

Attaining Competitive Advantage Through Effective Supply Chain Management of SMEs

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ABSTRACT

The interorganizational approach where relational elements are incorporated in the analysis of Supply Chain Management (SCM) of Small Medium Enterprises (SMEs) is adopted in this study. This is in line with the study's main intention of assessing the determinants or drivers for effective SCM of small businesses and their impact on the attainment of competitive advantage. The findings suggest an interesting perspective on SCM and distribution channel functions among SMEs where elements of information sharing, cooperation and integration are linked to competitive advantage. The correlation amongst the three independent variables of cooperation, information sharing and integration with competitive advantage are all significant, depicting the relevancy for SMEs to focus on these relational elements. The highest correlation is noted between information sharing and integration and this definitely makes sense as SMEs strive to integrate their functions that are moving towards the attainment of common goals. Thus, the more integrated the functions amongst supply chain and distribution partners, the more likely that information would be shared amongst them. However, it is interesting to note that the predictive ability of the relational elements of cooperation, information sharing and integration on competitive advantage is not supported through the regression analysis. In other words, the existence of cooperation, information sharing and integration amongst supply chain and distribution channel members do not necessarily predict that competitive advantage will be attained. There are perhaps other factors that should be considered besides relational elements that influence competitive advantage.

Keywords: *Supply Chain Management (SCM), SME, inter-organizational, relational elements, competitive advantage*

Introduction

The term supply chain management (SCM), has often been linked to both marketing and operations management. SCM forms part of management decision that integrates both marketing and operational requirements and in recent years has been given more emphasis as the integration becomes more complex and critical for the survival of firms. Decision making pertaining to SCM is often viewed from three levels; strategic, tactical and operational and together they relay the importance of SCM towards effective management. From a strategic perspective, Hamel (1991) and Porter (1985) note that competitive strategies undertaken by businesses through efforts such as SCM have a positive impact on the performance and survival of the firms. As such, it becomes pertinent that efforts geared toward SCM enhancement become an element of utmost priority for business firms to survive, regardless of the sizes of such firms. Such an understanding should also include the Small Medium Enterprises (SMEs) that make up 89.3% of companies in the manufacturing sector in Malaysia and therefore is a main source of job avenues in the country (SMI Business Directory, 2003).

The Small Medium Industries (SMIs) is one sector where firms of small and medium sizes strive to survive and sustain in this dynamic competitive business environment. Technical expertise to create brand name recognition and reputation (product differentiation), marketing expertise to formulate unique and diverse advertising campaigns for constructing a recognized image (marketing differentiation) and efficiency along the activities of the business to establish a low price presence (low cost) focusing on a geographic corner of the consumer market are the strategies that can create distinct patterns of competition for micro-business owners (Tehrani & White, 2003). Indeed, the influence of small enterprises on Malaysia's industrial competitiveness and economic competitiveness is very much profound. They provide diverse jobs for the community; provide the means for a family residing in a community to fend for themselves, and also attract skills and investments to the community to create long-term stability. However, many small enterprises are notoriously slow to invest in new technologies and to adopt best practices. This study therefore attempts to assess the extent of competitive advantage that SMEs are capable of attaining through SCM initiatives and channel relationship dynamics that SMEs establish in the supply chain and distribution channel.

The study aims:

1. To investigate the supply chain activities of small and medium enterprises (SMEs),

2. To examine the relationships between information sharing, cooperation and integration of channel members amongst the SMEs for the attainment of competitive advantage,
3. To examine which SCM's relational factors have major impacts on competitive advantage,
4. To determine whether technology adoption moderates the relationships between information sharing, cooperation and integration and competitive advantage attained by the SMES.

Research Framework

The study adopts the relational perspectives of SCM and therefore focuses on elements of cooperation, information sharing and integration of activities as the independent variables. Such relational elements are linked to the realization of the competitive advantage as measured by constructs relating to SCM activities. In addition, technology which is often postulated as a critical component in SCM and distribution function is used as a moderating variable between the independent variables and competitive advantage. The use of technology as a moderator is pertinent in assessing the extent of efficiency amongst SMEs in the SCM. The research framework is therefore depicted as follows:

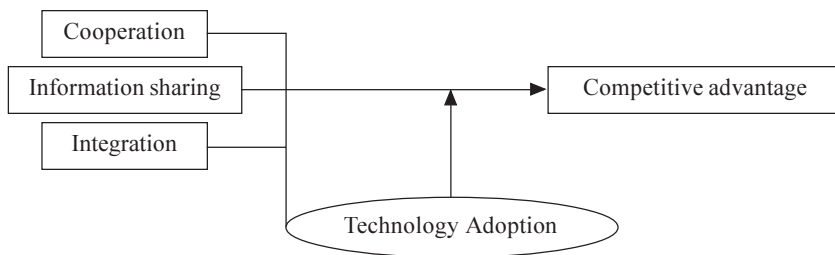


Figure 1: Research Framework

Literature Review

The importance of the Small-to-Medium sized Enterprises (SMEs) to the national economy had been repeatedly emphasis and its contribution in terms of income generation and labour employed has indeed a profound impact on the wealth of a country. Yet, the successful development of SMEs and the way they should be managed have gone largely unnoticed in the academic literature due to the heterogeneity of SMEs. The SME sector is not homogenous and management is therefore, contextually specific and dependent on a variety of factors (Goss

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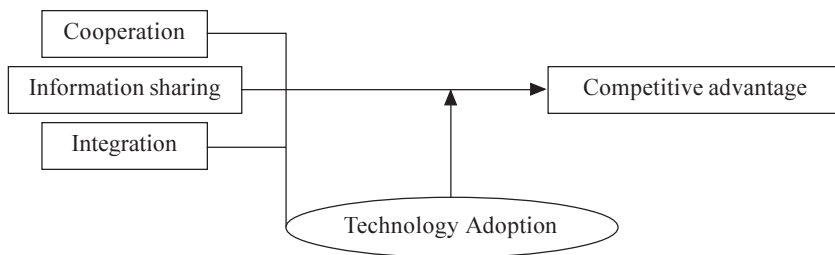


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& Jones, 1997; Hannon, 1999). As such, efforts on enhancing SME's capabilities are often lacking in concrete conceptualization of constructs that could be transformed into tactical inputs.

There are many internal and external factors that can hinder formation and sustainability of SMEs. Small size of customer base, lack of education and business acumen, deficient knowledge of government policies and regulations, inadequate technical skills, and lack of financial resources are among factors that inhibit the growth, stability and performance of small enterprises. Identification of the factors that can assist small enterprises to adopt and successfully implement distinct patterns of competitive strategies is crucial in stabilizing the future prospects of these businesses. Several studies (Miller & Grace, 1990; Miller & Levin, 1993; Littunen, 2000 and Tehrani & White, 2003) have examined primary factors and conditions that enhance potential capabilities and economic survival of small businesses. In addition, the restructuring, rationalization and move towards closer collaboration with suppliers through more effective supply chain management are changing the context of business relationships in supply chain (Fox, 1998).

Collaboration and cooperation are viewed synonymously and these form relational elements in SCM and marketing channels (Dwyer, Schurr, & Oh, 1987; Morgan & Hunt, 1994). Relational elements therefore, are often seen as offering many advantages such as enhanced efficiency, increasing channel member motivation, channel satisfaction and growth implications (Hausman, 2001). In addition, members in relational exchanges cooperate to enhance effectiveness and productivity as indicated by Frazier, Spekman and O'Neal (1988). Therefore, this study adopts the relational elements in SCM to address implications on competitive advantage.

SMEs operating in a supply chain are open to the peculiarities of interorganisational elements as firms with the supply chain are diverse and functionally different from one another. Business relationships between firms operating within the supply chain are dictated by relational elements with an orientation towards ongoing and long term relationships. Ellinger, Ellinger and Keller (2002) propose the attractiveness of long term relationships in distribution channel as channel members strive to enhance channel efficiency. In line with this, Macpherson and Wilson (2003) stress the need for SMEs to consider relational business competencies possible through collaborative business relationships in a supply chain.

At the supply end, the supply chain is depicting the essentials of collaboration as firms within the chain strive for efficient SCM. Webster (2008) notes that long term and close relationship with a buyer in a supply chain is generally positive, though it must be balanced against investments to ensure sustainability. Partnerships between members in the supply chain are becoming more common as collaborative efforts become more pronounced. Such partnership orientation is typical of collaborative or long term strategies (Black

& Peeples, 2005). Most organizations with this long term perspective forge long term partnerships and therefore create a marketing and operation system that meets the needs of all the parties.

Such long term partnerships dictate the need for sharing information and the integration of key supply chain and distribution activities (Mohr & Nevin, 1990). Supply chain and distribution partners are more likely to commit to long term relationships when the expectation of the relationship is high and the likelihood that it will lead to long term benefits is clear and justified. As such, relational elements form an important ingredient in the creation of competitive advantage.

Buyer-supplier relationship is one area of SCM which is seen as contributing to the competencies of organizations in the supply chain. Higginson and Alam (1997) observe that the belief and commitment of top management in SCM practices is a key component for the successful adoption of SCM. Thus, competencies are developed through commitment of buyers and suppliers within the supply chain to ensure it will benefit all parties involved.

Indeed, competencies leading to the development of a competitive advantage are sought after by organizations in the supply chain as they strive to enhance their performance. Jharkharia and Shankar (2004) noted that SCM can become a comprehensive and vital manufacturing strategy that can build and sustain competitive advantage and ultimately lead to better business performance. Although the list is not exhaustive, this study adopts a more practical approach in identifying competency elements relevant to the SMEs of Malaysia. Existing literature varies in terms of what constitute competencies in supply chain. Focusing on the importance of buyer supplier relationship in effective SCM, activities involving relevant parties and stakeholders in the supply chain are given more attention in identifying core competency elements. As such, information sharing mechanisms among the partners of a supply chain is essential for the smooth functioning of their relationships (Ellram, 1995). This is therefore recognized as a competency element that will influence effective SCM. In addition, many researchers (Kwan, 1999) have noted that information sharing in the supply chain can play an important role in reducing the inventory level as it allows the companies to quickly respond to market changes thus requiring minimum inventory across the supply chain.

Methodology

Both qualitative and quantitative methods of data collection were employed. The study commenced with the collection of qualitative data that were gathered via in-depth interviews and observations with some selected owner/manager in ascertaining pertinent SCM and distribution factors. The qualitative responses were meant to generate variables that were incorporated in conceptualization of

the instrument. In the instrumentation stage, a questionnaire was developed, pilot tested and evaluated before final administration. The contents of the questionnaire comprised of information that were used to develop the profile of SMEs as well as to provide the necessary input into testing a conceptual model that were used in determining the drivers for effective supply chain management as well as examining the relationships between these determinants with competitive advantage.

The sampling frame for this study was the SMI Business Directory 2003 and through convenient selection of the geographical region, the two areas of Kuala Lumpur and Selangor (the two most developed states in Malaysia) were selected. Random sampling was then utilized to select the SMEs in both areas and using the ‘drop-off’ method, the SME firms were visited and key personnel whose functions relate to SCM activities were requested to fill in the questionnaire. In total, sixty-three SMEs out of the one hundred questionnaires distributed responded and the data generated were analyzed through descriptive statistics and multivariate analyses.

Results and Discussions

Technology Adoption in SCM

It was found that SMEs adopt to a moderate extent soft technologies like JIT (mean = 3.2) and EDI (mean = 3.3) whereas all other technology initiatives like CAD, CAM and TQM are low in adoption (Table 1). With regards to CAD, CAM, TQM and EDI, the fabricated products, machinery and transport equipment sectors are most inclined in the adoption of these technologies. Seventy eight percent of those adopting EDI technology is from physical distributors, whilst 50% is from component manufacturers. Similarly, 78% of physical distributors, 67% of component manufacturers and 63% of final product manufacturers adopt JIT.

Table 1: Extent of Technology Adoption in SCM

N	Minimum	Maximum	Mean	Std.	Deviation
CAD	62	1.00	5.00	2.2903	1.23324
CAM	62	1.00	5.00	2.1613	1.17618
TQM	62	1.00	5.00	2.4516	1.26332
JIT	62	1.00	5.00	3.1935	1.46923
EDI	62	1.00	5.00	3.3065	1.54271
Valid N (listwise)	62				

Correlation Analysis

Correlation analysis was conducted to assess the strength of association between variables. From the correlation analysis in Table 2, there is evidence of associations between the competitive advantages in SCM with cooperation is $r = 0.328$, with information sharing is $r = 0.475$ and with integration is $r = 0.409$ ($n = 63$) and they are all significant at the $p < 0.01$ level. According to Cohen (1988), $r = 0.30 - 0.49$ are considered moderate, and $r = 0.5-1.00$ are considered large. This means that for SMEs, their competitive advantage element is very much related to information sharing and integration and moderately related to cooperation. In addition, information sharing is positively and largely associated with cooperation ($r = 0.538$) and integration ($r = 0.630$) and they are both significant at the $p < 0.01$ level, depicting subsequently that the greater the cooperation and integration amongst companies, the greater would be their information sharing or vice-versa. The correlation analysis is required so as to explore and obtain a general view of the association between the variables concerned before analyzing further their relationship with the dependent variable.

Regression Analysis

Regression analysis was conducted to investigate the following:

1. How well do cooperation, information sharing and integration predict SMEs' competitive advantage in the supply chain?
2. Which independent variable amongst the three is the best predictor of competitive advantage?
3. Whether the relationship between cooperation, information sharing and integration with competitive advantage is enhanced by technology adoption as a moderator?

Regression analysis or simultaneous method was conducted on all the variables after diagnostic tests of normality, linearity, homoscedasticity and outliers were carried out. The results are depicted in Tables 3 to 5. It is found that 25.8% of the variance in SCM competitive advantage exists in the sampled SMEs and from the ANOVA table this indication is significant ($\text{sig.} = 0.000$, $p < 0.005$). In order to find out which of the independent variables included in the models contributed to the prediction of the dependent variable, the coefficient table is presented. It could be seen that none of the variables is making any significant contribution to the prediction of the dependent variable since the significant levels are greater than 0.05. In other words, for SMEs, cooperation, information sharing and integration do not appear to predict the attainment of their competitive advantage.

The research also seeks to investigate if technology adoption when interacted with all the independent variables would moderate the direct relationship earlier on. Table 6 illustrates the findings. Table 6 reports that the model explains 25.3% of the variance in SCM competitive advantage with the direct relationship but only 6.6% with the effect from interactions with technology adoption as the moderator.

Table 2: Product-Moment Correlations between Measures of SCM Competitive Advantage with Information Sharing, Cooperation and Integration

Measures	1	2	3	4
1. SCM Competitive Advantage	1			
2. Cooperation	0.328**	1		
3. Information Sharing	0.475**	0.538**	1	
4. Integration	0.409**	0.220	0.630**	1

N = 63 **p < 0.01 (2-tailed)

Table 3: Regression Analysis of Integration, Cooperation and Information Sharing with SCM Competitive Advantage

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson	
					R Square Change	F Change	df1	df2	Sig. F Change		
1	.508 (a)	.258	.221	.42350	.258	6.852	3	59	.000	1.507	

a Predictors: (Constant), INTEGRAT, COPERATN, INFOSHA

b Dependent Variable: CompAdv

Table 4: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.687	3	1.229	6.852	.000(a)
	Residual	10.582	59	.179		
	Total	14.269	62			

a Predictors: (Constant), INTEGRAT, COPERATN, INFOSHA

b Dependent Variable: CompAdv

Table 5: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.271	.424		5.352	.000
	COPERATN	.112	.110	.137	1.015	.314
	INFOSHAR	.247	.156	.268	1.580	.120
	INTEGRAT	.171	.120	.210	1.430	.158

a Dependent Variable: CompAdv

Table 6: Regression Analysis of Integration, Cooperation and Information Sharing with SCM Competitive Advantage and Moderated by Technology Adoption

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.503 (a)	.253	.214	.42665	.253	6.551	3	58	.001	
2	.565 (b)	.319	.245	.41829	.066	1.781	3	55	.162	1.586

a Predictors: (Constant), INTEGRAT, COPERATN, INFOSHAR

b Predictors: (Constant), INTEGRAT, COPERATN, INFOSHAR, techINTG, techcoop, techINFO

c Dependent Variable: CompAdv

Conclusion

Efforts toward enhancing the efficiency and effective functioning of the SMEs especially in the supply chain must be upgraded if the nation's objective is to be realized. This study has only addressed a small area of SCM that contribute to the effectiveness of the SMEs. Much needs to be done and more variables need to be studied in order to understand fully the contribution of the SMEs.

It is proposed that future studies explore the effect and importance of other variables in attaining the competitive advantage of SMEs including functional variables such as supply chain and distribution channel structures, transactional and economic factors, as well as the environmental elements affecting SCM. The findings of this study could be extended further into other possible implications such as SMEs contribution to rural development, the effect of SCM from a

strategic perspective and other distribution channel functioning affecting effective development of the distributive trade. In conclusion, though the conceptualization and empirical findings in this study are not exhaustive, it does provide a useful foundation for exploring further other relational elements inherent in supply chain and distribution channels and on which future studies can build upon.

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