). In addition, the failures of teams in a league are not independent because, in most cases, a large number of teams fail at once when a league fails or partially merges with another league.⁶ Team failures in new leagues may influence league failure, but leagues still play a major role—in this case, it is the inability of fledgling leagues to provide sufficient support for their teams and the competition from established leagues that create the financial pressures that undermine new team viability (as in the examples above concerning efforts by the WFL and USFL to challenge the NFL). Established leagues exert financial pressure on teams in new leagues in a variety of ways, including the ability to sustain higher salaries for star players, locational advantages such as fan loyalty to local teams from the established leagues and control over preferable playing venues, and influence over media (including television contracts). This study, then, provides an essential context for those interested in analyzing team failure in America.

Our focus on leagues also reflects our view of leagues as interesting organizations in their own right, as well as a study of a special type of franchise organization. We also note that Land et al. (1994) considered leagues as organizations worthy of study because of the structured mutualism characterizing sports leagues, and conducted ecological analyses of league foundings and failures for minor leagues in baseball. (They also studied team mortality but in the context of minor leagues, which unlike major leagues, experience high team turnover.) Further, league organizations are the focus of attention and controversy in antitrust law (Grow, 2006; Jacobs, 1991; Miller, 2011). Major League Baseball has been exempted from the anticompetitive provision of the Sherman Antitrust Act since 1922 in exercising control over its teams, and the Sports Broadcasting Act of 1961 vests authority for making national broadcasting agreements with leagues rather than with teams. Current issues include the rights of leagues to constrain team actions to maintain “competitive balance” since competition between teams is the league’s “product” (Mehra & Zuercher, 2006), and whether a league should be treated as a single entity or a collection of teams with respect to labor issues, team relocations, and merchandise licensing (Feldman, 2009, 2012; Weistart, 1984).

A challenge for the empirical study of agglomeration among multi-unit organizations that operate in multiple local environments is the measurement of agglomeration for each of these organizations. The degree of agglomeration is likely to vary across the organization’s geographical locations. For initial empirical investigations of agglomeration in these circumstances, we suggest examining the effects of the mean and variance of agglomeration across locales. In our case, we will examine the mortality effects of the mean and variance of the number of competing sports across the locations of league teams.

Theory and Hypotheses

Organizational identity and professional sports leagues

While leagues in a given professional sport constitute a population and share a sharp identity, they also share a broader, less specific identity with leagues in other professional sports. On the one hand, leagues in a focal sport have a narrow restrictive identity that makes them a distinct population and distinguishes them from leagues in other sports because they play a different game. Over the history of professional sports leagues, for instance, football leagues have had similar rules of the game, player roles, and player skill sets that clearly differentiate them from other sports. Thus, while there were certainly differences in specific rules among the 14 football leagues which existed over the period of our study, audiences would immediately recognize them as having a distinctly different product identity than the 36 baseball leagues which also competed over this time span. At the same time, however, leagues in different sports share the broader identity of being professional sports leagues: their primary activity is to have games between teams with paid players. So we consider the populations of sports leagues in different sports to be related populations, and related agglomeration is present to the extent that leagues in different sports co-locate their teams in the same cities. Indeed, because of the interdependence among different sports, these populations could be considered as commensalistic, with overlapping niches that produce both competition and mutualism among the populations (Dobrev et al., 2006).

Related agglomeration and league mortality

We argue that one factor that may have an important impact on the fates of sports leagues is the extent to which they operate in cities with other professional sports. Because different sports have

overlapping identities there is likely to be some competition for fans, advertisers, media coverage, sports facilities, and other material resources from the environment.

But there is ample reason to think that agglomeration economies may accrue to sports leagues that co-locate near other sports. Winfree (2009) found that attendance rose when teams from other sports entered an area. Teams in different sports that are located in the same city may benefit for several reasons. As Pelnar (2009) suggests, they could formally cooperate in a number of ways such as by sharing facilities or lobbying to build them (according to Reiss, 1998, public financing of professional sports venues began in the late 1800s), and by developing joint ventures to attract fans to multiple sports. Teams can also realize cost savings from ownership of local teams in other sports, which is permitted except in the NFL, and from co-ownership of teams and media outlets (Pelnar, 2009; Winfree, 2009). Other sports in an area may also reduce a focal league's failure rate because the presence of related populations may give focal organizations access to relevant information and networks that aid them in their decision-making and access to resources (Audia, Freeman, & Reynolds, 2006). As a result, leagues that locate their teams in cities that have many sports may benefit from knowledge spillovers across locations: franchises in such areas will be able to learn from observing each other and sharing information, and this knowledge can then be diffused throughout a league's franchises. And it is clear that organizations in different sports do observe each other. Recent proposed changes to make baseball games shorter and as a result more exciting have been linked to comparisons with American football. Symbiotic effects might also arise from having common or similar exchange partners (e.g., vendors, venues, fans) and relevant third parties (e.g., media, local governments), whose knowledge of relating to other sports could facilitate a league's relationships in the community.⁷

Having multiple sports in an area may also be beneficial because it generates more overall attention to professional sports in general and satisfies the fans' natural desire for increased variety. There is also some evidence that attending sporting events is addictive and habit forming (Ahn & Lee, 2007). If so, the increased opportunities to attend sporting events afforded by cities with multiple sports may produce an energized fan base and provide additional business for exchange partners. For instance, data from Scarborough Research in 2016 showed that sports fans in Washington DC were quite likely to watch multiple professional sports. More specifically, 21 percent of baseball fans, 18 percent of football fans, 39 percent of hockey fans, and 42 percent of basketball fans in Washington DC were fans of all four sports.

Consistent with Romanelli and Khessina's (2005) arguments on regional industrial identity, the existence of multiple sports in a city could also foster the development of a strong sports identity in that region. Locating in an area that has a strong regional identity that is related to an organization's function can be beneficial because the existence of such a cluster sends a signal about which kinds of organizations are likely to thrive (Romanelli & Khessina, 2005) and such co-location can even aid in the emergence of new organizational populations (McKendrick, Jaffee, Carroll, & Khessina, 2003).

Population age and related agglomeration

What determines whether the returns to agglomeration outweigh the effects of direct competition for resources among leagues from different sports in terms of league mortality? We argue that the age of a league's sport is likely to influence how it will be affected by the presence of related populations. Sport age is linked to the strength of a sport's identity; older sports tend to be better established in the sense that they are more likely to be perceptually available to the potential audience, and they are more likely to engage that audience because age is a signal of authenticity. This identity strength affects the balance between the countervailing forces of competition and synergy

arising from agglomeration. As we discuss below, we expect that higher levels of agglomeration (local sport density) will favor the survival prospects of leagues in older sports but increase the mortality rates for leagues in younger sports.

Newer professional sports face many challenges. Until a new organizational population develops a “taken for granted” status, or cognitive and sociopolitical legitimacy, its access to resources is likely to be limited and its prospects uncertain (Aldrich & Fiol, 1994; Delacroix & Rao, 1994; Hannan, 1997). As a result, one factor that aids a population in gaining such legitimacy is simple persistence (Hannan, 1997). Holding other factors such as competition constant, networks and durable ties with diverse actors that aid legitimacy are likely to develop over time (DiMaggio & Powell, 1983). Moreover, the growth of newer populations is likely to depend on the extent to which an audience learns about them and their expected value to their constituencies (Suchman, 1995), a process that is likely to be aided by the aging of the population. Leagues in younger professional sports are in a difficult position because they must establish an infrastructure for player recruitment and development, and develop an audience or fan base. They are likely to benefit less from information sharing across sports because their weaker identities may cause them to be perceived as unproven or frivolous. Network, exchange partner (e.g., vendor), and third-party (e.g., media, local government) support may be offered less freely than to leagues in older, more taken-for-granted sports because of perceptions of limited business opportunities, limited public interest, and weaker identities.

In contrast, the identity of an older sport may be magnified when there are many other sports in the region. The presence of multiple sports in a region or city will allow the audience to process and compare across the different sports and reinforce ideas about the characteristics that a prototypical sport should have. In cities with multiple sports, older sports are more likely to be viewed as exemplars or prototypes of the overarching sports category by local audiences and younger sports are likely to fall short on many of the social codes or expectations associated with more established sports. Recent research suggests that organizations which violate the social codes associated with their category and violate audience expectations are thus more likely to suffer from poor performance or fail while those which appear prototypical of the form are rewarded (Hannan, Pólos, & Carroll, 2007; Zuckerman, 1999). In a city with many sports, a newer sport may have difficulty in attracting the attention of the audience as this attention may be monopolized by the more established sports.

Indeed, any attention that a newer sport attracts may highlight its deficiencies as compared with its more established counterparts. Dobrev et al. (2006) theorized that a “violation by comparison” effect can occur when a newer population of organizations shares a broad identity with a more established and institutionalized organizational form. In this instance, a new type of sports league shares the broad identity of being a professional sports league and this is likely to trigger comparisons with any leagues in the area in more established sports. As discussed above, newer sports are more likely to be seen as violating the codes of the overarching category when they are proximate to older sports and as a result suffer higher failure rates. Dobrev et al. (2006) found support for these general ideas in the Singapore banking industry. More specifically, they showed that the emergence of a new population, in their case financial cooperatives, triggered a violation by comparison effect with the older bank population, which led to higher failure rates among financial cooperatives.⁸

In cities with fewer sports, or in particular when there are no other professional sports, leagues in newer sports may be in a better position. Because there are fewer sports to compare with a focal league, the audience’s conceptions about what the appropriate features are for a prototypical organization (which are likely to be driven by older sports) may be less intensely held and less salient. As a result, leagues in newer sports that deviate from an established sports prototype may be less likely to be sanctioned by the audience. In a study of the Bavarian brewing industry, Beck, Swaminathan, Wade, and Wezel (2016) found that breweries which differed from the prototypical or exemplar brewery were less likely to fail when there were fewer organizations nearby that they

could readily be compared to. Similarly, in the same industry Cruz, Beck, and Wezel (2018) showed that breweries were less likely to be founded in areas in which incumbents were deeply embedded in the community. Being in more isolated settings may enable leagues in newer sports to develop a distinctive identity and attract and engage the attention of fans that have fewer alternatives.

On the other hand, an older sport has already established its legitimacy and has broader fan recognition. Leagues in older sports are in much better positions to take advantage of symbiotic and commensalistic ties. Their teams have more opportunities to share facilities, information, costs, etc., are more sought out by exchange partners, and enjoy greater public interest and media attention. In addition, as we noted earlier, the existence of multiple sports in an area is likely to increase a region's sports identity and result in an energized fan base. This fan base, however, will be most attracted to sports that fit the prototype, namely older sports. These arguments suggest the following hypothesis:

H1: Leagues that tend to be located in cities with higher numbers of sports (the average number of sports across the league's cities) will have a higher chance of failing when their sport is young and a lower chance of failing when their sport is old.

Market heterogeneity

In the first hypothesis, we considered the effect of the level of agglomeration for a league as indicated by the mean number of other sports in a league's cities, and its moderation by sport age. However, agglomeration can also vary considerably across the league's cities separately from its central tendency. So we now consider the effects of a league's variation in agglomeration—that is, variation in the number of sports across a league's cities—which we term market heterogeneity in agglomeration, focusing on the limited value of knowledge transfer and the limitations imposed by standardized league rules when market heterogeneity is high.

Past research supports the idea that multi-unit organizations such as franchise organizations transfer valuable knowledge across their organizational units (Darr et al., 1995). For instance, Mitchell et al. (2002) showed that nursing home chains transferred their capabilities to new outlets and Ingram and Simons (2002) found that similar knowledge transfers occurred in kibbutzim that were members of the same federation. In many cases, this knowledge transfer can be expected to result in a competitive advantage. Kalnins et al. (2006), for example, show that market turnover events involving the units of other multi-unit firms enhance the survival rates of all units of a focal multi-unit firm because they provide them with valuable information about the environment and their competitors. A critical factor that affects the acquisition and transfer of new knowledge, however, is how similar it is to the existing knowledge base (Cohen & Levinthal, 1990). When different units face different environmental conditions, knowledge transfer is likely to be much more difficult. Under these conditions local adaptation may generate idiosyncratic knowledge that is of little value in other settings (Sorenson & Sørensen, 2001).

Moreover, heterogeneous environments can negate some of the organizational advantages of multi-unit organizations which stem from their ability to apply standardized processes and procedures across all of their units (Jain, 1989; Norton, 1988; Sorenson & Sørensen, 2001). Indeed, Sorenson and Sørensen (2001) found that corporate-owned restaurant franchises which presumably tended to adopt more standardized and uniform practices performed more poorly in more heterogeneous environments. Most leagues have standardized rules on issues such as player selection and contracts, free agency, game scheduling, salary caps, team relocation, media rights, and merchandise that may have differential impacts on league teams located in different cities. Variation in agglomeration across a league's cities can complicate the task of managing the league,

can exacerbate the constraining effects of league policies on team flexibility in adapting to local conditions, and can limit the extent to which successful managerial practices for individual teams are transferable to other teams in the league. In our context, when the number of other sports is similar from city to city, what works well in one city is more likely to work well in another. Greater standardization is possible in league administration, and teams can benefit more from knowledge transfer from other league teams. However, when there is high heterogeneity across the league's market areas, with many sports in some cities and few in others, the league and its teams face a greater variety of managerial challenges. The league office may face more issues and more problems with policy administration, and teams may benefit less from knowledge sharing. In cities with many sports, leagues and their teams will need to be adept at assessing the competitive impact of leagues in other sports, negotiating with them on agreements that will be of mutual advantage such as sharing facilities and promoting new ones, crafting joint media agreements, and appealing to an energized fan base in complementary ways. In contrast, in cities with few sports or only one, much of the league and team activities are likely to be focused around developing and maintaining a fan base, promoting supportive relationships with city government, dealing with issues such as vendor contracts, licensing fees, and police protection that have become standardized in cities with many teams, and trying to develop a strong sports presence and identity in the city.

With greater market heterogeneity, some teams can be expected to have more problems than others in succeeding in their local markets, and they may realize less value in information sharing and vicarious learning from other league teams. And, some teams can be expected to suffer more adverse consequences than others from complying with standardized league policies. For instance, because of their enhanced sports identity, teams in cities with many different sports are likely to have more opportunities to increase team revenues (for example, through individual television contracts and merchandising). If allowed to go unchecked, this can damage the competitiveness of teams in less developed markets that are likely to have fewer sports. While revenue sharing rules have been adopted to counter this problem in some leagues, this in turn limits revenues for teams in more lucrative markets. With regard to the NFL, for instance, Rosner and Shropshire (2004, p. 35) observe that "sustaining collective concerns has been a constant struggle." Similarly, in the 2011 NBA lockout, the league's owners grappled with policy alternatives intended to promote competitive and profitable teams in both stronger and weaker markets, attempting to balance policies benefiting the health of the league as a whole against those favorable for particular markets (Beck & Belson, 2011). In any case, because leagues almost by definition have to adopt a wide array of standardized policies, many teams in leagues with high market heterogeneity are likely to do more poorly and as a result lower the viability of the league. In general, the less variation across the markets in which a league operates, the easier the job of managing the league and its teams.

Based on the above arguments, we expect that greater market heterogeneity leads to higher league mortality rates.

H2: Leagues facing higher variability in the number of other sports across the cities in which their teams are located (higher market heterogeneity) will have higher failure rates.

Same-sport competition

An important source of competition for leagues is from leagues in the same sport. Organizations face more intense competition for resources to the extent that their niches overlap and are consequently more likely to fail (Baum & Singh, 1994; Dobrev, Kim, & Carroll, 2002; Dobrev, Kim, & Hannan, 2001; Hannan et al., 2007; Sorenson & Audia, 2000). The total competitive intensity faced by a focal

organization is proportional to the aggregate overlap of all other population members in the focal organization's niche. Consistent with prior research we expect that the higher the level of niche overlap density, the higher the probability of failure. In our context, we expect league failure to be positively related to the league's niche overlap with other leagues in the same sport—that is, the degree to which league teams are co-located in markets with teams from other leagues in the same sport.

H3: Leagues facing higher competition within their sports (same-sport niche overlap density) will have higher failure rates.

Competition and market heterogeneity

While overlap with other sports (related agglomeration) may have both competitive and synergistic effects on a league, with the mortality consequences moderated by sport age (hypothesis 1), overlap with other leagues in the same sport (niche overlap density) has only competitive effects and increases a league's mortality risk (hypothesis 3). We now address how the effect of same-sport competition on league mortality may be exacerbated by market heterogeneity. Essentially, we consider how the limited value of knowledge transfer and the limitations imposed by standardized league rules under high market heterogeneity may be especially problematic for leagues facing more same-sport competition.

Our basic argument is that the flexibility constraints imposed by high market heterogeneity (discussed in hypothesis 2) will make leagues more susceptible to competitive pressures. There are two reasons for expecting flexibility constraints associated with high market heterogeneity to create difficulties for leagues in responding to market competition. First, with high market heterogeneity, knowledge transfer from other teams within the league is less useful to league teams, putting them at more of an informational disadvantage when facing competitive pressures (Cohen & Levinthal, 1990). Teams in such leagues may have less of a foundation for making sound strategic choices and might employ inappropriate strategies and resource allocations which will make them more vulnerable to competitors. Second, the performance consequences of standardized league rules and policies that constrain team management and limit the options of many teams to adapt to their local environments when market heterogeneity is high are likely to be more adverse when teams face direct competition. The systemwide standards adopted by leagues with high market heterogeneity are almost certainly going to be detrimental in some of the environments their teams face, making them more vulnerable to competitive pressures (Sorenson & Sørensen, 2001).

The following hypothesis is suggested:

H4: The positive effect of competition within a focal league's sport (niche overlap density) on failure will be exacerbated by increases in market heterogeneity.

Methods

Data and sample

Our primary source of data on professional sports leagues was *Sports Leagues and Teams: An Encyclopedia, 1871 through 1996* (Pollak, 1998). We included only major professional team sports leagues in the United States and Canada, relying on Pollak's extensive research on leagues (see Pollak, 1998, pp. 1–2) to classify leagues as major. We believe this geographical region defines a coherent organizational population, since the two countries are culturally and economically similar, and some leagues in this population included teams from both countries. We verified this

assumption by running supplementary analyses excluding leagues in years that they had teams only in Canada. Additional data sources are cited below.

The data set covered the entire population of leagues from the first American league in 1871 until 1997, when the observations were right censored. The population consisted of 188 leagues in nine sports—baseball (36), football (12), ice hockey (7), basketball (48), soccer (25), roller hockey (45), lacrosse (6), softball (4), and volleyball (5)—and included women's leagues and Negro leagues. Of these, 157 failed, 10 disappeared through merger, and 19 survived beyond 1997 (one failing at the end of that year).

Measures

League mortality. We defined a league as having failed in a particular year if the league was operating that year but not in the following year. The variable mortality was constructed as a dummy variable with a value of 0 if the observation was right censored (still alive) or 1 if the league failed. Leagues that disappeared through merger were treated as right censored rather than failures (see Sheehan, 1996); we considered a league to have merged if more than half of its teams joined another league.⁹ The number of league failures by year was shown in Figure 1.

Mean number of sports per city. This variable, our measure of related agglomeration, was calculated by counting the number of major league sports in each of the league's cities and then taking the average of this count.

Variance in number of sports per city. This variable, our measure of market heterogeneity, was calculated by counting the number of sports in each of the league's cities and then taking the variance of this count.

Sport age. Sport (population) age was the number of years since the first professional league was established in the sport. We can only observe the date of the establishment of the first professional league in a sport, although all sports started with amateur versions; for example, ball and stick games have been traced back at least 3000 years (Cramer, 2007).

Niche overlap density. For each of the league's cities, we counted the number of other leagues in the same sport that had teams in those cities, and took the average of this count. This measure is analogous to that of Baum and Singh (1994, 1996) and Podolny, Stuart, and Hannan (1996).

Control variables. *Market size*, the potential local fan base for a league, was measured by the total population of the metropolitan areas (in millions) in which the league had teams in a given year. Because of the skewness in size distributions in comparing populations across leagues, we used the log of total population. We used metropolitan area definitions from the 1990 US census and the 1991 Canadian census and decennial census population data (Statistics Canada, 1997; University of Virginia, 1999; Urquhart, 1965), assuming linear growth between census years; data for Canadian cities were obtained from Statistics Canada (Moore, 1999).

We also controlled for the *number of teams in a league* as well as the *number of league divisions* (structural differentiation), which could be related to somewhat looser centralized league control. Within a given sport, older leagues are expected to be better established and more resilient. So we controlled for *league age* as the number of years since the league's founding; merged leagues were measured as the older of the two leagues.

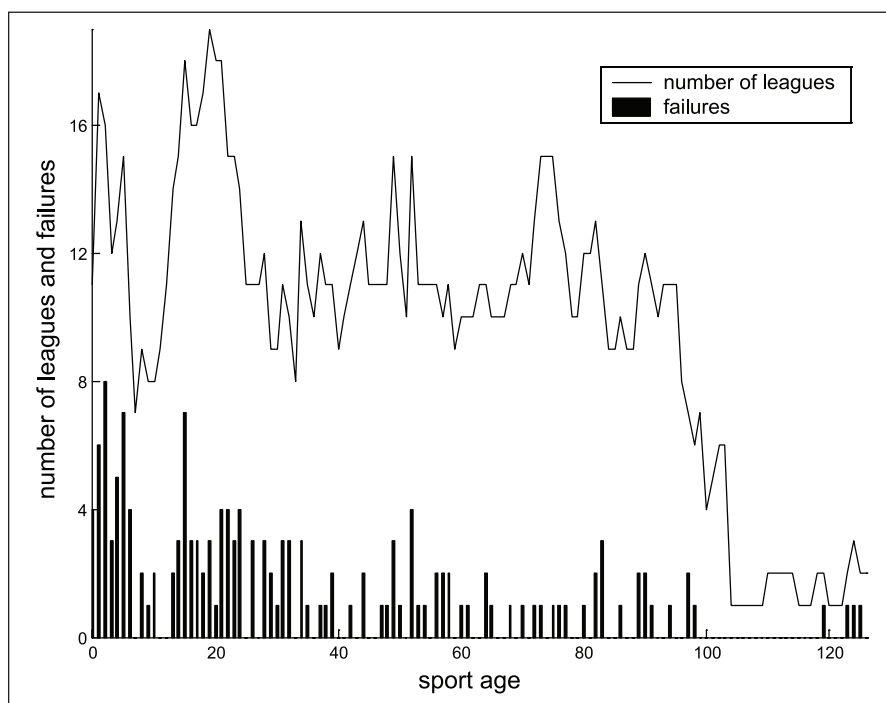


Figure 3. Distribution of Leagues and Mortality Events by Sport Age.

It is instructive to look at the relationship between sport age and league mortality, as shown in Figure 3. The pattern in this figure is provocative in that even though the number of leagues remains relatively stable across most sport ages, there appear to be fewer failures at higher levels of sport age. Interestingly, the few leagues that did fail at high sport ages (over 100 years old) were three women's baseball leagues and one senior baseball league, all of which were less than two years old when they failed.

Because fans would be likely to have more discretionary income to spend on sports in good economic times, we controlled for the US *GNP* growth rate, a proxy for discretionary income (Ingram & Baum, 1997). *GNP* figures were obtained from the US Department of Commerce (1951–1998, 1976) back to 1890, and prior to that, estimates of *GNP* are from Berry (1988). We also controlled for periods of *war* as it could affect the supply of players and the demand for sports.

Another possible effect on mortality rates of sports leagues is the media (Leifer, 1995). We controlled for effects of radio and television by including estimates of the percentage of US households with *radio*, the percentage of US households with *television*, and the percentage of US households with *cable television*, using data from the US Department of Commerce (1951–1998, 1976) to construct each of these measures. We note that before radio, however, media coverage of professional sports was widespread through newspapers (Betts, 1953; Eckard, 2005).

Using US measures for some controls was less than ideal because the study encompassed Canadian leagues too; unfortunately, Canadian measures sometimes could not be used because the data either did not exist or were not compatible with US data. Considering that Canadian data are likely to be highly correlated to US data, using the more comprehensive US data in these cases seemed the best available control strategy.

We also controlled for diversity in the organizational population with dummy variables for *women's leagues*, *Negro leagues*, *Canadian leagues* (if all teams were located in Canada during that year¹⁰), and type of sport. A measure of league performance was desirable, and the obvious candidates were revenues and attendance. However, these data were not available for most of the league histories. Other potential control variables at the city level, such as stadiums and media, were also not available for much of the historical period of the study.

Estimation

We used event history analysis to test the hypotheses. The data were split into year-long episodes, or spells, so that covariates can be updated on an annual basis. This yielded 1,211 league-year observations. Models were estimated using a piece-wise constant rate model which includes league age and our other covariates and we calculated robust standard errors clustered on each league. After examining survivor and hazard plots we determined that reasonable breakpoints for league age were 0 to 1 years, 1 to 2 years, 2 to 7 years, 7 to 10 years, 10 to 20 years, and over 20 years. The model is specified as follows:

$$r(t) = \exp(\beta x_n + \alpha z_t)$$

where $r(t)$ is the instantaneous probability of failure for a sports league at time t , where βx_n is a vector of independent variables and αz_t is a vector containing the league age pieces. Models were estimated using the "stpiece" routine in STATA written by Jesper Sørensen. The distribution of mortality events by league age is shown in Figure 4.

Results

Descriptive statistics and correlations for our variables are presented in Table 1. In order to test the hypotheses, we first estimated a baseline model with all control variables, and then added other variables to the baseline model. Table 2 shows the estimates for all models. The sport dummies and the dummies indicating that the league was a women's league or a Negro league are omitted from the table to conserve space.

Model 1, the baseline model, shows the effects of the control variables. The pattern of the age pieces in model 1 shows that older leagues were generally less likely to fail while sport age did not have a significant effect. Model 2 shows that the average number of sports per city (related agglomeration) was not significant, and, contrary to hypothesis 2, that the variance in the number of sports per city (market heterogeneity) was not significant. However, niche overlap density (same-sport competition) was significant, consistent with hypothesis 3. In model 3 we add the interactions to test hypotheses 1 and 4. Hypothesis 1 suggested that leagues located in cities with many different sports (higher related agglomeration) will have higher chances of failure if their sport is young and lower chances of mortality if their sport is older. Model 3 shows that the interaction of number of sports and sport age is significant. In order to see if hypothesis 1 is supported we graphed the results in Figure 5. The gray-shaded plane indicates a multiplier of one, where the interaction has no effect on the mortality rate. Consistent with hypothesis 1, Figure 5 shows that leagues in young sports that are located in cities with many sports on average have the highest hazard rates while leagues in older sports situated in cities with higher numbers of sports have the lowest chances of failure.

To fully assess the degree of support for hypothesis 1, it is important to assess the significance of the marginal effect of the average number of sports conditioned on sport age (for similar analyses see

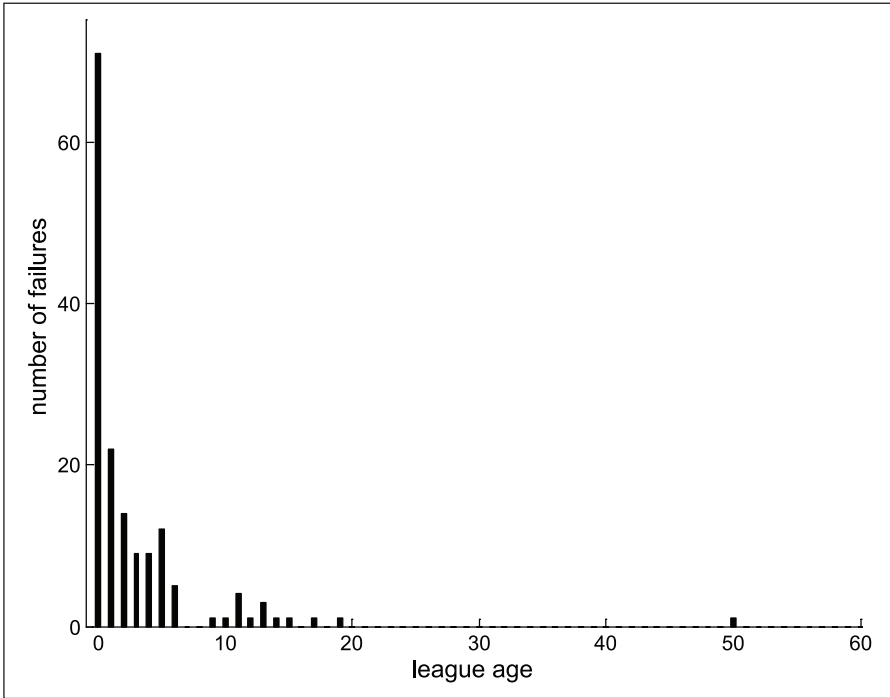


Figure 4. Distribution of Mortality Events by League Age.

Friedrich, 1982, and Dobbin & Dowd, 2000). We ran these conditional analyses and found that for very young sports, the mortality rate increases significantly with average number of sports, and that the mortality rate decreases significantly with the average number of sports for older sports. For sports with ages above 10 but below 60, the interaction was not significant. To further elucidate this interaction finding, we ran an analysis conditioned on the average number of sports and found that the mortality rate is significantly higher for younger sports and significantly lower for older sports but only at higher levels of agglomeration (average number of sports greater than three and marginally significant for three sports). Overall, then, our findings support hypothesis 1 for young and old sports under conditions of higher agglomeration; we observed no significant differences in mortality hazard when agglomeration is low or when sport age is in the intermediate range.

Hypothesis 4 suggested that the positive effects of market heterogeneity (as measured by a league's variance in the number of sports per city) on a focal league's chances of failure would be higher when within-sport competition is higher. Model 3 shows that market heterogeneity has a significant interaction with niche overlap density. Using Figure 6 to interpret this effect, we see that, consistent with hypothesis 4, the variation in the number of sports has virtually no effect when niche overlap density is low but sharply increases the hazard rate as niche overlap density increases. Similarly, the positive effects of niche overlap density are magnified when the variation in the number of sports is high. So, our findings support hypothesis 4.

Supplementary analyses

We used several approaches to examine the robustness of our findings with respect to the presence of both US and Canadian leagues in our population. Model 4 re-estimates model 3 but excludes

Table 1. Means, Standard Deviations, and Correlations of Variables.

Variable	Var	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
Mortality	1	0.13	0.34	1																									
League age	2	20.27	27.05	-0.25	1																								
Market size (ln population)	3	9.34	1.5	-0.21	0.45	1																							
Number of teams in league	4	9.57	6	-0.19	0.65	0.67	1																						
Number of divisions in league	5	1.57	1.07	-0.16	0.41	0.53	0.77	1																					
Niche overlap density	6	0.3	0.55	0.2	-0.19	0.03	-0.12	-0.13	1																				
Sport age	7	50.04	31.05	-0.19	0.52	0.59	0.54	0.48	-0.04	1																			
Mean number of sports per city	8	2.67	1.15	-0.11	0.28	0.69	0.42	0.4	0.07	0.47	1																		
Variance in number of sports	9	1.24	1.18	-0.07	0.12	0.58	0.32	0.38	-0.07	0.41	0.48	1																	
War	10	0.2	0.4	-0.12	0.12	0.07	-0.02	0.01	-0.01	0.15	0.03	-0.08	1																
GNP	11	0.03	0.06	-0.04	0	-0.03	-0.03	-0.03	-0.01	-0.05	-0.09	-0.11	0.22	1															
Radio	12	54.62	43.9	-0.19	0.45	0.56	0.41	0.5	-0.15	0.8	0.55	0.47	0.24	-0.03	1														
Television	13	37.07	45.67	-0.14	0.45	0.54	0.5	0.59	-0.18	0.72	0.52	0.45	0.08	-0.03	0.81	1													
Cable	14	11.03	20.65	-0.07	0.26	0.39	0.43	0.5	-0.08	0.63	0.47	0.42	-0.14	-0.06	0.54	0.71	1												
Women's league	15	0.05	0.21	0.07	-0.14	0.01	-0.08	-0.03	0.2	0.14	0.14	0.09	0.02	-0.02	0.2	0.13	0.2	1											
Negro league	16	0.06	0.24	0.04	-0.14	-0.03	-0.11	-0.13	0.15	0.11	-0.11	-0.06	0.01	0	-0.05	-0.19	-0.14	-0.06	1										
Canadian league	17	0.14	0.35	-0.09	0.1	-0.56	-0.28	-0.12	-0.21	-0.11	-0.32	-0.28	0.03	0.03	-0.02	-0.03	-0.06	-0.09	-0.1	1									
Baseball	18	0.23	0.42	-0.03	0.18	0.12	0.09	-0.22	0.25	0.17	-0.19	-0.19	0.01	0.02	-0.14	-0.22	-0.16	0.14	0.46	-0.23	1								
Basketball	19	0.19	0.39	0.08	-0.16	0.01	-0.02	0.02	0.04	-0.12	0.01	0.05	0.02	-0.01	-0.07	-0.07	-0.06	0.01	-0.12	-0.2	-0.27	1							
Football	20	0.19	0.39	-0.14	0.22	-0.07	0.07	0.26	-0.16	0.07	-0.11	0.01	0.07	0.01	0.22	0.13	0.05	-0.11	-0.12	0.48	-0.27	-0.23	1						
Hockey	21	0.1	0.31	-0.09	0.15	-0.06	-0.01	0.03	-0.17	-0.1	0.04	-0.07	0.01	0.02	-0.01	0.01	-0.03	-0.08	-0.09	0.2	-0.19	-0.16	-0.17	1					
Roller hockey	22	0.08	0.28	0.26	-0.21	-0.23	-0.15	-0.13	0.12	-0.24	-0.16	-0.08	-0.09	0.01	-0.31	-0.21	-0.12	-0.07	-0.08	-0.12	-0.17	-0.15	-0.15	-0.1	1				
Volleyball	23	0.01	0.11	0.05	-0.08	0.04	-0.07	-0.02	-0.06	-0.14	0.14	0.2	-0.06	-0.01	0.11	0.15	0.17	0.3	-0.03	-0.05	-0.06	-0.05	-0.05	-0.04	-0.03	1			
Softball	24	0.01	0.1	0.01	-0.07	0.07	-0.02	0.04	-0.03	-0.15	0.12	0.12	-0.05	-0.01	0.1	0.13	0.06	0.18	-0.03	-0.04	-0.06	-0.05	-0.05	-0.03	-0.03	-0.01	1		
Lacrosse	25	0.01	0.12	0.05	-0.08	0.06	-0.08	-0.03	-0.05	-0.01	0.22	0.05	-0.03	-0.07	0.1	0.12	0.17	-0.03	-0.03	-0.03	-0.07	-0.06	-0.06	-0.04	-0.04	-0.01	-0.01	1	
Soccer	26	0.16	0.37	-0.05	-0.16	0.1	0.01	0.04	-0.07	0.21	0.26	0.17	0.01	-0.02	0.15	0.21	0.19	-0.06	-0.11	-0.08	-0.24	-0.21	-0.21	-0.15	-0.13	-0.05	-0.04	-0.05	1

Table 2. Models for League Mortality.

Variables	(1)	(2)	(3)	(4)	(5)
Age 0 to 1 years	0.5107 (0.643)	0.8239 (0.735)	0.1002 (0.752)	0.5287 (0.722)	0.4617 (0.717)
Age 1 to 2 years	-0.0092 (0.683)	0.3268 (0.767)	-0.3560 (0.767)	0.1565 (0.740)	0.0879 (0.734)
Age 2 to 7 years	-0.0315 (0.673)	0.3234 (0.769)	-0.3369 (0.774)	0.1102 (0.743)	0.0422 (0.736)
Age 7 to 10 years	-2.3614* (1.193)	-2.0123 (1.239)	-2.5934* (1.229)	-1.9722+ (1.197)	-2.0541+ (1.192)
Age 10 to 20 years	-0.3473 (0.715)	0.0271 (0.810)	-0.6319 (0.817)	-0.0415 (0.789)	-0.1334 (0.782)
Age greater than 20 years	-3.2752** (1.255)	-2.8624* (1.303)	-3.5744** (1.312)	-2.6782* (1.296)	-2.6840* (1.279)
Market size (ln population)	-0.1010 (0.074)	-0.1407 (0.099)	-0.1662+ (0.099)	-0.2214* (0.097)	-0.2147* (0.096)
Number of teams	-0.0808 (0.050)	-0.0836+ (0.049)	-0.0730 (0.049)	-0.0865+ (0.050)	-0.0847+ (0.050)
Number of divisions	-0.2000 (0.251)	-0.1964 (0.248)	-0.1228 (0.250)	-0.1076 (0.248)	-0.1116 (0.248)
War	-0.6393* (0.321)	-0.6288+ (0.328)	-0.6635* (0.322)	-0.7669* (0.351)	-0.7669* (0.352)
GNP	-1.1357 (1.176)	-0.9269 (1.185)	-0.8735 (1.157)	-1.4028 (1.193)	-1.4078 (1.189)
Radio	0.0031 (0.005)	0.0005 (0.006)	0.0041 (0.006)	0.0056 (0.006)	0.0060 (0.006)
Television	0.0074 (0.005)	0.0069 (0.005)	0.0087 (0.005)	0.0077 (0.006)	0.0080 (0.006)
Cable television	-0.0045 (0.008)	-0.0061 (0.008)	-0.0005 (0.008)	0.0006 (0.009)	0.0004 (0.009)
Canadian league	-0.3229 (0.502)	-0.3124 (0.510)	-0.2789 (0.493)		
Sport age	-0.0087 (0.007)	-0.0037 (0.009)	0.0086 (0.010)	0.0075 (0.010)	0.0071 (0.010)
Niche overlap density		0.2242** (0.076)	0.1817* (0.075)	0.1656* (0.074)	0.1636* (0.074)
Mean number of sports per city		-0.0720 (0.113)	0.3176* (0.158)	0.3205* (0.159)	0.3225* (0.159)
Variance in number of sports per city		0.0961 (0.069)	0.0187 (0.087)	-0.0020 (0.089)	-0.0021 (0.089)
Mean number of sports × Sport age			-0.0086** (0.003)	-0.0086** (0.003)	-0.0087** (0.003)
Variance in number of sports × Niche overlap			0.2277* (0.110)	0.2545* (0.115)	0.2531* (0.116)
N	1211	1211	1211	1038	1055
Log-likelihood	-239.23	-238.38	-234.13	-213.04	-213.96

**p<.01, *p<.05, +p<.10 (two-tailed tests).

Dummies for sports, women's leagues, and Negro leagues included but not shown.

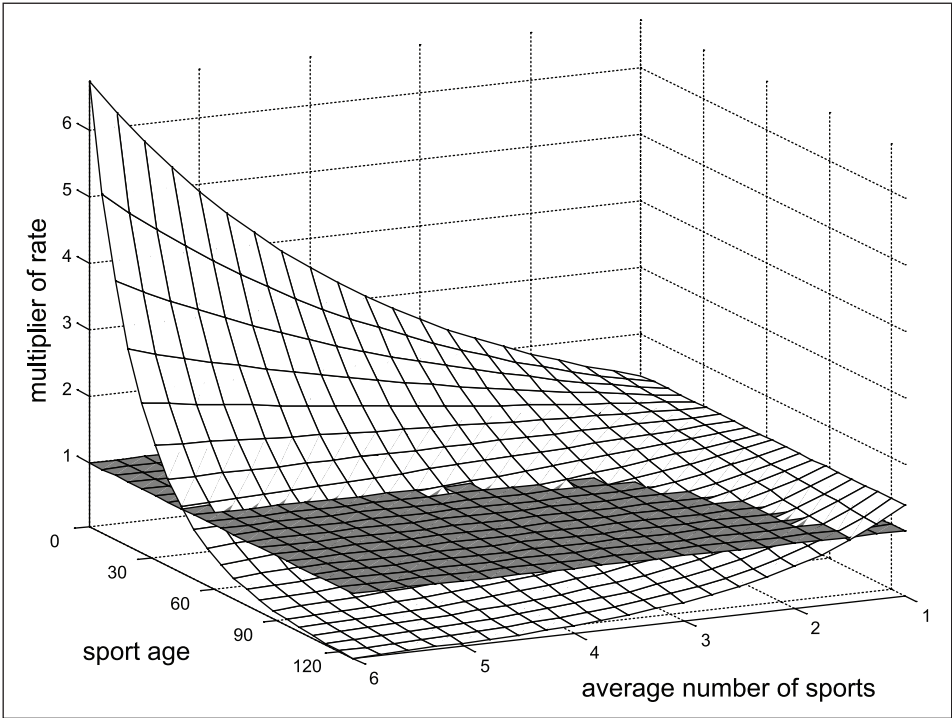


Figure 5. Interaction Effect of Average Number of Sports and Sport Age.

leagues in years that they exclusively had Canadian teams and model 5 excludes leagues that only had Canadian teams over their entire history (see Table 2). Even with the lower number of observations these models show that our results remain the same.

Another possible concern is that our number of sports variable is simply a proxy for city size. This concern is partially allayed by the fact that we control for a league’s total market size. To fully explore this, however, we estimated additional models (available from the authors upon request) that included the average population across a league’s cities and the variance in population across a league’s cities. Neither of these variables was significant and all our results remained substantively the same.

Discussion

Our findings shed some light on the effects of agglomeration and related populations on organizational survival chances. While we find no unconditional effect of the number of sports in a city on league survival, we do find that it has a significant effect that depends on sport age. More specifically, the presence of other sports in their cities benefits leagues in older sports while making leagues in younger sports more likely to fail. Our results suggest that younger populations are less likely to benefit from the effects of agglomeration in the presence of related populations. Perhaps one reason is that if older populations are present, younger populations are likely to suffer in comparisons to their more established counterparts. As we suggested earlier, in densely agglomerated settings with many related populations the audience is more likely to have strongly held

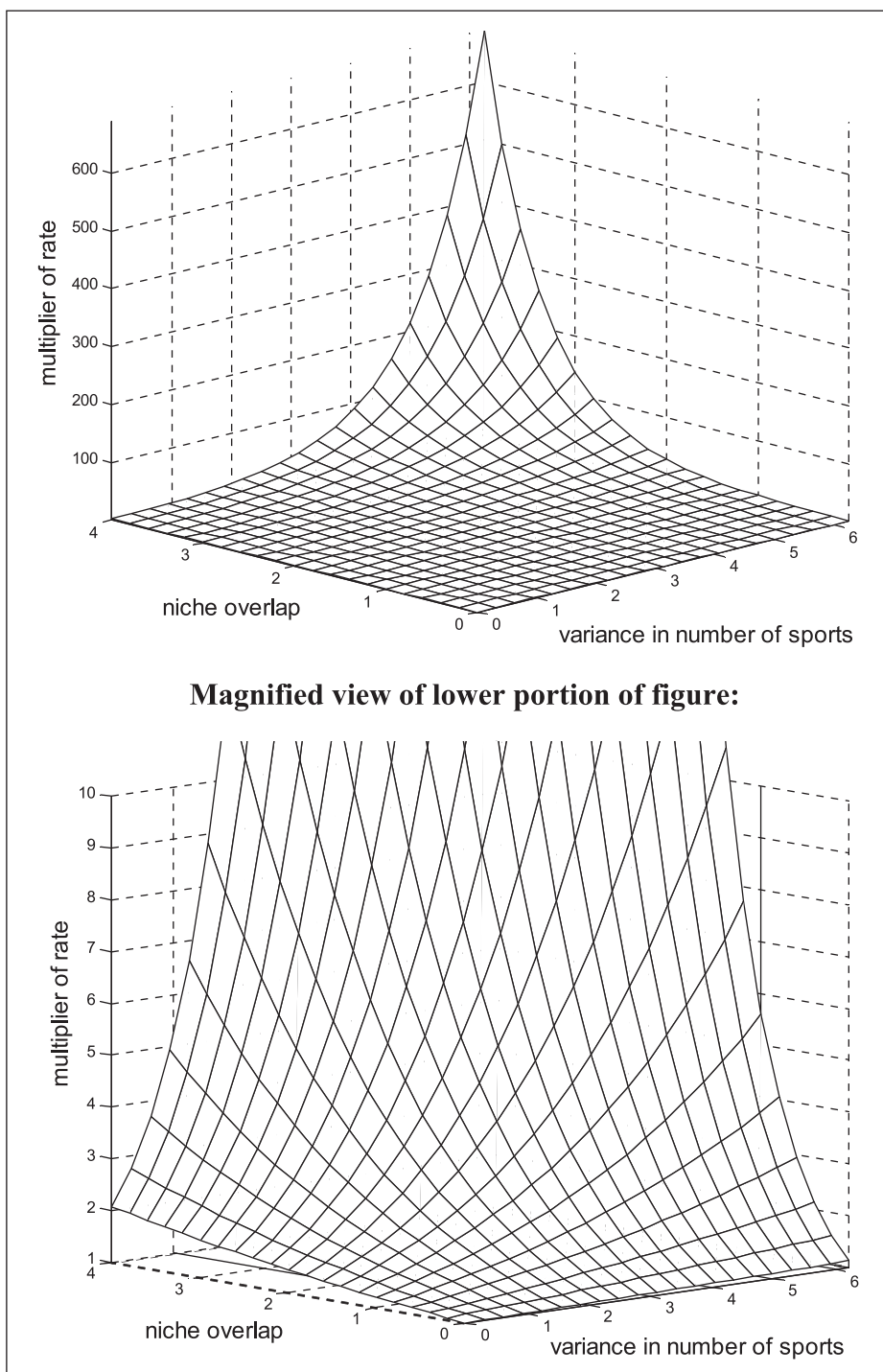


Figure 6. Interaction Effect of Variation in Number of Sports and Niche Overlap Density.

beliefs about what features prototypical organizations should have and organizations in younger populations are less likely to meet these expectations and to develop a distinctive identity (Beck et al., 2016; Cruz et al., 2018). Essentially, as Dobrev et al. (2006) have suggested, emergent populations that share a broad identity with a more established population in the area are likely to suffer from a violation by comparison effect. Younger populations are more likely to violate the identity codes associated with the older and more legitimate populations and to be sanctioned by audiences (Dobrev et al., 2006). While Dobrev et al.'s (2006) study examined a context with only two related populations—one established population (Singapore banks) and one younger population (financial cooperatives)—our findings on related agglomeration suggest an extension of the violation by comparison effect: the relative disadvantage for younger populations that are in the presence of co-located established populations may increase with the number or density of those established populations.

Our results may have strategic implications for other types of franchise organizations. One interesting avenue for future research would be to determine when and under what circumstances a franchise organization that is relatively isolated from related populations should expand into higher related agglomeration settings and when the benefits of such an expansion are likely to outweigh the drawbacks. Our results suggest that a population's age is an important factor and that older populations will tend to benefit from interactions with other populations that share a broad identity while younger populations gain advantages through isolation.

Our results also inform research on the effects of market heterogeneity on geographically dispersed organizations and show that heterogeneity in related agglomeration across locations is an important form of market heterogeneity. Past research has shown that franchise organizations that locate their units in heterogeneous environments can suffer performance deficits (Jain, 1989; Sorenson & Sørensen, 2001). Our finding—that leagues that have higher variance in the number of sports across their cities, and thus face greater market heterogeneity, are more likely to fail—reinforces this view. Importantly, however, we find that this disadvantage only becomes apparent when there is greater direct competition. That is, in our setting, greater variance in the number of sports across a league's cities only increased the failure rate when there was substantial competition (niche overlap) with other leagues in the same sport, which extends past research on the detrimental effects of market heterogeneity.

Opportunities also exist to further expand on the concept of related populations beyond our formal definition based on subforms (see note 1). Following Dobrev et al. (2006), we considered leagues in different professional sports to be related populations because they share a broad identity as professional sports leagues but sharper identities based on their individual sports. It seems obvious that most audiences would see strong similarities among leagues in different professional sports. But other populations such as the instrument manufacturers studied by Audia et al. (2006) might be seen as not so closely related. Future work attending to the degree of commensalistic and symbiotic population relatedness when analyzing agglomeration effects could be illuminating in this regard.

The organizational form of sports leagues also seems ripe for additional research. One possibility is to explore different types of change such as league expansions and contractions, and as has recently been highlighted for American college sports leagues, conference realignments. Work could also be extended to include other effects on league mortality, such as inequality of teams, ownership and governance structures, and, where data are available, performance indicators such as attendance and profitability, as well as to other outcomes such as league foundings and growth. Another interesting issue is the extent to which local and regional agglomeration effects may be diluted by the nationalization of audiences promoted by

expanding media coverage (Leifer, 1990); although our controls for radio, television, and cable showed no significant effects, internet usage was only beginning at the end of our observation period so its effects could be examined in later periods.

Another obvious extension is to examine professional sport leagues in Europe and other parts of the world, where most professional leagues typically have different organizational forms, characterized by promotion and relegation rather than a closed cartel system, and are more insulated from failure. Looking beyond the league as the focal organization, team foundings, failures, promotions, and relegations could be an interesting research topic, particularly in Europe, where these events are not regulated by the closed cartel league form of the US and Canada.

Opportunities also exist to theorize about and examine measures of agglomeration that consider the population age distribution faced by the focal organization. Consistent with our theory, we analyzed the number of related populations present in each location, but only considered population age for the focal organization. We did not directly consider the age distributions of the related populations, which would involve additional complexity in the analysis. Research on the effects of population age distributions in related agglomeration contexts would be an interesting area for future work.

Conclusion

Overall, we believe that our study reinforces a basic tenet of organizational ecology that a better understanding of organizations depends on the accumulated knowledge gained through detailed studies of specific populations of organizations. The main constructs in our study are geographical agglomeration of related populations, heterogeneity in agglomeration across geographical locations of a population, population age, and competitive overlap of populations across multiple locations. The key findings are that as agglomeration increases, organizations in older populations benefit and organizations in younger population suffer in terms of mortality rates, and that market heterogeneity and competition within populations combine to produce high mortality rates. This work contributes to the growing body of community ecology literature on the effects of population agglomeration.

While leagues are relatively unique organizational forms, a key advantage of our research context is that we were able to examine a variety of commensalistic processes using detailed information on multiple related populations. In addition, the league organizational form shares many characteristics with other multi-site organizational forms such as franchises (of which professional sports leagues are a special form). Our results on related populations, on population age, on market heterogeneity, and on competition are likely to be particularly applicable to these types of organizations. Professional sports leagues provide a major source of entertainment for much of the world. Our study illustrates how these leagues can also offer an interesting opportunity for examining organizational survival, or for addressing the question, to paraphrase The Clash, “Who will stay and who will go?”

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Notes

1. Formally, we define related agglomeration as the co-location of subforms of an organizational form. We regard the population of American professional sports leagues as an organizational form with a collective identity, with characteristics specified in the next section. Subforms are subsets of forms with sharper identities (Pólos, Hannan, & Carroll, 2002). We consider the populations of leagues in each sport to constitute subforms of the American professional sports league form because different sports have distinct but related identities among sports audiences.
2. Professional sports include both team sports such as football and individual sports such as golf. In this study we focus on team sports because team sports engage particular audiences or market segments and consist of teams located and performing in specific cities. We exclude professional sports associations for individual sports such as tennis and golf, which have fundamentally different organizational structures. We also exclude minor leagues, defined as leagues with formalized ties to major leagues to act as “feeders” or “farm systems” that provide players to the major leagues (except in the early history of professional sports); by definition, they do not exist independently of the major leagues. Leagues from both the US and Canada are included because they are not isolated systems—for example, Major League Baseball and the National Hockey Association have teams in both countries. Our criteria for determining major leagues are discussed in the “Methods” section.
3. The discussion in this and the next paragraph relies heavily on Eckard (2005). The first European professional sports league, the English Football League (soccer), was founded in 1888 (Cain & Haddock, 2005).
4. A note on terminology: although Eckard uses the term “franchisee” to refer to teams, we will use the more commonly used “franchises” to denote teams and “franchiser” to denote the league of which they are members.
5. According to Pólos et al. (2002) and Hannan et al. (2007), forms are populations or categories of organizations that have met some threshold of legitimacy or taken-for-grantedness. We believe this taken-for-grantedness is obvious for American sports audiences; professional sports leagues have been deeply ingrained in the American culture for over a century and have broad audience appeal, as evidenced by extensive media coverage of professional sports leagues since their inception and the revenues they generate.
6. Indeed in our sample 65 percent of the leagues that failed did not substantively decline in terms of the number of teams prior to failure. In the year prior to failure the number of teams in these leagues equaled the maximum number of teams that they had had at any point in their history.
7. Some of these observations echo research on agglomeration in other contexts, which suggests that organizations could benefit by locating in areas populated by similar organizations (Marshall, 1920; Weber, 1929). Co-location may provide opportunities for knowledge spillovers (Saxenian, 1994; Sorenson & Sørensen, 2001). Organizations located near similar firms may also benefit from regional acceptance due to a common broad identity (Romanelli & Khessina, 2005) and from investments in infrastructure that make a particular area more attractive (Canina, Enz, & Harrison, 2005).
8. In Dobrev et al.’s (2006) study the violation by comparison effect was triggered by the early proliferation of an emergent population in the presence of a more established organizational form with which it shared a broad identity. In our study we suggest that this process may occur when a newer sport is in the presence of more established sports in the same city.
9. In a very small number of cases Pollak (1998) indicated that a minor league temporarily became a major league. In these cases the league entered our data when it became a major league and was treated as right censored when it reverted to minor league status.
10. We used several approaches to examine the robustness of our findings with respect to the presence of both US and Canadian leagues in our population and these are discussed in the results section.

References

- Ahn, S. C., & Lee, Y. H. (2007). Life cycle demand for major league baseball. *International Journal of Sport Finance*, 2, 79–93.

- Aldrich, H. E., & Fiol, M. C. (1994). Fools rush in? The institutional context of industry creation. *Academy of Management Review*, 19, 645–670.
- Audia, P. G., Freeman, J. H., & Reynolds, P. D. (2006). Organizational foundings in community context: Instruments manufacturers and their interrelationship with other organizations. *Administrative Science Quarterly*, 51, 381–419.
- Barnett, W. P. (1990). The organizational ecology of a technological system. *Administrative Science Quarterly*, 35, 31–60.
- Barnett, W. P., & Carroll, G. R. (1987). Competition and mutualism among early telephone companies. *Administrative Science Quarterly*, 32, 400–421.
- Baum, J. A. C., & Rao, H. (2004). Evolutionary dynamics of organizational populations and communities. In Marshall Scott Poole, Andrew Van de Ven, et al. (Eds.), *Studying organizational change and development* (pp. 212–258). Oxford: Oxford University Press.
- Baum, J. A. C., & Singh, J. V. (1994). Organizational niches and the dynamics of organizational mortality. *American Journal of Sociology*, 100, 346–380.
- Baum, J. A. C., & Singh, J. V. (1996). Dynamics of organizational responses to competition. *Social Forces*, 74, 1261–1297.
- Beck, N., & Belson, K. (2011). N.B.A. Owners' Mutual Dependence Outweighs Divisions. *New York Times*, October 25, B14, B16.
- Beck, N., Swaminathan, A., Wade, J. B., & Wezel, F. (2016). Industry clusters and organizational prototypes: Evidence from the Franconian brewing industry. Working Paper.
- Berry, T. S. (1988). *Production and population since 1789: Revised GNP series in constant dollars*. Richmond, VA: The Bostwick Press.
- Betts, J. R. (1953). The technological revolution and the rise of sports, 1850–1900. *Mississippi Valley Historical Review*, 40, 231–256.
- Cain, L. P., & Haddock, D. D. (2005). Similar economic histories, different industrial structures: Transatlantic contrasts in the evolution of professional sports leagues. *Journal of Economic History*, 65, 1116–1147.
- Canina, L., Enz, C. A., & Harrison, J. S. (2005). Agglomeration effects and strategic orientations: Evidence from the US lodging industry. *Academy of Management Journal*, 48, 565–581.
- Cohen, W. M., & Levinthal, D. A. (1990). Absorptive capacity: A new perspective on learning and innovation. *Administrative Science Quarterly*, 35, 128–152.
- Cramer, B. (2007). Pitch man. *Forbes Life*, 179, 123–127.
- Cruz, M., Beck, N., & Wezel, F. C. (2018). Grown local: Community attachment and market entries in the Franconian beer industry. *Organization Studies*, 39, 47–72.
- Darr, E. D., Argote, L., & Eppler, D. (1995). The acquisition, transfer, and depreciation of knowledge in service organizations: Productivity in franchises. *Management Science*, 41, 1750–1762.
- Delacroix, J., & Rao, H. (1994). Externalities and ecological theory: Unbundling density dependence. In J. A. C. Baum & J. V. Singh (Eds.), *Evolutionary dynamics of organizations* (pp. 255–268). New York: Oxford University Press.
- DiMaggio, P. J., & Powell, W. W. (1983). The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. *American Sociological Review*, 48, 147–160.
- Dobbin, F., & Dowd, T. J. (2000). The market that antitrust built: Public policy, private coercion, and railroad acquisitions, 1825–1922. *American Sociological Review*, 65, 631–657.
- Dobrev, S. D., Kim, T. Y., & Carroll, G. R. (2002). The evolution of organizational niches: US automobile manufacturers, 1885–1981. *Administrative Science Quarterly*, 47, 233–264.
- Dobrev, S. D., Kim, T., & Hannan, M. T. (2001). Dynamics of niche width and resource partitioning. *American Journal of Sociology*, 106, 1299–1337.
- Dobrev, S. D., Ozdemir, S. Z., & Teo, A. C. (2006). The ecological interdependence of emergent and established organizational populations: Legitimacy transfer, violation by comparison, and unstable identities. *Organization Science*, 17, 577–597.
- Eckard, E. W. (2005). Team promotion in early major league baseball and the origin of the closed sports league. *Explorations in Economic History*, 42, 122–152.

- Feldman, G. (2009). The puzzling persistence of the single-entity argument for sports leagues: American Needle and the Supreme Court's opportunity to reject a flawed defense. *Wisconsin Law Review*, 2009, 835–916.
- Feldman, G. (2012). Antitrust versus labor law in professional sports: Balancing the scales after *Brady v. NFL* and *Anthony v. NBA*. *UC Davis Law Review*, 45, 1221–1300.
- Friedrich, R. J. (1982). In defense of multiplicative terms in multiple regression. *American Journal of Political Science*, 26, 799–833.
- Goldstein, W. (1989). *Playing for keeps: A history of early baseball*. Ithaca, NY: Cornell University Press.
- Grow, N. (2006). There's no "I" in "league": Professional sports leagues and the single entity defense. *Michigan Law Review*, 105, 183–208.
- Hannan, M. T. (1997). Inertia, density, and the structure of organizational populations: Entries in European automobile industries, 1886–1981. *Organization Studies*, 18, 193–228.
- Hannan, M. T., & Freeman, J. (1987). The ecology of organizational founding: American labor unions, 1836–1985. *American Journal of Sociology*, 92, 910–943.
- Hannan, M. T., & Freeman, J. (1988). The ecology of organizational mortality: American labor unions, 1836–1985. *American Journal of Sociology*, 94, 25–52.
- Hannan, M. T., & Freeman, J. (1989). *Organizational ecology*. Cambridge, MA: Harvard University Press.
- Hannan, M. T., Pólos, L., & Carroll, G. R. (2007). *Logics of organization theory*. Princeton, NJ: Princeton University Press.
- Ingram, P., & Baum, J. A. C. (1997). Chain affiliation and the failure of Manhattan hotels, 1898–1980. *Administrative Science Quarterly*, 42, 68–102.
- Ingram, P., & Simons, T. (2002). The transfer of experience in groups of organizations: Implications for performance and competition. *Management Science*, 48, 1517–1533.
- Jacobs, M. S. (1991). Professional sports leagues, Antitrust, and the single-entity theory: A defense of the status quo. *Indiana Law Journal*, 67, 25–58.
- Jain, S. (1989). Standardization of international marketing strategy: Some research hypotheses. *Journal of Marketing*, 53, 70–79.
- Kalnins, A., Swaminathan, A., & Mitchell, W. (2006). Turnover events, vicarious information, and the reduced likelihood of outlet level exit among small multi-unit organizations. *Organization Science*, 17, 118–131.
- Land, K. C., Davis, W. R., & Blau, J. R. (1994). Organizing the boys of summer: The evolution of US minor league baseball, 1883–1990. *American Journal of Sociology*, 100, 781–813.
- Leifer, E. M. (1990). Inequality among equals: Embedding market and authority in league sports. *American Journal of Sociology*, 96, 655–683.
- Leifer, E. M. (1995). *Making the majors: The transformation of team sports in America*. Cambridge, MA: Harvard University Press.
- Lu, S. F., & Wedig, G. J. (2013). Clustering, agency costs and operating efficiency: Evidence from nursing home chains. *Management Science*, 59, 677–694.
- Marshall, A. (1920). *Principles of economics*. London: Macmillan.
- McKendrick, D. G., Jaffee, J., Carroll, G. R., & Khesina, O. M. (2003). In the bud? Disk array producers as a (possibly) emergent organizational form. *Administrative Science Quarterly*, 48, 60–93.
- Mehra, S. K., & Zuercher, T. J. (2006). Striking out "competitive balance" in sports, antitrust, and intellectual property. *Berkeley Technology Law Journal*, 21, 1499–1546.
- Miller, C. A. (2011). A re-examination of the convergence of antitrust law and professional sports leagues. *Jeffrey S. Moorad Sports Law Journal*, 18, 375–376.
- Mitchell, W., Baum, J., Banaszak-Holl, J., Berta, W., & Bowman, D. (2002). Opportunity and constraint: Chain-to-component transfer learning in multiunit chains of US nursing homes, 1991–1997. In C. Choo & N. Bontis (Eds.), *Strategic management of intellectual capital and organizational knowledge* (pp. 555–574). New York: Oxford University Press.
- Moore, I. (1999). *Historical populations of Canadian metropolitan areas*. Ottawa: Statistical Reference Centre, Statistics Canada.

- Noll, R. G. (2002). The economics of promotion and relegation in sports leagues: The case of English football. *Journal of Sports Economics*, 3, 169–203.
- Noll, R.G. (2003). The organization of sports leagues. *Oxford Review of Economic Policy*, 19: 530–551.
- Norton, S. W. (1988). An empirical look at franchising as an organizational form. *Journal of Business*, 61, 197–218.
- Pelnar, G. (2009). Competition and cooperation between professional sports franchises: The impact on ticket prices. Munich Personal RePEc Archive: <http://mpira.ub.uni-muenchen.de/17787/>.
- Podolny, J. M., Stuart, T. E., & Hannan, M. T. (1996). Networks, knowledge, and niches: Competition in the worldwide semiconductor industry, 1984–1991. *American Journal of Sociology*, 102, 659–689.
- Pollak, M. (1998). *Sports leagues and teams: An encyclopedia, 1871 through 1996*. Jefferson, NC: McFarland & Co., Inc.
- Pólos, L., Hannan, M. T., & Carroll, G. R. (2002). Foundations of a theory of social forms. *Industrial and Corporate Change*, 11, 85–115.
- Reiss, S. A. (1998). Historical perspectives on sports and public policy. *Policy Studies Review*, 15, 3–15.
- Romanelli, E., & Khessina, O. (2005). Regional industrial identity: Cluster configurations and economic development. *Organization Science*, 16, 344–358.
- Rosner, S. R., & Shropshire, K. L. (2004). *The business of sports*. Sudbury, MA: Jones & Bartlett.
- Ruef, M. (2000). The emergence of organizational forms: A community ecology approach. *American Journal of Sociology*, 106, 658–714.
- Saxenian, A. (1994). *Regional advantage: Culture and competition in Silicon Valley and Route 128*. Cambridge, MA: Harvard University Press.
- Sheehan, R. G. (1996). *Keeping score: The economics of big-time sports*. South Bend, IN: Diamond Communications, Inc.
- Sidlow, E. I., & Henschen, B. M. (1998). Major League Baseball and public policy, or, take me out to the ballgame, wherever the game may be. *Policy Studies Review*, 15, 65–88.
- Sorenson, O., & Audia, P. G. (2000). The social structure of entrepreneurial activity: Geographic concentration of footwear production in the United States, 1940–1989. *American Journal of Sociology*, 106, 424–462.
- Sorenson, O., & Sørensen, J. B. (2001). Finding the right mix: Franchising, organizational learning, and chain performance. *Strategic Management Journal*, 22, 713–724.
- Statistics Canada. (1997). *Canada year book*. Altona, MAN: Freisens Corporation.
- Suchman, M. C. (1995). Managing legitimacy: Strategic and institutional approaches. *Academy of Management Review*, 20, 571–610.
- US Department of Commerce (1951–1998). *Statistical abstract of the United States*. Washington, DC: US Government Printing Office.
- US Department of Commerce (1976). *Historical statistics of the United States: Colonial times to 1970*. New York: Basic Books.
- University of Virginia (1999). *United States historical census data browser*. World Wide Website: www.fisher.lib.virginia.edu/census/, accessed February 15, 1999.
- Urquhart, M. C. (Ed.) (1965). *Historical statistics of Canada*. Cambridge, Toronto: The University Press.
- Wade, J. (1996). A community-level analysis of sources and rates of technological variation in the microprocessor market. *Academy of Management Journal*, 39, 1218–1244.
- Weber, A. (1929). *Theory of the location of industries*. Chicago: University of Chicago Press.
- Weistart, J. C. (1984). League control of market opportunities: A perspective on competition and cooperation in the sports industry. *Duke Law Journal*, 1984, 1013–1070.
- Winfrey, J. (2009). Fan substitution and market definition in professional sports leagues. *Antitrust Bulletin*, 54, 801–822.
- Zuckerman, E. (1999). The categorical imperative: Securities analysts and the illegitimacy discount. *American Journal of Sociology*, 104, 1398–1438.

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