Production Subcontracting: A Strategy for the Survival of Small and Medium Scale Industries in Nigeria

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Doi:10.5901/mjss.2015.v6n4s2p639

Abstract

This study set out to investigate production subcontracting as a strategy for the survival of small and medium scale industries in Nigeria. The paper discovered that enhancing the operational efficiency, reducing cost by concentrating on core business function, specialization to gain professional resources, strengthening cooperation between subcontracting partners were the major economic factors that have ensured the survival of small and medium scale industries in the region. This was also corroborated by the pattern of distribution of industries in the study area which was relatively clustered paving the way for both networking and clustering co-operations among the industries. The paper recommended that SMIs in other parts of the country should be strengthened by the adoption of this process.

Keywords: *Production Subcontracting, Small and Medium Scale Industries, Manufacturing, Networks*

1. Introduction

One of the main determinants for the growth and development of Small and Medium Scale Industries is the establishment of useful linkages arrangements which usually come in form of subcontracting processes (UNCTAD, 2004; Kumar & Subrahmanya, 2007**).** Small and medium scale industries play a predominant role in most developed and developing countries not only because of their number, variety and involvement in all segments of the economy but more importantly, their role in employment creation (Kumar & Subrahmanya, 2007; Kongmanila and Takahashi, 2009**)** Thus, from the planning stand point of view, SMIs are increasingly recognized as the principal means for achieving equitable and sustainable industrial diversification and dispersal; and in most countries small and medium scale industries (SMIs) account for well over half of the total share of employment, sales and value added (Udechukwu 2003). The economy of a developing nation like Nigeria ought to be characterized by a large number of small and medium scale industries both in the informal and formal sectors (Udechukwu, 2003). This is because they not only contribute significantly to improving living standards; they also bring about local capital formation and achieve high levels of production.

The performance of SMIs in Nigeria has not been the best despite the number of programmes initiated by the state and Federal government toward promoting and sustaining their operations in the country. Most of these programmes till date are mainly in the areas of monetary, fiscal, industrial policies and measures. This has led to the establishment of various schemes and institutions like; Small Scale Industry Credit Scheme (SSICS), Nigerian Industrial Development

Bank (NIDB), Nigerian Bank for Commerce and Industry (NBCI), National Directorate of Employment (NDE), and so on (SMIEIS, 2005). Similarly, one of the newest initiatives is the Small and Medium Industries Equity Investment Scheme (SMIEIS). This was initiated by the Central Bank of Nigeria as a means of providing long-term finances and professional guidance through participating Nigerian banks that commits 10 percent of their annual pre-tax profits to equity investment in the SMIs (Aremu and Adeyemi, 2011). As laudable as these programs are, quite a few were able to have reasonable impacts on the development of SMIs in the country. In responds to this, small and medium scale industries in the country need to be proactive in order to realise their full potentials and remain in business. One of the ways in which this can be realised in Nigeria is through the adoption of production subcontracting arrangements which on its own involves the externalization of production processes or operation in order to achieve maximum efficiency and competitiveness.

1.1 Research Gap

Industries resort to subcontracting because it helps them spread risks, lower costs, gain access to key technologies reduce working capital and adjust their level of production more flexibly by passing on the burden of idle overheads to the development of industries most especially small and medium sized subcontracting firms as globalisation and new technologies challenge supply system in mature industries (Holl, 2008). Similarly, the key to increased productivity among manufacturing small and medium enterprises (SMIs) is to build their capacities through improved knowledge or technological know-how. Considering the seemly low capital base of small and medium sectors in Nigeria and Africa as whole, industrial competitiveness, technological development and advancement cannot take place internally (inside the firm) but can be only be fostered through access to outside sources.

There have been a lot of empirical studies on the influence of production subcontracting on small scale industries. These studies include firm performance (Girma and Gorg, 2004; Morrison and Yasar, 2008; Lopez, 2009; Razzolini and Vannoni, 2010 and Gakure, Kimenia and Waititu, 2014), cost and benefits (Coase, 1937; Williamson, 1975, 1979, 1984, Scott, 1990; Abraham and Taylor, 1996, Ono, 2007 and Lopez, 2007) Determinants of production subcontracting (Taymaz and Kilicaslan, 2004; Diaz-Mora and Triguero-Cano, 2007, Kongmanila and Takahashib, 2009) etc. Most of these works have been analysed on regional scales and on a sectoral bases. The implication of this according to Kongmanila and Takahashi (2009) and Nwokocha (2014) is that it will be difficult to make a generalised assessment on subcontracting that will also capture its local aspect. Thus this work has been oriented to cover this intellectual gap by investigating production subcontracting in a local scale using industries in Onitsha metropolis, as a case study. This paper will also investigate what influences the decisions to engage in production subcontracting and the key variables that interact to make subcontracting to emerge and/or become effective. Some scholars such as (Holmes, 1986; Abraham and Taylor, 1996; Macmillan, 1995; and Lopez, 2007) in the course of their studies opined that minimisation of cost is the major explanation for production subcontracting while Tijun, Sandal, Jiehong and Dandan, (2009) stated that the main idea of subcontracting have gone beyond minimization of cost. They opined that the main factors influencing the use of this production strategy are reducing costs, concentrating on core business and accessing to professional capabilities and releasing key internal resources. Given these lines of thoughts, it is relatively difficult to make an informed assessment on what factors actually influences the decisions to engage in production subcontracting and the key variables that interact to make subcontracting to emerge and/or become effective.

1.2 Theoretical concepts of Production subcontracting

Subcontracting is usually defined as a situation where the firm offering the subcontract requests another independent enterprise to undertake the production or carry out the processing of a material, component, part or subassembly for it according to specifications or plans provided by the firm offering the subcontract (Holmes, 1986; Taymaz and Kilicaslan, 2005). Subcontracting has its foundations in the mechanism of linkages and economies of scale in industrial location theory. In the context of industrial sector, “linkage” refers to the flows of supplies, whether they are materials, semi-finished goods and components, or finished products, between two commercial concerns (Keeble, 1976). Linkages are best understood in term of the theory externality economies and in particular, in term of the distinction between pecuniary and technological externalities (Hussain, 2004). There are different types of linkages - backward linkage, forward linkage, service linkage, sales or marketing linkage, vertical and diagonal linkage. In other words, subcontracting (vertical or horizontal) is a specific form of outsourcing that involves intimate relations and information exchange between firms (Heshmati, 2003).

There are two approaches to subcontracting in entrepreneurship development, namely: the traditional and the modern approaches (Watanabe, 1971; Berger & Piore, 1984; Holmes, 1986). The traditional approach looks at

subcontracting as unequal, asymmetric power relationships between two different sets of enterprises: the large firms and the small firms (Berger & Piore, 1984; Holmes, 1986; Watanabe, 1971).

The modern approach treats subcontracting as a network of cooperative inter-firm links among interdependent small firms forming a business ecosystem (Taymaz & Kilicaslan, 2002; Tilman, 2004; Ceglie & Dini, 1999; Rama & Calatrava, 2002). This approach, looks at a group of firms cooperating (and competing) within a complex web of supportive institutions. Externalities, linkages and economics of scale generated by this form of cooperation and competition are internalized by the network so that the collective efficiency and flexibility of the industry is enhanced. Ceglie and Dini (1999) suggest that on the account of the common problems firms all share, small and medium scale firms are in the best position to help each other. They can do this through horizontal cooperation (they can collectively achieve economies of scale), vertical cooperation (they can specialize in their core activities and develop the external division of labour) and networking among enterprises, providers of business development services, and local policy makers.

1.3 Research Methodologies

1.3.1 Sample Selection

The overriding purpose of the present study was to establish the influence of production subcontracting on the survival of SMIs in Onitsha Metropolis, South East, Nigeria and the key variables that interact to make subcontracting to emerge and/or become effective. To achieve this, data from field survey of small and medium scale industries from the study area during August-March, 2013/2014 were used. Field survey was conducted by the researchers from the Department of Geography, University of Nigeria Nsukka.

Our original sample size was 165 industries which included all types of industries identified in the area. In order to have a limited margin of error in the selection of sample size, Yamane' formula of 1967 was used. Yamane's (1967) is thus given as:

$$n = \frac{N}{1 + Ne^2} \quad \text{..... (1)}$$

Where n = sample size, N = population size, e = the error of sampling/error of 5% points (.05).

By using Yamane's formula of sample size with an error of 5% and with a confidence coefficient of 95% (Yamane, 1967), the calculation from a population of 165 industries came up with 117 industries from five industrial group. To account for possible attrition, the number of sampled industries was increased to 120 industries with each industrial group have approximately 24 industries (See Table 1).

Table 1: The s in Onitsha Metropolis

Industrial Group/ Sectors	Number of industries
Food, Beverage and Tobacco	24
Chemical, Paint and Allied products	24
Domestic and Industrial Plastics, Rubber and Form	24
Basic Metal, Iron and Steel and Fabricated Metal Products	24
Printing, Paper products, and Publishing	24
Total	**120**

Field work 2013/2014

This number represents approximately 73% of the industries found in the study area as well as a balance representation of all the industries that engage in similar manufacturing activities in the study area. Furthermore, this number of industries was selected so as to effectively manage the cost and time allotted to this study.

1.3.2 Sample Size

In the course of the reconnaissance survey, each of the 120 sampled industries was visited to determine whether or not they are involved in production subcontracting. The visit involved personal interview with the managers of the industries or any other person designated to act in that capacity. The result of the reconnaissance survey indicated that 80 (representing 80%) of the 120 sampled industries were involved in production subcontracting in the study area (See

Table 2).

Table 2: Production Subcontracting industries and their Industrial Groups in the Study Area

Industrial Group/ Sectors	Number industries
Food, Beverage and Tobacco	14
Chemical, Paint and Allied products	11
Domestic and Industrial Plastics, Rubber and Form	20
Basic Metal, Iron and Steel and Fabricated Metal Products	18
Printing, Paper products, and Publishing	17
Total	**80**

Field work 2013/2014

Data on production subcontracting were collected from primary and secondary sources. Primary data were collected through the use of questionnaire, oral interviews and field observations while documentary materials such as journal articles, textbooks and the internet formed the secondary sources on which the theoretical framework of this study was based. A pilot test on 20 firms helped to eliminate ambiguities and improve the instrument as well as test for its reliability and validity.

The questionnaire contained both open and close ended questions and was administered through direct delivery techniques. Close-ended questions asking respondents to rate various questionnaire items using a 5-part Likert-type ordinal scale representing a spectrum of subjective feelings and opinions with; 5- very important, 4- important, 3- quite important, 2- not very important, 1- not at all important were employed to solicit specific responses. A few open-ended questions elicited unique answers to general questions.

1.3.3 Data Analysis Procedure

Data were analyzed with statistical measure such as the mean and standard deviation. These statistical measures were used to analyze the factors influencing the decisions to engage in production subcontracting as well as the factors influencing the selection of subcontracting partners. Nearest neighbour analysis was used to explore the pattern of distribution of the industries in the study area. The data for Nearest neighbour analysis were derived from the geographical coordinates of the industries. These coordinates which were rendered in degrees, minutes and seconds (DMS) were converted to decimal degrees with the aid of Tatuk GIS software in order to make them compatible with Quantum GIS tool which was used in the nearest neighbour analysis. The data were analysed using Quantum GIS software. The analytical tool of Principal Component Analysis was applied with the aid of Statistical Package for Social Sciences (SPSS) to further analyse the factors influencing the decisions to engage in production subcontracting in Onitsha Metropolis, Anambra State Nigeria. This was applied to nine (9) variables in order to bring out the underlying dimensions defining this production process. All analyses (excluding Nearest Neighbour Analysis) were carried out with the aid of Statistical Packages for Social Sciences version 17 (SPSS 17).

1.4 Brief description of the Study Area

The study area is Onitsha metropolis, Anambra State Nigeria. The area is located geographically between Latitude 06^0 04.58^{11}N and Latitude 06^0 10.00^{11}N of the Equator and Longitude 06^0 44.59^{1l} E and longitude 06^0 48.52^{11}E of the Greenwich Meridian. It is approximately 240km^2 north of Delta coast of the Rivers and Bayelsa States (Ofomata, 1987).The area is made up of Onitsha North Local Government (Onitsha inland town or Enu- Onitsha, and Odoakpu), Onitsha South Local Government Area (Fegge and Woliwo) and parts of Idemili North Local Government (Nkpor and Obosi including Awada; a suburb of Obosi) and Ogbaru Local Government Area (Iyi-Owa, Atani, and Okpoko). It is bounded in the North by Nsugbe, Nkwelle Ezunaka in the East, Obosi and Oba in the North and River Niger in the West (Figure 1 and 2).

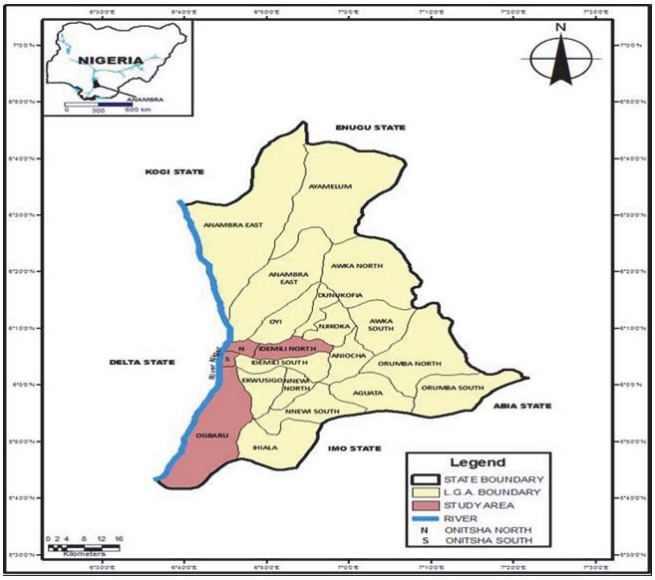

Figure 1: Map of Anambra State showing the study area
Source: Department of Geography University of Nigeria Nsukka

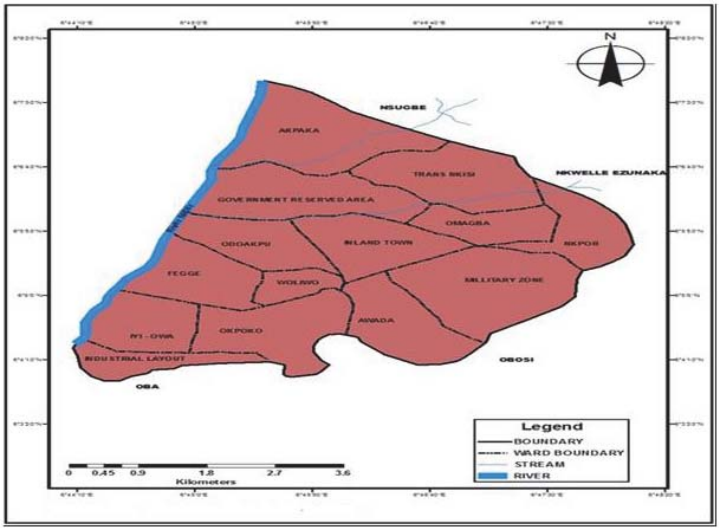

Figure 2: Map of Onitsha Metropolis
Source: Department of Geography University of Nigeria Nsukka

The population trend of the study area has been that of a continuous increase. Just like other modern cities of the world, the population of the study area have been on a steady increase right from the inception of the area. The earliest estimate of the population of the study area was given by Adolphe Burdo in the year 1800 where he estimated the population of to be 15,000 persons (Okoye, 1975). The population figure of Onitsha metropolis according to 1991 and 2006 population census of Federal Republic of Nigeria is presented in (Table 3.)

Table 3: Population Distribution the Study Area

	1991	2006
Onitsha North LGA	121,157	124,942
Onitsha South LGA	135, 290	136,662
Npor	64,732	94,697
Obosi	85,249	124,699
Iyiowa Odekpe	21,844	31,939

Source: Nigeria Population Commission (2006).

Economically, the area is predominantly a commercial city. It is one of the largest market in Africa and one of the fastest growing commercial cities in Nigeria (Igbokwe, Ezeomedo, and Ejikeme, 2013). There are many markets existing in this city, the popular ones are: the foremost Onitsha Main market, Marine market, Ochanja market, Relief market, Ose okwe odu Market, and Nkpor new/old motor spare parts market. These enabled the area to develop as an important industrial centre, east of River Niger in Nigeria, (Igbokwe and Emengni, 2004)

2. Presentation of Results

2.1 Factors/Motivations influencing the decision to use production subcontracting by industries

Table 4 illustrates descriptive statistics of Mean and Standard Deviation between pairs of variables. These statistical measures were used to analyze the likely factors which could influence the decisions to engage in production subcontracting and the key variables that interact to make subcontracting to emerge and/or become effective. Based on the field observation, the questionnaire synthesized 9 common factors influencing the use of production subcontracting which we asked the respondents to rank on a five point likert - type scale ranging from 1 = "not at all important" and 5 = "very important" based on how they affect their decisions.

From the analysis, the average mean value of each factor is greater than 2. This indicates that the investigated industries overall have a positive attitude towards this process. However, the average mean and standard deviation value of reducing cost of operation, concentrating on core business, increase flexibility and increased access to market within the industries with average mean and standard deviation values of 4.75 (SD =0.60), 4.12 (SD =0.83), 4.32 (SD = 0.77), and 4.08 (SD = 0.77) respectively have the highest influence on the respondents/industrialists. These factors are greater than 4 and this reveals that they are accepted as the most significant factors influencing production subcontracting in the area. This can also be corroborated by the general knowledge which states that a low standard deviation values indicates that the data points tend to be very close to the expected value (mean). Establishing strategic partnership between the industries with high standard deviation value of 4.02, showed a high variability within the factors. This means that the industries could have other reasons for forming or establishing strategic partnership between them (See Table 4).

Table 4: Descriptive statistics of the factors influencing the use of production subcontracting

	N	Range	Minimum	Maximum	Mean	Std Deviation
Increase market	60	3.00	2.00	5.00	4.08	0.77
Increase flexibility	60	2.00	3.00	5.00	4.12	0.83
Concentrating on core business function	60	4.00	1.00	5.00	4.32	0.77
Sharing and reducing of risk	60	4.00	1.00	5.00	3.13	1.36
Establish strategic partnership between the industries	60	3.00	1.00	3.00	2.85	4.02
Acquisition of specialized expertise	60	2.00	3.00	5.00	3.98	0.60
Access to professional resources	60	2.00	2.00	4.00	2.75	0.60
Gaining recognition around the industry	60	1.00	1.00	2.00	1.37	0.49
Reduce cost operation	60	2.00	3.00	5.00	4.75	0.60
Valid Number	60					

Source: Author's computation, 2013/2014

`While factors such as concentrating on core business function and reduction in operational cost help the industries to hedge the risks of production bottlenecks or over-capacity as well as maintain low overheads while achieving high flexibility in both internal and external operations, and hence makes them more resilient to crisis, increased access to market guarantees the survival and sustenance of the SMIs in the sector. For instance, it was observed that the plastic industries by virtue of the services they render to other SMIs in the study area most especially the food and chemical industries with packaging and distributing material have increase and already made market for their products going by this arrangement.

Furthermore, the nine (9) variables were equally subjected to a Principle Component Analysis. This is to help extract the major underlying components influencing the general degree of importance and influence of these factors. (See table 5 for results)

Table 5: A rotated PCA of the variables influencing the use of production subcontracting by industries in Onitsha Metropolis

	Variables	I	II	III	1V
X1	Reduce cost of operation	0.28	0.74*	-0.38	0.07
X2	Increase flexibility	0.79*	0.17	0.05	-0.16
X3	Increase access to market	0.93*	0.14	-0.08	-0.04
X4	Concentrate on Core business function	-0.12	0.89*	0.19	0.08
X5	Sharing and reducing risk	0.70*	-0.47	0.20	0.33
X6	Establish strategic partnership	0.00	0.10	0.03	0.97*
X7	Acquisition of specialized expertise	0.27	0.07	0.77*	-0.00
X8	Access to professional resources	0.30	0.11	-0.76*	-0.06
X9	Gaining recognition around the industry	- 0. 89*	0.13	0.10	-0.15
	Eigen value	3.07	1.65	1.41	1.11
	Percentage of explained variance	33.72	18.29	15.65	12.33
	Cumulative % of explained variance	33.72	52.02	67.67	80.00

NB (*) Significant loading exceeding +/- 0.50

Source: Field work and author's computation, 2013/2014

The PCA shown in Table 5 produced 4 components out of the 9 variables that together explained 80.00% of the total variance leaving 20.00% of the total variance unexplained.

Component 1 has significant loadings on four variables namely X2 – increase flexibility, X 3- Increase access to market, X5- Shearing and reducing of risks, and X9- Gaining recognition around the industry. Component 1 has an Eigen value of 3.04 and explained 33.72% of the total variance. Component 1 highlights the need for efficiency in production by increase in flexibility. The underlying dimension identified by component 1 is enhancing the operational efficiency in the industries.

Component II has significant loading on Variables namely; X1 Reduce cost of operation and X4 – Concentrating on core business function. This component has an Eigen value of 1.65 and explained 18.29% of the total variance in the data input. This component explains the effect of cost on production. This in other words means that industries concentrating on their core competencies will help reduce the cost of production. The underlying dimension as represented by these variables is reducing cost by concentrating on core functions.

Component III with an Eigen value of 1.41 explains 15.65% of the total variation in the data input. It has significant loadings on two variables. These variables are X7 – Acquisition of specialized expertise and X8 – Access to professional resources. The underlying dimension as represented by these variables is specialisation in industrial production in order to gain professional resources.

Finally, component IV has an Eigen value of 1.11 and explains 12.33% of the total variation in the data input. It has significant loading on one variable. This variable is X6 – Establishing strategic partnership. The undying dimension as represented by this variable is strengthening cooperation between subcontracting partners.

The results of the PCA showed that there exist links and mutual influence among the nine (factors). This is because some of the factors such as gaining recognition around the industry, establishing strategic partnership and access to professional resources which played little or no role in the decision to engage in production subcontracting by the industries (see table 3 above), were identified as important in the PCA analyses. The implication of this is that these factors even though they appear not to be recognised by the respondents, they are all subsumed into the much

recognised factors. They all combine together to achieve a particular result. For instance, there will be no subcontracting if all the industries in the study area have the capacity to provide all they needed including professional resources; neither will there be flexibility nor sharing of risks if there were no strategic partnership. The results in Tables 4 and 5 shows that this work does not support the findings of (Coase's 1937, Abraham, 1990; Abraham and Taylor, 1996; Holmes, 1986; McMillan, 1995 and López, 2007) which posited that minimization of costs is the main explanation or factor influencing production subcontracting processes for subcontracting. This work also differs with the findings of Bailey, Masson and Raeside (2002) which posited that the main reason behind the use of production subcontracting strategies is for better services. In view of this, the decision to subcontract or outsource any task goes beyond minimising cost and for better services as it also includes enhancing the operational efficiency in the industries, reducing cost by concentrating on core functions, specialisation in industrial production in order to gain professional resources and strengthening cooperation between subcontracting partners.

Similarly, the analysis of factors influencing the selection of production subcontractors by the surveyed industries in the study area in order to ascertain or bring out the factors that appear most significant to the industrialist showed that high quality of service, high degree of mutual trust with subcontractors, good reputation in the industry, location and lower cost played the highest role in the decisions to select subcontractors as the average mean value of each factor was greater than 3. These variables got average mean and standard deviation values of 4.18 (SD = 0.52), 4.22 (SD = 0.52), 4.08 (SD = 0.81), 3.68 (SD = 0.57) and3.72 (SD = 1.04) respectively. This can also be corroborated by the general knowledge which states that a low standard deviation values indicates that the data points tend to be very close to the expected value. Furthermore, the industrialist however valued less the cultural compatibility and management experience of the subcontractors than others. These factors have mean and standard deviation values of 1.73 (SD = 0.69) and 1.67 (SD = 0.57) meaning that most industrialists pay little attention to culture and management experience of their subcontractors. The cultural compatibility of the subcontractors or suppliers will be important when firms tend to form a long term strategic cooperation with the subcontract. Long term strategic cooperation with subcontractors from our observation does not currently exist between the subcontracting partners. This from our observation can be attributed to the nature of contracts utilized by the contracting partners. It was observed that most production contracts or subcontracting relationships were utilised on short terms basis. This according to the industrialists was to ensure efficiency and effectiveness on the part of the subcontractors. Management experience like the former was less significant because the industrialists were more inclined to selecting subcontracting partners who can offer the best services at any given time. (See Table 6).

Table 6: Factors influencing the selection of production subcontractors

Variables	N	Range	Minimum	Maximum	Mean	Std Deviation
Previously cooperated	60	4.00	1.00	5.00	2.03	0.80
Lower cost	60	3.00	2.00	5.00	3.72	1.04
Good reputation	60	3.00	2.00	5.00	4.08	0.81
High quality of service	60	3.00	2.00	5.00	4.18	0.87
Advanced technology	60	1.00	2.00	3.00	2.62	0.49
Management experience	60	2.00	1.00	3.00	1.67	0.57
Similar culture	60	2.00	1.00	3.00	1.73	0.69
Location advantages	60	3.00	2.00	5.00	3.68	0.78
High mutual trust	60	2.00	3.00	5.00	4.22	0.52
Valid Number	60					

Source: Author's computation, 2013/2014

2.2 Location and Pattern of distribution of industries

Historically, the focus for industrial location research has been on those variables influencing the choice of location for new firms (Badri, 2007). The importance played by the variables is demonstrated by their extensive use in studies involving the selection of industrial sites (Isard, 1956; Smith, 1966, 1981; Beckman, 1968; and Greenhut, 1974). This paper using the statistical tool of Principle Component Analysis, analysed a ranged of factors in order to ascertain their role in the location of industrial units in the study area as well as their roles in the development of small scale industries in the region (See Table 7)

Table 7: A rotated PCA of the variables influencing the use of production subcontracting by industries in Onitsha Metropolis

	Variables	I	II	III	1V	V
X1	Availability of raw material	0.83*	0.18	-0.31	0.11	0.01
X2	Access to market	0.91*	0.04	0.06	0.03	-0.07
X3	Access to transport	0.80*	-0.25	0.30	0.13	0.08
X4	Access to capital	0.89*	0.00	0.13	0.03	0.07
X5	Potential for linkage	0.08	0.05	-0.01	0.78*	-0.07
X6	Government incentives	0.12	-0.23	0.27	-0.08	-0.77*
X7	Location of other firms	0.03	-0.05	0.08	0.70*	0.08
X8	Closeness to home	0.12	0.28	0.61*	0.30	-0.24
X9	Cost of living	0.04	-0.56	0.27	0.03	0.56
X10	Availability of power	-0.08	0.95*	0.13	-0.01	0.04
X11	Presence of social amenities	-0.08	0.95*	0.13	-0.01	0.04
X12	Personal likeness of the area	0.49	-0.28	0.25	-0.17	0.47
X13	Family support	0.01	0.06	0.72*	-0.07	0.03
X14	Birth place	0.40	-0.28	-0.70*	-0.12	0.00
X15	Availability of communication facilities	-0.18	0.84*	0.39	0.04	-0.22
	Eigen value	3.45	3.20	1.99	1.28	1.21
	Percentage of explained variance	22.97	21.32	13.38	8.50	8.06
	Cumulative % of explained variance	22.971	44.23	57.56	66.07	74.12

NB{ *}Significant loading exceeding +/_0.60

Source: field work and Author's computation, 2013/14

The PCA shown in table 7 produced 5 components out of 14 variables that together explained 74.12% of the total variance leaving 25.88% of the total variance unexplained. Component 1 has significant loading on four variables namely X1-available to raw material, X2-access to market, X3- Access to transport, X4- availability of capital.

Component 1 has an Eigen value of 3.45 and explained 22.97% of the total variance. Component 1 highlights the availability of economic factors of industrial location such as raw materials, capital, market and transportation as significant to decision of SMI operators to locate their firms in an area. Furthermore it explains the economic rationality and profit maximization nature of SMI operators in the study area in their decision to locate their firms. The underlying dimension identified by component 1 is availability of economic variable cost as a factor of SMI distribution and location in the study area.

Component II has significant loading on three variables namely; X10-Availability of power, X11-Presence of local amenities, and X15- Availability of communication facilities. This component has an Eigen value of 3.20 and explains 21.32% of the total variance in the data input. This component explains the effect of infrastructural facilities and social amenities such as power, road, educational facilities etc on the location of SMI. The underlying dimension as represented by these variables is influence of infrastructure as a factor of SMI location and distribution.

Component III with an Eigen value of 1.99 explains 13.38% of the total variation in the data input. It has significant loading on three variables. These variables are X8 closeness to home, X13-Family support, and X14- birth place of the industrialist. The component highlights the influence of family support, place of origin and close proximity to home of the industrialist as influential location. The underlying dimension is influence of family ties as factor of industrial location and distribution in the area.

Component IV has significant on two variables X5-potential for linkage, X7- location of other firms in the area. The component has an Eigen value of 1.28 and explains 8.50% of the total variance of the PCA. This component signifies the attraction of industrial units to a place as a result of gains it will obtain from other industrial units both small and medium scale industries and large industries already in existence in the region through linkages and externalities of scale which usually take the form of production subcontracting. The underlying dimension is clustering/agglomeration economies effect as a factor of industrial location.

Finally, component V has an Eigen value of 1.21 and explains 8.06% of the total variance. It loads significantly on one variable namely X6- Government incentives. This component highlights the influence of Government policy as a factor of industrial location and distribution.

2.3 Pattern of industrial distribution in the study Area

The pattern of industrial distribution in the study area and how they are distributed across space showed that the pattern the study area is relatively clustered. Using the Nearest neighbour index (R) of Decey (1963) and Anyadike (2009), used in the analysis of settlement distributions and the distribution of populations on the earth surface (Sada, 1978; Mozie 2011), the index is interpreted as thus 0.1-0.90 as having a clustering process at work while 0.91-1.0 and above 1.0 shows regular and dispersal process at work. In view of this, the nearest neighbour index of 0.34 shows that the study area is relatively clustered (See Table 8 and Figure 3)

Table 8: Nearest neighbour analysis results of industries

Nearest Neighbour Indices	Values
Observed mean distances	0.01m
Expected mean distance	0.02m
Nearest neighbour index	0.34m
Total points	60

Source: Author's computation, 2014

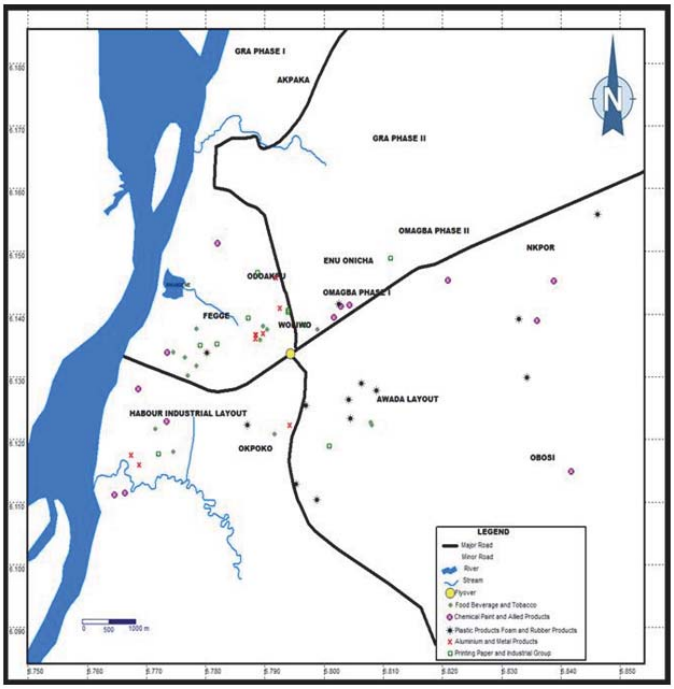

Figure 3: Spatial pattern of Industrial distribution in Onitsha Metropolis
Source: Department of Geography, University of Nigeria Nsukka

This pattern of distribution from our observation allowed for cooperation and networking among the industrial units in the study area in terms of manufacturing, distribution, maintenance services etc which were the forms in which different industries in the study area engage subcontracting. The observation generally shows that industrial cooperation exists within and among the industries. Similarly industries tend to locate where there will be need for their output (both services and product) and this usually takes place among industries with complementing production characteristics. This was observed among industries such as the chemical, paints and plastic industries which depend on each other for these

processes. It is also important to note that these industries need each other for their markets. This result however supports the new theoretical approach to production subcontracting which laid emphasis on networking initiatives and the development of industrial cluster. This approach suggested that on the account of the common problems firms all share, small and medium scale industries are in the best position to help each other. They can do this through horizontal cooperation (they can collectively achieve economies of scale), vertical cooperation (they can specialize in their core activities and develop the external division of labour) and networking among enterprises. (Pyke, 1992 and UNCTAD, 1994). This again underscores our earlier finding on the use of production subcontracting processes by firm size of which small and medium scale industries were found to be more actively involved in the use of production subcontracting processes to large scale industries.

Furthermore, this theory can also be affirmed by our findings on the locational decisions of the industrialists as was shown in Component IV of the rotated PCA of the locational characteristics of SMIs. This component has significant on two variables -potential for linkage, and - location of other firms in the area. This component signifies the attraction of SMI to a place as a result of gains it will obtain from other small and medium scale industries or large industries already in existence in the region through linkages and externalities of scale which usually come in form of production subcontracting.

3. Summary and Conclusion

The paper summarized the status quo of production subcontracting in industries in Onitsha Metropolis Nigeria. The findings mainly indicate that the key variables that interact to make subcontracting to emerge and/or become effective in the study area are

1. The pattern of distribution of industries in the study area generally was relatively clustered. This from our investigation have allowed for cooperation and networking among the industrial units in the study area in form of manufacturing, distribution, maintenance services etc leading to the establishment of production subcontracting processes among the industries. This has also allowed the industries to be strong and competitive as they can access state of the art service from their partners without having too many risk burdens to bear. This supported the new approach to production subcontracting which laid emphasis on networking initiatives and the development of industrial cluster.
2. Factors such as reducing operational costs, concentrating on core business function, improve quality of service and increasing flexibility within the industry with average mean and standard deviation values of 4.75 (SD = 0.60), 4.12 (SD = 0.83), 4.32(SD = 0.77), and 4.08 (SD = 0.77) respectively had the highest influence on the choice to use production subcontracting processes in the region. This result showed that the industries have a general acceptance of this process as it has made them stronger and more efficient. This result also differs with the findings of (Abraham and Taylor, 1996; Holmes, 1986; McMillan, 1995 and López, 2007) which sees minimization of costs as the main explanation for subcontracting relationships. As well as the results of Tijun, Sandal, Jiehong and Dandan (2009) which found reducing costs, concentrating on core business accessing professional capabilities and releasing key internal resources as the major factors influencing the use of production subcontracting in East China. The implication of this result is that the findings on this topic cannot not be generalised as different industrial units engage in production subcontracting processes to achieve different results.
3. The factors influencing the selection of production subcontractors by industries as was analysed also showed that high quality of service, high degree of mutual trust with subcontractors, excellent reputation in the industry, location and lower cost with average mean and standard deviation values of 4.18 (SD = 0.87), 4.08 (SD = 0.81), 4.22 (SD = 0.52) 3.68 (SD = 0.78) and 3.72 (SD = 1.04) respectively appears to play major roles in the decisions to select subcontractors by industries with similar culture and management experience playing less significant roles with average mean values of 1.73 (SD = 0.69) and 1.67 (SD = 0.57) respectively. This result however has a slight difference with the existing research by Baily and Meason (2002), which suggest that high service level, low cost of service and high technical services of suppliers (subcontractors) are the most important factors determining the selection of subcontractors in Western society. This also lays credence to our earlier assertion that results from this type of study cannot be generalized as they can differ geographically

4. Conclusion

Our analyses so far have shown that the outcome of subcontracting strategy in production system is geographical and any economic policies initiated in order to adopt or use this process should be geographically oriented. This in other words means that the processes of production subcontracting should be adopted base on the operational characteristics of the industry as well as the economic landscape of the region. Since the basis of industrialisation in any economy lies with the small and medium scale industries, adequate protections with viable and proactive policies needs to be given to them for their survival in the industrial market. This can be achieved through the establishment polices that will make industries wishing to establish in the region to have subcontracting tendencies as a condition for entering into the industrial sector. Industries should equally be made to sough for their industrial inputs locally as it will not only make them to seek assistance from their fellow local industries, it will also force them to support this process. This will not only create already made markets for these industries, it will also help them to hedge the risks of production bottlenecks or over-capacity as well as maintain low overheads while achieving high flexibility in both internal and external operations, and hence makes them more resilient to crisis.

5. Acknowledgements

We wish to acknowledge the assistance of the following: Department of Geography, University of Nigeria Nsukka. I am particularly thankful to Prof. I.A. Madu, a distinguished academic for his constructive, valuable and helpful comments in the course of this work. My profound gratitude goes to Dr. T.C. Nzeadibe, for facilitating and putting in place all the process leading to the completion of this paper. I equally thank the prospective and anonymous reviewers of this work and all those whom we reference their academic work.

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