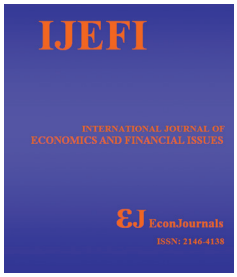


International Journal of Economics and Financial Issues

ISSN: 2146-4138

available at http: www.econjournals.com

International Journal of Economics and Financial Issues, 2017, 7(1), 19-23.

Does Labor Market Hysteresis Hold in Low Income Countries?

Ifedolapo Olabisi Olanipekun[1], Seyi Saint Akadiri[2]*, Osundina Olawumi[3], Festus Victor Bekun[4]

[1]Department of Economics, Eastern Mediterranean University, North Cyprus, [2]Department of Economics, Eastern Mediterranean University, North Cyprus, [3]Department of Economics, Eastern Mediterranean University, North Cyprus, [4]Department of Economics, Eastern Mediterranean University, North Cyprus. *Email: seyi.saint@emu.edu.tr

ABSTRACT

This study tests for labor market hysteresis in low income countries while accounting for structural break in the unemployment rates. This is to verify if unemployment in low income countries will return back to natural rate of unemployment in the long run using data from Nigeria and South Africa. It follows the procedure for single structural break unit root test by Zivot and Andrews (1992). The empirical result indicates that accounting for structural break makes the unemployment rate series stationary for Nigeria; hence, shocks to the unemployment rates will have temporary effects. Contrarily, evidence of hysteresis was found in South Africa's unemployment rates series because it was not stationary. Nigeria's macroeconomic policy can aim at lowering inflation through a contractionary policy, it will temporarily increase unemployment but it will return back to its natural state, but structural reforms that will prompt shock on South African unemployment will increase the persistence of hysteresis.

Keywords: Unemployment, Hysteresis, Unit Root, Stationarity
JEL Classi ications: C22, E24, J16, J21

1. INTRODUCTION

The assumption of the natural-rate hypothesis as given by the classical model of unemployment is that the fluctuations in aggregate demand will shift output and increase unemployment in the short-run, but the economy returns to the potential output level and the natural rate of unemployment known as the of the non-accelerating inflation rate of unemployment (NAIRU) in the long run (Phelps, 1967). Blanchard and Summers (1986) give the evidence from the United States and Europe after the 1970s recessions proved that a shock to aggregate demand which affects output and employment may have a permanent upshot on the unemployment rate in the economy and alter the natural rate of unemployment. The persistent impact of this alteration is sustained and is known as labor market hysteresis (Duval et al., 2010).

A rise unemployment which begins with a fall in aggregate demand leads to a fall in labor demand. Some workers lose their jobs and subsequently lose their job skills during their periods of unemployment, some are not be able to meet up with new technology introduced while out of job, and these will be unable to secure jobs after the recession ends. To Mathy (2015) long periods of unemployment psychologically affects some individuals, some adjust to a lower living standard experienced during their waiting period, this reduces their motivation to seek employment after the recession thereby changing their attitudes toward work. According to Guang-Rong and Yanjum (2011) these cause higher structural unemployment while new equilibrium unemployment is sustained at a higher level. The employed that have been reduced due to the recession will agitate for high real wages due to inflation, this permanently pushes real wages upward. Blanchard and Summers (1986) argued that the unemployed lose their power in forcing down the wage after inflation as some of those who previously were insiders now become outsiders in the wage determination process. Since wages are rigid downward but flexible upward, higher equilibrium level creates excess supply above demand for labor and this raises level of structural unemployment.

Many authors (Robert et al., 1999; Tiwari, 2014) have probed the labor market characteristics of high-income countries especially United States and Europe seeking explanations for the sustained high unemployment level after the past recessions. Investigating the labor market properties of the low income African countries

is important in explaining the extent to which we expect shocks to affect the labor market of poor countries over time. This article seeks to empirically test labor market hysteresis in African. The objective is to test whether unemployment in African countries can possibly be a random walk process which is non-mean reverting according to the hysteresis theory against the NAIRU hypothesis that the characteristics of the unemployment is a stationary and mean reverting process which returns to equilibrium after a shock. It is expected that the unemployment series be integrated of order one I(1) instead of order zero I(0). If unemployment is I(1), it means that hysteresis holds, therefore unemployment does not return back to equilibrium after a shock is experienced in the economy.

2. LITERATURE REVIEW

A number of studies employed various unit root tests for hysteresis such as univariate linear unit root tests, panel unit root tests, nonlinear unit root test and the structural break unit root test. Furuoka (2014) confirmed hysteresis with the augmented Dickey–Fuller (ADF) tests in all 14 regions tested, but the nonlinear Fourier ADF test confirmed hysteresis in only nine. Hoorelbeke (2010) used ADF, Phillips–Perron (PP) and Kwiatkowski–Phillips–Schmidt–Shin (KPSS), test results confirmed hysteresis in most of the regions examined, except two. However, Yilanci (2008) rejected the null hypothesis of a linear unit root to find evidence in for natural rate of unemployment for six countries but was unable to reject the null hypothesis of hysteresis for 10 countries. Apart from the criticism that Dickey–Fuller and PP tests have low power against a stationary process when it is close to the non-stationary boundary, it also has low power to detect a stationary process when the size of the series is not long enough, thus hysteresis may often be assumed where there is none.

Testing the pooled value of estimates from a number of separate series in panel unit root tests helps overcome the challenge of small sized data, but the panel unit root tests of Furuoka (2014) also confirmed that there is at least one region with hysteresis and at least one without as supported by the ADF linear test. Liew et al. (2009) tested individual countries and could not reject hysteresis for majority of the OECD countries, but was able to reject when cross-country interdependence in unemployment rates was incorporated in the estimation. Cheng et al. (2012) used recursive mean adjustment methods and allowed cross-section dependence in the panel data and found significant evidence of no stationarity. However, it is possible that only one of the series is stationary and still conclude stationarity. In a case where at least one of the series pooled is stationary, the panel unit root test often rejects the null hypothesis of unit root. Lee (2010) showed that nonlinear panel test supports the natural rate hypothesis of unemployment for 23 of 29 OECD countries. However, Chou and Zhang (2012) applied non-linear panel unit-root test to unemployment for G20 countries and hysteresis hypothesis is not supported in only nine countries. Likewise Chang et al. (2007) confirmed hysteresis when a nonlinear (logistic) unit root test was conducted on unemployment for 10 European countries, except for Belgium and the UK. However, Güriş (2015) used nonlinear unit root tests but could not confirm the hysteresis hypothesis in the case of Turkey. These studies show that linear unit root tests are not sufficient to establish hysteresis in unemployment.

Unemployment series may exhibit structural changes due to business cycles, in such cases, the linear tests are biased toward unity, and Dickey–Fuller test statistics are often non-rejected in favor of the alternative hypothesis of no unit root because, even if the unemployment series is stationary within each period of the breaks, hysteresis hypothesis may be wrongly assumed. Perron's test for structural change suggests that the sample be split into parts and use Dickey–Fuller tests on each part, apart from the reduced degrees of freedom that occur due to splitting, the actual breakpoint may be unknown, a full sample test is thereby recommended by Enders (2015). Where more than one break is suspected, Bai and Perron (1998) is employed, Ozdemir et al. (2013) tested unit root in the presence of endogenously determined multiple structural breaks at endogenously determined dates using the principles by Bai and Perron (1998). Their results show that endogenously determined structural breaks render the three series considered stationary. Unit root was confirmed when Canarella et al. (2013) accounted for one and two structural breaks in the mean of unemployment. Cuestas and Gil-Alana (2009), Cuestas et al. (2011) employed unit root tests incorporating structural changes, nonlinearities and fractional integration and found that shocks tend to be highly persistent but unemployment series were stationary for Central and Eastern European Countries. A unit root process can also exhibit structural breaks (Enders, 2015) whereby a shock in a sub period will have a permanent effect on the mean value of the sequence for unemployment before a break will not show a tendency to return to the pre-break level, for instance, Cevik and Dibooglu (2013) used a regime switching unit root test which shows that shocks to unemployment rate seem to be persistent in recessions, supporting the hysteresis hypothesis while shocks to US unemployment die out in expansion. Akdogan (2015) examined the unemployment hysteresis hypothesis for 33 countries, using linear and nonlinear unit root tests. The hysteresis hypothesis was rejected for 60% of the countries and many of the series display multiple structural breaks which pointed out alterations in mean level of unemployment.

The behavior of unemployment in various analyses has widely shown that the type of unit root test should depend on the characteristics of series. Structural breaks suggest alterations in mean of unemployment which might be due to changes in other macroeconomic variables such as real money supply, interest rates and output which may account for such shifts. According to Cuestas and Gil-Alana (2011) and Chang and Su (2014) such vital information may be reduced from the series while accounting for multiple structural breaks. Andrews (1993) developed a test that can be used to estimate a single structural break occurring at an unknown date.

3. METHODOLOGY

To ascertain the most appropriate theoretical explanation for characteristics of unemployment in Nigeria and South Africa for the period 1991:Q4-2015:Q4. The research uses unemployment

as a percentage of total labor force defined by World Bank (2016) as the share of the labor force without work but available for and seeking employment. Data were retrieved from international labor organization through the World Bank data base.

Hysteresis hypothesis is the deviation of unemployment from its past natural rate:

$$U_t^N = U_{t-1}^N + \alpha(U_t - U_{t-1}^N) \quad (1)$$

Where, α is a constant parameter U_t^N is the current natural rate of unemployment, U_{t-1}^N is the past natural rate of unemployment and U_t is the current actual rate of unemployment. Where $\left(U_t - U_{t-1}^N\right)$ is expected to be zero at natural rate of unemployment. When the actual unemployment is greater than the past natural rate unemployment, the sustenance is hysteresis. The hypotheses are empirically tested by employing both conventional (KPSS and PP tests) and contemporary unit root tests on unemployment rates in these countries. Considering the possibility of structural break from the graphical representation of the series as shown in Figures 1 and 2 the Zivot and Andrews (1992) unit root test which accounts for one structural break and uses the full sample is conducted with intercept and with both intercept and trend. Conventional tests were conducted were conducted with trend and intercept and with intercept only.

In the Equations (2) and (4), the break is assumed to affect only the intercept, while equations (3) and (5) are pure break models where all parameters can change:

$$\Delta UNNG_t = a_0 + \sum_{i=1}^{p} a_i \Delta UNNG_{t-1} + \gamma_0 D_t + \varepsilon_{NGt} \quad (2)$$

$$\Delta UNNG_t = a_0 + \sum_{i=1}^{p} a_i \Delta UNNG_{t-1} + (\gamma_0 + \sum_{i=1}^{p} \gamma_1 \Delta UNNG_{t-1}) D_t + \varepsilon_{NGt} \quad (3)$$

$$\Delta UNSA_t = \beta_0 + \sum_{i=1}^{p} \beta_i \Delta UNSA_{t-1} + \gamma_0 D_t + \varepsilon_{SAt} \quad (4)$$

$$\Delta UNSA_t = \beta_0 + \sum_{i=1}^{p} \beta_i \Delta UNSA_{t-1} + (\gamma_0 + \sum_{i=1}^{p} \gamma_1 \Delta UNSA_{t-1}) D_t + \varepsilon_{SAt} \quad (5)$$

$$D_t = \begin{cases} 1 \text{.....if\_} t > \text{breakdate} \\ 0 \text{.....if\_otherwise} \end{cases}$$

Where, $UNNG_t$ and $UNSA_t$ are the unemployment rates for Nigeria and South Africa respectively, D_t is the dummy variable indicating that a break occurs at the period t in each equation, a different dummy variable is used for each possible break date, while ε_{SAT} and ε_{NGT} represent the error terms.

4. EMPIRICAL RESULTS

According to the result presented in Table 1, Nigeria's unemployment rate was found to supports the natural rate hypothesis; it has mean-reverting properties in both tests conducted with only intercept at a significance value of 5% and with intercept and trend at a significance value of 1%. On the other hand, there is an evidence of hysteresis in the South Africa unemployment series because the null hypothesis of unit root cannot be rejected given that it is significant at 41%. The South Africa's breakpoint was in 1997Q2 when tested with intercept only, and 2003Q2 when tested with intercept and trend. The different tests for Nigeria also showed different break points 1999:Q2 and 2001:Q2 when tested with intercept only and with trend and intercept respectively. Hence, the Zivot–Andrew test results are supported by the results of the KPSS test presented in Tables 2 and 3 respectively.

Figure 1: Quarterly series of unemployment rates for Nigeria

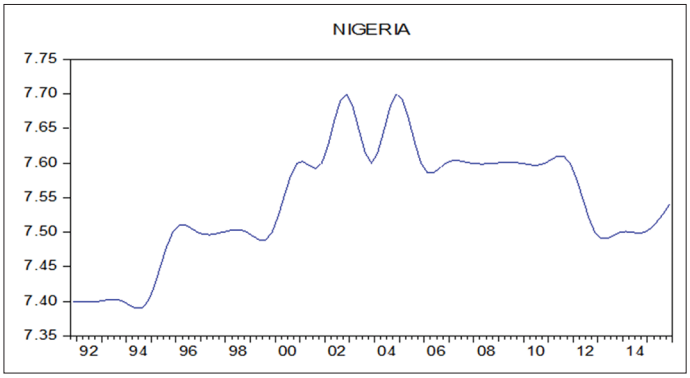
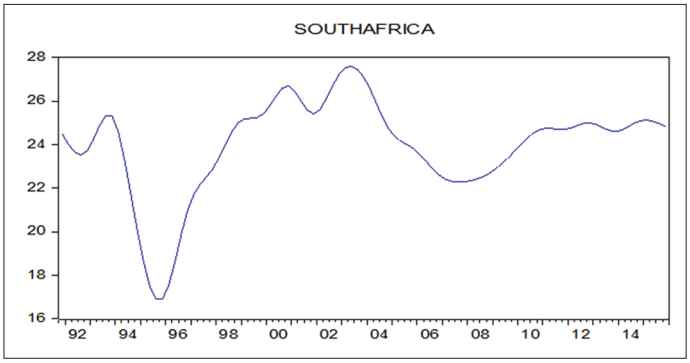


Figure 2: Quarterly series of unemployment rates for South Africa



The evidence is supported by the KPSS tests reported in Table 3. This show that Nigeria's unemployment series supports the natural rate hypothesis because it is stationary at level with LM statistic of 0.58 greater than the critical value of 0.46 at 5% level of significance, but South African unemployment both in Tables 2 and 3 are non-mean reverting. However, in Table 4 the PP tests conducted confirm hysteresis hypothesis in both countries, where it was I(1) than in Table 5 of I(0).

In Table 4, the PP tests conducted confirm hysteresis hypothesis for both countries. Though it was found stationary at first difference, i.e., I(1). While in Table 5 the series was non-stationary at levels I(0).

5. CONCLUSION

Based on the findings above, unemployment rates can therefore be described as non-stationary process for South Africa but a stationary

Table 1: Summary of Zivot Andrew test output

Unemploy-ment rates series	Zivot Andrew test							
	With intercept only				With trend and intercept			
	t-statistic	Critical value	Significance level	Break point	t-statistic	Critical value	Significance level	Break point
Nigeria	−3.111405	−4.93	5%	1999:Q2	−5.118144	−5.57	1%	2001:Q2
South Africa	−4.669396	Not significant		1997:Q2	-5.070192	Not significant		2003:Q3

Table 2: KPSS test at level

Unemployment series	Intercept only			Trend and intercept		
	LM-statistic	Level	Critical value	t-statistic	level	Critical value
Nigeria	0.575937	1%	0.739000	0.296421	1%	0.216000
		5%	0.463000		5%	0.146000
		10%	0.347000		10%	0.119000
South Africa	0.209147	1%	0.739000	0.097326	1%	0.216000
		5%	0.463000		5%	0.146000
		10%	0.347000		10%	0.119000

KPSS: Kwiatkowski–Phillips–Schmidt–Shin

Table 3: KPSS test at first difference

Unemployment series	Intercept only			Trend and intercept		
	t-statistic	Level	Critical values	t-statistic	Level	Critical value
Nigeria	0.216422	1%	0.739000	0.043812	1%	0.216000
		5%	0.463000		5%	0.146000
		10%	0.347000		10%	0.119000
South Africa	0.059599	1%	0.739000	0.058155	1%	0.216000
		5%	0.463000		5%	0.146000
		10%	0.347000		10%	0.119000

KPSS: Kwiatkowski–Phillips–Schmidt–Shin

Table 4: PP test at first difference

Unemployment series	Intercept only			Trend and intercept		
	t-statistic	Level	Critical values	t-statistic	Level	Critical value
Nigeria	−4.237723	1%	−3.500669	−4.285660	1%	−4.057528
		5%	−2.892200		5%	−3.457808
		10%	−2.583192		10%	−3.154859
South Africa	−3.411853	1%	−4.057528	−3.391676	1%	−3.500669
		5%	−2.892200		5%	−3.457808
		10%	−2.583192		10%	−3.154859

PP: Philip–Perron

Table 5: PP test at level

Unemployment series	Intercept only			Trend and intercept		
	t-statistic	Level	Critical value	t-statistic	Level	Critical value
Nigeria	−1.892177	1%	−3.499910	−1.514518	1%	−4.056461
		5%	−2.891871		5%	−3.457301
		10%	−2.583017		10%	−3.154562
South Africa	−2.110974	1%	−3.499910	−2.271955	1%	−4.056461
		5%	−2.891871		5%	−3.457301
		10%	−2.583017		10%	−3.154562

PP: Philip–Perron

process for Nigeria. The dynamic properties of the unemployment process found in this study are important for policy-making. In a case of South Africa, where the hysteresis is confirmed, structural reforms that will induce shock on unemployment will increase the persistence of hysteresis, thus, such should be avoided. For instance, an attempt to reduce inflation will have a persistent effect on unemployment. Changes in other macroeconomic variables such as interest rates, consumption, government expenditure, taxes, money supply, and other inflationary factors will cause unemployment series to change from an initial mean level and sustained it at a higher level.

On this premise, wage policies should be employed to stabilize wage while labor force participation should be stimulated

especially among migrants and female. However, shocks to unemployment in Nigeria will only be temporary. Thus, macroeconomic policy should be centered on measures that will moderate short run shocks. If this policy can be directed towards lowering inflation through contractionary policy, it will temporarily increase unemployment for a time being but it will return back to its natural state.

REFERENCES

Akdoğan, K. (2015), Unemployment hysteresis and structural change in Europe. In: EY International Congress on Economics II (EYC2015), November 5-6, 2015. (No. 266). Ekonomik Yaklasim Association.

Andrews, D.W. (1993), Tests for parameter instability and structural change with unknown change point. Econometrica: Journal of the Econometric Society, 821-856.

Bai, J., Perron, P. (1998), Estimating and testing linear models with multiple structural changes. Econometrica, 66, 47-78.

Blanchard, O.J., Summers, L.H. (1986), Hysteresis and the European unemployment problem. In: NBER Macroeconomics Annual 1986. Vol. 1.Cambridge: Mit Press. p15-90.

Canarella, G., Miller, S.M., Pollard, S.K. (2013), Unemployment rate hysteresis and the great recession: Exploring the metropolitan evidence. Available from: http://www.ssrn. 2298877.

Cevik, E.I., Dibooglu, S. (2013), Persistence and non-linearity in US unemployment: A regime-switching approach. Economic Systems, 37(1), 61-68.

Chang, M.J., Su, C.Y. (2014), Hysteresis versus natural rate in Taiwan's unemployment: Evidence from the educational attainment categories. Economic Modelling, 43, 293-304.

Chang, T., Ho, Y., Huang, C. (2007), Revisiting hysteresis in unemployment for Ten European countries: An empirical note on a more powerful nonlinear (LOGISTIC) unit root. Journal of Economic Development, 32(1), 49-59.

Cheng, K.M., Durmaz, N., Kim, H., Stern, M.L. (2012), Hysteresis vs. Natural rate of US unemployment. Economic Modeling, 29(2), 428-434.

Chou, H.C., Zhang, Y.C. (2012), Unemployment hysteresis in G20 countries: Evidence from non-linear panel unit-root tests. African Journal of Business Management, 6(49), 11887.

Cuestas, J.C., Gil-Alana, L.A. (2009), Unemployment hysteresis, structural changes, non-linearities and fractional integration in Central and Eastern Europe. Discussion Papers in Economics. Notttingham Trent University. p11.

Cuestas, J.C., Gil-Alana, L.A. (2011), Unemployment Hysteresis, Structural Changes, Non-Linearities and Fractional Integration in European Transition Economies.

Cuestas, J.C., Gil-Alana, L.A., Staehr, K. (2011), A further investigation of unemployment persistence in European transition economies. Journal of Comparative Economics, 39(4), 514-532.

Duval, R., Eris, M., Furceri, D. (2010), Labour force participation hysteresis in industrial countries: Evidence and causes. OECD, (Paris). Econometrica, 66, 47-78.

Enders, W. (2015), Applied Econometric Time Series. Hoboken, NJ: John Wiley & Sons.

Furuoka, F. (2014), Does hysteresis exist in unemployment? New findings from fourteen regions of the Czech Republic. Finance A Uver, 64(1), 59.

Guang-Rong, T.G.R., Yanjun, Y.A.N. (2011), External shocks, structural breaks and unemployment hysteresis in China. Management Science and Engineering, 4(4), 75-81.

Güriş, B., Tiftikçigil, B.Y., Tıraşoğlu, M. (2015), Testing for unemployment hysteresis in Turkey: Evidence from nonlinear unit root tests. Quality and Quantity, 1-12.

Hoorelbeke, D. (2010), Testing for Hysteresis in Unemployment in the Belgian Regions. Belgium: Research Centre of the Flemish Government, Brussels.

Lee, C.F. (2010), Testing for unemployment hysteresis in nonlinear heterogeneous panels: International evidence. Economic Modeling, 27(5), 1097-1102.

Liew, V.K.S., Chia, R.C.J., Puah, C.H. (2009), Does Hysteresis in Unemployment Occur in OECD Countries? Evidence from Parametric and Non-Parametric Panel Unit Roots Tests. MPRA Paper No, 9915.

Mathy, G. (2015), Hysteresis and Persistent Long-term Unemployment: Lessons from the Great Depression and World War 2. Available from: http://www.ssrn.2574850.

Ozdemir, Z.A., Balcilar, M., Tansel, A. (2013) International labour force participation rates by gender: Unit root or structural breaks? Bulletin of Economic Research, 65(s1), s142-s164.

Phelps, E.S. (1967), Phillips curves, expectations of inflation and optimal unemployment over time. Economica, 34(135), 254-281.

Roberts, J.M., Morin, N.J. (1999), Is hysteresis important for US unemployment? Washington, DC: Federal Reserve Board.

Tiwari, A.K. (2014), Unemployment hysteresis in Australia: Evidence using nonlinear and stationarity tests with breaks. Quality and Quantity, 48(2), 681-695.

Yilanci, V. (2008), Are Unemployment Rates Nonstationary or Nonlinear? Evidence from 19 OECD countries. Economics Bulletin, 3(47), 1-5.

Zivot, E., Andrews, D.W.K. (1992), Further evidence on the great crash, the oil-price shock and the unit root hypothesis. Journal of Business and Economic Statistics, 10, 251-270.