Unemployment Hysteresis in African Oil Exporting Countries: Evidence from Fourier Unit Root Test

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ABSTRACT: This study investigates the stochastic properties of unemployment rate in top ten African oil exporting countries, by examining whether the high unemployment rate in these countries are mean reverting or non-stationary. Using annual data spanning between 1991 and 2023, the study employs a battery of unit root tests, namely, Classical ADF, Fourier ADF (FADF), ADF with Structural Break (ADF-SB) and Fourier ADF with Structural Break (FADF-SB) to test which of the hypothesis of unemployment (natural rate hypothesis, hysteresis hypothesis and structural slump hypothesis) do the unemployment behaviours in African oil exporting countries actually belong to. Findings from the study reveal the superior functionality of FADF-SB over the other unit root tests, stemming from the ability of the ADF model laced with both Fourier and Structural Break to revert the high unemployment rates of all the reviewed countries to equilibrium. Based on the findings in this study, it is therefore concluded that the characteristics of unemployment rate in African oil exporting countries align with and support the structural slump hypothesis of unemployment and thereby recommended that the structural factors should be modelled in the unemployment trend of their economies.

KEYWORDS: Hysteresis, Fourier ADF, Structural Break, Non-linearity, Unemployment Rate
JEL Classification: C22, E24, J64

I. INTRODUCTION

Unemployment has been adjudged as a social and macroeconomic issues facing developing countries of the world (Kingdon and Knight, 2007). Critical macroeconomic policy objectives have been put in place particularly in Africa to achieve a robust and sustainable productivity with stable and low rates of unemployment. The stipulated macroeconomic policy goals have not been achieved as expected because the social and economic derivations of unemployment had resulted to income inequality, increased crime rates and huge poverty level (Kingdon and Knight, 2007). In this regard, it is quite pertinent to consider unemployment as one of the critical parameters in knowing the macroeconomic dynamics of most African economies and in setting up sound policies that will strengthen their economic growth and development.The major focus of this study is on the African oil exporting countries and what actually informed the investigation of a plausible persistence in the unemployment rates of these regions is because of Dutch Disease. Theoretical proponents agree that the ability to sell crude oil at higher prices should be a blessing to oil exporting countries, as this will boost the government income, strengthen expenditure on infrastructural facilities and increase the employment level (Cheratian et al, 2019). But reverse is the case as the past studies have attributed the major reason for chronic unemployment level, particularly in African oil exporting economies, to the problem of Dutch Disease which has characterised many resource-endowed countries (Cheratian et al, 2019).The concept of Dutch Disease which was introduced by Corden and Neary (1982) happens when an increase in the revenues got from the proceeds of products of the booming sector results in a tremendous reallocation of labour and other factors of production away from non-booming sectors to the booming sector. This actually makes the booming sector to lack enough strengths to accommodate all labours from the non-booming sectors. This will thus lead to the economy experiencing a rise in the unemployment level, a de-industrialization and a fall in productivity and output growth. In this regard, investigating into the unemployment behaviours in the African oil exporting countries will contribute to the existing research works and debates on unemployment dynamics in Africa. A deep delve into the dynamics of unemployment in African oil exporting countries makes this study to look into the three prominent hypotheses of unemployment, that is, natural rate hypothesis, hysteresis hypothesis and the structural slump hypothesis. The natural rate hypothesis, which according to Phelps (1967) and Friedman (1968) is equally known as the non-accelerating inflation rate of unemployment (NAIRU), explains the

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unemployment rate that has the potential to revert to equilibrium after some shocks. Second, the structural slump hypothesis means that the unemployment rate oscillates around the equilibrium, but shift at times as a result of structural changes due to technological advancement (Phelps, 1994). Third, the hysteresis hypothesis explains a shock that has a permanent impact on the unemployment rate. In the situation of this hysteresis hypothesis, unemployment rate does not have the potential to revert to equilibrium and it is therefore categorized as a non-stationary process. In a bid to test the validity of hysteresis hypothesis on the concept of unemployment so as to know the real behaviour of unemployment, series of empirical studies have been carried out by the past researchers. Most of these past studies have focused majorly on the developed economies (Furuoka, 2017; Gil-Alana, Ozdemir and Tansel, 2019; Cheng, 2022; Akdogan, 2017; Ozdemir, 2021). The few available research works on the developing countries, particularly Africa, were either focused on non-oil producing countries (Maskaeva and Msafri, 2021; Caporale and Gil-Alana, 2018; Pikoko and Phiri, 2018) or were based on studies that validated the unemployment hysteresis hypothesis using linear unit root test (Uchenna et al., 2018; Olanipekun et al., 2017; Dennis, 2022; Fattah, 2017; Ayinde and Egbetunde, 2015; Raifu, 2021). Meanwhile, the adoption of univariate linear unit root tests (ADF unit root test, Philip Perron unit root test), majorly poses ineffective statistical strength to detect the hysteresis hypothesis in the behaviour of unemployment rate (Song and Wu, 1988; Leon-Ledesma, 2002). This current study is therefore unique and novel in the sense that it investigates the hysteresis hypothesis in the behaviour of unemployment rate of ten African oil exporting countries (Algeria, Angola, Chad, Democratic Republic of Congo, Equatorial-Guinea, Gabon, Libya, Nigeria, South-Sudan and Tunisia) on which there are limited studies of unemployment hysteresis. In addition, this study is equally able to correct the shortcomings of the past research works who adopted the linear form of unit root test to investigate the existence of hysteresis in the unemployment behaviour. This is workable in this research work with the incorporation of a battery of unit root test, namely, Augmented Dickey Fuller (ADF) test, the Fourier ADF (FADF) test, the ADF with structural break (ADF-SB) and the Fourier ADF with structural break (FADF-SB) test. The last test, that is, Fourier ADF with structural break (FADF-SB) which is the major focus of contribution and novelty in this study is capable of capturing both the non-linearity and structural break components in the time series data. Also, following the econometric steps of Furuoka (2017), this study equally adopts the F-test to ascertain the most preferable estimation model among the four different unit root test chosen in this research work. The remaining aspect of this study is designed as follows: section 2 presents the review of empirical literatures, section 3 describes the data and methodological framework. Results and discussion of findings are reported in section 4, while section 5 presents conclusion and policy implications.

II. LITERATURE REVIEW

Adopting a monthly data set spanning from 1983M1 through 2019M7, Ozdemir (2021) tested the existence of hysteresis hypothesis in the unemployment rate of 19 Euro Area countries. Findings from the results of univariate unit root test initially employed in the study confirmed that there is an existence of hysteresis hypothesis in the unemployment rate of the whole 19 Euro Area countries. Even after adopting panel unit root tests that incorporates structural breaks, findings of the study still can't reject the hysteresis hypothesis for the 19 Euro Area countries. Furuoka (2017) examined the existence of hysteresis in the unemployment rate of 4 Nordic countries, that is, Denmark, Finland, Norway and Sweden, covering a period between 2000 and 2014. Findings from the results of ADF and FADF revealed that there is existence of hysteresis in the unemployment rate of all the 4 Nordic countries. But the results from the ADF-SB validated the existence of hysteresis for Finland and Sweden, while the null hypothesis of hysteresis for Denmark and Norway was rejected. Results from the FADF-SB which posed the most consistent findings confirmed the non-existence of hysteresis hypothesis in the unemployment of the 4 Nordic countries. Maskaeva and Msafiri (2021) investigated the hysteresis hypothesis in the youth unemployment rate of South Africa. By focusing on the macro-micro effects of employment policy, the study employed a Dynamic Computable General Equilibrium model with the 2015 South African Social Accounting Matrix to estimate the impact of youth unemployment on the aggregate economic outcomes. When the import price of fuel was reduced by 20 percent in the simulation model, the findings of the study revealed that there is an increase in the demand for youth labour, thereby reducing the youth unemployment rate of South Africa. Pikoko and Phiri (2018) examined 8 categories of unemployment for hysteresis hypothesis in South Africa. By employing univariate unit root test for the quarterly data of post-recession period of 2008, the study's findings confirmed that aside the adult unemployment aged 55 to 65 years, other unemployment, comprising youth unemployment rate show the existence of hysteresis hypothesis. Also, Olanipekun et al (2018) used univariate unit root test to investigate the hysteresis hypothesis in the unemployment rate of South Africa and Nigeria. Findings from their study revealed the existence of hysteresis hypothesis in South African unemployment while the null hypothesis of hysteresis was rejected for Nigeria. Caporale and Gil-Alana (2018) used a fractional integration approach to investigate the presence of hysteresis in the behaviour of unemployment rate of 11 African countries. Findings from the research confirmed the existence of hysteresis in the unemployment behaviour of the 11 African countries; the cause which was hinged on the stunted economic and financial growth and poor labour market framework. Raifu (2021) adopted panel OLS and panel ARDL to assess the

impact of institutional quality in the relationship between unemployment and oil price of African and Asian oil exporting countries. Findings from the panel OLS confirmed that an increase in oil price equally increases the rate of unemployment in African oil exporting countries, while the same increment in oil price reduces unemployment in the Asian oil exporting countries. Findings from the results of panel ARDL in its own case revealed that an increase in the oil price brings a reduction in unemployment of African oil exporting countries only in the short-run, while a reduction in the oil price reduces unemployment rate of Asian oil exporting countries only in the long run.

III. DATA SET AND RESEARCH METHODS

The data set designed for this study is based on the annual time series of unemployment rates spanning from 1991 to 2023. The unemployment rate which is the percentage of unemployment in total labour force was sourced from the World Development Indicators (WDI) of World Bank. The data on unemployment rate were compiled for the top ten African net oil exporting countries, namely, Algeria, Angola, Chad, Democratic Republic of Congo, Equatorial-Guinea, Gabon, Libya, Nigeria, South-Sudan and Tunisia.

The unemployment hysteresis hypothesis was examined in this study by four different types of unit root tests, namely, ADF, FADF, ADF-SB and FADF-SB. The last three unit tests are described as an extension of the conventional univariate unit root test (ADF). The basic version of the ADF test (Dickey and Fuller, 1979) is presented on the following model:

$$\Delta y_t = \beta + \alpha_0 y_{t-1} + \sum_{j=i}^{m} \alpha_i \Delta y_{t-1} + \mu_t \dots\dots\dots\dots\dots\dots.1$$

Where y_t represents the time series, β, α_0 and α_i depicts the estimated parameters; m represents the lag length of the autoregressive model and μ_t is the error term. The conventional ADF unit root test is known for its feature of not taking into a cognizance the unknown structural breaks and non-linearity in the model. Meanwhile, unemployment rate might have undergone smooth or instantaneous transition process over the years (Perron, 1989). Therefore, for the consideration of this, Enders and Lee (2012) broadened the conventional ADF unit root test, using the Fourier approximation to capture the non-linearity in the model. The Fourier ADF (FADF) capturing non-linearity is presented based on the following model:

$$\Delta y_t = \beta y_t + \alpha_0 + \theta_1 sin\left(\frac{2\pi kt}{N}\right) + \theta_2 cos\left(\frac{2\pi kt}{N}\right) + \sum_{j=i}^{m} \alpha_i \Delta y_{t-1} + \mu_t \dots\dots\dots 2$$

Where k is the Fourier frequency, θ are the parameters for the Fourier approximation, t represents the trend time; N is the number of observations, π is 3.1416. The parameters θ_1 and θ_2 become the real values when they are estimated, if they are zero (0), the model becomes linear, but becomes non-linear if they give a value of at least one. In order to take into account the structural break and non-linearity in the ADF framework, Furuoka (2017) further extended the ADF testing regression of Perron (2006) which only considered structural break in the unit root test. In this regard, the ADF unit root test is complimented by the ADF-SB of Perron (2006) and FADF-SB of Furuoka (2017) which are modelled respectively as follows:

$$\Delta y_t = \beta y_t + \delta DU_t + \gamma D(TB)_t + \alpha_0 y_{t-1} + \sum_{j=i}^{m} \alpha_i \Delta y_{t-1} + \mu_t \dots\dots\dots\dots\dots..3$$

$$\Delta y_t = \beta y_t + \theta_1 sin\left(\frac{2\pi kt}{N}\right) + \theta_2 cos\left(\frac{2\pi kt}{N}\right) + \delta DU_t + \gamma D(TB)_t + \alpha_0 y_{t-1} + \sum_{j=i}^{m} \alpha_i \Delta y_{t-1} + \mu_t \dots\dots\dots\dots.4$$

Where δ represents the coefficient of the structural break, DU_t is the break dummy while TB signifies the break date. DU_t is set to be one if t is greater than the TB, otherwise, DU_t will be set to zero. Moreover, it is equally pertinent to employ an estimation technique that will be used to determine the best among the four unit root tests. Determining the most preferable among the four alternatives is very important because of the following circumstances that subsist among the four types of unit root tests. First, the conventional ADF test is regarded as a restricted model of the FADF test, this is because, non-linearity terms are set to zero. Second, the ADF test is described as a restricted model of the ADF-SB test, because the structural break dummies are unavailable. Third, the ADF test is termed as a restricted model of the FADF-SB test, because both the structural break dummy and non-linearity are not present. Fourth, the FADF test is described as a restricted model of the FADF-SB, because there is no structural break dummy in the model. Lastly, the ADF-SB test is regarded as a restricted model of the FADF-SB test, because the non-linearity terms are not available. Therefore, from the above circumstances, five major cases are formed as follows:

$\Gamma_{FADF\_ADF}; \ \Gamma_{ADF-SB\_ADF}, ; \Gamma_{FADF-SB\_ADF}; \Gamma_{FADF-SB\_FADF}$ and $\Gamma_{FADF-SB\_ADF-SB}$

The F-statistics that is used to ascertain the most preferable unit root test is presented as follows:

$$F = \frac{(SSR_0 - SSR_1)/q}{SSR_1/(T-S)} \dots\dots\dots\dots\dots\dots 5$$

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Where SSR_1 represents the sum of squared residuals (SSR) from the unrestricted model. SSR_0 is the SSR from the restricted model; q denotes the number of restrictions in the restricted model. S is the number of regressions in the unrestricted model.

IV.   RESULTS AND DISCUSSIONS
A.   Descriptive Statistics

This aspect is purposefully conducted to help describe, show and summarize data in a meaningful way that patterns might come out from the data.

Table 1: Descriptive Statistics

Country	Mean	Minimum Rate	Maximum Rate	Standard Deviation
Algeria	17.83	9.82	31.84	7.61
Angola	16.32	14.22	17.48	0.64
Chad	0.87	0.63	1.68	0.24
DR Congo	3.91	2.95	5.51	0.72
Equatorial Guinea	8.19	7.39	9.19	0.34
Gabon	18.81	16.91	21.43	1.45
Libya	19.17	18.52	19.71	0.29
Nigeria	4.08	3.51	5.63	0.54
South Sudan	12.49	11.84	14.41	0.61
Tunisia	15.44	12.36	18.63	1.76

Source: Author's computation through E-view software

The table 1 above displayed the patterns of unemployment in the top ten oil exporting countries in Africa. Results in the table showed that Chad, DR Congo, Equatorial Guinea and Nigeria have relatively low unemployment rate with their values depicting single digit, while unemployment rates in Algeria, Angola, Gabon, Libya, South Sudan and Tunisia are relatively high with double digit values. Libya records the highest average unemployment rate (19.17%) while Chad has the lowest average unemployment rate (0.24%). The country with the utmost level of volatility in unemployment rate is Algeria with its standard deviation standing at (17.83) while Chad also records the lowest fluctuations in unemployment rate with standard deviation of (0.24).

Table 2: Augmented Dickey Fuller (ADF) Unit Root Test Results

Country	No Constant and Trend	Constant Only	Constant and Trend
Algeria	-0.8839	-0.6598	-3.4166
Angola	-0.8781	-3.0943	-3.6384**
Chad	0.9262	-1.8602	-3.4019
DR Congo	1.2950	0.0438	-2.4323
Equatorial Guinea	2.1239**	-0.7175	-1.7954
Gabon	1.1922	-0.9629	-3.0276
Libya	-0.4635	-3.9466	-3.9919**
Nigeria	-0.4132	-2.6289	-2.6319
South Sudan	1.4004	0.7816	-1.0876
Tunisia	0.0634	-1.7592	-2.0166

Source: Author's computation through E-view software

Note: (**) represents 5% level of significance

Table 2 above exhibited the results of conventional ADF unit root test which was carried out under three major specifications, namely, no constant and trend; constant only; constant and trend. Findings from the results showed that the null hypothesis of hysteresis were only rejected at 5% level of significance for Angola (under constant and trend specification), Equatorial Guinea (under no constant and trend specification and Libya (under constant and trend specification) while the test failed to reject the null hypothesis of unemployment hysteresis for the remaining seven countries. The implication of the findings from this traditional ADF unit root test is that the unemployment rates in Angola, Equatorial Guinea and Libya have the potential of reverting to their mean values while the unemployment hysteresis would be retained in Algeria, Chad, DR Congo, Gabon, Nigeria, South Sudan and Tunisia. However, just because of some methodological flaws that are associated with the conventional linear ADF unit root test, most especially in its difficulty to capture non-linearity and structural break, findings from this test might not be adjudged conclusive and robust, hence the need to proceed to a more sophisticated unit root test.

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Table 3: Results for ADF, FADF, ADF-SB and FADF-SB Unit Root Tests

Country	ADF	FADF	ADF-SB	FADF-SB
Algeria	-2.4264	-4.3872[2]**	-5.3788 (2013, 0.6970)**	-5.6353 (2012, 0.6667)[1]**
Angola	-4.7986**	-4.4933[1]**	-5.7321 (2014, 0.7273)**	-5.6767 (2014, 0.7273)[2]**
Chad	-3.4953	-4.7292[1]**	-5.1569 (2015, 0.7576)**	-5.7466 (2007, 0.5152)[1]**
DR Congo	-2.4270	-4.4517[1]**	-4.9598 (2016, 0.7879)**	-5.4266 (2015, 0.7576)[1]**
Equatorial Guinea	-4.3802**	-4.2784[1]	-4.7996 (2017, 0.8182)**	-5.1559 (2016, 0.7576)[1]**
Gabon	-3.3497	-4.1841[1]	-4.7304 (1996, 0.1819)**	-4.8872 (2017, 0.8182)[1]**
Libya	-4.3467**	-4.1710[1]	-4.1710 (1997, 0.2121)**	-4.8081 (2007, 0.5152)[1]**
Nigeria	-2.3644	-4.2319[1]	-4.8446 (1998, 0.2424)**	-5.1417 (2008, 0.5455)[1]**
South Sudan	-2.4071	-4.3958[1]	-4.9374 (1999, 0.2727)**	-5.6973 (2009, 0.5758)[1]**
Tunisia	-2.0171	-4.0485[1]	-4.6019 (2021, 0.9394)**	-5.1629 (2010, 0.6061)[1]**

Source: Author's computation through OxGauss codes in OxEdit software.

Note: (**) indicates 5% level of significance. Critical values for each test was adopted from Furuoka (2017). The values in the squared brackets represent the Fourier frequency. The values in the parentheses represent the break dates and break fractions respectively. In addition to the linear ADF unit root test which was reported earlier in table 2, the results in table 3 showed three more sophisticated unit root test (FADF, ADF-SB and FADF-SB). The FADF and ADF-SB tests, which are the revised versions of the classical ADF unit root test, are capable to capture non-linearity and structural break respectively. The FADF-SB which is a modified edition of the FADF can treat both non-linearity and structural break simultaneously. Results from the table 3 revealed a consistent results with the one obtained in table 2 in which the evidences of unemployment hysteresis hypothesis were rejected for just three countries (Angola, Equatorial Guinea and Libya) while the ADF test confirmed the existence of unemployment hysteresis in the remaining seven countries (Algeria, Chad, DR Congo, Gabon, Nigeria, South-Sudan and Tunisia). Even, despite the fact that the lag specification was fixed at one, the results of the ADF unit root test in table 3 is still in line with the one derived in table 2. Findings from the table 3 showed that there is a considerable improvement in the FADF test where non-linearity case was taken into account. In the FADF test, the existence of unemployment hysteresis was refuted for four countries (Algeria, Angola, Chad and DR Congo) while the evidence of unemployment hysteresis was confirmed in the remaining six countries (Equatorial-Guinea, Gabon, Libya, Nigeria, South-Sudan and Tunisia) when taking into a cognizance a Fourier pattern in the ADF model. Results from the ADF-SB (which accounts for only structural break) and FADF-SB (which takes care of both non-linearity and structural break) revealed some findings that are superior to the other two unit root test (ADF and FADF). Results from the two tests showed that the null hypotheses of unemployment hysteresis were rejected for all the top ten African oil exporting countries.

Table 4: Results for the Standard F-Statistics Tests

Country	Γ_{FADF_ADF}	Γ_{ADF-SB_ADF}	$\Gamma_{FADF-SB\_ADF}$	$\Gamma_{FADF-SB\_FADF}$	$\Gamma_{FADF-SB\_ADF-SB}$
Algeria	0.4551	13.0513**	10.6436**	8.7070**	10.1805**
Angola	0.3981	12.9515**	9.6972**	14.5953**	15.1581**
Chad	9.8941**	10.7826**	10.5146**	3.6047	11.9938**
DR Congo	0.5874	11.3376**	9.6349**	10.5704**	14.2053**
Equatorial Guinea	0.2338	10.9978**	3.7714	9.2698**	13.4391**
Gabon	0.0568	9.8074**	11.3966**	12.7292**	12.6355**
Libya	0.0272	6.4398	2.1695	11.3093**	10.0987**
Nigeria	9.7472**	10.6388**	12.6769**	9.1828**	13.1778**
South Sudan	0.4825	6.8561	11.5729**	8.5368**	9.1062**
Tunisia	9.7502**	2.8437	2.5729	3.9124	10.4686**

Source: Author's computation through OxGauss codes in OxEdit software.

Note: (**) indicates 5% level of significance. Critical values for each F-statistics was adopted from Furuoka (2017).
In a bid to confirm the solidity of the four major types of unit root tests employed in this study and to equally ascertain the most suitable test among them for proper policy decision making, the results of the standard F-statistics test is thereby presented in table 4. From the results, it was revealed that the first F-statistics (Γ_{FADF_ADF}) which captures and tests the superiority of FADF over ADF test could confirm the enhancement of the Fourier ADF test in just three countries (Chad, Nigeria and Tunisia) which implies its deficient degree of functionality when compared to the classical ADF. On the contrary, the F-statistics for (Γ_{ADF-SB_ADF}

and $\Gamma_{FADF-SB\_ADF}$) showed better improvements in seven countries for each of the two tests. A cursory look at the result in table 4 showed that the Fourier ADF with structural break ($\Gamma_{FADF-SB\_ADF-SB}$) actually surpassed the remaining three unit root tests by way of exhibiting remarkable improvements in all the ten African oil exporting countries. This is an indication that the unemployment policy decision are better made when taking into account the structural break factors.

V. CONCLUSION AND POLICY IMPLICATION

This research work examined the true random work pattern of unemployment rate in the top ten African oil exporting countries for the period of 1991 to 2023. The study aimed to ascertain whether macroeconomic shocks to unemployment have the ability of reverting to equilibrium or remaining permanent in the long run. In the course of carrying out this, four major types of unit root tests were employed (ADF, FADF, ADF-SB and FADF-SB). Findings from the results of ADF test revealed that the null hypothesis of unemployment hysteresis was rejected only for Angola, Equatorial Guinea and Libya while the ADF test failed to reject the evidence of hysteresis in the unemployment rate of the remaining seven countries (Algeria, Chad, DR Congo, Gabon, Nigeria, South-Sudan and Tunisia). This finding therefore implies that the conventional ADF unit root test lacks the non-stationarity rejection power if the element of non-linearity and structural break are not included in the model. The finding aligns with the work of (Mitchell, 1993). Moreover, findings from the results of FADF, in which the components of non-linearity was incorporated, showed a better but mixed results where null hypothesis of hysteresis were rejected for just four countries (Algeria, Angola, Chad and DR Congo), while the test failed to refute the existence of hysteresis in the unemployment rate of Equatorial Guinea, Gabon, Libya, Nigeria, South Sudan and Tunisia. Just as the results from the FADF test is confirming the transitory nature of unemployment rate in the first four countries and also the permanent nature of unemployment rate in the last six countries, the FADF test equally exposed its own deficiency in the area of unit root rejection if it is only Fourier components that are embedded in the ADF model (Chang, 2011). Findings from the FADF test results are in contrast with the assertions of Furuoka (2017) and Yaya et al (2019) who employed the same FADF, but confirmed its efficiency in the rejection of null hypothesis hysteresis for all the selected countries under their studies.Findings from the results of both ADF-SB and FADF-SB tests revealed that the null hypothesis of unemployment hysteresis for all the top ten African oil exporting countries were rejected in this study during the period under review. These findings are clear indications that the behaviour of unemployment in the African oil exporting countries are marked with a mean reverting process and the impact of any economic shocks to unemployment is transitory and not permanent, only if structural breaks and non-linearity are taken into account in their economic modelling. Findings from the results of these tests actually corroborate the results of the past research works who incorporated both non-linearity and structural breaks into their ADF models (Bolat et al, 2014 and Furuoka, 2017). From the policy point of view, findings from this study thereby recommends that African oil exporting countries should recognize the structural breaks in the modelling of unemployment trends of their economies. This is quite important because, any deviation in the structural factors such as the energy prices, technological change, real interest rate, real exchange rate, may impact the stationary equilibrium of the unemployment rate.

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