The Influence of Network Ties on Resource Transfer in Automobile Clusters in Ghana: A Fitted Logistic Regression

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ABSTRACT

Since the closing decades of the twentieth century, "networking" has become an accepted term and concept in the American and many societies across the globe. Our study evaluated the degree to which network ties and business linkages influence resource transfer in automobile clusters in Ghana. A total of 261 respondents were recruited to participate in the research in selected cities in Ghana. We observed a positive and significant relationship between linkages to other enterprises, venture capitalists, universities, venture networks, financial institutions, social network, government and transfer of technology, infrastructural, labour, skill and capital transfer to automobile firms. We further observed that firms located in the Kumasi cluster are more likely to influence resource transfer from clusters than those located in the Accra cluster. Similarly, intra-cluster ties were less responsive to resource transfer than ties with government.

Keywords: Cluster, Resource Transfer, Networking, Network Ties, Automobile.

INTRODUCTION

According to Hahn and Gold (2014) networking is a socio-economic business activity by which business people and entrepreneurs meet to form business relationships and to recognize, create, or act upon business opportunities, share information and seek potential partners for ventures. In the second half of the twentieth century, the concept of networking was promoted to help business people to build their social capital (Robison & Ritchie, 2016). In the US, workplace equity advocates encouraged business networking by members of marginalized groups (e.g., women, African-Americans, etc.) to identify and address the challenges barring them from professional success. Mainstream business literature subsequently adopted the terms and concepts, promoting them as pathways to success for all career climbers (Robison & Ritchie, 2016). From the latter periods of the twentieth century, "networking" has become an accepted term and concept in the American and many societies across the globe. Since the 2000s, "networking" has expanded beyond its roots as a business practice to the point that parents meeting to share child-upbringing tips to scientists meeting research colleagues are described as engaging in "networking" (Pozzi, 2013; Reger et al., 2017). Many business people contend that business networking is a more cost-effective method of generating new business than advertising or public relations efforts. This is because business networking is a low-cost activity that involves more personal commitment than company money. Country-specific examples of informal networking are guanxi in China, blat in Russia, good old boy network in America, and old boy network in the UK. As observed by Gillard, Foster, and Turner (2016) network members continually improve through unique peer review and network-driven processes. These processes make up a program that provides intensive business training in the form of coaching, consulting, and group workshops (Gillard et al., 2016). Network members...
observe and evaluate each other's companies in real time, learn from each other's successes, and generate positive solutions to their business opportunities to ensure continuous improvement within a time-proven system. According to Barnes (2016) business clusters have become major sources of network ties with proven records in many fields. In Ghana, automobile clusters have existed over time (especially in Accra, Kumasi, and Sekondi-Takoradi etc). These are geographical concentration of related automobile business firms, organizations, and institutions (dealing with vehicle manufacturing, accessories and components and parts) and have the benefit of like firms, institutions, and infrastructure surrounding it. Despite the age and value of the automobile clusters in Ghana to economic growth, the sector has largely escaped the interest of academics as the front-end of the sector is represented by a collection of presumed illiterates, conmen, tricksters, vagabonds and fraudsters etc even though in reality they act as middle men for very influential people in society. As such the extent to which business networks support resource transfer in the automobile clusters in Ghana remains a missing link in the extant literature. For this reason, there is very little knowledge about how intra-cluster partnership and relationship with other enterprises outside the automobile clusters such as venture capitalists, universities, research institutions, venture partners and social networks significantly influence resource transfer within the automobile cluster and its implications for sustainable cluster. Moreover, it is suggested that sponsorship-based ties with (e.g. governmental agencies and commercial banks) with automobile clusters in Ghana have significant influence on emerging automobile SMEs performance. These issues remain outstanding in the extant literature and provoke in-depth empirical studies such as this. We apply a novel logistic regression on an array of relevant information to establish the extent of relationship between network ties and resource transfer in this research.

NETWORK TIES (LINKAGES) AND FIRM PERFORMANCE

Whether a firm is an established one or a start-up, they only function as just a part of their value chain activities and mainly rely on their environment for additional resources (Sullivan & Ford, 2014). Companies do not possess unlimited resources and thus, look beyond their boundaries for external economic ties with complimentary resources. These external ties facilitate the firm’s effort of acquiring extra needed resources and also identify business opportunities due to the embeddedness of economic activities within the wider inter-organizational ties or networks (Semrau & Werner, 2014; Spith & Clauss, 2015). It therefore comes as a huge surprise that the famous research work on entrepreneurship, which was undertaken, based on a sample of new projects in Bavaria by Brüderl and Preisendörfer (2000) did not take into account the role of social capital on the growth of start-up firms. There is no denying the fact that, network ties play a crucial role in identifying business and market opportunities, transfer of important resources and also provide ideas for newly established firms (Stam, Arzlanian, & Elfring, 2014). Oftentimes, prospective network partners are hesitant to jeopardize their hard-earned reputation, capital and other resources to endanger their businesses in newly established firms who have uncertain financial future as well as survival on the market. Forming network ties and linkages with stakeholders which enhances mutuality, reciprocity and trust (Zane & DeCarolis, 2016) can go a long way to offer support to start-ups through their resource commitments. Networks provide the benefits of information, and that, a company endowed with sufficient social capital is well positioned to find business opportunities. Another benefit is that, these network partners provide information on market opportunities, current technology, and also cooperate to take advantage of new business opportunities. These companies also make referrals on behalf of the focal company to other third parties in a bid to form strategic business cooperation in order to seize strategic business opportunities and explore new ties. Network partners again help to facilitate the transfer of external resources gathered from third party ties which presents positive signs with respect to the start-up future prospects (Biligili, Kedia, & Bilgili, 2016; Rybka, Roijakkers, Lundan, & Vanhaverbeke, 2015). A lot of evidence abound indicating that, businesses that are successful, actively network with business organisations and regulators (Chen, Chang, & Lee, 2015; Greene, Brush, & Brown, 2015). Another study by Ferriani and MacMillan (2017) also observed that business network has a strong correlation with firm resource transfer.

Social capital espouses the positive effect of social networks on firm performance (Lee & Jones, 2015). Social enterprise capital is usually described as "the quantity of resources, material or virtual, which is accumulated to a corporate partner via the partner’s social relations, and that facilitates the achievement of firm objectives" (Lee & Jones, 2015). Most of the previous studies examined the concept, attributes and role of social capital but did not mention its nature with respect to new firms and their value creation.
This current article therefore attempts to distinguish between "sponsorship ties" and "sponsorship linkages" for the conceptualization of social capital of new ventures.

Sponsorship Ties: this refers to cooperative and bilateral linkages where the partners exchange resources and also sustain lasting ties (Demir & Söderman, 2015). That is, sponsorship ties usually exhibit a one-way relationship, thus, the sponsor only engages in one-way support for a business without receiving material or obvious rewards in return. The most significant differentiation criteria for partnership based vs. sponsorship-based linkages hinges on whether there is an openly bilateral exchange of resources between the partners. For example, in this paper, we considered the linkage with a venture capitalist as a partnership based since venture capitalist as a firm gains explicit rewards which comes in the form of equity ownership as compensation for their financial participation and management involvement of the new firm.

Partnership based Linkages: this is where a focal firm establishes linkages with external ties described as bilateral cooperation relations with environmental elements (Gutiérrez, Márquez, & Reficco, 2016). The review of the literature and interviews conducted with top business executives of the Ghanaian automobile SMEs revealed that four different types of partnership-based ties are identified in the promotion of new firms in the industry. These include ties to:

(i) Other enterprises
(ii) Venture capitalists
(iii) Universities and research institutions
(iv) Venture cooperatives

The formation of strategic alliances with other companies creates lasting relations with suppliers, customers and other companies who possess complementary resources. There are two ways through which strategic ties help new automobile SMEs to experience better performance. The first among this is that, ties are able to provide explicit information, knowledge and additional resources to the newly established SMEs (Badir & O’Connor, 2015; van Fenema & Loebbecke, 2014; West, Salter, Vanhaverbeke, & Chesbrough, 2014). Automobile SMEs with fewer resources generally seek technical, administrative and financial resources through cooperatives, as newly established market firms seek these resources through partnerships with firms in developed markets (Bilgili et al., 2016). On the other hand, strategic partnerships can assist new firms to obtain third party resources through alliance gesticulating (Lin, Wu, Hsu, & Perng, 2016; Ozmel, Reuer, & Gulati, 2013). Creating strategic partnerships with third-party companies shows that, new firms have a good chance of success. Improved market legitimacy helps to quell the fear of the firms that possess the resources and that are more concerned of reaping their investments in the new firms.

The involvement of investors such as venture capitalists in a new company not only enables a firm to gain financial resources as well as attracting management experts to the firm but also enhances the firm’s legitimacy in the market. Given that venture capitalists are encouraged to make the business successful, they offer managerial expertise to the new firm which is usually done by taking a seat on the firm’s management board, provide access to industry professionals and also call for management change in periods where management performance falls short in their estimation (Bertoni & Tykvová, 2015; Colombo, D’Adda, & Pirelli, 2016). This approach of full participation of venture capitalists in new SMEs is a regular phenomenon in the Ghanaian business environment. Thus, in the Ghanaian automobile industry, venture capitalists’ participation in newly established firms is seen to help reduce drastically the apprehensions of potential suppliers, buyers, investors and employees when committing themselves to the new firm. That is, their financial involvement indicates to other prospective partners that the venture has great prospects. Gaining legitimacy and also reducing uncertainty ensures that the firm can acquire external resources on favorable conditions (Chandler, Haunschild, Rhee, & Beckman, 2013; Hubbard, Pollock, & Pfarrer, 2016).

Cooperation between new firms, universities and research institutions helps the new firms to develop technical knowledge which otherwise could not have been acquired on their own (Ankrah & Omar, 2015; Santoro & Gopalakrishnan, 2015). In the area of consultancy too, both universities and research institutions offer a lot of consulting services to new firms on various projects and also offer them the opportunity for continuous professional training of staff (Abidin, Rani, Hamid, & Zainuddin, 2014; Varga, 2013). This long-standing cooperation helps facilitate the hiring of high-flying research professionals. The development of personal ties with universities and research institutions also encourage the transfer of human resource into the new firms (Noyes, Brush, Hatten, & Smith-Doerr, 2014). This phenomenon usually happens when students who are involved in research of new projects by these firms.
become conversant with the technology behind the project and are thus, likely to join such firms after completing their education. Results from the interviews conducted with some automobile firms’ CEOs revealed that, proprietors of high-flying Ghanaian new firms indeed take advantage of the ties established with the various universities as well as research institutions to access both new technologies and staff recruitment. A firm’s involvement in venture partnerships and the complementarity of ties working through an informal network impacts on the transfer of more social capital. Thus, through informal networks, firm owners can acquire valuable managerial expertise about the management of new firms, obtain market intelligence information and opportunities and also able to find more valuable partners via the informal network (Moustaghfir & Schiuma, 2013). A founder may be provided with access to information from his/her network that he/she can manage alone. Thus, usually, information flowing from such trusted sources is deemed more valuable, dependable and very clear to understand. This is because of the background of the partners and the intensity of such social ties (Zane & DeCarolis, 2016). While the network serves as a conduit for referral and where there is a representation of the owner’s interest which is displayed in a positive light, networks help companies find and develop new business opportunities (Zane & DeCarolis, 2016). In addition to this, networks facilitate access to other professionals such as lawyers, accountants and venture capitalists. In short, partnerships-based ties of an automobile startup makes it easier for these firms to acquire additional external resources in order to produce under better conditions and to also help with the identification and development of new business opportunities. Sponsorship-Based Ties: This refers to unilateral tie relations where external parties such as commercial banks, governmental agencies etc. provide support to new firms without necessarily expecting any explicit returns or rewards. Ghanaian newly established automobile SMEs benefit from support from governmental and other quasi state agencies which gives them competitive urge at the start of their businesses (Ozmel et al., 2013). Our earlier exposition on the benefits of partnership-based ties is enforced by this assertion. With financial insecurity being the bane for most newly established SMEs, the active participation and reputation of a sponsor strongly helps protect these firms against any adverse effects. That is, all these social capital available to these SMEs tend to add to their external resources and thus greatly contributing to the firms’ resource transfer and reduction of possible dangers that newly established firms usually face during the developmental phase (Almobaireek, Alshumaimeri, & Manolova, 2014; Weber, 2016). Thus, these ties offer some level of protection to the newly established firms from the industry environmental hazards (Almobaireek et al., 2014). There is always a window of opportunity for new firms to solicit for vital support from such external actors of no cost to them or on better conditions (Furlan & Grandinetti, 2014). Again, having these kinds of sponsorship from reputable external sources goes a long way to enhance their legitimacy and status in the industry (Ozmel et al., 2013; Petkova, 2016). Rare but critical resources (Zheng, Luo, & Maksimov, 2015) can be obtained from the external environment for emerging firm’s which enhances their legitimacy and prestige. However, it was found in the famous study of Brüderl and Preisendörfer (2000) that, government support does not affect the performance of emerging firms even when the regression model used captured both firm and environmental variables.

It is worthy to note that, successive Ghanaian governments have over the years pursued certain clear policies that have created a more favorable and friendly business environment for emerging businesses particularly for automobile SMEs to thrive (e.g. the declaration of the “golden age of business” policy framework in 2001 and the creation of the Free Zone enclave for emerging businesses as well as the establishment of state financial institutions such as the Venture Capital, Young entrepreneur Scheme Fund, Microfinance and Small Loan Centre (MASLOC), National Board for Small Scale Industries (NBSSI) etc. which are all geared towards the creation of a congenial environment for the nurturing of emerging SMEs. Again, the Ghanaian government has a policy that gives a great deal of tax incentives to firms operating in the automobile SMEs sector to stimulate innovation in the sector. Also, the government has established an industrial research institute (The Scientific and Industrial Research Institute in Mampong) to offer support to industrial research including the emerging SMEs. The current government has also initiated a policy that directs all government agencies and departments to first consider the option of buying cars from the local car manufacturers such as The Kantanka automobile group and the Mahindra car assembly plant. Such outright endorsements from such high places boost emerging SMEs morale and bolster their legitimacy in the public eyes. Some commercial banks such as the National Investment Bank also offer emerging automobile SMEs with loans at very low rates to support their innovative
projects. Figure 1 summarizes the framework of the
research and the intended hypotheses and
relationship to be tested in this research.

Figure 1: Research Framework

MATERIALS AND METHODS
Data Source
Data was collected from the owners, managers and
supervisors of three automobile clusters in Ghana.
Two of these clusters are located in the Greater
Accra Region with a business population of nearly
500 firms while the other cluster is located in Kumasi
(Ashanti Region) which is the second largest city in
the country. It has a business population of about 300
firms working in different segments of the cluster. A
total of 279 respondents were initially recruited to
participate in the research that took place over a
three-month period. The author adopted but modified
items to establish the construct of network ties and its
resulting effect on resource transfer from the extant
literature. This was constituted into a closed-ended
questionnaire that was robustly tested and fine-tuned
before administering to the selected respondents. For
example, the face validity of the measurement items
was assessed by faculty members and doctoral
students of the Institute of Open Economy and
Industry Development at the School of Finance and
Economics who acted as expert judges. After several
iterations of item editing and refinement, a final
constituted closed-ended questionnaire was
administered. Eventually, 261 respondents fully
completed the questionnaire and their responses were
accepted for analysis in the research. In terms of
construct measurement, we identified and measured
and recategorized the many different types of
linkages and ties examined in the literature (sponsorship
ties, partnership-based linkages etc. into
seven different types of organizational ties and
linkages based on the extant literature. These were
further decomposed into questions to clearly define
the existence of each one of the linkages. For
example, five questions were asked to examine the
presence of linkage to other enterprises while five
additional questions were also asked to determine
linkage to venture capital. The questionnaire also
involved five questions each to measure the level
or degree of linkage to universities, linkage to
venture networks, linkage to financial institutions,
linkages to social network and linkage to
government. Other demographic variables were
added such that the entire questionnaire was made
up of 40 questions.

Analytical Procedure
The analytical procedure included two staged
statistical analysis to obtain the results. First, we
performed factor analysis to investigate and validate
the threshold values of organizational ties. We
thoroughly verified the basic assumptions i.e. the
constant variance and normality and these did not
affect the results. We determined the appropriateness
of the data for factor analysis by employing Kaiser–
Meyer-Olkin measure of sampling adequacy (KMO-
MSA) and Bartlett’s Test of Sphericity. We recorded
a KMO value of more than 0.60 and a significant
value for the Bartlett’s Test of Sphericity. We
performed Varimax rotation and principle
components analysis for factor analysis. We
eliminated all the factors that had factor loadings
lower than 0.50 after which we conducted the
Cronbach’s alpha reliability analysis. We ensured
that all measure of sampling adequacy exceeded the
Cronbach’s alpha reliability value threshold level of
0.60 and large and significant Bartlett’s Test of
Sphericity. We eliminated 5 items of the initial 35
on the 7 organisational linkage or ties dimensions
since they had a factor loading lower than 0.50. The
exploratory factor analysis and reliability statistics
measures of the accepted 30 variables were
composed into seven composite values of linkage to
other enterprises, linkage to venture capital, linkage
to universities, linkage to venture networks, linkage
to financial institutions, linkage to social networks
and linkage to government. In the first model, we
designated the seven linkages or ties as independent
variables to test their effect on a dichotomous
resource transfer value. Second, we disaggregate
resource transfer into four variables (technology
transfer, infrastructure transfer, knowledge/labour,
skill transfer) and establish its individual relationship
with linkage to other enterprises, linkage to venture
capital, linkage to universities, linkage to venture
networks, linkage to financial institutions, linkage to
social network and linkage to government. In all, we
modeled a fitted logistic regression model by considering the situation where the independent variable is nominal scale and dichotomous (i.e. measured at two levels). This case provides the conceptual foundation for all the other situations. We assume that, the independent variable, x, is coded as either zero or one. The difference in the logit for a subject with x = 1 and x = 0 is
\[ g(1) - g(0) = \beta_0 + \beta_1 - \beta_0 = \beta_1. \]
In order to interpret this result we need to introduce and discuss measure of association termed the odds ratio. The possible values of the logistic probabilities may be conveniently displayed in a 2 × 2 as shown in Table 1.

**Table 1 Values of the Logistic Regression Model When the Independent Variable Is Dichotomous**

<table>
<thead>
<tr>
<th>Outcome Variable (Y)</th>
<th>Independent Variable (X)</th>
</tr>
</thead>
<tbody>
<tr>
<td>y = 1</td>
<td>x=1</td>
</tr>
<tr>
<td>( \pi(1) = \frac{e^{\beta_0 + \beta_1}}{1 + e^{\beta_0 + \beta_1}} )</td>
<td>( \pi(0) = \frac{e^{\beta_0}}{1 + e^{\beta_0}} )</td>
</tr>
<tr>
<td>y = 0</td>
<td>x=0</td>
</tr>
<tr>
<td>( 1 - \pi(1) = \frac{1}{1 + e^{\beta_0 + \beta_1}} )</td>
<td>( 1 - \pi(0) = \frac{1}{1 + e^{\beta_0}} )</td>
</tr>
<tr>
<td>Total</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.0</td>
</tr>
</tbody>
</table>

The odds of the outcome being present among individuals with x = 1 is defined as \( \pi(1)/[1-\pi(1)] \). Similarly, the odds of the outcome being present among individuals with x = 0 is defined as \( \pi(0)/[1-\pi(0)] \).

Nevertheless, if the coding scheme is different from the (0,1) then the odds ratio formula needs to be modified, but for the purpose of this study all the dichotomous variables will be coded using the (0,1) coding scheme. The interpretation given for the odds ratio is based on the fact that in many instances it approximates a quantity called the relative risk. This parameter is equal to the ratio \( \frac{\pi(1)}{\pi(0)} \). It follows that the odds ratio approximates the relative risk if \( [1-\pi(0)]/[1-\pi(1)] \approx 1 \). This holds when \( \pi(x) \) is small for both x=1 and 0. A 100(1-\( \alpha \))% confidence interval (CI) estimate for the odds ratio is obtained by first calculating the endpoint of a confidence interval for coefficient, \( \beta_1 \), and then exponentiating these values.

Under the assumption that the logit is linear in the continuous covariate, x, the equation for the logit is
\[ g(x) = \beta_0 + \beta_1 x. \]
It follows that the scope coefficient, \( \beta_1 \), gives the change in the log odds for an increase of “1” unit in x, that is
\[ \beta_1 = g(x+1) - g(x) \]
for any value of x. Most often the value of “1” is not statistically interesting. Hence to provide a useful interpretation for a continuous scale covariate we need to develop a method for point and interval estimation for an arbitrary change of “c” units in the covariate. The log odds ratio for a change of c units in x is obtained from the logit difference \( g(x+c) - g(x) = c\beta_1 \) and the associated odds ratio is obtained by exponentiating this logit difference
\[ OR_C = OR(x+c,x) = \exp(c\beta_1) \]
An estimate may be obtained by replacing \( \hat{\beta}_1 \) with its maximum likelihood estimate (\( \hat{\beta}_1 \)). An estimate may be obtained of the standard error needed for confidence interval estimation is obtained by multiplying the estimated standard error of (\( \hat{\beta}_1 \)) by c. Hence the endpoints of the 100(1-\( \alpha \))% confidence interval (CI) estimate of \( OR_C \) are
\[ \exp \left[ \hat{\beta}_1 \pm Z_{1-\frac{\alpha}{2}} \times cSE(\hat{\beta}_1) \right] \]
Since both the point estimate and endpoints of the confidence interval depends on the choice of c, the particular value of c should be clearly specified in all tables and calculations. Table 1 presents the computations of the crude odd ratio for effect of network ties or network linkages X on resource transfer Exp (B). As explained by Tennant and Pallant (2006) the crude odds ratio of factor explains the degree of influence of each of the variables on the dichotomous value of resource transfer which is the dependent variable of study. Firstly, the Wald’s and log likelihood ratio tests were also performed to ascertain the significance of effect of each of the explanatory variables on resource transfer in this model. According to (Brown, 2015), a probability value below or equal to 0.05 is considered to be statistically significant. Hence the inclusion of that explanatory variable as important in determining resource transfer Y= 0 or 1. The parameters of the model were estimated using maximum likelihood approach. The estimates for each explanatory variable are interpreted relative to the referenced category.
Table 2: Odd Ratio Output of Logistic Regression Predicting

<table>
<thead>
<tr>
<th>Variable</th>
<th>Estimates</th>
<th>S.E.</th>
<th>Wald</th>
<th>df</th>
<th>P-Values</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>0.591</td>
<td>0.149</td>
<td>17.588</td>
<td>1</td>
<td>0.000*</td>
<td>0.188</td>
</tr>
<tr>
<td>Age of Firm</td>
<td>-0.290</td>
<td>0.069</td>
<td>17.787</td>
<td>1</td>
<td>0.000*</td>
<td>1.805</td>
</tr>
<tr>
<td>Linkage to other enterprises</td>
<td>0.804</td>
<td>0.193</td>
<td>4.276</td>
<td>1</td>
<td>0.056*</td>
<td>1.898</td>
</tr>
<tr>
<td>Linkage to venture capital</td>
<td>0.168</td>
<td>0.131</td>
<td>1.609</td>
<td>1</td>
<td>0.199</td>
<td>1.183</td>
</tr>
<tr>
<td>Linkage to universities</td>
<td>0.744</td>
<td>0.389</td>
<td>3.660</td>
<td>1</td>
<td>0.056*</td>
<td>1.104</td>
</tr>
<tr>
<td>Linkage to venture network</td>
<td>0.364</td>
<td>0.243</td>
<td>2.242</td>
<td>1</td>
<td>0.136</td>
<td>1.379</td>
</tr>
<tr>
<td>Linkage to financial institutions</td>
<td>0.582</td>
<td>0.251</td>
<td>5.294</td>
<td>1</td>
<td>0.000*</td>
<td>1.000</td>
</tr>
<tr>
<td>Linkage to social network</td>
<td>0.657</td>
<td>0.266</td>
<td>3.630</td>
<td>1</td>
<td>0.056*</td>
<td>1.353</td>
</tr>
<tr>
<td>Linkage to government</td>
<td>0.004</td>
<td>0.039</td>
<td>0.156</td>
<td>1</td>
<td>0.691</td>
<td>1.009</td>
</tr>
<tr>
<td>Constant</td>
<td>3.036</td>
<td>0.330</td>
<td>8.459</td>
<td>1</td>
<td>0.000*</td>
<td>20.823</td>
</tr>
</tbody>
</table>

*Significant at 95% confidence interval, **Significant at 95% confidence interval, ***Significant at 95% confidence interval

In table 2, it is estimated that firms located in the Kumasi (cluster) is 0.748 more likely to transfer resources from clusters than those located in the Accra cluster with 95% confidence interval (p-value=0.000) is statistically significant. With an odds ratio of 1.805 and a confidence interval of 95%, it can be predicted that firms with significant number of years of experience are more likely to transfer resources from clusters than those with few number of years of experience, giving a similar statistically significant results.

The analysis also shows that firms with high linkage to other enterprises are 1.498 more likely to acquire resources than those with low linkage to other enterprises at 95% confidence interval (p-value=0.036). Similarly the results indicates that the odds of transferring resources from a cluster increases by a factor of 1.183 with a confidence interval of 95% when the linkage to venture capital is higher than those with low ties (p-value=0.018). It is estimated from an odds ratio of 0.004 that Linkage to universities is 1.104 times more likely than their counterparts to gain resource from a cluster with 95% confidence interval (p-value=0.000) controlling for other factors in the model. In the same regard, Linkage to financial institutions are 0.004 more likely to influence resource transfer by a clustered firm at 95% confidence interval (p-value=0.008) and is statistically significant. The odds ratio of 1.329 and a confidence interval of 95% (p-value=0.000), indicates that Linkage to social network are 1.853 more likely to support resource transfer while Linkage to government is also determined to be 1.183 more likely to contribute to transfer of resources in a cluster giving similar statistically significant results.

Table 3: Effect of Network Ties (Industry Linkages) on Technology Resource Transfer (TRT)

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>S.E.</th>
<th>Wald</th>
<th>df</th>
<th>Sig</th>
<th>Exp(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOE</td>
<td>0.146</td>
<td>0.472</td>
<td>2.967</td>
<td>1</td>
<td>0.015</td>
<td>1.155</td>
</tr>
<tr>
<td>LVC</td>
<td>0.130</td>
<td>0.472</td>
<td>2.967</td>
<td>1</td>
<td>0.015</td>
<td>1.155</td>
</tr>
<tr>
<td>LU</td>
<td>0.094</td>
<td>0.472</td>
<td>2.967</td>
<td>1</td>
<td>0.015</td>
<td>1.155</td>
</tr>
<tr>
<td>LFI</td>
<td>0.084</td>
<td>0.472</td>
<td>2.967</td>
<td>1</td>
<td>0.015</td>
<td>1.155</td>
</tr>
<tr>
<td>LSN</td>
<td>0.031</td>
<td>0.472</td>
<td>2.967</td>
<td>1</td>
<td>0.015</td>
<td>1.155</td>
</tr>
<tr>
<td>LG</td>
<td>0.031</td>
<td>0.472</td>
<td>2.967</td>
<td>1</td>
<td>0.015</td>
<td>1.155</td>
</tr>
</tbody>
</table>

In table 3 the effect of network ties (industry linkages) on technology resource transfer (TRT) in the selected cluster has been presented. The table shows that a tie to other enterprises (LOE) is .861 times likely to influence transfer of technology resources and this is statistically significant. Similarly, the odds of ties to venture capital (LVC) increasing the transfer of technology resources among the participating firms is 1.961 which is significant at 95% confidence interval. With an odd of .450 and significant value of 0.015, it is estimated that ties to universities (LU) can lead to positive acquisition of technology resource transfer in the selected cluster. This is also the case with the influence of ties to financial institutions (LFI). In the case of the latter, the odds of 1.074 denote a strong likelihood of technology resource transfer and this is statistically significant. It is estimated from an odds ratio of 1.179 and .810 that ties to social network (LSN) and ties to government (LG) respectively positively leads to technology resource transfer in the cluster and each of these is statistically significant at 95% confidence interval.

Table 4: Effect of Ties (Industry Linkages) on Capital Resource Transfer (CRT)

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>S.E.</th>
<th>Wald</th>
<th>df</th>
<th>Sig</th>
<th>Exp(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOE</td>
<td>0.473</td>
<td>0.275</td>
<td>2.967</td>
<td>1</td>
<td>0.015</td>
<td>1.155</td>
</tr>
<tr>
<td>LVC</td>
<td>0.341</td>
<td>0.214</td>
<td>2.967</td>
<td>1</td>
<td>0.015</td>
<td>1.155</td>
</tr>
<tr>
<td>LU</td>
<td>0.094</td>
<td>0.214</td>
<td>2.967</td>
<td>1</td>
<td>0.015</td>
<td>1.155</td>
</tr>
<tr>
<td>LFI</td>
<td>0.084</td>
<td>0.214</td>
<td>2.967</td>
<td>1</td>
<td>0.015</td>
<td>1.155</td>
</tr>
<tr>
<td>LSN</td>
<td>0.031</td>
<td>0.214</td>
<td>2.967</td>
<td>1</td>
<td>0.015</td>
<td>1.155</td>
</tr>
<tr>
<td>LG</td>
<td>0.031</td>
<td>0.214</td>
<td>2.967</td>
<td>1</td>
<td>0.015</td>
<td>1.155</td>
</tr>
</tbody>
</table>

In table 4 the effect of ties (industry linkages) on capital resource transfer (CRT) in the selected cluster has been presented. The table shows that a tie to other enterprises (LOE) is 1.605 times likely to influence transfer of capital resources and this is statistically significant. Similarly, the odds of ties to venture capital (LVC) increasing the transfer of capital resources among the participating firms is 1.417 which is significant at 95% confidence interval. With an odd of .497 and significant value of .026, it is estimated that ties to universities (LU) can lead to positive acquisition of capital resource transfer in the
selected cluster. This is also the case with the influence of ties to financial institutions (LFI). In the case of the latter, the odds of .849 denote a strong likelihood of capital resource transfer and this is statistically significant. It is estimated from an odds ratio of 1.032 and .855 that ties to social network (LSN) and ties to government (LG) respectively positively leads to capital resource transfer in the cluster and each of these is statistically significant at 95% confidence interval.

**Table 5: Effect of Network Ties (Industry Linkages) on Infrastructural Resource Transfer (IRT)**

In table 5 the effect of network ties (industry linkages) on infrastructural resource transfer (IRT) in the selected cluster has been presented. The table shows that a tie to other enterprises (LOE) is 1.297 times likely to influence transfer of infrastructural resources and this is statistically significant. Similarly, the odds of ties to venture capital (LVC) increasing the transfer of infrastructural resources among the participating firms is .649 which is significant at 95% confidence interval. With an odd of .970 and significant value of .009, it is estimated that ties to universities (LU) can lead to positive acquisition of infrastructural resource transfer in the selected cluster. This is also the case with the influence of ties to financial institutions (LFI). In the case of the latter, the odds of .766 denote a strong likelihood of labour resource transfer and this is statistically significant. It is estimated from an odds ratio of .847 and 1.121 that ties to social network (LSN) and ties to government (LG) respectively positively leads to labour resource transfer in the cluster and each of these is statistically significant at 95% confidence interval.

**Table 6: Effect of Network Ties (Industry Linkages) on Labour Resource Transfer (LRT)**

In table 6 the effect of network ties (industry linkages) on labour resource transfer (LRT) in the selected cluster has been presented. The table shows that a tie to other enterprises (LOE) is 1.447 times likely to influence transfer of labour resources and this is statistically significant. Similarly, the odds of ties to venture capital (LVC) increasing the transfer of labour resources among the participating firms is .963 which is significant at 95% confidence interval. With an odd of .970 and significant value of .009, it is estimated that ties to universities (LU) can lead to positive acquisition of labour resource transfer in the selected cluster. This is also the case with the influence of ties to financial institutions (LFI). In the case of the latter, the odds of .766 denote a strong likelihood of labour resource transfer and this is statistically significant. It is estimated from an odds ratio of .847 and 1.121 that ties to social network (LSN) and ties to government (LG) respectively positively leads to labour resource transfer in the cluster and each of these is statistically significant at 95% confidence interval.

### CONCLUSIONS AND IMPLICATIONS

Our study evaluated the degree to which network ties and business linkages influences newly established business performance in the form of resource transfer. Specifically, we established the degree to which Linkage to other enterprises, Linkage to venture capital, Linkage to universities, Linkage to venture networks, Linkage to financial institutions, Linkage to social network, Linkage to government significantly influences technology transfer, infrastructural transfer, labour and skill transfer and capital transfer. These issues remain outstanding in the extant literature and provoke in-depth empirical studies such as this. We applied a novel logistic regression on an array of relevant information to establish the extent of relationship between network ties and resource transfer in this research.

Our study observed a significant relationship between each of the linkages or network ties and resource transfer. For example, it was established that firms with high linkage to other enterprises are 1.498 more likely to influence transfer of resources...
than those with low linkage to other enterprises. We further observed that firms located in the Kumasi (cluster) are 0.748 more likely to influence resources transfer from clusters than those located in the Accra cluster with 95% confidence interval (p-value=0.000) is statistically significant. Most importantly, the study noted that, while ties with industry players were positively related to resource transfer, none surpassed the important role that the linkages with government and state agencies bring to the organisation as far as access to resources is concerned. In all spheres of resource transfer (technology, capital, knowledge, infrastructure), the attainment of high connections within government places organizations above their peers. This is consistent with the extant literature where evidence have been adduced of the overriding need for business organizations to prioritize their ties by ranking them based on their ability to acquire resources. This has the potential to support business organization to leverage the speed of decision making by identifying the major sources of key resources and avenues to access them without wasting much time on other routes that are less useful.

REFERENCES


