International Journal of Economics, Commerce and Management
United Kingdom Vol. IV, Issue 3, March 2016
http://ijecm.co.uk/ ISSN 2348 0386

NETWORK DIMENSIONS AND FIRM PERFORMANCE AMONG MANUFACTURING SMES: EVIDENCE FROM KENYA

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Abstract

The main objective of this paper is to investigate the influence of network dimensions on the performance of Kenyan manufacturing Small and Medium Enterprises (SMEs). There is evidence from literature that SMEs have positively impacted global economies, are agents of poverty alleviation and are seeds of large companies. Further, networking has been recognized as a vital element for enhancing competitive among SMEs. Networking dimensions was conceptualized under two variables. These two variables are network intensity and range. The study used descriptive design and targeted firms in the Kenyan manufacturing sector. Data was collected using self administered questionnaires from a sample of 132 manufacturing SMEs operating in Kenya registered by Kenya Association of Manufacturers (KAM). The main theory that informs this study is the social capital theory. Data was analyzed quantitatively using

descriptive statistics and inferential statistics using SPSS version 21. Two hypotheses regarding network dimensions were tested and, subsequently accepted. It was evident from the study network intensity and range has positive and significant relationship on firm performance.

Keywords: SMEs, Networking Intensity, Networking Range, Manufacturing, Firm Performance

INTRODUCTION

Small and Medium Enterprises (SMEs) by number dominate the world business stage. Estimates suggest that more than 95% of enterprises across the world are SMEs. This translates to over 60% of private sector employment (Ayyagari *et al*., 2007). However, it is noted that they suffer from limited resources for research, funding and market access compared to large enterprises. In this regard, networks can serve as a way to increase their core competences in innovation by partnering with complimentary firms (Leifer *et al*., 2006). Luo (2007), notes that for SMEs, networks are regarded as a means of providing diversity of knowledge, accessing resources and complimentary assets. In addition, firms that emphasizes on building business networks increase flexibility and efficiency (Lorenzi and Baden-Fuller, 1995), access network resources at minimal transaction cost (Casson and Cox, 1993), operate under reduced business risk, (Gulati *et al*., 2000) and eventually their performance is high (Dyer and Nabeoka,2000).

There is evidence from literature that network dimensions play a role in enhancing SMEs performance. Studies have shown distinct characteristics relating to network dimensions which include network intensity and range have a significant effect in performance of small and medium enterprises.

Background

SMEs face challenges in globalised economies and only sustainable strategies can save them from large enterprises. Notably, SMEs compared to large organizations have inadequate access to capital and finance, obsolete technology, inadequate industrial infrastructure, lower economies of scale, lack of modern management skills and lack of labour training (Antonio and Gregorio 2005).

SMEs therefore need support and resources from external parties such as other firms, supporting institutes, relative and friends (Bairrd, Lyles and Orris, 1993). Critical success factors for improving performance in SMEs as outlined by Soderquist (1996) include: development of networks and partnerships; promoting a corporate culture; developing flexibility and speed response to customers; creating an effective structure and analyzing competitors. Development

of networks and partnerships is essential for firms experiencing the need to be efficient, flexible and adaptive. Literature on Small firm networking indicates several benefits can be accrued through networking and they include: acquisition of information and advice (Carson *et al*., 1995; Shaw 1997); small firm's innovation process (Rothwell 1991) and expansion of expertise and knowledge (Gilmore *et al*., 2006).

Coleman (1988) posits that small business networking stems from the fact that SME owners or managers will seek information and resources from individual who are trustworthy to them. In this regard SME owners or managers will form linkages and networks with those individuals so that their businesses can gain competitive advantage. Notably, such business networks are bound by high level of trust.

Research on business networks to date has focused on the antecedents of network formation and relational content among firms rather than outcomes of such relationships and networks (Werner 2002; Kapasuwan 2006). Haves & Senneth (2001) notes that although the arguments in favour of networking appear compelling and most of the existing literature is premised on the belief that networking is beneficial, there is little empirical evidence to date of an association between firm performance and the owners use of networks particularly for established firms.

Gulati *et al.*, (2000) posit there is an urgent need for academic research to systematically investigate the effects of networks on firm performance. Further, Werner (2002), after reviewing international management research in top management journal found that impact of foreign partners on firm performance is a potential research area not frequently addressed.

Empirical literature on the impact of networking on the performance SMEs have produced mixed results. Thrikawala (2011) finds a significant positive relationship between an SME's engagement in various networks and the performance of the SME. In addition, Watson (2007) also found that SMEs that were involved in networking had higher performance and survive longer. On contrary, Rowley, Behrens and Krachhardt (2000) found a negative association between networking and performance.

Burt (1992) and Zhao and Aram (1995), break the network dimensions concept in two: the range and the intensity. Range refers to the differences among the contacts within a focal actor's network. It may also be viewed as the degree of diversity contained in a network. The intensity refers to the extent of the interacting organizations' resources committed to the relationship in terms of the frequency of contact and amount of resources exchanged.

Literature reveals there are studies conducted in relation to networking dimensions and firm performance. A study by Seck and Mazzarol (2006) conducted a study on "strategic networking and growth of Technology oriented SMEs: Evidence from Singapore" which targeted

112 technology-oriented SMEs in Singapore in relation to the role played by strategic networks and alliances in their development and growth. The findings found that firms growth is independent of network range but predicted by intensity. Secondly, a study conducted by Ge, Hisrich and Dong on "Networking, resource acquisition, and the performance of Small and Medium-Sized Enterprises: An empirical study of three major cities in China" examined 227 firms in three economic zones in China. The independent variables for the study were network intensity and range. The study found there was positive association between network intensity, network range and firm performance.

From ongoing, it is evident that research on networking for a developing country like Kenya is essential. This is because most of the studies regarding networking have been conducted in developed countries. It is unclear whether geographical and cultural differentials between developed and developing countries could allow seamless replication of those studies in countries like Kenya.

Overview of Manufacturing Sector in Kenya

It is factual from economic development that until a certain stage of maturity is reached, the economic growth of a country is driven by industrialization. Further, in both developed and developing countries, the presence of a vibrant manufacturing sector is a means of increasing the citizens' welfare (Migiro and Wallis, 2006). Strategic management research on network relationships usually occurs in the framework of a single industry (Schilling & Phelps, 2007), with an emphasis on manufacturing sector (Tsai, 2001).

Manufacturing sector is vital for Kenya's economic growth. Its performance is measured in growth, employment creation and contribution to the country's overall output and exports (KER, 2012). The share of manufacturing sector's employment to overall formal employment stands at an average of 13%. The contribution of the sector to the GDP has declined since 2011. In the year 2011 the contribution fell from 9.6 percent to 9.2 percent in 2012 while growth rate deteriorated from 3.4 percent in 2011 to 3.1 percent in 2012. These changes can be attributed to high costs of production, stiff competition from imported goods, high costs of credit, drought incidences in 2012 (KNBS, 2013).

Manufacturing sector in Kenya faces challenges when it comes to marketing of the products due to high competition in the global market. There has been an outcry related to high production costs and low exports. Studies have shown there is a positive association between size and propensity to export (Graner and Issakson, 2002).

This study investigates the influence of network dimensions and firms performance among manufacturing SMEs in Kenya. Specifically, the study seeks to answer the question:

Does network dimensions (network range and intensity) have influence on the performance of manufacturing SMEs?

Research Objective

To determine the influence of network dimensions (network range and intensity) on firm performance among manufacturing SMEs in Kenya.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Social capital theory emphasis on the sum of the actual resources embedded within, available through and derived from the network relationships possessed by an individual or unit (Nahapiet and Ghosal, 1988). Alder & Kwon (2002) posit that like any other resources, sources of social capital lie in business structures within which network actor is located. An inter-firm network places social capital at the firm's disposal, promoting and supporting the production of intellectual capital which ultimately fosters the competitive advantage of firms (Antoldi *et al.,* (2011).

Lee (2009) classified social capital in three broad dimensions: structural; relational and cognitive. Antoldi *et al.,* (2011), makes clear distinction between structural, relational and cognitive social capital. Structural dimension of social capital refers to the patterns of connection between actors: the number and kinds of actors involved; presence or absence of direct ties between specific individual actors network density, connectivity and hierarchy and the stability of ties between nodes.

On relational dimension they argue that it focuses on the behavioural assets of the network such as trust and trustworthiness, obligations and expectations. Granovetter (1992) notes that relational view focuses more on information and resources leveraged from personal and direct relationship the entrepreneur develops with others through history of interactions. This view includes many aspects of social context such as social interactions and the degree of trust in the relationships (Nahapiet and Ghosal, 1998).

Lee (2009), notes that relational social capital refers to the normative conditions and best practices that guide individual actor's relations. In addition, Lin & Si (2010), finds the normative conditions of trust, obligation, and expectations are the main components of relational dimensions. Relational embeddedness is significant since network engagement, norms and trustworthiness have the potential to lead to organizational advantage (Lee, 2009).

Finally, the cognitive dimension of social capital refers to the meaningful contexts of communication among and between actors (Nahapiet & Ghoshal, 1988). These dimensions facilitate the exchange of information, knowledge and resources (Kang *et al*., 2007).

Network Intensity and Firm Performance

Network intensity is the combination of time, mutual trust and reciprocal services (Granovetter 1973). Ahuja (2000), argues that the closer the relationship among members, the faster the speed of sharing resources. The more familiar contacts are, the more trustworthy the members become, and this reduces unethical behavior and encourages exchange amongst group members (Gulati 1995; Uzzi 1996). Through use of networks firms are capable of locating resources and hence the acquisition can be enhanced through mutual trust. Mutual trust therefore can gel members together hence contributing to firms performance. It can therefore be hypothesized that:

H_{1o}: *There exists a relationship between network intensity and firm performance in small and medium enterprises*

Network Range and Firm Performance

Network range refers to the variety and number of connections. In this regard the broader external network is the easier it is to have access to resources (Burt, 1992). The core strategy of the firm is to get resources needed at the lowest cost (Elfring and Hulsink, 2003) and that a social network plays an important role in capturing these resources. Dess and Starr (1992) notes, that the network has the benefit of reducing the uncertainty of innovation. In addition, through the networks there is enhanced communication and exchange of resources (Larson, 1991) hence speeding up the transfer of knowledge and technology. When this is achieved there is likelihood that performance is enhanced. It is therefore hypothesized that:

H_{2o}: *There exists a relationship between network range and firm performance in small and medium enterprises*

METHODOLOGY

The target population for this study was manufacturing SMEs registered by the Kenya Association of Manufacturers (KAM). The study targeted CEOs and founders. Systematic random sampling was used to select a sample of 132 firms from 660 firms registered under KAM in the small and medium enterprises category. A questionnaire was developed in consistent with previous studies with respect to construct measurements and was used as the main tool for data collection for this study. In order to increase the reliability of the data collected and minimizing the possibility of errors in the test instrument, pretesting was done targeting twenty firms. The study used both descriptive and inferential statistics. Data analysis was done using statistical package for social sciences (SPSS) version 21.

Measurements and Operationalization of Variables

The constructs were operationalized by selecting measurement scale items and scale types. Hair *et al.,* (2006), notes that in a survey research, operationalising a construct involves a series of scale items in a common format such as a likert scale or a semantic differential scale. The study was guided by the dependent variable (performance- measured in terms of profit and sales growth) and independent variables (network intensity and range) which forms the component of network dimensions.

Table 1: Operationalization of Variables

Variable Type	Construct	Indicator	Measurement	Relevant Literature
Dependent	Performance	Profitability, sales growth	Likert Scale	Roberston & Chetty (2002), Sousa (2003), Loxton & Weerawardena (2006)
Independent	Network range	Relationship with suppliers, government, universities	Likert Scale	Hoang and Antoncic (2001), Human and Provan (1997)
	Network Intensity	Intimacy level, meeting frequency	Likert Scale	Walter *et al.,(*2006), Dyer and Singh (1998)

Response Rate

Mugenda & Mugenda (2003) asserts that a response rate of 50 % is adequate, 60% is good and above 70% is very good. The number of questionnaires that were administered totaled to 132 while that that were returned were 100. This represents 76% response rate which can be considered very good. Most of the respondents were male with 61(61%) while their female counterparts constituted 39 (39%). This shows a huge disparity between male and female in the top management of SMEs. Brush *et al.,* (2004) found that gender has an effect on networking of SMEs. As pertaining the age, most of the respondents were aged between 25- 35 years constituting (45%), 35-45 years accounted to 34%, those between 45-55 years accounted for (13%) and over 55 years accounted for 8%.

ANALYSIS AND RESULTS

Reliability Coefficient

To minimize errors in the test instrument and also to increase the reliability of data collected, reliability test was conducted and Cronbach Coefficient Alpha was found to be 0.922. George and Mallery (2003) posit a value of 0.7 is acceptable. This therefore indicates that the test instrument was reliable.

Networking Intensity

Most of respondents accounting to 32% indicated they had known each other firms for more than 5 years, followed by 25% who mentioned they had known each other firms for 3-5 years, 18% have known each other firms for 2-3 years, 15% have known each other firms for 1-2 years and 10% have known each firms for 1 year.

Further, the study investigated whether respondents had close relationships and whether they met frequently. The results are as indicated in table 1

Table 2: Intimacy and Meeting Frequency

	Mean	Std deviation
Intimacy Level		
We keep a close relationship with each other	4.251	.540
Meeting Frequency		
We meet each other frequently	3.912	.624

From table 2, it was established that most of the respondents maintained a close relationship with each other and they met frequently. This is indicated by the means of 4.251 and 3.912 respectively.

Network Range

The study sought to establish whether respondents had connections outside their businesses and whether they maintained a close relationship with those contacts. The results are as shown in table 3.

Table 3: Network Range

	Mean	Std deviation
We closely work with our suppliers	4.472	.545
We enjoy Government support	4.121	.634
We closely work with University	1.713	.869
We have a good relationship with Agencies	3.808	0.541
We have a good relationships with our competitors	3.656	.618
We receive feedback from our customers	4.890	.390

From table 3, it is evident that most respondents maintain close relationship with customers and hence they receive feedback from them. This was rated highest at a mean of 4.89. The others were rated as follows: working with suppliers was rated high with a mean of 4.472, good relationship with agencies with a mean of 3.808 and good relationship with competitors with a

mean of 3.656. However, the study found that respondents indicated that they do not work with universities.

Correlation Analysis

Correlation coefficient establishes relationships between variables. This study used Pearson correlation coefficient to establish the relationship between independent and dependent variables.

Table 4: Correlation between Network Range and Firm Performance

		Firm performance	Networking range
Firm Performance	Pearson Correlation	1	.384*
	Sig. (2-tailed)		.000
	N	100	100
Networking Range	Pearson Correlation	.384*	1
	Sig. (2-tailed)	.000	
	N	100	100

**. Correlation is significant at the 0.05 level (2-tailed).

Correlation between network range and firm performance was found to be significant at 0.05 level since the p-value of 0.000 is less than 0.05. The correlation magnitude between firm performance and network range was found to be 38.4 %.

Table 5: Correlation between Network Intensity and Firm Performance

		Firm performance	Network Intensity
Firm Performance	Pearson Correlation	1	.801*
	Sig. (2-tailed)		.000
	N	100	100
Network Intensity	Pearson Correlation	.801*	1
	Sig. (2-tailed)	.000	
	N	100	100

**. Correlation is significant at the 0.05 level (2-tailed).

Correlation between network intensity and firm performance was found to be significant at 0.05 level since the p-value of 0.000 is less than 0.05. The correlation magnitude between firm performance and network range was found to be 80.1 %.

Hypothesis Testing

H_{10}: There is no relationship between network range and firm performance in small and medium enterprises

H_{1a}: There exists a relationship between network range and firm performance in small and medium enterprises

Table 6: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.846[a]	.716	.700	.27416

a. Predictors: (Constant), X_1 Network range

Table 7: ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	17.775	5	3.555	47.297	.000[a]
	Residual	7.065	94	.075		
	Total	24.840	99			

a. Predictors: (Constant),

b. Dependent Variable: firm performance

The coefficient of network range has an estimated standard error of 0.27416, F-statistic of 47.297 and an associated p-value of 0.000. This therefore indicates network range and its influence on firm performance is statistically significant at significance level α=0.05 since p<0.05. This shows that the influence of network range on SMEs performance is significant at this level. The null hypothesis (H_{1o}) is therefore rejected while the alternative (H_{1a}) is accepted that there is a statistically significant relationship between network range and SMEs performance.

H_{2o}: There is no relationship between network intensity and firm performance in small and medium enterprises

H_{2a}: There exists a relationship between network intensity and firm performance in small and medium enterprises

Table 8: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.853[a]	.727	.712	.26864

a. Predictors: (Constant), Network intensity

Table 9: ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	18.056	5	3.611	50.041	.000[a]
	Residual	6.784	94	.072		
	Total	24.840	99			

a. Predictors: (Constant),
b. Dependent Variable: firm performance

The coefficient of network intensity has an estimated standard error of 0.26864, F-statistic of 50.041 and an associated p-value of 0.000. This therefore indicates network intensity and its influence on firm performance is statistically significant at significance level α=0.05 since p<0.05. This shows that the influence of network intensity on SMEs performance is significant at this level. The null hypothesis (H_{2o}) is therefore rejected while the alternative (H_{2a}) is accepted that there is a statistically significant relationship between network intensity and SMEs performance.

DISCUSSIONS

The study established that networking dimensions plays an important role in the performance of manufacturing Small and medium Sized enterprises in Kenya. Networking dimensions was conceptualized under two specific aspects of network intensity and range respectively. On the aspect of intensity it was established that most of SMEs manager (32%) had known their counterparts for over five years. Further, it was established that majority of them (mean =4.251) maintain close relationship with each other. Finally, it was noted that most of them (mean =3.912) meet frequently. This findings are consistent with the assertion of Ahuja (2000), who noted that the closer the relationship among members, the faster the speed of sharing resources. This study supports the findings of Seck and Mazzarol (2006) who found that network intensity is a predictor of firms performance. Further, this study supports the findings of Lagat (2016) who found network intensity had an effect on supply chain performance.

Results on network range revealed that most of the manager maintained good relationships with other actors in the business environment. It was noted that most of the SMEs maintained good relationships with customers (mean=4.89). The study established good customer relations, working with suppliers and complying with government agencies acted as catalysts for networking. This is consistent with assertion of Burt (1992), that the broader external network is the easier it is to have access to resources. This study supports the findings of Ge, Hisrich and Dong (2004) who found positive association between network range and firm performance.

CONCLUSION

The findings of this research were able to establish that networking dimensions play an important role in performance of SMEs. The results of this study not only enriches literature on SMEs as pertains to networking but also has indicated specifically that networking dimensions (network intensity and range) influences their performance. With the ever changing business environment, this study brings an important aspect of inter-firm linkages which is key in acquisition of resources owned and controlled by others. Through such small firms are able to overcome their 'atomistic' nature and leverage on external resources.

LIMITATIONS OF THE STUDY

Like most of the studies, this study was not without limitations. The sample data for this study was collected in the Kenyan environment. This therefore means that the findings may not necessarily reflect other contexts. Notably, environmental dynamics greatly differ in relation to geographical and cultural contexts. In this regard, caution need to be exercised when generalizing the findings in the view of geographical and cultural differentials.

AREAS OF FUTHER RESEARCH

This study considered networking dimensions among manufacturing SMEs. Future studies should consider networking in service industry. Another prime area for future research would be to assess how networking evolves and its sustainability among different cultures. This is because culture is a strong determinant of how people operate, relate and do business. Further, future researchers should investigate how industry life cycles affect networking firm and managers. Finally, a study that considers networking and performance from both financial and non-financial measures would be appropriate for managers.

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