

Diversification Strategy: Themes, Concepts and Relationships

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Abstract—To explore the intellectual structure of diversification strategy research in the last two decade, this study identified the most important publications and the most influential scholars as well as the correlations among these scholar's publications. In this study, bibliometric and social network analysis techniques are used to investigate the intellectual pillars of the diversification strategy literature. By analyzing 67,723 citations of 1,224 articles published in SSCI journal in diversification strategy area between 1990 and 2009, this study maps a knowledge network of diversification strategy studies. The results of the mapping can help identify the research direction of diversification strategy research and provide a valuable tool for researchers to access the literature in this area.

Keywords—citation; co-citation; diversification strategy; strategic conflict; performance; dynamic capability

I. INTRODUCTION

Globalization has influenced the international diversification strategies of firms is an issue largely overlooked in both the strategic management and international business literatures [20]. The past two decade has especially seen extensive research on diversification strategy. Yet even though diversification strategy has established itself as an academic discipline, its establishment has been a slow process because researchers in this area prefer to publish their best work in more established journals. Another major obstacle to the development of diversification strategy lies in the subject's unusually high degree of interaction with other disciplines. This overlapping blurs the boundaries of diversification strategy and as a result its distinct theoretical model and analytical tools are unjustly attributed to other competing fields. With limited resources contributing to the development of diversification strategy, the cross-fertilization of ideas between scholars of diversification strategy will be much more difficult to obtain. Consequently, while there is no doubt that there is an area or field of diversification strategy, the question remains somehow unclear on what it is, how good its work is, and what are its prospects and needs for future development.

The aim of this study is to provide diversification strategy researchers with a unique map to better understand diversification strategy related publications and to provide a

systematic and objective mapping of different themes and concepts in the development of diversification strategy field. This study also attempts to help identify the linkage among different publications and confirm their status and positions in their contribution to the development of diversification strategy field. The principal methods used are citation and co-citation analysis, social network analysis, plus a factor analysis which is performed to identify the invisible network of knowledge generation underlying the diversification strategy literature.

II. STUDIES OF ACADEMIC LITERATURE

There are a number of techniques that can be used to study a body of literature. Most frequent is the simple literature review where a highly subjective approach is used to structure the earlier work. Objective and quantitative techniques have recently become popular with more databases available online for use. These techniques adopt author citations, co-citations, and systematic review [12] to examine the invisible knowledge network in the communication process by means of written and published works of a given field. These techniques are attractive because they are objective and unobtrusive [7].

Several studies have used the bibliometric techniques to study the literature of management research. For example, Ponzi [13] explored the intellectual structure and interdisciplinary breadth of knowledge management in its early stage of development, using principle component analysis on an author co-citation frequency matrix; Etemad [6] identified the most influential authors and studies in electronic commerce field by using citation analysis; Ramos-Rodriguez and Ruiz-Navarro [14] examined the intellectual structure change of strategic management research by conducting a bibliometric study of the Strategic Management Journal; Acedo and Casillas [1] explored the research paradigms of international management research by applying factorial analysis techniques in an author co-citation study. Chan, Seow and Tam [4] used citations from accounting dissertations completed during 1999-2003 to provide a ranking of accounting journals. To the best of our knowledge, no similar study has been conducted on the current research of knowledge management. Therefore this study aims to fill a gap in knowledge management literature by applying citation and co-citation analysis to a

representative sample of recent research on knowledge management collected by the Science Citation Index and Social Sciences Citation Index.

III. METHODOLOGY

The citation data used in this study included journal articles, authors, publication outlets, publication dates, and cited references. Based on the objective of this study, the authors explored the intellectual structure of diversification strategy between 1990 and 2009. This time period was chosen because contemporary diversification strategy studies of the last decade represent the most update and probably also the most important research on diversification strategy. Citation and co-citation analysis is the main method for this study.. First, the databases were identified as the sources of diversification strategy publications. Then data collection and analysis techniques were designed to collect information about topics, authors, and journals on diversification strategy research.

In the second stage, the collected data were analyzed and systematized by sorting, screening, summing, sub-totaling, and ranking. After a series of operations, key nodes in the invisible network of knowledge in diversification strategy were identified and the structures developed. In the final stage, the co-citation analysis was used and the knowledge network of diversification strategy was mapped to describe the knowledge distribution process in diversification strategy area.

In this study, the Science Citation Index (SCI) and Social Sciences Citation Index (SSCI) were used for analysis. The SCI and SSCI are widely used databases, which include citations published in over 8000 world's leading scholarly journals. While there are arguments that other online databases might also be used for such analysis, using SCI and SSCI provided the most comprehensive and the most accepted databases of diversification strategy publications.

Unlike other prior studies, the data used in this study were not drawn from journals chosen by peer researchers [17]. Instead, the entire databases of SCI and SSCI from 1999 to 2008 served as the universe for analysis. In order to collect the data, we used “key word” method which utilizes the SCI and SSCI databases key word search in article’s title and abstract. Using “Diversification strategy” as key word, this study collected 1,224 journal articles which further cited 67,723 publications as references. The cited references in these papers included both books and journal articles.

IV. RESULTS

A Citation Analysis

To identify the key publications and scholars that have laid down the ground work of knowledge management research, citation data were tabulated for each of the 1,224 source documents and 67,723 references using the *Excel* package. The citation analysis produced interesting background statistics, as shown in the following tables. Table 1 lists the most cited journals in diversification strategy area in the last two decades, among which *Strategic*

Management Journal, *Academy of Management Journal*, and *Academy of Management Review* are the top three most cited journals, followed by *Journal of International Business Studies* and *Journal of Finance*. The general pattern of the most cited journals shows that diversification strategy research features strategic, management and finance specific journals.

TABLE1 THE MOST FREQUENTLY CITED JOURNALS: 1999-2008

Journals	Total Citations
Strategic Management Journal	6,171
Academy of Management Journal	3,922
Academy of Management Review	1,764
Journal of International Business Studies	1,485
Journal of Finance	1,457
Administrative Science Quarterly	1,257
Management Science	1,195
Journal of Financial Economics	1,081
Strategic Management	1,048
Journal of Management	1,044

The most influential documents with the most citation and the most influential scholars were then identified by their total counts of citation within the selected journal articles. As shown in Table 2, the most cited diversification publication between 1990 and 1999 (the first decade years) was Rumelt’s paper *Diversification strategy and profitability* , followed by Palepu’s paper *Diversification strategy, profit performance and the entropy measure*, and Williamson’s book *Markets Hierarchies* (see Table 2).

TABLE 2 HIGHLY CITED DOCUMENTS: 1990-1999

Total Citations	Full Citation Index For Document
117	Rumelt RP, 1974, Strategic Management and Economic Performance
78	Palepu K, 1985, Strategic Management Journal, V6, P239
66	Williamson OE, 1975, Markets Hierarchies
61	Porter ME, 1985, Competitive Advantage
61	Ramanujam V, 1989, Strategic Management Journal, V10, P523
59	Porter ME, 1980, Competitive Strategy
45	Hoskisson RE, 1988, Strategic Management Journal , V9, P605
45	Prahalad CK, 1986, Strategic Management Journal, V7, P485
45	Rumelt RP, 1982, Strategic Management Journal, V3, P359
44	Hill CWL, 1987, Academy of Management Review, V12, P331
44	Porter ME, 1987, Harvard Business Review, V65, P43

For the second decade years (2000-2009), the most cited diversification strategy publications were the same as in the first decade years. The third most cited was Barney’s paper

Firm resources and sustained competitive advantage and Hitt's paper *International diversification: Effects on innovation and firm performance in product-diversified firms* and La Palepu's paper *Diversification strategy, profit performance and the entropy measure* (See Table 3).

TABLE 3 HIGHLY CITED DOCUMENTS: 2000-2009

Total Citations	Full Citation Index For Document
128	Barney J, 1991, Journal of Management, V17, P99
116	Hitt MA, 1997, Academy of Management Journal, V40, P767
116	Palepu K, 1985, Strategic Management Journal, V6, P239
101	Rumelt RP, 1974, Strategic Management and Economic Performance
89	Teece DJ, 1997, Strategic Management Journal, V18, P509
89	Wernerfelt B, 1984, Strategic Management Journal, V5, P171
77	Geringer JM, 1989, Strategic Management Journal, V10, P109
76	Tallman S, 1996, Academy of Management Journal, V39, P179
73	Porter ME, 1980, Competitive Strategy
70	Hoskisson RE, 1993, Strategic Management Journal, V14, P215

Journal articles and books combined, the top five most cited scholar between 1990 and 1999 (the first decade years) were Hoskisson, Porter, Rumelt, Hill, and Williamson (See Table 4). For the second decade years, the status of the most important scholars changed. The top five most cited scholars were Hill, Hoskisson, Teece, Porter, and Kogut (See Table 5). These scholars have the most influence in the development of diversification strategy area and thus collectively define this field. Their contributions represent the focus of the main research in the field and thus give us an indication of the popularity of certain Diversification strategy topics as well as their historical values.

TABLE 4 HIGHLY CITED AUTHORS:1990-1999

Author	Frequency	Author	Frequency
Hoskisson RE	251	Hambrick DC	153
Porter ME	235	Bettis RA	148
Rumelt RP	218	Hitt MA	148
Hill CWL	181	Montgomery CA	134
Williamson OE	164	Lubatkin M	128

Although the citation analysis does not eliminate the bias against younger scholars, a paper-based ranking (as in Table 2 & 3) places more emphasis on the quality (as opposed to the quantity) of the documents produced by a given scholar than a ranking of authors based on the frequencies with which a particular author has been cited (as in Table 4 & 5). In addition, Table 2 and 3 represent the key research themes in a field and give us an indication of the

popularity of certain Diversification strategy topics. The readers can find high citations are associated to what can be termed field-defining titles and they lay down the ground work for the understanding of diversification strategy as a distinct phenomenon. A comparison between Table 2 and 3 reveals some interesting patterns from the first decade years (1990-1999) to the second decade years (2000-2009). First, the top two most influential publications in the last decade remain the same, indicating their dominant status for the past decade in diversification strategy studies.

This is also true for the top two most influential scholars in the last decade. Second, on the one hand, the most cited publications in the first decade years have relatively smaller number of citations, comparing with the publications in the second decade years.

The gradual increase in the total citations supports the evolving process of diversification strategy research as an academic field and the process of gaining more and more recognition in the literature. On the other hand, the most influential papers in the first decade years and the second decade years do not change much. This indicates the development in diversification strategy is slow and a few classical works and influential authors still dominate the diversification strategy research. More efforts and theoretical breakthrough are thus needed in order to further advance the development of diversification strategy research.

TABLE 5 HIGHLY CITED AUTHORS: 2000-2009

Author	Frequency	Author	Frequency
Hitt MA	357	Rumelt RP	248
Hoskisson RE	309	Grant RM	214
Teece DJ	303	Jensen MC	205
Porter ME	297	Hambrick DC	197
Kogut B	276	Markides CC	182

B Co-citation Analysis

In this stage, data mapping was conducted and an intellectual structure of current Diversification strategy studies was revealed. Co-citation analysis is a bibliometric technique that information scientists use to map the intellectual structure of an academic field. It involves counting documents from a chosen field - paired or co-cited documents. Co-citation analysis compiles co-citation counts in matrix form and statistically scales them to capture a snapshot at a distinct point in time of what is actually a changing and evolving structure of knowledge [15].

Co-citations were tabulated for each source documents by using the *Excel* package. Many of the authors had very few co-citations that were either unlikely to have had a significant impact on the development of the field or were too new to have had time to impact on the literature. To facilitate analyses and improve the probability of its success, it was made sure that all authors in the final set had at least 30 citations in the first ten years and 30 in the second decade years. Based on the total number of citations in the selected journals, the top scholars were identified, and then a co-citation matrix was built before a pictorial map was

drawn to describe the correlations among different scholars. In doing so, we were following the procedures recommended by White and Griffith [7].

Social network analysis techniques were used to graph the relationships in the co-citation matrix and identify the strongest links and the core areas of interest in diversification strategy [12]. Figure 1 and Figure 2 show the core research themes in Diversification strategy studies, based on sampled articles with links of greater than or equal to ten co-citations shown in the network. This is produced using UCINET software [3] and shows graphically the core areas of interest. Different shapes of the nodes result from performing a faction study of these authors. This method seeks to group elements in a network based on the sharing of common links to each other. The diagrams show that current research in diversification strategy area is concentrating on the interactions of essential of Dynamic capabilities, Organizational capabilities, Strategic conflict, Firm Performance and Core competences. The few scholars in Figure 1 and 2 with the most links (co-citation) are the super stars in diversification strategy research. Their heavy citations and intensive interlinks with each other undoubtedly indicate their prestigious status in diversification strategy research and their publications and research work collectively define the future research directions of diversification strategy studies.

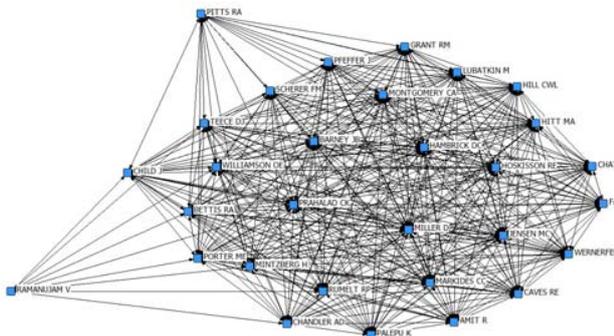


Figure 1 Key Research Themes in Diversification Strategy (1990-1999)

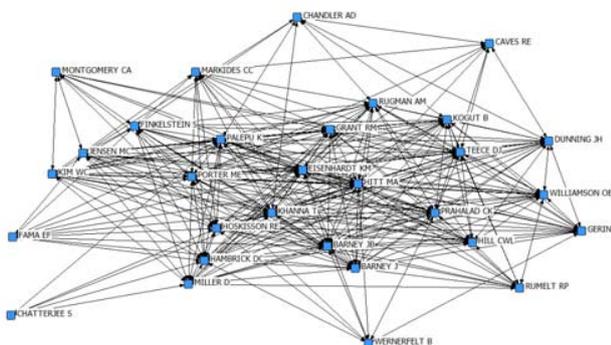


Figure 2 Key Research Themes in Diversification Strategy (2000-2009)

While the diagrams in Figure 1 and Figure 2 provide a clear picture, their foci are only on the very core areas and only a limited amount of information is revealed. By taking the co-citation matrix and grouping the authors using factor analysis of the correlations between the entries, we can determine which authors are grouped together and therefore share a common element. According to this, the closeness of author points on such maps is algorithmically related to their similarity as perceived by citers. We use r-Pearson as a measure of similarity between author pairs, because it registers the likeness in shape of their co-citation count profiles over all other authors in the set [19].

The co-citation correlation matrix was factor analyzed using varimax rotation, a commonly used procedure, which attempts to fit (or load) the maximum number of authors on the minimum number of factors. The diagonals were considered missing data and were applied the criterion of omitting the two cases [11].

Four factors were extracted from the data in the first decade years (1990-1999) and together they explained over 78.2% of the variance in the correlation matrix. Table 6 lists the four most important factors along with the authors that had a factor loading of at least 0.5. As is usual in this type of analysis, authors with less than a 0.5 loading or with cross-loadings were dropped from the final results [18]. We tentatively assigned names to the factors on the basis of our own interpretation of the authors with high loadings. Our interpretation of the analysis results is that diversification strategy research in this period is composed of at least three different sub-fields: Resource-based, Strategic conflict, Firm Performance and Overview of Corporate diversification (Please see Figure 1). We made no attempts to interpret the remaining factors due to their small eigenvalues. They have also been excluded from Table 6.

Similarly, studies on diversification strategy also clustered on different research themes between 2000 and 2009 and together they explained over 81.2% of the variance in the correlation matrix of the second four years, as pictured in Figure 2. Table 7 lists the seven most important factors along with the authors that had a factor loading of at least 0.5. We also tentatively assigned names to the factors on the basis of our own interpretation of the authors with high associated loadings. Our interpretation of the analysis results is that diversification strategy research at this stage is also composed of at least Six key subfields: Dynamic capabilities, Organizational capabilities, Strategic conflict, Firm Performance, Core competences and Risk and decision.

Figure 1 and Table 6 clearly indicated that the most influential authors in diversification strategy studies between 1990 and 1999 clustered together. The first factor in Table 6 appears to define Risk and Return by Amit, Prahalad and Rumelt. The two motives of diversification were contrasted in along various accounting risk and return measures, they are clearly not mutually exclusive. For example, managers may adopt policies that mix related and pure-financial diversifications. Such a diversification pattern is determined with the risk-return characteristic that the managers or stockholders desire [2].

Factor 2 is defined by Jensen, Markides and Chatterjee, and appears to represent Strategic conflict on diversification strategy research.

The interests and incentives of managers and shareholders conflict over such issues as the optimal size of the firm and the payment of cash to shareholders. These conflicts are especially severe in firms with large free cash flows- more cash than profitable investment opportunities [9].

TABLE 6 AUTHOR FACTOR LOADINGS: 1990-1999

Factor 1: Risk and Return	variance	Factor 2: Strategic conflict	variance
Amit R	0.918	Jensen MC	0.887
Prahalad CK	0.857	Markides CC	0.87
Rumelt RP	0.856	Chatterjee S	0.834
Williamson OE	0.846	Palepu K	0.806
Barney JB	0.843	Hitt MA	0.769
Porter ME	0.794	Hambrick DC	0.763
Child J	0.768	Hill CWL	0.746
Montgomery CA	0.764	Lubatkin M	0.602
Miller D	0.754	Wernerfelt B	0.562
Mintzberg H	0.752	Caves RE	0.525
Chandler AD	0.729		
Grant RM	0.670		
Pfeffer J	0.640		
Teece DJ	0.635		
Pitts RA	0.626		
Lubatkin M	0.618		
Scherer FM	0.578		
Wernerfelt B	0.574		
Factor3: Firm Performance	variance	Factor4: Overview of Corporate diversification	variance
Hoskisson RE	0.767	Ramanujam V	0.836
Bettis RA	0.646	Grant RM	0.551
Pitts RA	0.552		

Factor 3 represents Firm Performance is defined by Hoskisson, Bettis and Pitts. Hoskisson and Hitt [8] proposed the measurement of diversification has been influenced by the research question and assumptions about reality(e.g., market perfection and managerial motives for diversification). Factor 4 represents Overview of Corporate diversification is defined by Ramanujam and Grant.

For the second decade years, Figure 2 and Table 7 clearly indicated that the most influential authors in diversification strategy studies between 2000 and 2009 also clustered together.

TABLE 7 AUTHOR FACTOR LOADINGS: 2000-2009

Factor 1: Dynamic capabilities	variance	Factor 2: Organizational capabilities	variance
Teece DJ	0.869	Chandler AD	0.863
Markides CC	0.849	Palepu K	0.795
Grant RM	0.752		
Barney J	0.734		
Hill CWL	0.718		
Rumelt RP	0.714		
Porter ME	0.708		
Hitt MA	0.644		
Barney JB	0.633		
Kogut B	0.575		
Prahalad CK	0.504		
Factor 3: Strategic conflict	variance	Factor4: Firm Performance	variance
Jensen MC	0.734	Miller D	0.755
Kim WC	0.677	Hambrick DC	0.712
Finkelstein S	0.546	Montgomery CA	0.647
		Eisenhardt KM	0.557
		Hill CWL	0.525
		Finkelstein S	0.509
		Barney JB	0.503
		Grant RM	0.501
Factor5: Core competences	variance	Factor6: Risk and decision	variance
Williamson OE	0.850	Fama EF	0.832
Geringer JM	0.650	Khanna T	0.673
Eisenhardt KM	0.648		
Dunning JH	0.603		
Hitt MA	0.535		
Factor7: Competitive forces	variance		
Caves RE	0.770		
Chatterjee S	0.573		

The first factor in Table appears to define the Dynamic capabilities of diversification strategy is defined by Teece,

Markides and Grant. Teece, Pisano and Shuen [16] define dynamic capabilities as the firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments. Dynamic capabilities thus reflect an organization's ability to achieve new and innovative forms of competitive advantage given path dependencies and market positions [10].

Factor 2 is defined by Chandler and Palepu, and appears to represent Organizational capabilities on diversification strategy. Organizational capabilities, honed by oligopolistic competition, provided the dynamic not only for the continuing growth of such firms, but also for the industries which they dominated, and for the national economies in which they operated. They were created during the knowledge-acquiring processes that are always involved in commercializing a new product for national and international markets [5].

Factor 3 represents Strategic conflict of diversification strategy is defined by Jensen, Kim and Finkelstein. Factor 4 represents Firm Performance that is defined by Miller, Hambrick and Montgomery. Factor 5 represents Core competence that is defined by Williamson, Geringer and Eisenhardt. Factor 6 represents Risk and decision that is defined by Fama and Khanna. Factor 7 represents Competitive forces issues.

V. CONCLUSION

The past two decades years have seen extensive research on diversification strategy. This study investigates diversification strategy research using citation and co-citation data published in SCI and SSCI between 1990 and 2009. With a factor analysis of the co-citation data, this study maps the intellectual structure of diversification strategy research, which suggests that the contemporary diversification strategy research is organized along different concentrations of interests: essential of Dynamic capabilities, Organizational capabilities and Strategic conflict.

The mapping of the intellectual structure of diversification strategy studies indicates that diversification strategy has somehow created its own literature and that it has gained the reputation as a legitimate academic field, with diversification strategy specific journals gaining the status required for an independent research field, such as the Strategic Management Journal. Given that the Diversification strategy is still young and our analysis has shown that it has an evolving structure, it is believed that Diversification strategy publication outlets will gain more popularity and prestige that is required to become a more prominent academic field when we learn more about current paradigms and the key research themes in diversification strategy studies, how they relate, and what they stand for. With more scholars and more resources contributing to the diversification strategy area, a better academic environment conducive for research ideas' cross-fertilizing will be formed and diversification strategy, as a field, will gain more momentum for further development.

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