

CITATION FOOTPRINTS ON THE SANDS OF TIME: AN ANALYSIS OF IDEA MIGRATIONS IN STRATEGIC MANAGEMENT

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We elucidate the intellectual progression of the strategic management field by examining knowledge flows to and from the Strategic Management Journal (SMJ) during the period 1980–2009. We provide a detailed mapping of the evolution of the intellectual structure of the field and identify its input-output dependency relationships with other fields. Analysis of citation data using three analytic techniques: log-multiplicative model, pathfinder analysis, and entropy analysis allow us to discern strategic management's influence on and engagement with other disciplines. The results show that, within the intellectual universe of strategic management, SMJ has played a central role, both as a source and store of knowledge. We notice that, over time, there has been a decline in practitioner orientation, greater communication with finance and sociology, and increasing linkages with international business and entrepreneurship. Copyright © 2015 John Wiley & Sons, Ltd.

INTRODUCTION

The launching of the *Strategic Management Journal* was a watershed event in the evolution of the field of strategic management. Coming as it did a year after Schendel and Hofer (1979) published their seminal volume and coinciding with the publication of Porter's *Competitive Strategy*, the *Strategic Management Journal* provided researchers for the first time a forum uniquely devoted to publishing strategy research. In the next three decades, strategic management has come to be accepted by

leading universities around the world as a rigorous academic discipline. Its popularity among academics is evidenced by the fact that the Business Policy and Strategy Division of the Academy of Management is one of its largest divisions. Courses on strategy are now integral parts of the MBA curriculum in universities around the world. Equally important, the research of strategy scholars like Michael Porter and C. K. Prahalad are prominently presented in the popular business press.

Strategy researchers take legitimate pride in the interdisciplinary orientation of their field (Jemison, 1981; Porter, 1981) as well as its relevance to the world of practice. Right from the beginning, the field has been open to influences from a variety of disciplines and has erected minimal entry barriers to scholars from other disciplines to enter and contribute to its domain. As the main forum for publication of strategy research, *Strategic Management*

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Journal reflects the changing influences on the field from other disciplines. In a very thought-provoking article, March (2005) argued that, notwithstanding the broad mandates that journals start out with, over time most of them succumb to “creeping parochialism.” Such parochialism is the inevitable result of the shared world view of members in a journal’s intellectual community. Over time, a certain “local convergence” occurs in terms of theoretical and methodological approaches considered appropriate, resulting in the creation of intellectual silos that rarely communicate with each other. Daft and Lewin (2008) suggested that one way to overcome such creeping parochialism is through knowledge flows among research subcommunities. However, the patterns of such flows are not well understood and have rarely been subjected to rigorous analysis. They also suggested that academic journal niches are linked together through input-output dependency relationships and, therefore, a study of citation relationships across journals can provide valuable insights about the intellectual evolution and knowledge structure of a field as well as the pattern of idea migration across disciplines.

We believe that a longitudinal study of the input-output dependency relationships of *Strategic Management Journal* can serve several purposes. First, it can delineate the intellectual universe to which the field of strategy belongs. Second, comparisons of knowledge flows across time can provide valuable insights regarding the changing patterns of intellectual influences on strategy. Third, it can provide an assessment of the contribution of the field of strategy to other intellectual niches within the field of management and beyond, thus demonstrating its legitimacy or lack thereof as a vibrant discipline. As Daft and Lewin (2008) assert, there are two kinds of “relevance” for an academic discipline or journal: relevance to the problems of practice and relevance to the research of other academics. Fourth, by employing sophisticated network analysis on citation networks, we can establish the centrality or peripherality of specific journals within a network. Finally, input-output dependency relationships can identify possibilities of brokerage and closure within these networks. Thus, the exploration of ideational trails to and from the field of strategic management constitutes the primary objective of our research.

It is important to clarify that our goal in this paper is not to develop any kind of journal ranking. Although establishing a pecking order among

journals may be a needed and legitimate activity for establishing reward systems in academic departments, such rankings accomplish limited scholarly purpose and at times could even be misleading. Further, our goal is to study the knowledge flows to and from strategic management, and not to evaluate SMJ. SMJ is central to our analysis only because it is the main forum for publication of strategy research (Hoskisson *et al.*, 1999; Ramos-Rodriguez and Ruiz-Navarro, 2004). Given that the identity of the strategic management field is “ambiguous and highly contestable” (Nag, Hambrick, and Chen, 2007: 936), relying solely on SMJ for our analysis avoids the judgmental issues associated with deciding what article is a strategy article and what is not. The remainder of this paper is organized as follows. We begin by providing the rationale for studying knowledge flows across disciplines. This is followed by an overview of bibliometric analysis as a tool for understanding the intellectual structure of a field. In the next section, we describe our sampling procedure and provide a detailed description of the three major analytical techniques employed in this study, namely, log-multiplicative modeling, pathfinder analysis, and entropy analysis. This is followed by a presentation of our findings and a discussion of what the results mean. In the final section, we describe the limitations of our study, provide directions for future research, and offer our concluding comments.

INTERDISCIPLINARY KNOWLEDGE FLOWS

There have been several efforts, over the years, to understand mutual influences among the social sciences. While certainly the social sciences have grown through division of labor and the inevitable specialization of researchers by relatively narrow topic areas, there is also some concern that such fragmentation can hinder the flow of ideas across specialties, the cross-pollination of ideas across narrow knowledge domains, and the necessary integration of the social sciences that can lead to a more holistic understanding of social problems and their resolution. In one of the earliest efforts at understanding disciplinary provincialism in the social sciences, Rigney and Barnes (1980) found evidence that, while sociology, anthropology, and political science are relatively open to influences from

other social sciences, psychology and economics are relatively self-contained. Although Swedberg (1990) argued that the days of "cold war" between economics and other social sciences have come to an end, and that both economists and sociologists are now paying more attention to each other, a very detailed analysis of mutual influences by Baron and Hannan (1994) concluded that there is no evidence that economics has influenced sociology's core despite all the rhetoric to the contrary. In other words, the "Berlin Wall" between disciplines is still holding firm. A detailed analysis of interdisciplinary influences by Pieters and Baumgartner (2002) found that economics is the primary source of knowledge in the network of social science and business disciplines, but economics itself does not build from knowledge from other disciplines. They also found that finance builds so much from economics that it can be viewed as an integral part of economics. The second central discipline they identified was management because accounting, MIS/operations research, and marketing build substantially on knowledge developed in management. Similarly, management draws heavily from psychology and sociology. A study of influence patterns between econometrics and other disciplines by Wansbeek and Wedel (1999) concluded that, while marketing researchers draw heavily from econometrics, econometrics does not reciprocate such interest. On the other hand, "finance has attracted a lot of attention from econometricians and has spawned an econometrics literature of its own" (p. 6). More recently, Cantwell, Piepenbrink, and Shukla (2014) found that the *Journal of International Business Studies* is helping to connect disciplines that do not normally communicate with each other, thereby promoting their integration.

Although cross-disciplinary influences are generally considered to be beneficial, such enthusiasm is not universally shared. A quarter century ago, Hirsch, Michaels, and Friedman (1987) voiced concerns about the possible seduction of sociology by economics. A similar note of alarm has been repeatedly sounded in the field of organization studies as well. For example, Hirsch, Friedman, and Koza (1990) warned strategy scholars about the "risk of romance" with economics. Ghoshal and Moran (1996) offered a withering critique of the increasing influence of transaction cost economics and concluded that it is "bad for practice." More recently, Ferraro, Pfeffer, and Sutton (2005:21) warned that the language and assumptions of

economics are self-fulfilling and that this can cause societies, organizations, and leaders to "become trapped in unproductive and harmful cycles of behaviors that are almost impossible to change."

Individual researchers, institutions, journals, and disciplines are embedded within a network of interactions with other individuals, institutions, journals, and disciplines. Flows within a network can be cognitive (i.e., knowledge), expressive (i.e., affect), instrumental (i.e., power), or objective (i.e., goods and capital) (Gupta and Govindarajan, 1991). Given our objective to understand the mutual interdependencies among disciplinary areas, our emphasis in this paper is on the cognitive dimension. One of the most powerful ways to capture knowledge flows among intellectual communities is to track patterns of citations. There is a considerable body of research in the innovation area that emphasizes the value of "learning-by-interacting" (Gertler and Levitt, 2005). To the extent that citations represent one type of interaction, it does lead to some degree of learning by scholars in one area of ideas in another area.

One methodological approach that has been commonly used to study resource flows is input-output analysis. Ever since Leontief (1951) presented his model of the structure of the American economy through input-output tables, tracking the inflows and outflows of resources from an industry has become an important toolkit in the analysis of the economy. Organizations, organisms, and academic disciplines have their distinctive ways of converting their inputs into outputs. These unique conversion processes constitute the isolating mechanisms that maintain their distinctive characteristics. Further, the ecological communities that they belong to are characterized by resource flows that can be mathematically modeled through input-output analysis. Academic fields can exchange cognitive resources (i.e., knowledge flows) with either a large or small number of other fields, a process that enables us to classify them as either "generalist" or "specialist" disciplines. Studying both the density of knowledge flows with another discipline and the diversity of disciplines with which knowledge flows occur over extended periods of time can help us to gain insights about the movement of a discipline within the generalist-specialist continuum. As Beard and Dess (1988) point out, a major strength of input-output analysis is that it not only enables one to understand direct exchange of resources between two industries, but also indirect linkages even in the absence

of direct resource exchanges. They advocated the use of input-output relationships to identify each organizational species' niche within an ecological community and to model each species' direct and indirect dependence on other species for resources. Developing input-output models of academic disciplines similarly holds the potential for identifying each disciplinary area's niche and its direct and indirect symbiotic resource exchanges with other disciplines for ideas, paradigms, and methodologies.

BIBLIOMETRIC APPROACHES FOR UNDERSTANDING KNOWLEDGE FLOWS

As an academic field reaches maturity, it is common for scholars to undertake detailed analyses of the field itself in order to delineate its domain, explain its evolutionary patterns, identify significant intellectual influences, assess its contributions, and plan its future. The field of strategic management is no exception. In recent years, the field has been enriched by such major contributions as a historical analysis by Hoskisson *et al.* (1999), a lexicographic analysis by Nag *et al.* (2007), and content analyses by Boyd, Gove, and Hitt (2005). Yet another approach that has gained currency in recent years is bibliometric analysis (Nerur, Rasheed, and Nataraajan, 2008; Ramos-Rodriguez and Ruiz-Navarro, 2004; Ronda-Pupo and Guerras-Martin, 2010).

Social networks are essentially comprised of interactions for the exchange of resources (Knocke and Burt, 1982). As Pieters and Baumgartner (2002: 484) point out, "journal citation networks are specific social networks in which the actors are journals, the valued resources are ideas and knowledge, and the interactions are citations between journals." The relationship between two journals may be either one of cohesion (reciprocal citations), unidirectional flow (non-reciprocal citation) or mutual non-recognition (no citations). Given that each journal has a defined domain of interest, some very narrow and others rather broad, citation patterns also reflect the level of interaction between scholars in two disciplinary areas.

Bibliometric analyses are based on certain underlying assumptions. First, they assume that references cited in a research paper are reliable indicators of their influence. Thus, a paper or journal that is cited more often is assumed to be more influential than one that is cited less. As

March (2007: 541) commented, "frequent citation provides a signal that suggests there might be something of interest, or at least acceptability, in a reference." Second, over time, the accumulation of citations by a community of researchers acts as a "vote" for the importance and contribution of a paper, a scholar, or a journal. Third, bibliometric data can validate and complement the results of other approaches such as expert judgment of experienced researchers or fine-grained analysis based on extensive reading. Bibliometric methods, such as citation analysis and co-citation analysis, use citations as raw data. Citations have the advantage of quantifiability and objectivity and "can avoid some of the potential subjective biases" inherent in other types of analyses (Nerur *et al.*, 2008: 320).

Bibliometric methods have been gaining greater acceptance in a variety of research disciplines, ranging from marketing (e.g., Baumgartner and Pieters, 2003) and international business (Sullivan, Nerur, and Balijepally, 2011) to medical informatics (e.g., Morris and McCain, 1998). Authors cite the work of other scholars for a number of reasons. It may be to acknowledge intellectual debt, to provide legitimacy to one's arguments, to place one's own work in the overall context of the study of a topic, or sometimes even to refute another's work. In one sense, citations represent communications among authors and the interplay of ideas. They leave a clear intellectual footprint of where the author has been in his scholarly journey. Cronin referred to them as "frozen footprints on the landscape of scholarly achievement" (Cronin, 1984: 25). Bibliometric researchers study these footprints to trace ideational trails and retrospectively chronicle the history of a discipline. It helps them identify the intellectual currents of a discipline, the waxing and waning of outside influences, and the twists and turns in its advancement. The field of strategic management is particularly suitable to this type of analysis due to its eclectic origins and multidisciplinary orientation.

In our study, we employ three distinct analytic techniques to trace the input-output dependency relationship between the field of strategic management and other disciplines: analysis of citations using a log-multiplicative model, pathfinder analysis, and entropy analysis. Each of these analyses is performed with journals as the units of analysis. Each journal represents a disciplinary niche. The citation flows across journals are analyzed to gain insights into patterns of idea migrations. The citation analysis involving a log-multiplicative

model is a sophisticated technique that can identify influential sources and storers of knowledge after controlling for a number of factors (Pieters and Baumgartner, 2002). Pathfinder analysis is then used to generate a network structure of journals with which the *Strategic Management Journal* has input-output dependency relationships. The network structure is then subjected to an entropy analysis to understand how specific journals contribute to the stability of the network. These three analyses, together, can provide a reasonably comprehensive view of the evolution of the field, its defining influences, and its long-term impact. The analyses are repeated for well-defined blocks of time—five years—over the entire 30-year history of the existence of the *Strategic Management Journal*.

METHODOLOGY

Sample selection

Our primary goal in this paper is to identify the input-output dependency relationships between *Strategic Management Journal* and other journals. Therefore, the first step in our research is to identify the journals that have the highest frequency of knowledge interchange with SMJ. In other words, journals that either borrow frequently from SMJ or serve as valuable sources of knowledge to SMJ are the units of interest in our study. The *Journal Citation Reports* (JCR) for the social sciences was used for this purpose. These reports may now be accessed online through ISI's Web of Knowledge database published by Thomson Reuters. Since the data for the earlier years was not available online, we had to rely on journal citation reports that were on other media (e.g., print, microfiche, and CD-ROM).

Since our primary goal was to chronologically elucidate the ideational linkages between strategic management (as represented by SMJ) and other niche research communities, our time period of interest is 1980 (the year SMJ was first published) to 2009. In order to elicit the evolutionary patterns in SMJ's intellectual exchanges, we divided this 30-year period into six blocks of five years each. Division of the 30-year period into blocks of five years each is considered appropriate for a number of reasons. First, division into smaller time periods would result in each time period being too small to clearly see temporal patterns emerging. Second,

it would result in so many diagrams and tables that it would lead to cognitive overload. Finally, larger block sizes—say 10 years—would lead to an extent of aggregation of data that would prevent us from discerning shorter-term shifts in citation patterns. For each time period, the following steps were carried out.

Identification of journals

As mentioned earlier, the JCR was used to select (1) the top 20 journals that cite SMJ, and (2) the top 20 journals that are cited by SMJ. Thus, we have a sample that comprises journals that are either highly influenced by SMJ or play an important role in advancing the intellectual frontiers of strategic management. It must be noted that some journals may have very high reciprocal citations with SMJ and may therefore be among the top 20 in terms of being cited by or citing SMJ. Since there was not much citing activity in the early years of SMJ, our sample sizes were understandably small (11 for the 1980–1984 period, 17 during 1985–1989). However, the sample grew to 31 in 2000–2004 and 34 in 2005–2009, spurred perhaps by the increasing diversity of research traditions within strategic management as well as by the increasing influence that SMJ had on other research fields. Table 1 lists the journals that appeared in one or more time periods used in our study.

Compiling the cited-citing matrix

The next step is to compile an $N \times N$ matrix of citation flows between each pair of journals, where N is the number of journals included in the analysis. A partial matrix from our data set for the period 2005–2009 is shown in Figure 1.

The rows of the matrix represent citing journals, while the columns refer to cited journals. Thus, in Figure 1, SMJ cites AMJ 1,696 times and is, in turn, cited by AMJ 1,351 times. The diagonals represent self-citations, i.e., SMJ cites itself 3,995 times. The $N \times N$ matrix for a given time period is an aggregate of five matrices, each of which is for a year in that period.

The $N \times N$ matrix obtained in the above step is subsequently subjected to log-multiplicative, pathfinder, and entropy analyses. These steps are summarized in Figure 2. In the subsequent section, we discuss the various analyses that were performed in our study.

Table 1. Journals used in the analysis

Journal name	Abbreviation
Academy of Management Journal	AMJ
Academy of Management Review	AMR
Advances in Strategic Management	AdStratMgt
American Economic Review	AER
American Journal of Sociology	AJS
American Sociological Review	ASR
Administrative Science Quarterly	ASQ
British Journal of Management	BJM
Business Horizons	BusHzn
California Management Review	CMR
Entrepreneurship Theory and Practice	ETandP
Harvard Business Review	HBR
Human Relations	HumRel
International Journal of Human Resource Management	IJHRM
Industrial Marketing Management	IndMktMgt
International Journal of Operations and Production Management	IJOPM
International Journal of Technology Management	IntTechMgt
Journal of Business Ethics	JBE
Journal of Business Research	JBR
Journal of Business Venturing	JBV
Journal of Economic Behavior and Organization	JEconBehavOrg
Journal of Finance	JF
Journal of Financial Economics	JFE
Journal of International Business Studies	JIBS
Journal of Industrial Economics	JIndEcon
Journal of International Marketing	JIntMkt
Journal of Marketing	JMkt
Journal of Management Studies	JMS
Journal of Marketing Research	JMR
Journal of Management	JoM
Journal of Operations Management	JOpM
Journal of Political Economy	JPolEcon
Journal of Product Innovation Management	JProdInMgt
Journal of World Business	JWB
Long Range Planning	LRP
Management Science	MgtSci
Organization Science	OrgSci
Organization Studies	OrgStud
Quarterly Journal of Economics	QJE
Rand Journal of Economics	RandJEcon
Research in Organizational Behavior	ResOrgBehav
Research Policy	ResPol
Review of Economics and Statistics	RevEconStat
Sloan Management Review	SMR
Strategic Management Journal	SMJ
Technovation	Techn

Citation analysis using log-multiplicative model

Much like the exchange of various types of resources among actors in a social network, journals borrow ideas and concepts from one another to advance the corpus of knowledge in their fields (e.g., see Baumgartner and Pieters, 2003). Thus,

the matrix of citations to and from journals may be analyzed to assess their relative importance and/or influence, to visualize the strength of their relationships, and to determine their positional advantages in the network, if any. As discussed earlier, the rows of the matrix are *citing* journals that *send* citations to others in the network, while the columns are *cited* journals that *receive* citations from others in the network.

Multidimensional scaling (MDS) and log-linear analysis have been used to assess relationships among journals (Eagly, 1975; Stigler, Stigler, and Friedland, 1995). A log-multiplicative model accepts an asymmetric matrix as its input, allows us to determine the appropriate number of dimensions, and makes it relatively easy to analyze the results, thereby overcoming the shortcomings of MDS and log-linear models (Pieters and Baumgartner 2002). Following Pieters and Baumgartner (2002), we specify the following log-multiplicative model to assess the relative importance of journals:

$$\log F_{sr} = u + u_s^S + u_s^R + \delta_{sr} + \sum_{m=1}^M \xi_s^m \psi^m \xi_r^m$$

where *S* and *R* are row (i.e., citing) and column variables (i.e., cited). F_{sr} represents the expected frequency of a cell (intersection of *s* and *r*), and the standard log-linear parameters specified in the model are given by the symbol *u*. The main log-linear parameters of interest in our study are u_s^S and u_s^R , with the former being an indicator of a journal's importance as a storero/pository of knowledge and the latter signifying the value of a journal as a source of knowledge. Since the log-linear parameters are estimated independently, the assessment of a journal's importance as a source (or a storero) is not biased by either self-citations or the extent to which it cites (or is cited) by other journals in the network.

δ_{sr} refers to the effect that the diagonal values (i.e., self-citations) have. The cohesion among journals based on their mutual influence (i.e., reciprocal citations) is estimated by the term $\sum_{m=1}^M \xi_s^m \psi^m \xi_r^m$. *M* denotes the number of dimensions of association between *S* and *R*. Typically, multiple dimensions of association are analyzed, and the model with the best fit is selected based on the Bayesian information criterion (BIC). In particular, the model with the lowest BIC value is deemed to be the best fit for the data. The interested reader may refer to Pieters

CITING JOURNAL	CITED JOURNALS			
	SMJ	AMJ	AMR	HBR
SMJ	3995	1696	1014	283
AMJ	1351	2449	1145	156
AMR	1004	921	1524	176
HBR	0	0	0	18

Figure 1. A sample matrix of citation flows between journals

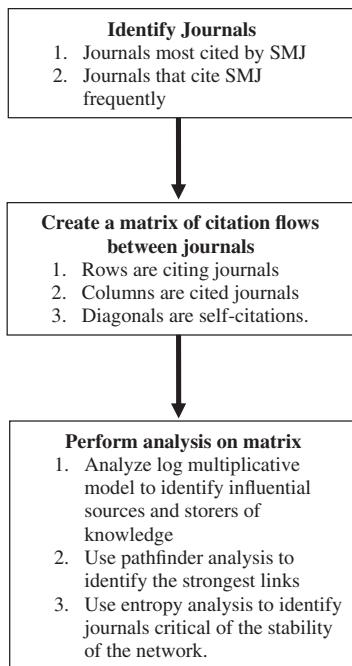


Figure 2. Outline of our research methodology

and Baumgartner (2002) for a detailed explanation of the model.

Pathfinder analysis

The scholarly exchanges among journals within a field, or across academic disciplines, may be analyzed using a graph-theoretic approach called pathfinder analysis. The technique, which has its origins in cognitive psychology (e.g., Schvaneveldt, 1990), has recently been employed in citations studies (Nerur *et al.*, 2008; Sullivan *et al.*, 2011; White, 2003). Pathfinder analysis relies on a similarity/dissimilarity matrix to generate a graph known as PFNet.

A sample PFNet is shown in Figure 3. As indicated earlier, a PFNet is essentially a graph with nodes and edges. Each node in a PFNet represents

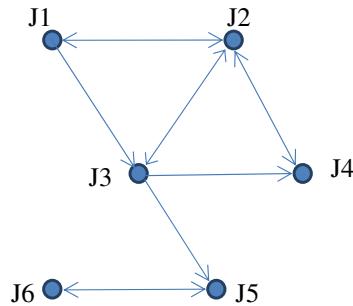


Figure 3. An example of a PFNet

the unit being analyzed, typically an author or a journal in citation studies. The nodes in our example, as well as in our study, denote journals. An edge between two nodes (journals in this example) represents a citation flow, with a bidirectional link implying a strong reciprocal citing relationship between the two journals. Thus, in Figure 3, J1 and J2 exhibit strong mutual citation flows. On the other hand, there is a unidirectional citation flow from J1 to J3, suggesting that J3 does not reciprocate to a comparable extent the high frequency of citations it receives from J1. Technically, a link from J3 to J1 does not appear because there exists an indirect path from J3 to J1 (say, from J1 to JX to J3 where JX represents some other journal in the network) that is shorter than the direct path. Likewise, the absence of a link between J4 and J5 means that there exists an indirect path from J4 to J5 (e.g., J4–J3–J5) that is shorter than the direct link between them. Thus, the PFNet emphasizes the strongest relationships among the journals in a network (Schvaneveldt, 1990). In particular, it allows the researcher to discern the following:

1. the strongest relationships among journals in a network based on citation flows,
2. distinct clusters of journals that share reciprocal relationships, and
3. centrality/peripherality of journals.

The graphic representation of the network of journals also enables one to see which journals play a brokering role, serving as a bridge between otherwise unconnected networks. For example, in Figure 3, J2 has strong reciprocal ties with J1, J4, and J3. J1 has no significant relationship with J4, either in terms of citing or being cited. J1 sends a noteworthy amount of citations to J3, which, in turn, cites J4 and J5 significantly. However, J3 does not reciprocate the citations it receives from J1; neither does it receive a significant quantity of citations from either J4 or J5. The prominent role that J2 plays is evident from the figure.¹ It is also apparent from the figure that there are two clusters, each of which has journals with strong reciprocal ties. The first cluster has the journals J1, J2, J3, and J4, and the second distinct cluster is made up of J5 and J6. There would have been only one cluster if J3 and J5 had had two-way communications.

The journal-to-journal citation matrix that was described earlier was used to generate a PFNet showing the journals and their relationships. The PFNet is essentially a communication graph that can be analyzed to assess the extent to which each journal contributes to the stability of the network (Cooper *et al.* 1993; Shaw, 1981, 1983; Sullivan *et al.*, 2011).

Entropy analysis

Concepts from information theory may be applied to determine the extent to which each journal contributes to the order or stability of the communication network, which is represented as a graph (Shaw, 1981). The graph may consist of independent clusters of mutually dependent journals, as is likely to happen if mutual or reciprocal influence is used to determine the presence of a link between journals. The entropy or level of disorder for the entire graph is first computed as follows (Cooper *et al.*, 1993):

$$I_e = \left(\frac{1}{\log_{10} 2} \right) \left(\log_{10} \left(\frac{N!}{N_1! N_2! \dots N_s!} \right) \right)$$

where N represents the total number of nodes (i.e., journals), N_1 the number of journals in the first

¹ It must be noted that our use of the term “significant” does not imply statistical significance. “Significant relationship” between two journals, say, A and B, implies that there exists no indirect path between A and B that is shorter than the direct link between the two.

cluster, N_2 the number of journals in the second cluster, and so forth. As mentioned earlier, each cluster comprises journals that share reciprocal ties. Journals in a cluster are said to be cohesive (Pieters and Baumgartner, 2002). The entropy, I'_e , is then calculated after removing a journal from the network. If I'_e is greater than I_e , the journal is said to increase the order or stability of the graph. If I'_e is equal to I_e , the journal does not affect the stability of the network. A journal has an adverse effect on the network (i.e., decreases the order of the network) if its removal results in a decrease in the entropy measure. For the sake of clarity, we show how entropy is calculated for each of the six journals in Figure 3.

As discussed earlier, we have two distinct clusters. The first, N_1 , has a size of four (J1, J2, J3, and J4) and the second, N_2 , has two journals (J5 and J6). Therefore, the entropy of the network is computed as follows:

$$I_e = \left(\frac{1}{\log_{10} 2} \right) \left(\log_{10} \left(\frac{6!}{4!2!} \right) \right) = (3.321928) \\ \times (1.176069) = 3.906891$$

The removal of J1 will reduce N to 5 and N_1 to 3 members. Therefore, the entropy of the network upon removal of J1 is

$$I_{J1} = \left(\frac{1}{\log_{10} 2} \right) \left(\log_{10} \left(\frac{5!}{3!2!} \right) \right) = (3.321928) \\ \times (1) = 3.321928$$

Notice that the removal of J1 reduces the entropy of the total network ($I_{J1} - I_e = -0.584963$). Thus, J1 is detrimental to the stability of the network. It can be easily seen that J3 and J4 have the same effect on the network. The removal of J2 causes the cluster N_1 to disintegrate—J1, J3, and J4 stand alone, since they are no longer bound together by J2. Therefore, the entropy of the network after J2 is removed will be

$$I_{J2} = \left(\frac{1}{\log_{10} 2} \right) \left(\log_{10} \left(\frac{5!}{2!} \right) \right) = (3.321928) \\ \times (1.778151) = 5.906891$$

The increase in entropy of the network when J2 is removed ($I_{J2} - I_e = 2.0$) implies that J2 is critical to the order of the network. The removal of J5 or J6

would impact N_2 and not N_1 . N_2 now becomes 1. Therefore, the entropy of the network when either J5 or J6 is removed will be

$$I_{J5} = \left(\frac{1}{\log_{10} 2} \right) \left(\log_{10} \left(\frac{5!}{5!} \right) \right) = (3.321928) \times (0.69897) = 2.321928$$

Thus, the removal of J5 (or J6) would decrease the entropy of the network, suggesting that neither of them contributes to the stability of the network. It is clear from our analysis of Figure 3 that J2 is the only journal that is critical to the stability of this network. Further, J1, J3 and J4, while being detrimental to the network, are less disruptive than J5 and J6.

RESULTS AND DISCUSSION

Not surprisingly, the number of journals in SMJ's citation environment was rather limited in the early time periods. However, this number has steadily increased, suggesting that there are now more journals frequently citing or being cited by SMJ than in the field's early stages of evolution. In addition to SMJ, only three journals—*Academy of Management Journal*, *Academy of Management Review*, and *Administrative Science Quarterly*—figure in all the time periods. Some journals, such as *Quarterly Journal of Economics*, *Journal of Marketing*, and *Journal of Management Studies*, have appeared in most of the time periods. *Long Range Planning*, which was a key member of the strategic management field's network in the first five time periods, does not merit inclusion in the 2005–2009 time frame. It is also interesting to note that it is only from 1990 that *Journal of Business Venturing*, *Journal of Financial Economics*, and *Organization Studies* have started playing a major role in the evolution of the strategic management field. Likewise, the field's ties with *Research Policy* (only from 1995) and *Journal of Business Ethics* (from 2000) did not happen until much later. There are several journals that have had infrequent citation links with strategic management, a case in point being *Business Horizons*, which appeared only in the first time period (i.e., 1980–1984).

Log-multiplicative model

For each time period, a log-multiplicative model with varying dimensions of association between

the sending and receiving journals was analyzed. A software program, ℓ EM, developed at Tilburg University in the Netherlands (Vermunt, 1997) was used to estimate the log-linear parameters. The BIC was the basis for determining the appropriate number of dimensions. The number of dimensions varied from 4 (in 1980–1984) to 12 (2005–2009). The ℓ EM protocol yields log-linear parameters to assess importance of journals in terms of citing (i.e., sending) as well as being cited (i.e., receiving). The estimated impact of each journal as a source of knowledge is shown in Table 2, and the influence of each journal as a storer is shown in Table 3.

Table 2 shows the influence scores for each journal in terms of being a source of knowledge to other journals in the network. The scores are scaled in such a way that the sum of individual journal values will be 0 (Pieters and Baumgartner, 2002). Therefore, journals with positive values have a more-than-average influence on the network. It can be seen from Table 2 that SMJ has been the most valuable source of knowledge for the last three time periods. Its value as a source was understandably low in its formative years (see 1980–1984). ASQ has consistently maintained a high rank as a source throughout all the periods. AMJ and AMR have been among the top four throughout the time period of interest in our study (i.e., 1980–2009).

Table 3 highlights the importance of journals as storers of knowledge. This is based on the citations that row journals send to column journals. Once again, SMJ has been the most influential storers in the network for all but one time period (1980–1984). LRP's role as a storer was very good in the first time period (rank 4), but it has since declined, finally dropping out of the strategic management field's citation network in the last period (2005–2009). *Journal of Business Research*, which was seventh as a storer when it joined the network in 1995, has moved to second place in the last time period. AMR has seen its position decline as a storer of knowledge in later time periods, which is rather surprising. This may perhaps be attributable to the fact that in recent years a relatively higher proportion of AMR articles have come from microdisciplines than from strategy.²

² We repeated the analysis with six-year time blocks instead of five-year blocks to assess robustness of results. The patterns observed essentially remained the same, especially in the case of core journals.

Table 2. LEM scores of journals as sources

Journal	1980–1984		1985–1989		1990–1994		1995–1999		2000–2004		2005–2009	
	Value	Rank	Value	Rank	Value	Rank	Value	Rank	Value	Rank	Value	Rank
AMJ	1.01	6	2.74	2	2.32	6	1.51	3	1.89	3	1.97	2
AMR	1.43	4	2.50	3	2.33	5	1.50	4	1.77	4	1.32	6
AdStratMgt	-6.09	10	1.88	6	2.38	4	1.04	5	1.63	5	-1.43	26
AER							0.29	7	0.94	8	0.96	9
AJS									0.80	11	0.79	14
ASR										1.94	3	
ASQ	2.44	3	1.65	7	2.63	2	1.85	2	2.01	2	-1.60	28
BJM									-2.25	28		
BusHzn	1.07	5									-1.96	29
CMR	1.00	7	0.48	12	0.60	10	-0.12	13	0.36	16	-0.96	25
ETandP												
HBR	3.01	2	2.17	5	2.68	1			1.52	6	0.96	10
HumRel							-0.82	18				
IJHRM											-1.96	29
IndMktMgt											-2.02	30
IJOPM									-3.38	31		
IntJTechMgt									-2.35	29	-2.64	33
JBE									-2.11	27	-1.37	27
JBR							-2.08	22	-1.01	23	-0.66	24
JBV					-0.53	16	-1.14	20	-0.33	20	-0.01	20
JEconBehavOrg							-0.50	15	0.13	17	-0.01	21
JF	-8.71	16	-3.26	19			0.71	13	0.97	8		
JFE			0.31	14	-0.04	12	0.83	10	0.85	12		
JIBS	0.60	10	0.53	12	0.00	11	0.66	14	0.58	16		
JIndEcon (JIE)					-1.08	19	-0.38	21				
JIntMkt								-2.94	30			
JMkt (JMark)	1.03	8	-8.81	21	0.19	8	0.78	12	0.87	11		
JMS	-1.99	15	0.44	13	0.11	9	0.00	19	0.12	19		
JMktRes									0.79	15		
JoM			-0.90	14	0.59	11	0.01	10	0.41	15	0.52	17
JOpM									-2.07	32		
JPolEcon									1.01	7		
JProdInMgt								-1.17	25	-1.32	26	
JWB									-2.05	31		
LRP	-0.30	8	-8.95	17	-2.01	18	-1.92	21	-1.14	24		
MgtSci	3.53	1	2.21	4	1.99	7	0.92	6			1.58	4
OrgSci							-0.29	14	1.10	7	1.35	5
OrgStud					-5.73	20	-0.72	17	-0.49	22	-0.47	23
QJE	-0.34	9	0.50	11	1.33	8			0.94	9	0.81	13
RandJEcon					0.31	15					-0.03	22
ResOrgBehav												
ResPol							-0.67	16	0.13	18	0.15	18
RevEconStat			-0.28	13	0.83	9						
SMR	0.95	9	-1.50	17								
SMJ	-6.78	11	4.13	1	2.60	3	1.94	1	2.38	1	2.29	1
Techn									-2.67	34		

Pathfinder and entropy analysis

The pathfinder algorithm yields a graphic representation of the strongest relationships among the journals. Since we are dealing with an asymmetric matrix of citation flows, the links are directional, with the arrowhead pointing in the direction of citing. For example, if an arrow is directed from A

to B, journal A is citing journal B. Two-way links (shown with thicker lines) suggest reciprocity. Reciprocity, a measure of journal cohesion (see Pieters and Baumgartner, 2002), is the basis for entropy analysis. The PFNet diagrams from the pathfinder software program have been redrawn to highlight the reciprocal relationships. These are shown in

Table 3. LEM scores of journals as storers

Journal	1980–1984		1985–1989		1990–1994		1995–1999		2000–2004		2005–2009		
	Value	Rank	Value	Rank	Value	Rank	Value	Rank	Value	Rank	Value	Rank	
AMJ	2.28	3	3.39	3	3.65	3	1.18	4	1.74	4	1.40	8	
AMR	2.89	2	3.52	2	3.13	5	1.21	3	1.35	7	0.75	20	
AdStratMgt									-0.10	21			
AER	-8.31	11	-1.44	12	-1.16	13	-1.60	19	-2.19	26			
AJS							-1.93	20	-1.64	24	-1.97	27	
ASR									-2.03	25	-2.11	29	
ASQ	1.98	4	0.61	9	2.03	9	0.44	9	0.45	19	0.07	24	
BJM									0.83	14	0.80	19	
BusHzn	1.03	7											
CMR	1.43	5	0.47	11	0.60	11	-0.77	17	-0.18	22			
ETandP											1.09	14	
HBR	-0.54	8	-1.65	13	-2.76	17			-5.13	31	-7.37	34	
HumRel							0.28	14					
IJHRM											1.41	7	
IndMktMgt											1.49	6	
IJOPM									0.62	16	1.00	13	
IntTechMgt									1.05	10	1.17	13	
JBE									0.72	15	1.56	5	
JBR							0.70	7	1.82	3	1.84	2	
JBV					2.40	8	0.31	13	0.91	12	1.01	15	
JEconBehavOrg							-1.03	18	-0.65	23	-0.61	26	
JF	-10.94	17	-5.97		20				-2.36	28	-2.37	30	
JFE			-4.00	19			-2.68	22	-2.28	27	-2.01	28	
JIBS	2.29	7	2.75		7		0.69	8	1.26	8	1.64	4	
JIndEcon							-2.35	21	-2.47	29			
JIntMkt									0.20	20			
JMkt	2.60	6	-7.02		21		0.33	11	0.86	13	0.70	22	
JMS	0.57	10	3.39		4		1.24	2	1.84	2	1.77	3	
JMktRes											-0.45	25	
JoM			2.69	5	3.66	2	0.97	6	1.51	5	1.22	12	
JOpM											0.99	16	
JPolEcon											-4.19	33	
JProdInMgt									0.49	18	0.63	23	
JWB											0.75	21	
LRP	1.38	6	-7.13	16	0.82	10	-0.40	16	0.60	17			
MgtSci	4.60	1	3.20	4	2.87	6	0.31	12			0.88	18	
OrgSci							1.10	5	1.49	6	1.26	11	
OrgStud					-3.50	18	0.43	10	1.20	9	0.91	17	
QJE	-2.27	9	-2.77	15	-2.00	16			-3.18	30	-3.68	32	
RandJEcon											-3.12	31	
ResOrgBehav						0.17	12						
ResPol								-0.31	15	0.93	11	1.32	10
RevEconStat			-2.37	14	-1.70	15							
SMR	1.21		8	-1.40	14								
SMJ	-4.47	10	5.75	1	4.05	1	1.89	1	2.33	1	1.85	1	
Techn											1.38	9	

Figures 4–9. A solid link between journals implies a reciprocal tie, while the dotted lines show the direction of citing. For example, the PFNet for the period 1995–1999 (see Figure 7) shows that *SMJ* has reciprocal ties with *AMJ*, *JIBS*, *JBV*, *CMR*, and *Research Policy*. Further, *SMJ* does not reciprocate the citations that it receives from *JBR*,

LRP, and *JMS*. It can also be seen that journals such as *JFE* and *Management Science*—to name but two—do not reciprocate the citations that they receive from *SMJ*.

The period 1980–1984 was marked by a high degree of disorder, as evidenced by the sparse level of reciprocity among journals. This is to be

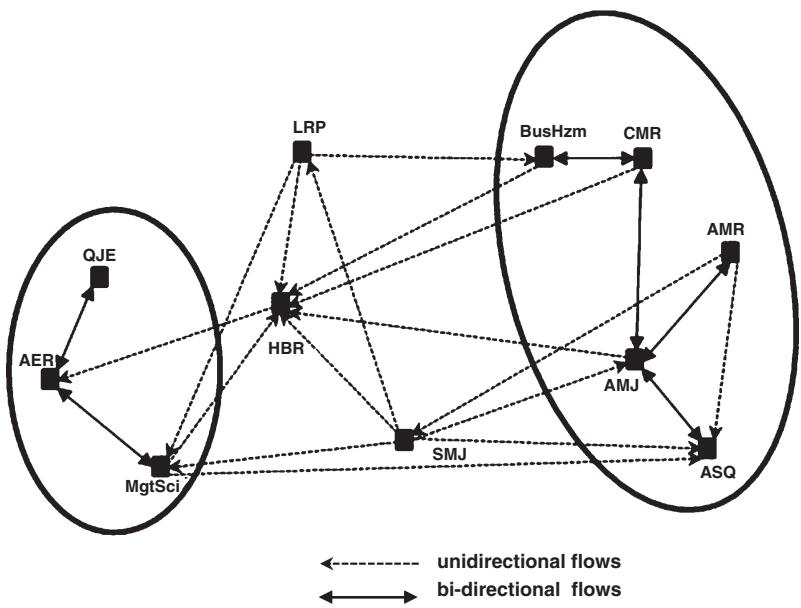


Figure 4. Pathfinder diagram 1980–1984

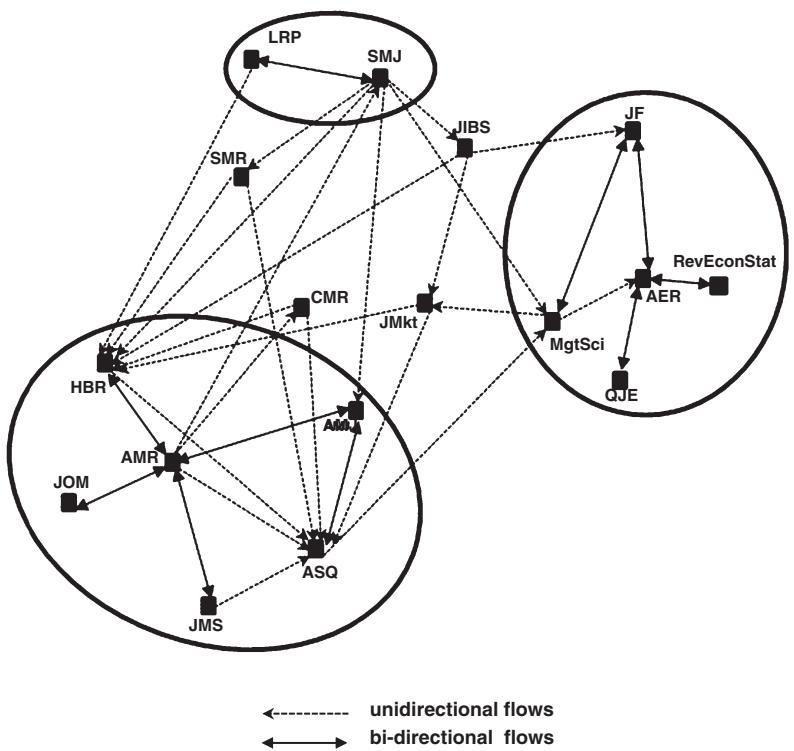


Figure 5. Pathfinder diagram 1985–1989

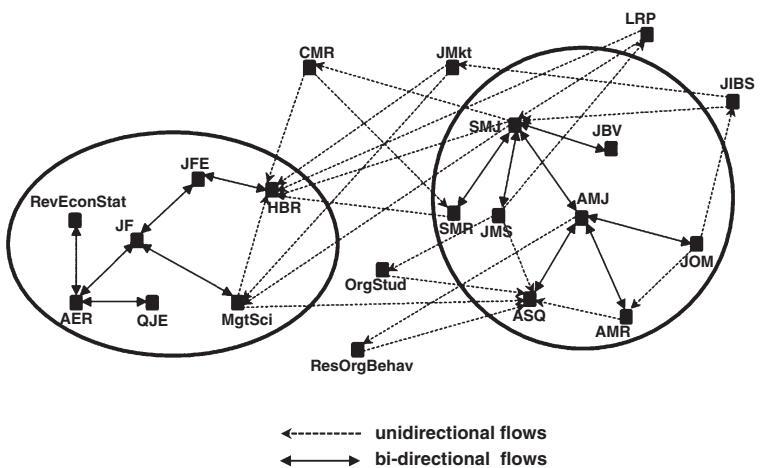


Figure 6. Pathfinder diagram 1990–1994

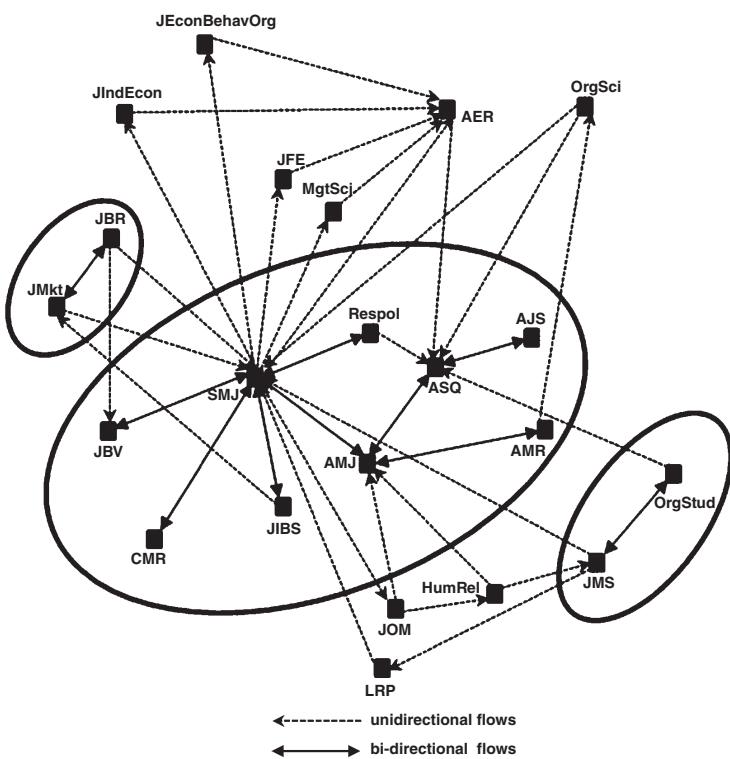


Figure 7. Pathfinder diagram 1995–1999

expected in the incipient stage of any field. There were only two distinct clusters,³ one that highlights the strong relationships among ASQ, AMJ, AMR, CMR, and *Business Horizons* and the other that

shows the important role that *American Economic Review* plays in bridging *Management Science* and *Quarterly Journal of Economics*. SMJ has no reciprocal ties in this network, which is not surprising. The second period, 1985–1989, is characterized by an expanding field (i.e., a larger network of journals defining SMJ's citation environment). We now have three clusters. The biggest cluster consists of AMR,

³ The clusters were formed by grouping together journals within the network in such a way that every journal in a cluster has reciprocal ties with at least one other journal in that cluster.

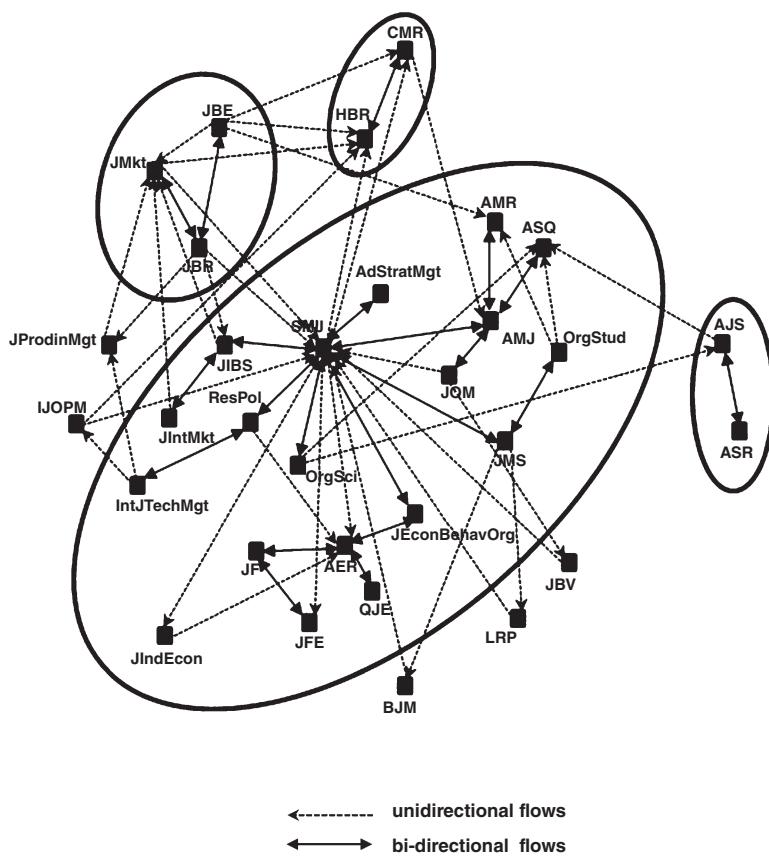


Figure 8. Pathfinder diagram 2000–2004

AMJ, ASQ, JMS, JoM, and HBR with AMR playing the central role in this cluster. *American Economic Review* continues to play a dominant part by linking four journals, namely, *Journal of Finance*, *Review of Economics and Statistics*, *Management Science*, and *Quarterly Journal of Economics*. SMJ has reciprocal relationships with LRP but not with any other journal.

SMJ's role as an influential storer and source becomes apparent about a decade after its inception. The time period 1990–1994 witnessed the emergence of SMJ as a prestigious journal in the network. Two distinct clusters can be discerned in this time period. The first cluster, held together mainly by SMJ and AMJ, consists of eight journals (SMJ, AMJ, ASQ, AMR, JMS, JOM, JBV, and SMR). The second comprises seven journals held together by AER and JF (AER, QJE, JF, JFE, *Management Science*, HBR, and *Review of Economics and Statistics*).

The time period 1995–1999 shows the emergence of *Research Policy*, JIBS, and *American*

Journal of Sociology as useful members of SMJ's citation environment. SMJ's centrality is all the more evident in this network. While *American Economic Review* continues as a major source of knowledge, its lack of reciprocal ties with other journals causes it to be not part of any cluster. The influence of *Management Science* has also dwindled in this period. The presence of a two-journal cluster (*Journal of Marketing* and *Journal of Business Research*) is another change in this period. Another development is the emergence of a two-journal cluster consisting of JMS and *Organization Studies*, which suggests that there is a stronger communication between these two European journals than a trans-Atlantic reciprocal exchange.

In the period 2000–2004, we see more journals becoming part of SMJ's network, with SMJ continuing to have a pervasive influence. The dominant cluster in this period has 19 journals, namely, SMJ, *Organization Science*, *Research Policy*, *International Journal of Technology Management*, AMJ,

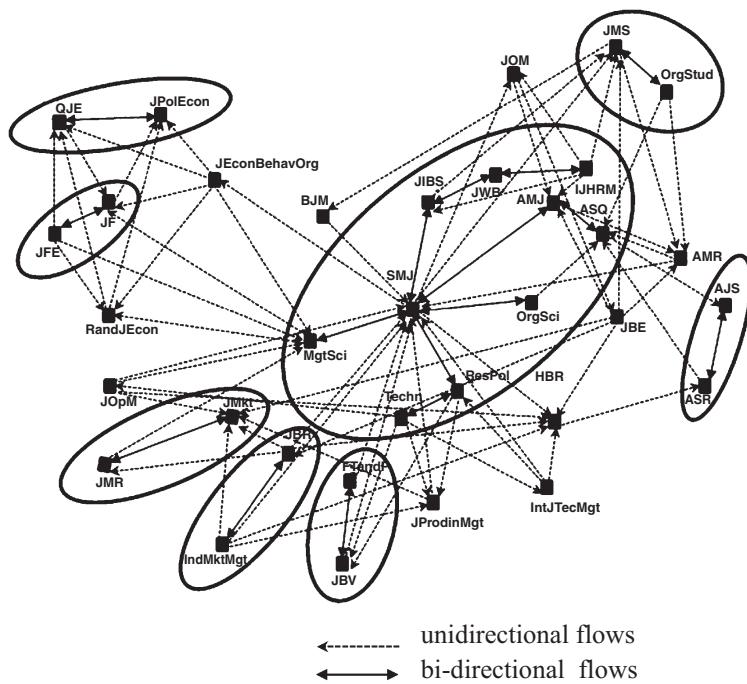


Figure 9. Pathfinder diagram 2005–2009

AMR, JoM, ASQ, JMS, *Advances in Strategic Management*, *Organization Studies*, *Journal of International Marketing*, *Journal of Industrial Economics*, JF, JFE, QJE, AER, *Journal of Economic Behavior in Organizations*, and JIBS. *American Sociological Review* and *American Journal of Sociology* now form a new cluster, reflecting the growing influence of sociology. *Journal of Marketing*, *Journal of Business Research*, and *Journal of Business Ethics* form a third cluster. The final cluster consists of HBR and CMR. Overall, the picture that emerges is one of interdisciplinary integration among a large number of journals through reciprocal citations. There is also less interaction with practitioner journals.

The last time period of our analysis, 2005–2009, reveals a field that has many distinct research communities, with the largest of them having 10 journals. *Quarterly Journal of Economics* and *Journal of Political Economy*, which was absent until this period, form a cluster. ETP and JBV now comprise a distinct cluster, signifying perhaps the growing influence of entrepreneurship in the strategy literature. *Organization Studies* and *Journal of Management Studies* form a niche area that is removed from SMJ's immediate network. Other interesting observations for this period are the surprisingly peripheral role of AMR, the decreasing

influence of HBR, the greater influence of JIBS, the reestablishment of reciprocal ties with *Management Science*, the increasing influence of *Research Policy*, and the emergence of *Technovation* as a new entrant in the network. The integration that was evident in the previous period is now giving way to an increasing tendency towards fragmentation.

Table 4 presents the results of entropy analysis. As discussed earlier, the entropy value of a journal is computed by taking the difference between the entropy of the network without the journal and the entropy of the network with all the journals included. Therefore, journals with positive entropy values provide order or stability to the network, since their removal would result in an increase in the entropy of the network. That is, Entropy Value of a journal (say, A) = (Entropy of the network without A) – (Entropy of the entire network). It is interesting to note that only two journals had positive entropy values during the period 1980–1984. Since the entropy value of a journal is largely dependent on the reciprocal ties it has with other journals, this implies that the journals in the network were not at all cohesive in the first time period. It can be seen that subsequent periods have at least three journals with positive values, with the period 2000–2004 having as many as eight.

Table 4. Entropy change rankings of journals

Journal	1980–1984		1985–1989		1990–1994		1995–1999		2000–2004		2005–2009	
	Value	Rank										
AMJ	2.45	1	0.82	3	6.32	1	6.1	2	11.21	2	1.4	3
AMR	-1.14	4	4.4	1	-1.39	6	-1.29	4	-0.78	9	-5.09	25
AdStratMgt									-0.78	9		
AER	-0.87	3	1.82	2	3.32	4	-4.46	14	10.21	4		
AJS							-1.29	4	-3.95	22	-4.09	11
ASR									-3.95	22	-4.09	11
ASQ	-1.14	4	-1.5	5	-1.39	6	1.71	3	-0.78	9	-1.77	6
BJM									-4.95	26	-5.09	25
BusHzn	-1.14	4										
CMR	0.86	2	-4.09	14	-4.39	16	-1.29	4	-3.95	22		
ETandP											-4.09	11
HBR	-3.46	9	-1.5	5	-1.58	12			-3.95	22	-5.09	25
HumRel							-4.46	14				
IJHRM											-1.77	6
IndMktMgt											-4.09	11
IJOPM									-4.95	26		
IntJTtechMgt									-0.78	9	-5.09	25
JBE									-3.37	20	-5.09	25
JBR							-3.46	10	-2.37	19	-4.09	11
JBV					-1.39	6	-1.29	4	-4.95	26	-4.09	11
JEconBehvOrg							-4.46	14	10.43	3	-5.09	25
JF	0.23	4	4.32	3					3.3	5	-4.09	11
JFE					1	5	-4.46	14	-0.78	9	-4.09	11
JIBS			-4.09	14	-4.39	16	-1.29	4	3.3	5	3.4	2
JIndEcon							-4.46	14	-4.95	26		
JIntMkt									-0.78	9		
JMkt			-4.09	14	-4.39	16	-3.46	10	-3.37	20	-4.09	11
JMS			-1.5	5	-1.39	6	-3.46	10	3.3	5	-4.09	11
JMktRes											-4.09	11
JoM			-1.5	5	-1.39	6	-4.46	14	-0.78	9	-5.09	25
JOpM											-5.09	25
JPolEcon											-4.09	11
JProdInMgt									-4.95	26	-5.09	25
JWB											1.4	3
LRP	-3.46	9	-3.09	12	-4.39	16	-4.46	14	-4.95	26		
MgtSci	-1.87	7	-1.77	9	-1.58	12	-4.46	14			-1.77	6
OrgSci							-4.46	14	-0.78	9	-1.77	6
OrgStud					-4.39	16	-3.46	10	-0.78	9	-4.09	11
QJE	-1.87	7	-1.77	9	-1.58	12			-0.78	9	-4.09	11
RandJEcon											-5.09	25
ResOrgBehav					-4.39	16						
ResPol							-1.29	4	3.3	5	1.4	3
RevEconStat			-1.77	9	-1.58	12						
SMR			-4.09	14	-1.39	6						
SMJ	-3.46	9	-3.09	12	6.32	1	9.42	1	33.06	1	12.12	1
Techn											-1.77	6

It is interesting to see that SMJ's removal in the first two time periods would have actually increased the order of the network. A plausible explanation for this is that the strategic management field was in its infancy and the influence of its cumulative traditions, if any, was yet to be seen. The customary

lag in citations may be a factor as well. However, the field appears to have matured after that, as evidenced by SMJ's primacy in lending stability to its citation environment for the remaining time periods. AMJ is the only journal with a positive value for five time periods, underscoring its stabilizing role

in the network of journals associated with strategic management.

LIMITATIONS AND FUTURE RESEARCH

While interpreting the results of our study, it is important to bear in mind some of its limitations. First, as is the case with most citation studies, our research rests on the assumption that all citations are equal. This premise is questionable on the grounds that the motivations for citing a scholarly article may be many, not all of which are for the purpose of building on the ideas espoused in the cited work. Second, our sample of journals for each time period is confined to those that are cited by or cite SMJ frequently, as determined by the JCR. Therefore, journals that are valuable sources to or borrowers from SMJ would not be in our analysis if they did not appear in JCR, although it is fair to state that JCR is considered to be a comprehensive source of citation information. Analysis using newly developed sources of citation data such as Google Scholar might provide additional insights about knowledge flows in real time as it includes virtually all material appearing on the Internet including working papers.

It must also be noted that, in our study, SMJ serves as a proxy for the field of strategic management. We acknowledge that there are a few other journals in which ideas and concepts with regard to strategic management are published. The influence of these articles/journals would not be accounted for in our research. However, we believe that this does not detract from the study in a major way, as SMJ is widely regarded as the premier outlet for strategic management (e.g., see Ramos-Rodriguez and Ruiz-Navarro, 2004).

It may also be argued that SMJ's central role in this network is tautological, given that citations to and from SMJ were used as the basis for the selection of journals. While this may be true to an extent, it must be understood that the rankings and influences are determined by the overall patterns of citations, including reciprocity, among the journals in SMJ's citation environment. Readers are cautioned from making any inferences of journal quality or the growth or decline of a journal's overall status based on the results of our study.

Our sample of journals for each time period was determined by focusing only on the key senders and receivers of SMJ's citations. In fact, we selected only the top 20 of each. The study could be extended to include a broader range of journals to gain insights into SMJ's pervasive influence. Further perspectives may also be gleaned by performing other types of analyses on the data. An example would be a social network analysis (SNA) to understand a journal's centrality, efficiency of communications with other members of the network, betweenness, and other advantages that accrue to journals by virtue of their position in the network.

CONCLUSIONS

Scholars in a discipline are continually engaged in the creation and dissemination of knowledge, either by building on prior conceptions or by forging new ideational trails. This process leads to the development of cumulative research traditions within a field, occasionally punctuated by paradigmatic shifts (e.g., Kuhn, 1970). The boundaries of a multidisciplinary field like strategic management are somewhat fluid, evolving as it does through incorporating insights from a number of sister disciplines. Studying the input-output dependency relationships of citations among journals can provide many insights because journals are the repositories of knowledge comprising articles that embody the key ideas expressed by the field's scholars.

Our analysis of input-output dependency relationships between the field of strategic management and other disciplines provides a number of interesting conclusions. First, there has been a steady and substantial expansion of the citation environment of the field of strategic management as evidenced by the fact that the number of journals in the citation environment has grown from 11 journals in the first five years to 34 journals in the last five years. Second, the intellectual structure of the field shows a high degree of disorder initially as evidenced by the sparse level of reciprocal ties with other journals, but in subsequent time periods we find a growing number of reciprocal relationships. A decade after inception, SMJ emerges as an influential storer and source of knowledge within the citation network. By any measure, this is a relatively short period for a journal, and thus a field, to establish itself. Third, the results of the entropy analysis show that the field is maturing with SMJ lending stability to the

knowledge network in the field. Fourth, it appears that the balance between theory and practice that existed at the beginning of the field has changed and the practitioner orientation of the field has diminished as shown by the relative decline in the influence of HBR and *Long Range Planning* within the network. Finally, the most interesting insight that emerges from our analysis is the evolving role of strategic management as an integrative, interdisciplinary field of study with increasing knowledge flows to and from a number of fields such as economics, finance, sociology, entrepreneurship, international business, technology and innovation, and ethics.

A comparison of the pathfinder diagrams and entropy analyses over the 30-year period of our study reveals an interesting pattern. The field of strategic management was fragmented and lacking in cohesion in its early years. Subsequently, the emergence of SMJ as the premier journal in the field lent stability and cohesion to the network. However, in the latest period covered by our analysis, we see signs of emergence of narrower intellectual niches. This raises a more general question: Are other nascent fields such as international business and entrepreneurship also prone to similar cycles of fragmentation-consolidation-niche emergence?

Given the primacy that is accorded to scholarship by academic institutions, it is no surprise that the standing of a journal within a discipline (or, in exceptional cases, across disciplines) is of considerable interest to academics and administrators alike. It is not uncommon for schools to encourage their faculty to publish in a specified list of journals, often rank-ordered based on some subjective and/or objective evaluation. Researchers have spared no efforts to assess the relative importance of journals, relying on a variety of techniques to evolve their rankings (Nerur *et al.*, 2008; Pieters and Baumgartner, 2002; Sullivan *et al.*, 2011). Researchers have also employed SNA to rank journals based on network characteristics such as centrality and betweenness (e.g., Polites and Watson, 2009). Our aim in this paper is not to confirm or disconfirm journal rankings, but to elucidate how SMJ's network of sources (i.e., the journals it cites) and citing journals has evolved since its inception.

A trend that might have implications for the use of citation data is the increasing emphasis placed on citation counts and impact factors by academic institutions and journal editors as a proxy for the

academic prestige of their institutions and journals (Monastersky, 2005; Starbuck, 2005). This has led researchers to undertake investigations into the antecedents of citations (Judge *et al.*, 2007) and efforts by editors to increase citations to their journals (Borokhovich, Bricker, and Simkins, 1999). The risks inherent in placing undue emphasis on citation counts to measure scholarly productivity have been voiced eloquently by a number of authors (Ilgen, 2007; Leung, 2007; Starbuck, 2005). Even more importantly, we need to be aware of the risk that the very act of measuring a phenomenon may inevitably end up affecting and altering the phenomenon that we are measuring.

The results of our study have implications for both research and practice. The analysis of input-output dependency relationships is useful in gaining insights in a number of contexts beyond journal citations. For example, patent filings include citations to prior patents. Tracking citation flows in patent filings can provide new insights into patterns of knowledge flows across firms and industries. An understanding of such flows can help us in predicting convergence of technologies as well as mapping trajectories of technological evolution. In the context of business schools, there has been debate in recent years about the usefulness of a capstone course in strategic management. The results of our analysis show that the citation universe of strategic management has been steadily expanding and that it is becoming more multidisciplinary. Our analysis, essentially, confirms its role as an integrative, interdisciplinary area of study.

We believe that our analysis has provided an in-depth view of the evolving structure of the strategic management field, identifying not only the many intellectual influences that have shaped its current state but also the growing influence the field has developed within management journals and beyond. The role that institutions play in the development of ideas has been highlighted recently in the context of the behavioral theory of the firm and Carnegie Mellon University by March (2007). We believe that specific journals also play a role similar to institutions in the development of both ideas and scholarly communities. SMJ has clearly played a seminal role in the development of the content of knowledge in strategic management as well as in the development of a scholarly community interested in strategic management. Our analysis suggests that the field of strategic management continues to be

interdisciplinary in its orientation, although there have been many discernible changes in the pattern of inflows and outflows over the past 30 years. In a retrospective on organizational studies, March (2007: 541) colorfully stated that “ideas take form and reproduce through an intergenerational, international pyramid of promiscuous and intellectual intercourse.” Ronda-Pupo and Guerras-Martin (2010) recently investigated intercountry collaboration among strategy scholars. Their results, along with the results of our study, suggest that March’s call for intellectual intercourse is being vigorously answered by strategy researchers. As new journals such as the *Global Strategy Journal* and the *Strategic Entrepreneurship Journal* develop through their infancy, it would be interesting to see if this results in fragmentation into disconnected silos or the continued reinforcement of a pattern of mutual interdependence.

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