Exploring Resources and Capabilities factors among Entrepreneurial Ventures using DEMATEL Approach

*Olamitunji Dakare[1]
Sulaimon Olanrewaju Adebiyi[2]
Bilqis Bolanle Amole[3]

[1]School of Management and Social Sciences, Pan-Atlantic University, Lagos, Nigeria
[2]Dept. of Business Administration, University of Lagos, Lagos. Nigeria
[3]Dept. of Accounting/Business Administration, Distance Learning Institute, University of Lagos, Nigeria

Resources and capabilities remain one of the most important factors that influence firms, more especially entrepreneurial ventures, to improve their competitiveness and achieve competitive advantage. In this context, present paper explores how entrepreneurial ventures and small businesses can better identify and distinguish the cause-and-effect relationship amongst resource and capability factors. Resource and capability factors among entrepreneurial ventures were classified into three dimensions and fourteen criteria after a review of the literature. The study applied the Decision-Making Trial and Evaluation Laboratory (DEMATEL) model to identify and describe the cause-and-effect relationship amongst resource and capability factors. The findings reveal that in prioritizing the importance of criteria and cause-and-effect relationship among criteria under the three core dimensions, firm climate, managerial competence, market knowledge and technological capabilities and equipment were the most critical criteria. Furthermore, the result has shown that firm climate is the most significant criterion in the adjustment of resource and capability factors of entrepreneurial ventures. Therefore, promoting a supportive and conducive firm climate among entrepreneurial ventures can enhance other resources and capabilities factors which, in turn, will improve the overall performance of entrepreneurial ventures and small businesses.

Keywords: Resources, capabilities, entrepreneurial ventures, small businesses, DEMATEL

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Developed and developing nations have long recognized that entrepreneurial ventures and small businesses play a pivotal role in accelerating socio–economic development. However, the strategic tasks facing entrepreneurial ventures of all shapes and sizes have been how they can survive, gain and sustain competitive advantage with their limited set of distinctive resources and capabilities. According to Barney (1991), the strategic source of sustainable competitive advantage can only be derived from the resources and capabilities that an organisation or an entrepreneurial venture control.

More importantly, sustainable competition, through resources and capabilities, largely begin with

organizational resources and capabilities that are valuable, rare, imperfectly imitable, and not substitutable (Barney, 1991; Barney, Wright and Ketchen, 2001). Also, resources and capabilities have been described and categorized as bundles of tangible and intangible assets (Barney *et al.*, 2001; Hitt, Ireland and Hoskisson, 2003), while some scholars and managers have described a firm's resources and capabilities to include management skills, organizational processes and routines, as well as the information and knowledge that organizations control (Barney *et al.*, 2001).

Today, most organizations, operating across the domestic, international and global fronts, are now leaning toward the use of their unique assets, owned and controlled as a key source of survival and sustainable competitive advantage (Barney and Clark, 2007). Also, as asserted by Barney *et al*. (2001), the dispersal of the resource–based view (RBV) in the field of strategic management and other associated disciplines has promoted the increasing interest of many academics and researchers to be involved in the theoretical development and empirical study of resources and capabilities (Andrews, 1971; Aaker, 1989; Barney, 1986; Barney, 1991; Conner, 1991; Collis and Montgomery, 1995; Day and Wensley, 1988; Day, 1994; Dierickx and Cool, 1989; Grant, 1991; Grant, 1996; Hansen and Wernerfelt, 1989; Lippman and Rumelt, 1982; Penrose, 1959; Prahalad and Hamel, 1990; Peteraf, 1993; Rumelt, 1984;; Rumelt, 1987; Rumelt , 1991; Spanos and Lioukas, 2001; Teece, Pisano and Shuen , 1997; Wernerfelt ,1984; Wernerfelt, 1989).

Therefore, in an attempt to achieve a clear and profound understanding of the contributions made from the extant studies on resources and capabilities, as an important source for organizations to develop and maintain competitive advantages, it suffices to say that, researchers in this discourse, have concentrated on three foremost streams of investigation:

I. Identification of resources and capabilities for sustainable competitive advantages (Amit and Schoemaker, 1993; Barney, 1991; Peteraf, 1993; Rumelt, Schendel and Teece, 1991; Wernerfelt, 1984).

II. Empirical studies that support the link between resources capabilities and various performance indicators (Alvarez and Barney, 2002; Barnett, Greve and Park, 1994; Barney and Arikan, 20–

01; Michael, Storey and Thomas, 2002; Mosakowski, 2002); and

III. Study of the antecedents of resources and capabilities or the variables that foster their development in organizations (Barney,1986; Rumelt,1984; Rumelt, 1987).

It is worth noting that the above-mentioned investigations have mainly considered resources and capabilities as the essential components, needed by organizations to survive and sustain competitive advantage (Barney and Clark, 2007). However, these previous studies on resources and capabilities, as determinants for organizations' competitive advantage, have some limitations. First, several studies have presumed that the resources and capabilities factors are independent of one another and are not causally related. Second, most studies have also presumed that the weights of the evaluated factors are identical. In order to overcome limitations highlighted above and to answer the following research questions that arose from the foregoing analysis – "What are the resources and capabilities factors related to entrepreneurial venture or small business in sustaining and creating competitive advantage?" and "Which resources and capabilities factors are the most influential factors in sustaining competitive advantage among entrepreneurial ventures?, this study employs the DEMATEL (Decision Making Trial and Evaluation Laboratory) method.

This study, however, reflects a mixture of the three research inclinations by extending the line of inquiry to determine how organizations, more especially entrepreneurial ventures and small businesses, can better identify and distinguish the cause-and-effect relationship amongst resources and capabilities factors. None of these previous investigations had directly tested multiple criteria decision-making (MCDM) methods in handling several complex factors that determine how to identify the specific resources and capabilities required for expected outcomes of business purposes (Wu, 2008). That is the research gap which this study is motivated to fill. Another potential contribution of this study is the use of the technique Decision Making Trial and Evaluation Laboratory (DEMATEL), which will, hopefully, provide a better understanding of how these distinct sets of resources and capabilities of

entrepreneurial ventures and small businesses affect each other and their final success.

For the purpose of achieving its aims, this article is divided into four sections. The first section provides a picture of the existing literature and the theoretical background related to the study. The second section addresses the research methods used in the study. The third section presents the results and discussions. Finally, the fourth section provides the concluding comments.

LITERATURE REVIEW

The Resource-Based View (RBV) Perspective

The extensive studies and discussions of resources and capabilities in the field of strategic management and entrepreneurship cannot be overemphasised, while the definition of the concept "resources and capabilities" not only remains to be properly verified but has also evolved along with abundant researches. For instance, the perception from early research studies referred to resources and capabilities as bundles of tangible and intangible assets, which include a firm's management skills, its organisational processes and routines, and the information and knowledge it controls (Barney, 1991; 2001 *et al.*) for the purpose of generating sustainable competitive advantage and earning above-normal rates of return (Barney, 1991; Wernerfelt, 1984). The overall assumption of RBV is that a firm can sustain and create competitive advantage through its bundles of resources and capabilities, rather than through how it positions itself in the market. With this assertion, the RBV is able to justify the dissimilarities in firm performance, not expounded by industry factors (Ortega, 2010). The widespread discussions in the 1990s have, however, further expressed the relationship between resources and capabilities. More specifically, Grant (1991), and Amit and Schoemaker (1993) have strongly argued that resources are inputs with which an organisation intends to carry out its activities. According to Grant (1991), resources alone do not generate any rent or secure advantages on the competitors, it is the capabilities that indeed provide the knack to manage aptly the resources to carry out a certain activity within an organisation (Grant, 1991). A capability is, therefore, a form in which an organisation combines its resources (Amit and Schoemaker, 1993) for the purpose of improving the productivity of other resources possessed by the firm (Makadok, 2001).

These upward research trends reflect that resources and capabilities can only ensure sustainable competitive advantage, if they are valuable (Barney and Arikan, 2001), rare, inimitable and organised (Barney and Hesterly, 2012). Researches have also summarised the components of resources and capabilities to include organisational resources and capabilities (Teece *et al.*, 1997), marketing resources and capabilities (Lado, Boyd and Wright, 1992) and technical resources and capabilities (Leonard-Barton, 1995; Lado *et al.,* 1992). Thus, resources and capabilities are key success factors for organisations to survive in a changing environment.

Despite the fact that RBV has been criticised on the ground that this school of thought has mainly concentrated on the perspective's internal focus and lacks dynamics (Foss, 1998), these criticisms have gradually been mitigated (Boccardelli and Magnusson, 2006). For instance, Amit and Schoemaker (1993) provided a connection between the internal resources and capabilities of the firm and the competitive situation at the industry level. Furthermore, Teece *et al.* (1997) added dynamics to the perspective by presenting the dynamic capabilities framework, based on the notions of position, process, and paths. The above arguments for the resource-based view school have extended its applicability domain to more rapidly developing and highly competitive environments (Boccardelli and Magnusson, 2006).

Defining Resources and Capabilities for a Successful Entrepreneurial Venture and Small Business

The relevant question is: "What are the resources and capabilities factors related to entrepreneurial venture or small business in sustaining and creating competitive advantage?" In response to this question, Ritam and Kalyan (2014) maintain that, for small businesses and entrepreneurial ventures to sustain and create competitive advantage through their resources and capabilities, they need to align their specific strengths with their expertise, to be able to increase their alliance capability. For Hashai and Almor (2004), and Knight and Cavusgil (2004), unique technologies and innovation factors are significant determinants of sustainable competitive advantage, superior capability to perform R&D activities (Knight and Cavusgil, 2004; Manalova, 2003), network partnerships that provide social capital (Davidson and Honig, 2003), brand names, in-house knowledge of technology, skilled

personnel, trade contracts, efficient procedures, financial, reputational (Spanos and Lioukas, 2001). However, with regard to the effects of resources and capabilities on firm performance, empirical results are mixed (Hitt, Hoskisson and Kim, 1997). In addition, Parayitam and Guru-Gharana (2010) and Radulovich (2008) take the view that researchers have a restricted understanding of firm performance and sustainable competitive advantage benefits of resources and capabilities. Based on the foregoing findings, this paper further applies the focus group research method to define specific resources and capabilities factors for entrepreneurial ventures and small businesses.

According to Lin *et al*. (2011), the purpose of focus group research is to facilitate an organised selected group discussion, which includes representatives of various classes. While the outcomes of these discussions give insights and also provide a better understanding of the subject, which simple survey items may not be able to achieve (Lin *et al*., 2011). Furthermore, focus group discussions allow brainstorming that brings additional information to the current issues and stimuli for new ideas. The present study has, however, raised a number of issues, including the possible resources and capabilities factors that are recognised by entrepreneurs' experts and academics. Through the focus group research procedure, based on the current studies of resources and capabilities, three resource and capabilities factors (i.e., organizational/managerial capabilities, marketing capabilities and technical capabilities), which are in line with the empirical research findings of Lado *et al*. (1992), Leonard-Barton (1995), Spanos and Lioukas (2001), and Teece *et al*., (1997), present study uses discussions that are aided with answers to open-ended questionnaires and recording equipment; opinions, however, are integrated and summarised. These will be analysed and discussed in the next session of study. Consequently, in this present study, the resources and capabilities factors, related to entrepreneurial venture or small business in sustaining and creating competitive advantage, include measures of organizational, marketing and technical capabilities factors.

METHODOLOGY

First, the expert validity survey has been used for this study. This research design helps to gather experts to confirm their expertise in an area or field (Lin *et al*., 2011). Based on this design, a panel of

qualified expert entrepreneurs was formed as a focus group and in-depth discussions, to gauge more specific ideas about resources and capabilities, were carried out. Thus, this group of experts provided their suggestions and reviews, based on their expertise and previous studies in literature that the authors have reviewed. Consequently, the substantial outlooks received from the discussions provided justifications for the results and helped to answer the research question: "What are the resources and capabilities factors related to entrepreneurial venture or small business in sustaining and creating competitive advantage?" During the course of the literature reviews and the process of the focus group, three resource and capabilities factors were identified. They are: organizational/managerial capabilities, marketing capabilities and technical capabilities factors (see Table 1, Appendix-I). Finally, the DEMATEL approach was employed to answer the research question: "Which resources and capabilities factors are the most influential factors in sustaining competitive advantage among entrepreneurial ventures?"

As noted earlier in this paper, DEMATEL is the acronym for Decision Making Trial and Evaluation Laboratory, as advanced by the Battle Memorial Institute, Geneva. According to Lin *et al*. (2011), the DEMATEL technique was originally designed for the purpose of explaining and understanding structural relations in a complex system. For Zhou, Huang and Zhang (2011), it helps to analyze complex problems related to real life. Ashtianipouri and Zandhessame (2015) maintain that it is a technique used to elicit expert opinions in order to have a clear view of a contextual relationship that exists among variables.

Meanwhile, much of the prolific academic researchers in many fields (e.g., Wu, 2008; Lin *et al*., 2011; Zhou *et al*., 2011; Ashtianipouri and Zandhessame, 2015; Raghuvanshi, Agrawal, and Ghosh, 2017) have reaffirmed that DEMATEL, as a technique, is useful when it comes to causal analysis because it enables studies to distinguish the connecting criteria of a system into cause and effect gro-ups. DEMATEL, as pointed out by Lin *et al*. (2011), allows decision-makers to recognise criteria that are of greater effect. Consequently, this study has adopted the DEMATEL approach since it can solve the causal relationship issues of resources and capabilities, required for expected outcomes of an

entrepreneurial venture, which, in turn, provides progressive options. The DEMATEL model construction process is stated below:

Step 1: Generating the direct relationship matrix: To draw the inter-relationships among various variables, a group of subject-related experts was formed that included four experts, two of whom were professors of entrepreneurship and two entrepreneurship experts, were requested to form a pair-wise matrix of variables, using the five-point scale to measure their responses ('0' indicates 'no influence', '1' indicates 'low influence', '2' indicates 'medium influence', '3' indicates 'high influence', '4' indicates 'extremely influence').

Step 2: Computing the average relation matrix: The average relationship was determined by calculating four direct relationship matrices X1, X2, X3, X4, from Equation 1

$$A = \frac{1}{K}(X_1 + X_2 + X_3 + X_4)$$ where K-expert = 4 (see Table 2, Appendix-II)   (1)

Step 3: Computing the normalised direct relationship matrix (N): Through Equations (2) and (3) the normalised matrix (N) was obtained.

$$a = \text{Min}\left\{\frac{1}{max \sum_i^n A}, \frac{1}{max \sum_j^n A}\right\}$$ (2)

Hence, a = 0.057 (see Table 3, Appendix-III)

$$N = a * A$$ (3)

Note: a represents constant, while A is referred to as the element of the average relationship matrix, the '*i*' represents an element of row and '*j*' represents an element of the column.

Step 4: Constructing the total-relation matrix: First, the normalized matrix was obtained and thereafter the total relationship matrix was calculated by

$$T = (N(I - N)^{-1})$$ (4)

The "*I*", however, symbolizes identity matrix. (see Table 4, Appendix-IV)

Step 5: Calculating the cause-and-effect relationship: Through Equations (5) and (6) the cause-and-effect relationship Table was determined.

The "R" means the sum of rows, while "C" means the sum of columns.

$$R = \left(\sum_{j=1}^{n} T_{ij}\right)_{nx1} \quad (5)$$
$$C = \left(\sum_{i=1}^{n} T_{ij}\right)_{1xn} \quad (6)$$

Study Questionnaire

The study questionnaire was adapted from Spanos and Lioukas (2001) comprised of three dimensions (i.e., organizational/managerial, marketing and technical capabilities) and 60 items, A five-point Likert scale was used to tap responses. This research instrument was, however, modified, based on the substantial viewpoints received from the focus group discussions, as earlier explained in this study. Consequently, the research instrument was subjected to validity testing through theoretical validity, nomological validity and content validity.

DISCUSSION

For this study to identify and distinguish the cause-and-effect relationship amongst the distinctive sets of resources and capabilities of entrepreneurial ventures and small businesses, the threshold value (0.181) was set-up to sort out or rank the insignificant effects. The measures/criteria were ranked according to importance or influence on the basis of (R+C) values, as follows: FC > MC > EOS > COR > KSE > ACE > SP > CIB > MK > ARC > CDC > TCE > EPD > EST.

(R−C) values are used to rank causal resources and capabilities factors amongst entrepreneurial ventures and small businesses, which are as follows: ACE > MC > KSE > FC > EOS > MK > EPD > TCE > ARC > CIB > CDC > EST > COR > SP.

Setting a Threshold value (α):

$$\frac{35.42}{196} = 0.181$$

According to Table 5 (see Appendix-V), under organizational capabilities measures, this study found that firm climate and managerial competence were the two most important criteria, based on first and second highest (R+C) values of 10.026 and 9.253, respectively, whereas both firm climate and managerial competence were in the cause group, based on their positive (R−C) values of 0.815 and 0.524, respectively. Strategic planning and coordination were in the effect group, given negative (R−C)

values of −1.949 and −1.387, respectively. Also, considering the figures obtained in Table 5, firm climate emerged the most critical distinctive set of organizational/managerial resources and capabilities factors. This is because it has a direct influence on the other six criteria. This finding is in alignment with that of Hult *et al.* (2007), they conclude that a culture of competitiveness [or firm climate], and knowledge development, including their interaction, increase performance. Meanwhile, managerial competence has a direct impact on strategic planning and a mutual interaction on coordination. This finding is also supported by Hooley *et al.* (2005) strongly argue that managerial competence upsurge reputational assets, organization reputation, brand, and credibility are significant assets in increasing firm performance.

Furthermore, the results in Table 5 also show that, for marketing capabilities measures amongst entrepreneurial ventures, the customers' "installed base" and market knowledge were the two most important criteria, based on higher (R+C) values of 1.407 and 1.388, respectively. The customers' "installed base" shows a negative net cause of (R−C) value of −0.023, while the market knowledge shows a positive net cause of (R−C) value of 0.086. Control and access to distribution channels has a net cause of (R−C) value of −0.065. Consequently, the figure obtained in Table 5 depicts market knowledge as the most significant distinctive set of marketing capabilities factor, since it has a significant impact on the other three criteria. This finding is also supported by the study carried out by Hult and Ketchen (2001); Menguc and Auh (2006); and Hult *et al.* (2005). These studies maintain that market orientation and market information processing have a strong impact on firm performance.

For the technical capabilities' measures, technological capabilities and equipment factor is the most important criterion, as it provides the highest (R+C) value of 0.898. This finding is also supported by the studies carried out by Ashtianipour and Zandhessami (2015) and Ortega, (2010), which maintained that entrepreneurs' utilization of technological capabilities will not only improve competitiveness but also lead to achieving competitive advantage. Efficient and effective production department is next to it, with an (R+C) value of 0.878. However, based on the (R−C) value of 0.054, efficient and effective production department was found to be the net cause and has a significant impact on the

other two criteria. This finding is also supported by the study conducted by Lages *et al*. (2009) that emphasizes that organizational learning capability improves product innovation.

CONCLUSION

This study has explored how entrepreneurial ventures and small businesses can better identify and distinguish cause-and-effect relationship amongst resources and capabilities factors. Resources and capabilities remain one of the most important factors that influence firms, more especially entrepreneurial ventures, to improve their competitiveness and achieve competitive advantage. Although, previous studies had focused mostly on understanding the resources and capabilities of an industry or a firm, they had not provided enough analysis on the interaction relation among them.

Consequently, our study applied the DEMATEL method to identify and describe the cause-and-effect relationship amongst the resource and capabilities factors of entrepreneurial ventures, which were classified into three dimensions and fourteen criteria after a review of the literature. The result of the study implied that entrepreneurs and their management should focus on how they will continue to improve their firms' organizational capabilities in the cause group (i.e., firm climate and managerial competence). The findings reveal that, in prioritizing the importance of criteria and cause-and-effect relationship among criteria under the three core dimensions, firm climate, managerial competence, market knowledge and technological capabilities and equipment were the most critical criteria. Furthermore, the result shows that a firm's climate is the most significant criterion in the adjustment of resource and capability factors of entrepreneurial ventures. Therefore, promoting a supportive and conducive firm climate among the entrepreneurial ventures can enhance other resources and capabilities factors, which, in turn, will improve the overall performance of entrepreneurial ventures and small businesses.

IMPLICATIONS

The results of this study have shown that there is in fact strong and positive evidence that resources and capabilities remain one of the most important factors that influence entrepreneurial ventures and small businesses to improve their competitiveness and achieve competitive advantage.

In terms of theoretical implications, firm climate, among other criteria in the adjustment of resources and capabilities dimensions, serves as the "ultimate" sources of sustainable competitive advantage among entrepreneurial ventures and small businesses. This result is in line with those of previous research studies (e.g., Hult *et al.*, 2007, and Lages *et al.,* 2009). The findings also provide a useful guide to entrepreneurial managers and practitioners on the need to create and promote a supportive as well as conducive firm climate that will enhance other resource and capability factors, which, in turn, will improve the overall competitiveness of entrepreneurial ventures and small businesses. The findings show clearly that, when considering resources and capabilities decisions under the three core dimensions, more focus needs to be given to firm climate, managerial competence, market knowledge, technological capabilities and equipment. This result, therefore, provides a clue as to why most of the small businesses and entrepreneurial ventures usually first try to create a supporting firm climate in line with their managerial aptitudes, which have also helped them to develop capacity building programs, which, in turn, have improved their workforce. As pointed out by Hewitt and Wield (1992), and Lucas (1993), a workforce that is knowledgeable and cultured is likely to be more efficient because of their greater ability to engross and effectively utilize new technology.

From the practice point of view, the results further reinforce the view that entrepreneurial ventures and small businesses need to identify and prioritize resources and capabilities when the environment is in a state of turmoil, since resources and capabilities factors within a business become more of a stable factor on which small businesses can base their competitive advantage. Consequently, when managers of small businesses are accessing their bundle of resources and capabilities in order to achieve a sustainable competitive advantage, it is important to consider the relative importance of criteria within each dimension of resource and capabilities factors. For example, firm climate and managerial competence are the most critical criteria within the organizational/managerial dimension of resources and capabilities factors. The ideal practice for entrepreneurial ventures and small businesses is to concentrate on how they can manage all three dimensions of resources and capabilities factors in order to enhance their business performance optimally and sustain their competitive advantage.

LIMITATIONS AND FUTURE DIRECTIONS

Our study has some limitations. First, the proposed DEMATEL method in this study is designed to solve the determination of a complex and interactive resources and capabilities issue of an entrepreneurial venture and small business. Further, research would need to provide an elaborate analysis of other sub-sectors of entrepreneurial ventures and small businesses. Second, this study was carried out by only employing the opinions of four experts; further research could be conducted by employing more robust statistical techniques in order to get more valid results. We also suggest that, in carrying out further research in the various sectors of small businesses and entrepreneurial ventures, there is need to employ other multi-criteria decision-making methods, such as the Analytical Hierarchy Process (AHP), Technique for Order Preference by Similarity to an Ideal Solution (TOPSIS), and Interpretive Structural Modeling (ISM), for the purpose of comparative analysis.

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Code	Measures
1.	**Organizational/Managerial Capabilities**
MC	Managerial competence
KSE	Knowledge and skills of employees
FC	Firm climate
EOS	Efficient organizational structure
COR	Coordination
SP	Strategic planning
ACE	Ability to attract creative employees
2.	**Marketing Capabilities**
MK	Market knowledge
CDC	Control and access to distribution channels
ARC	Advantageous relationships with customers
CIB	Customers "installed base"
3.	**Technical Capabilities**
EPD	Efficient and effective production department
EOS	Economies of scales and technical experience
TCE	Technological capabilities and equipment

Source: Authors' own

Table 1. Measures of Resources and Capabilities

	MC	KSC	FC	EOS	COR	SP	ACE	MK	CDC	ARC	CIB	EPD	EST	TCE
MC	0	3	3	2.25	2.25	3.5	2.5	0	0	0	0	0	0	0
KSC	2.5	0	3.25	3	3	1.5	1.5	0	0	0	0	0	0	0
FC	2.25	3	0	2.75	3.25	3.25	3	0	0	0	0	0	0	0
EOS	2.5	2.5	2.5	0	2.75	2.25	2.25	0	0	0	0	0	0	0
COR	1.75	1.25	2.5	1.75	0	3	2.25	0	0	0	0	0	0	0
SP	2.5	1	2	1.5	2.75	0	1.25	0	0	0	0	0	0	0
ACE	2.25	2	2.5	2.75	3	2.75	0	0	0	0	0	0	0	0
MK	0	0	0	0	0	0	0	0	2.5	2.75	2.75	0	0	0
CDC	0	0	0	0	0	0	0	2.25	0	2	2.25	0	0	0
ARC	0	0	0	0	0	0	0	2.5	2.75	0	2.5	0	0	0
CIB	0	0	0	0	0	0	0	2.5	2.75	2.5	0	0	0	0
EPD	0	0	0	0	0	0	0	0	0	0	0	0	3	2.75
EST	0	0	0	0	0	0	0	0	0	0	0	2	0	2.5
TCE	0	0	0	0	0	0	0	0	0	0	0	3	2.75	0

Source: Authors' own

Table 2. Direct-Influence Matrix

	MC	KSC	FC	EOS	COR	SP	ACE	MK	CDC	ARC	CIB	EPD	EST	TCE
MC	0	.171	.171	.128	.128	.199	.143	0	0	0	0	0	0	0
KSC	.143	0	.185	.171	.171	.086	.086	0	0	0	0	0	0	0
FC	.128	.171	0	.157	.185	.185	.171	0	0	0	0	0	0	0
EOS	.143	.143	.143	0	.157	.143	.143	0	0	0	0	0	0	0
COR	.099	.071	.128	.099	0	.171	.128	0	0	0	0	0	0	0
SP	.128	.057	.114	.086	.157	0	.017	0	0	0	0	0	0	0
ACE	.128	.114	.143	.157	.171	.157	0	0	0	0	0	0	0	0
MK	0	0	0	0	0	0	0	0	.128	.157	.157	0	0	0
CDC	0	0	0	0	0	0	0	.128	0	.114	.128	0	0	0
ARC	0	0	0	0	0	0	0	.128	.128	0	.143	0	0	0
CIB	0	0	0	0	0	0	0	.128	.157	.128	0	0	0	0
EPD	0	0	0	0	0	0	0	0	0	0	0	0	.171	.157
EST	0	0	0	0	0	0	0	0	0	0	0	.114	0	.143
TCE	0	0	0	0	0	0	0	0	0	0	0	.171	.157	0

Source: Authors' own

Table 3. Direct-Relation Matrix

	MC	KSC	FC	EOS	COR	SP	ACE	MK	CDC	ARC	CIB	EPD	EST	TCE
MC	0.569	0.681	0.786	0.695	0.814	0.854	0.635	0	0	0	0	0	0	0
KSC	0.653	0.5	0.752	0.688	0.797	0.721	0.564	0	0	0	0	0	0	0
FC	0.708	0.704	0.669	0.744	0.891	0.876	0.683	0	0	0	0	0	0	0
EOS	0.659	0.628	0.727	0.546	0.794	0.772	0.609	0	0	0	0	0	0	0
COR	0.52	0.47	0.595	0.528	0.53	0.669	0.499	0	0	0	0	0	0	0
SP	0.468	0.391	0.502	0.44	0.573	0.435	0.347	0	0	0	0	0	0	0
ACE	0.642	0.599	0.72	0.676	0.799	0.778	0.479	0	0	0	0	0	0	0
MK	0	0	0	0	0	0	0	0.084	0.203	0.222	0.228	0	0	0
CDC	0	0	0	0	0	0	0	0.185	0.076	0.176	0.192	0	0	0
ARC	0	0	0	0	0	0	0	0.19	0.195	0.079	0.209	0	0	0
CIB	0	0	0	0	0	0	0	0.192	0.22	0.194	0.086	0	0	0
EPD	0	0	0	0	0	0	0	0	0	0	0	0.058	0.212	0.196
EST	0	0	0	0	0	0	0	0	0	0	0	0.15	0.053	0.174
TCE	0	0	0	0	0	0	0	0	0	0	0	0.204	0.202	0.061

Source: Authors' own

Table 4. Total-Relationship Matrix

	R	C	R+C	R-C
MC	5.034	4.219	9.253	0.815
KSE	4.675	3.973	8.648	0.702
FC	5.275	4.751	10.026	0.524
EOS	4.735	4.317	9.052	0.418
COR	3.811	5.198	9.009	-1.387
SP	3.156	5.105	8.261	-1.949
ACE	4.693	3.816	8.509	0.877
MK	0.737	0.651	1.388	0.086
CDC	0.629	0.694	1.323	-0.065
ARC	0.673	0.671	1.344	0.002
CIB	0.692	0.715	1.407	-0.023
EPD	0.466	0.412	0.878	0.054
EST	0.377	0.467	0.844	-0.09
TCE	0.467	0.431	0.898	0.036

Source: Authors' own

Table 5. Cause-and-Effect Relationship Matrix