POLAC ECONOMICS REVIEW (PER)
DEPARTMENT OF ECONOMICS AND MANAGEMENT SCIENCE
NIGERIA POLICE ACADEMY, WUDIL-KANO

ANALYSING URBANIZATION AND UNEMPLOYMENT NEXUS IN NIGERIA WITH THE ROLE OF ENERGY POVERTY

Muhammad Mustapha Abdullahi Department of Economics, Umaru Musa Yar'adua University Katsina

Ahmed Malumfashi Halliru Department of Economics, Umaru Musa Yar'adua University Katsina

Abstract

The study examined the impact of urbanization on unemployment in Nigeria by employing annual time series data spanning over the period 1980 to 2022 using Johansen cointegration technique to analyze the long run and short run dynamics. The empirical results showed that urbanization significantly reduces unemployment in the short run but the impact is not significant in the long run. The results also indicated that trade openness is another important variable that significantly reduce unemployment both in the short run and long run. However, energy poverty increases unemployment in the short and long run but surprisingly human capital increases unemployment in Nigeria. Therefore, to reduce unemployment, it is recommended that more investment in infrastructure especially energy should be made to keep pace with the rate of urban growth. There is also the need for the development of new cities as well as promoting rural development to reduce influx of people into cities while encouraging the importation of capital and intermediate goods.

Key Words: Unemployment, Urbanization, Energy Poverty, Human Capital and Trade Openness.

1. Introduction

The development of cities offers great opportunities for economic progress because of the potentials for an agglomeration of industries and economic of large scale production leading to more job opportunities and a decline in unemployment. This occurs because urban centres are the major source of finance as well as investment destination, attract higher investment in infrastructure and human capital due to concentration of higher institutions of learning that promote research and development which combined to drive the proliferation of both small, medium and large-scale industries. With increased investment and increase economic activities, more employment opportunities proliferate leading to reduction in unemployment. This argument and the experience of some developing countries around the globe such as Ethiopia and Brazil encourage developing countries such as Nigeria to promote the development of urban centres with the result that urban centres now accommodate significant portion of national population.

In Nigeria, the percentage of population living in urban areas has significantly increased from 22.7 in 1970 to 34.8 in the year 2000. The figure rose to 43.5 in 2010 and by the 2022 urban population in Nigeria rose to 52.7 (World Bank, 2023). But urbanization, though reflect a sign of economic development, if not well managed increase pressure on environment and infrastructure due to increased in energy demand (Zhou et al. 2013). This is because urban centres are: areas where administrative and commercial buildings are based; foreign investment destinations; industries hubs associated with large waste and pollution; large commercial joints characterized by the growing population and heavy transport of customers and merchandise which correspond with high energy demand (Wang et al. 2020). In addition, urban life is associated with increased use of home appliances such as water heaters and air conditioners that deplete energy infrastructures and increase energy poverty. Energy poverty especially in developing world is a serious concern particularly in countries like Nigeria where about 44.6 percent of the population are energy poor as at 2020 (World Bank, 2023). One of the consequences of energy poverty is

to undermine the manufacturing sector activities and other small and medium scale enterprises leading to a decline in jobs opportunities and consequent rise in unemployment.

It is evident in Nigeria that the growth of urban cities coincides with rise in unemployment. For example, in 2009 the National Bureau of Statistics (NBS) put the rate of unemployment in Nigeria at alarming rate 19.70 percent representing about 30 million people and when this figure is combined with additional 40 million unemployed Nigerian reported by the United Nations in the same period the rate became 50 percent for the country which had an estimated population of 140 million at that time. The figure rose to 21.5, 23.9 and 28 percent in 2010, 2011 and 2015 respectively. The rate of unemployment stands at 33 percent in 2022 (Statista, 2023) and this is evident by the large number of people including university graduates parading the urban streets in search of jobs. This development serves as a motivation for this work and novelty of this study is that we account for the role of energy poverty in analyzing urban-unemployment nexus in Nigeria.

Many empirical studies were carried out to examine the impact of urbanisation on different economic development indicators (for example Luc et. al (2013), Alaci et.al, 2012, Isioma 2013, Chamhuri et. al 2016) but most of these studies focused on the urbanization-economic growth nexus but studies on urbanization-unemployment nexus are scanty. However, the few studies that investigate the urbanization-unemployment nexus such as (Chamhuri et al., 2016) did not account for the role of energy poverty which we accounted for in this study to address the gap. We also extended the sample period to 2022 and human capital was added in the model as control variable. The rest of the paper is designed as follows: section 2 provides empirical literatures, section 3 is the methodology, section 4 is the empirical results while section 5 concluded the paper.

2. Literature Review

2.1 Empirical Review

There are many empirical studies on the impact of urbanisation in different economic indicators using different analytical techniques. For example, Jema et al. (2012) examined the impact of integrated urban housing development program on household poverty alleviation in Adama city of Ethiopia using a propensity score matching model. It evaluated the difference in total consumption expenditure between households who participated in the program and those who did not. The empirical result shows that participant households in the program have significantly higher consumption expenditure per adult equivalent than non-participant households.

Factors that positively and significantly promote participation in the program are the years of schooling, work status, place of birth and asset ownership while sex, prior job, being student and self-reliant have a negative and significant effect. The paper recommended for empowerment of women and provision of technical training as a major strategy for poverty alleviation. Isioma (2013) examined the effect of urbanisation on the Nigerian economy using OLS regression method. The research was motivated by the high rate of rural-urban migration and unemployment in the country. The empirical result shows that urbanisation has a significant impact on economic growth. The work recommended that government should provide more access to higher education, scholarship and agricultural facilities to the rural populace.

Anett and Guanghua (2013) analyzed the key determinants of urbanization using instrumental variable approach. The result shows that GDP impacted large and positive on urbanization. Also, the results indicate a unilateral causality between urbanization and growth with economic growth causing urbanization. Other factors that significantly and positively impact on urbanization are industrialization and education. Luc et al. (2013) examined the role of rural diversification and secondary towns in poverty reduction using panel technique tracking 3,300 individuals from households in rural Kagera, Tanzania. The result shows that about one in two individuals/households exited poverty by transitioning from agriculture to the rural non-farm economy or secondary towns. Only one in seven exited poverties by migrating to a large city and they have faster consumption growth. Also, an analysis of cross-country panel of 51 developing countries confirmed that rural diversification and secondary town's development

leads to more inclusive growth pattern than metropolitization. The paper recommended that efforts should focus on how best to urbanize and develop rural non-farm economy and secondary towns.

Ceyhum and Cem (2014) investigate the relationship between the level of urbanization and the size of the informal economy using cross-country datasets. The empirical results indicated that there is an inverted-U relationship between informality and the level of urbanization, implying that the share of the informal sector grows in the early phases of urbanization but declines in the latter phases. Other factors identified to have affected the size of the informal sector are taxes, trade openness and institutional quality. Abdullahi and Sani (2015) analyzed the relationship between urbanization and economic growth in the republic of China for the period 1986-2013 using OLS method. The empirical results showed a significant positive relationship between urbanization and economic growth over the period. Furthermore, the granger causality results indicated a bidirectional causality exist between urbanization and economic growth. The paper recommended for policy development on economic base, favourable migration and tertiary service sector growth to enhance marginal efficiency of labour.

Chamhuri et al. (2016) examined the consequences of rapid urbanisation and urban vulnerable group in Malaysia using data on urbanisation, household income, and poverty, population at rural and urban levels. The finding shows that there was downward trend in urban poverty indices. The rate of poverty decreased from 25.5 percent to 1 percent in 2012 in urban areas. The finding also shows that average household monthly income in urban areas is almost twice that of rural families thus indicating high level of income inequality. The study also observed that although urbanisation increased to about 71 percent in 2010, the high concentration of people in urban areas created various problems including high cost of living, crime, environmental degradation, unemployment and poverty. The paper recommended that the poor should be located and appropriate policies and programs should be designed to tackle poverty.

Ali et al. (2020) examined the impact of urbanization and electricity consumption on economic growth in Nigeria over the period 1971-2014. Utilizing the fully modified OLS, the empirical results shows that electricity consumption aids the country's growth but urbanization impede economic growth. Thanh (2021) investigated the impact of urbanization on income and employment in Vietnam using a survey data representing 515 household. The findings reveal that while urbanization enhances income, it increases unemployment by lowering employment in the cities. Chen et al. (2023) analyze the correlation between urbanization and vulnerable employment using data for 163 countries over 1991-2019. The results show that urbanization reduces vulnerable employment significantly for G7 group and BRICS countries. Jacobs et al. (2023) investigated the relationship between urbanization and economic growth in South Africa utilizing quarterly data over 1997-2020. The findings show that economic growth and urbanization reduce unemployment by promoting job opportunities. Borhan et al. (2023) investigated the impact of economic growth and urbanization in Malaysia over 1984-2020 utilizing ARDL estimation. The results show that urbanization increase unemployment in the long run.

3. Methodology

Annual time series data was used for the period 1980 to 2022 and it was sourced from Central Bank of Nigeria (CBN) and World Development Indicators (Wold Bank). The data was on the following variables: Unemployment (Unemployment % of labour force) which is the dependent variable, urbanization (percentage of urban population), human capital (total school enrolment), trade openness and energy poverty.

Table 1: Variables definition and data sources

Variable	Variable definitions	Sources
UNEMP	Unemployment	CBN
URBAN	Urbanization (% of Urban population)	WDI
TOP	Trade openness (volume exports + imports % of GDP)	WDI
EPOV	Energy poverty	WDI
HCPT	Human capital (total school enrolment)	WDI

Source: WDI - World Development Indicators (2023) and CBN – Central Bank of Nigeria (2022)

3.1 Model Specification and Estimation Procedure

To find out the impact of the independent variables on the dependent variable, the model in a log linear form is specified as:

$$UNEMP=\beta_o+\beta_1URBAN + \beta_2LEPOV + \beta_3LHCPT + \beta_4TOP + \mu.. \quad (1)$$

The short run dynamic and error correction model is specified as:

$$\Delta UNEMP=\beta_o + \beta_1\Delta URBAN + \beta_2\Delta logEPOV + \beta_3\Delta logHCPT + \beta_4\Delta logTOP - ECT + \mu. \quad (2)$$

Where:

UNEMP = Unemployment rate

URBAN = Urbanization (Percentage of urban population)

EPOV = Log of energy poverty

HCPT = Log of human capital

TOP = Trade openness

4. Results and Discussion

The time series characteristics of the data was first investigated to test for the stationarity of the data to avoid spurious regression and this implies unit root test for all the variables using both ADF and Phillips-Peron tests. The outcomes of the unit root test process suggest that all the variables become stationary after taking first difference as shown in Table 2.

Table 2: Unit Root Tests

Variable	ADF at Level	PP at Level	ADF at First Difference	PP at FirstDifference	Order
UNEMP	-1.019	-0.409	-6.513***	-14.755***	I(1)
URBAN	-1.423	-1..496	-6.148***	-6.116***	I(1)
EPOV	-0.515	2.384	-4.563***	-7.837***	I(1)
HCPT	0.055	-0.886	-9.559***	-10.921***	I(1)
TOP	-0.220	-0.150	-6.396***	-6.329***	I(1)

Source: Researcher's Computation

Table 3: Johansen Cointegration Test)

EigenValue	Trace Statistics	5% Critical Value	Prob.**	Hypothesized No. of CE (s)
0.738394	71.42573	69.81889	0.0370	None *
0.469145	32.53923	47.85613	0.5824	At most 1
0.223724	14.17449	29.79707	0.8307	At most 2
0.139736	6.830320	15.49471	0.5975	At most 3
0.081499	2.465341	3.841466	0.1164	At most 4

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

From table 3 above, Johansen procedure to test whether the variables have any long run equilibrium relationship or not was carried out and the long run test show that we reject the null hypothesis of no cointegration and accept the alternative hypothesis of at most 1 cointegration between the variables based on the trace statistics (32.539) which is less than the critical value (47.856). Johasen procedure is then used to obtain the long run coefficient of the model as well as the short run dynamics and error correction.

Table 4: Long Run Results, Dependent Variable (Unemployment)

Variable	Coefficient	Std Error	t-stat
URBAN(-1)	-1.011	1.056	-0.957
LEPOV(-1)	6.750**	3.276	2.060
LHCPT(-1)	-0.124	0.131	-0.946
LTOP(-1)	-2.976*	0.965	-3.083

Source: Researcher Computation

The results in Table 4 shows the long run estimates of the coefficients and reveals that a percent increase in urbanization reduce unemployment by 1.01 percent but the coefficient is not statistically significant even at 10%. This implies that increased urban population does not significantly reduce unemployment in Nigeria in the long run. This can be attributed to the fact that urban areas experiences large influx of rural migrants far above the job opportunities available for them. Lack of basic amenities in the rural areas makes people, especially youth, to leave their homes for towns and stay permanently irrespective of job availability or none. The capital-intensive method of production of firms in urban areas might also explain why only small portion of the available labour get employed in these urban areas and this is consistent with the findings of Chen et al. (2023).

As for energy poverty, a 1 percent increase in energy poverty increase unemployment by 6.75 percent and the coefficient is statistically significant. This implies that energy deficiency leads to declining manufacturing sector performance and the closure of so many small scale enterprises as well as the dismal performance of agriculture where the majority of the labour force is engaged. A 1 percent increase in human capital reduces unemployment by 0.12 percent but the coefficient is not statistically significant. The reason for low and insignificant influence of human capital in reducing unemployment can be attributed to very low level of skills acquisition contents in the educational system which produces plenty of school leavers that cannot depend on themselves or meet the requirement of industries. Trade openness significantly reduces unemployment in the long run. A 1 percent increase in trade openness reduces unemployment by 2.97 percent. This suggest that trade openness does not constitutes a threat to employment in Nigeria but rather support it as it makes the importation of capital and intermediate goods possible which increase the proliferation of productive activities in the country.

Table 5: Short-run results: Dependent Variable (Unemployment)

Variable	Coefficient	Std Error	t-stat
D(URBAN(-1))	-2.577	1.259	-2.045
D(LEPOV(-1))	-0.928	2.640	-0.351
D(LHCPT(-1))	0.212	0.101	2.099
D(LTOP(-1))	-2.339	1.136	-2.058
ECM(-1)	-0.561	0.147	-3.798
Adj. R^2	0.96		
F-stat	203		
DW	2.1		
JB(Prob.)	0.62		
HET(Prob.)	0.41		

Source: Researcher's Computation

The short run dynamics and error correction mechanism is provided in table 4. The results show that urbanization significantly reduces unemployment in the short run. In the short run urban areas provides plenty jobs especially in the building and construction sectors as they attract heavy investment both from local and foreign sources. Another significant factor is human capital but in the short run it shows a positive relationship with unemployment implying that as more people enrol into schools unemployment also increase. This can be attributed to the fact that the more the people enrol into schools the higher their tastes in terms of the type of jobs they accept and the more they consider only formal and urban sector jobs and look down on the informal sector. The diagnostic tests results are provided in the lower part of table 4. It shows that the error terms are normally distributed and homoskedastic and the problem of autocorrelation is absent as indicated by the DW statistics.

5. Conclusion and Recommendations

This study examined the impact of urbanization on unemployment in Nigeria by employing Johansen technique to analyze the long run and short run dynamics. The empirical results showed that urbanization significantly reduces unemployment in the short run but the impact is not significant in the long run. The policy implications of this are that policies that promote urban growth only provide temporary relief to unemployment but as large urban population outweigh job opportunities and urban households exert more pressure on the available infrastructure especially power. Unless right measures are taken, energy is diverted from industrial use to household consumption leading to under capacity utilization and low labour demand. It is recommended that more investment in infrastructure should be made to keep pace with the rate of urban growth. There is also the need for the development of new cities as well as promoting rural development to reduce influx of people into cities.

References

Abdulahi, D. M. And Sani, I. U. (2015). An Economic Analysis of Urbanization and Economic Growth in the Republic of China. Proceedings of the International Sumposium on Emerging Trends in Social Science Research. ISBN:978-1-941505-23-6 Chennai India.

Alaci, D. S. A., Duru, P., Jiya, S. N. and Hassan, Y. T (2012). Urbanisation Opportunities in the Attainment of the Millennium Development Goals for Nigeria. Sokoto Journal of the Social Sciences ISSN: 1595-2738 Vol.2 No.2, pp161-173

Ali, H. S., Nathaniel, S. P., Uzuner, G., Bekun, F. V., & Sarkodie, S. A. (2020). Trivariate modelling of the nexus between electricity consumption, urbanization and economic growth in Nigeria: fresh insights from MakiCointegration and causality tests. Heliyon, 6, 03400

Anett, H. and Guanghua, W. (2013). Asia Development Bank (ADB) Economic Working Paper Series No. 355, July, 2013

Abubakar, A. and Kassim, S. (2016). Sectoral Impact of Bank Credit in Malaysia: ARDL Modelling Approach. Pertanika Journal of Social Science and Humanities, 24(S): 205-211

Borhan, H., Ridzuan, A. R., Mohamad Idham Md Razak, M. I., & Mohamed, R. N. (2023). The Dynamic Relationship between Energy Consumption and Level of Unemployment Rates in Malaysia: A Time Series Analysis Based on ARDL Estimation. *International Journal of Energy Economics and Policy*, 13(2), 207-214.

Chamhuri, S., Ferdoushi, A., Ahmad, B. and Shahin, M.M. (2016). Urbanization and Urban Poverty in Malaysia: Consequences and Vulnerability. Journal of Applied Sciences ISSN 1812-5654 DOI: 10.3923/jas.2016.154.160

Ceyhum, E. and Cem, O. (2014). Lurking in the Cities: Urbanization and the Informal Economy. JEL Classification No. E26,011,017

Central Bank of Nigeria, 2015. Annual report and statement of account.

CBN (2022), " The Economy and Implications for Development", Central Bank of Nigeria, Statistical Bulletin, Vol. 9. No. 2 Realm Communications, Lagos.

Chen, M., Huang, X., Cheng. J., Tang. Z. & Huang, G. (2023). Urbanization and vulnerable employment: Empirical evidence from 163 countries in 1991–2019. Cities, 135 (2023) 104208

Isioma, I. (2013). The Effect of Urbanisation and Unemployment on the Nigerian Economy. Research Project Submitted to the Department of Economics, Caritas University, Enugu, Nigeria.

Jema, H., Mohammed, A. and Abdela, G. (2012). Impact of Integrated Urban Housing Development Program on Household Poverty Alleviation: Adama City, Oromia Regional National State, Ethiopia. Asian Journal of Empirical Research, 3(3): 237-25.

Jacobs, S., David, O. O. & Wyk, A. SV. (2023). The Impact of Urbanization on Economic Growth in Gauteng Province, South Africa. *International Journal of Economics and Financial*, 13(2), 1-11.

Luc, C., Joachim, D. W. and Yasuyuki, T. (2013). Urbanization and Poverty Reduction: The Role of Rural Diversification and Secondary Towns. Policy Research Working Paper 6422, World Bank Africa Region.

Narayan, P. K. (2004). Fiji's tourism demand: the ARDL approach to co-integration. Tourism Economics, 10(2), 193-206.

Pesaran, M. H., Shin, Y., & Smith, R.J. (2001). Bounds testing approaches to the analysis of level relationships. Journal of Applied Econometrics, 16, 289-326

Rachel, M., Arjan, H. and Sally, B. (1997). Urbanisation and Urban Poverty: A Gender Analysis. Report prepared for the Gender Equality Unit, Swedish International Development Cooperation Agency (Sida), October 1997

Randal, O. T. (2009). Population Growth and Cities. The Electronic Journal of Sustainable Development, 1(3)

Thanh, T. C. (2021). Urbanization – changes in employment and incomes of people in Vietnam. Problems and Perspectives in Management, 19(3), 321-331.

Todaro, M. P. and Smith, S. C. (2009). Economic Development, Third Edition, Pearson Education Limited, ISBN:978-1-4058-7424-3

United Nations (UN) 2006. World Urbanization Prospects: The 2006 Revision. http://esa.un.org/unup.

United Nations Population Fund (UNFPA) 2007. State of World Population 2007: Unleashing the Potential of Urban Growth. New York: UNFPA.

Ursula, G. (2012). Urbanization and the Employment Opportunities of Youth in Developing Countries. Background paper prepared for the Education for All Global Monitoring Report 2012 Youth and skills: Putting education to work. 2012/ED/EFA/MRT/PI/25

World Bank (2015), World Development Indicators 2015 on CD-ROM, World Bank, Washington D.C.

Wang, Z., Rasool, Y., Zhang, B., Ahmed, Z. &Wang, B. (2020). Dynamic linkage among industrialisation, urbanisation, and CO 2 emissions in APEC realms: Evidence based on DSUR estimation. *Structural Change and Economic Dynamics*, 52, 382–389.

Zhou, X., Zhang, J. & Li, J. (2013). Industrial structural transformation and carbon dioxide emissions in China. *Energy Policy*, 57, 43–51.