UNEMPLOYMENT AND INFLATION TRADE-OFF: THE NIGERIA EXPERIENCE IN THE CONTEXT OF PHILIP CURVE

ADENIYI IDOWU OKEOWO
Department of Economics, Glorious Vision University, Ogwa, Edo State, Nigeria
***Okeowo4hope@gmail.com**, 09050229091.*

ABSTRACT

Price stability and full employment are not complimentary macroeconomic objectives rather they are conflicting macroeconomic goals. In order words inflation and unemployment are also conflicting policy objectives. It therefore implies that one must be sacrificed to attain the other. The main objective of this study is to analyse the unemployment and inflation trade-off: the Nigerian experience regarding the Philip curve. The study used time series econometric analysis. The Augmented Dickey-Fuller (ADF) unit root test showed that the variables were of I(0) and I(1), hence Autoregressive Distributed Lag Model (ARDL) was used for the estimation. The study found that the Philip Curve of an inverse relationship between the two variables (Inflation rate and Unemployment rate) is true for Nigeria economy. The analysis showed that inflation rates fall from 34 percent to 12.2 percent and consequentially to 12.0 percent for the decade analysis. Conversely unemployment rate increased from 3.3 percent to 13.7 percent and subsequently to 15.6 percent. This study therefore confirms Philip theory in Nigeria. Theoretical evidence showed that monetary policy used in solving unemployment worked best when it allowed the real economy to respond appropriately to economic fundamentals. This was shown by low speed of adjustment of 48.9 as shown by the co-integration result. It was recommended that credit control and demonetisation of currency with higher denomination can be a viable monetary policy while a surplus budget and reduction in government expenditure can be a viable fiscal policy when inflation poses a serious challenge.

Keywords: Unemployment, Unit root, Inflation, Autoregressive, Distributed Lag.

JEL: P2, P3, P4**.**

1 INTRODUCTION

There are four basic economic policy objectives: attainment of a high rate of or full employment, price stability, economic growth and balance of payments equilibrium. Mirela (2013) sees objective of price stability to be most important of all, while (Olanipekun et al., 2015) lay more emphasis on economic growth sustainability. In monetary domain, the inclusion of exchange rate stability makes this policy objective to be five. These objectives are not complementary to each other. Rather they conflict with one another, if a government tries to fulfill one objective, some other objectives move away; this is what is regarded in economics as a trade-off in conflicting policy objectives. It thus means that one objective has to be sacrificed to attain the other. Conflicts of policy objectives occur when one objective is sacrificed to achieve another. For economic growth to be instigated the economy must accept a certain minimal level of inflation; hence there exists a trade-off between economic growth and price stability. In simple terms, price stability has to be trade-off for economic growth or vice versa. A trade-off equally exist between full employment and balance of payments. If there is an increase in government spending, it generates employment in the economy. However, this can lead to increase in imports, which consequently leads to a balance of payments disequilibrium. Several studies such as (Pedro and Uthman, 2022),

(Okereke and Obinna, 2022) and (Omotunde et al., 2023) have been conducted to analyse and disaggregate inflation to enhance price stability and support employment generation. Okereke and Obinna (2022) investigate the price of food items exchange rate prices and petroleum products price changes, which have been in an upward swing in the past decades. Several policy recommendations have been given for implementation. The study is intended to make an empirical inquiry into the trade-offs between inflation and unemployment and demonstrate that there is a need for delicate balancing between the two conflicting policy targets of price stability and full employment in the economy. This paper major's objective is to look at the trade-off between unemployment and inflation in Nigeria between 1989-2021.

2 LITERATURE REVIEW

2.1 Conceptual Literature

Inflation is associated with a general increase in prices. Jhingan (2010) recognises demand-pull or monetary theory of inflation, Cost–push inflation, mixed 'demand-pull' 'cost-push inflation', sectoral or demand–shift inflation, structural inflation, marking inflation and 'open and suppressed' inflation. On the other hand, Unemployment in Nigeria is labour force that is willing and able to work but is unable to get a job for thirty-nine hours before the unemployment statistic is released (John and Bright, 2012). In Nigeria, unemployment seems to be chronic, with millions of youth roaming about the street without hope of getting a job. Retrenchment is the order of the day as employers must cut expenses to meet up with the spiral increase in production cost. Rural-urban migration is not helping the situation. Rural job seekers join their counterparts in the cities. This further exacerbates the situation. To be counted as unemployed, out-of-work employees, must have these three qualities: they are not working even part-time or temporarily, they are available to work and they actively search for work in the past four weeks.

Many Nigerian youth have to take to street hawking to survive. Olubukola (2013) also noted that some degree holders have to take to 'okada riding' to keep body and soul together. Olubukola further stated that companies and industries like textile industries steel companies, and the Nigerian Railways are folding up. Many manufacturers are experiencing low turnovers in their business, with incessant power failure, thus having to rely on generating sets that have to be fueled at exorbitant costs. Companies in Nigeria are reducing their workforce, thus sending thousands of their employees in search of already scarce jobs. The banking sector appears to be a worse hit when compared to other sectors in Nigeria.

Uduak (2016) identifies some steps taken by the government to address this challenge. It includes the Structural Adjustment Program (SAP), the National Directorate of Employment (NPE), Small and Medium Enterprises Development Agencies (SMEDAN), the National Agency for Poverty Eradication Programme (NAPEP), the Belter Life Programme, the National Open Apprenticeship Scheme, the Graduate Job Creation Loan Guarantee Scheme, Agricultural Sector Employment Program, the Subsidy Reinvestment and Empowerment Program (SURE-P) and Youth Enterprise with Innovation in Nigeria (YOUWIN). Despite these policies and programs, he observed that youth unemployment remains a major challenge to the developmental process of the Nigerian economy.

2.2 Theoretical Literature

Mathew (2019) analyses the classical theory of unemployment. The study submitted that government regulation tends to increase unemployment. An increase in minimum wage will increase the operational cost of the business with the effect of either downsizing the current labour or refusing to hire more labour. The implicit contract theory justifies the reason for layoffs rather than downward wage adjustment. This theory explains the main causes of unemployment in the period of recession. The theory specified that Labour laws and contracts make it extremely difficult for employers to cut wages, hence, they resort to downsizing. The Keynesian theory postulated that employment depends on effective demand (Jhingan, 2010). Therefore, Keynesian theory submitted that unemployment is generally a lack of effective demand in an economy

Uduak (2016) emphasised skill acquisition as a panacea to the current trend of unemployment in Nigeria. They draw heavily on the Stuart (2004) model. This is not a surprise as the major study on unemployment that offers skill acquisition as a solution often draw heavily on the study done by Professor Stuart Dreyfils, a mathematician and professor. As observed by this author, (Stuart, 2004) model posits that in the acquisition and development of a skill, one passes through five levels of proficiency. It includes the novice stage, advanced beginner, competent, proficient and expert stages. In the first stage, the instruction process begins with the instructor decomposing the task environment into a context-focal features that the beginner can recognize without the desired skill. At the advanced beginner stage, Stuart further stated that the novice gains experience coping with real situations and begins to develop an understanding of the relevant context; he or she begins to note, or an instructor point out, conspicuous examples of meaningful additional aspect of the situation or domain. The competent level typified the period by which the learner see his action in terms of long-term objective. With continued practice, the competent performer moves to the proficient stage. At the expert stage, the action seems to be natural, without recourse to some principles (Stuart, 2004).

2.3 Empirical Literature

Obute and Aondongusha (2020) investigate the Nigerian inflationary threshold with economic growth. Inflation targeting was the core prerequisite given in that study to attain and sustain economic growth according to Obute and Aondongusha. The study is equally in line with (Adamu and Usman, 2022). The study analyse oil price fluctuations with economic growth. However, growth is only sustainable if macroeconomic policies address unemployment challenges in the economy. Omotunde et al. (2023) emphasised the impact of inflation rates on the agricultural sector output. In all, recent studies tend to emphasise inflation targeting for sustained economic growth. The other side of the coin (unemployment targeting) must be sustainable to attain the desired economic growth and if need be, deliberate policies must be initiated and implemented to attain an optimum trade-off policy decision. Varshney and Meenakshi (2023) emphersised the core unemployed in their analysis. The finding shows that government intervention in the provision of employment has a significant impact in unemployment reduction.

Michael (2013) attributes unemployment to terrorism, kidnapping and armed robbery. According to Michael, unit roots, with structural breaks and the Autoregressive Fractional Integrated Moving Average (ARFIMA) approach were used. Evidence of convergence among ten states was

discovered. The states include Anambra, Adamawa, Akwa Ibom, Bornu and Kaduna. Others include Kano, Jigawa, Plateau and Oyo. The study concluded that the unemployment challenge may persist in these states. Michael's analysis call fall continuous research in this area. The last paragraph of his research was unequivocal about this dilemma. This eye-opening paper by Michael shows that all hands must be on deck to find a lasting solutions to this scourge of unemployment. Maximova (2015) sees inflation and unemployment as a scourge on the economy. Considering Nigeria's experience in the past years Maximova's analysis is true.

In forecasting and econometric investigation, Autoregressive Integrated Moving Average, popularly known as the Box-Jenkins methodology and vector autoregression can be used. Odusanya (2010) suggests two points that are noteworthy. Firstly, the supply of money should continually be kept in check given its potential impact on the economy. Secondly, the interest rates on lending should be reduced. Olawunmi and Adebayo (2017) found out that the resultant impact of unemployment and inflation on economic growth is dynamic in nature. They recommend that the Nigerian government should concentrate on reducing the rising unemployment rate in Nigeria.

Vikesh and Subrina (2004) work seems to be unique in their analysis. They found evidence of a structural break that is significant. Girijasankar (2001) used econometric modeling to investigate the relationship between inflation and economic growth. The author found two interesting results. First, they found a positive relationship between inflation, economic growth and employment. Second, inflation seems to affect growth in a larger proportion. He later concluded that inflation is needed for growth; however moderate growth rate is surface for an economy in order not to fuel inflation

Olubukola (2013) listed ten causes of unemployment. They include low Gross Domestic Products growth rate, wrong policy prescription, faulty educational system, neglect of the agricultural sector, poor enabling environment, rural-urban migration, rapid population growth, faulty educational system, the rapid expansion of the educational system and gradual collapse of the manufacturing sector. Others include the absence of industrialisation, poor agricultural system, inadequate social amenities, when supply is higher than demand, economic recession, our faulty educational system, high cost of education (especially the private ones) and the introduction of cash crops under colonial systems, our faulty development plans, over populations and geographical immobility of labour.

Corruption should be fought in all sectors, whether private or public, to increase power supply, the government should make provision for bail-out funds and the agricultural sector should be given proper attention. Since unemployment and poverty are two sides of a coin, Odejimi (2014) emphasises that eradication of extreme poverty can only be achieved if the microcredit scheme is given their rightful place in funding small-scale entrepreneurs. It equally implies that the provision of microcredit in funding SMEs can be a panacea to the scourge of unemployment. Odusanya (2010) recommends a reduction in interest rates to fight this menace.

3 METHODOLOGY

The analysis is based on time series data for the Nigerian economy for the period 1989 – 2021. The data were collected from the Central Bank of Nigeria (CBN). The paper uses secondary data within the space of 33 years. The sample period is divided into three decades (ten years period): 1989-1998, 1999-2008 and 2009-2018.

The volatility chocks experience during the Covid-19 pandemic were not included in the decade analysis. Within the ten years periods, the average inflation rate and unemployment rate are calculated for the three periods. Time series data of macroeconomic variables of most economies, especially the developing economies are not very satisfactory due to poor data gathering mechanisms. The data set may not be stationary when econometrics tools are applied. It implies that the classical least square assumptions for econometric estimation and forecasting are negated. In such cases, econometric results may not be ideal for policy analysis, formulation and implementation. Autoregressive Distributed Lag (ARDL) Model can be used when the variables are 1(0), 1(1) or both. The paper, therefore, uses (ARDL) in its analysis.

Do Thi and Zhang (2016) posited that the augmented ARDL model can be presented in the functional form:

$$Dy_t = c_0 + c_1 t + \lambda_{yx} z_{t-1} + \sum_{i=1}^{p-1} \gamma_i Dy_{t-i} + \sum_{i=0}^{p-1} \gamma_i Dx_{t-i} + \delta_t w_t + u_t \qquad t = 1,\ldots,n$$

where y_t is the regressand, c_0 is the constant, x_{it} are the regressors, w_t is the vector of deterministic variables. The operational form is given as: $DLn(INFR) = \alpha + \beta_1 D(InUNMPR)_{t-1} + \beta_2 D(In\ INFR)_{t-1} + w_1 UNMPR + w_2 INFR + U_t$ Where: INFR is Inflation Rate UNMPR is the Unemployment rate

4 RESULT AND DISCUSSION OF FINDINGS

The level of stationarity of the time series was investigated by applying the Augmented Dickey and Fuller test (ADF). The ADF test results for the time series variables are presented below. The critical values for each of the variables are lesser than the respective ADF test statistics except for inflation rate at levels as shown in Table 4.1. In the final evaluation, unemployment rate is stationary while inflation is non-stationary at levels using the ADF criteria. However, in line with econometrics theory, the two variables are stationary at first difference.

Table 4.1 Unit Root Test Result

Levels				**Fist Difference**		
Variables	ADF Test Statistic	**5 percent Critical Value**	**Remarks**	**ADF Test Statistic**	**5 percent Critical Value**	**Remarks**

INFR	-2.58492	-2.957110	Non-stationary	-5.481688	-2.960411	Stationary
UNMPR	-3.47099	-2.957110	Stationary	-10.56624	-2.960411	Stationary

E-views result

Table 4. 2 Bounds Test of Cointegration Results

F-Statistic	11.48596
Upper bounds	5.73
Lower bounds	4.94

Table 4.3 ARDL Cointegrating Form

Variables	Coefficients	T-ratio	Prob.
CointEq(-1)	-0.489873	-3.359864	0.0023

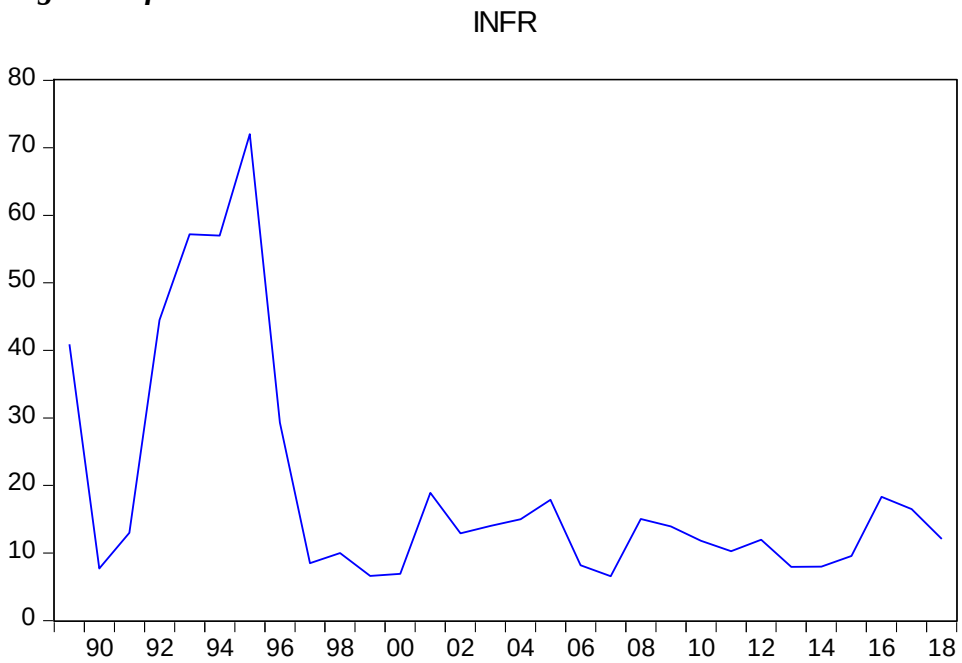
Table 4.4 Short-Run Dynamic Model

Variables	Coefficients	T-ratio	Prob.
C	16.73335	2.840479	0.0085
INFR(-1)	0.869691	5.441505	0.0000
UNMPR	-0.602963	-1.977371	0.0583

ARDL co-integration technique is preferable when dealing with variables that are I(0), I(1) or a combination of both (Emaka and Aham, 2016). The short-run dynamic model (Table 4.4) shows that the unemployment rate and inflation rate have a negative and positive relationship respectively, the table equally shows that one period lag of the inflation rate has a positive relationship with the unemployment rate. The bounds test of cointegration results shows that there is co-integration among the variables as shown by the F-stastistic of 11.5 (Table 4.2). The adjustment mechanism is (CointEq(-1) -0.489873). The coefficient of the (CointEq(-1)) is equal to -0.489873 (Table 4.3), suggesting that deviation from the long-term inflation path is corrected by around 48.9 percent over the following year. The above result also validates Philip's macroeconomic theory in Nigeria which is in line with Uche.s (2009) findings. The low speed of adjustment of 49% also lends empirical support to (Varshney and Meenakshi, 2023) study.

4.1 Inflation and Unemployment, Graphical Presentation

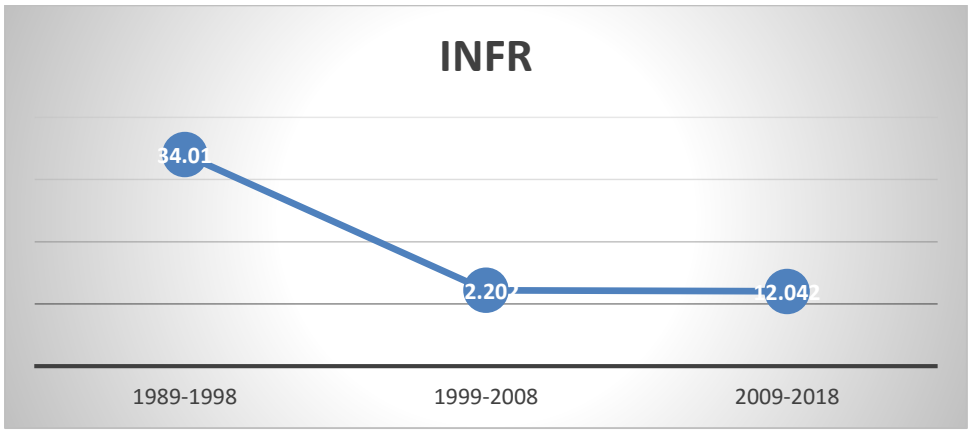
Figure1InflationRates1989-2018



Source: author's calculation

Decades (10 years) analysis as depicted in figure 2, show that the average inflation rate between 1989-1998 stood at 34.0 percent, with this high inflation rate, monetary authorities started to initiate policies that can drag this rate down, this is observable in the next decade. The next decades witnessed an average inflation rate of 12.2 percent i.e. from 1999-2008. 2009-2018 average inflation rates recorded 12 percent. This shows a further slide in the double-digit inflation rate of 12.2 percent, representing a 1.7 percent decrease in the last ten years.

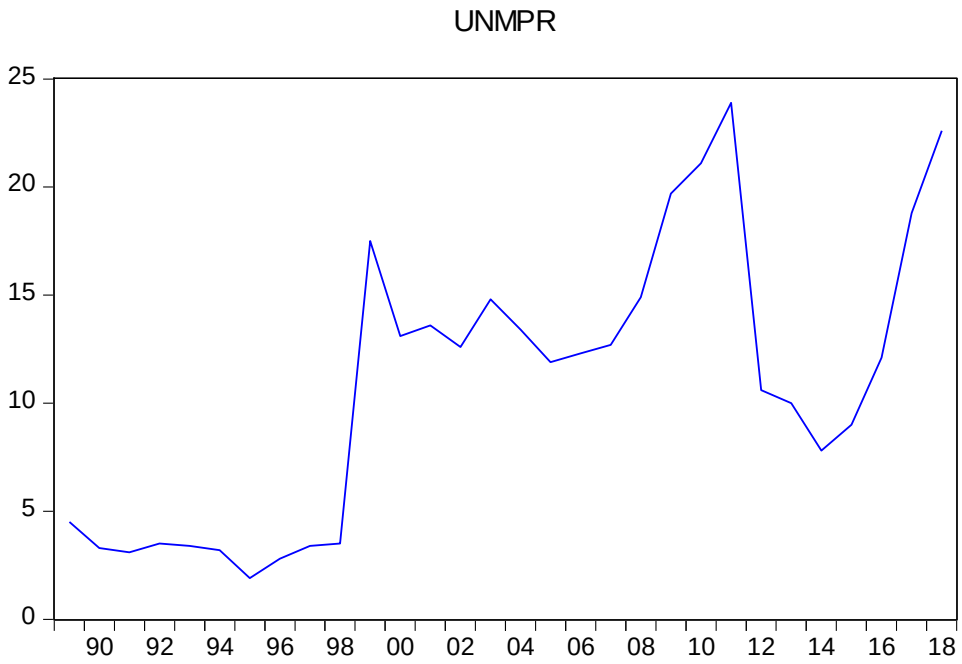
Figure 2 Inflation Rates, Decade Representation



Source: author's calculation

The analysis shows that the average inflation rate decreased from 34.0 percent to 12.2 percent in (1989-1998) and (1999-2008) respectively. It further slide to 12.0 percent in (2009-2018)

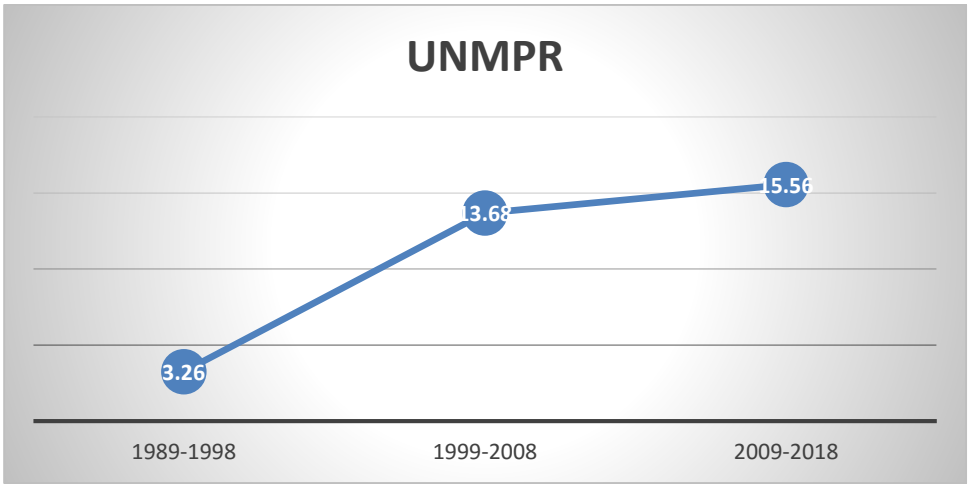
Figure 3 Unemployment Rates 2005-2011



Source: author's calculation

In line with the methodology of this analysis the average unemployment rate increased from 3.3 percent to 13.7 percent, in (1989-1998) and (1999-2008) respectively. It further increases to 15.6 percent from (2009-2018). This is shown in Figure 4 below.

Figure 4 Unemployment Rates, Decade Representation



Source: author's calculation

Contrary to what was obtainable in inflation rates, unemployment rates increase significantly from 3.3 percent to 13.7 percent in (1989-1998) and (1999-2008) respectively. It further increased to 15.6 percent from (2009-2018). From the above, it can be seen that as inflation rate is falling, unemployment is increasing, which supports Philips' proposition.

5 CONCLUSION AND POLICY RECOMMENDATION

The study analyses unemployment and inflation trade-off, the Nigeria experience in the context of the Philip Curve. This study finds out that Philip's trade-off theory (Inflation rate and Unemployment rate) is true for Nigeria's economy. The analysis shows that inflation rates fall from 34 percent to 12.2 *percent* and consequentially to 12.0 percent for the decade analysis. Conversely unemployment rate increased from 3.3 *percent* to 13.7 percent and consequently to 15.6 percent. The negative association between unemployment and inflation pointed out by the Philip curve can be used as a guiding principle for the formulation of economic policies in Nigeria. In recent years, unemployment has raised high enough and the opportunities to find a job for the working population are still quite an acute problem. The rise in prices is continuing rigorously, as we can see in increasing prices for goods and services. Inflation-unemployment trade-off provides an important insight for policymakers. It suggests that the ideal macroeconomic situation with stable prices and full employment is unattainable without a trade-off.

Credit control and demonetisation of currency with higher denomination can be a viable monetary policy while a surplus budget and reduction in government expenditure can be a viable fiscal policy when inflation poses a serious challenge. The current inquiries lend support to the existence of the Philips Curve in the context of a developing economy, such as Nigeria. This analysis encourages a closer look at various factors that may influence the unemployment rate and the inflation rate in the country. Government should review the curriculum of the educational system in the country that would make graduates to creative and be self-employed, instead of looking for scarce job opportunities.

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