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# EFFECTS OF SUPPLY CHAIN IMPROVEMENT ON OPERATIONAL COMPETENCY: EVIDENCE FROM ENGINEERING EMPLOYEES OF OIL AND GAS FIRMS IN NIGERIA

**Motilewa, B. D., Ibidunni, A. S., Worlu, R. E., Moses, C. L., Agboola, O. M.**Department of Business Management,  
Covenant University, Ota, Ogun State, Nigeria**ABSTRACT**

*This study focused on assessing the effect of supply chain improvement on the operational competency of oil and gas firms operating in Nigeria. The study adopted the mixed methods approach where quantitative and qualitative methods (survey and interview) were used in order to enhance greater validity of the research. For the quantitative research, copies of structured questionnaire were distributed to 350 employees of the selected firms, while 30 respondents were interviewed for the qualitative research. Based on the results of the regression and thematic analyses, findings show that supply chain improvement does have a significant effect on the operational competencies of firms. It is thus recommended that oil and gas firms take into cognisance the benefits accruable when they reduce production and operation costs by investing in socially and environmentally responsible relationships with their local suppliers.*

**Keyword:** Supply Chain Improvement, Operational Competence, Corporate Social Responsibility, Social Innovation, Oil and Gas Firms, Nigeria.

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**1. INTRODUCTION**

The oil and gas sector in Nigeria has been termed a controversial sector for several decades. This is because there has been persistent, widespread engagement in unprincipled business practices that entail adverse social, environmental, and ethical consequences (Du and Vieira, 2012; Woolfson and Beck, 2005). Previous studies by Ekpenyong and Udofia (2015) and Fadun (2014) have documented the negative social and environmental consequences of the

operations of oil and gas firms, such negative effects as global warming, deterioration in air and water quality for host communities, and the resource curse that has afflicted many countries with abundant oil resources. The firm's suppliers are in most social responsibility literature considered a branch of the firm's stakeholders that may not necessarily benefit directly from the firm's social responsibility practices (Sweeney, 2009). However, Porter and Kramer (2006; 2011) emphasise the role a firm's suppliers play in corporate social responsibility, highlighting that a firm's commitment to improving its supply chain by effectively harnessing the relationship with its immediate suppliers, service providers, firms in related industries and associated institutions has the potential to enhance organisational performance, through increased operational competence. Crane, Matten and Spence (2013) further reiterates this argument, by including supply chain improvement as a major aspect of CSR in the marketplace. Through supply chain improvement, firms are able to get access to improved quality of resources (labour, machinery, capital and skills) and are able to have better control over cost of operations and risks. While several researchers such as Amaeshi, Adi, Ogbechie and Amao (2006) and Amaeshi, Osuji and Nnodim (2008) have sought to find the relationship between supply chain improvement and operational competence, in several industries such as financial, education and manufacturing industries, the peculiarity of the oil and gas sector lies in the nature of its suppliers, the intensity of the technology used in the industry, and the regulations imposed by the government in the sector. It only becomes essential that a study of social responsibility in the oil and gas sector capture the true relationship between the firm and its suppliers, which highlights the benefits accruable as a result of better business process in the firm.

## **2. MATERIALS & EXPERIMENTAL PROCEDURES**

### **2.1. Supply Chain Improvement**

Supply chain improvement as a construct of corporate social responsibility seeks to reengineer a firm's entire supply chain in such a way that incorporates social, environmental and economic value to the relationship between the firm and its suppliers (Porter and Kramer, 2011). This includes investment in resources, such as research, technology and partnership that will assist the firms' suppliers in attaining efficiency (Spekman, Whane and Boyd, 2005). Supply chain improvement dominantly involves patronising, supporting and investing in local suppliers rather than international suppliers. A firm that is able to carefully harness its relationship with its local suppliers gains more control of its inputs, which invariably leads to reduced operating and material costs, essentially operational competence (Amaeshi, Osuji and Nnodim, 2008). Supply chain improvement also goes as far as ensuring that suppliers conform to socially responsible behaviour (Crane and Matten, 2004).

### **2.2. Operational Competence**

Operational competence is tagged with management's drive at reducing production/operation costs while yet utilising input resources to generate proportionate outputs (Kuo, Huang and Wu, 2010; Simpson, 2012; Ibidunni, Olokundun, Motilewa, Atolagbe & Osibanjo, 2018). This implies that at every decision making unit the firm attempts to optimise operations based on cost, quality, labour and other related input and output measures. It entails getting the most value from resources and eliminating waste in production and operations resulting from the ability to source input cheap, faster and better. Operational competence is a firm's ability to optimise resource output given a level of input. Relating operational competence with corporate social responsibility, it encompasses such benefits as reduced cost, access to better quality materials, as well as improved labour market, as a result of the firm's relationship with

its various stakeholders (specifically through an overhaul of the firm's internal operations, especially as regard waste management and supply chain improvement). Arvind, Sanjay and Omar (2005) perceive a firm to be operationally competent as long as it is capable of responding to the day-to-day requirements of members of its supply chain in an efficient manner.

## **2.2. Supply Chain Improvement and Operational Competence**

The supply chain improvement strategy seeks to reengineer a firm's entire supply chain, including natural resource extraction and sourcing, manufacturing, shipping and product delivery. Supply chain improvement goes beyond investment in resources, such as research that will assist the firms' suppliers, but also to ensuring that suppliers as well conform to socially responsible behaviour. A major aspect of supply chain improvement rests in the firm's ability to locally source for materials needed for production, thereby ensuring the development of its local suppliers (Amaeshi, Osuji and Nnodim, 2008). Firms are readily perceived as more powerful than their suppliers, and consequently expected to assume responsibility for the practices of their suppliers. As such, a firm's exercise of power should be used in such a way that encourages suppliers to adhere to some reasonable practices. Crane and Matten (2004) commends that firms can go a step further to extend training programs to the staff of their suppliers in order to minimise the rate of frictions at the point of transaction. Operational competence achieved from investment in socially and environmentally re-engineered value chain posits that the firm's investment in improved environmental friendly technology, efficient administrative processes across its supply chain will lead to reduced costs and risks and internal efficiencies, thereby improving productivity (Holiday, Schmidheiny and Watts 2002; Porter and Kramer, 2002; Ibidunni, Ibidunni, Oke, Ayeni & Olokundun, 2018). As Porter and Kramer (2011) asserts, a company's productivity can be greatly enhanced by having high-quality supporting industries and services nearby. While outsourcing from distant suppliers is possible, it is not as efficient as using capable local suppliers of services, components, and machinery, as proximity enhances responsiveness, exchange of information, and innovation, in addition to lowering transportation and inventory costs.

## **3. METHODOLOGY**

The study adopted the mixed methods approach where quantitative and qualitative methods (survey and interview) were used in order to enhance greater validity of the research by ensuring that there are no gaps in the information or data collected and to provide more information from the firms' various stakeholder groups, rather than limiting the study to information from one stakeholder group. The study population consists of the stakeholders of the top oil and gas firms quoted in the Nigerian stock exchange four firms. For the quantitative research, copies of structured questionnaire were distributed to 350 employees of the selected firms. Following the works of Saunders, Lewis and Thornhill (2009), it is stipulated that a sample size of twenty (20) to thirty (30) respondents be adopted when using semi-structured interviews, to give the researcher time to carry out in-depth analysis of the responses. Thirty interviews were thus conducted for the other stakeholder groups (stockholders, suppliers, contractors and community members).

## **4. ANALYSIS AND FINDINGS**

Out of the 350 copies of questionnaire distributed, only 336 were retrieved and analysed for this study. Across the four firms, male respondents were 194 (57.7%), while female were 142 (42.3%). Hence indicating that more male respondents participated in the study than female

respondents. Respondents under 25 years were 20 (5.9%), 25-35 years were 144 (42.9%), 36-45 years were 136 (40.5%) and 46 years and above were 36 (10.7%). 75 (22.3%) respondents were senior managers, 68 (20.2%) were analysts, 108 (32.3%) respondents were supervisors and 85 (25.3) respondents were in the category of other workers. This implies that most respondents that engaged in the present study were basically youths and young adults.

**Table 1** Standard Multiple Regression of Supply Chain Improvement and Operational Competence

Coefficients					
	Standardised Coefficients		df	F	Sig.
	Beta	Std. Error			
Policy to ensure honesty and quality	.499	.122	2	16.814	.000
Process to ensure effective feedback	.180	.092	2	3.818	.023
Use of local content	.396	.075	2	27.596	.000
Commitment to providing technical capacities	.490	.078	4	39.267	.000
Advocates new industry standards	.195	.136	3	2.032	.009
<b>R</b>	<b>0.754</b>				
<b>R<sup>2</sup></b>	<b>0.569</b>				
<b>Adj. R<sup>2</sup></b>	<b>0.560</b>				
<b>F-value</b>	<b>13, 322 = 32.653</b>				
<b>Sig.</b>	<b>0.000 (p &lt; 0.01)</b>				
Predictors: (Constant), Supply_chain: <i>honesty in contracts with suppliers, dialogue with suppliers, promotion of local suppliers, support of local suppliers, industry standards</i>					
Dependent variable: Operational_competence					

Source: Researchers’ Field Survey, 2018

The above Table 1 showed the statistical significance of the variables of supply chain improvement on operational competence using the standard multiple regression. This tested the null hypothesis that multiple R in the population equals 0. The rule here is that, a model reaches statistical significance when Sig. = .000, this really means that  $p < .0005$ . Consequently, from the table above, supply chain improvement is statistically significant to operational competence where Sig. = .000 {F (13, 322) = 32.653}. The table also shows the combined influence of the independent variables (honesty in contracts with suppliers, dialogue with suppliers, promotion of local suppliers, support of local suppliers, industry standards) on operational competence (the dependent variable) of the firms. Based on the result, supply chain improvement made significant joint influence on operational competence as R square value = 0.569 indicating that the total contribution or influence made by all the independent variables was 56.9%. This signifies that supply chain improvement had significant joint influence on the operational competence of oil and gas firms. The result in Table 1 shows that the firms’ commitment to improve it’s supply chain helps to facilitate its operational competence. It is also revealed that honesty and quality in all the firm’s contracts with its suppliers is a major predictor of operational competence which has the highest beta value of ( $beta = .499, p < .005, Sig. .000$ ) compared to other variables of supply chain improvement: providing technical capacities and assistance to local suppliers (support of local suppliers) scaled ( $beta = .490, p < .005, Sig. .000$ ), promotion of local suppliers scaled ( $beta = .144, p < .005, Sig. .004$ ). Statistically, this means that honesty in contracts with suppliers makes the strongest unique contribution in influencing operational competence.

#### **4.1. Qualitative Analysis**

Theme: Assessment of the Firms' Supply Chain Improvement Initiatives

The theme revealed that while oil and gas firms follow the local content bill and ensure at least 50% of their suppliers are sourced locally, several external stakeholders perceive that oil and gas firms (especially the multinationals) are only interested in getting the job done at the cheapest cost, while paying little attention to the development of their suppliers.

It plays a major role since firms around them no longer need to buy from black market 'cos of distance but good petrol/diesel from a main source at market price.

##### ***Firm 2/Community member***

They take Advantage of local competition

##### ***Firm 4/Employee***

The firm makes sure that at least more than 50% of her supplies and contract work is sourced locally, this boosts the firm's community visibility and adds to the local content development of Nigeria

##### ***Firm 1/Contractor***

They only want their job done. Suppliers sort things out their own way

##### ***Firm 3/Contractor***

Good opportunities given to local suppliers in line with the Local content regulations.

##### ***Firm 3/Community member***

They are performing to expectations but still need to pay for services on time

##### ***Firm 4/supplier***

### **5. DISCUSSION**

The adoption of supply chain improvement in the oil and gas sector is aided by the Nigerian content development bill of 2006, which ensures that Nigerian goods and services are given first consideration in the oil and gas sector, thereby ensuring that substantial proportion of activities, materials, engineering parts and human capital utilised in the sector is domiciled in the country. Findings from the above analysis showed that there is a significant relationship between supply chain improvement and operational competence. This implies that oil and gas firms are able to reduce production and operation costs through investments in socially and environmentally responsible relationships with their local suppliers. This finding is in agreement with Porter and Kramer's (2011) creating shared value perspective, where it is advocated that good relationships with local suppliers foster greater dependability, logistical efficiency and ease of collaboration, which have the ability to boost the firm's productivity. This is also consistent with the contentions of other researchers such as Orlitzky and Swanson (2012), Smith (2007) and Berman, Wicks, Kotha and Jones (1999). On the other hand, respondents from the qualitative study acknowledged that while oil and gas firms follow the local content bill and ensure at least 50% of their suppliers are sourced locally, they perceive that oil and gas firms (especially the multinationals) are only interested in getting the job done at the cheapest cost, while paying little attention to the development of their suppliers. Of all the various components of supply chain improvement, the regression analysis revealed that the firm's honesty in contracts with suppliers makes the strongest unique contribution in influencing operational competence.

## 6. CONCLUSION AND RECOMMENDATIONS

This study focused on assessing the effect of supply chain improvement on the operational competency of oil and gas firms in Nigeria. Based on the regression and thematic analyses, the study concludes that supply chain improvement does have a significant effect on operational competencies of firms. It is thus recommended that oil and gas firms take into cognisance the benefits accruable when they reduce production and operation costs by investing in socially and environmentally responsible relationships with their local suppliers, as this fosters greater dependability, logistical efficiency and ease of collaboration, which has the ability to boost the firms' productivity.

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