

MACROECONOMIC FALL OUTS OF ECONOMIC UNCERTAINTY: ARE THE RESULTS SAME ON ECONOMIC GROWTH, POVERTY, AND UNEMPLOYMENT OF PAKISTAN?

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ABSTRACT

Purpose: This study is initiated to inquire into the impact of economic uncertainty on the key macroeconomic indicators for instance GDP growth, poverty, and unemployment of Pakistan. For the analysis, the time series data was used from 1972 to 2024.

Methodology: For the purpose of regression analyses, Autoregressive Distributed Lag (ARDL) technique is used. Also, Granger Causality test is incorporated to observe causality between the selected variables.

Novelty: This study is novel since it addresses the interconnected macroeconomic issues in varied framework. This research explores the dynamic relationship of these macroeconomic variables against economic uncertainty.

Findings: The results identify long-term relationship between economic uncertainty and these macroeconomic variables. The findings show that GDP growth and economic uncertainty are negatively related. However, poverty and unemployment are traced as increasing at the back of economic uncertainty in both time horizons.

Implications: The findings highlight persistent challenge on Pakistan to bring policy reforms to mitigate the adverse effects of economic uncertainty.

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INTRODUCTION

The world economic outlook is set to grow slow in current times and the downside impact on macroeconomic indicators are located to be at risk. The impact of monetary tightening, the geopolitical risks are so heightened that extra degree of uncertainty and potential volatility are to pertain for long in the presence of busy political calendars (United Nations, 2024)

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Several large developed economies have showed a remarkable resilience however with a robust labor market that supports the consumers' high spendings of money on buying the routine commodities despite of high prices and monetary tightening (Loungani & Choi, 2015). Thus, the central banks are addict to raising interest rate to control excessive spending and also creating business abruptic for the businesses who have to bear high cost of borrowing.

Furtherance in the macroeconomic uncertainty is being cited in developed economies like USA to have recorded GDP growth at 1.4 percent in 2024 compared to 2.5 percent during 2023. Similarly, Japan and commonwealth of independent states are also not of different trend of GDP growth. European market is facing some recovery at 1.2 percent GDP growth by 2024 compared to less than 1 percent during 2023. But this recovery is reliant upon rise in real wages and robust labor market together with tight fiscal policies and withdrawal of fiscal support towards the varied economic sectors that are burden on the government. According to Loungani and Choi (2015), the developing countries are embedded with divergent growth patterns. For instance, Africa, East Asia, South Asia, West Asia, Latin America and Caribbean, and altogether least developed countries are to range bound between 3 to 7 percent of GDP growth.

Several events like global financial crisis, trade conflicts, pandemic, and political polarization have elevated the concerns about economic uncertainly. Yet, the measure of uncertainty is difficult since it is a nebulous concept that reflects the uncertain mind of consumer, producer, and a policy maker about the future events (Ahir et al., 2022). It is a macroeconomic phenomenon related to economic and firms' growth as well as the events like war, climate changes, and general election.

The economic uncertainty is on its verge. The 2024 United Nations Development Program (UNDP) trend report informs that there are persistent socio-economic issues worldwide during 2023 than in either of the single year after second World War. More than seventy elections in 2024 have given a half of world's population to cast votes. The growing gender equality is less sufficient to shatter the men to stop thinking of beating women and of considering them as their right. The investments in fossil fuels are growing to \$2.8 trillion. The Artificial Intelligence-powered misinformation are the biggest thread to the world, said World Economic Forum (2024). There are issues of inflation, migration, and warmest years around the globe that are leading to new protests in the developing and developed countries (United Nations Development Program, (UNDP), 2024).

The issue of unemployment and diverse remunerations are the challenges of the current world. According to UNDP, the GDP per capita would have been 20 percent higher than the current figure if the gender inequality was not to hold any more. Lack of education and ethnic minorities are causing young women to stay away from education who are in the age bracket of 15 to 24 years (UNDP, 2024). The struggling countries while attempting to cut-off cost of production, lay down workers which causes unemployment and later reduce consumer spending that is negative feedback which contributes to the deeper economic downfall. The economic uncertainty entrenches unemployment and economic distress. Moreover, the employment-generating investments and willing labor forces persuades to the deviating risks in the

demand and supply of the labor. The demographic dividend of the less developed world markets in turn transposes this demand and supply gaps into chronic unemployment (World Economic Forum, 2024).

The inadequate social protection and economic uncertainty among the displaced labor force that struggles to enter into the workforce does face higher rates of poverty, homelessness, and hunger. The anticipated disruption in the job market, on the other side, also enable technology, income, knowledge, and wealth so that to become more concentrated. In that way, it perpetuates cycles of poverty. World Economic Forum report on global risks (2024) states that if such economic trenches are un managed, relate to the economic hardships, unemployment, and poverty. Additionally, the social disintegration, lack of jobs, economic unrest, and poverty are well-known and potential drivers of criminal activities and further illicit economic activities.

Macroeconomic aspects are changing their shape as the economic uncertainties are budding. According to UNDP (2024), world is still far away from the track of “No Poverty”. Economic deprivations are leading to unemployment and poverty. According to the report, extreme poverty declined to 9 percent from that of 38 percent within 2019 to 2018. However, even today, among 6.1 billion people, around 1.1 billion still live in an acute multifaceted poverty in 110 countries. By 2030, the fragile states are projected to make highest number of extreme poor. Heavily indebted countries like Pakistan are a victim of harshest unemployment, poverty, and economic uncertainty. The debt burden hits the poor and job market. Around 3.3 billion people survive in countries which are facing the issue of debt interest payments that exceed the government spending of social infrastructure. Around 165 million people are seen falling into poverty trap between 2020 to 2023 as the debt servicing swung away the social protection, education, and health spending (UNDP, 2024).

Economy of Pakistan is in a state of upset at macroeconomic front. The issues like economic uncertainty, depressed GDP growth, poverty, and ever-increasing unemployment are on the front-line. Altogether, rising foreign debt is further posing pressure on the economy. These issues are piled-up due to weaker governance and political turmoil which disengaged the country for macroeconomic plans at national level. The concerns are increasing day by day including economic upheavals, slower growth, poverty, and unemployment. In Pakistan, 37.2 percent of population lives below a poverty line of \$3.65 per day (World Bank, 2024). Likewise, issue of unemployment is also abruptic. By 2023, approximately 5.5 percent people are unemployed and this percentage is expected to rise to 8 percent by 2024 (Statista, 2024)¹.

This research caters the issue of economic uncertainty, economic growth, unemployment, and poverty and thus it is novel because it addresses the interconnected macroeconomic issues in varied framework. This research explores the dynamic relationship of these macroeconomic variables against economic uncertainty. The study is organized in a way that; Section I is written on Introduction. Section II is allocated for Literature Review. Section III is written on methodology. Whereas, Section IV and Section V cater Results and Discussions and Conclusion and Policy Implications.

¹ This information is got from Statista, Market insights, global indicators.

LITERATURE REVIEW

The literature on economic uncertainty agrees upon huge real economic effects at the back of economic uncertainty (Zeng et al., 2022; Wen et al., 2021; Liang et al., 2021; He et al., 2020). The effects of economic uncertainty are manifold (Bloom, 2009; Ferderer, 1993). Looking into impact of economic uncertainty, the fallouts are more often traced on economic growth patterns (Liu & Gao, 2022; Cepni et al., 2020 Stockhammar & Osterholm, 2016; Baker et al., 2016) and earlier by Bernanke (1983).

Several studies found the impact of uncertainty on macroeconomic variables, asset prices, and firm-specific variables (Bannigidadmath et al., 2024; Wang et al., 2014; Shi et al., 2020). Economic development, unemployment, oil prices, and stock return related effects are tracked by Scheffel (2016) and Chen et al. (2019), Golab et al. (2022), and Caggiano et al. (2017).

In the list of macroeconomic variables, poverty is also of significant importance (Bowley, 1915; United Nations, 2015). Poverty is related to deprivation from the economic resources which cover basic needs on an individual (Rowntree, 1901; Townsend, 1979). Being one of the aspects of macroeconomic variables, uncertainty posts effects on it.

Uncertainty is related to unemployment as well. Choi and Loungani (2015) found that increase in the aggregate uncertainty leads to increase unemployment even if the period of Great Recession is dropped. Earlier, Bloom (2009) also demonstrated negative effect of uncertainty on industrial production and employment. According to Choi and Loungani (2015), oil price volatility, business cycles, and credit spread are the variables on which uncertainty bases (Baker et al., 2013; Caldara et al., 2014; and Gilchrist et al., 2014). Topel and Weiss (1988) had a most relevant work on sectoral uncertainty and unemployment. The findings declared that firms and workers go with the policy of “wait and see” before moving investment capital towards industry which leads the workers towards unemployment. Furthermore, Lilien (1982) also suggested that dispersion into the sectoral shocks lead to increase unemployment.

Economic uncertainty at macroeconomic front impacts the process of economic development and economic forecasting. Either of the increase in uncertainty reduces economic growth at significant rate (Madanizadeh & Setayesh, 2020). The economic recessions are also predicted by such macroeconomic uncertainties (Ercolani & Natoli, 2020). Moreover, low employments and supply side and demand side investment concerns are also related with such uncertainties (Dibiasi & Sarferaz, 2023; Bicchal and Durai, 2020). The economic uncertainties in one country also bear impact over the countries whom it is engaged by the mean of trade and any other channel of foreign capital borrowings. To Bicchal and Durai (2020), economic uncertainty had more significant effect on India’s economy than its own internal uncertainties. Researchers have tried to explore the facts on macroeconomic issues such as unemployment, poverty, and economic growth in Pakistan. In recent, Shaheen et al. (2021), Rehman et al. (2022), and Shah et al. (2022) examined the complexity of relationships among economic growth, poverty, unemployment, and education in Pakistan. However, the studies lack behind in exploring the impacts of economic

uncertainties on macroeconomic aspects rather went with capturing the connection of such macroeconomic variables with one another. Shaheen et al. (2021) and Rehman et al. (2022) analyzed that impact of education on economic growth is held positive. However, unemployment and poverty posted negative effects. The findings go otherwise with Rehman et al. (2022). Among the list of macroeconomic variables, inflation is also significant in its impact on economic growth (Rehman et al., 2022). Also, population growth is taken into account by Shah et al. (2022) and the results are mixed since economic growth is in question while Rehman et al. (2022) commenced negative association of population growth on economic growth. The studies by Shaheen et al. (2021), Rehman et al. (2022), and Shah et al. (2022) used research methodologies of Generalized Method of Moments (GMM), ARDL, and non-linear ARDL. These findings are emphasized on impact of uncertainty on macroeconomic side of a particular country. However, there is a need to carry out a comprehensive study on locating the impact of economic uncertainty on economic growth, unemployment, and poverty so as to know the impact of such uncertainties and to see if there is any difference in the nature and direction of impact on wide length of time series data.

METHODOLOGY

Data Collection

The data for the analyses is collected for the range from 1972 to 2024. The data is collected from World Bank Development Indicators, World Uncertainty Index, Ministry of Finance, Government of Pakistan, Handbook of Statistics, and State Bank of Pakistan.

Specifications of the Models

The intent of this research is to explore the effects of economic uncertainty on macroeconomic variables of Pakistan. The chosen macroeconomic variables are economic growth, poverty, and unemployment. The generalized logarithmic form of the specific models is given in Eq [1], Eq [2], and Eq [3].

$$GDP = f(UNCY, INF, UNEMP) \quad [1]$$

$$HCR = f(UNCY, GDP, POP) \quad [2]$$

$$UNEMP = f(UNCY, FDI, EDU) \quad [3]$$

3.3 *Description of Variables*

The descriptions related to the measurement of variables is given in Table 1

Table 1

Description of Variables

Variable	Notation	Measurement
Economic Uncertainty	UNCY	The data is a frequency count of world uncertainty present in economic intelligence unit country report. A higher the number, higher economic uncertainty does it show.
Economic Growth	GDP	Annual percentage rate of growth of GDP at market prices at constant local currency.
Poverty	HCR	Poverty gap at USD3.65 per day based at 2017 PPP). The value is expressed in percentage.

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Unemployment	UNEMP	Unemployment is referred to as the percentage sharing of labor force which is wondering without any work.
Inflation	INF	Inflation is measured in terms of Consumer Price Index. The Laspeyres formula is generally used.
Population	POP	Population growth rate (annual) for a year (t) is an exponential growth rate of a midyear population from previous year to the present year. It is expressed in a percentage. The data bases on the de facto description of population, that counts all the residents despite of the legal status or citizenship. The data is expressed in percentage.
Foreign Direct Investment	FDI	It is a net investment inflow which are acquire for the management interest of ten percent or more in the enterprise that operates in a specific country. The data series is the net inflows exclusive of the disinvestment divided by the GDP of the said year.
Education	EDU	Over-all government disbursement on education is expressed in percentage of GDP. It comprises disbursement sponsored by transferences from across the border sources to the government. Over-all disbursements are referred to the governments at local, regional and central governments.

Empirical Analyses

The methodological persuades for this research are carried forward in following steps:

Unit Root Test

Prior to found the long run relationship (cointegration) between economic uncertainty and economic growth, poverty, and unemployment, the unit root test is conducted. The standard unit root test given by Dickey and Fuller (1979) is helpful to check the order of integration of each variable.

In that case, the frequently used method is of Augmented Dickey and Fuller ((ADF), 1981). The ADF test bases upon following function.

$$\Delta y_t = \beta_0 + \beta_1 t + \hat{\alpha} y_{t-1} + \beta_i \sum_{i=1}^n \Delta y_{t-i} + \varepsilon_t \quad [4]$$

In Eq [4], ε_t is the white noise error term. And y_t shows the specific variable and $\hat{\alpha}$ represents the state of unit root. The $\Delta y_{t-1} = (y_{t-1} - y_{t-2})$; $\Delta y_{t-2} = (y_{t-2} - y_{t-3})$, etc.

The issue of unit root is said to be not present if the computed F statistic of a specific variable is significant and less than the corresponding critical value.

Long Run Relationship (Cointegration)

While attempting to visualize the cointegration among the variables of interest, if the variables are stationary of order I(0), I(1), or a mixture of both, the cointegration is to be diagnosed by Autoregressive Distributed Lag (ARDL). The regression technique of ARDL is more powerful in analyses compared to the conventional methods(s) (Pesaran & Shin, 1995).

At the prelim, the earlier stated Eq [1]. Eq [2], and Eq [3] are rewritten in the form of unrestricted Error Correction Models (ECM). The equational forms are given in Eq [5], Eq [6], and Eq [7].

$$\Delta GDP = \alpha + \beta_1 GDP_{t-1} + \beta_2 UNCY_{t-1} + \beta_3 INF_{t-1} + \beta_4 UNEMP_{t-1} + \sum_{i=0}^{P_1} \delta_1 \Delta GDP_{t-i} + \sum_{i=0}^{P_2} \delta_2 \Delta UNCY_{t-i} + \sum_{i=0}^{P_3} \delta_3 \Delta INF_{t-i} + \sum_{i=0}^{P_4} \delta_4 \Delta UNEMP_{t-i} + \varepsilon_t \quad [5]$$

$$\Delta HCR = \alpha + \beta_1 HCR_{t-1} + \beta_2 UNCY_{t-1} + \beta_3 GDP_{t-1} + \beta_4 POP_{t-1} + \sum_{i=0}^{P_1} \delta_1 \Delta HCR_{t-i} + \sum_{i=0}^{P_2} \delta_2 \Delta UNCY_{t-i} + \sum_{i=0}^{P_3} \delta_3 \Delta GDP_{t-i} + \sum_{i=0}^{P_4} \delta_4 \Delta POP_{t-i} + \varepsilon_t \quad [6]$$

$$\Delta UNEMP = \alpha + \beta_1 UNEMP_{t-1} + \beta_2 UNCY_{t-1} + \beta_3 FDI_{t-1} + \beta_4 EDU_{t-1} + \sum_{i=0}^{P_1} \delta_1 \Delta UNEMP_{t-i} + \sum_{i=0}^{P_2} \delta_2 \Delta UNCY_{t-i} + \sum_{i=0}^{P_3} \delta_3 \Delta FDI_{t-i} + \sum_{i=0}^{P_4} \delta_4 \Delta EDU_{t-i} + \varepsilon_t \quad [7]$$

The β_i are the long run multipliers. The short run multipliers are represented by δ_i . Whereas, the Δ s show the sign of first difference and white noise error term is given by ε_t , respectively.

Subsequent to the ECM, the long run coefficients are found later after the authentication of long run relationship (Narayan, 2005). It is done so by Bound Test. The asymptotic critical values are given by Pesaran and Pesaran (1997) and Pesaran et al. (2001). The conclusion bases upon the comparison of computed F statistics and the F statistic table values at upper bound. If the computed F statistic of a specific ECM is found to be higher than the F statistic table value at upper bound, the conclusion is said to be that: there exist long run relationship and vice versa. However, if the computed Wald Test F statistic is lying between upper and lower bound F statistic table value, the conclusion about long run relationship is said to be inconclusive.

After the long run relationship is confirmed, the long run coefficients are computed through following equational representations.

$$\Delta GDP = \alpha + \sum_{i=0}^{P_1} \delta_1 \Delta GDP_{t-i} + \sum_{i=0}^{P_2} \delta_2 \Delta UNCY_{t-i} + \sum_{i=0}^{P_3} \delta_3 \Delta INF_{t-i} + \sum_{i=0}^{P_4} \delta_4 \Delta UNEMP_{t-i} + \varepsilon_t \quad [8]$$

$$\Delta HCR = \alpha + \sum_{i=0}^{P_1} \delta_1 \Delta HCR_{t-i} + \sum_{i=0}^{P_2} \delta_2 \Delta UNCY_{t-i} + \sum_{i=0}^{P_3} \delta_3 \Delta GDP_{t-i} + \sum_{i=0}^{P_4} \delta_4 \Delta POP_{t-i} + \varepsilon_t \quad [9]$$

$$\Delta UNEMP = \alpha + \sum_{i=0}^{P_1} \delta_1 \Delta UNEMP_{t-i} + \sum_{i=0}^{P_2} \delta_2 \Delta UNCY_{t-i} + \sum_{i=0}^{P_3} \delta_3 \Delta FDI_{t-i} + \sum_{i=0}^{P_4} \delta_4 \Delta EDU_{t-i} + \varepsilon_t \quad [10]$$

The P_i are the optimal orders of lags. The δ_i are the long run coefficients.

Short Run Relationship (Cointegration)

Hereafter, the long run coefficient estimates, the short run coefficients are estimated. The equational forms are given in Eq. [11], Eq [12], and Eq [13], respectively.

$$\Delta GDP = \alpha + \sum_{i=0}^{P_1} \gamma_1 \Delta GDP_{t-i} + \sum_{i=0}^{P_2} \gamma_2 \Delta UNCY_{t-i} + \sum_{i=0}^{P_3} \gamma_3 \Delta INF_{t-i} + \sum_{i=0}^{P_4} \gamma_4 \Delta UNEMP_{t-i} + \phi ECT + \varepsilon_t \quad [11]$$

$$\Delta HCR = \alpha + \sum_{i=0}^{P_1} \gamma_1 \Delta HCR_{t-i} + \sum_{i=0}^{P_2} \gamma_2 \Delta UNCY_{t-i} + \sum_{i=0}^{P_3} \gamma_3 \Delta GDP_{t-i} + \sum_{i=0}^{P_4} \gamma_4 \Delta POP_{t-i} + \phi ECT + \varepsilon_t \quad [12]$$

$$\Delta UNEMP = \alpha + \sum_{i=0}^{P_1} \gamma_1 \Delta UNEMP_{t-i} + \sum_{i=0}^{P_2} \gamma_2 \Delta UNCY_{t-i} + \sum_{i=0}^{P_3} \gamma_3 \Delta FDI_{t-i} + \sum_{i=0}^{P_4} \gamma_4 \Delta EDU_{t-i} + \phi ECT + \varepsilon_t \quad [13]$$

The γ in each equation is the estimated short run coefficient of a specific variable. The ϕ is a coefficient of Error Correction Term (ECT). It is supposed to be negatively signed, significant, and less than 1. The coefficient values represent the speed of adjustment towards long run.

Granger Causality Test

The definitions of causality and feedbacks are very general in nature (Granger, 1969). If $\delta^2 X/U < \delta^2 (X/\overline{U-Y})$ and $\delta^2 Y/U < \delta^2 (Y/\overline{U-X})$ then it is said to be a feedback effect occurring in both X and Y component which is denotable by $Y_t \Leftrightarrow X_t$. According to Granger (1969), it is said to be bidirectional causality. However, one way causality is also not questionable and, in that case, either X_t is to cause Y_t alone or vice versa.

RESULTS AND DISCUSSIONS

Descriptive Analyses

The results of descriptive statistics are given in Table 2. Descriptive statistics are the brief information of data set. The information is broken down into the central tendencies and measurement of spread (standard deviation). The results show that UNCY, UNEMP, and FDI have least dispersion from their respective mean value. The maximum dispersion is recorded on HCR and INF which shows significant fluctuation in these variables over the specific range of data. Kurtosis on GDP is recorded to be mesokurtic which means that the probability of extreme, rare, or outlier data is almost zero and the data of said variable is normally distributed. On the other side, UNCY, INF, FDI, and EDU are leptokurtic. And HCR and UNEMP are platykurtic. Skewness measures the relative symmetry of distribution around the mean. Except GDP, the entire variables are found to be rightly skewed. Finally, the Jarque-Bera probabilities confirm that GDP, HCR, and UNEMP are the variables where the null hypotheses of normally distributed residuals are not rejected.

Table 2

Descriptive Statistics

	UNCY	GDP	HCR	UNEMP	INF	FDI	EDU
Mean	0.14	4.61	3.28	3.89	10.09	0.69	2.36
Maximum	0.64	10.22	3.69	8.54	32.42	3.04	3.62
Minimum	0.00	-1.27	2.85	0.40	2.53	-0.06	1.57
Std. Dev.	0.12	2.28	0.21	2.20	6.73	0.63	0.46
Skewness	1.75	-0.12	0.40	0.27	1.69	2.18	0.78
Kurtosis	7.72	3.00	2.15	2.19	5.66	8.13	3.63
Jarque-Bera	76.17	0.12	3.01	2.08	40.95	100.20	6.27
Probability	0.00	0.94	0.22	0.35	0.00	0.00	0.04

Pair wise Correlation

The computations of pair wise correlation are given in Table 3. The pair-wise correlation analyses represent the strength of relationship between the variables. The findings show no issue of multicollinearity however, at maximum, mild correlation is found between HCR, GDP, INF, and EDU.

Table 3

Computations of Correlation

	UNCY	GDP	HCR	UNEMP	INF	FDI	EDU
UNCY	1.00	-0.15	0.14	-0.02	-0.02	-0.24	0.09
GDP	-0.15	1.00	-0.45	0.11	-0.23	-0.12	-0.15
HCR	0.14	-0.45	1.00	0.11	0.35	-0.15	-0.15
UNEMP	-0.02	0.11	0.11	1.00	-0.20	-0.21	-0.02
INF	-0.02	-0.23	0.35	-0.20	1.00	0.06	0.32
FDI	-0.24	-0.12	-0.15	-0.21	0.06	1.00	0.34
EDU	0.09	-0.15	-0.15	-0.02	0.32	0.34	1.00

Unit Root Test

The information about the state of stationarity is given in Table 4. The ADF (1981) test results show that all the variables are turned out to be stationary. However, UNCY, GDP, and HCR are stationary at I(0) means at level. And UNEMP, INF, FDI, and EDU are stationary after first differenced I(1).

Table 4

Unit Root Test

Variable	<i>t</i> statistic	Prob.	Conclusion
UNCY	-4.92	0.00	I(0)
GDP	-5.69	0.00	I(0)
HCR	-2.81	0.06	I(0)
UNEMP	-8.52	0.00	I(1)
INF	-7.77	0.00	I(1)
FDI	-5.01	0.00	I(1)
EDU	-7.01	0.00	I(1)

Bound Test

The ordinary least square is performed on Eq [5], Eq [6], and Eq [7] and Wald test is run to find out the *F* statistics. Prior to that, Schwarz Bayesian Criterion is used to sort out the optimal lag length of variables. Table 5 represents the respective *F* statistics (computed and table values) which are exported from Narayan (2005). The conclusions are drawn that long run relationships exist on each model.

Table 5

Bound Test

Equation	Optimal Lag Length	Computed <i>F</i> Statistic	Upper & Lower Critical Value	Conclusion
GDP/(UNCY, INF, UNEMP)	3; (1, 2, 0, 3)	8.29*	2.79 & 3.67	Long run relationship
HCR/(UNCY, GDP, POP)	3; (2, 2, 3, 3)	8.39*	2.79 & 3.67	Long run relationship
UNEMP/(UNCY, FDI, EDU)	5; (1, 5, 0, 5)	3.73*	2.79 & 3.67	Long run relationship

Note: * shows 5 percent level of significance.

Long Run Coefficients

The long run coefficients estimations of each model are given in Table 6. The variable of interest is economic uncertainty. The ARDL based regression results confirm that economic uncertainty is significantly affecting chosen macroeconomic variable i.e. economic growth, poverty, and unemployment.

In case of economic growth, the value of coefficient is negative. It is found that 0.28 percent of reduction in economic growth is evident at the back of 1 percent increase in economic uncertainty. Andaloussi and Maggi (2023) stated that world growth is to get slow down from 3.4 percent to 2.8 percent by 2024. Therefore, findings of this study also fall in line with the verdict of Andaloussi and Maggi (2023) by adding a notion that one of the reasons behind deterioration in economic growth is economic uncertainty. This reason gets a support from the study of Liu and Gao (2022) who mentioned that world uncertainty index has a predictability for the GDP. Also, strongest forecasting ability for GDP growth rate is diagnosed during the COVID-19 period (Liu & Gao, 2022). Similar results are found by Bannigidmath et al. (2023) who investigated that global economic uncertainty has a power to negatively predict GDP growth however, during the period of pandemic, as found by Liu and Gao (2022). This study has an edge to further the understanding on the issue of economic uncertainty. That is; a wider range impacts are found evident on GDP growth and not only during the phase of pandemic.

The effect of economic uncertainty on poverty is positive. The findings confirm that 1 percent increase in economic uncertainty tends to increase poverty by 0.09 percent. the impact is significant however, mild as compared to that of GDP. Poverty is also declared as a sequel of income inequality which is caused by economic uncertainty (Kebalo & Zouri, 2024; Theophilopoulou, 2022; Thye et al., 2021). Economic uncertainty leads towards an increase in commodity prices, said Fang et al. (2018), which cause poverty at large. Therefore, findings of present study go in support with Ramos (2019) who exclaimed that economic sustainability is required to alleviated poverty. Economic uncertainty has an effect on employment, GDP, and consumption, said Rossi and Miescu (2023), Bannigidmath et al. (2023), Andaloussi and Maggi (2023), and Kandoussi and Langot (2022), thus these sequels take the economy to face poverty (World Bank, 2020).

Moving on to unemployment, it is found that unemployment pressure increases by 0.47 percent at the back of any 1 percent increase in the economic uncertainty. The economic uncertainty shocks have a theoretical effect on an evolution of unemployment (Boom, 2009). The unemployment pressures' response to aggregate uncertainty is short lived and the sectoral uncertainty shock are found to be more persistent (Choi & Loungani, 2015). However, the present study locates the time series negative impacts of economic uncertainty over unemployment, as recorded by Kandoussi and Langot (2022). Thereby proves that economic uncertainty has persistent long run impacts, unlike those found by Choi and Loungani, (2015). Similarly, Caggiano et al. (2017) explored the significant impact of economic policy uncertainty over the unemployment of United States and the findings confirmed significant impact

however during the period of recession. Therefore, findings of present study are not found to be foreign to the earlier computations rather has an edge to locate time series impacts of economic uncertainty on macroeconomic aspects such as GDP, poverty, and unemployment. In the line of empirical studies, Ahmed et al. (2020) verified the effects of economic uncertainty on unemployment of USA based on monthly data and found the results similar to the present study.

Most of the control variables are also significant in their impact on GDP, poverty, and unemployment. They are widely used in previous researches (Faridi et al., 2019; Kursheed et al., 2023; Mehmood et al., 2024). Inflation is found negative to be negatively affecting economic growth. The trend of rising prices is nothing less than to posting negative effect on the economic wellbeing. Moreover, GDP is found to have negative effect on poverty. It is not hard to believe that any increase in economic growth is to cloud away the traces of poverty from the experiencing economy. The same are the findings of this study. Further to that, FDI is found to bring down the unemployment pressures. The findings go away from those of Mehmood et al. (2018a; 2018b). The reason might be wide range of data used in this study thus having an edge over the previous researches. Also, it is interesting to note that increase in government expenditure on education is posting downward effect on employment. One percent increase in government expenditure on education increases unemployment by 4.05 percent. The fact might not be forgotten that any increase in the level of education changes the mindset of the job seekers to take more time in fetching an attractive job. Thus, in the meantime, the job aspirants are to remain unemployed. The intercepts of entire models also show that effects of omitted variables are significant.

Table 6**Long Run Coefficients**

Dependent Variable is GDP				
Variable	Coefficient	Std. Error	t statistic	Prob.
UNCY	-0.28	0.15	-1.85	0.07
INF	-0.28	0.16	-1.74	0.08
UNEMP	0.21	0.14	1.44	0.16
C	2.38	0.49	4.90	0.00
Dependent Variable is HCR				
Variable	Coefficient	Std. Error	t statistic	Prob.
UNCY	0.09	0.04	2.30	0.03
GDP	-0.48	0.08	-5.98	0.00
POP	0.03	0.08	0.37	0.72
C	4.12	0.14	29.09	0.00
Dependent Variable is UNEMP				
Variable	Coefficient	Std. Error	t statistic	Prob.
UNCY	0.47	0.21	2.21	0.03
FDI	-0.88	0.27	-3.22	0.00
EDU	4.05	1.88	2.15	0.04
C	-3.61	1.65	-2.19	0.04

Short Run Coefficients

Table 7 throws a light on the results of short run coefficients. In case of GDP, economic uncertainty is found posting negative impact. Therefore, similar outcomes are recorded as are found in case of long run. Economic uncertainty is crucial in impact on economic growth (Andaloussi & Maggi, 2023; Liu & Gao, 2022).

The short run impact on poverty is positive. Therefore, the conclusion is that; economic uncertainty possesses a quality of increasing poverty in both time horizons. Kebalo and Zouri (2024) are of the view that this engagement with high poverty is due to income inequality that falls within economic uncertainty and poverty. By distressing GDP and unemployment, economic uncertainty takes towards poverty (World Bank, 2020; Kandoussi & Langot, 2022).

Unemployment is also found to increase at the back of any increase in economic uncertainty. Most of the coefficients of UNCY are found causing more unemployment due to economic uncertainty. Thus, impacts are consistent in both time horizons and are relatable to Choi and Ioungani (2015), Ahmed et al. (2020), and Caggiano et al. (2017).

The control variables are mostly significant. Unemployment is causing to reduce GDP growth and increase in population is found as increasing poverty. However, if urban population is relied upon, Gibson et al. (2023) found that increase in urban population helps in reducing poverty. FDI is located to reduce unemployment. Better use of foreign investments is fruitful for curbing “No Vacancy” issues of job seekers (Khan & Naseem, 2024). Similarly, increase in government education expenditure is traced to significantly reducing unemployment on all the observations. However, in long run, the results are vice versa. Therefore, the conclusion is that; government education expenditure which produces the qualified people tend to favor unemployment reduction in short run but opposite in long run due to searching for elevated jobs because of getting tired-off working with low paid employer either.

The coefficients of ECT are significant, correctly signed, and within the designated range. In the model of economic growth, 79 percent of the imbalances in equilibrium are adjusted in long run. In the model of poverty and unemployment, the figures of the correction of disequilibrium are found to be 66 percent and 40 percent, respectively.

Table 7

Short Run Coefficients

Dependent Variable is GDP				
Variable	Coefficient	Std. Error	t statistic	Prob.
D(UNCY)	-0.05	0.06	-0.82	0.42
D(UNCY(-1))	-0.24	0.07	-3.61	0.00
D(INF)	-0.25	0.16	-1.49	0.14
D(UNEMP)	0.18	0.13	1.40	0.17
D(UNEMP(-1))	-0.18	0.13	-1.45	0.15
D(UNEMP(-2))	-0.30	0.13	-2.38	0.02

<i>ECT</i>	-0.79	0.13	-6.31	0.00
Dependent Variable is HCR				
Variable	Coefficient	Std. Error	t statistic	Prob.
D(HCR(-1))	0.15	0.11	1.37	0.18
D(UNCY)	0.01	0.01	0.89	0.38
D(UNCY(-1))	0.05	0.01	3.82	0.00
D(GDP)	-0.12	0.03	-4.41	0.00
D(GDP(-1))	0.06	0.04	1.49	0.14
D(GDP(-2))	0.09	0.03	2.81	0.01
D(POP)	-0.07	0.20	-0.37	0.71
D(POP(-1))	0.47	0.23	2.04	0.05
D(POP(-2))	0.36	0.22	1.65	0.11
<i>ECT</i>	-0.66	0.10	-6.83	0.00
Dependent Variable is UNEMP				
Variable	Coefficient	Std. Error	t statistic	Prob.
D(UNCY)	0.03	0.07	0.50	0.62
D(UNCY(-1))	0.31	0.06	5.01	0.00
D(UNCY(-2))	0.10	0.07	1.51	0.14
D(UNCY(-3))	0.20	0.06	3.47	0.00
D(UNCY(-4))	0.12	0.06	2.13	0.04
D(FDI)	-0.32	0.14	-2.28	0.03
D(EDU)	0.06	0.45	0.14	0.89
D(EDU(-1))	-1.57	0.47	-3.32	0.00
D(EDU(-2))	-1.66	0.44	-3.76	0.00
D(EDU(-3))	-1.93	0.66	-2.91	0.01
D(EDU(-4))	-1.77	0.83	-2.13	0.04
<i>ECT</i>	-0.40	0.08	-4.89	0.00

Granger Causality

The Granger causality test results are published in Table 8. One way causality is found between economic uncertainty and GDP growth. On account of unemployment, the results are unidirectional since one sided causality is located from economic uncertainty to GDP growth and unemployment. However, though cointegration is found between poverty and economic uncertainty but no traces of causality are found in case of poverty and economic uncertainty despite significant coefficient values in both time horizons. The opted macroeconomic variables are also located for having one sided causality among one another. The relationship among macroeconomic variables is also explored by Shaheen et al. (2021) and Rehman et al. (2022).

Table 8

Granger Causality

Granger Causality	Null Hypothesis	F statistic	Prob.	Conclusion
UNCY $\Leftrightarrow$ GDP	UNCY $\rightarrow$ GDP	3.59	0.03	Unidirectional causality
	GDP $\rightarrow$ UNCY	0.30	0.74	
UNCY $\Leftrightarrow$ HCR	UNCY $\rightarrow$ HCR	0.004	0.99	No causality
	HCR $\rightarrow$ UNCY	1.44	0.25	
UNCY $\Leftrightarrow$ UNEMP	UNCY $\rightarrow$ UNEMP	2.59	0.09	Unidirectional causality
	UNEMP $\rightarrow$ UNCY	0.58	0.57	
HCR $\Leftrightarrow$ GDP	HCR $\rightarrow$ GDP	0.77	0.47	Unidirectional causality
	GDP $\rightarrow$ HCR	5.68	0.006	
UNEMP $\Leftrightarrow$ GDP	UNEMP $\rightarrow$ GDP	0.31	0.73	Unidirectional causality
	GDP $\rightarrow$ UNEMP	2.34	0.09	
HCR $\Leftrightarrow$ UNEMP	HCR $\rightarrow$ UNEMP	0.02	0.98	No causality
	UNEMP $\rightarrow$ HCR	1.68	0.19	

Diagnostic Checking

The models are also diagnosed for possible errors at the back of regression estimates. The diagnostic checking is given in Table 9 and the conclusion are given in last column.

Table 9

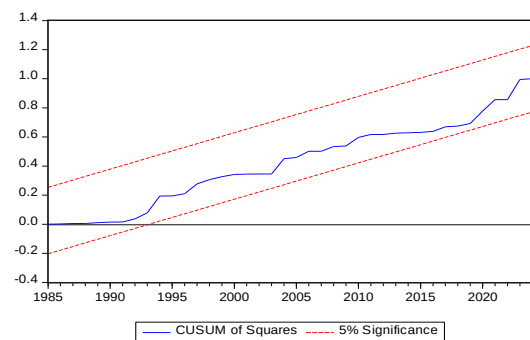
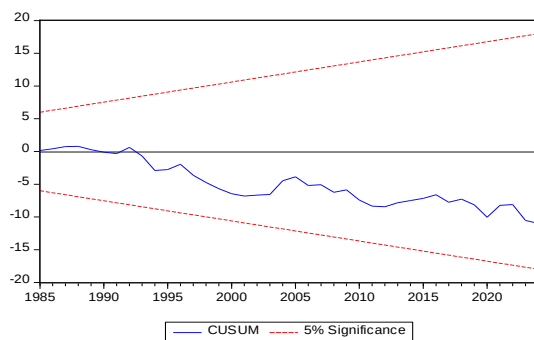
Diagnostic Checking

GDP/(UNCY, INF, UNEMP)	Test	F statistic	Prob.	Conclusion
	Breusch-Godfrey Serial Correlation LM Test	0.19	0.90	No Serial Correlation
	Heteroskedasticity Test ARCH	0.15	0.98	Data is homoskedastic
	Jarque-Bera	0.45	0.80	Residuals are normally distributed
	Ramsey RESET Test	1.37	0.26	Model is correctly specified
HCR/(UNCY, GDP, POP)	Test	F statistic	Prob.	Conclusion
	Breusch-Godfrey Serial Correlation LM Test	3.21	0.20	No Serial Correlation
	Heteroskedasticity Test ARCH	8.73	0.12	Data is homoskedastic
	Jarque-Bera	1.45	0.49	Residuals are normally distributed
	Ramsey RESET Test	2.06	0.16	Model is correctly specified

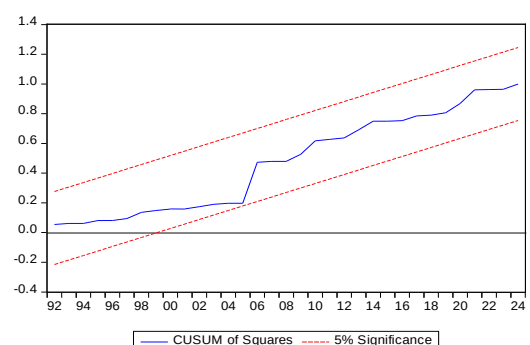
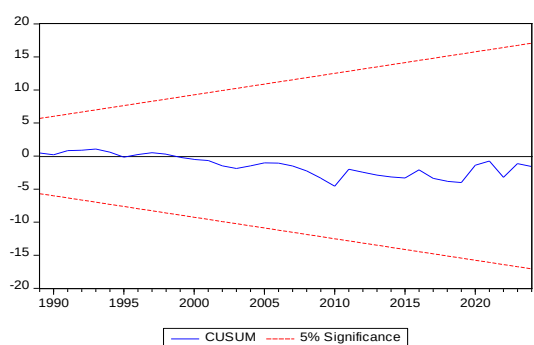
UNEMP/(UNCY, FDI, EDU)	Test	<i>F statistic</i>	Prob.	Conclusion
	Breusch-Godfrey Serial Correlation LM Test	3.71	0.16	No Serial Correlation
	Heteroskedasticity Test ARCH	5.39	0.98	Data is homoscedastic
	Jarque-Bera	0.53	0.77	Residuals are normally distributed
	Ramsey RESET Test	0.17	0.87	Model is correctly specified

The results of CUSUM and CUSUM sum of squares are furnished in Figure 1. The results confirm that the long run and short run parameters are accurate within 5 percent level of significance. Also, the structural breaches are found absent within the time series estimation. Thus, in the absence of structural instability and inconsistency in the long run and short run parameters, the CUSUM and CUSUM sum of square results confirm that the coefficients in entire models are stable and consistent.

GDP/(UNCY, INF, UNEMP)



HCR/(UNCY, GDP, POP)



UNEMP/(UNCY, FDI, EDU)

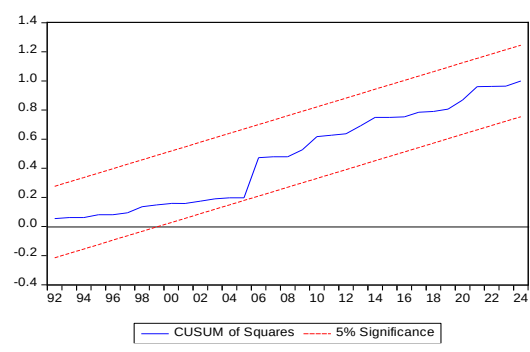
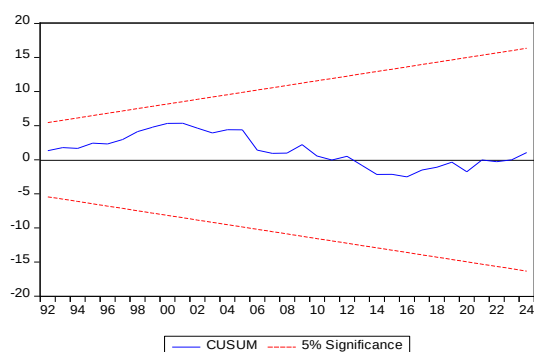


Figure 1

CUSUM & CUSUM of Squares

CONCLUSION & POLICY IMPLICATIONS

Conclusion

Economic uncertainty is foresighted to pertain for longer span of time. Even developed countries are also not away from the effects of economic uncertainty particularly on macroeconomic front. Consumers, producers, and policy makers are uncertain about the future economic outlook in the presence of economic uncertainty. This study was aimed to locate the sequels of economic uncertainty on macroeconomic indicators such as GDP growth, poverty, and unemployment in Pakistan. To do the regression analyses on time series data from 1972 to 2024, ARDL technique was used. Bound test authenticated a long run relationship between economic uncertainty and macroeconomic indicators. The findings confirmed that economic uncertainty has a negative effect on GDP growth. Also, it is found that poverty and unemployment are to rise as a result of economic uncertainty in both time horizons.

Moreover, Granger causality test was performed to know if causality is present between the macroeconomic indicators and economic uncertainty. The results proved causality relationship in case of GDP growth and unemployment though unidirectional.

Policy Implications

Based upon the findings of the study, some of the practical policy implications are suggested as follows:

1. There is a need to strengthen economic diversification through policies which help to diversify the economic base by reducing reliance on few sectors. In that way, the targets of GDP growth must be reliant upon industrial promotions based upon technology, renewable energy, and for instance manufacturing of goods which help to bring about stability and assist in evading the exposure from internal shocks such as of economic uncertainty.
2. The focus should be on enhancing social safety network by implementing and strengthening social safety net programs which can help in rescuing the vulnerable population from the adverse effects of economic uncertainty. This network can include unemployment benefits, retirement plans, food assistance, and conditional cash disbursements to alleviate poverty and to support those who are the job seekers.
3. The public and private expenditure on varied sectors is crucial in order to promote requisite investment funds to equip the workers with technical skills and knowledge to match the demand of industries. This can help in reducing the effect of economic uncertainty on furthering of unemployment.

Limitations of the Study

Though present study is unique in covering the significant literature gap. The scope of study is still limited since it is based upon Pakistan and not on the emerging economies either. Moreover, ARDL technique is although appropriate but still not fully capable in holding a potential to address the nonlinear dynamics and or structural breaks in the time series data over the specific time period.

These limitations perhaps do not shade out the significance of this study however, the future research can be initiated to highlight the essentials of this research area by using complementary analytical methods to gain further knowledge on the impact of economic uncertainty on chosen macroeconomic indicators.

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