JOURNAL OF CREATIVITY AND BUSINESS INNOVATION

**Journal of Creativity and Business Innovation, Vol. 3, 2017.**

www.journalcbi.com
ISSN 2351 – 6186

This paper is available at: http://www.journalcbi.com/industrial-cluster-and-competitive-advantage-of-micro-firms-in-wood-industry-in-ghana.html

# Industrial Cluster and Competitive Advantage of Micro-Firms: Insight from Wood Industry in Ghana

**Daniel M. Quaye, Isaac Mensah**
Department of Marketing and Entrepreneurship
University of Ghana, Accra-Legon, Accra, Ghana.

**Abstract**
The extent of association and complementarity in improving competitive advantage of industrial cluster cannot be underestimated. This paper explored the competitive advantage of micro-firms in a cluster on the basis that firms in a cluster derive essential benefits that those outside do not enjoy. The paper proposed that factors of product, horizontal networking and innovation increase competitive advantage. Based on a convenient sample of 249 wood operators in a cluster (Ayifua Wood Village) our result supports that horizontal networking and innovation enhances competitive advantage, while access to factors of production was not supported. The paper concludes and recommends that micro-firms in a cluster must "unlearn" their idiosyncratic approach to business, open-up, share information, knowledge and develop strong networks in the cluster to bolster their competitive edge. The paper contributes to literature by adopting competitive advantage as a composite measure, contrary to what exist in previous studies.

**Keywords***:* industrial cluster, competitive advantage, micro-firms, wood industry, Ghana

## Introduction

Generally activities of micro-firms have been characterized as engine for economic growth and development. Micro-firms across the globe constitute the most dominant form of business contributing significantly to employment creation, domestic and national income. Despite the significant contributions of micro-firms particularly in emerging economies such as Ghana, studies have identified multiplicity of challenges inhibiting their competitive performance. Challenges such as lack of access to credit/finance (Abor & Quartey, 2010; Fraser, Bhaumik & Wright, 2015); market information (Hinson & Mahmoud, 2011); improved technology (Quaye, 2014); modern and improved experience (Karaev, Lenny Koh, Leslie & Szamosi, 2007) have been identified as principal challenges mitigating competitive strength of small businesses. Coupled with challenging Ghanaian business environment (Frazer, 2005) micro-firms are therefore compelled to mould themselves to bolster their competitive performance (Fassoula, 2006).

JOURNAL OF CREATIVITY AND BUSINESS INNOVATION

**Journal of Creativity and Business Innovation, Vol. 3, 2017.**

www.journalcbi.com
ISSN 2351 – 6186

This paper is available at: http://www.journalcbi.com/industrial-cluster-and-competitive-advantage-of-micro-firms-in-wood-industry-in-ghana.html

Consequently, contemporary studies have made a strong call for extensive investigation into the challenges in micro-business units (Bino Paul et al., 2017, 448). Quite apart from this, an important question arises whether the genesis of challenges confronting micro-firms is as a result of their size, as claimed by Fassoula (2006). Sengenberger and Pyke (1992) pointed out that the problem of many micro-firms is not their size, but being isolated. Indeed, the dynamisms of micro-firms and the nature of their business mean that individually they have little capacity to respond to competitive pressure with improved competitive strategies. Studies such as Ceglie and Dini (1999 cited in Amoah-Mensah, 2015) have concurred that competitive disadvantage of micro-firms can be addressed through "network" where firms locate in a particular geographical area. The system of network has been variously described as "geographic cluster" (Lei & Huang, 2014); hot spot or industrial cluster (Pouder & Caron, 1996).

The concept of industrial clustering has been an age-old practice until 1990s where industrial cluster assumed more essential role in research fields such as management, economics and policy (Bell, 2005; Porter, 1990; Tallman et al., 2004). According to Aufretsch and Feldman (2004) industrial clustering represents a set of interconnected organisations supporting innovations in a particular industry. Usually, industrial cluster comprises producers, suppliers, distributors and competitors (Gunawa, Jacob & Geert, 2013) and local institutions such as government agencies, research organizations (Porter, 2000). Semi-Conductor industry in Silicon Valley, automobile industry in Detroit (USA), textile and footwear manufacturing industry in Italy, Japan's cutlery industries, Special Economic Zones (SEZs) in China and Taiwan are few great stories of industry clusters. For instance, Schwab and Xavier (2010) indicated that, the World Economic Forum in 2010 ranked Taiwan as number one for industrial cluster development. In Ghana, few industrial clusters such as Sokoban wood village in Kumasi and Tema industrial area among others exist.

The advantages of industrial cluster are numerous. Firms located in a cluster enhance competitive advantage (Caniels & Romijn, 2005; Schmitz & Khalid, 1999). However, a critical view of literature reveals that studies examining the effects of industrial cluster and competitive advantage of micro firms are very limited and rare in emerging economies (Amoah-Mensah, 2015; Gunawan et al., 2013). Some studies have even questioned the importance of clustering (Meyer-Stamer, 2002).

While few studies have examined the relationship from theoretical and conceptual perspective (Boja, 2011; Zeinalnezhad, Muriati & Shahnorbanun, 2011) other studies have also focused on assessing the relationship from specific industrial perspectives such as: sea food

JOURNAL OF CREATIVITY AND BUSINESS INNOVATION

**Journal of Creativity and Business Innovation, Vol. 3, 2017.**

www.journalcbi.com
ISSN 2351 – 6186

This paper is available at: http://www.journalcbi.com/industrial-cluster-and-competitive-advantage-of-micro-firms-in-wood-industry-in-ghana.html

processing (Felzensztein et al., 2010); biotechnology (McCann & Folta, 2011); financial services (Bell, 2005) and high technological industries (Stam and Elfring, 2008). Extent literature in emerging countries examining industrial cluster and competitive advantage of micro-firms in the wood industry is absent. Study by Amoah-Mensah (2015) in this regard focused on only SMEs and also examined competitive advantage measures including (sales, profit, quality and quantity). This allows the researcher to address these gaps by expanding knowledge on the effects of industrial cluster on competitive advantage of micro-firms in an emerging economy. Again, we examined competitive advantage as a composite measure of firm performance contrary to what exist in literature.

Against this backdrop, our aim in this paper is to attempt an investigation into the relationship between industrial clustering and competitive advantage of micro-firms in Ghanaian wood village. We contribute to the growing debate regarding the relationship between industrial cluster and competitive advantage.

**Concept of industrial cluster**

It is currently difficult to conclude that micro-firms can survive without support from other industry firms. To survive and remain competitive in the market, small-firms must establish network ties with other firms in their locality owing to the competitive advantage (Lundequist & Power, 2002) through resources sharing and skills transfer (Lundequist & Power, 2004). Described as a cluster, Porter (1990; 2003) defined cluster as a group of interconnected related and unrelated firms, suppliers, service providers or specialized firms in a geographical area who are linked by commonalities and complementarities. On the other hand, Schmitz (1992) defined cluster as a group of firms in a same sector and within a close proximity. A cluster also comprise of small and specialized firms that undertake different but complementary activities, linked both horizontally or vertically via a mix of co-operative and competitive relations (Perry & Tumbunan, 2009) Essentially, industrial cluster may comprise of a group of firms in a geographical area who operate in a similar industry Suffice to say that, clustering also includes firms who operate in unrelated but complementary industry. Firms normally cluster via their unique and common functions that they perform. The synergistic nature of cluster means that firms directly and indirectly develop strategies to promote their common interest.

The benefits of clusters are numerous. Porter (1990) lucidly affirmed that firms within a cluster benefits from effect of agglomeration due to similarities in infrastructure such as labour, qualified suppliers, availability of capital support, professional services, and research and development labs (Saxenian, 1994). Clusters also improves competitive advantage

JOURNAL OF CREATIVITY AND BUSINESS INNOVATION

**Journal of Creativity and Business Innovation, Vol. 3, 2017.**

www.journalcbi.com
ISSN 2351 – 6186

This paper is available at: http://www.journalcbi.com/industrial-cluster-and-competitive-advantage-of-micro-firms-in-wood-industry-in-ghana.html

(Lundequist & Power, 2002) where one firm shares the skills it owns with other organisations to foster efficient production (Power & Lundmark, 2004). Clusters of firms reduce input cost, develop common suppliers, train professional labour and produce technical knowledge, spillover effect (Tallman et al. 2004) leading to improvement in competitiveness (Bell et al. 2009; Gertler, 2003). Johnson (2003) indicated that, in a cluster, firms can easily identify emerging clients' needs and trends, thus adjust their production to responds. In effect, the whole is greater or mightier than the sum of its part (Amoah-Mensah, 2015).

From theoretical perspective, Amoah-Mensah (2015) noted that, one relevant theory that stresses on location benefits is Porter's cluster theory which posits that firms benefits from a cluster by increasing productivity or output via production, networking, competition, innovation and entry/creation of new firms. Park, Jaeun and Taejong (2010) agreed that industrial clustering may benefits firms through knowledge and technology spillovers which subsequently enhance critical innovation of these firms in the cluster. Cluster further promote strategies such as joint actions, which gives the cluster a collective efficiency and competitive advantage over other entities located outside the cluster (Schmitz, 1995). Amoah-Mensah (2015) in a study of Kumasi Sokoban wood village in Ghana indicated that firms in an industrial clusters share factors of production (specialized equipment and labour), engage in horizontal networking (information sharing and joint action), vertical networking (suppliers, customers and public/private institutions), healthy competition and innovation to gain competitive advantage. Following the recommendation of Amoah-Mensah (2015), we aim to discuss the effect of industrial cluster (access to factors of production, horizontal networking and innovation) competitive advantage.

## Industrial Cluster and Competitive advantage

### *Access to factors of production*

Kelynhans (2006) indicated that natural resources (land, trees, mineral deposits), capital goes (building and machines), labour and enterprise are essential factors of production. Access to right quality and quantity factors of production is essential to produce quality output and undertake large business contracts. Owing to the resource and size constraints of micro-firms, managers in this respect are motivated to seek support from other firms who have similar equipment and possess the required skill, knowledge, abilities and expertise. In this regard, industrial cluster represent a rightful place where talent often concentrate, and thus labour resources can be sped up (Krugman, 1991).

JOURNAL OF CREATIVITY AND BUSINESS INNOVATION

**Journal of Creativity and Business Innovation, Vol. 3, 2017.**

www.journalcbi.com
ISSN 2351 – 6186

This paper is available at: http://www.journalcbi.com/industrial-cluster-and-competitive-advantage-of-micro-firms-in-wood-industry-in-ghana.html

In the wood industry for instance, majority of essential industry equipment are capital intensive. Industrial cutting and design machines and sandpapering equipment and other working equipment are expensive. While majority inherit these industrial equipment from their families, few single business owners are able to acquire them. In extreme conditions, business owners form groups in order to acquire these industrial machines on credit and cash. Importantly, firms that are unable to contribute to purchase the equipment are allowed to use the equipment and machinery for their wood works at a fee. This form reduces cost of conveying all heavy wood products to other location for processing. Because all activities occur in a single location, wood operators who do not possess a skill to perform particular wood designs engages other machine operators who possess the right skill to perform the task. While these individuals are paid a fee for their service the job owner is able to monitor the work to ensure high quality.

Quite profoundly, studies have established that frequent, easy and quick access to skilled labour, professional services enhances firm's competitive advantage (Lei & Huang, 2014). In the case of Taiwan, Feng and Wang (2007 cited in Lei and Huang 2014) found that frequent sharing of production facilities and equipment and key personnel enable firm to gain competitive advantage, and even against large firms. The issue of competitive advantage is eminent because micro-firms are able to execute their order on time and frequently because orders are executed among several firms. In the further wood industry cluster, Mawardi, Choi and Perara's (2011) found that availability of skilled labour, raw materials are the mainstay of local external economy of the cluster.
The paper argues that, mere existence of firms in a cluster is not a guarantee to outcompete firms outside the cluster. Micro-firms in cluster must improve and intensify the strength of their relationship among themselves, ensure a symmetric exchange of resources (labour and equipment) in order to achieve competitive advantage. On the backdrop of this the paper therefore proposes that:

**H1a:** Access to factor of production (labour and equipment) in a cluster leads to competitive advantage.
**H1b:** Degree of network mediates the relationship between access to factors of production and competitive advantage.

***Horizontal Networking***
Central to operations of micro-firms is a close relationship and contacts with other competing firms otherwise called inter-firm relationship (horizontal networking) (Amoah-Mensah, 2015). Despite the differences in description such as alliances, networking and co-operation (Narula, 2004),

JOURNAL OF CREATIVITY AND BUSINESS INNOVATION

**Journal of Creativity and Business Innovation, Vol. 3, 2017.**

www.journalcbi.com
ISSN 2351 – 6186

This paper is available at: http://www.journalcbi.com/industrial-cluster-and-competitive-advantage-of-micro-firms-in-wood-industry-in-ghana.html

Hendrike (2003) defined horizontal networking as a level of co-operation among competitive firms. In a cluster, micro-firms are exposed to varied degree of relationship and information about new business activities, market opportunities, finance opportunities, technologies among others. New information emerging from participants in the cluster is widely circulated among firms in the cluster. Because micro-firms are flexible and easily adaptable to change, managers are able to adjust their business operations and systems to explore and exploit any opportunities. In dense clusters, proactive firms anticipate transformative information and develop strategies to exploit them, thus improve competitive performance through first mover advantage. Rosenfield (1995) indicated that network-co-operation among firms to take advantage of complementarities, exploit new markets, integrate activities or bring their resources and knowledge together to achieve economies of scale.

Despite the benefits, cluster poses some degree of problems. Unfortunately, some firms in the cluster may not be willing to circulate and share relevant information and knowledge for fear of "invasion". However, the close proximity of micro firms makes it impossible for one single business owner to monopolize information for longer period. Therefore, firms located inside a cluster are better served with high-quality knowledge than those outside (Porter 1990), because long distance of information flow may reduce the substance and quality of the information (Sexenian, 1994). Subsequently, information flow in the cluster propels firms within the cluster to take first advantage. Studies such as Terziovski (2003); Premaratne (2001): Boschma and Wal (2007) revels that networking positively influences performance of small firms. In the view of Tallman et al. (2004) knowledge (information) exchange among firms remains one central element to competitive edge.

It is interesting to note that when micro-firms are located in an industrial cluster they are able to undertake structural development in their cluster such as lightning, sheds, develop their road networks, and even support social and welfare services for members. Participants jointly develop strong bargaining power in performing their business activities. Members in a cluster are able to lobby government and government agencies to provide flexible regulatory systems such as taxes rebates and support services. These incentives are essential to provide higher competitive advantage over other firms who are located outside the cluster. For a cluster to derive these services for competitive advantage require strong degree of network and association between members and support agencies. Lei and Huang (2014) noted that competitive performance of any cluster relationship is dependent on the degree of network rather than the mere close proximity of the firms in the cluster. On this backdrop, this paper proposes that:

JOURNAL OF CREATIVITY AND BUSINESS INNOVATION

**Journal of Creativity and Business Innovation, Vol. 3, 2017.**

www.journalcbi.com
ISSN 2351 – 6186

This paper is available at: http://www.journalcbi.com/industrial-cluster-and-competitive-advantage-of-micro-firms-in-wood-industry-in-ghana.html

**H2a:** Horizontal networking in an industrial cluster leads to competitive advantage
**H2b:** The effect of horizontal networking and competitive advantage is mediated by degree of network.

***Innovation strategies***

According to Schumpeter (1934) innovation mean the introduction of new good, the use of new materials, the development of new methods of production, the opening of new market, or the implementation of new approach to the firm. Although Quaye and Acheampong (2013) have found that small firms in Ghana are not innovative enough but further study in Ghana (Ayyagari, Asli & Maksimovic, 2011) and Taiwan (Yeh-Yun Lin & Yi-Ching Chen, 2007) has shown that some innovations have come from micro firms. Micro-firms are characterized by lack of resources and environmental constraints that has existed over the years. In this paper, the researcher is of the view that knowledge and expertise are fundamental to develop innovation such as new products, new markets and marketing tools, organizational processes, product designs among others. Fundamentally, cluster breeds innovation because firms will share information and knowledge. Indeed, studies have emphasized that micro-firm in a cluster share new knowledge among themselves which serve as sources of innovative ideas for competitive advantage (Porter, 1990).

Further studies have argued from the point that effective knowledge sharing and learning (Gilbert, McDougall & Audretsch, 2008; McCann & Folta, 2011) is the cornerstone of competitive through finding new and better ways to compete in an industry (Porter 1990). For McCann and Folta (2011) view of scholars lucidly affirm that micro firms who are actually part of geographically centered cluster easily access new ideas owing to the propensity of knowledge spillovers. Perspective of Schumpeter further supports such view to the effect that knowledge creation is a process of sharing information within an actor's network. Consequently, building and sharing information in an industrial cluster relationship enhances innovation (Fukugawa, 2006), increases sales particularly in UK, Germany and Ireland (Roper, 1997) and India (Subrahmanya, 2011). Buttressing this view, RBV theorist support our argument that knowledge that is firm specific, complex, embedded and tacit (Grant 1996) is an essential source for competitive advantage (Lei & Huang, 2014). In this paper, the researcher conceptualize that firms in a cluster develop and share knowledge more easily and faster, thus supporting the development of unique strands of innovations for competitive advantage. This innovation development strategy among micro firms appears to be regular, unique and usually informal since it is not easy for a single competitor outside the industrial cluster to imitate the innovation. This paper therefore proposes

JOURNAL OF CREATIVITY AND BUSINESS INNOVATION

**Journal of Creativity and Business Innovation, Vol. 3, 2017.**

www.journalcbi.com
ISSN 2351 – 6186

This paper is available at: http://www.journalcbi.com/industrial-cluster-and-competitive-advantage-of-micro-firms-in-wood-industry-in-ghana.html

that:

**H3a:** Innovation in a cluster positively leads to competitive advantage
**H3b:** Degree of network mediates the effect of innovation and competitive advantage.

**Performance Measurement:**
**Competitive advantage**

Studies from management and economic perspectives have assumed that micro firms in clusters are homogeneous hence achieve similar performance (Lei & Huang, 2014). This is because several performance measures exist to determine how actual firm performance meets expectation. Studies have therefore established that close proximity of firms increases their visibility in the cluster which means that they can easily get referrals from other partners (Gilsing et al., 2008). Further studies have advanced that geographically centered firms enjoy benefits such as profits which other firms outside do not enjoy (Caniels & Romijin, 2005; Oerlemans, Meeus & Boekema, 2001). Studies measuring competitive advantage as a multidimensional scale have employed cost efficiency (production cost, selling price and cost of sales (Kaleka 2002; Wheelwright 1984), quality of service (improved features and service performance; Miller & Roth, 1994; Wheelwright, 1984), service (technical support/after sale service, product accessibility (Kelaka, 2002; Miller & Roth, 1994), Flexibility (ability to handle and responds to difficult products, non-standard orders, products and volume change (Wheelwright, 1984) and delivery dependability (timely delivery, prompt response to failures; Miller & Roth, 1994; Wheelwright, 1984). This paper selected: quality, cost, flexibility, accuracy in delivery, customer service, and innovativeness to measure competitive advantage. The researcher employed all the respondents to compare their business with other competing and non-competing firms in answering the question using five-point Likert-scale ranging from 1 (Least agree) to (Strongly agree).

**Mediating Effect: degree of network**

Although firms in a cluster may have similar size (employee and capital) but their degree of competitive performance may be different (Saxenian, 1994). An important question arises regarding the cause of the difference in their competitive performance. In search of answers to these questions, Lei and Huang (2014) in their study of two industrial clusters in Taiwan noted that degree of network strength plays a mediating role between cluster and competitive advantage. Degree of network measures the extent to which a firm possesses the levels of network available (Lei and Huang 2014). Using sociological quantitative evaluation of network (Knoke & Kuklinski, 1982) the study adopt the dimensions of Lei and Huang (2014)

JOURNAL OF CREATIVITY AND BUSINESS INNOVATION

**Journal of Creativity and Business Innovation, Vol. 3, 2017.**

www.journalcbi.com
ISSN 2351 – 6186

This paper is available at: http://www.journalcbi.com/industrial-cluster-and-competitive-advantage-of-micro-firms-in-wood-industry-in-ghana.html

who identified four dimensions to measure degree of network: Density, intensity, reciprocity and multiplexity. On a five point Likert-scale, respondent were asked to evaluate their perception concerning the density of their relationship with other participants (Kenis & Knoke, 2002), intensity of the relations (Tichy et al., 1979), reciprocity (symmetrical exchange of resources between firms (Kenis & Knote, 2002; Tichy et al., 1979) and multiplexity (Kenis & Knote, 2002, Tichy et al., 1979). This paper therefore proposes that strength of the network in the cluster is important to strengthen and improve competitive success of the firms.

**Theoretical Foundation**

Firms create competitive advantage by using their own internal resources (Barney, 1991) or leveraging external resources (Dyer & Hatch, 2006) that are valuable (exploit opportunities and/or neutralize threats in a firm's environment), rare among a firm's current and potential competitors, inimitable and non-substitutable (Barney, 1991). Different list of firms element are considered resources (Doherty & Terry, 2013) including assets, organizational processes, attributes, information and knowledge which are considered relevant to develop product for customer satisfaction (Barney, 1991; Wernerfelt, 1984). The advantages originating from inter-organizational networks may include provide access to complementary resources (information) for the development, production, and marketing of products (Deeds & Hill, 1996; Lamin & Dunlap, 2011). In fact, the focus of many of the recent contributions seems to have shifted towards the role of firms' internal resources and capabilities (Hassink, 2008). Probably the reasons behind this change come from the cluster's difficulties in coping with external challenges in the current globalized markets (Gupta & Subramanian, 2008). This paper adopts RBV as the foundational theory to explain the role of resources (knowledge, relationships, information, factors of production and innovation) in achieving competitive advantage.

**Conceptual Framework**

Firms in a cluster share factors of production (equipment and labour), engage in horizontal networking (information sharing and joint action), and innovation to gain competitive advantage (Amoah-Mensah, 2015). Following the recommendation of Amoah-Mensah (2015), this paper therefore conceptualises that micro-firms in a cluster share factors of production, engage horizontal networking, jointly develop innovation to achieve competitive edge over firms outside the cluster. Competitive advantage as an independent variable was measured based on: quality output, efficiency, flexibility, accuracy in delivery, and innovativeness. Regarding the mediating variable, this paper adopted the dimensions of Lei and Huang (2014) who identified four dimensions of degree of network including: density, intensity, reciprocity and multiplexity of the network

JOURNAL OF CREATIVITY AND BUSINESS INNOVATION

**Journal of Creativity and Business Innovation, Vol. 3, 2017.**

www.journalcbi.com
ISSN 2351 – 6186

This paper is available at: http://www.journalcbi.com/industrial-cluster-and-competitive-advantage-of-micro-firms-in-wood-industry-in-ghana.html

relationship. Figure 1 therefore depicts the conceptual framework of the relationship between industrial cluster and competitive advantage mediated by degree of network.

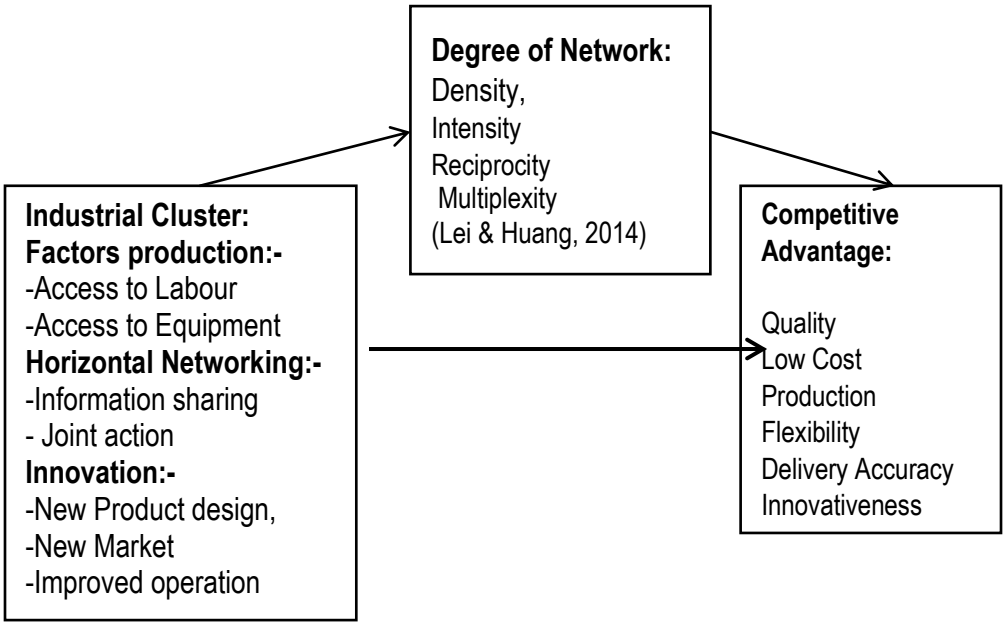


*Figure 1.* Industrial Cluster and Competitive Advantage of Micro-firms in the Wood Industry. Source: Quaye and Mensah (2017).

**Study Methods**

The study was context in Cape Coast Metropolis the capital town of Central region of Ghana and the former administrative region of the then Gold Coast under the colonial era. The region has a population of 2,201,863 inhabitants with 51,697 businesses of which 6,410 are located in Cape Coast (Ghana Statistical Service, Integrated Business Enterprise Survey 2016). Within the Cape Coast metropolis, this study is limited to the Ayifuah Wood Village a suburb of the Metropolis. The village was originally formed by an entrepreneur named Nana Gyasi who initially settled at the location as the sole wood merchant trading in wood and wood related products. Subsequently, other wood merchants and operators joined trading in wood and related activities. Currently, the village has 298 wood operators engaged in buying and selling wood, wood processing and design, carpentry works and other auxiliary services. The village also has drivers, food vendors and other activities. Due to the collective effort of these wood operators, they have instituted welfare scheme to support members and organize cleaning exercises in and around the town. Again, the village with the support of Government has acquired new plots on land for future resettlement. The village generates funds through welfare contributions, offload and wood fees where operators are charged Ghc 1

JOURNAL OF CREATIVITY AND BUSINESS INNOVATION

**Journal of Creativity and Business Innovation, Vol. 3, 2017.**

www.journalcbi.com
ISSN 2351 – 6186

This paper is available at: http://www.journalcbi.com/industrial-cluster-and-competitive-advantage-of-micro-firms-in-wood-industry-in-ghana.html

(local currency) of new consignment into the village.

The study adopts a positivist methodological paradigm in formulating research questions, hypothesis and empirically testing under careful controlled circumstances (Boateng, 2014). Using research survey design and a convenient sampling technique, this quantitative study used structured questionnaire as the primary data collection instrument. The researcher personally developed the study questionnaire and administered to 254 wood operators in the village. 249 out of the 254 questionnaires sent to the field were considered usable and valid for analysis. The self-administered questionnaire provided a major strength since there was no language barrier as the researcher understand the "Akan" language as a first traditional language.

**Validity and reliability**

To ensure reliability of the study, two main criteria were adopted which includes: Cronbach alpha and composite reliability mostly used in structural equation modeling (Hair, Hult, Ringle & Sarstedt, 2014; Hair, Sarstedt, Matthews & Ringle, 2015). To ensure validity in this study, construct validity measures such as: convergent validity (Rezaei & Ghodsai, 2014; Rezaei, 2015) and discriminant validity (Rezaei, 2015; Rezaei & Ghodsi, 2014) were employed. Discriminant validity used construct correlations and cross-loading criterion while convergent validity employed Average Variance Extracted (AVE) and factor loadings (Kim, Hwang Zo & Lee, 2014; Rezaei, 2015).

**Data Analysis and Presentation**

**Analytical approach**

Data Analysis was done in five main levels: Descriptive analysis, Exploratory Factor analysis (EFA), Confirmatory Factor Analysis (CFA), Structural Equation modeling (SEM-AMOS) and discussion of findings. In arriving at the findings, SPSS was used for the descriptive analysis, whereas AMOS was used for SEM to test the hypothesis. Before performing the actual analysis of the main data, preliminary data analysis was done. During the preliminary data analysis (PDA), datasets were cleaned and cleansed (Ainim et al., 2015) to eliminate unengaged responses and correct errors that could skew the research findings (Coakes, 2006).

**Descriptive analysis**

The paper sought to identify three descriptive elements of respondents. The paper asked respondents to indicate their age range, level of education and status of their business. This was important because the paper controlled for these characteristics in order to know how they influence competitive performance. Table 1 therefore shows the result of

JOURNAL OF CREATIVITY AND BUSINESS INNOVATION

**Journal of Creativity and Business Innovation, Vol. 3, 2017.**

www.journalcbi.com
ISSN 2351 – 6186

This paper is available at: http://www.journalcbi.com/industrial-cluster-and-competitive-advantage-of-micro-firms-in-wood-industry-in-ghana.html

respondent's characteristics.

Table 1. Descriptive statistics of respondents

| Profile of Respondents | Statement | Frequency | Percentage (%) |
|---|---|---|---|
| Age | 18-27 | 89 | 35.7 |
| | 28-37 | 141 | 56.6 |
| | 38-47 | 15 | 6.0 |
| | 48-57 | 1 | 0.4 |
| | 58 and + | 3 | 1.2 |
| Education | No education | 1 | .4 |
| | Non-formal | 145 | 58.2 |
| | Junior High School | 90 | 36.1 |
| | Senior High School | 10 | 4.0 |
| | Tertiary | 3 | 1.2 |
| Work Status in the Cluster | Buying and Selling wood | 81 | 32.5 |
| | Processing and designing | 134 | 53.8 |
| | Carpentry | 30 | 12.0 |
| | Other Auxiliary wood works | 4 | 1.6 |

From Table 1, out of 249 valid responses received from the field, majority of 141 respondents representing 56.6 percent ages range between 28-37 while 89 respondents representing 35.7 percent ages ranged between 18-27. The least age group in the cluster ranged between 48-57 years. The result therefore means that the cluster is populated with youthful and vibrant wood operators who are within the ages of 18-37. In terms of educational background, majority of 145 respondents representing 58.2 percent have no formal education, followed by junior high school and senior high school graduate with 90 (36.1%) and 10 (4.0%) respectively.

One respondent out 249 respondents in the cluster had no form of education. The findings indicate that a majority of wood operators in the village have either formal education or non-formal (training). The study further sought to investigate the work status of the respondents within the cluster. Three main categories were identified. The study result shows that majority of 134 wood operators in the village representing 53.8 percent process and design wood products. 81 respondents out of 249 are engaged in buying and selling of wood while minority of 4 respondents operates in other auxiliary processes.

JOURNAL OF CREATIVITY AND BUSINESS INNOVATION

**Journal of Creativity and Business Innovation, Vol. 3, 2017.**

www.journalcbi.com
ISSN 2351 – 6186

This paper is available at: http://www.journalcbi.com/industrial-cluster-and-competitive-advantage-of-micro-firms-in-wood-industry-in-ghana.html

Table 2: Descriptive Statistics of Measurement Statements (Item Code, Mean, SE Mean and Std. Deviation).

| Scale Items | Item code | Mean | SE Mean | Std. Dev | Skewness | Kurtosis |
|---|---|---|---|---|---|---|
| I work for other members in the village for a commission | Fop1 | 3.39 | .08 | 1.23 | -.422 | -.639 |
| Other members can use by machine and pay me | Fop2 | 3.35 | .076 | 1.20 | -.426 | -.694 |
| I join other members to use my machine for special works | Fop3 | 3.26 | .08 | 1.20 | -.204 | -.863 |
| I use other members machine when my machine cannot undertake a particular design | Fop4 | 3.16 | .07 | 1.14 | -.245 | -.611 |
| My workers join other members to when I have not have a job to work on | Fop5 | 3.18 | .07 | 1.24 | -.232 | -.922 |
| I receive information on new wood designs in the market | Hol1 | 3.97 | .06 | 1.00 | -1.150 | 1.362 |
| Members give and share market information such as wood prices | Hol2 | 4.06 | .05 | .79 | -1.004 | 1.748 |
| Member share information on jobs that they want others to join | Hol3 | 3.96 | .053 | .83 | -.987 | 1.687 |
| Members collectively influence the prices of job performed at the village | Hol4 | 3.67 | .06 | .93 | -.585 | -.006 |
| Members collectively contract micro-credit facilities to help members business | Hol5 | 3.61 | .07 | 1.05 | -.701 | .075 |
| Members share knowledge about improvement in the wood industry | Inv1 | 3.46 | .06 | .97 | -.460 | -.139 |

JOURNAL OF CREATIVITY AND BUSINESS INNOVATION

**Journal of Creativity and Business Innovation, Vol. 3, 2017.**

www.journalcbi.com
ISSN 2351 – 6186

This paper is available at: http://www.journalcbi.com/industrial-cluster-and-competitive-advantage-of-micro-firms-in-wood-industry-in-ghana.html

| | | | | | | |
|---|---|---|---|---|---|---|
| We come together to create new wood designs for our customers | Inv2 | 3.04 | .07 | 1.09 | .004 | -.680 |
| We share information in order to improve our work | Inv3 | 3.58 | .06 | .92 | -.593 | .223 |
| I improve my operation processes through information from members | Inv4 | 3.57 | .06 | .92 | -.765 | .502 |
| We share market information which helps me explore more market opportunities | Inv5 | 3.42 | .07 | 1.03 | -.458 | -.318 |
| My relationship in the cluster in deep rooted and strong | Dnt1 | 3.38 | .07 | 1.06 | -.481 | -.280 |
| My relationship with other members in the village is very strong | Dnt2 | 3.06 | .07 | 1.07 | -.132 | -.670 |
| I receive benefits in the same way I help other members in the village | Dnt3 | 2.87 | .07 | 1.06 | .024 | -.652 |
| I have a strong work relationship with members who are not in my area of work | Dnt4 | 3.2 | .07 | 1.08 | -.257 | -.496 |
| Belonging to the village has improved the quality of my wood works | Cprf1 | 3.50 | .06 | 1.01 | -.553 | .068 |
| My cost of jobs and contract is lower compared to if I had been outside the village | Cprf2 | 3.42 | .06 | 1.01 | -.346 | -.370 |
| My production process and operation is flexible and easy | Cprf3 | 3.45 | .06 | .99 | -.262 | -.275 |
| I am able to develop new wood design which brings me more | Cprf4 | 3.28 | .07 | 1.04 | -.344 | -.414 |

JOURNAL OF CREATIVITY AND BUSINESS INNOVATION

**Journal of Creativity and Business Innovation, Vol. 3, 2017.**

www.journalcbi.com
ISSN 2351 – 6186

This paper is available at: http://www.journalcbi.com/industrial-cluster-and-competitive-advantage-of-micro-firms-in-wood-industry-in-ghana.html

| | | | | | | |
|---|---|---|---|---|---|---|
| customers | | | | | | |
| I get more profit because I execute work and deliver them on time | Cprf5 | 3.21 | .07 | 1.09 | -.031 | -.590 |

From the table 2, the highest mean recorded was 4.06 (Members give and share market information such as wood prices) while the lowest mean was 2.87 (I receive benefits in the same way I help other members in the village). This there means that members in the cluster share information as well as receive information to help themselves and their members. The 24 variables displayed in table 2 represent the components of the 5 main constructs depicted in the conceptual framework. Industrial cluster had three constructs which included access to factors of production (Fop), horizontal networking (HoI) and innovation (Inn). The mediating variable was the degree of network (Dnt) which had one construct. The dependent variable which was competitive performance (Cadv) also had 1 Construct.

The dependent and independent variables follows a normal distribution: the skewness and kurtosis values were within the acceptable limit for normal distribution of ±2 (George & Mallery, 2011) indicating that the data are close to normal. This form of data assessment was relevant and consistent with Baumgartner and Homburg (1996) who asserted that these processes ensure that the data is error free and suitable for analysis purposes.

**Exploratory factor analysis**

Principal component analysis was undertaken with Eigen values greater than 1. A Varimax Rotation was conducted and small co-efficients were suppressed. The absolute value was 0.5.The principal component analysis was conducted based on the responses of the 24 scales on the likert scale with the aid of SPSS version 20.

In addition, Kaiser (1970) asserted that the suitable value for the Kaiser-Meyer-Olkin (KMO) should be 0.6 or above. In this paper, the value for the KMO was .846, Bartlett's Test of Sphericity (Bartlett, 1954) reached statistical significance (Approx.: Chi-square= 2881.798, df. 276, sig. 0.000) which aided the correlation matrix to be factorised. Table 3 shows the result for all the tests that was undertaking to order to ensure the data is "fit" for confirmatory analysis.

JOURNAL OF CREATIVITY AND BUSINESS INNOVATION

**Journal of Creativity and Business Innovation, Vol. 3, 2017.**

www.journalcbi.com
ISSN 2351 – 6186

This paper is available at: http://www.journalcbi.com/industrial-cluster-and-competitive-advantage-of-micro-firms-in-wood-industry-in-ghana.html

Table 3.Robustness test result

| Principal Component Loadings | | | Internal Consistencies | | Construct Reliability (CR) | Average Variance Extracted (AVE) |
|---|---|---|---|---|---|---|
| Item Code | | Varimax | Variance | Cronbach Alpha | | |
| | | | | | 0.913 | 0.679 |
| Factor1 | Fop1 | 0.825 | 75.738 | 0.919 | | |
| | Fop2 | 0.856 | | | | |
| | Fop3 | 0.878 | | | | |
| | Fop4 | 0.862 | | | | |
| | Fop5 | 0.823 | | | | |
| Factor2 | Hol1 | 0.725 | 62.350 | 0.788 | 0.802 | 0.506 |
| | Hol2 | 0.845 | | | | |
| | Hol3 | 0.784 | | | | |
| | Hol5 | 0.654 | | | | |
| Factor3 | Inv2 | 0.558 | 55.552 | 0.727 | 0.734 | 0.411 |
| | Inv3 | 0.701 | | | | |
| | Inv4 | 0.781 | | | | |
| | Inv5 | 0.665 | | | | |
| Factor4 | Dnt1 | 0.718 | 64.892 | 0.818 | 0.821 | 0.537 |
| | Dnt2 | 0.838 | | | | |
| | Dnt3 | 0.745 | | | | |
| | Dnt4 | 0.782 | | | | |
| Factor5 | Cadv1 | 0.769 | 57.846 | 0.816 | 0.819 | 0.532 |
| | Cadv2 | 0.802 | | | | |
| | Cadv3 | 0.831 | | | | |

From Table 3, out of a total of 24 measurement items, 21 loaded very well above a threshold set at 0.5. While all items in factors of production were maintained, one item each from horizontal networking and innovation construct were deleted. In terms of the mediating variable (degree of network), all the items on that construct was maintained. In terms of the dependent variable, competitive performance, 4 items were maintained while 1 was dropped (Cadv4). Internal consistencies were examined using Cronbach Alpha values. The retained scales or items met the threshold for Cronbach alpha of 7.0. According to Cronbach (1951) the Cronbach alpha value should be 7.0 or above before a data collection instrument can be deemed reliable.

The reliability measures in this study are above the acceptable levels

JOURNAL OF CREATIVITY AND BUSINESS INNOVATION

**Journal of Creativity and Business Innovation, Vol. 3, 2017.**

www.journalcbi.com
ISSN 2351 – 6186

This paper is available at: http://www.journalcbi.com/industrial-cluster-and-competitive-advantage-of-micro-firms-in-wood-industry-in-ghana.html

(Cronbach's alphas > .70, Average Variance Extracted > .50, composite reliability > .70) as recommended by scholars (Fornell & Larcker, 1981). Furthermore, the factor loadings (ranging from 0.56 to 0.878) showed good convergent validity. The result for validity and reliability indicators of the final measurement model together are displayed in the robustness table above.

Table 4. Improvement of Fit Indices

| Phase | Modification | GFI | PClose | SRMR | RMSEA | NFI | CFI | AGFI | χ2/df |
|---|---|---|---|---|---|---|---|---|---|
| I | Original Model | 0.86 | 0.03 | 0.06 | 0.06 | 0.85 | 0.92 | 0.83 | 1.893 |
| II | Deleted: Horizt_Integratn 1, Innovation_Dev 1, and Perf5 | 0.96 | 0.67 | 0.06 | 0.05 | 0.96 | 0.96 | 0.94 | 1.546 |

Table 4 shows the model fit indices for the structural model before and after some measurement items were dropped. The table shows that the main indicators improved after three items were deleted from the dependent and independent construct. After some items were deleted correlation matrix was checked to indicate the degree of strength among the variables. Table 5 below also shows that there is a strong correlation among the study construct.

Table 5. Correlation Matrix after deletion.

| | FOP | HZIT | INNV | PERF | DON |
|---|---|---|---|---|---|
| **FOP** | **0.824** | | | | |
| **HZIT** | 0.210 | **0.711** | | | |
| **INNV** | 0.436 | 0.596 | **0.641** | | |
| **PERF** | 0.536 | 0.425 | 0.328 | **0.730** | |
| **DON** | 0.269 | 0.308 | 0.353 | 0.198 | **0.733** |

**Confirmatory factor analysis**

After all five dependent and independent variables have been confirmed "fit" the researcher proceeded to confirmatory analysis using SEM (AMOS) in order to test the two main hypotheses (H1a-c and H2a-c).

JOURNAL OF CREATIVITY AND BUSINESS INNOVATION

**Journal of Creativity and Business Innovation, Vol. 3, 2017.**

www.journalcbi.com
ISSN 2351 – 6186

This paper is available at: http://www.journalcbi.com/industrial-cluster-and-competitive-advantage-of-micro-firms-in-wood-industry-in-ghana.html

**Structural model: testing direct relations between independent and dependent relationship**

**H1a:** Access to factors of production positively affects competitive advantage.

**H2a:** Horizontal networking positively affects competitive advantage

**H3a:** Innovation positively affects competitive advantage

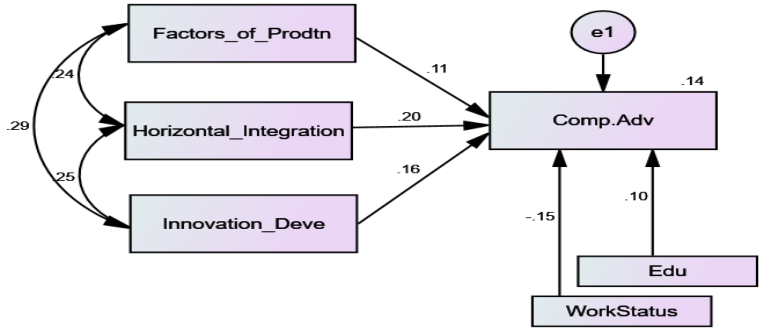


*Figure 2.* Structural equation model for industrial cluster and competitive advantage.

Table 6: Hypothesis test result without mediator.

| Relationship (Hypothesis) | Construct Structural Relationship | β Estimate | SE | T-Values | P-Values | Outcome |
|---|---|---|---|---|---|---|
| *Hypothesis 1a: Access to factors of Production has a Positive Relationship With Competitive Advantage* | FOP--> Cadv | 0.113 | 0.051 | 1.811 | 0.070 | **Not Supported** |

JOURNAL OF CREATIVITY AND BUSINESS INNOVATION

**Journal of Creativity and Business Innovation, Vol. 3, 2017.**

www.journalcbi.com
ISSN 2351 – 6186

This paper is available at: http://www.journalcbi.com/industrial-cluster-and-competitive-advantage-of-micro-firms-in-wood-industry-in-ghana.html

| | | | | | | |
|---|---|---|---|---|---|---|
| *Hypothesis 2a: Horizontal Networking has a Positive Rlationship with Competitive advantage* | HZIT >Cadv | 0.196 | 0.073 | 3.172 | 0.002 | **Supported** |
| *Hypothesis 3a: Innovation development has a Positive relationship with Competitive Advantage* | INNV->Cadv | 0.159 | 0.059 | 2.545 | 0.011 | **Supported** |

Table 6 explains the direct relationship among the various constructs of the independent variable (access to factors of production, horizontal networking and innovation) and the dependent variable (competitive advantage). Factors of production (H1a) which is a construct for industrial cluster does not have a significant relationship with competitive performance and as a result of that, the hypothesis is not supported. This is because, a construct or a variable must have a t-value ≥ 1.96 and *p-value* ≤ 0.05 in order for the relationship to be supported and since the relationship between factors of production and competitive advantage has t-value <1.96 which is 1.811 and a corresponding *p-value* of 0.070 which is >0.05, there is no significant relationship. On the other hand, horizontal networking has a significant relationship with competitive advantage (H1b; t-value is 3.172 > 1.96; *p-value =0.002<0.050)*. Again, the paper found a significant effect of innovation on competitive advantage (H1b: t-value 2.545 > 1.96; *p-value*= 0.011 <0.05). Regarding control variables, our model found a significant influence of work status on competitive advantage while the study did not find any influence of education level on competitive advantage of firms in the cluster.

**Structural Model: Testing independent variable relationship and dependent variable with mediator**

Figure 3 shows the direct effect of the three independent variables (factors of production, horizontal networking and innovation) and one dependent variable (competitive advantage) mediated by degree of network. The study also controlled for level of education and work status of the respondents.

JOURNAL OF CREATIVITY AND BUSINESS INNOVATION

**Journal of Creativity and Business Innovation, Vol. 3, 2017.**

www.journalcbi.com
ISSN 2351 – 6186

This paper is available at: http://www.journalcbi.com/industrial-cluster-and-competitive-advantage-of-micro-firms-in-wood-industry-in-ghana.html

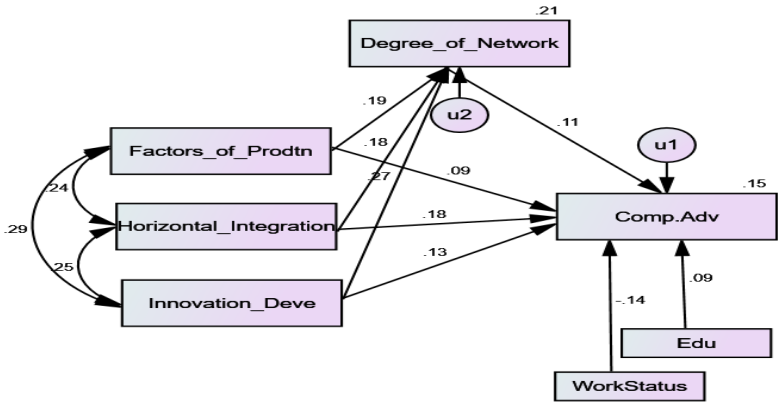


*Figure 3.* Industrial cluster and competitive advantage mediating with degree of network.

Table 7 presents insights into hypotheses (H1b-H3b) which highlight the relationship between factors of production, horizontal networking, innovation and competitive performance with the presence of the mediating variable, degree of networking.

Table 7. Hypothesis test result with mediator.

| **MEDIATION TEST** | **Direct Without Mediator** | | **Direct With Mediator** | | **Mediation Effect** |
|---|---|---|---|---|---|
| | **β Estimate** | **P-Value** | **β Estimate** | **P-Value** | |
| *Hypothesis 1b: Degree of Network Mediates the relationship between Factors of Production and Competitive advantage* | 0.113 | 0.070 | 0.075 | 0.146 | **No Medition** |
| *Hypothesis 2b: Degree of Network Mediates the relationship between Horizontal Networking and Competitive advantage* | 0.196 | 0.002 | 0.210 | 0.005 | **Partial Mediation** |

JOURNAL OF CREATIVITY AND BUSINESS INNOVATION

**Journal of Creativity and Business Innovation, Vol. 3, 2017.**

www.journalcbi.com
ISSN 2351 – 6186

This paper is available at: http://www.journalcbi.com/industrial-cluster-and-competitive-advantage-of-micro-firms-in-wood-industry-in-ghana.html

| | | | | | |
|---|---|---|---|---|---|
| *Hypothesis 3b: Degree of Network Mediates the relationship between Innovation and Competitive advantage* | 0.159 | 0.011 | 0.130 | 0.045 | **Partial Mediation** |

Study hypothesis (H1b) proposed that degree of network in a cluster mediates the relationship between factors of production and competitive advantage. Surprisingly, the study showed insignificant effect of access to factors of production and competitive advantage, thus the degree of network does not mediate the relationship. Thus, the hypothesis is not supported. Hypothesis (H2b) also proposed that degree of network in a cluster mediates the relationship between horizontal networking and competitive advantage. Although the study found a significant effect of horizontal networking and competitive performance, the mediation effect shows that degree of network partially mediates the relationship between horizontal networking and competitive advantage. Thus, the hypothesis is supported. Study hypothesis (H3b) proposed that degree of network mediates the relationship between innovation and competitive advantage. The study result shows that degree of network partially mediates the relationship between innovation and competitive advantage. Thus, the hypothesis is supported.

**Discussion of Findings**

The research finding indicated that access to factors of production does not influence competitive advantage. This is because the relationship access to factors of production and competitive advantage (H1) is not supported. Surprisingly, the study result means that sharing factors of production such as capital and labour in cluster does not directly influence competitive advantage. This finding is contrary to Lei and Huang (2014); Feng and Wang (2007) who found that easy access to skilled labour, frequent sharing of production facilities and equipment create competitive advantage, but it is consistent with research findings of Yoshi Takahashi (2009) which indicated that lending factors of production within a cluster does not influence competitive advantage. This result also means that wood operators in the village share equipment, facilities and labour but such collaborative efforts yield not results in improving their competitive performance.

Our second study hypothesis (H2) supports previous studies that found a significant effect of horizontal networking and competitive performance (Tallman et al. 2004). Thus, information sharing and collective action of members in the village influence the competitive performance of their businesses. Our study result further confirms the findings of Dockel and

JOURNAL OF CREATIVITY AND BUSINESS INNOVATION

**Journal of Creativity and Business Innovation, Vol. 3, 2017.**

www.journalcbi.com
ISSN 2351 – 6186

This paper is available at: http://www.journalcbi.com/industrial-cluster-and-competitive-advantage-of-micro-firms-in-wood-industry-in-ghana.html

Lambrecht's result that indicated that networking influence firm performance.

Regarding hypothesis (H1), previous studies have found a significant influence of innovation and competitive performance of small-sized firms (Caniels & Romijn, 2005; Gilbert et al., 2008; Lei & Huang, 2014; McCann & Folta 2011), our study result support these findings. The findings from this study supported the existence of a positive relationship between innovation and competitive advantage of cluster of small firms. Thus, innovation development among the members in the cluster directly influences competitive advantage. This finding further confirms empirical studies noting that cluster are more successful through innovation, compared to similar firms that are not part of the cluster (Caniels & Romijn, 2005).

The overall effect of the hypothesis (H1-H3) findings of the research confirms previous studies that clustering strategies including sharing and exchange of new knowledge, new market and improved processes play a very significant role in achieving competitive advantage (Power & Lundequist, 2004). Thus, apart from factors of production, horizontal networking and innovation development directly influences firm performance. The study confirms previous studies by Lundequist and Power (2002) that industrial cluster create competitive advantage. These findings however appear contrary to Meyer-Stamer (2002) who questioned the relevance of industrial clustering.

**Summary**

The study used convenience sampling approach to sample size of 254 wood operators to undertake exploratory factor and confirmatory factor analysis with the use of AMOS version 21. The findings indicated that there was no significant relationship between factors of production and competitive advantage. Again, the study found a significant relationship between horizontal networking and competitive advantage. Thirdly, the study found a significant relationship between innovation development and competitive advantage. Thus, apart from access to factors of production, horizontal networking and innovation development among members in a cluster affects the competitive position of firms in cluster.

Another objective was to determine the mediating role of degree of network on the relationship between industrial cluster and competitive advantage. Degree of network did not mediate the relationship between access to factors of production and competitive advantage since the direct relationship was not supported. As a result, no mediation could occur. On the other hand, degree of network partially mediated the relationship

JOURNAL OF CREATIVITY AND BUSINESS INNOVATION

**Journal of Creativity and Business Innovation, Vol. 3, 2017.**

www.journalcbi.com
ISSN 2351 – 6186

This paper is available at: http://www.journalcbi.com/industrial-cluster-and-competitive-advantage-of-micro-firms-in-wood-industry-in-ghana.html

between horizontal networking and competitive advantage, and innovation and competitive advantage.

**Conclusion**

The conclusion is discussed below.

Industrial cluster and the role that degree of network plays in achieving competitive advantage cannot be underestimated. The research findings indicated that horizontal networking and innovation in a cluster significantly create competitive advantage. The study also concludes that sharing factors of production in a cluster of wood operators does not improve the competitive advantage of firms in the cluster. The finally concludes that degree of network mediate the relationship between horizontal networking, innovation, and competitive advantage.

**Recommendations and Practical implications**

The following recommendations have been made based on the research findings and conclusion.

The study recommends that cluster firms must share relevant product design information, market information and job/contract information in order to improve their competitive performance. Again, the study recommends that industrial clustering must be approached with "win-win" syndrome which is built on strong, deep rooted and reciprocal relationships. From policy objective, there is the need for a common platform for all members in the cluster in such a way that learning and innovation are open to all members of the cluster, thus generating dynamic capabilities among all members (Paul et al., 2017). Although access to factors of production was not significant, the study recommends that members must improve the benefits of collective use of machines and labour and other resources to improve their competitive strength.

**Directions for Further Research**

There are some directions for future research. The study was done in Central regional capital of Cape Coast. Other studies may be done in other regions of Ghana and beyond in order to widen knowledge on the relationship between industrial cluster and competitive advantage. Again, this study investigate the relationship between firms within a cluster, other studies may consider undertaking a comparative investigation on the relationship between firms in the cluster and firms outside the cluster. The researcher used a non-probability sampling technique, convenience sampling which makes generalisation of findings difficult. A probability technique such as simple random can be used to undertake future research.

JOURNAL OF CREATIVITY AND BUSINESS INNOVATION

**Journal of Creativity and Business Innovation, Vol. 3, 2017.**

www.journalcbi.com
ISSN 2351 – 6186

This paper is available at: http://www.journalcbi.com/industrial-cluster-and-competitive-advantage-of-micro-firms-in-wood-industry-in-ghana.html

## References

Abor, J., & Quartey, P. (2010). Issues in SME development in Ghana and South Africa. *International Research Journal of Finance and Economics,* 39(6), 215-228.

Amini, A., Darani, M., Afshani, M., & Amini, Z. (2012). Effectiveness of marketing strategies and corporate image on brand equity as a sustainable competitive advantage. *Interdisciplinary Journal of Contemporary Research in Business,* 4(2), 192-205.

Amoah-Mensah. A. (2015). Industrial clustering and competitive advantage of SMEs in the Wood Industry. *Journal of Business and Enterprise Development*, 5(1), 95-124

Ayyagari, M., Demirgüç-Kunt, A., & Maksimovic, V. (2011). Small vs. young firms across the world, contribution to employment, job creation, and growth. Policy Research Working Paper, World Bank, 5631, 1-58

Bagozzi, R. P., & Yi, Y. (2012). Specification, evaluation, and interpretation of structural equation models. *Journal of the academy of marketing science,* 40(1), 8-34.

Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of management,* 17(1), 99-120

Bell, G. G., (2005). Clusters, networks, and firm innovativeness. *Strategic management journal,* 26(3), 287-295.

Bell, S. J., Tracey, P., & Heide, J. B. (2009). The organization of regional clusters. *Academy of Management Review,* 34(4), 623-642.

Paul GD, B., Paul GD, B., Achar, A. P., Achar, A. P., Muniyoor, K., & Muniyoor, K. (2017). What determines the performance of small business units?: Insights from a jewellery cluster, *Journal of Workplace Learning*, (29)6, 447-472.

Boateng, R. (2016). *Research made easy*. Accra, Ghana: CreateSpace Independent Publishing Platform.

Boschma, R. A., & Ter Wal, A. L. (2007). Knowledge networks and innovative performance in an industrial district: the case of a footwear district in the South of Italy. *Industry and Innovation,* 14(2), 177-199.

Boja, C. (2011). Clusters models, factors and characteristics. *International Journal of Economic Practices and Theories,* 1(1), 1-19

Caniëls, M. C., & Romijn, H. A. (2005). What drives innovativeness in industrial clusters? Transcending the debate. *Cambridge Journal of Economics,* 29(4), 497-515.

Ceglie, G., & Dini, M. (1999). *SME cluster and network development in developing countries: the experience of UNIDO*. Vienna: UNIDO,

Cronbach, L. J., (1951). Coefficient alpha and the internal structure of tests. *Psychometrika,* 16(3), 297-334.

Deeds, D. L., & Hill, C. W. (1996). Strategic alliances and the rate of new product development: an empirical study of entrepreneurial biotechnology firms. *Journal of Business Venturing,* 11 (1), 41-55.

Dyer, J. H., & Hatch, N. W. (2006). Relation-specific capabilities and barriers to knowledge transfers: creating advantage through network relationships. *Strategic management journal,* 27(8), 701-719.

Fassoula, E. D., (2006. Transforming the supply chain. *Journal of Manufacturing Technology Management,* 17(6), 848-860.

Felzensztein, C., Gimmon, E., & Carter, S. (2010). Geographical co-location, social networks and inter-firm marketing co-operation: the case of the salmon industry. *Long Range Planning,* 43(5), 675-690.

Feng, F., & Wang, K. (2007).Analysis on Knowledge Transfer Based on Small-world Network Model in the Industrial Cluster [J]. *Science of Science and Management of S. & T* , (7), 017.

Fornell, C. & Larcker. F. D. (1981). Structural equation models with unobservable variables and measurement error: Algebra and statistics. *Journal of marketing research*, 382-388.

JOURNAL OF CREATIVITY AND BUSINESS INNOVATION

**Journal of Creativity and Business Innovation, Vol. 3, 2017.**

www.journalcbi.com
ISSN 2351 – 6186

This paper is available at: http://www.journalcbi.com/industrial-cluster-and-competitive-advantage-of-micro-firms-in-wood-industry-in-ghana.html

Fraser, S., Bhaumik, S. K., & Wright, M. (2015). What do we know about entrepreneurial finance and its relationship with growth?. *International Small Business Journal,* 33(1), 70-88.

Fukugawa, N. (2006). Determining factors in innovation of small firm networks: a case of cross industry groups in Japan. *Small Business Economics,* 27(2-3), 181-193.

George, D. & Mallery, P. (2011). Descriptive statistics. *SPSS for Windows step by step. A simple guide and reference,* 17, 95-104, India: Pearon Education India.

Gertler, M. S., & Wolfe, D. A. (2006). Spaces of knowledge flows: Clusters in a global context. *Clusters and regional development: Critical reflections and explorations*. Working paper, DRUID Tenth Conference, Denmark, Copenhagen, 218-235.

Ghana Statistical Service, (2016). Integrated Business Establishment Survey Regional Spatial Business Report, Accra. Ghana: GSS.

Gilbert, B. A., McDougall, P. P., & Audretsch, D. B. (2008). Clusters, knowledge spillovers and new venture performance: An empirical examination. *Journal of business venturing,* 23(4), 405-422.

Gilsing, V. A., & Duysters. M. G. (2008). Understanding novelty creation in exploration networks—structural and relational embeddedness jointly considered. *Technovation,* 28(10), 693-708.

Grant, R. M., (1996). Toward a knowledge-based theory of the firm. *Strategic management journal,* 17(S2), 109-122.

Gunawan, T., Jacob, J., & Duysters, G. (2013). Entrepreneurial Orientation and Network Ties: Innovative Performance of SMEs in an Emerging-Economy Manufacturing Cluster. *Maastrict School of Management Working Paper,* 2013/23.

Gupta, V. & Subramanian, R. (2008). Seven perspectives on regional clusters and the case of Grand Rapids office furniture city. *International Business Review,* 17(4), 371-384.

Hair, Jr, J. F., Sarstedt, M., Matthews, L. M., & Ringle, C. M. (2016). Identifying and treating unobserved heterogeneity with FIMIX-PLS: part I–method. *European Business Review,* 28(1), 63-76.

Hinson, R. E., & Mahmoud, M. A. (2011). Qualitative insights into market orientation in small Ghanaian businesses. *International Journal of Marketing Studies,* 3(1), 35.

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural equation modeling: a multidisciplinary journa,l* 6(1), 1-55.

Lamin, A., & Dunlap, D. (2011). Complex technological capabilities in emerging economy firms: The role of organizational relationships. *Journal of International Management,* 17(3), 211-228.

Lei, H. S., & Huang, C. H. (2014). Geographic clustering, network relationships and competitive advantage: Two industrial clusters in Taiwan. *Management Decision* 52 (5), 852-871.

Kaleka, A. (2002). Resources and capabilities driving competitive advantage in export markets: guidelines for industrial exporters. *Industrial Marketing Management,* 31(3), 273-283.

Karaev, A., Lenny Koh, S. C., & Szamosi, L. T. (2007). The cluster approach and SME competitiveness: a review. *Journal of Manufacturing Technology Management,* 18(7), 818-835.

Kenis, P., & Knoke, D. (2002). How organizational field networks shape interorganizational tie-formation rates. *Academy of Management Review,* 27(2), 275-293

Kim, K., Hwang, J., Zo, H., & Lee, H. (2016). Understanding users' continuance intention toward smartphone augmented reality applications. *Information Development,* 32(2), 161-174.

Kleynhans, E. P. J., (2006). The role of human capital in the competitive platform of South African industries. *SA Journal of Human Resource Management,* 4(3), 55-63.

Knoke, D. & Kuklinski, J. H. (1982). Network analysis. Research Report of US office of Naval

JOURNAL OF CREATIVITY AND BUSINESS INNOVATION

**Journal of Creativity and Business Innovation, Vol. 3, 2017.**

www.journalcbi.com
ISSN 2351 – 6186

This paper is available at: http://www.journalcbi.com/industrial-cluster-and-competitive-advantage-of-micro-firms-in-wood-industry-in-ghana.html

Research and Austrialian Researh Concil.

Knoke, D. & Kuklinski, J. H. (1982). Network analysis.Krugman, Paul R. (1991). *Geography and trade*. MIT press.

Lundequist, P. & Power, D. (2002).Putting Porter into practice? Practices of regional cluster building: evidence from Sweden. *European planning studies,* 10( 6), 685-704.

McCann, B. T., & Folta, T. B. (2011). *Performance differentials within geographic clusters. Journal of Business Venturing,* 26(1), 104-123.

Meyer-Stamer, J. (2002). Clustering and the creation of an innovation-oriented environment for industrial competitiveness: beware of overly optimistic expectations. *International Small Business Journal,* 20 (3), 1-23.

Miller, J. G., & Roth, A. V. (1994). A taxonomy of manufacturing strategies. *Management Science,* 40(3), 285-304.

Narula, R. (2004). R&D collaboration by SMEs: new opportunities and limitations in the face of globalisation. *Technovation,* 24(2), 153-161.

Oerlemans, L. A., Meeus, M. T., & Boekema, F. W. (2001). Firm clustering and innovation: Determinants and effects. *Papers in regional science,* 80 (3), 337-356.

Park, Y., Shin, J., & Kim, T. (2010). Firm size, age, industrial networking, and growth: A case of the Korean manufacturing industry. *Small Business Economics,* 35(2), 153-168.

Perry, M., & Tahi Hamonangan Tambunan, T. (2009). Re-visiting Indonesian cases for cluster realism. *Journal of Enterprising Communities: People and Places in the Global Economy,* 3(3), 269-290.

Porter, M. E., (1990). The competitive advantage of nations. *Harvard business review,* 68(2), 73-93.

Porter, M. E., (2000). *Location, competition, and economic development: Local clusters in a global economy. Economic development quarterly,* 14(1), 15-34.

Porter, M. (2003). *The economic performance of regions. Regional studies,* 37(6-7), 549-578.

Pouder, R., & John, C. H. S., (1996). Hot spots and blind spots: Geographical clusters of firms and innovation. *Academy of Management Review,* 21(4), 1192-1225.

Power, D., & Lundmark, M. (2004). Working through knowledge pools: labour market dynamics, the transference of knowledge and ideas, and industrial clusters, *Urban Studies*, 41(5/6), 1025-1044.

Premaratne, S. P., (2001). Networks, resources, and small business growth: The experience in Sri Lanka. *Journal of small business management,* 39(4), 363.

Pyke, F. & Sengenberger, W. (1992). eds. *Industrial districts and local economic regeneration*. International Labour Organisation.

Quaye, D. (2014). Credit and its impact on Technological Entrepreneurship in Ghana, Developing Economy Perspectives on Marketing and Entrepreneurship: The Ghanaian Dimension. *University of Ghana Readers*, 4, 75-91.

Rezaei, S. (2015). Segmenting consumer decision-making styles (CDMS) toward marketing practice: A partial least squares (PLS) path modeling approach. *Journal of Retailing and Consumer Services,* (22), 1-15.

Rezaei, S. & Ghodsi. S. S. (2014). Does value matters in playing online game? An empirical study among massively multiplayer online role-playing games (MMORPGs). *Computers in Human Behavior,* (35), 252-266.

Roper, S. (1997). Product innovation and small business growth: a comparison of the strategies of German, UK and Irish companies. *Small Business Economics,* 9(6), 523-537.

Saxenian, A. (1994). Regional networks: industrial adaptation in Silicon Valley and route 128.

Schmitz, Hubert. (1992). On the clustering of small firms. *IDS bulletin,* 23(3), 64-69.

Schmitz, H. (1995). Collective efficiency: Growth path for small-scale industry. *The journal of development studies,* 31(4), 529-566.

JOURNAL OF CREATIVITY AND BUSINESS INNOVATION

**Journal of Creativity and Business Innovation, Vol. 3, 2017.**

www.journalcbi.com
ISSN 2351 – 6186

This paper is available at: http://www.journalcbi.com/industrial-cluster-and-competitive-advantage-of-micro-firms-in-wood-industry-in-ghana.html

Schmitz, H, & Nadvi. K. (1999). Clustering and industrialization: introduction. *World development,* 27(9), 1503-1514.

Schumpeter, J. A. (1982). The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest, and the Business Cycle (1912/1934). *Transaction Publishers.–1982.–January*, *1*, 244.

Schwab, K., & Sala-i-Martin, X. (2010). World Economic Forum. In *The Global*.

Stam, W. & Elfring, T. (2008). Entrepreneurial orientation and new venture performance: The moderating role of intra-and extraindustry social capital. *Academy of Management Journal,* 51(1), 97-111.

Subrahmanya, M.H. (2011). Technologic lore: Does Innovation Facilitate Growth of Firm Size?. *The Asian Journal of Technology Management,* 4(1), 41-55.

Tallman, S., Jenkins, M., Henry, N., & Pinch, S. (2004). Knowledge, clusters, and competitive advantage. *Academy of management review*, *29*(2), 258-271.

Terziovski, M. (2003). The relationship between networking practices and business excellence: a study of small to medium enterprises (SMEs). *Measuring business excellence,* 7(2), 78-92.

Tichy, N. M., Tushman, M. L., & Fombrun, C. (1979). Social network analysis for organizations. *Academy of management review,* 4(4), 507-519.

Wernerfelt, B. (1984). A resource-based view of the firm. (1984). *Strategic management journal,* 5(2), 171-180.

Wheel Wright, S. C. (1984). Manufacturing strategy: defining the missing link. *Strategic management journal,* 5(1), 77-91.

Yeh-Yun Lin, C., & Yi-Ching Chen, M. (2007). Does innovation lead to performance? An empirical study of SMEs in Taiwan. *Management Research News,* 30(2), 115-132.

Zeinalnezhad, M., Mukhtar, M., & Sahran, S. (2011). A study on benchmarking models and frameworks in industrial SMEs: Challenges and Issues. *International Journal on Advanced Science, Engineering and Information Technology,* 1(1), 6-11.

**Corresponding Author:**
Isaac Mensah can be contacted via: imensah012@st.ug.edu.gh