Testing the Abrams Curve Hypothesis in Pakistan

ABSTRACT

The purpose of this study is to test the congruence of the Abrams Curve for Pakistan's labor market, which relates unemployment to specific economic measures, including inflation, GDP growth, literacy rates, and government expenditures. To analyse both short-run and long-run dynamics using time-series data from 1991 to 2023, the study employs the Autoregressive Distributed Lag (ARDL) model. The results indicate an insignificantly negative association between inflation and unemployment, suggesting some consistency with the Abrams Curve, but also indicating that the theory's applicability in Pakistan is limited due to structural obstacles. Government spending displays a strong positive correlation with unemployment, indicating an ill-designed fiscal policy. The analysis highlights policy movements on multiple fronts, including education reform, gender-inclusive labor force policies, and gender-targeted budgetary measures, to address unemployment in a sustainable manner. This study contributes to the ongoing discourse on unemployment in developing economies by linking theoretical frameworks with real-world empirical data and providing actionable insights for Pakistani policymakers.

4. EMPIRICAL RESULTS AND DISCUSSIONS

This chapter presents the empirical results derived from using the dataset and methodology introduced in the previous chapter.

4.1 DESCRIPTIVE STATISTICS

Table 1: Descriptive Statistics of the Economic Indicators

	UER	LR	INF	GDPR	EX
Mean	1.885667	50.16702	9.488485	3.751982	10.87449
Median	0.597000	54.00000	9.496211	4.116400	10.60896
Maximum	6.338000	61.93830	30.76813	6.573800	14.26367
Minimum	0.398000	30.19520	2.529328	0.004900	8.655707
Std. Dev.	1.958608	8.913261	5.798688	1.876777	1.193811

The above table contains descriptive statistics of the variables used in the analysis; Unemployment rate (UER), Literacy rate (LR), inflation (INF), GDP growth rate (GDPR), and Government expenditures (EX). This data provides us with a perspective on the means, dispersion and spread of the data, which is key in understanding the economic play in Pakistan.

Unemployment Rate (UER)

Then we calculate the mean (1.89%) and median (0.60%) of the unemployment data that shows the unemployment distribution is positively skewed. The unemployment rate varies greatly over the cross section of countries for a particular time period, as evidenced by its high rate of 6.34% and low rate of 0.40%. This study will look to deduce the effect of inflation on this variable over the period, including the minimum and maximum unemployment rate. Given the nature of unemployment statistics and the potential for significant shifts in response to various social and market factors, the relatively low standard deviation of 1.96 indicates moderate variability in unemployment rates, partly due to the marked effects of different economic cycles and government policy changes.

Literacy Rate (LR)

Mean literacy = 50.17%, median literacy = 54.00% indicating a slight negative skew. With a maximum literacy rate of 61.94% and a minimum of 30.20%, there is a wide variance in educational achievement across the various regions and different times. With a standard deviation of 8.91, the variation in the literacy rates highlights the necessity of implementing targeted education policies to bridge the existing disparities.

Inflation (INF)

Inflation has a mean and median of 9.49% and 9.50%, respectively, reflecting a fairly symmetric distribution. Both a high maximum inflation rate (30.77%) and a minimum (2.53%) highlight times of economic volatility and a consequence of successful monetary policy intervention. The high standard deviation of 5.80 indicates a very volatile pattern of inflation in Pakistan descriptive statistics.

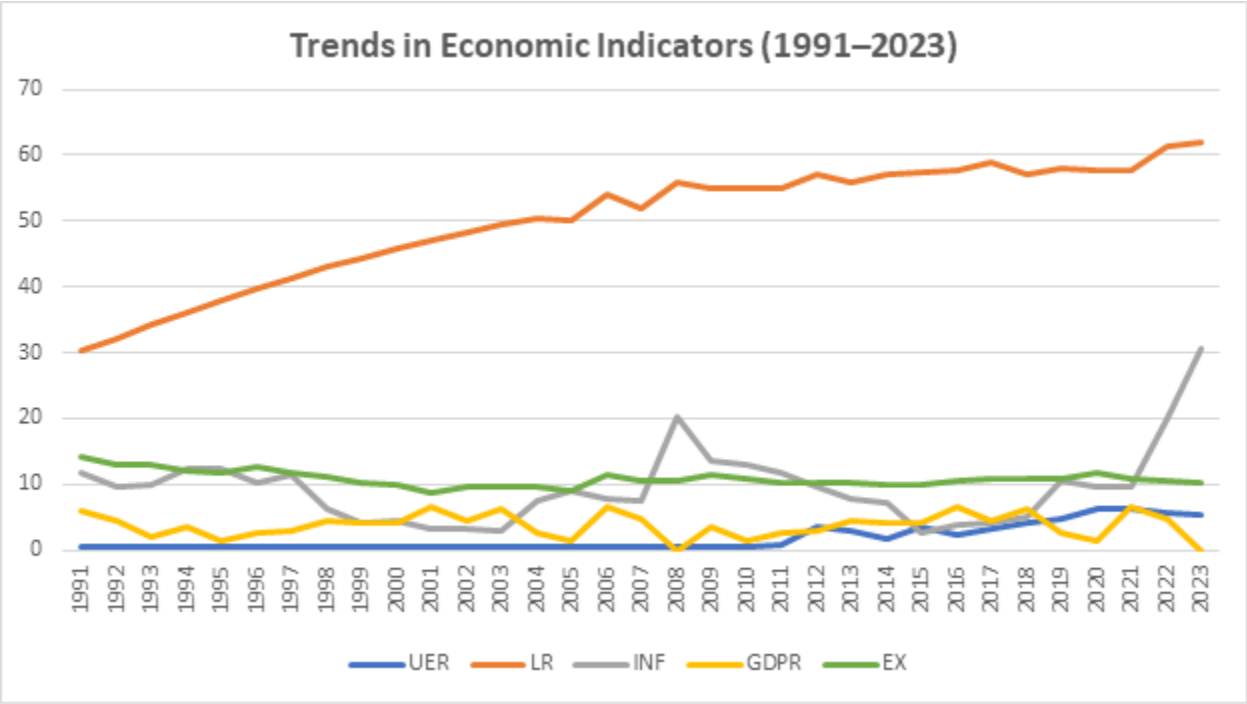
GDP Growth Rate (GDPR)

The GDP growth rate mean is 3.75% (median 4.12%), so we have slightly negatively skewed distribution. From Table 4, it is evident that low economic growth is 0.00% and maximum is 6.57% which show that economic performance is good in the presence of encouraging monetary policy and no surprises. The 1.88 standard deviation indicates moderate deviation, signifying variability in economic growth over time.

Government Expenditures (EX)

The mean government expenditure is 10.87%, and the median is 10.61%, which confirms that the distribution is slightly positively skewed. 14.26% spending at the higher threshold is still a testament to changes in fiscal policy, and an evolution of economic ethos. The standard deviation of 1.19 is low, indicating relatively low variance in the data, which suggests that governments spent consistently over the study period.

Figure 1: Trends in Key Economic Indicators: Unemployment, Literacy, Inflation, GDP Growth, and Government Expenditures (1991–2023)



For the period from 1991 to 2022, the key economic variables—unemployment rate (UER), literacy rate (LR), inflation (INF), GDP growth rate (GDPR), and government expenditures (EX)—these presented in the chart, will allow you to see their dynamics over the past period. Periods of unemployment rate (UER) observed indicate that it has remained volatile over the recent decades and is influenced significantly by the business cycles and policy changes. Literacy rate (LR) is even shown at upward trend, which reflects better conditions of education as well better factor. Inflation (INF) has clear peaks and troughs in it, showing moments of economic instability and engagement from monetary policy. The GDP rate is not a straight line; it has fluctuations. A continuous rise in government expenditure (EX) presents an illustration of differences in fiscal policy and economic priorities. Additionally, the data highlights significant fluctuations in these variables, especially economic growth, revealing their interdependence, and emphasizing the need for comprehensive monetary and fiscal interventions to tackle labor market challenges and enhance economic growth in Pakistan.

4.2 Unit Root Test Results

The Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit root tests were conducted to determine the stationarity of the variables used in the study, including unemployment (UER), literacy rate (LR), inflation (INF), GDP growth (GDPR), and government expenditures (EX). The results are presented for both levels and first differences of the variables, with the probability values (p-values) in brackets. The null hypothesis for both tests is that there is a unit root (i.e., the series is non-stationary). The results are given in Table 2.

Table 2: Unit Root test results

ADF			**PP**	
Ho: There is a unit root			**Ho: There is a unit root**	
Levels			**First Difference**	
Variables	**ADF**	**PP**	**ADF**	**PP**
UER	-2.1008 (0.5258)	-2.0011 (0.5786)	-6.9825 (0.0000)	-7.2915 (0.0000)
LR	-2.0031 (0.5768)	-1.0209 (0.9267)	-5.8550 (0.0000)	-5.9489 (0.0000)
INF	0.4979 (0.8175)	0.4464 (0.8049)	-4.4719 (0.0001)	-4.4610 (0.0001)
GDPR	-0.9232 (0.3090)	-2.8006 (0.0694)	-5.3119 (0.0000)	-7.1969 (0.0000)
EX	-2.3708 (0.1586)	-3.4138 (0.0178)	-6.3202 (0.0001)	-7.5794 (0.0000)

Both the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit root tests show that Unemployment Rate (UER), LR, INF, GDPR and EX are all non-stationary at levels, since their test statistics have p-values larger than the significance level (1%, 5%, 10%) and we cannot reject the null hypothesis of unit root. Lastly, ADF and PP tests indicate that for UER, LR, INF and GDPR, first differencing yields stationary time series (p-value < 1% level: → The null hypothesis of unit root is thus rejected with high confidence). EX showed mixed results at levels, where the ADF test suggested non-stationarity ($p = 0.1586$) and the PP test suggested stationarity at the 5% significance level ($p = 0.0178$), while both tests confirmed stationarity after first differencing ($p < 0.0001$). Hence, the hypothesis of unit root in upon the levels is validated, as all of the variables become stationary at the first difference.

The results of the unit root test, in levels indicate that all variables (UER, LR, INF, GDPR, and EX) are non-stationary while at first difference stationary. This result is important for the ARDL model validity because although the other is basically bilateral, we have the possibility to reach short-run and long-term relationships analyzing unemployment and its determinants. And if the variables were not stationary, meaning they contain unit roots, it must be shown to have a stochastic trend and that any analysis utilizing the variables at their levels will result in spurious regression results.

Hence, since both of the variables became stationary in first differencing, the ARDL bounds testing approach, which allows a combination of stationary and non-stationary time series, is appropriate. This is well-suited for exploring the relationship between unemployment and its determinants in Pakistan because it allows for the examination of the country's labor market's structural and institutional peculiarities.

4.3 F-Bound Test

The F-bounds test was conducted to examine the presence of a long-run relationship between unemployment (UER) and its determinants, including inflation (INF), GDP growth (GDPR), literacy rate (LR01), and Government Expenditure (EX). The null hypothesis of the test is that there is no levels relationship (i.e., no cointegration) among the variables. The results of the F-bounds test are presented in the table below, followed by a detailed interpretation.

Table 3: F-Bounds Test Results

Test Statistic	**Value**	**Significance Level**	**Critical Value (I(0))**	**Critical Value (I(1))**
F-statistic	6.47874	5%	3.058	**4.223**

Using a sample of 29 observations, the Autoregressive Distributed Lag (ARDL) framework was applied to determine whether long runtime cointegration existed between the UER and each of the independent variables LR, INF, GDPR and EX through bounds testing approach. The best lag structure is specified based on the Akaike Information Criterion (AIC) of which, four lags were specified for both the dependent and independent variables. The computed F-statistics of 6.478744 was also greater than the upper bounds of I(0) 4.223 and lower bounds of I(1) 3.058 at 5% level of significance, confirming a rejection of null hypothesis of no cointegration. This outcome implies a long-run equilibrium relationship among the variables, which means that deviations from that equilibrium will self-correct in the short-run.

4.4 ARDL Long-Run:

In order to analyse the long-run relationship between the UER and its determinants INF, GDPR LR, and EX, Autoregressive Distributed Lag (ARDL) model was utilized and the long-run coefficient were extracted. Table below presents the results followed by the explanation

Table 4: Long-Run Coefficients from ARDL Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LR	-0.023698	0.104389	-0.227015	0.8223
INF	-0.158333	0.109234	-1.449478	0.1601
GDPR	0.190448	0.288772	0.659511	0.5158
EX	1.499566	0.367374	4.081851	0.0004

1. **Literacy Rate (LR)**:

The coefficient for LR(-1) is -0.023698, which shows a negative coefficient between literacy and unemployment in the long run. Higher literacy rates, therefore, might help fight employment, since a more educated body of workers can better meet new labor market conditions. However, the coefficient is statistically insignificant as a result of misinterpretation of education and labor market in Pakistan and low-quality education in some regions of Pakistan.

2. **Inflation (INF)**:

The coefficient for INF(-1) is -0.158333, which suggests a negative relationship between inflation and unemployment over the long term. The finding is consistent with the Abrams Curve, which claims an inverse correlation between inflation and unemployment. However, that coefficient is statistically insignificant, possibly due to Pakistan's unusual economic circumstances, including stagflation (high inflation with high unemployment) and structural rigidities in the labor market. Both these factors may undermine the classical negative correlation proposed by Abrams Curve.

3. **GDP Growth Rate (GDPR)**:

The long-run response between GDP growth and unemployment, is confirmed by the value of the coefficient of GDPR(-1) of 0.190448. This finding is surprising, because economic growth is generally thought to lower unemployment. However, the negligible difference in employment generation for Pakistan may be an indication of the unevenness of growth across sectors where growth was concentrated in low-producitivity or capital-intensive sectors, producing less employment per unit of output. Moreover, informal labor markets and underemployment may distort the relationship between GDP growth and unemployment.

4. **Government Expenditures (EX)**:

The coefficient of EX is 1.499566 which shows that there is a strong positive relationship between unemployment and government expenditure in the long run. This effect is statistically significant at the 1% level: more government expenditure is linked with increased levels of unemployment. This result challenges the standard Keynesian perspective, which holds that government spending induces economic activity and lowers unemployment (Keynes, 1936). In the case of Pakistan, it may be indicating that this public spending is not efficient, possibly due to nonproductive public spending, allocation inefficiencies, or even corruption. Moreover, high government spending may displace private investment, leading to even higher unemployment.

The ARDL model results provide both supporting and contradicting evidence for the validity of the Abrams Curve in Pakistan. Similarly, although the negative sign on inflation (INF(-1)) is in line with the Abrams Curve hypothesis of a negative correlation between unemployment and inflation, the lack of statistical significance imply that the standard model does not apply to the labor market realities in Pakistan. The dynamics of unemployment seem to be mostly driven by structural factors — stagflation, informal employment, gender — in kind of a link in a chain. Moreover, the positive relationship between government expenditures and unemployment highlights the ineffectiveness of demand-side policies in mitigating unemployment in Pakistan, especially when supply-side constraints and inefficiencies in public spending are prevalent. These findings offer a glimpse into the dynamics — and significance — of an integrated approach to tackling unemployment, factoring in real-time policy direction, nooks and crannies of demographic and gender inclusion, economic stability, and an emphasis on education and government spending. This study not only contributes to the existing literature by providing empirical evidence of the challenges and opportunities in tackling unemployment in a developing economy with distinct structural challenges but also highlights the need for tailored policies that consider the specific characteristics of Pakistan's labor market.

4.5 Unconditional ECM

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Cointegrating Equation				
ECT(-1)	-0.515759	0.067543	-7.636013	0.0000
Short-run Regressors				
Linear: Dependent				
D(UER(-1))	0.074771	0.117201	0.637970	0.5331
Linear: Independent				
D(LR)	0.079971	0.101300	0.789452	0.4421
D(INF)	-0.036156	0.034794	-1.039142	0.3152
D(GDPR)	-0.110385	0.050409	-2.189808	0.0448
D(EX)	-0.014665	0.108737	-0.134864	0.8945

ECM mechanism

ECT (-1) stands for the lagged error correction term, also known as the speed of adjustment coefficient. It is statistically significant and lies between -1 and 0. This indicates a long-term relationship between the unemployment rate and the independent variables. The coefficient is thus negative, meaning that any divergence from the long-run equilibrium is corrected at a speed around 51.58% per year. This means that the system quickly readjusts to restore equilibrium, suggesting long-run stability of the relationship.

4.6 Short-Run Dynamics:

The short-run coefficients provide insights into how changes in the independent variables affect unemployment in the short term. The results are as follows:

- **D(UER(-1):** The lagged difference unemployment rate has positive coefficient of 0.074771 but that is insignificance statistically. In other words, historical variations in unemployment explain very little about current levels of unemployment in the immediate term.
- **D(LR):** The change in literacy rate appears to be a positive driver in human development, it is statistically insignificant but with a positive coefficient of 0.079971. That means the boost to literacy rates in the short run doesn't necessarily translate into fewer people without jobs, either because the jobs that people are being trained for don't exist or because there's a lag between getting trained and actually getting a job.
- **D(INF):** The coefficient for change in inflation has a value of -0.036156, which is negative and carries no statistical significance. This matches with the Abrams Curve, which provides a theoretical basis for why temporary inflation could lead to lower unemployment, although the impact is not strong enough in the case of Pakistan to be statistically significant.
- **D(GDPR):** The coefficient for the change in GDPR is equal to -0.110385 which is negative and statistically significant at the p=0.05 level. This suggests that short-run rises in GDP growth have a large impact on lowering unemployment, consistent with economic theory. In contrast, the coefficient by the magnitude of effect is rather small, possibly reflecting growth being concentrated in low-productivity sectors or informal employment in Pakistan.
- **D(EX):** The change in EX have a coefficient of -0.014665 but it is negative and not significant. This implies that an increase in government spending in the short run won't reduce unemployment much, probably because of misallocation of public expenditure or crowding out of private investments.

4.7 Diagnostics Analysis

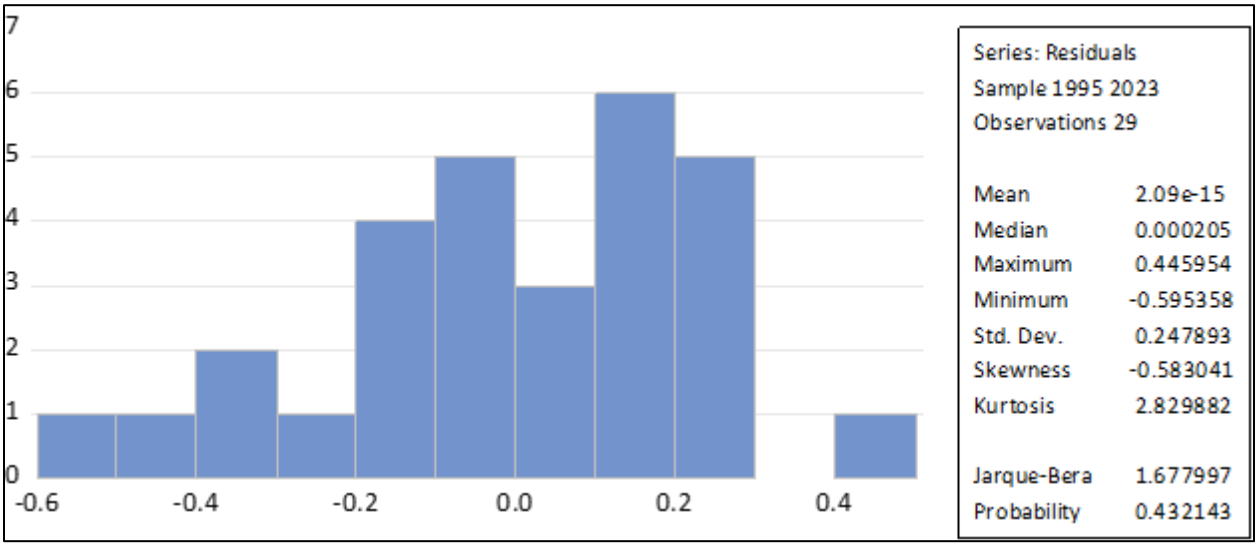
Diagnostic Tests for robustness and reliability of the ARDL model to estimate the dynamics of relationship between unemployment (UER) and its determinants in Pakistan. The tests are autocorrelation, normality of residuals, and model specification. These tests are evaluated in regard to objectives and outcomes of the study below.

4.7.1 Autocorrelation

Breusch-Godfrey Serial Correlation LM Test:			
Obs*R-squared	0.766705	Prob. Chi-Square(1)	0.6816

To check the presence of autocorrelation in the residuals, the Breusch-Godfrey Serial Correlation LM Test was executed. The Obs*R-squared (0.766705) are not significant at 5%, p-value: 0.6816. Due to the p-values being larger than the typical significance levels (5%), we cannot reject the null hypothesis of no autocorrelation. This shows that residuals are not serially correlated and the model does not face any autocorrelation problems. This result enhances the reliability of the ARDL model, as autocorrelation can lead to inefficient estimates and biased standard errors.

4.7.2 Normality Testing



Based on the histogram, the fact that residuals of the ARDL model exhibits a normally distributed with bell-shaped curve, based on histogram, residual does not exhibit any pattern. The normality assumption is a good sign as the mean of the residuals is approximately zero. Since the kurtosis value of 2.9882 is approximately equal to the ideal value of three, the distribution of residuals has not deviated from normal distribution. the Jarque-Bera Test. The p-value for test statistic value of 1.677997 is 0.432143, which is certainly more than usual significance level. And one of the core assumptions of ARDL model is that the remaining errors are normally distributed. Normality of residuals is required for valid hypothesis test and true confidence intervals and hence this result further validates the robust estimates provided by the model.

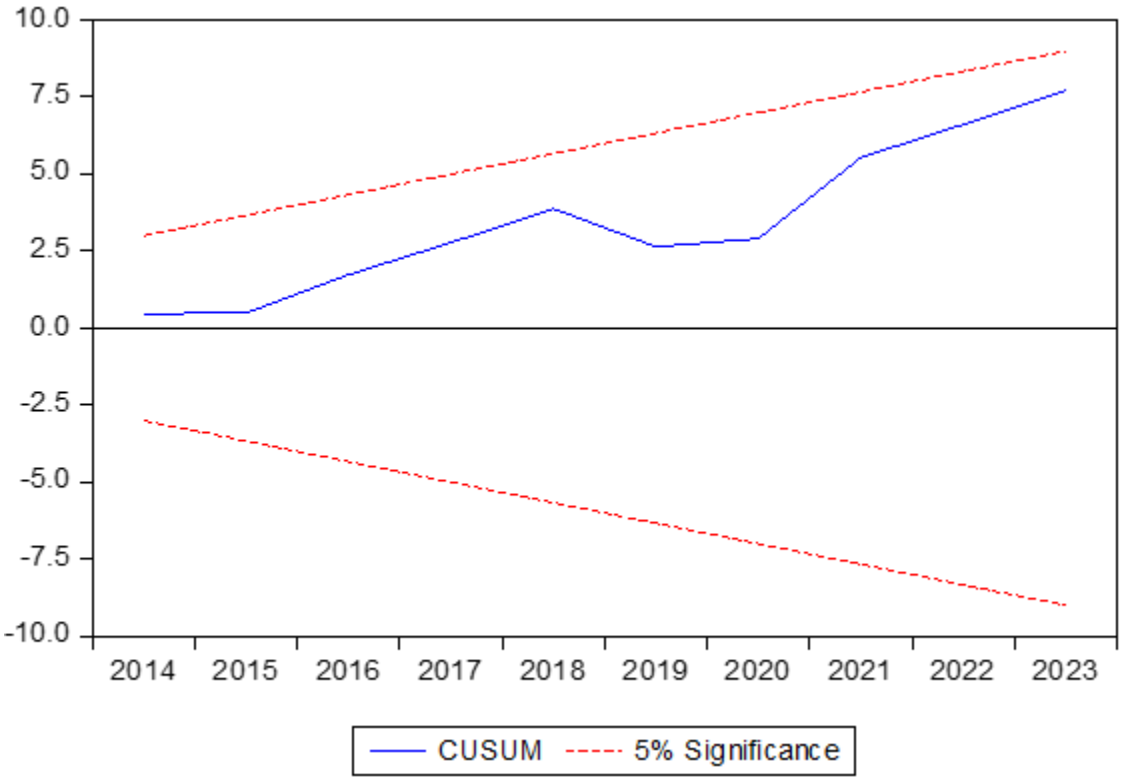
4.7.3 Model Specification (Ramsey RESET Test)

Ramsey RESET Test			
	Value	df	Probability
Likelihood ratio	**2.578000**	**1**	**0.1084**

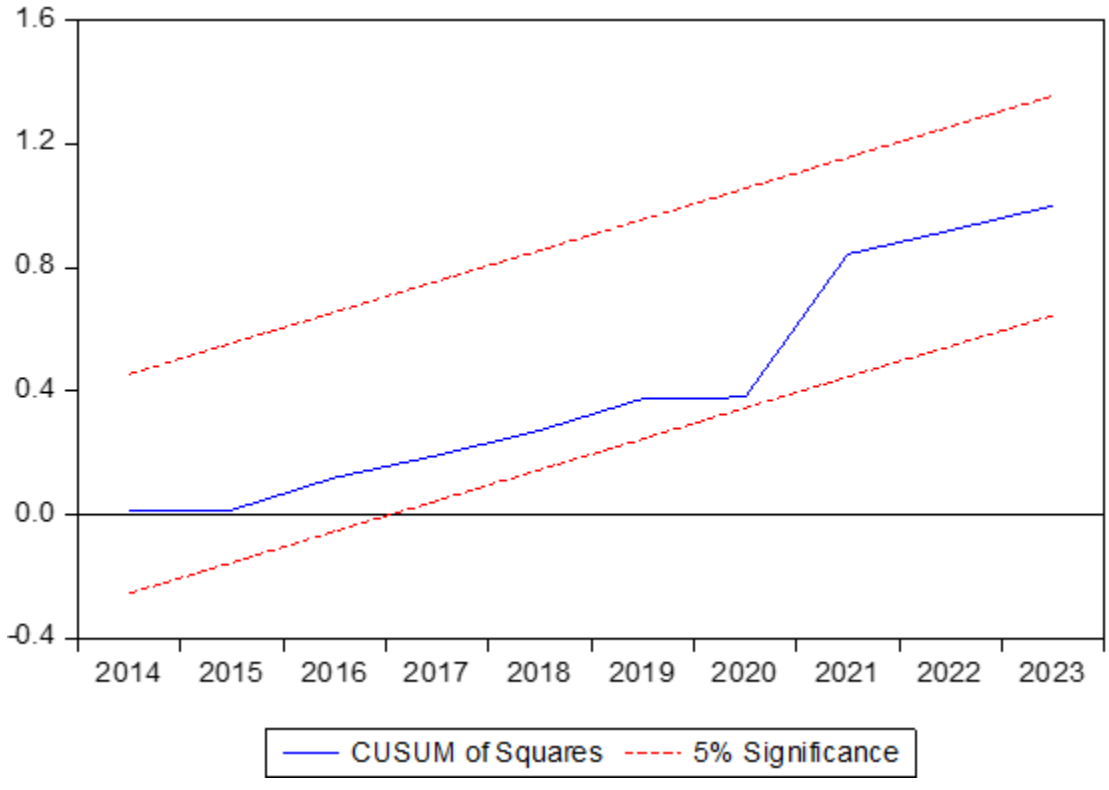
The Ramsey RESET Test was conducted to assess the specification of the model, particularly to check for functional form misspecification or omitted variables. The test evaluates whether the model adequately captures the relationship between the dependent variable (unemployment rate, UER) and the independent variables (LR, GDPR, INF, EX). The test results show a Likelihood Ratio (LR) statistic of 2.578000, with 1 degree of freedom and a p-value of 0.1084. At the conventional significance levels (e.g., 5% or 10%), the p-value of 0.1084 is greater than the threshold, indicating that the null hypothesis of no functional form misspecification cannot be rejected. This suggests that the model is adequately specified. The Ramsey RESET Test results support the validity of the model, providing confidence in the robustness of the estimated relationships between unemployment and the selected macroeconomic and socio-economic variables in Pakistan.

The robustness and reliability of the estimated relationship between UER and its determinants in Pakistan are confirmed by the diagnostic analysis of the Autoregressive Distributed Lag (ARDL) model. The Breusch-Godfrey Serial Correlation LM Test show no evidence of autocorrelation in the residuals, thus assuring the efficiency of the estimates and the validity of the standard errors. In addition to this, the Jarque-Bera Test produced a p-value of 0.432143 ($p > 0.05$), indicating the acceptance of the null hypothesis at the common significance level, pointing to the fact that the residuals follow a normal distribution, with a near-zero skewness and a kurtosis around 3, confirming the validity of one of the main assumptions of the ARDL model. Also, the Ramsey RESET Test does not provide statistically significant evidence of the functional form misspecification or omitted variables. Together, these diagnostic tests validate the ARDL model, assuring confidence in the estimated causal relationships between unemployment and its determinants, as literacy rate, inflation, GDP growth, and government expenditures. This approach will help highlight unemployment dynamics in Pakistan, as the model fitted in these two stages will suggest supporting data before making recommendations on unemployment in Pakistan and possible interventions to control it.

4.7.4 CUSUM and CUSUM Square Test



First, the CUSUM (Cumulative sum) test of ARDL model tests the stability of regression coefficients, which is a significant step in ensuring that the findings can be reliable. We see the blue line is the cumulative sum of recursive residuals with red dashed lines indicating 5% significance bounds. Also, the CUSUM at each moment is always contained in those critical limits throughout the period of the sample, which indicates that the model is structurally stable and does not present a significant structural break or changes in parameters. This lack of trend implies that the linkages between the UE and its determinants—such as INF, GDPR, LR — remained constant over time, thus reinforcing the robustness of the ARDL model proposed above for investigating the dynamics of unemployment in Pakistan. This stability of the model indicates that it is appropriate in capturing unemployment dynamics in Pakistan and providing specific potential interventions to these challenges in the labor market context.



The CUSUM of Squares test is used to test whether the variance of regression residuals tends to change over time, and no structural breaks occur in the model. Regular LHS accumulates log-likelihoods while the right LHS captures squares of log-likelihoods shown in above graph, and CUSUM of Squares line (blue) remains within 5% level of significance (dashed red lines) thus confirming that no structural breaks exist in the model. Since the cumulative sum still remains below the critical limits we can conclude that changes in the residual variance are statistically insignificant. The results support the proposition that unity relationships characterizing the dynamic association amongst (UE) and its setters (INF, GDPR, EX, LR)are stable across periods, thereby supporting the long run stability of the ARDL model. The results ascertain that the model is very robust and, consequently, it can be utilized for research of economic policies. Indeed, the results lend support to the use of this model in producing meaningful economic conclusions, by showing that any such effect would not arise from structural instability or abrupt shifts in parameters.

Using the Autoregressive Distributed Lag (ARDL) model, we have conducted an empirical analysis of UER and LR, INF, GDPR, and EX, their respective relationships in the context of unemployment in Pakistan, which is a significant area of study. From the descriptive statistics, we can see everything from unemployment had moderate fluctuations, literacy rates was always present but regional, Inflation was in the upper half of the final part of the year from comparing where GDP growth is regarded as good performance. The unit root tests confirm the non-stationarily at level for all variables but stationary at first difference level, which allows the usage of the ARDL specification (i.e., model can contain both stationary and non-stationary variables). The computed F-statistic (6.478744) is larger than the critical bounds at all levels, confirming a long-run cointegrating relationship between unemployment and its determinants, because its corresponding critical limits have been applied to the F-bounds test of 5%. This means that deviations from equilibrium in the short term will self-correct through time, revealing the stability of the long-run relationship.

In the long-run ARDL analysis, the results provided mixed evidence regarding the validity of the Abrams Curve in Pakistan. While the negative coefficient for inflation (-0.158333) aligns with the Abrams Curve's prediction of an inverse relationship between inflation and unemployment, the coefficient is statistically insignificant, suggesting that the traditional framework may not fully capture the complexities of Pakistan's labor market. Structural factors such as stagflation, informal employment, and gender disparities likely weaken the expected inverse relationship. The short-run dynamics from the Unconditional Error Correction Model (ECM) further revealed that GDPR significantly reduces unemployment in the short term, while inflation and government expenditures have insignificant effects, reinforcing the need for targeted policy interventions.

The diagnostic tests confirmed the robustness and reliability of the ARDL model. The Breusch-Godfrey Serial Correlation LM Test indicated no autocorrelation in the residuals, while the Jarque-Bera Test confirmed the normality of residuals, satisfying key assumptions of the model. The Ramsey RESET Test showed no evidence of functional form misspecification, and the CUSUM and CUSUM of Squares tests demonstrated the structural stability of the model over time. These findings underscore the validity of the ARDL model for analyzing unemployment dynamics in Pakistan and provide a solid foundation for policy recommendations.

Thus, while the empirical analysis finds partial support for the Abrams Curve from the negative relationship between inflation and unemployment in the study period, the broader evidence suggests that the Abrams curve provides an incomplete account of the dynamics of unemployment in a country which faces structural and institutional challenges that are indeed unique to Pakistan. By emphasizing sustainable GDP growth, it also calls for an integrated framework for employment policies based on education and skills, efficiency in government expenditures, and gender inclusiveness within the labor force. The findings are a valuable addition to the existing literature, providing empirical evidence of the dual challenges of formalizing informal employment and creating new job opportunities in a developing economy with specific structural obstacles that policymakers can draw upon with the goal of designing targeted interventions for sustainable economic development.

5. CONCLUSIONS

Unemployment occurs when people who are able and willing to work are unable to find employment. There are many reasons for this phenomenon, which causes inefficiencies such as income inequality, regional imbalance, and misallocation of resources (Çelikay 207). High unemployment leads to production being lower than it could be, leaving a vital factor of production, labor, unemployed. Some of the pent-up demand that will be released when things have returned to normal will be met by underutilised labour. This economic bleeding effect is especially harmful for developing economies, where the resources are already sparse. As a result, unemployment is seen as a major challenge for developing countries. Unemployment remains a common phenomenon across both developing and developed economies, necessitating government measures aimed at securing employment.

There is no agreement to speak of among competing schools of economics on the issues of government interventions and unemployment. The classical argument holds that markets are naturally self-correcting and unemployment is not a long-run problem. Within this school, supply creates its own demand — the famous Say's Law — and any unemployment that is caused is due to the temporary variations or rigidities of the market, for instance the rigidity of wages. From this perspective, unemployment is transitory, and will resolve naturally as the market reverts to its equilibrium level with no need for government intervention.

In contrast, the reality is that unemployment occurs in the Keynesian view due to a failure of aggregate demand. Whereas classical economists (among others) believe that money supply is neutral and markets are in equilibrium; Keynesians hold that a multitude of factors can lead to persistent unemployment. They focus on government interventions, through fiscal and monetary policies, to boost aggregate demand, create jobs, and reduce unemployment, especially in cases of economic recession. Those working closely with the economy's fundamentals show the need for the government to play a key role in stabilization and unemployment reduction.

Such conflicting understandings highlight the challenges of properly dealing with unemployment, especially in developing economies like Pakistan. The classical and neo-classical approaches may stress the ability of markets to adjust on its own, that markets, will eventually, not only come correct with financial instruments but, self-adjust upward (the long-run) to the point of economic equilibrium, where the forces of supply and demand adjust one another; whereas, the Keynesian approach focuses on the inability of markets to adjust on their own through what it describes as players capturing elements of the markets, crony capitalism, and the ineffectiveness of financial instrument adjustment, necessitating very necessary government intervention to overcome demand deficiency and structural inefficiency. For Pakistan, as an economy affected with labor market inflexibilities, skill mismatches, and structural weaknesses, a nuanced intermix of market forces and focused government involvement will be necessary to efficiently address unemployment and facilitate broad-based economic development.

The Pakistani economy, traditionally agrarian but increasingly service-oriented, has struggled with macroeconomic stability and faced chronic unemployment, perpetual inflation, and intermittent growth. Moderate GDP growth is also evident but is coupled with structural fragilities: youth unemployment exceeds 11% and inflation skyrocketing (38% in 2023). Sustainable development is needed and yet challenging to realize. The combination of population pressures, low literacy rates (62.8%) and gender inequity compounds these challenges, hindering the development of human capital and locking a cycle of poverty. In Pakistan's specific context, traditional economic models, like the Abrams Curve that displays an inverse relationship between inflation and unemployment, remain inadequate; and the country's socio-economic landscape, such as informal labor markets, climate vulnerabilities, and political instability, inform the naturalize of its corporate response.

This study investigates the applicability of the Abrams Curve to Pakistan regarding inflation, GDP growth, literacy rates, and unemployment. Through this exploration, the study seeks to uncover the main drivers of unemployment in a developing economy characterized by structural challenges, including high population growth, low literacy levels, and gender disparities in the labor force. The results shows whether the proposed Abrams Curve of an inverse relationship between inflation and unemployment holds in a country like Pakistan. The research further elaborates on the importance of gender equality and human capital development in determining labor market outcomes. The findings will inform policymakers in formulating evidence-based interventions, including education investments, vocational training, and gender-inclusive policies, to combat unemployment and foster sustainable economic growth. This endeavour establishes a crucial intersection between theoretical constructs and the empirical realities of Pakistan’s labour market, providing socially feasible alternatives to address the perennial challenge of unemployment in the country and promote equitable growth.

Using the Autoregressive Distributed Lag (ARDL) model, this study thoroughly examines the relationships between unemployment and its key determinants, including the literacy rate, inflation, GDP growth, and government expenditures. The results of the empirical analysis in this study suggest that the inflation-unemployment relationship, as per the Abrams Curve hypothesis, is not a direct case for the Pakistani economy. The long-run ARDL analysis yielded a negative coefficient for inflation, in line with the theoretical expectation of the Abrams Curve; however, the relationship was statistically insignificant. It suggests that the traditional inflation-unemployment trade-off, as illustrated by the Phillips Curve, is less relevant to Pakistan, where structural and institutional factors ultimately determine its labor market trends.

There are several key reasons why the Abrams Curve does not hold in its entirety in Pakistan. First, stagflation is not uncommon in the country — inflation and unemployment can be high at the same time — which contradicts the curve's implicit assumption that there is a stable inverse relationship. Second, specific structural inefficiencies such as skill mismatches and a large informal labor sector. Third, government spending didn't reduce unemployment as Keynesian theory would suggest; instead, it likely increased it, possibly due to issues of resource misallocation, corruption, and the crowding out of private investment.

These findings suggest that policymakers in Pakistan cannot rely solely on demand-side macroeconomic interventions to address unemployment. It instead requires a multidimensional solution, targeting structural rigidities through reforms in education, vocational training, inclusive gender-based labor policies, and streamlined fiscal management. However, the application of the Abrams Curve directly in the context of Pakistan is limited, as it is relevant in its theoretical framework to developed economies where the labour market is more flexible. Future studies may consider alternative representations of the curve that incorporate structural characteristics specific to developing economies, such as Pakistan, and provide a more reliable suggestion on the appropriate policy stance to maintain sustainable employment growth.

Based on the study's findings, Pakistan requires a comprehensive policy approach to address unemployment that moves beyond conventional macroeconomic solutions. First, targeted education reforms should align vocational training programs with labor market demands to reduce skill mismatches. Meanwhile, initiatives to improve female literacy and workforce participation must be prioritised through gender-sensitive policies, such as affordable childcare and anti-discrimination laws. Second, fiscal policy should be restructured to redirect government expenditures from unproductive subsidies toward high-employment sectors such as SMEs, renewable energy, and agro-based industries while improving transparency to minimise corruption and crowding-out effects. Third, formalising the informal labor sector through social protection schemes and financial inclusion can mitigate vulnerabilities to underemployment. Additionally, given Pakistan's recurrent stagflation, monetary policy should strike a balance between controlling inflation and promoting growth-oriented measures, avoiding an overt reliance on the inverse relationship of the Phillips Curve. Ultimately, future research should develop localised economic models that incorporate structural variables, such as the share of informal employment and gender disparities, to inform policymaking better. These interventions, collectively addressing supply-side constraints and institutional inefficiencies, offer a viable pathway to sustainable employment generation in Pakistan's unique socioeconomic context.

The results of the study suggest that Pakistan requires an alternative policy framework that extends beyond macroeconomic prescriptions to address the issue of unemployment. Firstly, opening vocational training programs to meet labor market demand. For the second, fiscal policy must be reorganised such that government spending is redirected away from especially unproductive subsidies and into high-employment sectors, such as SMEs, renewable energy, and agro-based sectors, in conjunction with improved transparency to mitigate corruption and crowding-out effects. Third, social protection schemes and financial inclusion initiatives targeting the informal labour sector can help reduce the vulnerabilities of underemployment. Moreover, even though Pakistan has frequently faced stagflation, the thrust of monetary policy should be both inflationally tight and growth-oriented; an over-reliance on the inverse of that Abrams Curve is clearly not in order. Finally, future research needs to develop economic models grounded in local contexts that consider structural variables, such as the share of informal employment or gender disparities, to inform policymaking more effectively. By addressing both supply-side constraints and institutional inefficiencies simultaneously, these two interventions can collectively provide a sustainable solution for generating employment in Pakistan.

Appendix

EViews Printouts

Long run Form and Bound Test

ARDL Long Run Form and Bounds Test
Dependent Variable: D(UER)
Selected Model: ARDL(4, 4, 2, 1, 3)
Case 2: Restricted Constant and No Trend
Date: 03/27/25 Time: 22:26
Sample: 1995 2023
Included observations: 29

Conditional Error Correction Regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-4.591713	4.521497	-1.015529	0.3338
UER(-1)*	-0.515759	0.156035	-3.305409	0.0079
LR(-1)	-0.012222	0.052984	-0.230678	0.8222
INF(-1)	-0.081662	0.055055	-1.483283	0.1688
GDPR(-1)	0.098225	0.157324	0.624351	0.5464
EX(-1)	0.773414	0.251332	3.077260	0.0117
D(UER(-1))	0.074771	0.228015	0.327920	0.7497
D(UER(-2))	-0.179252	0.193817	-0.924856	0.3768
D(UER(-3))	0.523451	0.193495	2.705234	0.0221
D(LR)	0.079971	0.179575	0.445337	0.6656
D(LR(-1))	-0.606745	0.179743	-3.375618	0.0071
D(LR(-2))	-0.773816	0.187831	-4.119756	0.0021
D(LR(-3))	-0.564028	0.144864	-3.893505	0.0030
D(INF)	-0.036156	0.054434	-0.664209	0.5216
D(INF(-1))	0.157395	0.043603	3.609728	0.0048
D(GDPR)	-0.110385	0.093138	-1.185177	0.2633
D(EX)	-0.014665	0.154486	-0.094926	0.9262
D(EX(-1))	-0.311910	0.210262	-1.483431	0.1688
D(EX(-2))	-0.560768	0.198150	-2.830016	0.0179

* p-value incompatible with t-Bounds distribution.

Levels Equation
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LR	-0.023698	0.104389	-0.227015	0.8250
INF	-0.158333	0.109234	-1.449478	0.1778
GDPR	0.190448	0.288772	0.659511	0.5245
EX	1.499566	0.367374	4.081851	0.0022
C	-8.902831	7.813881	-1.139361	0.2811

EC = UER - (-0.0237*LR -0.1583*INF + 0.1904*GDPR + 1.4996*EX
-8.9028)

F-Bounds Test — Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)
		Asymptotic: n=1000		
F-statistic	6.478744	10%	2.2	3.09
k	4	5%	2.56	3.49
		2.5%	2.88	3.87
		1%	3.29	4.37

ECM

ARDL Error Correction Regression
Dependent Variable: D(UER)
Selected Model: ARDL(4, 4, 2, 1, 3)
Case 2: Restricted Constant and No Trend
Date: 03/27/25 Time: 22:29
Sample: 1995 2023
Included observations: 29

ECM Regression
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(UER(-1))	0.074771	0.117201	0.637970	0.5378
D(UER(-2))	-0.179252	0.108526	-1.651707	0.1296
D(UER(-3))	0.523451	0.099258	5.273631	0.0004
D(LR)	0.079971	0.101300	0.789452	0.4482
D(LR(-1))	-0.606745	0.090563	-6.699728	0.0001
D(LR(-2))	-0.773816	0.102360	-7.559782	0.0000
D(LR(-3))	-0.564028	0.098366	-5.733950	0.0002
D(INF)	-0.036156	0.034794	-1.039142	0.3232
D(INF(-1))	0.157395	0.026288	5.987294	0.0001
D(GDPR)	-0.110385	0.050409	-2.189808	0.0534
D(EX)	-0.014665	0.108737	-0.134864	0.8954
D(EX(-1))	-0.311910	0.154115	-2.023872	0.0705
D(EX(-2))	-0.560768	0.133092	-4.213378	0.0018
CointEq(-1)*	-0.515759	0.067543	-7.636013	0.0000

R-squared	0.907190	Mean dependent var	0.169241
Adjusted R-squared	0.826754	S.D. dependent var	0.813702
S.E. of regression	0.338686	Akaike info criterion	0.978785
Sum squared resid	1.720622	Schwarz criterion	1.638858
Log likelihood	-0.192377	Hannan-Quinn criter.	1.185512
Durbin-Watson stat	1.712311		

* p-value incompatible with t-Bounds distribution.

F-Bounds Test — Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	6.478744	10%	2.2	3.09
k	4	5%	2.56	3.49
		2.5%	2.88	3.87
		1%	3.29	4.37

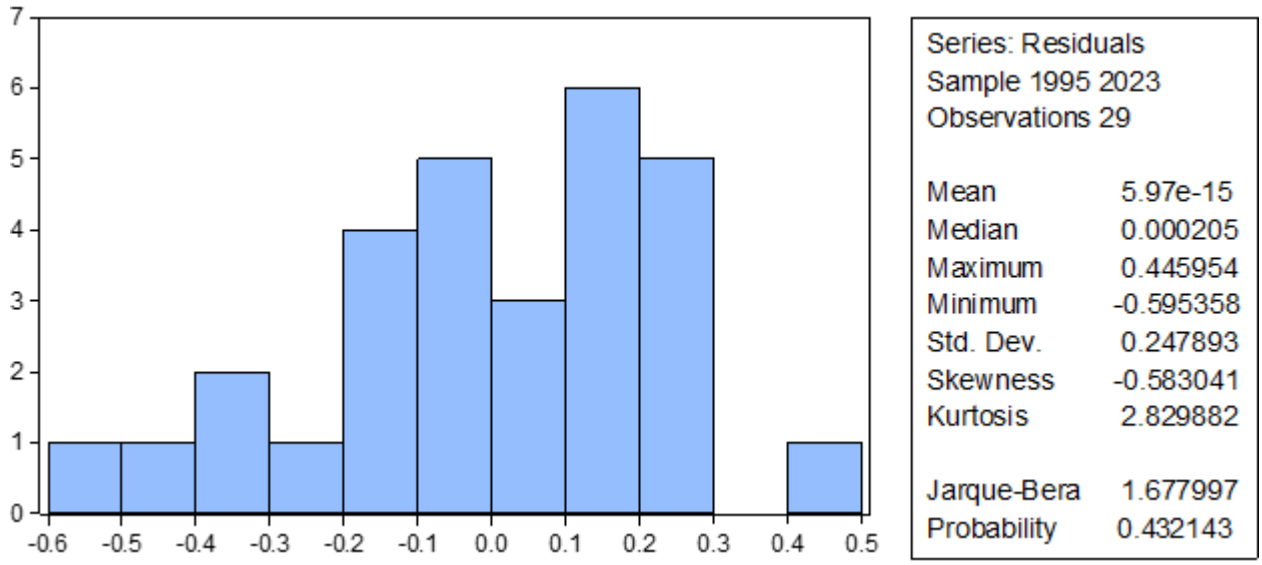
Diagnostic Testing

Autocorrelation

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.108624	Prob. F(2,8)	0.8984
Obs*R-squared	0.766705	Prob. Chi-Square(2)	0.6816

Normality Test



Ramsey Reset Test

Ramsey RESET Test
Equation: UNTITLED
Specification: UER UER(-1) UER(-2) UER(-3) UER(-4) LR LR(-1) LR(-2) LR(-3) LR(-4) INF INF(-1) INF(-2) GDPR GDPR(-1) EX EX(-1) EX(-2) EX(-3) C
Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	0.914718	9	0.3842
F-statistic	0.836708	(1, 9)	0.3842

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	0.146356	1	0.146356
Restricted SSR	1.720622	10	0.172062
Unrestricted SSR	1.574267	9	0.174919

Data set

YEAR	UER	LR	INF	GDPR	EX
1991	0.586	30.195	11.7913	6.0516	14.2637
1992	0.583	32.281	9.5090	4.4448	12.8421
1993	0.588	34.276	9.9737	2.1204	13.0200
1994	0.591	36.181	12.3682	3.4726	12.0210
1995	0.596	37.997	12.3436	1.5017	11.7435
1996	0.591	39.725	10.3738	2.6801	12.6451
1997	0.596	41.367	11.3755	3.0276	11.8936
1998	0.6	43.000	6.2280	4.3669	11.2641
1999	0.602	44.395	4.1426	4.1164	10.3601
2000	0.597	45.783	4.3667	4.2179	9.9160
2001	0.595	47.090	3.1483	6.5738	8.6557
2002	0.597	48.316	3.2903	4.4326	9.6286
2003	0.595	49.462	2.9141	6.1517	9.7312
2004	0.588	50.529	7.4446	2.4976	9.6868
2005	0.582	50.000	9.0633	1.2741	9.1610
2006	0.582	54.000	7.9211	6.5139	11.5686
2007	0.398	52.000	7.5987	4.7675	10.4025
2008	0.423	56.000	20.2861	0.0049	10.5821
2009	0.535	55.000	13.6478	3.4726	11.5288
2010	0.653	55.000	12.9389	1.5017	10.9188
2011	0.796	55.000	11.9161	2.6801	10.2266
2012	3.667	57.000	9.6824	3.0276	10.0993
2013	2.954	56.000	7.6922	4.3669	10.2598
2014	1.827	57.000	7.1894	4.1164	10.0274
2015	3.566	57.414	2.5293	4.2179	9.7890
2016	2.286	57.629	3.7651	6.5738	10.6090
2017	3.193	59.000	4.0854	4.4326	10.7537
2018	4.083	57.000	5.0781	6.1517	10.9936
2019	4.83	58.000	10.5784	2.4976	10.7498
2020	6.162	57.862	9.7400	1.2741	11.7888
2021	6.338	57.770	9.4962	6.5139	10.9296
2022	5.548	61.302	19.8739	4.7675	10.4919
2023	5.499	61.938	30.7681	0.0049	10.3067