The impact of inflation and GDP growth rate on unemployment in Egypt during the period 1991-2022 using the ARDL Model

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Abstract:

This study aims to identify the impact of inflation and GDP growth rate on unemployment rate in Egypt during the period 1991-2022 using ARDL model, to test short- and long-term effects.

The study concluded that there is an inverse long-term relationship between unemployment and the GDP and that there is no long-term relationship between unemployment and inflation.

The value of the error correction factor in the dynamic model also showed that the unemployment rate adjusts towards its equilibrium value in each period by 19.97%, meaning that the unemployment rate takes about five years to adjust towards its equilibrium value.

Keywords: Inflation, GDP Growth rate, Unemployment, Egypt, ARDL Model.

JEL classification codes : E31, O40, E24, O55, C22.

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Introduction:

Egypt grapples with substantial economic hurdles, chief among them being the unemployment a pressing issue, impacting both social cohesion and economic prosperity. This challenge directly undermines individuals' quality of life, exacerbating poverty and inequality. Its origins are multifaceted, stemming from rapid population growth, a mismatch between labor skills and market demands, inadequate investments in productive sectors, and other contributing factors.

Aside from the issue of unemployment, the Egyptian economy has long grappled with high inflation rates due to various factors. These include fluctuations in global oil prices and shifts in the local currency exchange rate. Such instability can dampen investment and spending, consequently limiting job creation and contributing to elevated unemployment rates.

In recent years, Egypt has experienced fluctuations in its GDP growth rate, influenced by various factors such as political stability, economic reforms, and global market trends which affect economic changes in the country, including unemployment.

The study problem can be formulated in the following main question:

To what extent does inflation and GDP growth rate impact unemployment in Egypt during the period 1991-2022?

❖ Study Hypothesis:

- ✓ There is a statistically significant effect of the inflation rate on the unemployment rate in Egypt during the period 1991-2022.
- ✓ There is a statistically significant effect of GDP growth rate on the unemployment rate in Egypt during the period 1991-2022.

❖ study Objectives:

- ✓ To decide the impact of Inflation on Egypt's Unemployment rate.
- ✓ To track down the effect of Gross domestic product on Unemployment in Egypt.
- ✓ To recommend a model for the effect of inflation and Gross domestic product on unemployment in Egypt utilizing the ARDL model.

❖ Method and Tools used:

Our study is based on the application of econometric methods to examine how Egypt's unemployment rate is affected by growth rate and inflation. The Autoregressive Distributed Lag (ARDL) model is employed, first assessing the

stability of time series and testing for cointegration. Subsequently, we estimate the cointegration equation for both the long and short terms. Finally, we verify the validity of the estimated model. In terms of data, we gather annual data for all variables from statistics provided by the World Bank spanning the period from 1991 to 2022.

I. Literature review:

(Shahid , 2014)'s research planned to analyze what expansion and joblessness mean for monetary development in Pakistan from 1980 - 2010. The review found a drawn-out interface between the factors inspected utilizing the ARDL model.

The examination directed by (Yelwa , Omoniyi, & David, 2015) breaking down how joblessness, expansion, and financial development cooperated in Nigeria from 1987 to 2012. Utilizing auxiliary information, the review explored the connection between these factors utilizing normal least squares system. The outcomes demonstrated that loan costs and complete public use altogether affected financial development in Nigeria over the long haul. In addition, as per the review, joblessness and expansion have clashing outcomes on Nigeria's Gross domestic product.

The examination directed by (Si Mohammed & Taled , 2018) tried to survey the effect of financial development on joblessness inside the Algerian economy from 1985 to 2015. Using Gordon's dynamic regulation. The discoveries uncovered that the powerful impact was principally restricted to the present moment, showing that monetary factors were Procyclical. Subsequently, the review reasoned that notwithstanding Algerian monetary development rates, joblessness rates stayed unaffected. This was credited to the Algerian economy's weighty reliance on oil creation, which neglects to produce steady public incomes.

(Attia Mohamed Omran & Bilan, 2021) directed a review to examine the relationship among expansion and Egypt's joblessness rate. The examination used time-series information crossing from 1980 to 2019 and utilized a vector autoregressive (VAR) model along using the Drive Reaction Capability (IRF) instrument. The review's decisions showed that expansion and Gross domestic product had a positive relationship, while simultaneously applying an adverse consequence on the joblessness rate.

The review made by (Hassan, Khalifa, & Shoieb, 2022) dug into the joblessness rates among youthful people matured somewhere in the range of 15 and 29 years, using data accumulated from the 1998, 2006, 2012, and 2018 Egyptian Work Market Board Study (ELMPS), to produce a cross-sectional portrayal of the

length and pace of joblessness as of the present moment. Utilizing data taken from the 2018 ELMPS, the review utilized counterfeit brain organizations (ANNs) to explore the determinants influencing joblessness. The investigation uncovered that variable like respondents' orientation, age, and schooling level arose as the main determinants of joblessness. On the other hand, factors, for example, conjugal status, abundance list, parental schooling, and spot of home were viewed as inconsequential. Besides, the review featured that both joblessness rates and middle span were quite higher for females contrasted with guys, across both youthful people and the more extensive workforce.

The exploration directed by (Shiferaw, 2023) expected to investigate the powerful interrelationships among joblessness, expansion, and Gross domestic product in Ethiopia. The multivariate Understudy t summed up autoregressive score (GAS) model, the ARDL model, and cross-wavelet change (XWT) examination were among the logical strategies utilized in the review to analyze different monetary factors. Also, the Toda-Yamamoto (TY) causality test was utilized to inspect the elements among the factors. The discoveries featured a huge effect of joblessness on both Gross domestic product and expansion. Accordingly, the review prescribes executing hearty arrangements to decrease joblessness, particularly among the young. Besides, it highlights the dire requirement for administrative mediation to address Ethiopia's financial difficulties through extensive restoration endeavors.

In the investigation of (BENLARIA & MEDIANI, 2023) They evaluated what Gross domestic product and expansion meant for Algeria's joblessness rate utilizing the ARDL model. The examination discoveries recommend that these variables noteworthily affect the pace of joblessness inside the country. In particular, higher Gross domestic product development and expansion were viewed as related with expanded joblessness over the long haul, while populace development showed a reverse relationship with joblessness.

II. **Variables:** The variables are:

- ✓ **Inf**: inflation rate
- ✓ **UMP** : Unemployment rate
- ✓ **GDP**: gross domestic product growth rate

1. **Inflation:** The rate at which prices are rising over time is known as inflation. Put otherwise, inflation is a measure of how quickly money depreciates. (FERNANDO, 2024)

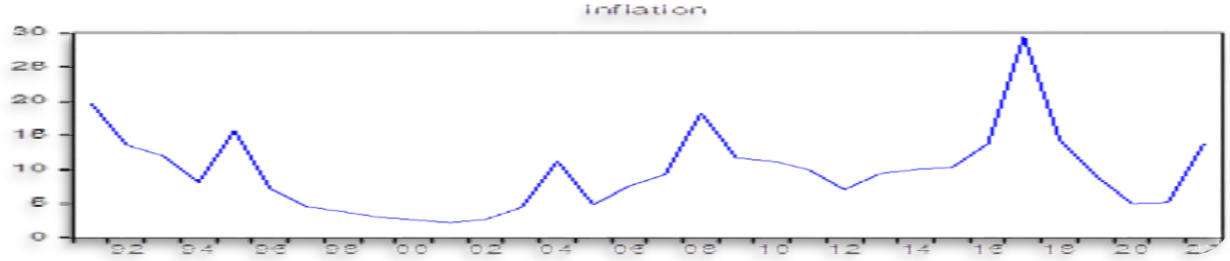
Inflation reflects economic and social effects and problems that result in the redistribution of real income. For example, different categories of income earners are affected in different ways. Some achieve profits and others achieve losses, as the limited or fixed income group is relatively affected and this category includes salary earners and bond holders, as They bear losses in the form of a decrease in their real incomes. As for the other category in which inflation affects the wages of workers and owners of commercial and industrial projects, whose cash incomes rise at rates greater than the inflation rate and thus they achieve profits, i.e. an increase in their real incomes, with the increase in prices, this does not affect costs directly except after a certain period of time. For example, workers' wages do not rise directly after the prices of produced goods rise except after a certain period of time, that is, after workers demand that their employers raise their wages.

Inflation has effects on the distribution of wealth in the form of in-kind assets, as individuals who own real estate and land increase the size of their wealth in the event of inflation, so that they can sell these properties and lands for cash amounts greater than what they paid when they purchased them. Conversely, individuals who own cash assets will They are exposed to losses during an inflationary situation, due to a decrease in their purchasing power, i.e. a decrease in the real value of wealth.

Inflation affects investment through its negative impact on the state's ability to attract foreign investments, as the prices of real estate, raw materials, and workers' wages rise, which results in an increase in the costs of new projects, and then the profit rate of these projects decreases, which prevents foreign investors from investing in that country.

Inflation also affects foreign trade, as in a country that suffers from inflation at higher rates than other countries, the prices of goods imported from abroad become much cheaper than goods produced locally, which results in increased imports and curbing exports due to the inability of local goods to compete in global markets.

Fig.1. The Inflation rate in Egypt during the period 1991-2022



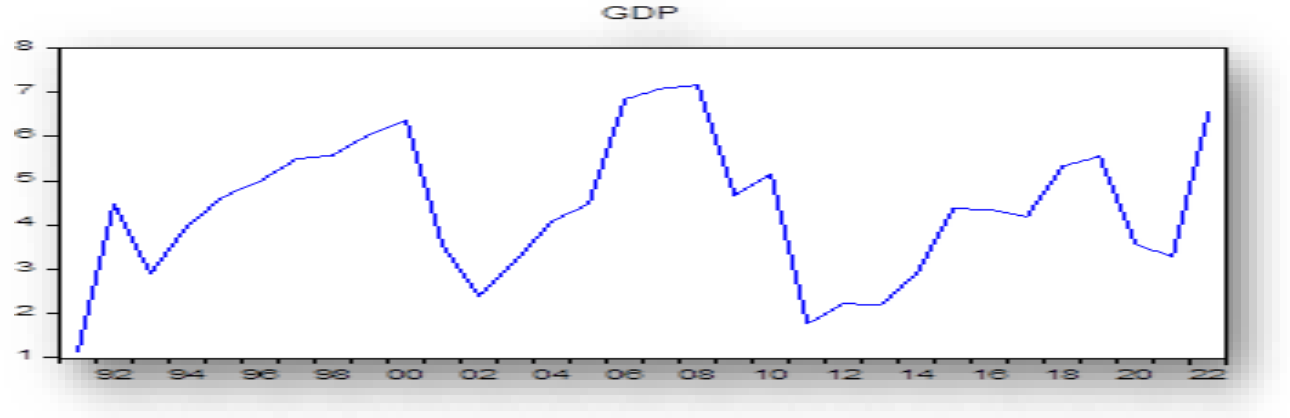
Source: prepared by researchers based on the EViews 10.0 program

Over the past decade, Egypt has grappled with persistent inflationary pressures. Particularly since the onset of 2011 Arab Spring, inflation has surged at an accelerated pace. Between 2011 and 2015, the average annual inflation rate soared to around 10 percent, markedly surpassing the six to seven percent rate observed across the broader MENA region. This rapid inflationary trend can be attributed to several factors, including heightened global oil prices, escalating food costs, an expanding fiscal deficit, and a substantial surge in the money supply.

The inflationary landscape witnessed a dramatic shift during 2016–2017, with rates soaring to unprecedented levels. Over this period, the 12-month inflation rate rose, from 10 % in January 2016 to more than 30 % by April 2017. This abrupt spike is directly caused by fluctuations in the currency rate. Despite enduring significant political turmoil and pressure on the balance of payments, the Egyptian pound experienced an average annual depreciation of seven percent between 2011 and 2015. However, In March 2016, the pound was purposely devalued by 13% by the Central Bank of Egypt (CBE), which worsened the issue, pegging it at EGP 8.85 per US dollar. This move triggered a phenomenon known as "exchange rate pass-through," where the currency depreciation swiftly translated into higher import prices, subsequently driving up consumer prices. Consequently, this one-time event significantly contributed to the inflation surge observed in April 2017 (Khan & Miller, n.d.) ,then the inflation rate decreased during the period 2018-2021, but rose again in 2022.

2. **Economic Growth rate:** A dynamic economy is characterized by its capacity to continually expand the array of economic goods available to its populace over the long term. This capacity hinges on advancements in technology and the accompanying institutional and ideological shifts necessary to accommodate evolving needs and demands. (Aloua, 2013, p. 60)

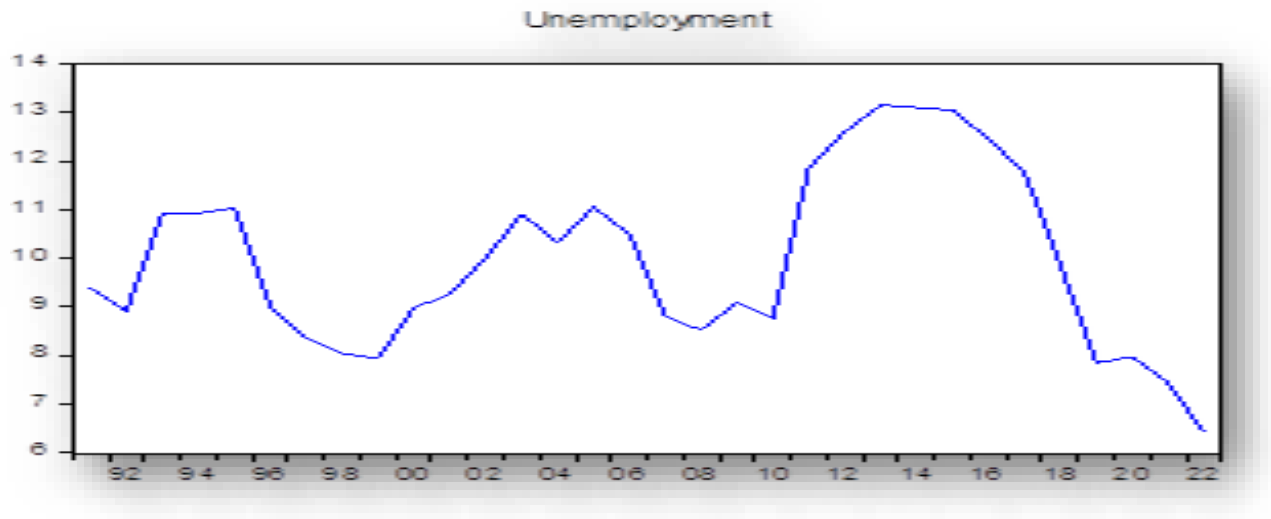
Fig.2. GDP rate in Egypt during the period 1991-2022



Source: prepared by researchers based on the EViews 10.0 program

3. **Unemployment:** "Unemployment" encompasses individuals who are actively seeking employment but encountering challenges in securing it. This category also includes those who are part of the workforce but are currently employed in positions that do not match their qualifications or desired level of employment. As a crucial metric of a nation's economic well-being, unemployment reflects the balance between available jobs and the labor force's capacity to fill them. It is often measured by dividing the entire labor force by the number of jobless people. (TEAM, n.d.)

Fig.3. The Inflation rate in Egypt during the period 1991-2022



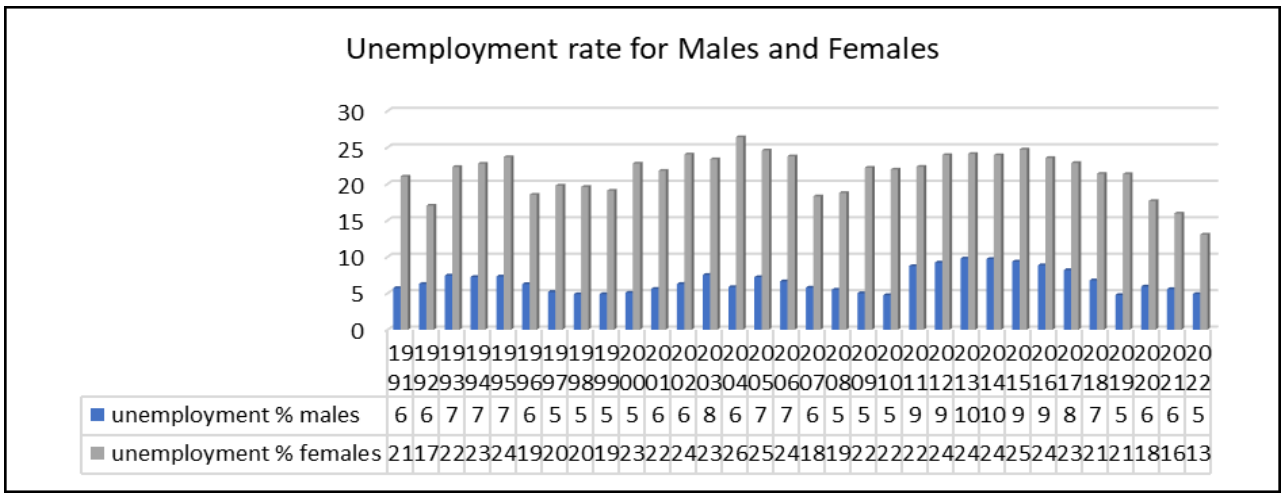
Source: prepared by researchers based on the EViews 10.0 program

III. RESULTS AND DISCUSSION

The following graph illustrates the evolution of unemployment rates among males and females in Egypt from 1991 to 2022. It's evident that unemployment rates for both genders experienced fluctuations throughout the study period. Notably, the unemployment rates for females substantially surpass those of males, approximately three times higher. The peak unemployment rate reached 25% for females in 2015, whereas for males, it peaked at 10% in 2013 and 2014.

Over the past five years, unemployment rates have declined, reaching their lowest levels estimated at 5% for males and 13% for females in 2022. This achievement can be attributed to the state's policies and concerted efforts aimed at alleviating unemployment.

Fig.4. The Unemployment rate for males and females in Egypt during the period 1991-2022



Source: prepared by researchers based on world bank (world bank data, n.d.)

1. Descriptive statistical study of variables:

The time series for inflation: the average for this dataset was 9.77, with a median of 9.39. 2.26 was the lowest reported number, and 29.50 was the highest. 5.84 was the value dispersion from the average. Additionally, the torsion coefficient was non-zero, estimated at 1.23, indicating an asymmetric distribution of the dataset.

The time series for GDP: the mean for this series was 4.39, while the Median was 4.42, with the highest rate recording a value of 7.15, while the lowest rate was 1.12, the torsion coefficient's value is non-zero, having been measured at -0.06, which is proof of the series' asymmetric distribution, whereas the dispersion of the series values from their average of 1.58.

The time series for Unemployment: The data in this series showed that the mean was 4.39, the median was 4.42, the highest rate was 7.15, the lowest was 1.12, and the dispersion of the series values was 1.58. Additionally, the torsion coefficient was estimated to be -0.06, indicating that the series was asymmetrically distributed.

Table 1. The descriptive statistical study of variables

	GDP	INFLATION	UNEMPLOYMENT
Mean	4.390316	9.778151	9.944375
Median	4.421882	9.394344	9.620000
Maximum	7.156284	29.50661	13.15000
Minimum	1.125405	2.269757	6.400000
Std. Dev.	1.589107	5.848198	1.816340
Skewness	-0.065500	1.234506	0.226952
Kurtosis	2.284703	5.230761	2.127494
Observations	**32**	**32**	**32**

Source: prepared by researchers based on the EViews 10.0 program

2. Stability tests: (unit root test)

To determine the statistical characteristics of the time series under investigation, we employed the Philips-Perron (P.P.) test and the Augmented Dickey-Fuller (ADF) test. These tests aim to detect the presence of a unit root to evaluate the stability of the variables. According to the null hypothesis, there is instability in the variable if it contains a unit root. Conversely, the alternative hypothesis proposes that the variable is stable if it does not contain a unit root.

2.1. Augmented Dickey-Fuller (ADF) Test: The ADF test is a common tool for testing stability. It involves estimating a regression model to determine whether the time series contains a unit root. If the computed ADF value is less than the critical value, we reject the null hypothesis and consider the series stable.

Table 2. ADF (Augmented Dickey-Fuller test) results

	Level			1st Difference		
	Intercept	Trend and intercept	None	Intercept	Trend and intercept	None
INF-LN	0.1190	0.2650	0.4000	0.0001	0.0004	0.0000
GDP-LN	0.0018	0.0105	0.6101	0.0000	0.0000	0.0000
UMP-LN	0.4710	0.8811	0.4412	0.0032	0.0084	0.0002

Source: prepared by researchers based on the EViews 10.0 program

Through the results of Table N° 02, Since the ADF test value is more than 0.05, we draw the conclusion that all variables are unstable at the level, but rather stable at the first difference because When the ADF test value is less than 0.05, the alternative can be accepted and the null hypothesis can be rejected. which states that the variables are stable at the first difference and do not contain on the unit root.

2.2. Philips-Perron (P.P.) Test: Similar to the ADF test, the P.P. test addresses certain deviations in the data, such as potential confounding errors. It can be useful when the time series does not meet the ADF test requirements.

Table 3. P.P (Philips-Perron test) results

	Level			1st Difference		
	Intercept	Trend and intercept	None	Intercept	Trend and intercept	None
INF-LN	0.1190	0.2650	0.4000	0.0001	0.0004	0.0000
GDP-LN	0.0018	0.0105	0.6101	0.0000	0.0000	0.0000
UMP-LN	0.4710	0.8811	0.4412	0.0032	0.0084	0.0002

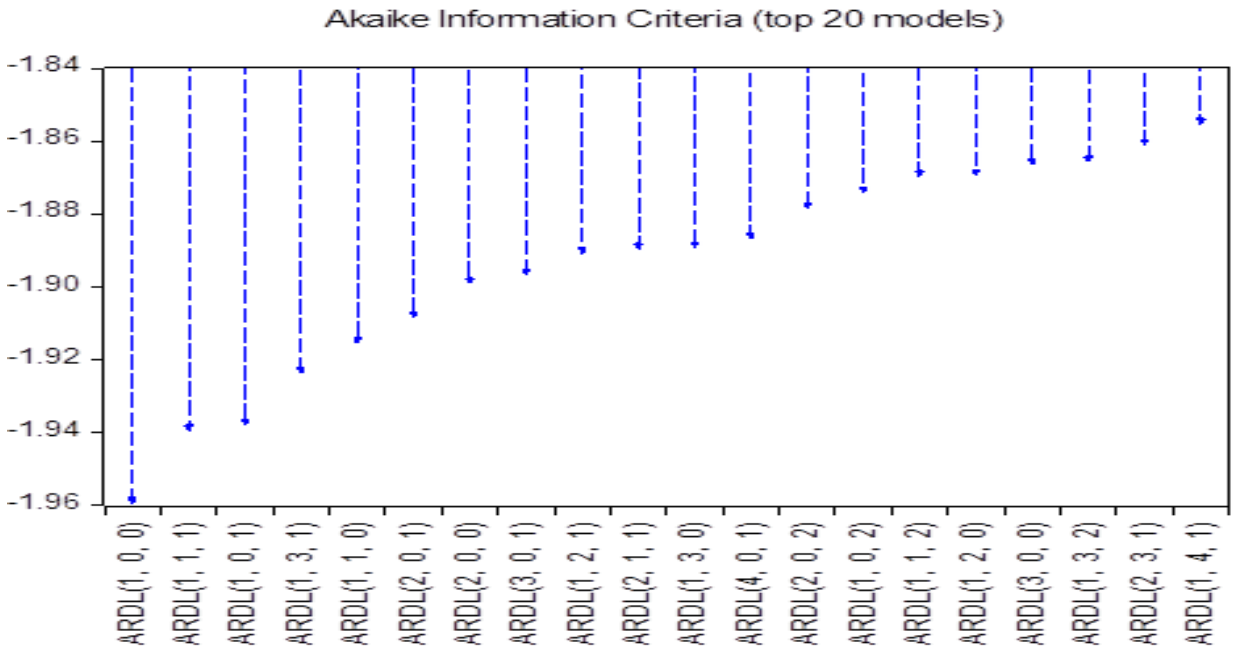
Source: prepared by researchers based on the EViews 10.0 program

Through the results of Table N° 03, Since the P.P. test value is greater than 0.05, Because the value of the P.P. test is less than 0.05, we are allowed to reject the null hypothesis and accept the alternative, which states that the variables do not contain on the unit root, leading us to the conclusion that all variables are unstable at the level but rather stable at the first difference, i.e. stable at the first difference.

3. Lag selection criteria:

A selection was made using the Akaike information criteria for the ARDL model (1,0,0), which were derived from the figure N°05. This implies that the dynamic regressors will have one lag for unemployment and zero lags for GDP and inflation.

Fig.5. Akaike Information Criteria



Source: created by researchers based on the EViews 10.0 program

4. ARDL Boundary test (F-Bound Test) for cointegration:

We assess the F esteem corresponding to the lower and upper limits of I(0) and I(1) over the long haul structure and limits test. The cutoff points test, which applies the Wald test to learn a steady connection between factors over a lengthy timeframe, checks cointegration among the factors being scrutinized.

The following assumptions are used to investigate cointegration between the variables in the equation: An alternate theory is that cointegration occurs.

Null hypothesis: The cointegration is absent.

For this test, a non-standard Fisher distribution is employed. Thus, whether to accept or reject the null hypothesis depends on comparing the estimated Fisher

value at different significance levels. The test results are shown in the table that follows:

Table 4. F-Bound Test for cointegration

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic : n=1000	
F-statistic	**6.810919**	10%	2.63	3.35
k	2	5%	3.1	3.87
		2.5%	3.55	4.38
		1%	4.13	5

Source: created by researchers based on the EViews 10.0 program

The tables show that the Fisher measurement's figured worth surpasses both the most extreme and upper limits for all levels. This involves dismissing the the null hypothesis and embracing the alternative, which expresses that the joblessness rate and development rate cointegrate, i.e., that a balance association exists over the drawn out at all significant values.

5. Estimating the study model using autoregressive distributed lag (ARDL) models:

working out the drawn-out relationship gauge We assessed the drawn-out relationship in the wake of ensuring there was a drawn-out adjusted relationship; the outcomes are shown in the accompanying table.

Table 5. Results of estimating the long-run relationship

Levels Equation				
Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	T-Statistic	Prob.
LOGINF	-0.025336	0.146172	-0.173330	0.8637
LOGGDP	-1.058893	0.533377	-1.985261	0.0574
C	3.812677	0.919825	4.145002	0.0003
EC = LOGUMP - (-0.0253*LOGINF -1.0589*LOGGDP + 3.8127)				

Source: created by researchers based on the EViews 10.0 program

Several important conclusions are shown by the table analysis. Firstly, the fixed term is statistically significant, indicating its impact on the model. Additionally, the parameter associated with the logarithm of GDP is also significant, displaying a negative sign. This aligns with economic theory, which posits an inverse relationship between economic growth and unemployment. To be more precise, a rise of one unit in the GDP logarithm translates into a 0.058893% drop in

unemployment. However, it's noteworthy that the inflation rate appears to be insignificant, suggesting the absence of a long-term relationship between inflation and unemployment in Egypt during the study period.

6. Error correction model:

The error correction factor in this test ought to be negative and significant. The following table displays the results:

Table 6. Results of short-run relationship estimation and error correction model

Variable	Coefficient	Std. Error	T-Statistic	Prob.
C	0.761548	0.241676	3.151105	0.0040
LOGUMP (-1) *	-0.199741	0.103807	-1.924149	0.0649
LOGINF**	-0.005061	0.027903	-0.181365	0.8574
LOGGDP**	-0.211504	0.043546	-4.857079	0.0000

ECM Regression

Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	T-Statistic	Prob.
CointEq (-1) *	-0.199741	0.036304	-5.501886	0.0000

R-squared	0.496040	Mean dependent var	-0.012332
Adjusted R-squared	0.496040	S.D. dependent var	0.112264
S.E. of regression	0.079697	Akaike info criterion	-2.189452
Sum squared resid	0.190547	Schwarz criterion	-2.143194
Log likelihood	34.93650	Hannan-Quinn criter.	-2.174373
Durbin-Watson stat	1.483133		

Source: created by researchers based on the EViews 10.0 program

Based on the table's values, we can see that the error correction factor is -0.1997, and it is negative and significant at a probability much less than 1%, and therefore 19.97% errors in the short run are automatically corrected over time to reach long-run equilibrium, and this result can be explained by the fact that the dependent variable, which is the unemployment rate it takes five years to correct the short-term imbalance and return to equilibrium in the long term.

Additionally, we observed that the independent variables account for 50% of the variation in the unemployment rate, with an R-squared of 0.496040.

7. Model diagnostic tests:

Autocorrelation Test for Errors We conducted a test and the results are shown as follows:

7.1. serial correlation LM test:

the results of the LM test are shown in the following table:

Table 7. Breusch-Godfrey Serial Correlation LM Test

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	**1.172593**	Prob. F (2,25)	0.3260
Obs*R-squared	**2.658631**	Prob. Chi-Square (2)	0.2647

Source: created by researchers based on the EViews 10.0 program

From the table we notice that the Fisher probability is bigger than 0.05 (0.3260) so There is no autocorrelation problem between errors.

7.2. Homogeneity of variance test:

The test ARCH was employed. which examines the homogeneity of variance; the table that follows displays the results:

Table 8. Heteroskedasticity Test : ARCH

Heteroskedasticity Test: ARCH			
F-statistic	0.597819	Prob. F (1,28)	0.4459
Obs*R-squared	0.627131	Prob. Chi-Square (1)	0.4284

Source: created by researchers based on the EViews 10.0 program

We notice from the table that the probability value is bigger than 0.05 which means that variance heterogeneity is not an issue.

7.3. Study of the stability of residues:

The Ljung-Box test has confirmed that the residuals of the calculated model show white noise features. In time series analysis, autocorrelation in residuals is a crucial indicator of stability, and this statistical test is used to evaluate its presence. The test results show that, in this case, all of the residuals' autocorrelation coefficients lie inside the confidence interval, typically set at a significance level of 0.05. This outcome leads us to accept the null hypothesis that there is no significant autocorrelation in the residuals.

Figure N°06 visually represents these findings, illustrating the Ljung-Box test results. The graph likely shows a series of autocorrelation coefficients plotted

against lag values, with critical bounds delineated to indicate the significance level. The stability of the residuals is confirmed by the fact that all probability related to the autocorrelation coefficients are greater than 0.05. This stability is pivotal as it suggests that the model adequately captures the underlying patterns in the data without systematic errors or biases affecting its performance.

Fig.6. Ljung-Box test for the series of residuals of the estimated model

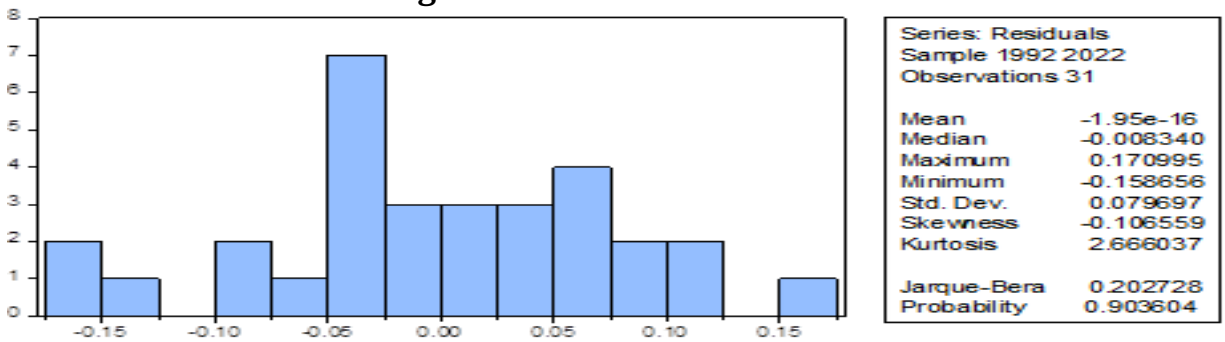
Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
. |***** |	. |***** |	1	0.648	0.648	14.746	0.000
. |**. |	. *| . |	2	0.309	-0.192	18.200	0.000
. | . |	. *| . |	3	0.020	-0.168	18.215	0.000
.**| . |	.**| . |	4	-0.257	-0.266	20.790	0.000
.**| . |	. |* . |	5	-0.295	0.097	24.299	0.000
.**| . |	. *| . |	6	-0.305	-0.149	28.197	0.000
.**| . |	. *| . |	7	-0.284	-0.096	31.697	0.000
. *| . |	. | . |	8	-0.155	0.026	32.787	0.000
. | . |	. | . |	9	-0.029	0.051	32.826	0.000
. |* . |	. |* . |	10	0.132	0.101	33.682	0.000
. |**. |	. | . |	11	0.229	-0.004	36.401	0.000
. |* . |	. *| . |	12	0.169	-0.114	37.949	0.000
. | . |	. *| . |	13	0.023	-0.149	37.980	0.000
. *| . |	. *| . |	14	-0.159	-0.125	39.503	0.000
.**| . |	. | . |	15	-0.234	0.039	43.012	0.000
.**| . |	. | . |	16	-0.224	-0.027	46.417	0.000

Source: created by researchers based on the EViews 10.0 program

7.4. Test for normal distribution of residuals:

According to the figure N° 07 The results of Jarque-Bera test are bigger than 0.05 which means that the residuals follow a normal distribution.

Fig.7. Normal distribution test



Source: created by researchers based on the EViews 10.0 program

7.5. Structural stability testing:

We utilize the Cumulative Sum of Recursive Residuals (CUSUM) test to assess the processed model coefficients' primary dependability.

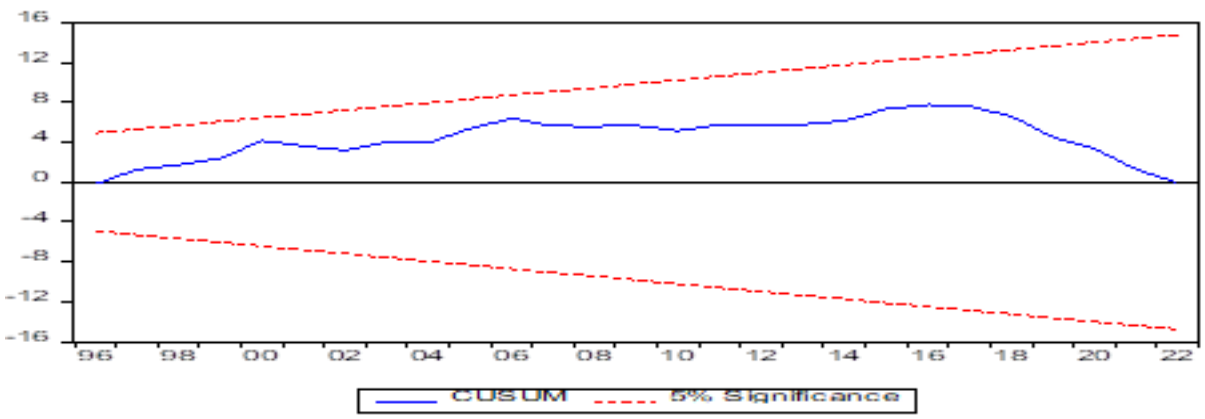
This measurable strategy assesses whether the coefficients in the mistake amendment condition recipe stay stable over the long run. Primary steadiness is

affirmed when the histogram of the CUSUM measurement reliably falls inside as far as possible laid out at the 5% importance level. Alternately, assuming that the CUSUM measurement strays outside these cutoff points, it recommends likely flimsiness in the coefficients.

Figure N° 08 delineates the consequences of the CUSUM test, giving this evaluation a visual portrayal. The chart shows that the CUSUM measurement stays inside the critical limits at the 5% importance level throughout the review periods inspected. This consistency shows that the model's underlying soundness is kept up with over the course of time; the dependability of the model's forecasts isn't risked by any striking movements or varieties in the coefficients.

Accordingly, considering the ends drawn from Figure N° 08, we presume that the assessed model boundaries show underlying solidness. This recommends that the affiliations addressed by the model coefficients turn out as expected and are predictable across the whole dataset that is being dissected. The absence of underlying changes in the coefficients reinforces the soundness of the model's design and elevates confirmation in regards to its ability to offer exact experiences for simply deciding or doing extra research in the important field of study.

Fig.8. The results of CUSUM test

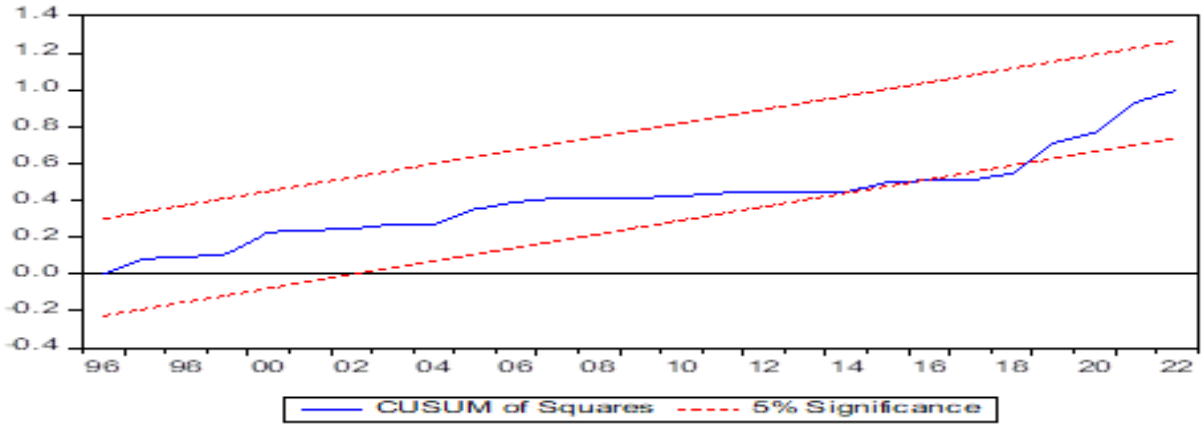


Source: created by researchers based on the EViews 10.0 program

The CUSUM test graph stays within the 5% significance level, as seen in Figure 9. This finding implies that the model's residuals are statistically stable, meaning that the error structure has not changed significantly over time. This stability is important because it validates the consistency of the model's underlying assumptions and the accuracy of its forecasts. It suggests that there are no systemic flaws or biases that have evolved throughout the course of the analysis, and that the model accurately represents the connection between variables. In order to make wise decisions or come to reliable conclusions in the research or

analysis, one can have faith in the robustness and validity of the model's results thanks to the CUSUM test results.

Fig.9. The results of CUSUM of squares test



Source: created by researchers based on the EViews 10.0 program

IV. Conclusion

This study utilized an ARDL model to analyse the relationships among key economic variables. Initially, the model's applicability was confirmed through rigorous testing, including unit root tests that established the stability of all variables at their first differences. Structural and diagnostic tests further validated the robustness of the model. The findings revealed a significant long-term inverse relationship between the unemployment rate and economic growth, this confirms the first hypothesis that there is a statistically significant effect of GDP growth rate on the unemployment rate in Egypt during the period 1991-2022. In contrast, the study did not find evidence supporting a long-term relationship between inflation and unemployment, indicating that changes in inflation do not consistently impact unemployment levels in the long term this negates the second hypothesis, which states that there is a statistically significant effect of the inflation rate on the unemployment rate in Egypt during the period 1991-2022. These conclusions underscore the complex dynamics within the economy and provide valuable insights for policymakers and researchers alike.

The study also found according to the value of the error correction factor in the dynamic model that the unemployment rate adjusts towards its equilibrium value in each period by 19.97%, meaning that the unemployment rate takes about five years to adjust towards its equilibrium value.

Recommendations: we propose the following recommendations:

- The adoption of a single currency by Maghreb countries to create an economic bloc capable of keeping pace with global economic developments. (Nouri, 2024, p. 477)

- Encouraging foreign direct investments (FDI) is pivotal not only for enhancing job creation but also for driving economic diversification by attracting FDI, countries can introduce new industries, technologies, and management practices that spur growth in domestic sectors. This influx of investment not only creates employment opportunities but also strengthens local industries through knowledge transfer and technological advancement. Moreover, FDI stimulates infrastructure development and enhances global competitiveness, positioning economies to thrive in a dynamic international market. Thus, fostering a conducive environment for FDI is essential for achieving sustainable economic development and reducing dependency on traditional sectors.

- Developing targeted programs aimed at the youth, with a special focus on females, given their higher representation among Egypt's unemployed.

- Upgrading the nature of instruction and offering professional preparation projects to outfit youthful people with the important abilities requested by the work market.

- Promoting entrepreneurship and supporting small and medium enterprises (SMEs) by creating a conducive business environment and providing financial and technical assistance.

- Implementing effective monetary policies to curb inflation rates, including raising interest rates to discourage excessive spending and encourage saving, thereby reducing public demand for goods and services.

- Facilitating access to foreign markets and bolstering trade ties between Egypt and other nations to ensure the availability of goods at competitive prices.

- Combatting corruption across various sectors of the economy and enforcing measures to regulate prices and prevent unjustified hikes.

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