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Construction des citadelles académiques entre 1991 – 2009 en Management

Bastiones de la investigación: arquitectura de los baluartes académicos de 1991 a 2009

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Résumé de l'article

Comment les citadelles académiques se construisent-elles ? En décrivant l'évolution des réseaux de co-autorat de 180 journaux en management entre 1991 et 2009, nous identifions la formation d'une ligue « élite » dont les acteurs restent dominants malgré une forte croissance de la communauté de recherché en gestion. Cette élite maintient sa domination en s'appuyant sur des mécanismes d'auto-renforcement entre le système de revue par les pairs dans les journaux scientifiques et de classement par des tiers influents et cela malgré la diminution progressive du nombre de citation reçue. Les universités américaines qui forment l'élite dominent les journaux scientifiques les mieux cotés, même si de nouveaux poles émergent en Asie et en Europe.

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ABSTRACT

How were paper bastions added to the walls of academic citadels? By mapping the evolution of the coauthorship network in 180 management journals from 1991 to 2009, we identify an elite league of business schools that retained dominance despite the research community's significant growth. The elite universities maintain their prominence through a loop of reinforcement involving the peer review process and third-party ranking bodies, though the perceived quality of the papers published was declining as measured by the percentage of overall citations. Leading U.S. universities dominate top journal publications, while new local poles of management research among European and Asian universiteis emerged.

Keywords: Business school ranking, business research, coauthorship, citation analysis, social network analysis.

RÉSUMÉ

Comment les citadelles académiques se construisent-elles ? En décrivant l'évolution des réseaux de co-autorat de 180 journaux en management entre 1991 et 2009, nous identifions la formation d'une ligue « élite » dont les acteurs restent dominants malgré une forte croissance de la communauté de recherché en gestion. Cette élite maintient sa domination en s'appuyant sur des mécanismes d'autorenforcement entre le système de revue par les pairs dans les journaux scientifiques et de classement par des tiers influents et cela malgré la diminution progressive du nombre de citation reçue. Les universités américaines qui forment l'élite dominent les journaux scientifiques les mieux cotés, même si de nouveaux poles émergent en Asie et en Europe.

Mots Clés : classement des business school, Recherche en gestion, co-autorat, analyse des citations, analyse des réseaux.

RESUMEN

¿Cómo se incorporaron los bastiones de la investigación a las principales instituciones académicas? Cartografiando la evolución de la red de coautorías de 180 publicaciones sobre gestión y dirección de 1991 a 2009, hemos identificado una liga de élite de escuelas de negocios que se mantuvo dominante a pesar del significativo crecimiento de la comunidad investigadora. Las universidades de élite mantienen su prominencia utilizando un circuito de refuerzo que implica procesos de revisión entre pares y organismos exteriores de clasificación, aunque la calidad percibida de los artículos publicados fue declinando según las mediciones del porcentaje de citas globales. Las universidades estadounidenses líderes dominan los primeros puestos de las publicaciones, al tiempo que emergen nuevas áreas locales de investigación en gestión en Europa y Asia.

Palabras clave: clasificación de escuelas de negocios, investigación empresarial, coautoría, análisis de citas, red social de análisis.

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The global market for a business education has expanded rapidly during the last four decades following the influential Gordon and Howell report (1959) and has been fueled by a seemingly unquenchable thirst for a U.S.-style education and associated research-production model. As a premier research-based academic discipline, with its ensuing high demand and high cost, the business school field has experienced intense and growing isomorphic pressures. The pressures have manifested themselves in what appears as control of the top management journals by an elite league of business schools whose aggregate faculties dominate the editorial boards of the journals (Burgess and Shaw, 2010) that are used by external organizations, like *Business Week, US News,* and *Financial Times*, to rank their institutions. These highly publicized rankings have forged reputations of power, privilege, and prestige and sent signals of prominence and perceived quality (Rindova *et al.*, 2005) to stakeholders, thus creating a stratified vertical marketplace in business education.

The ultimate stamp of academic approval is having one's research published in a prestigious journal with the hope that this research will inform and encourage debates. However, it has been observed that articles published in high-ranking journals are not always linked to significant contributions. Many articles that were rejected in the rounds of reviews by influential journals were later proved to be highly valued papers (Starbuck, 2005). A perception exists, to a certain extent, that an elite alliance dominates publications in top journals. Burgess and Shaw (2010) provided evidence that the editorial boards of the FT 40 journals[1] (i.e., the highest ranked management journals forming

1. The list was extended to 45 journals in 2012, referred to as FT45 in the following text.

the *Financial Times* list for grading business schools) were dominated by a small number of U.S. institutions. It was argued that the existence of the elite alliance may bring bias in the peer review process, and may negatively affect the creation and dissemination of new knowledge (Starbuck, 2005).

By taking an inductive approach focusing on the management and business publication data, this study has three objectives. First, we attempt to further explore the phenomenon from the "outcome" perspective (i.e., the papers published, distinct from the alliances that Burgess and Shaw [2010] discovered in the journal editorial boards, which could be viewed as the "intervening mechanism" of the dominance). We analyze the collaboration network of the universities whose members publish in management journals and try to identify the elite league as the outcome of the mechanism. Adopting a dynamic approach, we examine the evolution of the collaboration network in order to identify the elite league from a longitudinal point of view. Second, we evaluate the role the elite league plays and the consequences it causes to the management research community. Given the dominant position of the league, one might expect its publications to increasingly guide the evolution of management research. However, as found in the study, the influence of the elite league's creation of new work is diminishing, indicated by its shrinking share of total citations. At the same time, a loop of reinforcement exists involving the leading journals, the elite universities, and the third-party ranking bodies through which the elite league maintains its position. Third, we identify the existence of an important disruptive factor, the emerging regional poles of collaboration between local universities, which we will argue may present a potential challenging force to break the dominance of the U.S. university-centered elite league.

Theoretical background

Scholarly impact

The knowledge of management and business administration has greatly increased through the efforts of numerous academic researchers and business practitioners contributing to the research publication system. Measuring scholarly impact is important, as it "is one of the strongest currencies in the Academy and has traditionally been equated with number of citations - be it for individuals, articles, departments, universities, journals, or entire fields" (Aguinis *et al*., 2012, p.105). Today, although the presumption is that journal citations are a greater measure of impact and eminence than the absolute number of journal publications, argument continues to diverge. Some argue publication count is the best measure (Shane, 1997), while others steadfastly hold to the primacy of citations as the principle measure of impact (Podsakoff *et al*., 2008). Journal quality is tied to the number of citations received, which affords reputations to the individuals, departments, and institutions involved (Alexander and Mabry, 1994). The Journal Impact Factor (JIF) was created to allow the ranking of influential journals that have a small publication count (Garfield, 2006), and over time, the JIF has come to encompass the impact of both the author and the journal. However, disagreement does exist. For example, Baum (2011, p.464) criticized that "as a measure of research quality, the JIF is fundamentally flawed", citing the fact that articles within a publication are quite varied and a large number of articles enjoy a "free-ride". In addition, the effect of the "skewed few" shows that the distribution of citations is highly concentrated among a small number of papers (Baum, 2012) and a significant amount of self-, mutual-, and group-citations can be found (Macdonald and Kam, 2011).

Structural homophily and status dynamics

The phenomenon of homoplily, which states that people tend to associate with others who are similar to them, has long been observed in social life (Lazarsfeld and Merton, 1954). Homophily suggests that people who share a common status, similar characteristics, or mutual value beliefs more easily communicate and form relationships. Beyond the personal level, homophily is also documented at the organizational level. For example, firms with similar resource profiles are more likely to build inter-firm collaborations (Mowery *et al*, 1996). Furthermore, social network analysis stresses one specific dimension of homophily, structural homophily, which describes the phenomeon that social actors embedded in central positions in a pre-existing network are more likely to create new ties with each other (Ahuja *et al*, 2009). Firms at the center of a network often have an information advantage and can identify the most valuable and reliable potential partners, which are often in central positions as well, so as to reduce uncertainty (Chung *et al*., 2000; Gulati and Gargiulo, 1999).

Industrial sociologists noticed that prominent firms are more selective in partner's social status when creating economic exchange ties (Podolny, 1993). Firms' improvement or decline in status is a function of the relative status of its partners: it would be enhanced by the firm's ties to higher-status organizations and diminished by ties to lower-status establishments (Podolny and Phillips, 1996). Therefore, higher status partners are preferred over those of lower status for building up social or economic ties, and highest status organizations become exclusive in the formation of collaboration relationships and tend to forge elite alliances among themselves to maintan their superior status. As mentioned before, business education is a stratified vertical market based on the prominence of the universities. When building up collaborative relationships, the universities sitting at the peak of the pyramid prefer to work with the universities at the same top status to fortify the elite league and maintain their dominant position in the business education system.

Institutional reputation

Rindova *et al*. (2005) analyzed two distinct dimensions of reputation: first, the economic dimension, which addresses how stakeholders evaluate a particular organizational attribute with a focus on the perceived quality and how its value is shaped by the strategic choices of the organization (Baden-Fuller *et al*., 2000); and second, the institutional dimension, which addresses the accumulated recognition, i.e. prominence, that an organization has and how it is affected by "influential third parties, such as institutional intermediaries and high-status actors, make vis-à-vis organizations" (Rindova *et al*., 2005, p.1034). For example, because the quality of an individual MBA graduate is difficult to evaluate a priori, the reputations of business schools strongly influence recruiters' preference. In Rindova's study, prominence

had an effect on MBA recruiters' assessment of quality, while media rankings, publications in premier journals, and faculty prestige had an effect on prominence. Perceived quality did not have an effect on price premium, but it did have a effect on prominence. These findings suggest that business schools may benefit more from overall stakeholder recognition than from direct perceptions of the quality of their education. From the social network perspective, prominence is not an attribute of the actor; instead, it is a network structural property (Wasserman and Faust, 1994). Actors located at the center of a network are more prominent and have higher visibility, reputation, influential power, and social status.

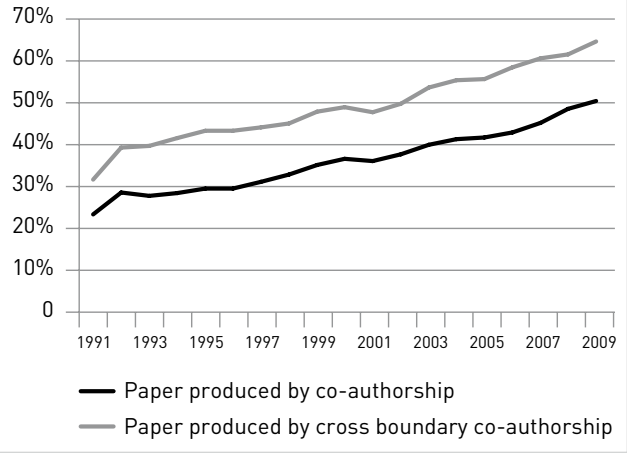
Research design and methodology

Newman (2001) found that scientific communities appeared to have the elements of small world network and conjectured that this property might be a crucial feature for scientific communities to actually function. He found that these small world networks were highly clustered, meaning that if two scientists shared a common collaborator, they were much more likely to have collaborated than two scientists who were chosen at random. In this paper, we use the concept of a *league* construct and emphasize the close collaboration amongst the universities that intensively publish jointly. To map out the existence, formation, and boundaries of leagues within the business research domain, we examine recurring coauthorship amongst scholars from different business schools. We adopted the social network analysis approach (Wasserman and Faust, 1994) and treated the cross-boundary coauthorships as collaborations between universities in the production of business knowledge. A social network contains social actors, and a set of social relations connects them. In our case, the actor is the university and the relationship is the cross-boundary coauthorship. We used Uninet 6.5 software (Borgatti *et al*., 2002) to perform the network analysis and NetDraw 2 integrated (Borgatti *et al.* 2002) to visualize the networks.

Data: Coauthorship in business research publications

The data were collected from 1991 to 2009 from the ISI–WOS database (Institute for Scientific Information – Web of Science database provided by Thomson Reuters, referred to as ISI hereafter), which records detailed information of articles published in peer-review academic journals. The database contains 180 most prestigious business and management journals covering all relevant disciplines. We identified 134,051 articles, among which more than 50% were coauthored, and nearly 40% were coauthored by cross-boundary collaboration. These articles come from approximately 12,000 organizations. The number of publications per organization ranged from one article all the way up to 1,988 from Harvard University. Over 2,210 organizations published more than five papers during the period and accounted for 92.5% of the total publications. In 1991 (see Figure 1), 31.9% of the papers were produced by collaboration and 23.7% by cross-boundary collaborations. These numbers increased to 64.7% and 50.6% in 2009. In 1991, an average of 1.44 researchers from 1.30 universities coauthored an article, and in 2009, these numbers increased to 2.11 and 1.77, respectively.

FIGURE 1
Papers produced by coauthorship



The university coauthorship network

We constructed the university coauthorship network by assigning an edge between two universities whose members wrote an article together. Articles with a single author or with several authors from a single university do not create any edge between universities, and articles with multiple authors from different universities create one or more edges. By so doing, we constructed the cross-boundary coauthorship network, in which there are more than 12,000 nodes and 100,000 edges. For example, the University of Pennsylvania published 1,975 articles and had 2,002 cross-boundary coauthorships. Because researchers in a pair of universities may have coauthored many papers, the edges are valued. For example, the value of the edge between MIT and Harvard University is 75, indicating that the two schools produced 75 articles collaboratively in the 19-year period.

TABLE 1
Articles and Cross-Boundary Coauthorships

Period	Year	Articles	Cross-boundary coauthorships
91–98	8	40,673	20,579
99–03	5	34,543	23,510
04–06	3	25,670	21,459
07–09	3	20,869	21,067

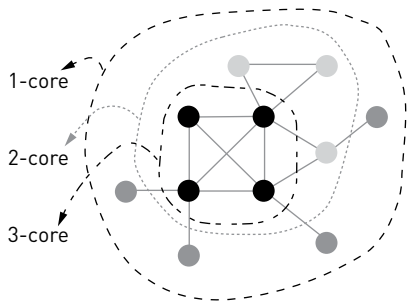
Our longitudinal data allows us to track the evolution of the network. We split the 19 years (1991-2009) into four periods with the criteria of equal number of cross-boundary coauthorships (see Table 1) in order to analyze the dynamics of the collaboration. Other ways of splitting are possible, but for the purpose of this study, we did not use equal time duration or equal number of papers as criteria to classify the time periods on the basis of two considerations: first, the number of journals collected in the database was increasing, and as a result, the number of papers was increasing during the time interval. An equal time duration would make the number of papers

and coauthorships unbalanced between periods; and second, the number of coauthorships per paper increased significantly (see Figure 1). Periods classified by an equal number of papers would have an unbalanced number of coauthorships and may bias our analysis of the evolution of the linkages.

K-core decomposition

We adopted the "k-core decomposition" technique (Alvarez-Hamelin *et al*, 2006) to identify the league. A k-core is a subgroup of a network in which all nodes are connected to at least k other nodes in the subgroup. In the network shown in Figure 2, for example, all nodes have at least one edge, and therefore all nodes are in the 1-core; the four blue nodes have only one edge, respectively, and when we increase the k value to 2, they are removed from the 2-core, in which all nodes have at least two edges in the subgroup. When we increase the k value to 3, only the four red nodes remain in the 3-core and the three yellow nodes are removed. There is no 4-core in this network. When we increase the value of k, we identify the nodes with greater connectivity at the center of the network and "decompose" the network into a multilayer core-peripheral structure. By so doing, the most central, well-connected, important or prominent nodes remain with the highest value of k in the decomposition exercise.

FIGURE 2
Sketch of K-core decomposition of a small network (cited from Alvarez-Hamelin *et al*., 2006)



It is worth noting that k-core decomposition does not take into account the value of the edges, but only the number of edges. However, in our university coauthorship network, this is problematic because the value of an edge serves to make sense of the strength of the collaboration. We care about the strong relationships between universities whose members publish a substantial number of articles. Therefore, we set a threshold of T=5 to dichotomize the network of each period. Other threshold values are possible, while at T=5, the underlying structure significantly appears. With this threshold, we created four binary networks in which a value of 1 indicates the existence of a strong connection between two universities that coauthored more than five articles, and a value of 0 indicates the absence of a strong connection. We set k=3, which means that a university in the 3-core has at least three strong ties to other universities of the 3-core.

Clique analysis

A clique in a network is a maximal, fully connected subgroup in which every member is directly connected to all other members (Wasserman and Faust, 1994). In our analysis of the coauthorship network, a clique presents the most cohesive collaboration among the universities. In order to identify the strongly collaborating universities that may potentially present a disruptive force that challenges the existing league, we performed a clique analysis. This analysis was done in the non-elite universities during the fourth period and identified a number of poles of close collaboration presenting strong geographic proximity, which we will show later.

Results

The elite league

The elite universities are characterized as extremely productive in business knowledge creation, as evidenced by publications in peer-reviewed journals, collaborate extensively to shape the direction of the research field, and build up the league by sustaining stable collaborations amongst themselves. We identify the member universities of the elite league by three criteria: first, stable productivity - the university must be in the top 100 list of publications in each of the four periods; second, internal connectivity - the universities must have a large number of coauthorship collaborations connecting them to other members in the league; and third, sustainability - the university must be sustained in the elite group over time. We used the k-core decomposition for the dichotomized binary networks and identified the 3-core of each of the four periods under investigation. Figures 3 to 6 illustrate the 3-cores in which the nodes represent the universities and the lines represent the strong collaborations between universities. The size of the node is proportional to the number of papers published; a round node represents the universities from the United States, and square nodes represent those outside the United States; a red color signifies the universities that exist in all 3-cores of the four periods and are members of the elite league we identified.

In Figure 3: Period 1 (1991–1998), we see a total of 43 organizations existing in the 3-core and there are only two non-U.S. universities. The connections in the graph are dense with a cluster beginning to take shape around the dominance of Harvard University, the University of Pennsylvania, New York University (NYU), and the University of Michigan. Figure 4: Period 2 (1999–2003) reveals a similar dominant pattern of actors and level of connectivity among 50 universities. The number of non-U.S. institutions has increased to seven, and they are located at the periphery. In Figure 5: Period 3 (2004–2006), we see that the connectivity pattern begins to lessen in intensity and there are 38 universities in the 3-core. Finally, in Figure 6: Period 4 (2007–2009), the pattern congeals around the elite league with an evenly distributed level of connectivity. If three of the four non-U.S. universities were removed, the figure would be seen as a relatively evenly distributed periphery around a dense, but discernible, U.S.-centric core of institutions.

It is found that 24 universities appear in the 3-core of all four periods, indicating these universities are very stable in terms of number of papers published and in their positions

FIGURE 3
3-core of the university coauthorship network in period 1 (1991–1998)

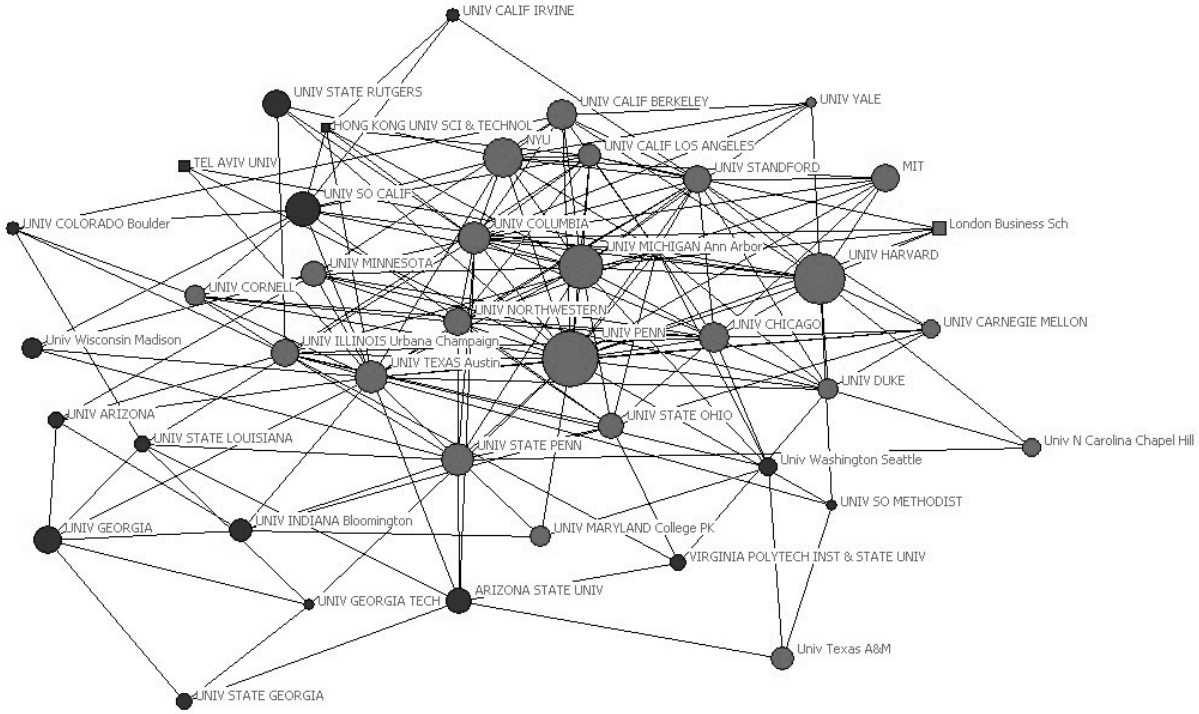


FIGURE 4
3-core of the university coauthorship network in period 2 (1999–2003)

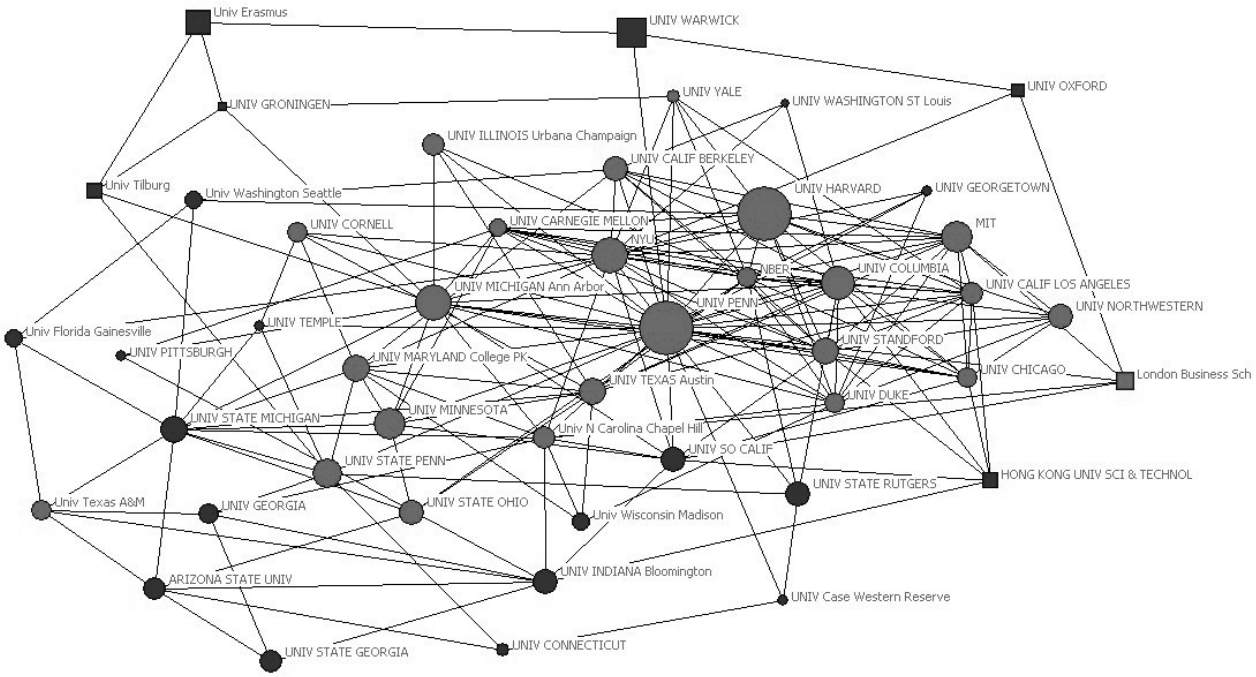


FIGURE 5
3-core of the university coauthorship network in period 3 (2004–2006)

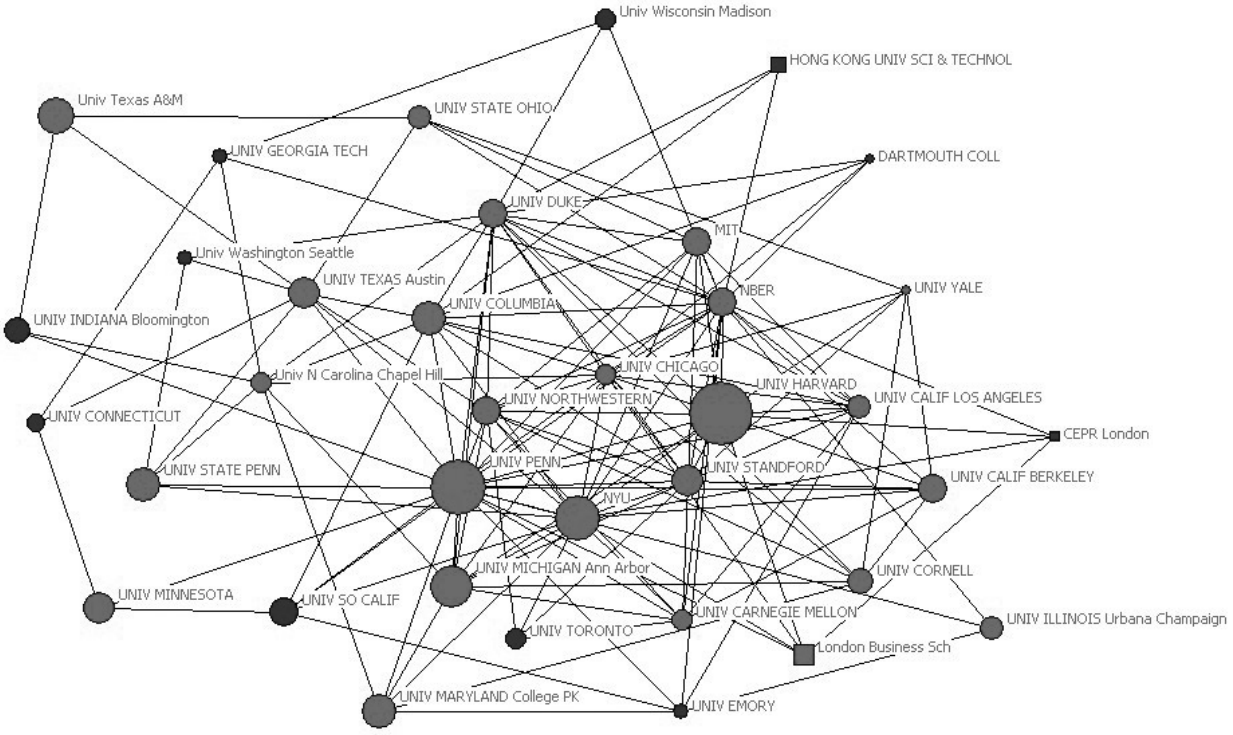
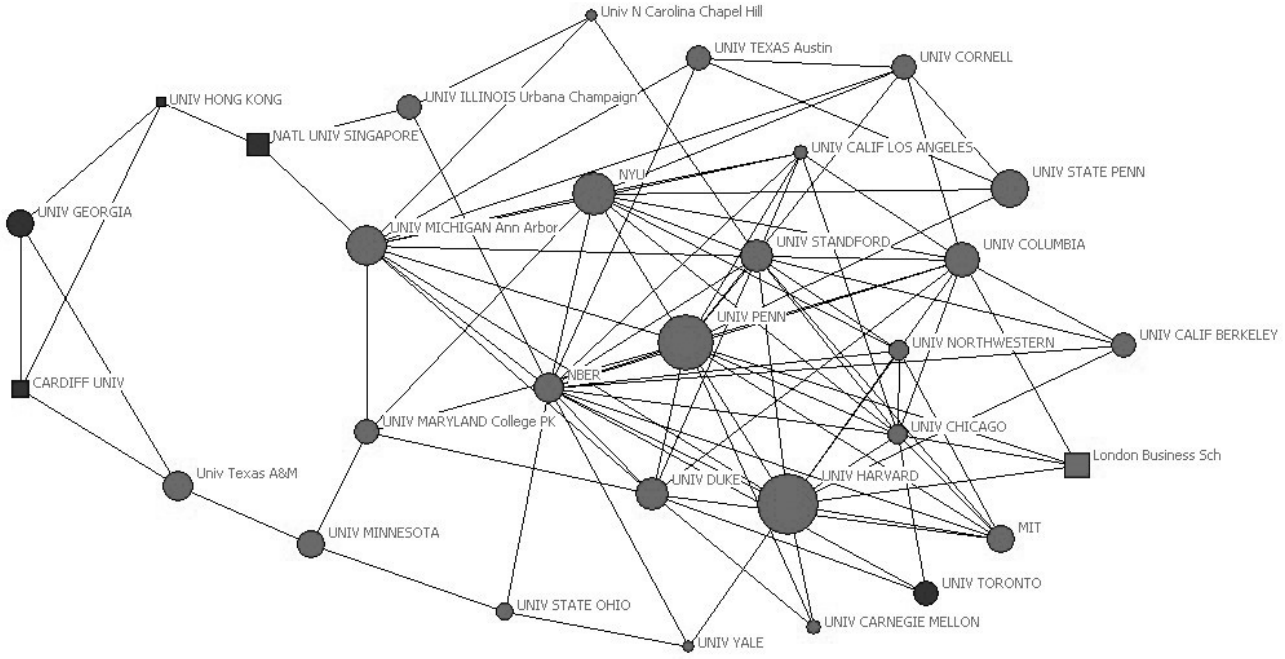


FIGURE 6
3-core of the university coauthorship network in Period 4 (2007–2009)

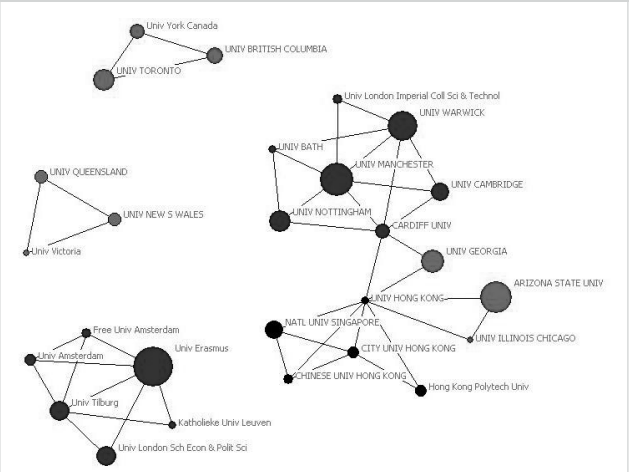


of centrality in the coauthorship network (see Table 2). These 24 universities constitute the elite league of business schools in the coauthorship network.

The regional pole of collaboration

A clique analysis of the 75 non-elite universities during period 4 of our study (see Figure 7) shows the emergence of potential new leagues based on geographic and national proximities and/or on the thematic proximity of associated journals.

FIGURE 7
Cliques among 75 non-elite universities in the FT Top 100 for period 4



Discussion

The elite league

When comparing our list of 24 elite universities with the top 24 institutions with the highest number of editorial board memberships of FT45 journals created by Burgess and Shaw (2010), we found that 20 universities are present in both lists. That is, 20 out of the 24 universities with the largest number of editorial board memberships are in the stable elite league we identified. The collaboration on journal editorial board memberships implies the potential for control, collusion, and a joint direction of a research agenda from the input side of the publication of management research. Our research has identified the elite league through the publication coauthorship network and reveals the outcome of such control, collusion and joint research direction. The consistent evidence from both the "intervening mechanism" and "outcome" perspectives maps the existence and boundary of the dominating elite league. The league is small in comparison to the management research community, which consists of 12,000 institutions that have published in ISI journals for the past 20 years, and its share is only 0.2%.

The loop of reinforcement

With the rapid expansion of the business education market, the accreditation bodies like AACSB, EQUIS, AMBA and EFMD are getting more active. The *Financial Time* rankings focus on an institution's research capabilities, its degree of internationalization, and the career trajectories of its graduates. As with all ranking bodies, a significant emphasis is placed on research, which is reflected in the quantity of articles published and associated citations. As such, in Figures-- 8 and 9, we present the evolution of the management research community as measured by the number of organizations publishing in ISI journals and the share of papers published by the elite league.

TABLE 2
24 Universities Constituting the Elite League (1991-2009)

	University*	Publication Ranking	Articles
1	HARVARD	1	1988
2	PENN	2	1975
3	UNIV. of MICHIGAN at Ann Arbor	3	1476
4	NYU	4	1468
5	COLUMBIA	6	1224
6	PENN STATE UNIV.	7	1213
7	UNIV. of TEXAS at Austin	8	1133
8	STANFORD	9	1106
9	MIT	11	1103
10	MINNESOTA	13	1088
11	BERKELEY	14	1071
12	NORTHWESTERN	16	1000
13	UNIV. of MARYLAND at College Park	19	972
14	UNIV. of ILLINOIS at Urbana Champaign	20	971
15	TEXAS A&M	22	964
16	UNIV. of CHICAGO	25	918
17	DUKE	26	912
18	OHIO STATE	27	908
19	CORNELL	28	878
20	UCLA	29	845
21	UNC - Chapel Hill	33	768
22	CARNEGIE MELLON	35	716
23	LONDON BUSINESS SCHOOL	36	715
24	YALE	69	503

* NBER (National Bureau of Economics Research) was excluded.

FIGURE 8
Growth in size of business research community

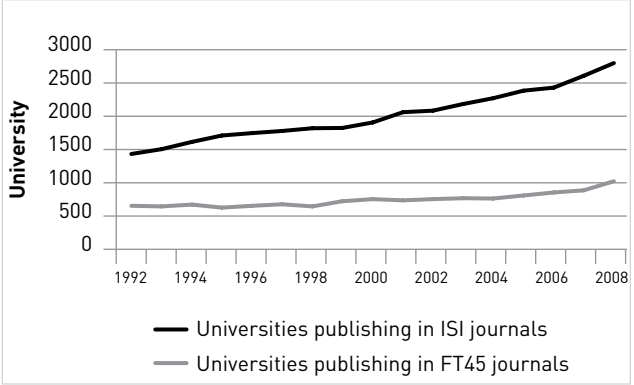
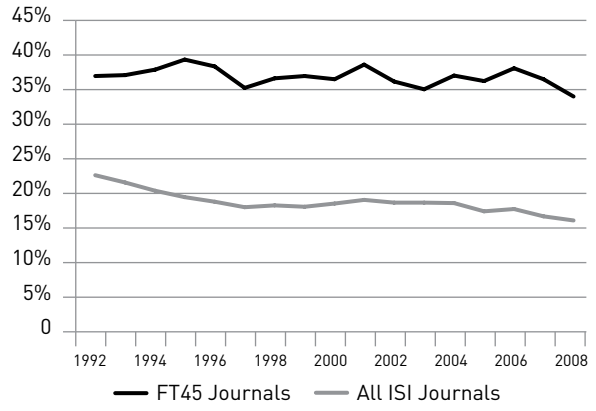


FIGURE 9
Share of papers authored or coauthored by the 24 elite universities

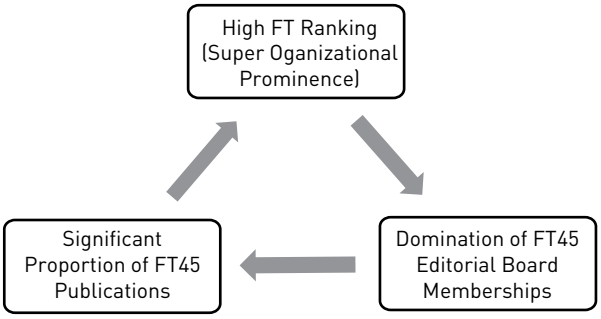


The size of the management research community has consistently increased and nearly doubled during the past 20 years (see Figure 8). During this same period, scholars from the 24 proposed elite universities have authored or coauthored a significant proportion of the total articles published each year (see Figure 9). This proportion has held amazingly stable over this period. While there has been almost 12,000 institutions involved in management knowledge production and more than 2,000 regular producers of more than five articles, the share of articles contributed by the 24 elite universities remains extremely high: every year about 15% to 20% of the total articles in ISI journals and 35% to 40% of FT45 articles have been authored or coauthored by researchers from the elite league.

The overwhelming domination of the elite league in the FT45 publications reflects the controlling positions of the universities on the FT45 editorial boards, as revealed by Burgess and Shaw (2010), and it presents a loop of reinforcement between the business school ranking system and the elite league. The number of articles published in FT45 journals is a key criteria for evaluating universities' research capability by the *Financial Times* in ranking MBA programs, which are the most important and profitable programs in business education market. This ranking is often used as a proxy for the business school ranking. We checked the *Financial Times'* top 100 global MBA rankings since 2000, when the ranking was first released, and found the elite universities remained extremely stable in the list with an extremely small fluctuation. Nineteen elite universities were in the list over all 17 years from 2000 to 2016; only three universities (Penn State University, Ohio State University, and the University of Illinois) dropped from the list once, and two universities (Texas A&M and Minnesota) dropped three times.

The U.S. domination of the FT45 journal editorial board memberships, the significant proportion of publications by board memberships' institutions, and the stable high positions in the ranking system may reinforce one another and create a positive upward spiral. The more editorial board memberships, the higher the chance that the universities will have papers published in the leading journals and the concomitant higher position in the ranking system, all of which leads to superior institutional prominence. As Ozbilgin (2004) pointed out, there is an "overall lack of transparency in recruitment of editorial board members" (p.219), and the prestige of the university with which the scholar is affiliated plays an implicit role in the decision process. This triangular loop creates an advantage for members of the elite league and effectively erects a barrier to new entry. Although we lack evidence to locate the starting point of this loop, the existence of the triangle presents an interesting phenomenon that may not happen by coincidence (Figure 10).

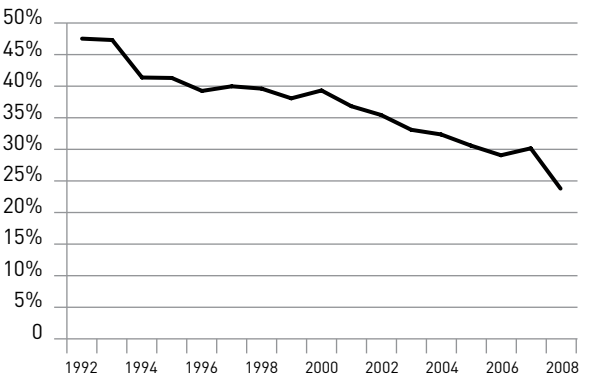
FIGURE 10
The loop of reinforcement



Decoupling organizational prominence and perceived quality

When we evaluate the perceived quality of the articles published by the elite league, we see an interesting picture. Although criticism exists on the citation count-based measurement (Lariviere and Gingras, 2010; Wang, 2014), it is still the most widely used tool to evaluate the quality of academic publications created by players at different levels (i.e., universities, departments, or individual authors). Our citation analysis reveals that the share of the total citations received by articles authored and coauthored by the 24 elite universities has eroded over time from 48% in 1991 to 23% in 2009 (see Figure 11). Although the elite universities' production has still remained high, their

FIGURE 11
Share of total citations of papers authored or coauthored by the 24 elite universities



perceived quality has been declining significantly, as evidenced by this erosion.

This erosion represents a gap between perceived quality and organizational prominence in the business education market, and the gap appears to be widening. This is leading to a divergence in information to such a point that the elite league of business schools could possibly be viewed as developing emergent and potentially deliberate strategies to influence organizational reputations as presented by the loop of reinforcement in the previous section. Organizational reputation is an overarching long-term impression, but its remanence is long and subject to discrepancies between signals of organizational prominence and perceived quality. Concurrently, business school rankings have been ostensibly frozen, as has memberships on the editorial boards of influential journals, which are highly dominated by universities in the elite league. How sustainable is the practice of using research articles' citation counts as the key criteria of organizational prominence when this is created by third-party ranking bodies that adopt such a limited number of journals in the evaluation?

Regional poles of collaboration

It has been well evidenced that U.S. universities dominate the publications in leading management journals (Mangematin and Baden-Fuller, 2008). In the elite league we identified from the publication coauthorship networks, U.S. institutions also dominate: there are 23 U.S. business schools in the elite league and only one non-U.S. However, segmentation is evolving and growing on a subdisciplinary basis (Biehl *et al*., 2006), so as to produce general statements to address key specific questions of local business managers in different markets or to produce specialized knowledge for professionals in different areas, such as marketing, finance, etc. This creates a demand for localized research for business study and education and for research projects to target local business issues. In Figure 7, we observe that the cliques (i.e., the closely collaborating universities after excluding the U.S.-oriented elite league) are clearly geographically clustered within distinct boundaries. The University of Erasmus and the University of Tilburg lead a six-university collaboration group mainly from Europe; the University of Manchester, the University of Warwick, and the University of Nottingham lead seven universities in Great Britain; the National University of Singapore and the four leading universities in Hong Kong build up the corps in Asia; and in Canada and Australia, three local universities in each country collaborate closely. These regional clusters could appear as local elite leagues. This trend may continue to develop and at some point compete and even challenge the current U.S. domination in management research publication.

Conclusion

The issues of academic research and business school rankings are dynamic, complex, and controversial. In this paper, we have explored a novel approach to investigate the relationships between universities, research publications, and ranking systems. A portion of our findings appears as a complement to the results of Burgess and Shaw (2010) and provides evidence of the existence of an elite league of universities dominating management knowledge creation and dissemination. The top universities build up such a stable and, to a certain extent, exclusive league through intensive collaborations with each other in order to maintan their superior statuses (Podolny, 1994). Although the league's members are at the peak of the academic pyramid and the league is quite small, there are reasons to be concerned about the possible unintended consequences of this hegemonic activity that may lead to stagnation in research innovation (Macdonald and Kam, 2007), higher homogeneity in research methodology and design, and what appears to be one single worldwide model of business education. The proxy of organizational prominence by business school rankings along with the power and influence afforded to the editorial boards of a small number of leading journals bring into question the relevance and rigor of this metric, given the stable dominance of the elite league in the process of publication selection. The domination on editorial boards, the high productivity of publications, and the prominent position in the institutional rankings reinforce each other and form a stable triangle that serves as the bastion on the wall of the academic citadel. Although this triangulation is stable and will likely continue to function in future years, new regional poles of collaboration are forming that may present a potential competing force that could challenge the existing domination of U.S. universities in the elite league.

While we believe that our analysis has exposed several important issues in the management knowledge creation system and business education market, we see several additional opportunities for future research. A limitation of our study is that the number of journals in our database grew during the study period. It could be argued that this growth slightly skewed our findings, and this deserves further exploration. Additional studies could be conducted using other units of analysis at departmental or country levels or could focus on coauthorship networks in specific management research disciplines. If different patterns of collaboration were discovered, they could be compared by the k-core decomposition and clique analysis technique. Another direction of further research might be the study of the dynamic of the elite league. Using longitudinal data to map the possible changes of boundary and structure of the collaboration networks, a detailed trajectory of the league's evolution could be created. Lastly, new channels of publication, new systems of research quality evaluation, and new approaches to business education delivery offered by Google citation, online open access databases, massive open online courses (MOOCs), etc. may fundamentally shift the dominant logic of the business education industry. Innovative studies on these emerging phenomena are expected to continue to explore this important topic.

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