CLUSTERING AND THE NATURE OF RELATIONSHIP AMONGST FIRMS IN THE LAGOS REGION, NIGERIA

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Abstract: Regional cluster, a geographically bounded concentration of interdependent firms, is the best environment to fostering a strong relationship amongst firms which can lead to amazing technological and industrial expansion. This paper underscores clustering and the resultant nature of relationship amongst firms, using the Lagos region as a case study. One hundred and three questionnaire were administered in twelve industrial estates; one questionnaire in each of the firm. This connotes that all the firms in the industrial estates were successfully covered in the questionnaire administration, which was administered. A descriptive statistical analytical technique was adopted. The paper has reveals the types of working relationship amongst firms in the Lagos region which includes; raw materials purchase, subcontract, collaboration in research and development, sales promotion, transportation, power supply, water supply, security, waste treatment, telecommunication, ports and shipping as well as labour supply. The paper found out that raw materials purchase/supply was more striking amongst the working relationship types. Also, the paper has revealed services sharing amongst the firms and transport as the most dominant. The most important location advantage was the market facilities. The analysis of variance carried out in relation to variation in clustering amongst the firms at 0.05% level was significant. The paper concluded that industrial cluster if encouraged, will lead to increase working relationship, which in turn have the capability of boosting, promoting and encouragingeconomies of clustering. Cluster concepts spatially emphasize inter-firm relations that facilitate innovative activity, which is recognized as a driving force of sustained economic growth. It is therefore recommended that these clustering of firms should be made viable, encouraged and strengthened through government investment in the industrial sector, making the location factors to be liberal, giving tax holidays to the younger investors, relaxing the laws governing the importation of some raw materials, as this will have a significant positive impact on productions.

Key words: clustering, working relationship, services sharing, Lagos Region

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INTRODUCTION

Regional clusters may be used as a catch-word for older concepts like industrial districts, specialized industrial agglomerations and local production systems. A regional cluster may be defined as a geographically bounded concentration of interdependent firms. According to

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Rosenfeld (2004) a *„cluster should have active channels for business transactions, dialogue and communication".* Without active channels even a critical mass of related firms is not a local production or social system and therefore does not operate as a cluster. It is argued that regional clusters are the best environment for stimulating innovation and competiveness of firms (Ashem & Isaksen, 2006). Krugman (1992) has argued that concentration is the most striking feature of the geography of economic activities and has its benefits. So having production and resources already concentrated in a region gives a region a competitiveness advantage. Clusters are specialized in a small number of industries, reflecting the mere general point that economic, entrepreneurial and technological activities in specific industrial sectors tend to agglomerate at certain places (Malmberg, 1996; Strange, 2008). Building the regional cluster is even perceived by some as the way to compete globally, as economic *„specialization is (seen as) the only way to overcome the `globalization trap` that is outrunning the risk of being out competed across the board"* (Lagedijk 2010, p. 165). Indeed, the role which space and distance play in determining the nature and behaviour of the economy is the central departure point which defines the urban and regional economic paradigm. Here, the spatial corollary of aspatial increasing returns to scale is economies of agglomeration, and the spatial corollary of aspatial decreasing returns to scale is diseconomies of agglomeration.

Agglomeration and cluster concepts spatially emphasize inter-firm relations that facilitate innovative activity which is recognized as a driving force of sustained economic growth in the new growth theory (Portal, 1998). Cluster policy also encourages the integration of many different aspects of economic development and development policy. Competitiveness is increasingly seen to occur between clusters, value chains or network of firms rather than just between individual firms. It is also argued that regional clusters are the best environments for stimulating innovation and competitiveness of firms (Asheim & Isaksen 2006; Coe & Helpman, 2009).

Studies about the nature of clustering of firms and its effects have been carried out by many researchers. The study of Wheeler (2004), suggest that agglomeration of firms comes about as a result of potential benefits (especially lowering of total costs) accruable to firms close together in space. His concern for overall cost minimization made him to consider the role of agglomeration forces as a factor that could induce firms to locate away from the point of least transport cost. Cicone and Hill (2009), imply that production is more efficient or cost effective when it is spatially concentrated. Firms benefit from the proximity of firms that are in the same industry or are suppliers, (demanders) of their inputs (outputs). Negative spillovers, or insufficient density to facilitate economical production, can conversely be called thin market effects. Once an agglomeration of firms becomes established, progressively more external economies are created forming a cumulative process. The propensity to agglomerate (locationally) increases further either when transactions include small-scale, irregular, unstandardized, or contact-intensive activities that have high unit linkage costs, or when firms seek to reduce demand fluctuations by improving their customer base through locational clustering (Leung, 1993).

The existence of externalities and increasing returns to scale in production is the most important explanatory factor for the geographic concentration of firms. Even if individual firms face constant internal returns to scale, agglomeration may generate externalities that create productivity advancements for individual firms in a given locations and therefore lead to increasing returns to scale at an aggregate level.

CONCEPTUAL ISSUES AND RELEVANT LITERATURE

The success of some regional clusters has focused attention on the creation of external economics and on the role of knowledge intensive, local environments in stimulating the competitiveness of network of firms. Competition is increasingly seen to occur between clusters, value chains or network of firms rather than just between individual firms. It is also argued that regional clusters are the best environments for stimulating innovation and competitiveness of firms (Asheim & Isaksen, 2006; Reiss & Traca, 2008). The first stage in cluster development often

involves new firm spin-offs leading to a geographical concentration of firms in nearly the same production stage. The agglomeration is followed by local competition that is an essential driver of innovation and entrepreneurship.

Based on Porter's 1990 concept of an industrial cluster a different and more instrumental approach emerged. Clustering is more or less seen as an independent, partial process with its own laws of development, where the laws of successful clusters can be reverse-engineered in order to imitate the success stories (Storper, 2000). According to Porter (1998a) companies gain competitive strength in regional cluster because of a better access to specialized and experienced employees, supplier, specialized information and public goods, and by the motivating force of local rivalry and demanding customers. It is the case of external economics strengthened by proximity. In spite of the original contextualization of industrial clusters within a framework of national competitive advantage by Porter, it is the concept of local competitive advantage, which has dominated discussion of cluster development over the past decade. In part, this is due to the longer tradition of research on localizing competitive advantage which linked aspects of the cluster concept specific process and it's embedding in local business networks to spatial considerations. While particularly evident in the industrial district literature and the debates over whether areas such as the Third Italy and Baden- Wurttemberg represented new regional development paradigms (Piore & Sabel, 1984; Bos & Koetter, 2010), the importance of local context was endorsed by Porter (1998) and subsequently investigated in greater detail in the writings of Storper (1998), and Enright (2005). A substantial body of literature has emerged on the theory of the geographical clustering of firms and a large number of empirical studies have attempted to identify and assess the role of clustering of economic activity in relation to innovation and economic performance. Most of these employ quantitative and case study methods. An important contributor to the cluster debate, at least in terms of public awareness, is Porter (1990), whose work may be, as Martin and Sunley (2007) argue a case of clever positioning and marketing of the cluster idea. A Porter (national) competitiveness and the strength of national clusters are directly related. A successful cluster promotion policy is the key to economic performance.

However, at least two distinct concepts of cluster are employed. Porter's (1990) use of the term relates clustering to (essentially national) competitiveness and he alludes strongly to input-output types of relations, involving multiplier effects, as well as perhaps unclearly defined linkages between factors inputs, supporting industries and demand conditions, in the context of a competitive environment. He also refers to the importance of innovation, information flows and common goals, mediated by personal and community relationships and patterns of ownership. Geographical proximity appears more as an incidental factor within an essentially national cluster of interlinked industries, which gives rise to a lack of clarity on the relationship between the Porter clusters diamond and geographical space. The other use of the term builds directly on the concept of agglomeration economies, incorporating an explicit spatial dimension. Gorden & McCann (2010) suggest that there are two versions of this concept of agglomeration, the open membership model where cluster membership is open to any firm locating in the area under market conditions and a social network or club version, involving social capital within an institutional framework and with limited access. However, on closer analysis this distinction becomes blurred. In addition, they identify a type of cluster based upon input-output type linkages, the industrial complex. They establish a three-fold typology of clusters: (I) a model of pure agglomeration (II) the industrial complex model, based fundamentally on input-output relations and (III) the social network model, drawing on ideas of social capital. Whilst useful, it is questionable how far the three types of cluster are in fact independent.

STUDY AREA AND METHODS

The Lagos region is situated along the south west of Nigeria, approximately between latitudes 6027' and 6037' north of the equator and longitudes 3015' and 3047' east of Greenwich

meridian, with a land area of about 1,088 km ², covers about 32 percent of the land area of Lagos state. About 20 percent of this area is made up of Lagoons and mangrove swamps.

Lagos region is the leading, industrial, commercial, financial and maritime nerve-centre of the country. Over 60 percent of all commercial transactions in Nigeria are carried out or finalized in the Lagos region. About 70 percent of the total value of industrial investments in Nigeria is in the Lagos region. Over 65 percent of the country's industrial employment is concentrated in this region, leaving the remaining 35 percent in other parts of the country. It is, in part, the recognition of the marked concentration of industries in the Lagos region that informed its choice as the study area for this work. Perhaps the strategic position of the Lagos region within the country, which explains why industrial concerns and trading companies have their head offices, located in this region. The Lagos region has two seaports, Tincan and Apapa. The two ports handle about 60 percent of Nigeria's total export excluding crude oil and about 70 percent of imports. Major terminals for both road and rail routes are located in the Lagos region. The strategic location of the Lagos region is further strengthened by the presence of the most important airport.

Questionnaire was designed to elicit information on clustering and nature of relationship amongst firms in the Lagos region. The questionnaire was administered such that firms in each of the industrial estates/areas and the outlying firms were visited one after the other. In each case, the questionnaires were left with the industrialist/designated officer to complete. One hundred and three questionnaire were administered in twelve industrial estates; one questionnaire in each of the firm. This connotes that all the firms in the industrial estates were successfully covered in the questionnaire administration; all the questionnaires were retrieved.

FINDINGS
CLUSTERING OF FIRMS

The distribution of these firms varied from one industrial estate/ to another as depicted in table 1. There were 13 (12.6%) in Apapa, 3 (2.9) in Matori, 7 (6.8%) in Agbara, 24 (23%) in Ikeja, 14 (13.6%) in Ilupeju, 3 (2.9%) in Ijora, 7 (6.8%) in Iganmu, 10 (9.7%) in Oshodi/Isolo, 2 (1.94%) in Ogba, 4 (3.94%) in Ikorodu, 9 (8.7%) in Oregun, 7 (6.8%) in Surulere/Mushin. This analysis shows that the number of agglomeration firms varied across the estates; however, none of the firms in Gbagada, Agidingbi, Oyediran/Yaba, Ilasamaja, Lagos South-West, Akowonjo, Kirikiri, Abesan/Ipajaresponded. The twelve industrial estates covered were the core areas of industrial activities in Lagos states.

Table 1. Distribution of firms
Field Survey, 2014

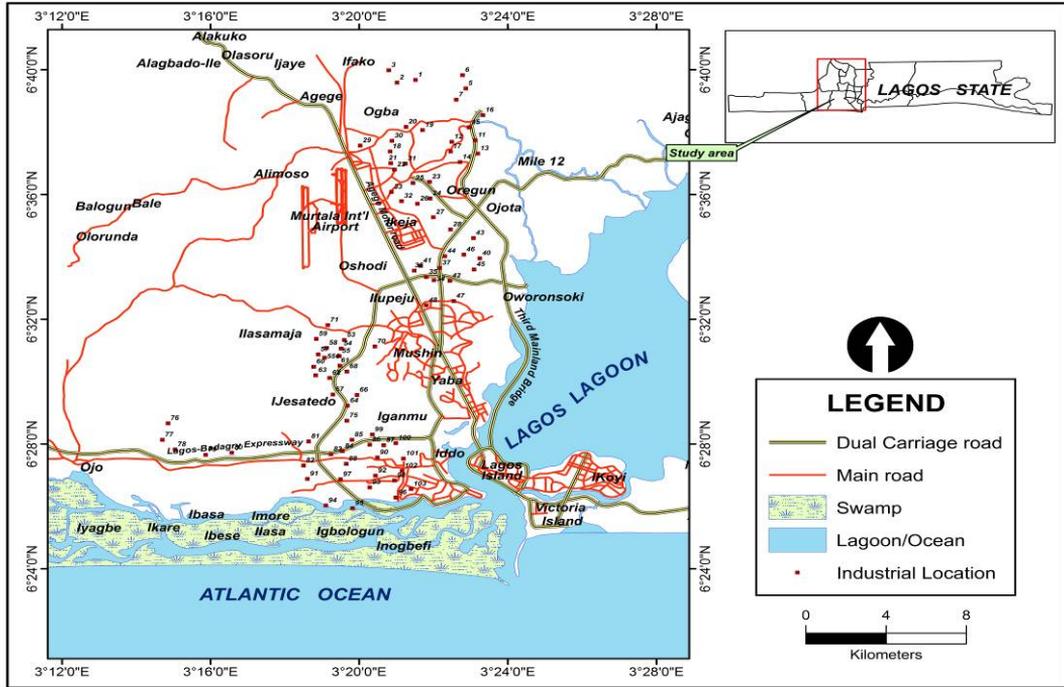| No	Industrial Estate/Area	Number of Firms	Percentage of Total
1	Apapa	13	12.6
2	Matori	03	2.9
3	Agbara	07	6.8
4	Ikeja	24	23
5	Ilupeju	14	13.6
6	Ijora	03	2.9
7	Iganmu	07	6.8
8	Oshodi/Isolo	10	9.7
9	Ogba	02	1.94
10	Ikorodu	04	3.94
11	Oregun	09	8.7
12	Surulere/Mushin	07	6.8
Total		103	100

Figure 1. Clustering of Firms

Table 2. Significance of Clustering
Source: Author's Analysis, 2014

% Savings	Joints Transportation		Joint Power Supply		Joint Raw Material Purchase/Supply		Collaboration in R & D		Joint labour		Joint Water Supply		Joint waste treatment		Joint Security		Joint telecomm		Joint port & shipping		Access to financial institution	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
<10	29	28.2	38	36.9	24	23.3	42	40.7	43	41.7	60	58	53	51.5	55	53	79	76.7	51	49.5	20	19.4
11-20	10	9.71	18	17.5	26	25.2	12	11.7	18	17.5	19	18	06	5.8	16	15.5	15	14.6	7	6.8	17	16.5
21-30	20	19	9	8.7	9	8.7	3	2.9	17	16.5	9	9	12	11.7	12	11.7	8	7.8	13	12.6	12	11.7
31-40	10	9.71	1	0.97	6	5.8	10	9.71	4	3.9	10	10	11	10.7	7	6.8	1	0.97	10	9.71	07	6.8
41-50	14	13.6	19	18.4	6	11.7	17	16.5	15	14.6	3	3	8	7.8	5	4.9	-	-	5	4.9	25	24.3
51-60	10	9.71	9	8.7	10	16.5	9	8.7	06	5.8	2	1.94	10	9.71	5	4.9	-	-	12	11.7	9	8.7
61-70	05	4.9	7	6.8	4	7.8	8	7.8	-	-	-	-	1	0.97	2	1.94	-	-	5	4.9	5	4.9
71-80	1	0.97	2	1.94	1	0.97	2	1.94	-	-	-	-	1	0.97	1	0.9	-	-	-	-	3	2.9
81-90	2	1.94	-	-	-	-	-	-	-	-	-	-	1	0.97	-	-	-	-	-	-	5	4.9
91-100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	103	100	103	100	103	100	103	100	103	100	103	100	103	100			103	100	103	100	103	100

The significance of clusteringis revealed in table 2. Due to joint transportation, only 1 (0.97%) firms saved between 81-90%, whereas as a result of joint power supply, (7.8%) firms realized between 61 and 70%. The percentage savings in collaboration in research and development indicated that 17 (16.5%) firms between 41and 50%, whereas 15 (14.6%) firms realised between 41 and 50% as a result of joint labour. Due to Joint Water Supply, two (1.94%) firms saved between 51 and 60%, while as a results of joint waste treatment, 10 (9.71%) firms saved between 51 and 60%. Another, 5 (4.9%) firms realized between 51 and 60% as a result of Joint Security whereas, 79 (76.7%) firms realized <10% savings in joint telecommunication. Also,

5 (4.9%) firms saved between 61-80% due to joint ports and shipping, while three (2.9%) firms realizedbetween 71 and 80% as a result of access to financial institution. The Analysis of Variance carried out in testing the variation of clustering benefits, as depicted in table 3 shows that the result was significant at 5% level (0.000<0.05), which connote that clustering benefits vary significantly amongst the firms. This result tends to confirm Ciccone's (1991) assertion that clustering of firms comes about as a result of potential benefits (especially lowering of costs) accruable to firm's close together in space.

Table 3. Summary of the Analysis of Variance (ANOVA) for the Benefits of Clustering
Source: Author's Analysis, 2014

	Sum of Squares	Df	Mean Square	F-Cal.	F-Tab
Between Groups	100142.756	10	10014.276	34.917	1.84
Within Groups	224277.491	782	286.800		
Total	324420.247	792			

THE NATURE OF WORKING RELATIONSHIP

Table 4 reveals the working relationship and the nature of such relationship among manufacturing firms. Out of 103 (100%) firms, 50 (11.7%) firms are involved in raw materials purchases/supply, 42 (9.8%) are involved in subcontract, 34 (7.96) were involved in collaboration in R & D and sales promotion respectively, while 47 (11%) are involved in transportation, 29 (6.79%) are involved in power supply, 27 (6.3%) are involved in water supply, 40 (9.4%) in security, another 24 (5.6%) are involved in waste treatment, also, six (1.41%) are involved in telecommunication, furthermore, 45 (10.5%) in ports and shipping, while, 49 (11.5%) are involved in Labour supply relationship. It is vivid from the foregoing that most of the firms were involved more in raw materials purchase/supply relationship.

Table 4. Types of Working Relationship
Source: Author's Analysis, 2014

Working relationship	Frequency	Percentage
Raw materials purchase/supply	50	11.7
Subcontract	42	9.8
Collaboration in research and development	34	7.96
Sales promotion	34	7.96
Transportation	47	11
Power supply	29	6.79
Water supply	27	6.3
Security	40	9.4
Waste treatment	24	5.6
Telecommunication	6	1.41
Ports and shipping	45	10.5
Labour supply	49	11.5
Total	427	100

The total is greater than 103 because of multiple responses.

SERVICES SHARING AMONGST FIRMS

Table 5 shows the sharing of services with other firms. Out of 103 (100%) firms, 43 (6.76%) firms share electricity, 45 (7.1%) firms share water, 59 (9.3%) firms share Labour, while, 73 (11.5%) share transport facilities, 68 (10.7%) share security, 46 (7.2%) share waste treatment, 57 (9%) share sub contract services, 71 (11%) share raw materials purchase/supply services, seven (1.!%) share telecommunication services, 43 (6.76%) share ports and shipping services, another 63

(9.9%) share sales promotion services, while 61 (9.6%) firms collaborate in R&D. It is evident from the above table that transport facilities formed the most important facility being shared by the firms.

Table 5. Sharing Services with other Firms
Source: Author's Analysis, 2014

Services	Frequently	Percentage
Electricity	43	6.76
Water	45	7.1
Labour	59	9.3
Transport facilities	73	11.5
Security	68	10.7
Waste treatment	46	7.2
Sub contract	57	9
Raw materials purchase/supply	71	11
Telecommunication	7	1.1
Ports and shipping	43	6.76
Sales promotion	63	9.9
Collaboration in R& D	61	9.6
Total	636	100

Total is greater than 103 because of multiple response

LOCATION ADVANTAGES AMONGST FIRMS

The various advantages offered in the estate were revealed in table 6. Out of 103 (100%), 48 (16.2%) of the firms attested to the transportation advantages, 43 (14.5%) raw materials. Another, 37 (12.5%) opined labour advantages, 30 (10.1%) power supply, 65 (22%) market, 15 (5.1%) subcontract, while, 29 (9.8%) attested to water supply advantages. Furthermore, 11 (3.7%) enjoyed security advantages, 13 (4.4%) attested to ports and shipping, while five (1.7%) attested to sales promotion advantages.

Table 6. Advantages Offered by Locating within the Estate
Source: Author's Analysis, 2014

Advantages	Frequency	Percentage
Transport	48	16.2
Raw materials	43	14.5
Labour	37	12.5
Power supply	30	10.1
Market	65	22
Sub contract	15	5.1
Water supply	29	9.8
Security	11	3.7
Ports and shopping	13	4.4
Sales promotion	05	1.7
	296	100

Total is greater than 103, because of multiple response.

SUMMARY AND CONCLUSION

The paper has revealed the marked concentration of firms in the Lagos region; theconcentration was most striking in Ikeja industrial estates. The research further revealed the immense significance of industrial cluster which includes joint transportation, joint power supply, joint raw material purchase / supply collaboration in research and development, joint labour supply, joint water supply, joint waste treatment, joint security, joint telecommunication, joint ports and shipping as well as access to financial institution. Of all these benefits the dominant is

the access to financial institution. There has been growing numbers of regional and local cluster development in Africa especially Accra, Kenya. Also, there have been successful stories of cluster development in Nigeria, at Onitsha in Anambra State and the computer village in Otigba in Lagos. It must be noted that the industrial cluster in Western Europe, in regions as diverse as north Rhine Westphalia (Germany), Spain and Scotland have been the key drivers of economic development and the role of clustering of economic activity in relation to innovation and economic performance has being tremendous. So, adopting cluster policy in African nations is a good development.The paper also reveals the nature of working relationship amongst manufacturing firms. Such working relationship includes; raw materials purchases / supply, subcontract, collaboration in R & D, sales promotion, transportation, power supply, security, waste treatment, telecommunication, ports and shipping, Labour supply relationship. Raw materials purchase/supply relationship was the dominant. Services sharing amongst the firms ranges from electricity to sales promotion service. Of all the ten location advantages enjoyed by firm's market facilities were the most significant.

Industrial cluster can lead to amazing technological development of a region; this is because clustering is capable of generating multiplier effects that can lead to socio-economic transformation of a region positively. Thereby facilitating diffusion and innovation creation which will immensely contributes to the economic welfare and improved standard of living. The development of industrial estates is highly significant in encouraging agglomeration of firms, coupled with this is the development of infrastructural facilities. Facilities such as power supply, water supply and transport, which will have centripetal effects on the investors, these facilities will significantly enhance the operations of agglomeration firms. Industrialization in this modern world is a determinant of national power, thus, any country that failed in this aspect, will find it difficult to perform in other aspects of the economy. In development of clustering, government has an important role to play, the small scale, the medium and large scale enterprises must be encouraged. Concerted efforts at the development of the iron and steel and petrol chemical industries will encourage cluster development. The development of these major projects could facilitate local sourcing of raw materials, parts and or sub-assembly in basic metal, iron and steel and fabricated metal products and the industrial and domestics and rubber products industries. Clustering, if encouraged, will lead to increase agglomeration economies, these clustering should be made viable, encouraged and strengthened through government investment in the industrial sector, making the location factors to be liberal, giving tax holidays to the younger investors, relaxing the laws governing the importation of some raw materials, as this will have positive impact on productions. Financial aids should be given to these industries in form of loan, while the collateral securities should be made affordable for the investors. Assistance, in form of subsidy should be given to the investors. Agglomeration policy could be further harnessed to launchany countryor region into the desired goal of industrialization, and also help to transform the economy of such country.

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