An Empirical Study of Resource Contribution in SMEs Alliance

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ABSTRACT

SMEs operating in a rapidly changing and uncertain business environment need to form cooperative alliances in order to obtain necessary resources. However, most alliances between partners result in failure. Hence, this paper examines how different types of resource contribution affect the performance of alliances in relation to the use of dissimilar and similar resources. The results indicate that the contribution of dissimilar resources by both the focal and partner firms has a significant positive impact on alliance sustainable commitment. The results also showed that there was a positive relationship between the contribution of dissimilar resources by the partner firms and alliance performance. However, the contribution of dissimilar resources alone by the focal firms had no significant impact on alliance performance.

INTRODUCTION

Alliance is defined as the "collaborative efforts between two or more firms in which the firms pool their resources in an effort to achieve mutually compatible goals that they could not achieve easily alone" (Lambe et al., 2002, p. 141). Reijnders and Verhallen (1996, p. 36) have referred to it as "a coalition of a number of organizations intended to achieve mutually beneficial goals". Cooperative alliances allow firms to explore new technology, enhance a firm's knowledge foundation, lower development costs and time-to-market, and reduce the capital requirements and risks involved in development new products and services (Garcia-Falcon and Medina-Munoz, 1999; Grant 1996; Kelley and Rice, 2002; Lee et al., 2006). The approach is often adopted by small and medium-sized enterprises (SMEs) as a competitive strategy to obtain necessary resources in a rapidly changing and highly uncertain business environment (Child and Faulkner, 1998; Dyer and Singh, 1998; Forrest, 1990; Harrison et al., 2001; Pfeffer and Salancik, 1978).

However, according to and Das and Teng (2000b), around 60% of alliances between partners resulted in failure. Hence, the choice of partners and resource fit of alliance partners are of great importance for SMEs (Grant et al., 1999). For those SMEs without much resource, the formation process of alliance can be partly viewed as a process to increase both of their tangible and intangible resources (Das and Teng, 2003). Value generated from alliances is enhanced when partners have different resource profiles and contribute these resources into the alliance. These partner characteristics are important since they help in the evaluation of optimum allocations of inter-partner resources for potential alliances to achieve suitable alliance resource alignments (Das and Teng, 2000a).

This paper attempts to examine how different types of resource alignment affect the performance of alliances via the contribution of dissimilar and similar resources. The focus of this study is the small hemodialysis clinics in Taiwan. These small hemodialysis clinics have formed alliances to confront the fierce competition as well as to absorb the regulatory pressure from the government (Yang, 2003). The literature on inter-organizational collaborations has been criticized for its relatively narrow concentration on large firms and for ignoring SMEs' alliances where large firms do not operate in similar ways (Prater and Ghosh, 2005). Due to their size SMEs are more likely to seek external expertise (Bode and Burn, 2002). Similarly, these small hemodialysis clinics must form alliances to obtain these scarce resources. Unlike large firms which own a lot of slack resources to be able to form alliances with many partners, these small hemodialysis clinics tend to form alliances with only a small number of partners and therefore, their dependence on these partners is higher than large firms (Mambula, 2002; McGregor and Gomes, 1999). In this regard, these small Taiwanese hemodialysis clinics offer an appropriate context for research.

LITERATURE REVIEW

Similar Resource Contribution

SMEs are particularly in need of finding suitable partners with dissimilar or similar resources due to their insufficient slack resources (Srinivasan et al., 2005). Forming alliances is one way for firms which have possessed similar resources to decrease inter-firm rivalry. Chen (1996: p. 107) has defined resource similarity as "the degree to which two partner firms contribute resources compatible, in terms of both type and amount, to an alliance". The understanding of resource similarity is very important because the firms which have possessed similar resources can potentially be the fierce rivals (Chen, 1996). Moreover, resource similarity can also assist in interorganizational learning among alliance partners. For example, according to Pitts and Lei (1997), alliances formed to learn and absorb tacit knowledge are more difficult to manage among partners that come from different cultural background than partners from a similar cultural background. In addition, Inkpen (2000) has proposed that the relatedness between inter-partners' knowledge base supported the acquisition of alliance knowledge. Therefore, we argue that resource similarity represents smaller knowledge distance and higher cultural similarity between alliance partners. These similarities are likely to assist alliance partners in developing a thorough understanding of their own knowledge and culture, and these can also enhance mutual learning and coordination, and ultimately lead to increased alliance performance.

Dissimilar Resource Contribution

On the other hand, the uniquely dissimilar resource contribution is particularly critical to SMEs in their partner selection processes. SMEs are particularly in need of finding suitable partners with the dissimilar resources since it is difficult to produce alliance synergy without dissimilar resource contribution (Harrison et al., 1991; 2001). Although potential competitors can easily imitate the research-based synergy from an alliance where the inter-partners have strong research orientations, it will be much more difficult for them to acquire the synergy derived from dissimilar resource contribution (Harrison et al., 2001). Therefore, they are less likely to be interested in forming an alliance with firms who are only able to contribute similar resources. It is proposed that there is a negative correlation between inter-partners on the contribution of similar resources. This implies that one party does not require the contribution by the other party on the resources they already own. On the other hand, there is a positive correlation between inter-partners on the contribution of dissimilar resources. Inter-partners that possess dissimilar resources are able to complement each other within an alliance. Therefore, the following hypotheses are proposed:

H1a There is a negative correlation between the focal firm and the partner firm on the contribution of the similar resources;

H1b There is a positive correlation between the focal firm and the partner firm on the contribution of the dissimilar resources;

H2 Higher dissimilar resource contribution leads to higher alliance sustainable commitment;

H3 Higher dissimilar resource contribution leads to higher alliance performance.

METHODOLOGY

Data Collection

This research targeted small Taiwanese hemodialysis clinics. Due to increasing costs and declining revenue, many of these small hemodialysis clinics have resorted to form alliances with medium-sized hospitals or large healthcare service providers in order to survive (Lee and Jones, 2004). It has been increasingly popular for several nephrologists to set up a small hemodialysis clinics via joint venture. This is because that the supply of nephrologists and hemodialysis centers, and the demand from the patients have been quite growing at the steady rate. However, in recent years, most of these small hemodialysis clinics have realized that they can only compete with major hospitals through cooperative alliances as most of the patients prefer to go to big hospitals for long-term treatments.

In order to test the proposed hypotheses, seven in-depth semi-structured interviews lasting one hour each were conducted with five experts from industry associations and small hemodialysis clinics to get insights into industry

dynamics and to develop and refine the survey scales. Prior to determining the sample size for the survey, a pilot survey of ten industry executives was conducted. The survey was subsequently modified. The main survey, undertaken between 2004 and 2005, targeted small hemodialysis clinics within the Taiwan hemodialysis industry. A list of 376 hemodialysis clinics was obtained from the Taiwan National Kidney Foundation database. Through the help of a healthcare provider, 127 hemodialysis clinics were determined to have formed joint venture or contract-based partnership with other physicians, hospitals or healthcare providers and most of their owners/managers also agreed to help our survey. These 127 small hemodialysis clinics were classified to have formed alliances with others (Mowery et al., 1998). Then the questionnaire, accompanied by a covering letter to explain briefly the purpose and aim of the survey and a reply-paid return envelope was then sent to owner/manager of these 127 hemodialysis clinics listed in the database. This questionnaire basically asked the owners/directors or persons who were capable of representing their views to complete and return the questionnaire. The respondents were asked to answer the questions in relation to the cooperative relationship with their most important alliance partner. Additionally, the respondents were promised that their responses and identities would remain strictly confidential in order to maximize the potential response rate.

A total of 80 questionnaires were received after three follow-up mailings or phone calls were carried out to increase the response rate. Eleven incomplete questionnaires were discarded, giving a net response rate of 54.3%. These 69 completed questionnaires represented 54.3% of all registered small hemodialysis clinics that have formed alliances with others in Taiwan. The sample size also represented 18.4% of the total number (376) of registered hemodialysis clinics in Taiwan. In addition, the sample size is comparable to many other similar studies conducted in the last few years. For example, Sarkar et al. (2001) collected 68 responses from 561 large international contractors sent (a net response rate of 12.1%) in their study of alliance on the role of dissimilar resource contribution, compatibility, and relationship capital on alliance performance. Non-response bias was tested by comparing the early and late responders on all constructs and no significant difference between the two groups was found (Armstrong and Overton, 1977).

Measurement

Respondents were asked to indicate their agreement on a seven-point Likert scale (1 for strongly disagree and 7 for strongly agree) with statements concerning four main constructs: (1) alliance sustainable commitment; (2) alliance performance; (3) focal firm's resource contribution – intangible resource, physical resource, and organizational capabilities; and (4) partner firm's resource contribution – intangible resource, physical resource, and organizational capabilities. Higher ratings for these questions indicated: (1) greater sustainable commitment to the alliance by respondents; (2) higher performance for respondents to remain in the alliance; (3) greater level of resource contributions from the focal firms; and (4) higher resource contributions from the partner firms. In addition, we have used focal firm's perceptual sustainable commitment and performance to represent alliance sustainable commitment and performance in accordance with the finding by Geringer and Hebert (1991) in which they have found that subjective performance is positively related to the objective measures of international joint venture (IJV) performance (i.e. survival, stability and duration).

Contribution of Similar and Dissimilar Resources

This study has defined the inter-organizational resource cooperation among the hemodialysis clinics as the unique and valuable resources contribution by both the focal and partner firms. According to the resource-based viewpoint, resources (for a hemodialysis clinic) can be categorizes as specialized hemodialysis support, medical support services and management systems (Chatterjee and Wernerfelt, 1991; Collis, 1991; Short et al., 2002). There were twenty questions within the questionnaire and respondents were asked to indicate their agreement on a seven-point Likert scale (1 for strongly disagree and 7 for strongly agree) with statements concerning the resource contribution by both the focal and partner firms from the perspective of the focal firms. It was anticipated that respondents were able to estimate each other's contributions since there was a significantly positive correlation between a parent firm's perceptual performance with IJV performance and the other partner's perceptual performance (Geringer and Hebert, 1991). Factor analysis was performed on these measurement items to ensure that all scales were unidimensional and to assess reliability. A factor analysis was then performed to examine question items in each construct and questions with an item loading below 0.5

were deleted without losing the representation of each of the constructs. Cronbach's alphas for all constructs are provided in Appendix 1 with all above 0.85 indicating an acceptable reliability of the measures (Nunnally, 1978).

The *sustainable commitment* scale was derived from Daniel et al. (2002) and Sarkar et al. (2001). We revised the scale into a four-item scale and the alpha value for this scale was 0.94, indicating acceptable values of internal consistency (Nunally, 1978). This scale measured the focal firm's willingness to invest required resources into the alliance.

The *performance* scale was based on Daniel et al. (2002) and Sarkar et al. (2001) perceptual measure of assessing performance with both the relationship and performance between IJV partners. In this survey, *performance* was used as an indicator for alliance performance, and measured on a seven-point Likert-type scale (1 for strongly disagree and 7 for strongly agree). Moreover, four items on hemodialysis characteristics were used as control variables. These include individual rating and size of hemodialysis clinic, length of cooperative alliance, and type of cooperative institution (i.e. hospital or healthcare provider).

According to Johnson et al. (1996), the resource contributions from both the focal and partner firms are part of the formative measurements and as such, traditional associational-based validation procedures do not apply. Therefore, the measures for *sustainable commitment* and *performance* were analyzed for reliability and validity in accordance with the guidelines set out by Anderson and Gerbing (1988) and Agarwal and Karahanna (2000). The reliability of the research constructs for *sustainable commitment* and *performance* was evaluated using Cronbach's coefficient alpha (α). The α values for *sustainable commitment* and *performance* in the sample were 0.84 and 0.94, respectively. According to Nunnally (1978), an α value of 0.70 or above indicates a reliable measurement instrument.

RESULTS

Most small hemodialysis clinics surveyed (42 respondents, 60.9%) operated independently in small and medium-sized hospitals while the remaining 27 small hemodialysis clinics (39.1%) operated as local medical clinics. In terms of the number of hospital beds, 25 small hemodialysis clinics (36.3%) had less than 19 beds while the other 27 centers (39.1%) had between 21-30 beds. The remaining 17 small hemodialysis clinics (24.6%) had more than 30 beds (up to 65 beds). They were small in number of hospital beds by Taiwanese standards. In terms of the alliance age, 26 respondents (37.7%) had less than 3 years and 25 respondents (36.3%) had between 3 and 5 years. 18 respondents (26.0%) had more than 6 years (the longest was 13 years).

Table 1 presents the descriptive statistics and Pearson correlation for the variables used in this study. Although there were few slightly stronger correlations among some independent variables, the maximum variance inflation factor (VIF) for the independent variables in all models was less than 2.766, and the average VIF was less than 1.754. This indicated that multicollinearity was not unduly influencing the least squares estimates (Neter et al. 1985). Therefore, there was no evidence of multicollinearity in the data.

Table 2 presents the correlation matrix to highlight the relationships between the focal firms and the partner firms within inter-organizational resources cooperation. The items shown in Table 2 are the types of resources that can be contributed by the partners: (1) specialized hemodialysis support; (2) medical support services; and (3) management systems. The results in Table 2 demonstrated that between the focal firm and the partner firm there was a negative correlation on the contribution of similar resources. On the other hand, there was a positive correlation on the contribution of dissimilar resources between inter-partners. This supported the initial concept of similar/dissimilar resource contribution mentioned earlier in the paper since most of correlation coefficients were found to be significant. Thus, *H*1a and *H*1b were partially supported.

	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13
Contributed by focal firms															
1. Specialized hemodialysis support	5.520	1.363	1.000												
2. Medical support services	4.955	1.226	0.000	1.000											
3 .Management systems	5.561	1.399	0.000	0.000	1.000										
Contributed by partner firms															
4. Specialized hemodialysis support	4.871	1.497	-0.222$^+$	0.260$^+$	0.109	1.000									
5. Medical support services	4.120	1.785	0.311*	-0.524**	0.279$^+$	0.000	1.000								
6. Management systems	4.876	1.884	0.492**	0.354*	-0.140	0.000	0.000	1.000							
Control variables															
7. Ratings	3.880	0.990	-0.211	0.116	-0.071	-0.012	-0.083	-0.112	1.000						
8. Size†	1.046	0.224	0.023	-0.102	-0.011	0.104	0.119	0.004	-0.440**	1.000					
9. Length of cooperation†	0.560	0.267	0.100	-0.023	0.240$^+$	0.075	0.158	0.112	-0.210$^+$	0.281*	1.000				
10. Hospital‡	0.373	0.493	-0.133	-0.503**	0.017	0.095	0.361*	-0.556**	-0.197	0.115	0.032	1.000			
11. Healthcare provider‡	0.392	0.224	0.140	0.406**	0.067	0.285*	-0.107	0.510**	0.096	0.025	-0.196	-0.619**	1.000		
12. Performance	5.672	1.230	0.119	-0.110	0.178	0.506**	0.232$^+$	-0.028	-0.298*	0.405**	0.274$^+$	0.177	0.232$^+$	1.000	
13. Commitment	6.304	0.695	0.247$^+$	0.522**	0.200	0.219	-0.015	0.417**	0.029	0.187	0.241$^+$	-0.355*	0.286*	0.000	1.000

$^+p<0.10$，$^*p<0.05$，$^{**}p<0.01$，$^{***}p<0.001$

† Both size and length of cooperation were applied with a logarithm transformation.

‡ Dummy variables.

Table 2: Correlations for the Focal and Partner Firms' Resource Contribution

		Focal firms		
		Specialized hemodialysis support	Medical support services	Management systems
Partner firms	Specialized hemodialysis support	-0.222$^+$	0.260$^+$	0.109
	Medical support services	0.311*	-0.524**	0.279$^+$
	Management systems	0.492**	0.354*	-0.140

$^+p<0.10$，$^*p<0.05$，$^{**}p<0.01$，$^{***}p<0.001$

Models 1 and 2 in Table 3 analyzed the relationship between the individual resource contribution by both parties and the alliance sustainable commitment. The regression analysis results in Table 3 indicated that the contribution of specialized hemodialysis support items and medical support services items by the focal firms had significant positive effect on the alliance sustainable commitment. In addition, the results also showed that the contribution of management systems items by the partner firms had a positive impact on the alliance sustainable commitment. From the above findings, it can be concluded that the contribution of *dissimilar* resources by both the focal and partner firms had a significant positive impact on the alliance sustainable commitment. Thus, **H2** was fully supported.

Models 3 and 4 in Table 3 analyzed the relationship between the individual resource contribution by both parties and the alliance performance. The regression analysis results in Table 3 showed that the contribution of these three items (i.e. specialized hemodialysis support, medical support services and management systems) by the focal firms had no significant relationship with the alliance performance. However, there was a positive relationship between the contribution of specialized hemodialysis support by the partner firms and the alliance performance. Therefore, as long as the partner firms were able to make significant contribution on other resource items it can still have a positive effect on the alliance performance. Thus, **H3** was partially supported.

Table 3: The Effects of Resource Contribution and Performance: Unstandardized Regression Coefficients

	Sustainable Commitment				Performance			
	Model 1		Model 2		Model 3		Model 4	
	Beta	S.D.	Beta	S.D.	Beta	S.D.	Beta	S.D.
Constant	-2.042*	1.001	-1.769	1.162	-2.196*	1.067	-1.216	0.988
Contributed by focal firms								
1. Specialized hemodialysis support	0.240+	0.122			0.060	0.130		
2. Medical support services	0.492**	0.136			-0.076	0.145		
3. Management systems	0.159	0.122			0.075	0.130		
Contributed by partner firms								
4. Specialized hemodialysis support			0.229	0.151			0.329*	0.128
5. Medical support services			0.036	0.149			0.125	0.126
6. Management systems			0.305+	0.178			-0.165	0.151
Control variables								
7. Ratings	0.152	0.138	0.175	0.154	-0.064	0.147	-0.165	0.131
8. Size[†]	0.941	0.627	0.978	0.568	1.066	0.668	0.822	0.570
9. Length of cooperation[†]	0.873	0.522	0.605	0.580	0.923	0.556	0.872+	0.483
10. Hospital[#]	-0.124	0.327	-0.540	0.444	0.976+	0.346	0.476	0.378
11. Healthcare provider[#]	0.058	0.320	-0.116	0.425	1.211**	0.341	0.877*	0.362
F-value	4.584		2.558		3.797		5.527	
P	0.001***		0.024*		0.002*		0.000***	
Adjusted R^2	0.379		0.206		0.323		0.430	

$^+p<0.10$ ， $^*p<0.05$ ， $^{**}p<0.01$ ， $^{***}p<0.001$

[†] Both size and length of cooperation were applied with a logarithm transformation.

[#] Dummy variables.

DISCUSSION AND IMPLICATIONS

The above findings have showed the dissimilar nature of resources contributed by all partners. The fact that there was a negative correlation between the similar resources provided by both the focal and partner firms indicates that the focal firms do not need similar resources provided by the partner firms. In terms of dissimilar resources, there was a positive correlation between the resources contributed by both the focal and partner firms. This has showed that the partner firms were able to provide necessary resources to satisfy needs of the focal firms. Moreover, there was a positive relationship between the resources contributed by both the focal and partner firms and the alliance sustainable commitment and performance. There are two approaches to establish the relationship between dissimilar resource contribution and alliance performance. One approach is that *as long as* the partner firms were able to make significant contribution on some resource categories even when the focal firms failed to contribute significant unique resources it could still have a positive effect on the alliance performance. The other approach to establishing successful relationship was through *both* the focal and partner firms contributing unique dissimilar resources into the alliance. The implication of the findings is that symmetrically dissimilar resource contribution by inter-partners can increase alliance sustainable commitment. Therefore, it can be said that successful alliance depends on partners' willingness to contribute a

symmetric share of the requisite resources. Focal SMEs are only willing to fully commit themselves to the alliance when they perceive the "fair dealing" (Ring and Van de Ven, 1994). That is, each partner has to provide equal or symmetric resource contributions in their alliance.

In addition, we further confirm that alliance performance could only be achieved when inter-partner contributed dissimilar resources to the alliance. Moreover, from the four models in Table 3 we fail to establish a positive relationship between the alliance performance and the overlapping similar resources contributed by both the focal and partner firms. Therefore, the results demonstrate that similar resource contribution had no impact on alliance performance. Furthermore, Table 3 has showed that the most characteristics of both the focal and partner firms had no direct effect to the alliance performance. Therefore, the dissimilar resources contribution was the key success factor for establishing alliances.

According to Johnson et al. (1996), alliances have succeeded in pooling the required resources for partners. However, previous studies so far had only concentrated on dissimilar resource contribution. This study attempted to examine the alliance partners' contribution in terms of both similar and dissimilar resources. The results indicated that alliance partners paid much attention on each other's ability to uniquely and symmetrically contribute dissimilar resources. This had a significant impact on the alliance sustainable commitment and performance.

Previous research concentrated on large firms and most research assumed that these large firms paid particular attention on their partners' ability to contribute dissimilar resources within the alliance. These large firms regarded similar resources as the surplus or slack resources. The measurement proposed by this research had provided the means to evaluate both similar and dissimilar resources. The measurement could be applied to both large firms and SMEs in other industries in the future.

First, past research did not find consistent empirical support that there was a positive relationship between dissimilar resource contribution and alliance performance (Das and Teng, 2000a; Hill and Hellriegel, 1994). Our results indicated that dissimilar resource contribution was positively and significantly related to alliance sustainable commitment and performance. The results had shown that the focal SMEs were more likely to select partners which had owned the requisite dissimilar resources. The success of the alliance can only be achieved through this sort of resource fit.

Second, previous research provided inconsistent results on the relationship between similar resource contribution and alliance performance. For instance, Das and Teng (2000a; 2003) proposed that similar resource contribution had positive relationship with alliance performance but Grant et al. (1999) and Harrison et al. (1991) failed to find that similar resource contribution was positively related to performance. Our results supported the finding by Harrison et al. (1991). We suspect that this has something to do with the resource scarcity by SMEs and the fact that SMEs placed great emphasis on dissimilar resource contribution as an important criterion for establishing alliance. It is possible that dissimilar resource contribution will produce far more alliance synergy than similar resource contribution for SMEs in forming alliance (Harrison et al., 1991; 2001).

Third, past research findings suggested that the criteria for dissimilar resources contribution depended heavily on uniqueness and symmetry of resources (Johnson et al., 1996). In this research, it was found that the criteria could be applied as the basis for alliance sustainable commitment. Therefore, the establishment of successful alliance depended not only on partners' sustainable commitment to contribute unique and performing resources but also on the perception of fair dealing of these resources by the focal SMEs.

Managerial Implications

This study has several managerial implications. First, the results showed the relative importance of various aspects in choosing the appropriate alliance partners. The results from this study indicated that SMEs should be careful in: (1) selecting their alliance partners; (2) evaluating the type and amount of dissimilar resources the partners are prepared to contribute to the alliance; and (3) determining which partners are willing to contribute resources to the alliance. Insufficient contribution of dissimilar resources to the alliance can often lead to failure. Therefore, these criteria can guide SMEs in their partner selection process as well as in establishing cross-border alliances. Second, potential partners should also be selected in accordance with the types of resource items they are able to bring into the alliances.

LIMITATIONS AND FUTURE DIRECTIONS

While the study makes important contributions to the alliance literature, some limitations in our research need to be acknowledged. First, we undertook a cross-sectional approach to data collection and this did not allow the study of the temporal aspects of a relationship. Also, the choice of variables used in this study may not capture the complex nature of the cooperative alliance process of the business environment in which SMEs operate. Second, we collected information from only one side of the dyad. It is possible that only those interested in the research topic are likely to complete and return the questionnaire. Possibly those replying were more likely to be satisfied with their cooperative alliances than the average non-respondent. To what extent perceptions would have converged is unknown. Finally, it would be interesting to conduct the research in other countries. This research has relied on the information provided at a particular point in time. Further research could take a longitudinal approach as the perception and performance of the alliance in SMEs is likely to change over time.

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