Conflict and Development in the Niger Delta Region of Nigeria. 
A Panel Co-integration Approach

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Abstract
The paper examines the direction of causality between conflict and development in the Niger Delta region of Nigeria. The famous panel Granger Causality/Block exogenous test was adopted to analyse panel data for conflict and development for two Niger Delta states from 2005-2013. The results show a bidirectional relationship (reverse causality) between conflict and development. That is, while underdevelopment is causing conflict in the Niger Delta, conflict is as well resulting from development. The significance of these findings is that both sides of the argument on this topic are valid. That is, those arguing for causality running from development to conflict and those arguing for causality running from conflict to development. Thus, no side of the argument on its own gives the whole picture. The implication of the findings is that, for the government to stop the armed conflicts in the Niger Delta, adequate development plans have to be consistently implemented by both the government and oil companies located in the Niger Delta. Nevertheless, the limitation of the paper is the small observation used, which may not have been sufficient to carry out a co-integration analysis. Hence, further studies need to be carried out in order to ensure the accuracy of the results.

Keywords: Niger delta, conflict, development, co-integration, crude oil, Nigeria

INTRODUCTION
There is plethora of literature on the causal relationship between conflict and development. A research by UNDP (2010) suggests that agitations and anger from underdevelopment are what result to violent conflict thus, arguing that underdevelopment gives rise to violent conflict. Meanwhile, other papers such as Collier; et al., (2014), Kim & Conceicao (2010), Iyoboyi, (2014), Rodrik (1999), and Okafor (2017) are in opposition to such claims. They maintain that violent conflict hampers development and discourages investments, thus arguing that violent conflict is a major cause of underdevelopment. Although these arguments are on-going in the academic discipline of development economics, majority of papers for Nigeria only focus on the impact of conflict on development or vice versa. They overlook the importance of understanding the direction of causality between the two phenomena, especially in the case of the Niger Delta. This is a serious gap in literature that this research aims to address.

The Niger Delta region of Nigeria, which is made of up nine states has seen so many cases of armed conflict in the past between the government and the communities for control of crude oil in the area. According to ACLEDDATA, (2016) there has been at least, 240 cases of armed conflict mostly from Rivers state and Bayelsa state between 2003 and 2013. These cases include, destruction of crude oil pipelines, bombing of government buildings, killing of oil workers and other violent acts. These acts usually lead to major cut in economic activities in the areas thus affects the level of development, which accords with the theory that conflict has negative impact on development. These persistent conflicts have had a negative impact on profitability of businesses in the Niger Delta region.

Problem Statement
The struggle of the Niger Delta people in Nigeria has been a concern since the discovery of oil in Oloibiri-Bayelsa state by Shell-BP in 1956, and in Ogoni-Rivers state in 1957(The Gobal Foundation , 2016). Despite the fact that the Niger Delta holds the secrete to Nigeria’s abundant crude oil export, accounting for about 90% of Nigeria’s revenue, (Akpan & Akpabio, 2009), local communities in the Niger Delta remain poor. Osuoka, (2003) found that resorting to conflicts by the Niger Delta people has become the only viable way of expressing grievances by the oil rich communities. Since majority of the youth in the Niger
Delta are unemployed, opportunity cost of fighting becomes extremely low, which further exacerbates the already deteriorating conditions. Data from Opendataforafrica (2016) show that low education attainment, Unemployment and poverty persists in Niger Delta communities. Although the Niger Delta locals claim that the government has not done enough in bringing this situation under control (Omotola, 2007), the Nigerian government has not been completely unresponsive to their demands. For example, Worldbank (2009) reports that several measures have been taken by the government to reduce the conflict, with the establishments of bodies such as the Niger Delta Development Commission (NDDC) in 1999, Oil Mineral Producing Areas Development Commission (OMPDAEC) in 1992, Ministry of Niger Delta Affairs (MNDA) in 2008 and the amnesty program by President Yar’Adua in 2009, which where all created as a move to encourage economic and social development and reduce the conflict in the regions (John, 2011). However, adequate effort has not been made in trying to combat conflict using development measures. This may be as a result of ignorance of the theoretical stance on the effect of underdevelopment on conflict, which this paper tries to shed more light on using empirical evidence.

**Gaps in Literature**

With several reports arguing that conflicts in the Niger Delta is as a result of grievances from slow development in the areas (World Bank, 2009), no empirical evidence has been found for this claim.

Further literature search showed that only one empirical paper was done for Nigeria on this topic. However, the study which was conducted by Okafaro (2017) at national level had high level of data aggregation, which may have failed to capture the unique case of the Niger Delta. These present a serious gap in literature which needs to be addressed. Therefore, this study finds this topic worthwhile pursuing, focusing on the time periods 2005-2013, when conflict was rife in the Niger Delta region of Nigeria according to Premium Times (2015).

**Research Objectives**

With existing arguments as guide, this present paper tries to add to knowledge and bridge this gap by adopting a panel co-integration approach for the Niger Delta using micro-level data with the objective of investigating the direction of causality between poor development level and rising conflicts. Following this objective, the questions for this research is as follows, ‘what is the nature of the relationship between conflict and development in the Niger Delta region of Nigeria’?

**Significance of Study**

This paper is highly valuable to the study of Development Economics. The topic of conflict and development has been under contention since the emergence of Development Economics as an academic discipline during the post-second World War, defined by violent conflict (Ginty & Williams, 2009). Ginty & Williams (2009) opine that earlier researchers were confined to studying developing states, which were prone to conflicts arising from decolonisation, post-independence power struggles and proxy competition among cold Warriors. The authors state that, earlier researchers have by and large overlooked the potential for development to contribute to both war and peace, in the aspect of what the paper enumerate as de-development, underdevelopment and uneven development. A historical evidence for this argument is seen in the Niger Delta case. Ginty & Williams (2009) further sustain that earlier studies on the subject of conflict and development used war and interplay between military and political leaders in different states as basis for their study, not considering the fact that economic conditions within states can induce violent conflict thus, regarding those studies as being myopic and limited in knowledge. As such, this paper will contribute to this ongoing argument by using level of development as recommended by Ginty & Williams (2009) to ascertain the nature of the relationship between conflict and development for the Niger Delta.

**Data/Methodological Framework**

To achieve the objective set for this research, the famous panel Granger Causality/Block exogenous test approach is adopted. Two development indicators (unemployment rate and education enrolment) were chosen to represent level of development in Niger Delta. The data for conflict (number of reported fatalities as proxy) is obtained from ACLEDDATA (2016), and that for development indicators (unemployment rate and education enrolment as proxy) were obtained from Opendataforafrica (2016). The observation runs from 2005 to 2013 to capture the periods when conflict was very high in the Niger Delta. Nevertheless, due to limited availability of data, only a few states were selected to represent the Niger Delta.

**Descriptive Statistic**

The main reason for carrying out the descriptive statistics is to examine whether the series follow a normal distribution or not. In econometrics, most of the statistical analysis and hypothesis testing procedures rely on the assumption that the variables follow the Gaussian normal distribution.
Table 1: Descriptive Statistics for all Variable

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Median</th>
<th>Maximum</th>
<th>Minimum</th>
<th>Std. Dev.</th>
<th>Skewness</th>
<th>Kurtosis</th>
<th>Jarque-Bera</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>LCONFLICT</td>
<td>2.163800</td>
<td>1.945910</td>
<td>3.95124</td>
<td>0.000000</td>
<td>1.214311</td>
<td>-0.055284</td>
<td>2.011486</td>
<td>0.618366</td>
<td>0.73404671</td>
</tr>
<tr>
<td>LEDUCATION</td>
<td>10.60699</td>
<td>10.55698</td>
<td>14.10115</td>
<td>9.967026</td>
<td>0.515169</td>
<td>0.721335</td>
<td>2.544480</td>
<td>1.430496</td>
<td>0.48907104</td>
</tr>
<tr>
<td>UNEMPLOYMENT</td>
<td>31.54667</td>
<td>27.80000</td>
<td>67.40000</td>
<td>12.10000</td>
<td>15.75966</td>
<td>1.446363</td>
<td>4.159196</td>
<td>6.069752</td>
<td>0.14808171</td>
</tr>
</tbody>
</table>

The Jarque Bera statistics, which shows insignificant p-values for the descriptive statistics placed on table 1 above shows that variables follow normal distribution, which satisfies the assumption for parametric analysis. Note that variables are logged to convert them to percentages except for unemployment rate which is already expressed in percentages.

Figure 1: Historical Trend of unemployment, Education and Conflict in the Niger Delta

Data Source: ACLEDDATA (2016) and Opendataforafrica (2016)

The three graphs in figure 1 above show an interesting perspective to the theory being tested. Between 2006 and 2009 when conflict was high in the Niger Delta, it can be observed that education enrolment fell and unemployment was high. As conflict starts to decline towards 2013, education enrolment started rising and unemployment stabilized at around 25% (indication of improving development). However, caution should be taken in reading this graph, as one cannot conclude whether the falling conflict led to the rising development or, the rising development is responsible for the falling conflict. A solid conclusion can only be reached after conducting the appropriate tests, which would determine the direction of causality.

Panel Unit Root Test

A requirement for the use of Granger causality test is that variables must follow the I (1) process that is, they become stationary when differenced once (Gujarati and Porter, 2010). Panel unit root test using Levin, Lin & Chut statistic, Im, Pearan and Shin W-stat, ADF-Fisher Chi-square and PP-Fisher Chi-square is shown below in tables 2-4 for the three variables.

Null hypothesis H0: there is no unit root
Alternative hypothesis Ha: there is unit root

Decision Rule: Accept null hypothesis if probability value is less than 0.05, otherwise accept.
Results shown on tables 2, 3 and 4 above confirm that all variables follow I (1) process, by showing significant p-values for their first differenced operator.

Cointegration Test
Having found evidence that the variables are integrated of order one, the next step is to test whether they are cointegrated. A test of panel cointegration result is used to determine the appropriate model to adopt, as Granger causality test can be conducted by either using vector error correction model (VECM) or vector autoregressive model (VAR) (Gujarati & Potter, 2010). Nevertheless, it is more appropriate to first of all, select lag length for the tests. Below is a table which shows the lag selection criteria.

Table 5: Lag Order Selection Criteria

<table>
<thead>
<tr>
<th>Lag</th>
<th>LogL</th>
<th>LR</th>
<th>FPE</th>
<th>AIC</th>
<th>SC</th>
<th>HQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>-74.40691</td>
<td>NA</td>
<td>80.53421</td>
<td>12.90115</td>
<td>13.02238</td>
<td>12.85627</td>
</tr>
<tr>
<td>1</td>
<td>-60.73700</td>
<td>18.22654*</td>
<td>39.99057*</td>
<td>12.12283*</td>
<td>12.60774*</td>
<td>11.94330*</td>
</tr>
</tbody>
</table>

* indicates lag order selected by the criterion
As can be seen on table 5 above, the lag selection criteria using AIC and SC favours the use of only 1 lag. Thus, lag 1 is selected for the purpose of the panel cointegration test placed on table 6 below.

Table 6: Pedroni Residual Cointegration Test

Series: LNCONFLICT LNEDUCATION_ENROLLMENT UNEMPLOYMENT_RATE
Sample: 2005 2013
Included observations: 18
Cross-sections included: 2
Null Hypothesis: No cointegration

<table>
<thead>
<tr>
<th>Weighted Statistic</th>
<th>Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Panel v-Statistic</td>
<td>-0.309839</td>
<td>0.6217</td>
</tr>
<tr>
<td>Panel rho-Statistic</td>
<td>0.274849</td>
<td>0.6083</td>
</tr>
<tr>
<td>Panel PP-Statistic</td>
<td>-0.339174</td>
<td>0.3672</td>
</tr>
<tr>
<td>Panel ADF-Statistic</td>
<td>0.869947</td>
<td>0.8078</td>
</tr>
</tbody>
</table>

Results from Table 6 above shows that p-values for Panel v-Statistics, Panel Rho-Statistics, Panel PP-Statistics and Panel ADF–Statistics are generally insignificant thus, VAR model is preferred for the study to the ECM model.

The VAR Model

The specification for the VAR model to be used for the test of causality in the variables is given below.

Multivariate Vector Autoregressive (VAR) Model

\[
\Delta \text{LNCONFLICT}_{it} = \beta_0 + \sum_{i=1}^{P} \beta_1 i \Delta \text{LNCONFLICT}_{it} + \sum_{i=1}^{P} \beta_2 i \Delta \text{LEducation}_{it} + \sum_{i=1}^{P} \beta_3 i \text{Unemployment}_{it} + \epsilon_t \quad \ldots \ldots .1
\]

\[
\Delta \text{LEducation}_{it} = \alpha_0 + \sum_{i=1}^{P} \alpha_1 i \Delta \text{LNCONFLICT}_{it} + \sum_{i=1}^{P} \alpha_2 i \Delta \text{LEducation}_{it} + \sum_{i=1}^{P} \alpha_3 i \text{Unemployment}_{it} + \epsilon_t \quad \ldots \ldots .2
\]

\[
\Delta \text{Unemployment}_{it} = \Phi_0 + \sum_{i=1}^{P} \Phi_1 i \Delta \text{LNCONFLICT}_{it} + \sum_{i=1}^{P} \Phi_2 i \Delta \text{LEducation}_{it} + \sum_{i=1}^{P} \Phi_3 i \text{Unemployment}_{it} + \epsilon_t \quad \ldots \ldots .3
\]

Where,
\[\Delta = \text{the difference operator} \]
\[L = \text{natural log of variable} \]
\[i t = \text{panel representation for state i at time t} \]
\[P = \text{lag of variable which has been given as 2 lags} \]
\[\epsilon_t = \text{white noise error term} \]
\[\beta, \alpha \text{ and } \Phi = \text{coefficient of variables} \]

RESULTS

Assessment of P-Values from the VAR estimate showed significant relationships for conflict, education and unemployment rate at 10%. This shows that results from the research can be relied upon in drawing a strong conclusion.

Panel VAR Granger Causality/Block Exogeneity Test

This test is carried out in form of a Wald Test.

Null hypothesis H0: there is no joint causality running from the explanatory variables to the dependent variable

Alternative hypothesis Ha: there is joint causality running from the explanatory variables to the dependent variable

Decision Rule: If probability value is less than 0.05, reject null hypothesis and accept alternative hypothesis, otherwise accept null hypothesis and reject alternative hypothesis.
As can be observed from the output in Table 7 above, null hypothesis for no joint causality running from the two development indicators (education and unemployment rate) to conflict was rejected as p-values were significant at 5%. Again, from Table 8, the null hypothesis of no joint causality running from conflict to unemployment rate was also rejected as p-values is significant at 5%. Thus, the inference is drawn that there is bidirectional relationship (reverse causality) between conflict and underdevelopment in the Niger Delta. This means that both variables under investigation are causing each other.

### DISCUSSION OF RESULTS

Causality Running from Conflict to Underdevelopment

The Niger Delta region of Nigeria has seen so many cases of armed conflict in the past between the government and the people of Niger Delta for control of crude oil in the area. According to ACLED DATA, (2016) there has been atleats, 240 cases of armed conflict for Rivers state and Bayelsa during the period under study. These cases include, destruction of crude oil pipelines, bombing of government buildings, killing of oil workers and other violent acts. With these cases of armed conflict in the Niger Delta, it can be ascertained that conflict is the reason behind the underdevelopment in the region. Kim & Conceicao (2010) which are in support of this finding state that development cannot thrive in the face of violent conflict. The paper found evidence of causal effect of conflict on development for Rwanda, following the civil war and genocide in the 1990-2000, which occurred in the country. Rodrik (1999) also reported similar findings, arguing that conflict has adverse effects on economic growth. A research carried out by Collier, Elliott, Hegre, Hoeffler, Reynal-Querol, & Sambanis (2014) for developing countries, highlight violent conflicts to be the primary cause of underdevelopment in the developing countries. Finally, Okafor (2017) using panel estimation techniques also provides evidence for causality running from conflict to underdevelopment for ECOWAS countries. These previous findings provide support for the findings in this present paper for the direction of causality from conflict to underdevelopment.

Causality Running from Underdevelopment to Conflict

The struggle of the Niger Delta people in Nigeria has been a concern since the discovery of oil in Oloibiri-Bayelsa state by Shell-BP in 1956 and Ogoni, Rivers state in 1957 (The Gobal Foundation, 2016). As mentioned in the earlier part of this paper, despite the fact that the Niger Delta holds the secret to Nigeria’s abundant crude oil export, accounting for about 90% of Nigeria’s revenue, (Akpan & Akpabio, 2009), local communities in the Niger Delta remain poor. Osuoka, (2003) found that resorting to conflict by the Niger Delta people has become the only viable way of expressing grievances by the oil rich communities. Since majority of the youth in the Niger Delta are unemployed, opportunity cost of fighting becomes extremely low, which further exacerbates already deteriorating conditions. Data from Opendataforafrica (2016) show that low education attainment, unemployment and poverty persists in Niger Delta communities. While there are many factors that could cause conflict, many empirical studies find that poor economic performance is associated with higher incidence of conflict, see (Kim & Conceicao, 2010). A report by UNDP (2010) also shows that being poor is correlated with most forms of conflict.

These therefore provide justification for the reverse causality running between underdevelopment and conflict for the Niger Delta.

### CONCLUSION/POLICY RECOMMENDATIONS

The objective of this paper was to determine the direction of causality between conflict and development in the Niger Delta region of Nigeria,
using the Panel VAR Granger Causality/Block Exogeneity tests. The results show a bidirectional relationship (reverse causality) between conflict and development for the Niger Delta, which is a recent development on this topic done for the Niger Delta. This finding should encourage researchers to choose to investigate the direction of causality, instead of assessing the obvious. The findings of this paper are therefore summarised in a diagram below for better understanding, so as to recommend suitable policies that can be pursued by the Nigerian government towards the resolution of the persistent violent conflict in the Niger Delta.

![Diagram showing the relationship between Conflict and Underdevelopment](image)

**Figure 3: The Niger Delta Situation and Suitable Policies**
*Source: Authors Construct*

The diagram in figure 3 above shows the summary of this paper. From the diagram, the Nigerian government can choose sound policies that would work to avoid factors in box A, or policies to improve factors in box B. The Bidirectional relationship the Niger Delta faces means that by implementing polices that could work to improving the factors in box B, factors in box B would automatically address itself. Hence, it is recommended that the Nigerian government should consider creating jobs and providing basic amenities for the Niger Delta people. The oil companies in the Niger Delta should take care of the environment, initiate adequate corporate social responsibility measures and offer scholarships for locals. Hence, it is recommended that the Nigerian government should consider creating jobs and providing basic amenities for the Niger Delta people. The oil companies in the Niger Delta should take care of the environment, initiate adequate corporate social responsibility measures and offer scholarships for locals. Although evidence seen earlier in figure 1 shows that the situation in the Niger Delta has been slightly improving since 2012, implementing the recommendations from this research should further speed up the rate of improvement. This finding is in line with Ginty & Williams (2009) argument that development is also a major source of violent conflict in the modern world worth researching.

**Limitations of the Research and Recommendations for Further Study**

There are two serious limitations to this study. First is the assumption that data from only two states is sufficient to generalise for the other remaining 7 states in the Niger Delta. Secondly, according to rule of thumb, the use of Granger causality test is more appropriate when observation is very large. The observation in this paper is not up to 100 which means that the results produced may be bias to some extent. It was very difficult to obtain data on a disaggregated level for all the 9 states that make up the Niger Delta. Therefore, future researchers should try to obtain disaggregated data for the 9 Niger Delta states, which will increase the observation and provide a stronger conclusion.

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