THE NEXUS BETWEEN INCOME INEQUALITY, OIL RESOURCES AND THE INSTITUTIONAL SYSTEM IN OIL EXPORTING COUNTRIES: EVIDENCE FROM NORWAY

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Abstract - Within the existence of weak institutional environment and the spread of corruption in natural resources exporting countries, a big challenge has been raised to achieve high levels of growth and prosperity. Natural resources are a coin with two faces either a curse or a blessing depending on the state of the governmental system. Regulations play a key role for better resource exploitation. The current study attempts to investigate the nexus between income inequality, oil resources and the institutional system in oil rich countries (Norway). Using the autoregressive distributed lag (ARDL) bounds testing approach. The GINI index is used as a proxy for income inequality while oil rents and oil exports are used to measure the dependency on natural resources. Government stability and the interaction between oil rents and democracy are used as measures for the institutional system in Norway. Bound testing for co-integration and error correction model (ECM) under ARDL methodology was applied. Results have indicated the existence of a long run relationship among the variables. We found evidence that natural resource abundance widens income inequality while strong political and institutional framework reduces income inequality, which confirms previous findings in the literature. Between the terms "blessing and curse", oil rich countries with strong political system and institutional framework as Norway have succeeded to maintain stability within the economy. Oil abundance in Norway widens Income Inequality but the effect is less when it is accompanied with strong institutional and governmental policies.

Keywords - Income Inequality, Oil Rents, Institutional System, ARDL

I. INTRODUCTION

Within the existence of weak institutional environment and the spread of corruption in natural resources exporting countries, a big challenge has been raised to achieve good levels of development and prosperity. Natural resources could be a coin with two faces either a curse or a blessing depending on the strength of the Internal governmental environment. Regulations play a key role for better resource exploitation. Oil dependent countries are among most troubled, the most authoritarians and conflicts ridden. Political distribution of rents causes distortions and reduces the efficiency of investment and economic reform (Karl2005). Politics affects the collection, allocation and use of oil rents while oil affects politics in return, a large concentrated rent source in national income can turn the social and political institutions of a producing country, into what some have termed the "rentier state"(Karl 1999, Auty 2001). Income Inequality is associated with natural resources; it is driven by six basic forces: politics, demography, education, trade competition, finance and labor-saving technological change (Lindert et al 2016). Very dependent oil economies are associated with higher income inequality (Parcero et al 2016). From the other hand, some studies have shown that oil abundance lowers income inequality when there is good attainment in education and health sectors due to oil booms.

The current study attempts to investigate the nexus between income inequality, natural resources and institutional system in oil rich countries (Norway). Using the autoregressive distributed lag (ARDL) bounds testing approach. The dependent variable is represented by the GINI index as a proxy for income inequality while oil rents and oil exports are used to measure the dependence on natural resources. Government stability and the interaction between oil rents and democracy are used as measures for the institutional system in Norway. The research is being structured into five sections: section1 is an introduction, section2 gives an overview on the oil sector and the institutional system in Norway, section3 reviews the literature, section4 provides methodology and empirical results while the last section covers the concluding remarks.

II. OVERVIEW ON THE OIL SECTOR AND THE INSTITUTIONAL SYSTEM IN NORWAY

Norway has a stable economy with vibrant private sector, a large state sector and an extensive social safety net. It is rich with natural resources as oil which provides about 9% of jobs 12% of GDP 13 % of the state's revenue and 37% of exports. Norway is the world's 16th oil producer and 10th oil exporter. It has the world largest sovereign wealth fund with over $1 trillion at the end of 2017 (CIA). The discovery of oil in Norway in 1960 was followed by a long phase of large investments in the industry. In 1990 Norway established the GPFG to administer oil revenues and the first net transfer to the GPFG occurred in 1996. By undertaking its investments abroad, the GPFG also limits Dutch Disease effects. (Kabezon et al 2018). Norway has diversified its economy during the past few years. The share of hydrocarbon exports has reached 55.47% of total exports while the non-

hydrocarbon exports represent 47.55% of total exports in the country. (World Bank).The political system in Norway is a parliamentary democracy with a royal figurehead. Elections are based on proportional representation. Since 1961, every government has been either a minority government or a majority coalition government (Overbye 2017). Norway has maintained good levels of governance and was too far to experience sharp political tension and instability according to the world bank governance indicators (World Bank Report). The country has been engaged in foreign aid programmes to African countries. The main goal of the implementation of this strategy was to strengthen governance application within the Norwegian system, reduce corruption and enhance democracy and human rights in the targeting countries (Nustad 2006). The prudent planning of the Norwegian government played an extremely important role in managing oil and gas revenues, Norway has established a sovereign wealth fund to prevent its economy from any possible shocks and crises to the time when its natural resources are drain out (Norges Bank 2018).

III. REVIEW OF THE LITERATURE

Resource rich countries should focus more on the institutional factor to prevent rent seeking and patronage (Kim et al 2017). Governments should adopt policies to prevent dependency on a single commodity as the use of prudent exchange rate policies and measures to boost the competitiveness of manufacturing and agricultural sectors and direct their oil revenues spending toward investments in infrastructures and on education and health (Brempong 2002). Natural resources lead also to inequality in the presence of corrupted political system and weak institutional economic framework (Ross 2007). Resource booms reduce inequality in the short run in developing countries in the presence of unskilled labor intensive non-traded sector while in the long run the effect will diminish, and inequality levels return to the pre boom state (Dobson et al 2012). In countries were asset distribution is less equal corruption is associated with a smaller increase in income inequality and a large drop in growth rate (Buccellato et al). Extent of corruption depends on natural resource abundance, government policies and bureaucracy (Li et al 2000).

(Leite et al1999) found evidence that Income inequality reduces economic growth and Increases poverty within MENA region, Thus, Institutional quality is positively linked with income inequality in poor countries while in rich countries there is a negative linkage (Ncube et al 2013). (Chong et al 2000) demonstrated that in some cases corruption reduces inequality in Latin American Countries. The explanation for these findings is related to the large informal sector that provides jobs for the poorest in society while in the provision of some government projects corruption will improve along with the welfare of the poorest. Corruption affects budgetary revenues and expenditures by reducing economic growth, progressivity of taxes, the level of social spending and the formation of capital human. (Goderis et al 2011). It also decreases the growth rate by reducing investment and productivity of the existing resources where the poor endure the most of its effect (Gupta et al 1998).

Oil rents can be a struggle for democracy. (Asfaha 2012) Found that Among oil exporters countries Norway and Mexico tend to be democracies while Nigeria Russia and Venezuela show a weak level of freedom. Efficient political mechanisms lead to better desirable effect of natural resources on the economy (Schubert 2006). Enhancing democracy and increasing government spending on education housing and social affairs can reduce the negative externality of oil rents that affects income distribution while the increase of inflation due to financial development, high liquidity and military expenditures worsen the gap between the rich and poor (Diaji 2016). Rise in oil exports does greater damage to democracy in poor states than in rich ones (Ross 2001). High level of political fractionalization indicates weak government which consequently make oil revenues to be fully wasted, in contrast when there is less fractionalization, oil revenues exercise positive effect on income (Bjorvatin et al 2012). High income oil states can experience violence and political instability in low income countries due to large scale distributive policy, when oil rents are being distributed by patronage (Hodler 2009). Ethnicity is another factor that affect Income Inequality. (Basedau et al 2006) showed evidence that natural resources raise income inequality in ethnically polarized countries but reduce it in ethnically homogenous countries as Norway

IV. METHODOLOGY AND EMPIRICAL FINDINGS

The aim of this study is to investigate the relation between income inequality, natural resources and the institutional system in Norway. To check for co-integration among the variables bound test approach and error correction model (ECM) have been used to detect the existence of long run and short run relationship using autoregressive distributed lag ARDL (Pesaran and Shin1999, Pesaran et al 2001).
-The general ARDL (p, q) model is specified as:

$$Y_t = Y_0 + \gamma_i \sum_{i=0}^{p} Y_{t-1} + \sum_{i=0}^{q} \beta_i X_{t-1} + \varepsilon_{it}$$

Where:
Y_t: The dependent variable represented by the natural logarithm of the GINI Index

Y_0: The constant
Y_{t-1}: Lag of the dependent variable Y_t
X_{t-1}: The matrix of the independent variables (LNOIL_RENT, LNOIL_EXP, LNGDP, LNGOV_STAB, LNOILDEMO)
γ and β: Parameters
$_{\varepsilon}$t is the error term

4-3-Bound test for co-integration:
The general form of the co-integration equation is as follow:

$$\Delta Y_t = Y_0 + \sum_{i=1}^{p} \gamma_i Y_{t-1} + \sum_{i=1}^{q} \beta_i X_{t-1} + \sum_{i=1}^{p} \alpha_1 \Delta Y_{t-1} + \sum_{i=1}^{q} \alpha_2 \Delta X_{t-i} + \varepsilon_{it}$$

4-4-Error Correction Model (ECM):
The general form of the Error Correction Model is:

$$\Delta Y_t = Y_0 + \sum_{i=1}^{p} \alpha_1 \Delta Y_{t-i} + \sum_{i=1}^{q} \alpha_2 \Delta X_{t-i} + \gamma ECT_{t-1} + \varepsilon_{it}$$

4-2-Data:
We used annual data from the period 1984-2016 in Norway based on their availability. For Income Inequality we used GINI Index from the SWIID Database while Oil Rents, Oil Exports, GDP growth were extracted from the World Bank Database. Government Stability and Democratic Accountability were taken from the World Bank Governance Indicator Database to represent the institutional system.

4-5-Results and discussion:
4-5-1-Unit Root Test:

SERIES	ADF TEST		PP TEST	
	Level	First Difference	Level	First Difference
LNGINI	(-1.013)	(-5.289) *	(-1.063)	(-5.288)*
LNOIL_RENTS	(-3.414)**	-	(-3.414)**	-
LNOIL_EXP	(-2.895)	(-5.687)*	(-2.882)	(-5.068)*
LNGDP	(-2.020)	(-3.922)**	(-1.90)	(-3.92)**
LNOILDEMO	(-3.873)**	-	(-3.802)**	-
LNGOV_STAB	(-3.490)**	-	(-2.691)***	-

Table-1-Unit Root Test
(*) 1% level of significance
(**) 5% level of significance
(***) 10% level of significance

From table 1, the unit root test shows that LNGINI, LNOIL_EXP and LNGDP are first order integrated while LNOIL_RENTS, LNOILDEMO and LNGOV_STAB are stationary at level. However, the non-stationary series attained stationarity after the first difference.

4-5-2-Cointegration test:

F-Bounds Test	Null Hypothesis: No Levels Relationship			
Test Statistic	Value	Signif	I_0	I_1
F-Statistic K	3.293149 5	10%	2.08	3
		5%	2.39	3.38
		2.5%	2.70	3.72
		1%	3.06	4.15

Table-2- Bound Test

Table- 2- shows that the computed F statistic (3.27) is greater than the upper bound critical value at level of significance (1%,2.5%, 5% and 10%) respectively, then the null hypothesis H0 is rejected, the variables under study are co-integrated.

4-5-3-Estimation of long run coefficients:

Variables	Coefficient	Sd.err	t.statistic	prob
LNOIL_RENTS	0.692	0.183	3.766	0.001
LNOIL_EXP	0.158	0.127	1.240	0.030
LNGDP	-0.135	0.039	-3.464	0.002
LNGOV_STAB	-0.129	0.064	-2.024	0.057
LNOILDEMO	-0.711	0.175	-4.051	0.007
C	5.474	0.899	6.0865	0.001

Table-3- Long Run Coefficients

the coefficients of all the variables are significant at 5% level of significance except LNGOV_STAB which is significant at 10% level.
-one unit change in LNOIL_RENTS leads to 0.69 unit increasing in LNGINI.
-one unit change in LNOIL_EXP leads to 0.15 unit increasing in LNGINI.
-one unit change in LNGDP leads to 0.13 unit decreasing in LNGINI.
-one unit change in LNGOV_STAB leads to 0.12 unit decreasing in LNGINI.
-one unit change in LNOILDEMO leads to 0.71 unit decreasing in LNGINI.

4-5-4- Error Correction Model:
Table-4- shows that ECT (-0.54) is negative and significant at 5% level of significance, this indicates the presence of equilibrium between the short and the long run, deviation from the long term is corrected by 54 % by the next year.

The speed of conversion from the short run to the long run equilibrium is 1/0.54= 1.85 which means that 54% of the disequilibrium between short and long term will be corrected after less than two years.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNGDP)	-0.075	0.030	-2.477	0.022
D(LNGDP(-1))	-0.069	0.027	-2.496	0.021
D(LNGOV_STAB)	-0.024	0.022	-1.098	0.085
CointEq(-1)*	-0.540	0.098	-5.507	0.000
R-squared	0.517	**Mean dependent var**	0.005	
Adjusted R-squared	0.460	**S.D. dependent var**	0.020	
S.E. of regression	0.014	**Akaike info criterion**	-5.462	
Sum squared resid	0.005	**Schwarz criterion**	-5.273	
Log likelihood	83.205	**Hannan-Quinn criter.**	-5.403	
Durbin-Watson stat	1.846			

Table-4- Error Correction Model

4-5-5-Diagnostic tests for the ARDL model:
To test the validity of the ARDL model we have applied some diagnostic tests to check for serial correlation, heteroskedasticity and model stability using CUSUM and CUSUM OF SQUARES tests.

Tables 5 and 6 show that the residuals are not auto correlated and there is no Heteroskedasticity in our model. Figure-1- demonstrates that residuals fall within the significance level of 5%, which indicates that the model is stable in the period under study and can be used for prediction.

F-statistic	0.183965	**Prob. F(2,17)**	0.8336
Obs*R-squared	0.614348	**Prob. Chi-Square(2)**	0.7355

Table-5-Breusch-Godfrey Serial Correlation LM Test

F-statistic	**1.207**	Prob.F(9,19)	**0.346**
Obs*R-squared	10.552	**Prob.Chi-Square(9)**	0.307
Scaled explained SS	4.185	**Prob.Chi-Square(9)**	0,898

Table-6-Heteroskedasticity Test Breusch-Pagan-Godfrey

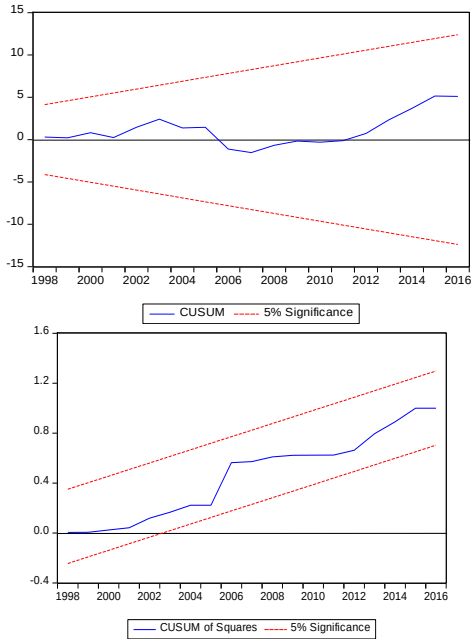


Figure-1- CUSUM and CUSUM of squares tests

V. CONCLUSION

The literature on income inequality and oil abundance argued whether oil dependence countries can achieve high levels of growth or the dependency on natural

resources within their economies may reduce growth rates and increase inequality and poverty. We found evidence that natural resource abundance widens income inequality while strong political and institutional framework reduces income inequality, which confirms previous findings in the literature. Between the terms "blessing and curse", oil rich countries with strong political system and institutional framework as Norway have succeeded to maintain stability within the economy. Oil abundance in Norway widens Income Inequality but the effect is less when it is accompanied with strong institutional and governmental policies.

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