An Empirical Investigation of Inflation and Wage Dynamics in Nigeria: ~~:~~ a New Evidence.

Comment [U1]: Not required
Can be reframed as ""Inflation and Wage Dynamics in Nigeria: New Empirical Insights"

Abstract

The current inflationary pressure in Nigeria is eroding the purchasing power of the salaried workers and the value of the national currency with the proposition that it could worsen the welfare of the citizens despite the abject and extreme poverty that prevails in the country. The paper therefore is~~made~~ an empirical investigation into the inflation and wage dynamics in Nigeria. The variables were tested for unit roots using ADF tests. The unit roots s that all the variables are non-stationary at levels except the Consumer Price Index of Transportation (CT) and Wages and Salaried Workers as Proportion of Total Employment (WSW). Employee compensation including remittances (COMP), inflation rate (INFR), WSW and Consumer Price Index of Transportation (CT) are stationary at first difference. Autoregressive Distributed Lag (ARDL) model was used in the methodology. The short-run dynamic model showed that a 6% fall in the lag period of inflation level led to a 1% increase in employee compensation and a one-year previous period fall of 30% in WSW, bringing about I% increase in employee compensation. The long-run model showed that the variables are co-integrated which indicates that variation in the short run will be corrected in the long run with 59% speed of adjustment. It was recommended that maximum price legislature, demonetisation of currency, exercising great caution in incurring public debt, drastic reduction in government expenditure and adoption of rational wage policy can be a viable macroeconomic policy option.

Comment [U2]: Sentence not clear!!!

Keywords: inflation, wage dynamics, consumer price index, price legislature, co-integration.

JEL: E3, E31, E32

1. Introduction

The relationship between inflation and wage structure demands constant research for appropriate policy recommendations. Inflation which refers to a continuous increase in the general price level of goods and services does have a great impact on wages. Research has

shown that as inflation rises it reduces the purchasing power of stagnated wage structure. In situations where wages are increasing, the growth has been low even after accounting for inflation. There is also evidence in the literature that low-income earners spend a larger proportion of their income on essential goods and services and inflation constantly leads to a decline in the real value of wages. Sanchez (2015) observed that in a frictionless economy, such as a reduction in real wage growth occasioned by a rising and unbridled inflation rate, the result will be slower growth in labour productivity. The International Labour Organization (ILO) report (2022) insists on a well-designed policy measure to prevent the deepening of the existing level of poverty, which is mostly caused by eroding the purchasing power of the middle class through inflation, inequality and social unrest. The Geneva ILO report further submitted that severe inflationary pressure, eroding of purchasing power, accompanied by slow growth, partly driven by the war in Ukraine and global energy crisis are causing a noticeable fall in real wages in many countries across the globe. The report particularly pinpoints the middle-class and the low-income households as the most hit. The global wage report of 2022-2023, where the impact of inflation and COVID-19 were analysed with wages and purchasing power, showed that, for the first time in the century, the monthly wages fell in real term to negative (-0.9%) in the first half of 2022. Houngbo (2022) cited in Global Wage Report (2022)further recorded that the multiple global crises have led to a decline in real wages, placing tens of millions of workers in a dire situation as they face increasing uncertainties. Houngbo insisted that the purchasing power of the lowest paid should be maintained, otherwise, the world should be prepared for an uncontrolled rise in income inequality and poverty, pointing to the fact that, the effort that has been put in place for the post-pandemic recovery should not be put at risk with the consequence of fueling social unrest across the globe and undermining the goal of achieving prosperity and peace for all. Attempting to ignore the sign and phenomenon of the inflation-wage dynamic syndrome, is an attempt to ignore the root of rising income inequality, growth in living standards and a host of other economic challenges particularly the near stagnation of wage growth structure. Mishel et al (2015) noted that wage stagnation, which has become a chronic economic challenge was not created by abstract economic trends, rather, it is a policy choice made on behalf of those with the most income, wealth and power. Slow and unequal wage growth, accompanied by continuous reduction of workers' standard of living, stems from a growing wedge between overall productivity; which is the comparison between goods and services produced per hour worked and the pay received. Lawrence et al., further used historical data to show that wage stagnation affects low-wage workers more than middle-age workers but has a lesser impact on high-wage workers. The impact of global integration with

low-wage countries was also observed by the paper, especially the admission of China to the World Trade Organisation in the late 1990s has negatively affected the wages and salaries of non-college workers. Similarly, weak enforcement of labour union law and erosion of labour standards beyond the decline in the real value of the minimum wages cause the wages and salaries to be stagnated. Similarly, the need to moderniselabour standards, especially in terms of the provision of sick, family and vacation leave, worker misclassification, wage theft, and increased workers who are exposed to employers' exploitation aggravates the current wage structure stagnation. World Bank (2022) cited in Bailev (2023) recorded that Nigeria's accelerated inflation growth has eroded the N30000 minimum wage by 35.5 percent and the poverty net has widened by five million people in 2022. Similarly, Bailev, citing the Nigeria Development Update Report (2022), shows that the higher inflation in 2022 has pushed an estimated five million Nigerians into poverty between January and September 2022, due to high prices of stable foods such as rice, bread, wheat and yam, with rural area recording higher inflation rate. The inflation trend between 2020 and 2022 has eroded the purchasing power of wages and salaries such that the inflation stock has pushed an estimated 15 million Nigerians into poverty. The report further stated that the consumer price inflation had heightened, making it one of the highest in the world. The same paper also cites Picod.com, an international e-commerce platform, which reveals that the basic food items required for survival by an average Nigerian family which cost N48, 130 in January 2023was 60.4 percent higher and bigger than the country's minimum wage. The report further insists that the wages of the least paid workers increased at a slower rate when compared to the food prices and the minimum wage is not enough to cover a basic basket of product. The 60.4 percent was the highest in the past five years when compared to 36.6 percent in 2022, and 17.7 percent in 2021, with 2019 and 2020 recording 5.1 percent and 8.1 percent respectively.Okojie (2022) strongly advises the government to find a permanent solution to the surge in food prices to tame inflation. Okojie observed that households spend over fifty percent of their monthly income on food. The Central Bank of Nigeria raised the interest rate by 150 basis points to 15.5 percent to reduce the inflationary pressure and the cash reserve ratio was equally increased from 27.5 percent to 32.5 percent. The writing further stated that over 105 million Nigerians still live in abject and extreme poverty according to data from the World Poverty Clock of the Brooking Institute. There is a need for constant research to reduce the alarming inflationary pressure. If not checked, the current inflationary trend, according to the World Bank, will push more Nigerians to chronic poverty.

2. Literature Review

2.1 Theoretical literature

Five major theories of wages surface in the economics literature. The subsistence theory, the standard of living theory, the wage fund theory, the residual claimant theory and the marginal productivity theory (Jhingan, 2007). The subsistence theory also known as the iron laws of wages postulated that the price of labour is determined by its cost of product. The minimum subsistence expenses required for the worker to support himself and the family to ensure that labour supply is maintained is the cost of labour power. The theory treats labour power as a commodity. The standard of living wage theory postulates that wages and standard of living become equal in the long run. In other words, there is a habitual level of standard of living that the workers try to maintain in the long run. The wage funds establish a functional relationship between population and capital. The population here, according to the theory, refers to the number of people who enter the labour market for employment, while the wage fund is the capital set aside by the entrepreneur for the services of labour. While the residual claimant theory maintained that wages of labour are paid out of the product of its industry, the marginal productivity theory proposed that in a competitive market, wages tend to be equal to the marginal product of labour.

Two major theories of inflation often surface in economic literature. The demand-pull and the cost-push inflation theory. The demand-pull occurs when the demand for goods rises more than the supply while the cost-push occurs when unions enforce an increase in wages and employers increase business profit.The minimum wage is the lowest legally allowed income below which no workers employed should be paid (Zuhumnan, 2023). Zuhumnan suggests that to fortify workers' income against inflation, salaries should be increased annually by 4.9 percent or a monthly pump-up by 0.4 percent. The research further observed that in 1974, during the first oil boom, the minimum wage was sixty naira, equivalent to two hundred and twenty-eight dollars per month and adjusted for inflation, the amount is about ninety thousand naira today. The paper therefore suggests that at the minimum, the minimum wage should not be less than fifty-four thousand naira. This should not be a problem as the federal oil proceeds can be used to finance this increment. While making all efforts to increase the minimum wage, Zuhumnan recommended the following steps to fight and eradicate ghost workers (fraudsters, especially government workers, creating fake identities to file benefit claims) from the system. Firstly, a

central payment system should be adopted. Iweale was cited to have adopted this scheme which weeded out over five thousand ghost workers from the system saving the government over one billion dollars. Secondly, technology can be used to track the payment system. Biometrics can come into play here where fingerprints and other important details of the employee are stored in a central database.

2.2 Empirical literature

Since 2015 Nigeria has experienced a high level of price volatility, with global oil price vagaries, the COVID-19 pandemic and the Russian-Ukraine war posing a serious challenge to the nation (Adetayo, 2023). Adetayo further noted that current inflation is at an 18-year high (26%) with a continued plunge of the naira against the dollar. The situation became worse when the decades-long subsidy was removed by Bola Tinubu, accompanied by naira devaluation and unchecked and continued increase in the general prices.

Historically, the first minimum wage can be traced back to 1981, when the minimum wage stood at N1500 per month. Ten years later (1991), this was increased to N3000. In 2004, through the intervention of the labour act, the minimum wage was set at N5500 per month.Inflation and minimum wage structure are not unconnected with the rate of unemployment. Analyst, therefore, tends to establish the macroeconomic link between these variables (Abdurranf, 2019). Abdurranf empirical study of the impact of the national minimum wage increase on unemployment and inflation rates in Nigeria is highly revealing. The ARDL model was disaggregated into distinct models: the Cobb-Douglas production function and the Phillip empirical analysis. With the use of ECM and ARDL, the unemployment rate was used as the dependent variable in model one while inflation was used as the dependent variable in model two. The short and long-run result show that the national minimum wage has a positive and significant relationship with unemployment and inflation. The result equally shows that as the national minimum wage increased by 10%, the unemployment rate recorded an increase of 1 to 2.3%. Empirically and theoretically, therefore, it can be adjudged that an increase in national minimum wage will not granger cause a significant increase in the unemployment rate. Similarly, as the national minimum wage increases by 10% inflation rate increases by 1.3% and 1.1% in the short and long-run periods. The study recommended that to avoid the minimum wage structure from having a significant effect on inflation and unemployment rate, there should be a steady and mild increase in the minimum wage without calling for strike or negotiation.

Inflation and real wages are directly related to labour productivity. Iheanacho (2016) examines the short and long-run relationship between real wages, inflation and wage productivity. ARDL model was adopted in addition to diagnostic tests which examine the model for serial correlation, normality,heteroscedasticity and stability test - which examine the Correlative Sum of Recursive Residual (CUSM) - and the Cumulative Sum of Square of Recursive Residual (CUSUMSQ) were conducted. The paper proxies the rate of inflation by the growth of the consumer price index. The real wage rate was proxy by the hourly compensation in the manufacturing sector and productivity by the output per hour in the manufacturing sector. Iheanache's finding suggests that the variables are not statistically significant in exerting influence on productivity when treated in isolation. When GDP per capita is introduced as a controlled variable, the research result shows a positive and significant relationship between the real wage and labour productivity with real wage driving productivity. On the final note Iheanache's study recommended that to enhance productivity, adjustment mechanisms that creates inflationary pressure in the labour market should be avoided.

Analysts such as Emmanuel and Imoisiestablished a link between inflation, wages and poverty. Income growth rate, a good proxy for wage structure, adult literacy growth rate, health growth rate, misery index and government expenditure were used as regressors while poverty growth rate was used as a regressand. The study recommended that there is a need to check inflation to reduce poverty and unemployment. The study makes it clear that inflation has a strong impact on wage structure and poverty with its attendance effect on unemployment. However, there is a need to do further research on Emmanuel and Imoisi study. The methodology in the study indicates that ARDL was used after testing the variables for unit roots. The order of integration shows that the variables are of I(0) and I(1) which justify the need to use ARDL, but the least square was used in the methodology which calls for further inquiry into the output of the study to avoid policy inconsistency. Buba et al (2018) view constant wage stagnation as a political weapon to impoverish the people to continue to perpetuate corruption in public space. The paper established a linkage between politics and trade balance determination. The politics that goes into minimum wage negotiation and trade imbalance call for urgent attention. Employing the asymmetric co-integration adjustment mechanism put forward by Enders and Sikios (2001) in the methodology, the momentum-threshold autoregressive (M-TAR) and threshold autoregressive (TAR) conducted show that there exists an asymmetric cointegration relationship between trade balance and the exchange rate which is constantly been influenced by inflation due to the devaluation of local currency. Buba et al study lends empirical support to

the fact that the trade balance deficit is greatly influenced by changes in the exchange rate. Oscar and Nechio (2023) analyse inflation and wages since the pandemic period. Based on the novel nature of the pandemic, a new approach was used to achieve identification. Local Projection (LP) and Difference-in-Difference (DID) estimation were used in the methodology. The paper raised an observation after applying the Real Disposable Income (RDI) gap to analyse Phillip's mechanism. It was shown that inflation does not immediately respond to this gap; rather it takes a few quarters. Keeping inflation expectations stable is a major role of the central bank. However, the recent pick-up in the inflation trend indicates that expectations have been revised upward. Therefore the paper proposed how inflation may spill over into wages through Phillip's mechanism for wages. Oscar and Nechio opined that wages respond more to the activity gap strongly than prices. Similarly, two observations stem from the above assertion: it was observed that firms have other margins over which they can adjust prices and wages to respond to inflation expectations, though the dynamics are much slower as natural expectation theory demands. Observing that there is strong evidence that the Philip theory is still obtainable in the current post-pandemic era, the demand-supply imbalance leads to an increasing inflation trend. It was recommended that there should be a moderate revision of inflation expectations, controlling prices and wage inflation and maintaining fiscal and monetary policies credibility that keeps inflation at bay. It was concluded that as inflation grows, expectations drift the more and the larger the impact on price and wage inflation, the inflation-wage spiral will be inevitable should these dynamics linger. Ademola and Badiru (2016) did not specifically consider wage structure and inflation rather their work looked at unemployment and inflation. They build an ARDL model containing a GDP growth rate, unemployment rate and inflation rate. The Johansen cointegration results show the existence of a long-run relationship between economic growth, unemployment and inflation. The findings of the paper reveal that Nigeria's economic growth rate is exclusive in nature. An economic growth that has little impact in reducing inequality, a growth that does not increase the living standard of an average Nigerian citizen. The finding is in line with the dualistic theory which explains the presence of a dual economy between the rich and the poor and the existence of abject and chronic poverty amid plenty often perpetuated by the political class. Ukonta (2013) debunks the claim of an increase in wages and salaries fueling the inflationary pressure. Ukonta did an expository study on the impact of salary increases on inflation in Nigeria. Using OLS in its methodology, the Salary Bill of the Federal Government (SBFGN) workers was used as the independent variable while inflation was used as the dependent variable. The study shows plainly that salary increase has no impact on inflationary pressure, insisting that further research and continuous research should be made on

the major variables that have a high impact on inflation in Nigeria. Further recommendations were made on how to tackle inflation. It should be noted that Ukonta findings and policy recommendations require further validation. The point is, making policy recommendations on OLS without further test may not be ideal. Analysts who use econometric techniques are often advised to test the data series for stationarity before the application of OLS. Except the variance and auto-covariance of the data properties are time-invariant, applying OLS may produce spurious results. Ogunjobi (2014) portrays the similitude of Nigeria Dutch disease syndrome with wealth and poverty paradox. The question is: could a country's wage structure and the inflationary trend depict whether a country is rich or poor? To Ogunjobi, the answer is in the affirmative. The paper used cointegration, error correction model and a causality test in its methodology. The paper's mode of presentation, analysis and conclusion is so convincing. The conclusion is clear: the country is rich but the people are poor.

Wage-price spiral could have a serious economic implication. Wage-price spiral occurs when workers, in an attempt to keep-up with the rising inflation, demand for higher pay. In a spillover effect, businesses then raise the prices of goods and services to cover higher labour costs. Persistence increase in prices with0out a corresponding increase in wages and salaries will result to cost of living crisis. Reid (2023)recorded that private companies should be encouraged to raise wage between 5 to 7 percent in sector that could afford it, while there should be mandatory increment in wages and salaries of government workers, this, according to the paper will help to balance the effects of inflation rather than fueling it. Alvarez and Hansen (2023) data analysis suggest a persistence wages and price growth trend, the paper raise concern that prices and wages are continually feeding on each other and this unwholesome trend is likely to increase over a sustained period. The emergence of this spiral, raised a serious concern that inflation may keep rising base on inflation-expectation theory. However, the paper concluded that wage-price spiral risks still appear contained.

3. Methodology

The analysis uses time series data for the period 1991 – 2023.~~The analysis uses time series data for the Nigerian economy for the period 1991 – 2023.~~ The data were collected from the Central Bank of Nigeria (CBN) website and the World Bank database. Since the data properties are of I (1) and I (0), ARDL was used in the methodology. The model is specify as follows: DLn (COMP) = α_0+ α_1D(*INFR*) + α_2D(CT) + α_3D(CF) + α_4lNFR + α_5CT + α_6CF + *et*. Where, COMP is

the compensation of employees including workers' remittance, INFR is the inflation rate, CT is the consumer price index for transportation and CF is the consumer price index for food.

4. Presentation and Analyses of Results

TABLE I: Unit Root Tests

Variables	ADF Test Stat. Level	conclusion	ADF Test Stat. 1st Diff.	conclusion
CF	2.621396 (-2.986225)	Non-stationary	0.836828 (-2.98103)	Non-stationary
COMP	-1.949799 (-2.957110)	Non-stationary	-5.660768 (-2.96041)	Stationary
CT	4.335822 (-2.967767)	stationary	-4.011390 (-2.96041)	Stationary
WSW	-0.494909 (-2.9571100	Non-stationary	-6.396698 (-2.96041)	stationary
INFR	-2.090377 (-2.957110)	Non-stationary	-5.357138 (-2.96041)	Stationary

Result extracted from E-views output

~~Table Ishows~~The results (Table I) indicated that ~~that~~ all the variables are non-stationary at levels except CT. COMP, INFR, WSW and CT are stationary at first difference while CF is non-stationary. The results in Table ~~I~~II~~i~~ shows that the compensation of employees including workers' remittance, inflation rate, consumer price index for transportation and consumer price index for food are co-integrated.

The bounds test result indicate~~d~~s that the F-statistic value (3.573983) is greater than the critical values of Upper bounds (3.52) and Lower bounds (2.45). Thus, the time series are co-integrated, indicating that a long-run relationship exists among the variables; which indicate~~d~~s that the short-run deviation in their relationships will be corrected in the long-run.

Table II Bounds Test of Co-integration Results

F-Statistic	3.573983

Comment [U3]: Kindly check the journal's guidelines for sub headings

Comment [U4]: All the table titles are too short kindly reframe into a more meaningful sentence

Formatted: Font color: Red

Formatted: Font color: Red

Formatted: Font color: Red

Comment [U5]: The discussion part can be a further strengthened with reasons

Formatted: Font color: Red

Upper bounds	3.52
Lower bounds	2.45

Table IIIARDL Cointegrating and Long Run Form

Formatted: Font color: Red

Variables	Coefficients	T-ratio	Prob.
CointEq(-1)	-0.590464	-2.704364	0.0269

The speed of adjustment, in the long run, is shown in Table III (CointEq(-1) -0.590464). The coefficient is equal to -0.590464, suggesting that deviation from the long-run path is corrected by around 59 percent over the following year.

Table IV Short-Run Dynamic Model

Formatted: Font color: Red

Variables	Coefficients	Std. Error	t-Statistic	Prob.
CF	-0.041253	0.062893	-0.655917	0.5303
CT	-0.052754	0.071105	-0.741914	0.4794
COMP(-1)	0.859719	0.293165	2.932544	0.0189
INFR(-2)	-0.060750	0.026588	-2.284881	0.0517
WSW	1.550075	0.837909	1.849932	0.1015
WSW(-1)	-0.301522	0.801775	-0.376069	0.7166

E-views output

The short-run dynamic model in Table IV shows an inverse relationship between employee compensation and inflation. It indicates that a 6 per cent ~~%~~ fall in two lag periods of inflation level led to a 1 per cent~~%~~ increase in employee compensation. By corollary, as inflation falls by 6%, employee compensation increases by 1per cent~~%~~. Similarly, there is an inverse relationship between wages and salaried workers as a percentage of total employment (WSW), and employee compensation and remittance. It implies that as the one-year previous period of WSW falls by 30 ~~0%~~per cent, employee compensation increases by 1 per cent~~%~~. The model indicated ~~s~~ that the current trend of inflation eroding the real value of the national currency, thereby reducing the workers purchasing power, will lead to workers exiting paid employment to more viable ventures that increase their purchasing power. The paper did not analyse whether or not

workers will consider establishing their private firms, however, the possibility of this scenario may be an option for some. This requires further research to be able to make a clear-cut prediction in that regard. The short-run model also shows an inverse relationship between the consumer price index for food and employee compensation. As CT increases workers compensation falls and vice versa with the ratio of five to one. Similarly, as CF increases, COMP falls and vice versa with a ratio of four to one. The result implies that as these indexes (CT and CF) rise, they erode the purchasing power of the average worker. Policies to reduce these indexes should be initiated and adopted to increase the purchasing power of the workers.

5. Recommendation and conclusion

Maximum price legislation can be a viable macroeconomic policy to curb the current inflation spiral. The government should initiate and promulgate a 'price ceilings' mechanism for major consumable products. From the angle of a monetary policy measure, demonetisation of currency and credit control via the sale of a security in the open market and regulation of consumer credit can be adopted. Exercising caution in incurring public debt and a deliberate drastic reduction in government expenditure can be a good fiscal policy measure. Increase in consumer goods production and ensuring a rational wage policy can be a long-term government objectives.

Reference.

Abdurrauf, B. (2019). Impact of national minimum wage increase on unemployment and inflation rates in Nigeria: an empirical analysis. *Amity journal of economics*, 4(1), pp17-34.

Ademola, A.&Badion, A. (2016). The impact of unemployment and inflation on economic growth in Nigeria (1981-2014). *International Journal of Business and Economic Sciences Applied Research*, 9(1), pp47-55.

Adetayo, O. (2023). Nigerian workers' wages diminish as inflation rise and government revenue dips. Retrieved from: www.aljazeera.com/feature.

Alvarez, J. & Hansen, N. (2023). Wage-price spiral risks still contained, latest data suggests. Retrieved from: https://www.imf.org/en/blogs/articles/2023/02/24/wage-price-spiral-risks-still-contained-latest-data-suggests (accessed 5 January 2024)

Bailey, B. (2023). Inflation erodes Nigeria's minimum wage by forty-one percent in three years. Retrieved from: https://businessday.ng/business-economy/articles. (accessed 12 November 2023)

Buba, S., Al-Jadi, S. M. I. &Guza, G. M. (2018). Asymmetric co-integration between exchange rate and trade balance in Thailand. *World Journal of Economic and Finance*, 4(1), pp75-84

Global Wage Report (2022).Rising inflation brings striking fall in real wages, ILO report finds. Retrieved from: https://www.ilo.org/global/about-ilo/newsroom/news/wcms_862321/lang--en/index.htm (accessed 12 January 2024)

Iheanacho, E. (2017). Empirical review on the relationship between real wages, inflation and labour productivity in Nigeria. ARDL bounds testing approach. *Issues in Economics and Business*, 3(1), pp9-29.

Mishel, L., Gould, E. &Bivens J. (2015). Wages stagnation in nine charts. Retrieved from: https://www.epi.org/publication/charting-wage-stagnation (Accessed 11 December 2023)

Ogunjobi, T. A. (2014). Poverty and unemployment paradox in Nigeria. *Journal of Humanities and Social Science,* 19(5), pp106-116.

Okojie, J. (2022). Inflation outpaces Nigeria's real wages by hundred percent. Retrieved from: https://businessday.ng/business-economy/article (accessed 12 November 2023)

Oscar, J. &Nechio, F. (2023). Inflation and wage growth since the pandemic. Retrieved from:https://www.ncbi.nlm.nih.gov/pmc/articles/pmc 10184877 (accessed 16 November 2023)

Sanchez, J. M. (2015). The relationship between wage growth and inflation. Retrieved from: https://www.stlouisfed.org/on-the-economy/2015/november.

Ukonta, C. J. (2013). The impact of salary increase on inflation in Nigeria. A B.Sc. project presented to the Department of Economics, Faculty of Management and Social Sciences Caritas University Enugu (accessed 18 January 2024)

Zuhumnan, D. (2023). Collapse of real wages in Nigeria: when those on minimum wage live below minimum wage. Retrieved from: https://www.thecable.ng(accessed 12 February 2024)