Local Content Policy and Entrepreneurs in the Nigerian Oil and Gas Industry: Determinants of Compliance and Implication for the Economy

VINCENT, Moses Oweđe1, UDEORAH, Sylvester Alor F.2
1, 2Department of Economics, University of Port Harcourt, Port Harcourt, Nigeria

Abstract: - The evolution of the local content policy in many countries of the world is considered a response to the call for patronage and engagement of local entrepreneurs and a possible resultant development of entrepreneurs in a particular country. The Nigerian government also deemed it necessary to design and sign into law the Nigerian Content Act which provides for the development of Nigerian content in the Nigerian oil and gas industry in the year 2010. This paper examined the determinants of compliance with the provision of the Nigerian Oil and Gas Industry Content Development Bill by entrepreneurs who owns and manage marine vessel service companies in Nigeria. Secondary data collected from the Nigerian Content Regulatory body was used in this study. Using multinomial logit and probit regression econometric technique, owning a Nigerian built and flagged vessel was not a significant determinant of compliance but rather having and operating different categories of vessels proved to be the significant determinant of compliance to the Nigerian content act by vessel owners. It was therefore recommended that the government should give grants to vessel owners to enable them acquire all the categories of vessels and hence comply with the policy to the benefit of the nation.

I. INTRODUCTION

Innovations, resulting from technology and science, has been a major force driving the oil and gas industry in most oil rich developed countries. As more “complex geologic structures” are encountered, development of improved technology in response to the challenges have made increase in oil and gas output sustainable in these developed countries (e.g. United States of America). Sadly, oil rich developing countries are yet to independently meet the level of technological advancement required for optimal performance of their oil and gas industry. Companies are increasingly required by law to ensure that host communities benefit from their operations in all ramifications. The local content policy (LCP) appears to be a potent tool to train local professionals. The question however is how to design the policy to reflect the particular needs and circumstances of each country (Nwapi, 2016). Local content policy is a deliberate effort by government to develop local talent and indigenous business through the instrumentality of the law.

It is now widely accepted that the countries that managed to catch up with the old industrialized, high-income countries are the ones whose governments proactively promoted structural change. But industrial policies also frequently fail. But Altenburg (2011) in a study confirmed that many industrial policies have failed, but also that in some cases, industrial policies have indeed accelerated structural transformation— even in political regimes with fairly strong authoritarian and clientell traits. Therefore, it will not be out of place to state that local content is one of such policies or attempt to “accelerate structural transformation” in the oil and gas industry.

This paper provided an empirical evidence on the determinants of compliance by entrepreneurs (specifically vessel vendors) to the Nigerian Content Act. The category of the vessels, defined by the nature of task they are built for, was the main focus for this study.

II. LITERATURE REVIEW

Local Content: Definitions, Objectives and Global Trend

de Souza (2013) defined local content as the percentage of materials, equipment, systems and services produced locally in relation to the total amount of purchases made by a concessionaire currently operating in Brazil. “….it is expected that the activities of supply of equipment and services for the mineral industry can create benefits like:

- Economic – business expansion
- Social – job creation and greater competitiveness
- Technical – development of intellectual capital
- Environment – development of more efficient mineral activities”

Local content policies are enacted by governments to provide incentives to local industry so that it can develop and attain global competitiveness. The goals of the Brazilian local content policy are to increase participation of the national industry on a competitive basis, develop technologies in Brazil, increase the competence of the technical community and generate employment and income in Brazil (ANP, 2008).

Mirilli et al (2013), described local content as a “protection policy to allow the local capacity to develop to be able to sustain the local economy and to increase the likelihood of local companies to export to other countries”.

www.rsisinternational.org
In Trinidad and Tobago the stated intent of local content policy is to “maximize the participation of its national people, enterprises, technology and capital through the development of locally owned businesses, local financing and human capabilities in the conduct of all activities connected with the energy sector, along its entire value chain, within and outside T&T.”

Mirielli et al (2013) gave a popular definition of local Content as a political orientation designed to improve the participation of local/domestic companies in providing services and goods for a specific economic sector, generating revenue, jobs and technological development.

Over the years, the trends in expanding and retaining more value in-country have evolved to include:

- Procurement of goods and services
- Employment of nationals
- Technology transfers, research, innovation
- Investments in infrastructure and utilities provision
- Social investments in skills development and enterprise development
- Other community social investments

Given the above listed trends in local content, there are three types of local content that oil and gas producing states have found in ensuring delivery of oil and gas projects benefits to their citizens; as described by Esteves et al 2015:

Regional Content

National Content

Community Content

Regional Content –

If local firms can jointly become part of a regional cluster or a growth pole, or can be located closely together in industrial parks, this can offer opportunities for building technological capacities and shape regional economic governance enabling local firms to participate in global value chains (Fessehaie, 2011). Regional local content therefore is the possibility of resource developers and subnational government entities to jointly develop strategies and plans that ensure foreign companies contribute to regional development by sourcing from businesses and recruiting their workforce from within the region in which an oil and gas project is located. This further provides increased learning opportunities and supports enterprises to diversify into related sectors within the “Cluster”. Clusters can be defined as a ‘geographically proximate group of interconnected firms and associated institutions in related industries (Porter, 1998). Clusters are an alternative way of organizing the value chain. In addition, the geographic proximity can generate economies of scale and positive externalities such as lower costs of intermediate inputs or services, better access to skilled personnel, or greater attractiveness to clients (Webber & Labaste, 2010). For instance with the discovery of oil in Ghana and other countries in the sub-Sahara African region, governments could learn from the Nigeria experience and encourage the development of well-functioning industrial clusters within the region which would in turn forge innovation.

National Content

- In the words of List Friedrich 1909, “in society man is not merely productive owing to the circumstance that he directly brings forth products or creates powers of production, but he also becomes productive by creating inducements to production and to consumption, or to the formation of productive powers. . . . Manufacturing production yields either productive instruments or the means of satisfying the necessities of life and the means of display. . . . Manufacturing industry, therefore, furthers production by the community by means of inducements . . . . In any case products must be created before they can be consumed, and thus production must necessarily generally precede consumption. In popular and national practice, however, consumption frequently precedes production . . . .” As mentioned earlier that the antidote to ‘resource curse’ is ‘resource-led development’ . . . it therefore holds that the overall competitiveness of an economy hinges on Economic Diversification. Hence the need to focus not only on exploiting the comparative cost advantages of resource endowments but to formulate policies and support the development of production technologies that would benefit other economic sectors over time (Kunanayagam and Dietsche, 2014).

But then, macroeconomic policies are a necessary, but not a sufficient condition to drive economic diversification because from the public sector perspective, any type of local content measure is a form of industrial policy. From the perspective of resource developers, building linkages between the extractive and other economic sectors is not a business priority, in particular if the commercial onus lies with developing and exporting resources fast. However, there is a business case if efforts made to build linkages with the economy of the host country improve the business environment (e.g. reducing non-technical risks such as the cost of conflicts) and if it positively impacts the cost of doing business over time. In fact, several forums, including the OECD’s Policy Dialogue on Natural-Resource-Based Development (2014), the Harvard Business School (2011) and others have put forth the notion of creating ‘shared value’, this concept advocates that resource developers look inward, leveraging their core business towards addressing social issues and gaining a competitive advantage from this.

National content therefore is the use of regulation, legislation and contractual obligations by government to promote transformational opportunities associated with the hydrocarbon sector through various types of linkages (discussed later), i.e collaborative efforts between the private and public sector. In fact, it is ultimately not either / or, of state versus market, but how both work together.

Community Content
- Efforts to develop local community capacity, comprising education and skills development, SME development and social investments to build an enabling local environment and healthy workforce, tend to be designed with a number of features in mind. They are aimed at minimizing community dependency by creating transferable skills and diversifying the local economy; strengthening corporate relationships with local communities and government; and creating a positive corporate image in the local communities. (Esteves & Barclay, 2011)

Community Content focuses more narrowly on a project’s ‘zone of influence’, its ‘directly affected communities’, or its ‘host communities’, where the geographical boundaries tend to be defined in permitting processes. The parameters that are typically drawn upon to identify project’s local community area include: a certain kilometer radius distance; with some commercial capability; within a reasonable daily commute; where employees live; and immediate host communities (villages or settlements). These boundaries are negotiated with the permitting authority and are the basis for company obligations on impact assessments, mitigations and livelihood enhancements through social investments. At this level, local content often involves low skilled employment and purchasing of goods and services (i.e. camp maintenance and house-keeping, drivers, security etc.). Esteves and (2012) described different reasons for community content:

Meeting community expectations to participate in the economic opportunities offered by the project by which they are impacted;

Creating jobs and stimulating economic activity in local communities;

Developing skills and access to broader opportunities for local communities;

Creating sustainability of economic benefits beyond the life of the oil & gas project.

2.2 Local Content in the Oil and Gas Industry: A Global Trend

2.2.1 United States

More oil and gas service and supply companies are domiciled in the U.S. than in any other country. This is a natural result of the fact the global exploration, production and service industry primarily developed and matured in the U.S. (and the former Soviet Union) over the past 130 years. In addition to its long history in the sector, the U.S. has an unusual land tenure regime. The federal government’s control over oil and gas resources is limited to those areas under federal lands and offshore under the Outer Continental Shelf. The states own resources under state lands and in state waters immediately offshore. Private Citizens and companies own the remainder. The U.S. also has thousands of oil and gas producing companies, most of them smaller independent companies that have provided opportunities for many supply businesses to develop and thrive. Since the industry essentially developed in the U.S., there has never been a direct federal policy on local content in the oil industry.

2.2.2 United Kingdom’s Experience

From the beginning, the U.K. government took a very hands-on and direct approach to development of its oil and gas resources including explicit policies to build local content. At the time oil was discovered in the North Sea, the U.K. was a leading industrial country with a well-educated and technically trained workforce. The economy was well supplied with manufacturing, shipbuilding, and engineering firms.

While significant oil and gas production was new to the U.K., there were British companies with international expertise, including British Petroleum, which was partly owned by the government. To protect its economic interests in the North Sea, the government developed policies for awarding exploration and production licenses to companies to ensure that domestic companies and labor would participate in the development. Proactive government policies enabled domestic labor and industry to develop the specialized skills and capacity to service the offshore oil and gas industry. The U.K. first established a discretionary licensing system that allowed the government to selectively choose which exploration and production (E&P) companies would be granted concessions. While less economically efficient than an auction system, discretionary licensing gave the government more control over intricate details of each contract awarded including requirements for local participation. By the early 1970’s, a number of factors, including several major new offshore discoveries which would significantly expand investment in the sector, prompted changes in British policy. At the time, there was growing political concern that British firms were not capturing a significant amount of work supplying goods and services in the expanding industry. U.K. local content was then estimated at 30-40 percent.

In 1973, under significant political pressure, the government enacted three measures to improve the amount of local content in the petroleum sector:

- The establishment of the Offshore Supplies Office (OSO);
- The introduction of an auditing procedure for monitoring purchases made by oil companies; and
- The provision of financial assistance to the U.K. supplies industry.

The OSO was an independent agency set up expressly to help domestic firms gain as large a share of the petroleum supply and service market as possible. In support of U.K. industry, the OSO was charged with promoting creation of new ventures to supply the market, developing the industry’s capability to win orders, providing advice on joint ventures, and assisting companies with research and development needs. The OSO also assisted the E&P companies in
identifying U.K. suppliers of equipment and support services. The E&P companies were required to submit quarterly reports to OSO for contracts awarded in amounts greater than £100,000 and greater than £50,000 for maintenance. The companies were required to list the contractors selected and those who competed but were not selected. The OSO used these reports to determine whether qualified U.K. contractors were overlooked. Over a twenty year period, the OSO would evaluate local contractors and, through a range of programs, help them upgrade their skills and competencies to remedy competitive deficiencies. The introduction of an auditing procedure for monitoring purchases resulted in a Memorandum of Understanding between the U.K. government and the United Kingdom Offshore Operators Association (UKOOA) formalizing the auditing procedure and the concept of full and fair opportunity. A code of practice was promulgated that defined procedures which operators were required to undertake in the tendering and contract award process. In the monitoring procedure, the U.K. share was defined as "representing the value of contracts and main sub-contracts placed with companies which make a substantial contribution to the U.K. economy through employment, manufacturing, or sub-contracting". This ensured that real value was being created in country through job creation or local procurement of goods and services, not just local incorporation. This was backed up by an implicit understanding that the companies working more closely with the U.K. supply industry would be looked at more favorably in the future. There were no legal sanctions imposed on companies for failure to meet local content objectives, however, such companies could expect difficulties in future bidding rounds. While there was not an explicit metric employed for giving local firms an edge, the operators were at times pressured to accept bids from U.K. firms that may not have been competitive on purely commercial grounds.

In 1977, U.K. local content was greatest in supplying plant and equipment as well as general services for an average of 62 percent. Over time, as competencies developed, the overall percentage increased to 82 percent by 1986 with nearly 100 percent of post development operations—ongoing maintenance and production—locally sourced. The local content was more in the form of value added than domestic ownership. A 1986 study by the University of Aberdeen found that many of the over 1000 oil-related companies in the area were local affiliates of foreign (mostly U.S.) supply and service companies that had set up U.K. operations to source material and labor from the local economy. Most of the locally owned companies tended to be in non-core oil and gas activities. The study demonstrated that in such a technologically specialized and capital intensive industry, it is difficult for startup companies to break into the business even with strong government support. In the early 1990’s, the U.K.’s entry into the European Union foreclosed much of the OSO’s authority to monitor and maintain local content policies. Since that time, domestic content has declined to 60-70 percent and the government has shifted focus to supporting domestic companies in efforts to gain access to international opportunities. The U.K. government’s activist role of direct monitoring coupled with an extensive program for local capacity building paid off with significant expansion not only of local content, but with development of internationally competitive companies. There are currently over 1200 companies based in the U.K. offering a variety of services to the petroleum sector.

2.2.3 Canada Experience

Atlantic Provinces of Canada Oil and gas development in Western Canada has a similar history to that of the U.S. A number of the international oil companies have Canadian affiliates that have operated in the country for decades. By contrast, the Canadian government played a proactive role in the early development of oil and gas resources offshore the Atlantic provinces of Nova Scotia, Newfoundland and Labrador.

Exploration of Atlantic Canada had been carried out since the 1960’s, but the discovery of the Hibernia field in 1979 made the potential for serious production apparent. The Canadian federal government, in cooperation with the provincial governments, implemented a number of measures to ensure the field would be developed with major Canadian ownership and local participation. The Hibernia field received a direct capital subsidy of over $1 billion. In exchange, the project had to ensure major portions of the construction and operating expenditures and employment were received by Canadian, specifically Newfoundland and Labrador workers and businesses, and that almost two million engineering hours would occur in the province.

Recent development has occurred without government largess in the form of subsidies; however, operators are required to submit a “Benefits Plan” to the provincial government before a plan can be approved for a field to be developed. The proponents are required to undertake, within the province, research and development activities and education and training, with first consideration being given to the residents of the province. In addition, the proponents, in acquiring goods and services for their projects, have to give ‘full and fair opportunity’ to provincial manufacturers, consultants, contractors and service providers. Furthermore, in satisfying their procurement requirements, the proponents have to ensure that first consideration is given to services provided from within the province and to goods manufactured in the province so long as those goods and services are competitive in terms of fair market price, quality and delivery.

The provincial governments, whose policies are closely modelled after those of the U.K., also have local content offices, the “Offshore Boards”, similar to the OSO. While the provincial Offshore Boards are responsible for monitoring and auditing the operators, they do not have authority to set explicit targets or to enforce levels of participation. They do, however, use detailed auditing standards to review operations and assess the value of local content.
The provinces have been quite successful at capturing local employment benefits; projects have ranged from a high of 85 percent at Hibernia to 57 percent at other operations. The local capture of total project expenditure has been less successful. For Hibernia, the figure was 47 percent during the development phase, and 54 percent for ongoing operations. Local expenditures in other operations range from 27 percent to 51 percent depending on the project and the phase of the project.

For the most part, local expenditure and employment are greatest in the post development operations phase. As described earlier, the Atlantic Provinces commissioned a detailed study to evaluate the success of local content policies and to seek recommendations for policies to ensure a successful transition as oil and gas development has matured. The review’s key recommendation was to provide better information to the public regarding the types of expenditures by phase of activity. A web-based monitoring system was recommended to provide better information on expenditures and business opportunities. Recognizing the local benefits relative to the technological capacity of the region was also cited as an important factor for regional policymakers.

The situation in the Atlantic Provinces is somewhat difficult to directly compare to other national experiences since Canada has a long history of oil and gas development in the western provinces. The effort here was to increase the benefits to the local communities adjacent to the offshore fields where there is a lower overall industrial base and relatively little experience in the industry. Recognizing the regional disparities, the Canadian government provided a one-time subsidy to launch the Hibernia field. The Hibernia field resulted in considerable local benefits, but without such direct government intervention other projects experienced a lower but still relatively significant level given the industrial capacity of the region. The provinces have focused in particular on local employment, separating industry statistics on investment and jobs.

2.2.4 Norway

Norway took an even more proactive approach than the U.K. by establishing a national oil company, Statoil. With the creation of Statoil, the government set in motion a series of deliberate policies and mandates that essentially forced the international oil companies to develop the Norwegian industry as a condition, and byproduct, of their own operations.

As in the U.K., when oil was discovered in Norway in the 1960’s, the country was economically stable with considerable industrial technical capacity, notably internationally renowned shipyards. The combination of its well-developed economy and its technical capacity in other fields gave Norway considerable bargaining power in its relations with the private oil companies. The Norwegian petroleum law, enacted in 1965, is based on the British model of structuring and awarding licenses through individual negotiations with the IOCs. This enabled the government to choose which international companies it would work with to maximize the resulting domestic benefits. In the beginning, preference was given to companies who would join with Norwegian interests. By 1967, government equity participation in offshore development was required. The percentage could be reduced if Norwegian interests were included as part of the group licensed to develop a specific field.

In 1972, the Goods and Services Office (GSO) was established by the Ministry of Industry. The goals and responsibilities of the GSO, similar to the U.K.’s OSO, were to monitor the number of Norwegian companies being awarded contracts throughout the procurement process. Statoil was created at the same time and policies that would ensure technology transfer and personnel training were imposed. Norway set a new precedent with the Stafford field by leasing it to an operating group led by Mobil with the proviso that Statoil had the right to eventually takeover as the operator. The producer group was required to cooperate in developing Statoil’s expertise to the point it would be in a position to carry out the operator role on its own. According to Oystein Noreng, “International oil majors were placed in the role of technical assistants and joint teams were used to fast-track the Norwegian companies into fully-fledged operators. Consensus in Norway was that operatorship was needed to learn the tools of the trade and to be able to meet foreign oil companies as equals.” Since development was at an early stage in the North Sea, the international oil companies provided Norwegian personnel on the job training at operations in other parts of the world. The trained professionals were then brought back home to “Norwegianize” the industry. By requiring joint operating ventures, Norway ensured the rapid transfer of knowledge, expertise and technology the Norwegian firms would not have otherwise had. By the late 1970s the government also required the international majors to fund research and technology development at Norwegian institutions. Companies were required to conduct at least 50 percent of the research for technology needed to develop prospects in Norway at local institutions. This requirement for cooperation on technology development was instrumental in developing Norwegian companies that today are globally competitive in various aspects of offshore development. There were downsides to Norway’s aggressive local development effort, however, as economic activity that developed from the exploitation of oil and gas resources diverted resources from other areas of the economy. Growth of the domestic petroleum industry put pressure on wages in other sectors. It also made the economy of such a small country vulnerable to the swings in economic activity in the oil and gas sector, especially in the 1980’s. Local content in Norway today is roughly 50 percent. For a country with a small population relative to the size of the resource, that level of local content is probably as much as can be expected given the specialized nature of the industry. Perhaps as important as the local content metric is the success of Norwegian companies internationally.
2.2.5 Brazil

Though what was in practice then was not exactly pronounced “local content”, its concept is associated with the history of petroleum regulation and industrialization in Brazil—talking about the Brazilian industrial revolution between 1930 to 1956. According to R. de, “the creation of CNP (National Petroleum Council) in 1939 was the first government initiative to structure and regulate oil exploration in the country and then nationalized its industry in the 1953 by creating a state owned oil company, Petrobras. Until the 1997 when the Petroleum Law (Law 9.478/97) was enacted, Petrobras, with the engagement of local support and supply companies, was the sole developer of all Brazilian oil and gas. By virtue of these protectionist policies, the local content in the Brazilian petroleum sector has always been very high. Brazil has been an oil producer since the 1930’s, but increased its production significantly after the discovery and development of offshore resources began in the 1970’s. Petrobras used some foreign contractors in the early years of offshore development. But, by the 1980’s, the focus shifted almost exclusively to development of domestic technology using licensing agreements with international suppliers. By licensing technologies developed by other companies, Brazilian industry had access to state of the art technology it could then adapt to specific domestic requirements. Technological progress in the oil industry internationally has been an evolutionary process, by adapting proven tools and techniques to different circumstances and challenges. This approach worked well for the Brazilian industry. At one point, Petrobras held the world record for the well drilled in the deepest water. By developing the engineering plans for deepwater projects and using and adapting technology, the Brazilian industry has become a global leader in deep-water and ultra-deep water exploration and production. The amount of local content varied from well above 90 percent to as low as 80 percent during the development stage of the domestic offshore industry, depending on Petrobras’ need to reach out to international technology leaders.

However, rigid government policies that protected the domestic supply and service companies and prevented outside participation contributed to delays and underdevelopment of domestic resources. In 1997, national policy changed to partially privatize Petrobras and allow foreign companies to acquire concessions for oil and gas exploration and development. An independent agency, the National Petroleum Agency (ANP), was established to manage a competitive leasing scheme and to regulate the industry. The initial lease awards were based primarily on upfront bonus bids with lesser consideration for local content. As local content declined to around 80 percent, the policy was modified to put greater weight on local content. Detailed local content percentages are specified— a minimum of 30 percent in the offshore and 70 percent onshore. With the increased focus on local content, interest from international oil companies fell off rather significantly in subsequent lease sales. But then, political exigencies even led to cancellation of bids for some deepwater platforms to enable local shipyards to certify their engineering and technical capabilities.

One significant, but not necessarily negative outcome has been that foreign investors have purchased equity in Brazilian firms as a way to increase local content in the formerly locally-owned service and supply industry. For example, firms from Norway and Singapore acquired stakes in Brazilian shipyards, and other U.S. and U.K. vendors set up or expanded businesses in Brazil. While the international industry has become active in Brazil since restructuring, the dominance of Petrobras ensures that a large measure of local content will continue. Importantly, though, involvement of the IOC’s has resulted in needed expertise and technology transfer—extended reach drilling, for example--from specialized firms with no previous presence in Brazil. By keeping the sector closed for decades, Brazilian labor and companies were protected while they developed skills and capabilities. The lack of competition led to higher costs and some delayed technological development, but ensured the economic activity and spin off benefits from the petroleum sector were internalized.

2.2.6 Trinidad and Tobago (T&T)

Trinidad and Tobago (T&T) has been a small oil producing country for some time, but is rapidly becoming an important natural gas producer. T&T has over 26 trillion cubic feet (tcf) of proven natural gas reserves which it has developed into an LNG and petrochemical industry. Recognizing its potential future as a significant supplier to the North American market, the country has increasingly focused on its niche in the natural gas industry. Efforts are currently underway to expand local content with an emphasis on how best to gain the most value added from the production, use and export of its most prolific domestic natural resource. The need for greater local content, including local ownership, had been extensively debated in the parliament and in the civil society for a number of years. Then, in 2004, the government adopted a local content and local participation policy framework. The government has recognized that its previous approach of insisting on preferences for local suppliers has not been successful. The new policy framework is fairly detailed in a number of areas. Local content and participation are defined to include ownership, control, decision-making and preferential access to financing. The international producers themselves are required to commit to contracting with local companies, not simply deferring to their own primary contractors to bring the local content to a project. The intent is to have companies manage their contractors as a portfolio with maximum opportunity to take advantage of local capacity. Education and training of workers and support for local businesses in developing “strategic skills” are key elements. The intent is also to focus on the development of businesses in areas that can serve other sectors of the economy, not only the petroleum sector. Finally, the government is to establish a database of the status of projects and opportunities for local suppliers. The concept is
to provide an electronic clearinghouse for the operators to find local suppliers and vice versa.

The educational efforts, with government support, cover a range of areas—from expanding the geosciences program at the University of the West Indies (UWI) to the establishment of the National Energy Skills Centre/T&T Institute of Technology (NESC/TTIT). The academic programs all have collaborations with universities in the U.S. and Canada and with industry and professional societies. The NESC/TTIT, created in 1998, has a program focusing on theory, practice and management skills for technicians and undergraduate engineers. The regular curriculum is supplemented with a continuing education program of technical workshops. The energy programs go beyond the upstream oil and gas business to include the needs of the downstream gas sector. For example, the National Gas Company of Trinidad and Tobago Limited (NGC) sponsored a training program in conjunction with NESC to train new welders and to upgrade welders’ skills in anticipation of construction of a major cross island transmission pipeline.

On the business side, the government has identified a potential $2.7 billion in annual business across the economy that T&T businesses are losing to foreign competition. To close that gap, the Centre for Energy Enterprise Development (CEED) was established to provide SME’s (small and medium-sized enterprises) with the advice and tools required to become more competitive in the energy sector, specifically to help entrepreneurs capture supply chain niches. ….” (Shirley Neff, 2005)

2.2.7 Local Content Policies among Developing Countries of Africa

Summarily, local content is now evolving in less developed countries. For example, Ghanaian government approved a Policy Framework for Local Content and Local Participation in Petroleum Activities in 2010. Also, Tanzanian government also approved a Natural Gas Policy in 2013, and published a Local Content Policy in 2014 pending approval before other regulations are pushed forward. Mozambique, a new hydrocarbon producing country, also approved a Petroleum Law (containing specific local content requirement) in August 2014. Equatorial Guinea in the wake of its hydrocarbon discovery also approved a new local content regulations for the oil and gas sector. Local content is now being called ‘non-technical risk’ by business managers. For Nigeria, the Nigerian content was implemented in the year 2010.

The National Petroleum Corporation (NNPC) defined the Nigerian content as as “the quantum composite value added or created in the Nigerian economy through the utilization of Nigerian human and material resources for the provision of goods and services to the petroleum industry (NNPC, 2008). While it can be argued that this definition seems more of a textbook definition rather than a practical one; Chief Tony Obuaya, one of the leading voices in the clamour for higher local content, view local content (LC) from the perspective of value additions. He defines local content in two ways: a set of deliberate orientation and actions to build domestic capacity relevant for service and product delivery comparable within that industry and an opportunity to locally build a sustainable culture of service quality and capabilities exceeding customers’ expectations and comparable to international standards through key local personnel and management” (Obuaya, 2005). A common factors for the definitions provided so far are “certain key indices”. This position was corroborated by the Chairman of Nigeria’s House of Representatives committee on petroleum (upstream), to have stated that local contents means different things to different people the common denominator is value addition in the country (Ugwushi, 2010).

The concept of local content is neither new nor restricted to Nigeria, as it has for long be operated in several other oil producing countries. Warner (2007) view local content (LC) from an angle of ‘community content’. For example, oil producing investors in Trinidad and Tobago are mandated by law to “give preference to national subcontractors where such are competitive with foreign bidders in skills, availability and price and meet technical and financial requirements”. Also, 95 out of every top position (supervisors or managers) in every oil producing company in Nigeria should be occupied by Nigerians (Warner 2007 cited by Ugwushi, 2010).

III. METHOD OF STUDY

Research Design: Quasi-Experimental research design was be adopted for this study.

Data Type: Secondary data sourced from the Nigerian Content Development and Monitoring Board (NCDMB) will be used to investigate the determinants of compliance of entrepreneurs to the local content policy in the oil and gas industry in Nigeria.

Sample for the Study

Entrepreneur sampled for this study are vendors/service providers for transport and other services in the oil and gas industry in Nigeria. All registered vendors/service providers for transport and other services in the oil and gas industry in Nigeria were sampled for this study.

Variables

Dependent Variable: Service Company Categorization will constitute the dependent variable for this study. This measures the degree of compliance of vendors/service providers for transport and other services in the oil and gas industry in Nigeria. Companies categorized by NCDMB as AA, A, BB, and B implies compliance with the local content policy in different degrees and magnitude respectively. Also, our compliance metric is drawn from the level of consideration accorded a service provider when tenders are made; NCDMB (2015) stated that service providers categorized under the A and B category are accorded consideration mostly as against service providers categorized under the C, D, and E.
For the purpose of this analysis, we shall assign numeric values to the letters used to signify different levels of compliance as follows: AA = 7; A = 6; BB = 5; B = 4; C = 3, D = 2 and E = 1.

**Econometric Technique: Multinomial Logistics Regression**

Logistic regression analysis was used to identify the relationships between dependent variable (company categorization) and independent variables (types of vessels used) (Woo-Yong & Ditton, 2006). The logistic regression model is shown as the following form:

\[
\ln \left( \frac{p}{1-p} \right) = \beta_0 + \beta_1 x_i
\]

Where \( p \) = the probability of compliance with the policy;
\( (p/1-p) \) = odds of compliance;
\( \beta_0 \) = constant;
\( X_i \) = vector of independent variables
\( \beta_i \) = parameter estimate for the \( i \)th independent variable.

The logistic regression is powerful in its ability to estimate the individual effects of continuous or categorical independent variables on categorical dependent variables (Wright, 1995).

The multinomial logistic regression model used is generally effective where the dependent variable is composed of a polytomous category having multiple choices. The basic concept was generalized from binary logistic regression (Aldrich & Nelson 1984; Hosmer & Lemeshow, 2000). In a multinomial logistic regression model, the estimates for \( \beta \) parameter can be identified compared to a baseline category (Long, 1997). In this study, having no willingness to substitute was specified as the baseline category. The multinomial logistic regression model with a baseline category would be expressed as follows:

\[
\log \left( \frac{\pi_i}{\pi_1} \right) = \beta_0 + \beta_1 x_i
\]

The logistic model uses the baseline-category logits with a predictor \( x \). This multinomial logistic regression model can be a useful tool for modeling where the dependent variable is a discrete set of more than two choices (Agresti, 1996). The multinomial logistic regression model used in this study estimates the effect of the individual variables on the probability of choosing a type of alternative resource substitute for their recreational fishing activity.

## IV. RESULTS AND INTERPRETATION

**Research Objective I: To determine the relationship between ownership and usage of Nigerian built and flagged vessels and vendors/service providers’ compliance with the Nigerian local content policy in the oil and gas industry.**

The coefficients of Nigerian built and flagged vessels (nig_vessels) explanatory variables, as shown in Tables 1 below, informs us of the relationship that exists between ‘owning and using a Nigerian built and flagged vessels’ by vessels vendors/service providers in the oil and gas industry and compliance with the local content act. The coefficient of nig_vessels (i.e. 14.61) in the AA column is positive implying that the positive relationship exists between ‘owning and using a Nigerian built and flagged vessels’ by vessels vendors/service providers and complying absolutely with the local content act. Owning and using a Nigerian built and flagged vessels in the oil and gas industry is more likely to make a vendor/service provider comply fully (i.e. class AA) with the local content act.

### Table 1: Multinomial Logistic Regression Result for Determinants of Local Content Compliance by Vessels Service Providers in the Nigerian Oil and Gas Industry

<table>
<thead>
<tr>
<th>Explanatory Variables</th>
<th>Dependent Variables (Compliance to Local Content Policy)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AA</td>
</tr>
<tr>
<td>nig_vessels</td>
<td>14.61</td>
</tr>
<tr>
<td></td>
<td>[0.98]</td>
</tr>
<tr>
<td>cat1</td>
<td>1.42***</td>
</tr>
<tr>
<td></td>
<td>[0.00]</td>
</tr>
<tr>
<td>cat2</td>
<td>1.16***</td>
</tr>
<tr>
<td></td>
<td>[0.00]</td>
</tr>
<tr>
<td>cat3</td>
<td>0.30**</td>
</tr>
<tr>
<td></td>
<td>[0.04]</td>
</tr>
<tr>
<td>const.</td>
<td>-1.43***</td>
</tr>
<tr>
<td></td>
<td>[0.00]</td>
</tr>
</tbody>
</table>

**Source:** Authors Computation with Stata 13

Note: Values in [ ] are the probability statistics of the z-score; ***, **, * implies significance at 1%, 5% and 10% respectively.

**Model Performance:** The probability of the chi² statistics is 0.00 implying that the entire model is statistically significant. The Pseudo R² of 0.21 shows that the value is greater than the minimum value of McFadden value of 0.2. Thus the model behaved normally.

**Company Categorization AA:** The coefficient of nig_vessels is positive. The positive coefficient of nig_vessels (i.e. 14.61) in
the AA column implies that ownership and usage of a Nigerian built and flagged vessels in the oil and gas industry is more likely to make a vendor/service provider absolutely comply (i.e. class AA) with the local content act. Secondly, the coefficient of cat1 (i.e. 1.41) is positive in the AA column. This implies that ownership and usage of a non-dynamically positioned vessels in the oil and gas industry is more likely to make a vendor/service provider absolutely comply (i.e. class AA) with the local content act. Thirdly, the coefficient of cat2 (i.e. 1.16) is positive in the AA column. This implies that ownership and usage of a dynamically positioned vessels in the oil and gas industry is more likely to make a vendor/service provider absolutely comply (i.e. class AA) with the local content act. Fourthly, the coefficient of cat3 (i.e. 0.30) is positive in the AA column. This implies that ownership and usage of a short term vessels in the oil and gas industry is more likely to make a vendor/service provider absolutely comply (i.e. class AA) with the local content act. Lastly, the coefficient of the constant (i.e. -1.43) is negative. This means that non-ownership and usage of all four types of vessels will make a vendor/service provider less likely to absolutely comply (i.e. class AA) with the local content act.

Company Categorization A: The coefficient of nig_vessels is positive. The positive coefficient of nig_vessels (i.e. 1.46) in the AA column implies that ownership and usage of a Nigerian built and flagged vessels in the oil and gas industry is more likely to make a vendor/service provider absolutely comply (i.e. class AA) with the local content act. Secondly, the coefficient of cat1 (i.e. 1.41) is positive in the AA column. This implies that ownership and usage of a non-dynamically positioned vessels in the oil and gas industry is more likely to make a vendor/service provider absolutely comply (i.e. class AA) with the local content act. Thirdly, the coefficient of cat2 (i.e. 1.16) is positive in the AA column. This implies that ownership and usage of a dynamically positioned vessels in the oil and gas industry is more likely to make a vendor/service provider absolutely comply (i.e. class AA) with the local content act. Fourthly, the coefficient of cat3 (i.e. 0.30) is positive in the AA column. This implies that ownership and usage of a short term vessels in the oil and gas industry is more likely to make a vendor/service provider absolutely comply (i.e. class AA) with the local content act.

Company Categorization A: The coefficient of nig_vessels (i.e. 13.99) in the A column implies that a positive relationship exists between ‘owning and using a Nigerian built and flagged vessels’ by vessels vendors/service providers and complying with the local content act. Owning and using a Nigerian built and flagged vessels in the oil and gas industry is more likely to make a vendor/service provider sufficiently comply (i.e class A) with the local content act. Though owning and using a Nigerian built and flagged vessels in the oil and gas industry is less likely (i.e. -0.37) to make a vendor/service provider slightly comply (i.e. class B) with the local content act, owning and using a Nigerian built and flagged vessels in the oil and gas industry is more likely to make a vendor/service provider reasonably comply (i.e. class BB) with the Nigerian local content act. The foregoing shows that a positive but insignificant relationship exists between owning and using a Nigerian built and flagged vessels in the oil and gas industry and exhibiting a remarkable (i.e. class AA, A, and BB) compliance with the Nigerian local content act. Thus no significant relationship exists between ‘owning and using a Nigerian built and flagged vessel and complying with the Nigerian local content act in the oil and gas industry’

Research Objective II: To ascertain the extent to which owning and using the various categories of vendors’ vessels are more likely to influence compliance with the local content policy in the oil and gas industry in Nigeria.

The result presented in table 2 will help us achieve objective two, as stated above, of this research work. The coefficients of cat1, cat2, and cat3 in table 2 will be used to ascertain the extent to which the owning and using the categories of vendors’ vessels is more likely to determine compliance with the local content policy in the Nigerian oil and gas industry.

Table 2: Multinomial Model Marginal Effect

<table>
<thead>
<tr>
<th>Company Category Classification</th>
<th>Multinomial Logit Average Marginal Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>nig_vessels</td>
<td>-0.85 [0.99]</td>
</tr>
<tr>
<td>cat1</td>
<td>-0.15*** [0.00]</td>
</tr>
<tr>
<td>cat2</td>
<td>-0.11*** [0.00]</td>
</tr>
<tr>
<td>cat3</td>
<td>0.08 [0.99]</td>
</tr>
</tbody>
</table>

Note: Values in [ ] are the probability statistics of the z-score; ***,**,* implies significance at 1%, 5 % and 10% respectively.

Tables 2 above provide us with the marginal effect result derived from the estimated multinomial model. It was found that an additional acquisition and/or usage of a category 1 vessel (s) (i.e any of crew boat, security vessel, diving support vessel, fast supply intervention vessel, supply vessels, mooring launch vessels, and shallow draft vessels) by a vessel vendor/service provider will make compliance with the Nigerian local content policy in the oil and gas industry 15% less likely. Thus, a service provider is 85% more likely to comply with the Nigerian local content policy in the oil and gas industry as it acquires and uses an additional category 1 vessel in doing its business. Additionally, the acquisition and/or usage of a category 2 vessel (s) (i.e accommodation vessel, platform supply vessel, anchor handling tug Vessel, tug boat, multi-purpose vessel, and pipe lay barges) will make compliance with the Nigerian local content policy in the oil and gas industry 11% less
likely. This implies, on the other hand, that a service provider is 89% more likely to comply with the Nigerian local content policy in the oil and gas industry as it acquires and uses an additional category 2 vessel in doing its business in Nigeria.

Lastly, acquisition and/or usage of a category 3 vessel (s), though 8% more likely to make a service provider comply with the local content policy, has no significant impact on the likelihood of complying with the local content policy.

Hypothesis I: Ownership and usage of Nigerian built and flagged vessels do not significantly determine vendors/service providers’ compliance with the Nigerian local content policy in the oil and gas industry.

The significance of ownership and usage of Nigerian built and flagged vessels shall be determined using the probability statistics of the z-score in each of the compliance categories (i.e AA, A, BB, and B) equation shown in tables 4.22.

In the compliance category AA equation, the probability statistics of the z-score for the nig_vessels coefficient is 0.98. Since 0.98>0.05, it implies that ownership and usage of Nigerian built and flagged vessels does not significantly determine total compliance (i.e category class AA) with the Nigerian local content policy in the oil and gas industry.

From the compliance category A equation, the probability statistics of the z-score for the nig_vessels coefficient is 0.98. Since 0.98>0.05, it implies that ownership and usage of Nigerian built and flagged vessels does not significantly determine sufficient compliance (i.e. category class A) with the Nigerian local content policy in the oil and gas industry.

Furthermore, the probability statistics (i.e 0.99) of the z-score, as shown in table 4.22, for the nig_vessels coefficient in the compliance category BB equation is greater than 0.05. Hence, we conclude that ownership and usage of Nigerian built and flagged vessels do not significantly determine reasonable compliance (i.e. category class B) with the Nigerian local content policy in the oil and gas industry.

Lastly, the probability statistics (i.e 1.00) of the z-score for the nig_vessels coefficient in the compliance category B equation is greater than 0.05. Hence, we conclude that ownership and usage of Nigerian built and flagged vessels do not significantly determine slight compliance (i.e. category class B) with the Nigerian local content policy in the oil and gas industry.

The foregoing shows that we can completely accept the null hypothesis of ownership and usage of Nigerian built and flagged vessels do not significantly determine vendors/service providers’ compliance with the Nigerian local content policy in the oil and gas industry.

Hypothesis II: Owning and using various categories (i.e category 1, category 2, and category 3) of vendors’ vessels has no significant impact on compliance with the local content policy in the oil and gas industry in Nigeria by vessels vendors/service providers.

The result presented in tables 4.22 also includes the probability statistics of the z-score for all the category of vendors’ vessels in each of the compliance categories (i.e AA, A, BB, and B) equation.

The coefficient of category 1 vessels (i.e. cat1) in the compliance category AA equation has a z-score probability statistics that is less than 0.05 (i.e 0.00<0.05). This shows that owning and using category 1 vessels has a significant impact on total compliance by vessels vendors/service providers with local content policy in the oil and gas industry in Nigeria. Next, the coefficient of category 2 vessels (i.e. cat2) has a z-score probability statistics that is less than 0.05 (i.e 0.00<0.05) implying that owning and using category 2 vessels has a significant impact on absolute compliance by vessels vendors/service providers with local content policy in the oil and gas industry in Nigeria. Lastly, the coefficient of category 3 vessels (i.e. cat3) has a z-score probability statistics that is less than 0.05 (i.e 0.00<0.05) implying that owning and using category 3 vessels has a significant impact on absolute compliance by vessels vendors/service providers with local content policy in the oil and gas industry in Nigeria.

The coefficient of category 1 vessels (i.e. cat1) in the compliance category A equation has a z-score probability statistics that is less than 0.05 (i.e 0.00<0.05). This shows that owning and using category 1 vessels has a significant impact on sufficient compliance by vessels vendors/service providers with local content policy in the oil and gas industry in Nigeria. Next, the coefficient of category 2 vessels (i.e. cat2) has a z-score probability statistics that is greater than 0.05 (i.e 0.24>0.05) implying that owning and using category 2 vessels has no significant impact on sufficient compliance by vessels vendors/service providers with local content policy in the oil and gas industry in Nigeria.

The coefficient of category 1 vessels (i.e. cat1) in the compliance category BB equation has a z-score probability statistics that is less than 0.05 (i.e 0.04<0.05). This shows that owning and using category 1 vessels has a significant impact on absolute compliance by vessels vendors/service providers with local content policy in the oil and gas industry in Nigeria. Next, the coefficient of category 2 vessels (i.e. cat2) has a z-score probability statistics that is greater than 0.05 (i.e 0.59>0.05) implying that owning and using category 2 vessels has no significant impact on sufficient compliance by vessels vendors/service providers with local content policy in the oil and gas industry in Nigeria.

The coefficient of category 3 vessels (i.e. cat3) has a z-score probability statistics that is greater than 0.05 (i.e 0.99>0.05) implying that owning and using category 3 vessels has a significant impact on absolute compliance by vessels vendors/service providers with local content policy in the oil and gas industry in Nigeria.
The coefficient of category 1 vessels (i.e. cat1) in the compliance category B equation has a z-score probability statistics that is less than 0.05 (i.e. 0.00<0.05). This shows that owning and using category 1 vessels has a significant impact on slight compliance by vessels vendors/service providers with local content policy in the oil and gas industry in Nigeria. Next, the coefficient of category 2 vessels (i.e. cat2) has a z-score probability statistics that is less than 0.05 (i.e 0.01<0.05) implying that owning and using category 2 vessels has a significant impact on slight compliance by vessels vendors/service providers with local content policy in the oil and gas industry in Nigeria. Lastly, the coefficient of category 3 vessels (i.e. cat3) has a z-score probability statistics that is greater than 0.05 (i.e 0.33>0.05) implying that owning and using category 3 vessels has no significant impact on slight compliance by vessels vendors/service providers with local content policy in the oil and gas industry in Nigeria.

The foregoing shows that only category 1 vessels proved to significantly influence all class of compliance with local content policy as it has a significant impact on all the compliance categories (i.e AA, A, BB, and B). Furthermore, owning and using category 1, category 2, and category 3 vessels has a significant impact on absolute compliance with local content policy in the oil and gas industry in Nigeria.

V. CONCLUSION AND RECOMMENDATIONS

From the findings of this study so far, we can conclude that though fabrication of vessels in Nigeria is one of the requirement by the Nigerian Content Law, it is not the main determinant of compliance by marine vessels vendors in the Oil and Gas Industry in Nigeria. The ability of a vendor to acquire and operate different categories of vessels has proven to be the core determinant of compliance. Vendors who can compete in all front due to ownership of all categories of vessels are more likely to comply with the local content policy in Nigeria. It was therefore recommended that the government should give grants to vendors to enable them acquire different categories of vessels for their operations. This will surely increase demand for local labourers and technical development as well.

REFERENCES


[7]. Esteves,A.M., Coyne, B. and Moreno, A. (2013). Local Content Initiatives: Enhancing the Subnational Benefits of the Oil, Gas and Mining Sectors. Revenue Watch Institute (RDI) Briefing, July 2013, pp. 2–3,online: RWI.


