

The Mediating Role of Regulatory Quality in the Political Stability-Unemployment Nexus: Evidence from Pakistan

Mahtab Ahmad¹ and Deng Aiming²

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Abstract

This study examines the mediating role of regulatory quality in the relationship between political stability and unemployment in Pakistan from 1996 to 2024. Grounded in institutional economics, we argue that effective regulatory governance is a crucial transmission channel through which political stability influences labour market outcomes. Using time-series data and OLS regression with formal mediation analysis, the results show that both political stability and regulatory quality have significant negative effects on the unemployment rate. More importantly, regulatory quality acts as a substantial partial mediator, accounting for approximately 38.9% of the total effect of political stability on unemployment. This finding reveals that nearly two-fifths of the employment benefits of political stability are realised through improved regulatory frameworks. The results remain robust across diagnostic tests, alternative specifications, functional forms, and estimation methods. The study concludes that in Pakistan, periods of political stability have not consistently reduced unemployment due to weaknesses in regulatory governance. Therefore, policymakers should adopt an integrated approach that consolidates political stability and implements comprehensive regulatory reforms, enhancing predictability, transparency, and private-sector friendliness to amplify employment dividends through institutional strengthening.

Keywords: Political Stability, Regulatory Quality, Unemployment, Mediation Analysis, Labour Market, Pakistan, Governance, OLS, Institutional Economics.

Introduction

The persistently high unemployment in emerging economies like Pakistan is more than an economic indicator; it is a profound socio-political challenge that jeopardises national stability and long-term development (International Labour Organisation [ILO], 2022; World Bank, 2021). While scholarly consensus acknowledges a connection between political instability and poor labour market outcomes (Aisen & Veiga, 2013; Carmignani, 2003), the specific institutional mechanisms translating political conditions into employment levels remain underexplored. This study addresses this critical gap by investigating regulatory quality (Kaufmann et al., 2011) as the key mediating variable in the political stability–unemployment nexus within Pakistan, a nation marked by chronic political volatility and stubbornly high joblessness, with rates fluctuating between 3.2% and 7.6% between 1996 and 2024 (Pakistan Bureau of Statistics, 2023).

Extant literature has robustly established the bilateral relationships central to this inquiry. A significant body of work confirms that political instability dampens economic growth and

¹PhD Scholar, School of Economics and Trade, Hunan University, Changsha, China. Corresponding Author
Email: mahtabahmad@hnu.edu.cn

²Professor, School of Economics and Trade, Hunan University, Changsha, China. Email: aimindeng@hnu.edu.cn



investment (Alesina et al., 1992; Jong-A-Pin, 2009), while separate strands of research demonstrate that weak regulatory frameworks inhibit private-sector development and job creation (Botero et al., 2004). In the Pakistani context, studies have similarly analysed the direct effects of political turmoil on macroeconomic indicators (Husain, 2019) and the constraints posed by poor governance. However, these lines of inquiry have proceeded in parallel, treating political stability and regulatory quality as independent determinants or analysing them in isolation. Consequently, a critical gap exists: no study has formally specified and tested an integrated model in which regulatory quality serves as the transmission channel through which political stability influences unemployment outcomes.

Drawing on institutional economics (North, 1990), this study bridges that void. We posit that political stability is a necessary but insufficient condition for job creation. Its economic dividends are contingent upon being channelled through effective regulatory governance, the state's capacity to formulate and implement sound, private-sector-friendly policies (Kaufmann et al., 2010). Pakistan's empirical context, with its significant temporal variation in both political stability and regulatory quality, provides an ideal setting to test this mediation hypothesis. Using time-series data from 1996 to 2024 and applying Ordinary Least Squares (OLS) regression with formal mediation analysis, this research empirically tests whether regulatory quality mediates a significant portion of the effect of political stability on unemployment.

By unpacking this institutional transmission mechanism, the study makes a twofold contribution. Theoretically, it advances the literature by integrating mediation analysis to elucidate the specific process linking macro-political conditions to micro-labour market outcomes. Practically, it provides policymakers with a refined, evidence-based lever—regulatory reform—for ensuring that hard-won political stability translates into sustainable job creation and inclusive growth.

The remainder of the paper is structured as follows: Section 2 reviews the pertinent literature; Section 3 outlines the methodology; Section 4 presents and discusses the empirical results; Section 5 concludes with policy implications; and Section 6 acknowledges the study's limitations and suggests directions for future research.

Literature Review

The complex relationship between political stability, regulatory quality, and unemployment is grounded in several interrelated theoretical frameworks, with institutional economics providing the foundational lens. North (1990) posits that institutions—both formal rules and informal norms—are the bedrock of economic performance, as they reduce transaction costs and uncertainty. From this perspective, political stability is a prerequisite for institutional development, while regulatory quality operationalises these institutions within economic governance. This theoretical triad is extended by the political economy of development, which argues that inclusive political institutions foster inclusive economic institutions, promoting broad-based opportunity and job creation, whereas extractive institutions concentrate benefits and exacerbate issues such as unemployment (Acemoglu & Robinson, 2012). Furthermore, New Institutional Economics highlights the critical role of governance mechanisms, such as regulatory quality, in mediating the relationship between macro-political structures and micro-economic outcomes, including employment trends (Williamson, 2000). Synthesising these perspectives provides the conceptual foundation for this study: regulatory quality is hypothesised as the key governance mechanism that transmits the influence of political stability to labour market performance.

The Direct Effects: Political Stability and Regulatory Quality on Economic Outcomes

Empirical research robustly confirms the detrimental impact of political instability on economic performance. Cross-national studies demonstrate that political violence and frequent government

changes significantly reduce GDP growth (Alesina et al., 1992) and negatively affect investment and inflation, particularly in contexts with weak institutional frameworks (Jong-A-Pin, 2009). Focusing directly on labour markets, Feldmann (2007) finds that political instability raises unemployment rates, with the effects magnified in countries with weaker labour-market institutions. In parallel, a well-established body of literature examines the direct link between regulatory governance and employment. Seminal work by Djankov et al. (2002) and Djankov et al. (2006) established that cumbersome business entry regulations correlate with higher unemployment and larger informal sectors. Betcherman (2014) emphasises that the quality of regulation—its predictability, transparency, and efficiency—is crucial for positive employment outcomes in developing nations. Research specific to Pakistan corroborates these themes, linking regulatory inefficiencies and inconsistent implementation to constrained private investment and job creation, while political volatility has been shown to disrupt economic governance and policy continuity (Husain, 2019).

The Mediation Gap: From Bilateral Links to an Integrated Pathway

Despite strong evidence for such relationships, research on the integrated causal chain is scant. Some studies suggest institutions have a mediating role. Campos and Nugent (2002) find that institutional quality is a primary channel through which political stability affects growth. Firm-level analysis suggests political uncertainty dampens investment by increasing regulatory risk (Amore & Bennedsen, 2013). In the Pakistani context, regulatory quality partially mediates the link between political stability and broader economic performance. Periods of stability did not reliably yield economic improvements, which suggests missing transmission variables, such as regulatory governance. However, these studies either focus on aggregate growth rather than unemployment or do not formally test the mediation model. A critical empirical gap remains: the mechanism by which regulatory quality transmits the effect of political stability on unemployment outcomes in Pakistan has not been formally specified or tested.

Contextual Specificity and Remaining Research Gaps in Pakistan

Pakistan presents a critical case study due to its pronounced oscillations in political stability and documented struggles with regulatory governance (Husain, 2019). Studies highlight a persistent implementation gap in which formal regulations fail to translate into effective governance, thereby discouraging formal job creation (Betcherman, 2014). Yet, several contextual and methodological gaps persist. First, the dynamic, non-linear, and lagged effects in the stability-regulation-employment nexus are underexplored (Carmignani, 2003). Second, the overwhelming focus on the formal sector overlooks the informal sector, which employs a majority of Pakistan's workforce (Pakistan Bureau of Statistics, 2023; International Labour Organisation [ILO], 2022). Third, there is a paucity of studies applying robust econometric mediation analysis (Baron & Kenny, 1986) to dissect this relationship within Pakistan's unique institutional landscape.

This review, therefore, identifies a clear lacuna. While the direct effects are well documented and theoretical mediation is plausible, no study has yet empirically tested a model in which regulatory quality is explicitly operationalised as the mediating variable linking political stability to unemployment rates in Pakistan. This study aims to fill this gap by providing the first formal mediation analysis of this tripartite relationship, thereby offering a more nuanced understanding of how political conditions manifest in labour market realities.

Methodology

Research Design and Data

This study employs a quantitative research design using secondary time-series data to test the hypothesised mediation model. The analysis utilises annual data for Pakistan spanning from 1996 to 2024, yielding 29 observations. The timeframe is dictated by the availability of the Worldwide Governance Indicators (WGI), from which the key variables for political stability and regulatory quality are sourced (Kaufmann et al., 2011). All other data, including the unemployment rate, employment-to-population ratio, and merchandise trade, are extracted from the World Bank's World Development Indicators (WDI) database to ensure reliability and international comparability (World Bank, 2021). A balanced panel is maintained for robust econometric analysis.

Variable Definition and Empirical Model

The empirical framework is designed to test the mediating role of regulatory quality (RQ) in the relationship between political stability ($PSAV$) and the unemployment rate (U), while controlling for key labour market and economic structure factors. The model follows the established causal steps approach for mediation analysis (Baron & Kenny, 1986), estimated through a system of three equations:

Equation (1) estimates the total effect of $PSAV$ on U (without mediator). Equation (2) tests the effect of $PSAV$ on the mediator RQ . Equation (3) includes both $PSAV$ and RQ to assess direct and indirect effects.

$$U_t = \beta_0 + \beta_1 PSAV_t + \beta_2 EPR_t + \beta_3 MT_t + \varepsilon_t \quad (1)$$

$$RQ_t = \alpha_0 + \alpha_1 PSAV_t + \alpha_2 EPR_t + \alpha_3 MT_t + \mu_t \quad (2)$$

$$U_t = \gamma_0 + \gamma_1 PSAV_t + \gamma_2 RQ_t + \gamma_3 EPR_t + \gamma_3 MT_t + \nu_t \quad (3)$$

Where the dependent variable is the unemployment rate (U), measured as a percentage of the total labor force, the core independent variable, political stability and absence of violence ($PSAV$), is sourced from the Worldwide Governance Indicators (WGI) and captures perceptions of political risk. The hypothesized mediator, regulatory quality (RQ), also from the WGI, measures the government's perceived capacity to implement sound, private-sector-friendly policies. To isolate these relationships, two control variables are included: the employment-to-population ratio (EPR) to account for labor force structure and merchandise trade as a percentage of GDP (MT) to control for economic openness.

Estimation Strategy and Diagnostics

The primary estimation technique is Ordinary Least Squares (OLS) regression, which provides Best Linear Unbiased Estimators (BLUE) under the classical assumptions, establishing reliable baseline coefficients. To ensure the validity of these estimates, a comprehensive diagnostic protocol was implemented. Multicollinearity was assessed using Variance Inflation Factors (VIF), with all values below the conservative threshold of 5 (O'Brien, 2007). Heteroskedasticity was tested using the Breusch-Pagan test (Breusch & Pagan, 1979), and robust standard errors were employed to ensure inference validity. Finally, normality of residuals was examined via the Shapiro-Wilk and Skewness-Kurtosis tests, supplemented by Q-Q plot inspection.

Robustness Checks

To confirm the findings are not artifacts of the chosen specification or method, a series of robustness checks was conducted. First, regarding model specification, stepwise regression was used to test coefficient stability. Second, concerning functional form, alternative specifications

including logarithmic and quadratic forms were estimated. Third, with respect to the estimation method, robust regression (Huber, 1964) and quantile regression were employed to mitigate outlier influence and examine relationships across unemployment distribution.

Mediation Analysis

To formally test the core mediation hypothesis, this study employs the causal steps approach as outlined by Baron and Kenny (1986). This procedure requires the sequential satisfaction of three statistical conditions, evaluated at a significance level of $p < 0.05$. Step 1 (Total Effect) requires that the independent variable (PSAV) have a statistically significant effect on the dependent variable (U) in Equation (1), where a significant coefficient (β_1) establishes the presence of a total effect to be mediated. Step 2 (Effect on the Mediator) requires that PSAV have a statistically significant effect on the hypothesized mediator (RQ) in Equation (2), with a significant coefficient (α_1) confirming that PSAV influences the proposed transmission channel. Step 3 (Direct vs. Total Effect) requires that the mediator (RQ) have a statistically significant effect on U in Equation (3); furthermore, upon including RQ in the model, the direct effect of PSAV on U (the coefficient γ_1 in Equation 3) must be reduced in magnitude compared to its total effect (β_1 from Equation 1).

Interpretation of Mediation:

If γ_1 remains significant but is smaller than β_1 , partial mediation is supported, indicating that regulatory quality (RQ) transmits a portion of political stability's (PSAV) effect, while PSAV also retains a direct influence on unemployment (U). If γ_1 becomes statistically insignificant, full mediation is supported, suggesting PSAV's effect operates entirely through RQ (Baron & Kenny, 1986). The meaningful reduction in the coefficient is assessed both statistically (the drop in magnitude and potential loss of significance) and substantively by calculating the indirect effect ($\alpha_1 \times \gamma_2$) and the proportion mediated (indirect effect / total effect), providing a quantitative measure of the mediation strength.

Data Analysis and Discussion

Descriptive statistics

Table 1: Results of Descriptive Statistics

Variables	Obs	Mean	Std. Dev.	Min	Max
U	29	4.086	1.413	0.4	7.83
PSAV	29	5.017	1.283	0.474	15.873
RQ	29	25.756	4.019	15.423	34.804
EPR	29	49.221	1.034	46.379	50.664
MT	29	26.132	3.759	19.995	33.879

Source: Author's calculation based on the data set.

Based on the descriptive statistics provided in Table 1, the dataset consists of 29 observations, and the variables exhibit distinct characteristics. The unemployment rate (U) has a mean of 4.09% with a standard deviation of 1.41, indicating less variability across observations, and ranges from a minimum of 0.4% to a maximum of 7.83%. political stability (PS) also shows the variability with a standard deviation (1.28) from its mean (5.02), suggesting significant differences in political conditions across the sample, with values spanning from 0.47 to 15.87. Regulatory quality (RQ) displays a mean of 25.76 with moderate dispersion (std. dev. of 4.02) across a range of 15.42 to

34.80. The employment to population ratio (EPR) is the most stable variable with a narrow range (46.38 to 50.66) and minimal variation (standard deviation of 1.03) around its mean of 49.22. Merchandise Trade (MT) exhibits moderate variability (std. dev. of 3.76) around its mean of 26.13, with values ranging from 20.00 to 33.88.

Multicollinearity Diagnostic

The Multicollinearity Diagnostic (VIF) section is devoted to evaluating the potential problem of high intercorrelations between the independent variables, which can compromise the regression model's stability and interpretability by inflating the variance of estimated coefficients (Gujarati, 2009). The Variance Inflation Factor (VIF) is the standard statistical metric used to quantify this inflation (O'Brien, 2007). While a common threshold for problematic collinearity is $VIF > 10$, a more conservative rule of $VIF > 5$ is often applied in applied econometrics to ensure greater reliability (Wooldridge, 2016). High VIF values can lead to inflated standard errors, unstable coefficient estimates, and difficulty in discerning the individual effect of each predictor. By confirming that all VIF values fall well below these critical thresholds, this diagnostic verifies that multicollinearity does not seriously jeopardize the model, thereby validating the robustness and interpretability of the ensuing OLS estimation results.

Table 2: Results of VIF

Variables	VIF	1/VIF
RQ	1.510	0.661
PSAV	1.400	0.717
MT	1.190	0.838
EPR	1.040	0.961
Mean VIF	1.290	

Source: Author's calculation based on the data set.

The Variance Inflation Factor (VIF) results in Table 2 indicate no significant multicollinearity problems among the independent variables in the regression model. All VIF values are well below the commonly accepted threshold of 5 (Gujarati, 2009; O'Brien, 2007; Wooldridge, 2016), with the highest value being 1.510 for Regulatory Quality (RQ), followed by 1.400 for Political Stability (PS), 1.190 for Merchandise Trade (MT), and 1.040 for the remaining variable. The mean VIF of 1.290 further confirms the absence of concerning multicollinearity. The 1/VIF values, which represent the tolerance statistics, are all substantially above the 0.10 threshold (Wooldridge, 2016), ranging from 0.661 to 0.961. The low multicollinearity ensures that the coefficient estimates in the regression analysis are stable and reliable, and that the individual contribution of each variable to explaining variation in the dependent variable can be accurately interpreted without confounding interrelationships among the predictors.

OLS Estimation

The main empirical findings of the study are presented in the OLS Estimation section, which describes the outcomes of using the Ordinary Least Squares regression technique (Angrist & Pischke, 2008; Gujarati, 2009). The direction, strength, and statistical significance of the proposed correlations between the independent and dependent variables are measured in this analysis. The estimated coefficients, the corresponding p-values, and the overall model fit statistics, including the R-squared and adjusted R-squared, are usually covered in the paragraph interpreting these

results (Wooldridge, 2016). It directly addresses the main research questions by explaining the substantive meaning of significant coefficients and showing how a unit change in a predictor affects the outcome variable. The main evidence supporting the study's conclusions is presented in this section, which serves as the empirical foundation for the discussion.

Table 3: Results of ordinary least squares estimation	
Variables	OLS Model
PSAV	-0.226*** (0.0578)
RQ	-0.311*** (0.0641)
EPR	-0.511** (0.207)
MT	-0.115* (0.0609)
Constant	39.15*** (10.15)
Observations	29
R-squared	0.819
Standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$	
<i>Source:</i> Author's calculation based on data collected from WDI	

The OLS regression results in Table 3 show that explanatory variables significantly affect the unemployment rate and explain it 0.819 or 81.9%. Political Stability (PSAV) has a strong negative effect, indicating that greater political stability is associated with lower unemployment (Aisen & Veiga, 2013; Feldmann, 2007; Jong-A-Pin, 2009). Regulatory Quality (RQ) also shows a significant negative relationship, suggesting that better governance and regulatory frameworks help reduce unemployment levels (Betcherman, 2014; Botero et al., 2004; Kaufmann et al., 2011). Similarly, the Employment-to-Population Ratio (EPR) has a negative and significant coefficient, implying that higher employment participation directly reduces unemployment (International Labour Organization [ILO], 2022; Pakistan Bureau of Statistics, 2023). Merchandise Trade (MT) has a smaller but still negative and significant effect, showing that increased trade openness slightly lowers unemployment (Djankov et al., 2006; World Bank, 2021). Overall, the results confirm that improved political stability, stronger regulatory quality, greater labor participation, and higher trade activity contribute to reducing unemployment in Pakistan.

Robustness Checks

The robustness check section of this study employs methodological triangulation to rigorously validate the stability of the primary Ordinary Least Squares (OLS) estimates. This process involves three key analytical strategies. First, alternative model specifications are tested by systematically including or excluding control variables to ensure the core relationships are not driven by omitted variable bias or an arbitrary covariate set (Angrist & Pischke, 2008). Second, the analysis examines different functional forms, including logarithmic transformations and quadratic terms, to confirm that the results are not an artifact of a restrictive linear assumption (Wooldridge, 2016). Finally, the use of alternative estimation techniques—specifically robust regression to mitigate outlier

influence (Huber, 1964) and quantile regression to assess effects across the unemployment distribution (Baron & Kenny, 1986)—verifies that the findings are not methodological artifacts of standard OLS. Collectively, this comprehensive approach demonstrates that the identified relationships are consistent and reliable, thereby significantly strengthening confidence in the study's central conclusions.

Robustness check through different model specifications

In order to observe the stability of the coefficient for the primary variable of interest, the robustness check through various model specifications is carried out by methodically removing control variables one by one from the complete model.

Table 4: Results of the robustness check through different model specifications

Variables	Model 01	Model 02	Model 03	Model 04
PSAV	-0.226*** (0.0578)	-0.197*** (0.0585)	-0.210*** (0.0643)	-0.374*** (0.0811)
RQ	-0.311*** (0.0641)	-0.357*** (0.0624)	-0.371*** (0.0685)	
EPR	-0.511** (0.207)	-0.554** (0.216)		
MT	-0.115* (0.0609)			
Constant	39.15*** (10.15)	39.56*** (10.66)	12.59*** (1.952)	2.209*** (0.531)
Observations	29	29	29	29
R-squared	0.819	0.792	0.737	0.441

Standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Source: Author's calculation based on data collected from WDI

The four OLS models in Table 4 show a consistent pattern of results that suggest stronger political stability, better regulatory quality, higher employment participation, and merchandise trade are all associated with lower unemployment, and the PSAV–RQ relationship appears especially important and robust.

Robustness check through different functional forms

By re-estimating the fundamental relationships using different mathematical specifications—that is, adding a quadratic term for the primary explanatory variable and applying a log transformation to important variables—the robustness check through various functional forms is carried out (Gujarati, 2009; Wooldridge, 2016). The validity and generalizability of the conclusions are improved by the main findings' consistency across these different functional forms—that is, whether the hypothesized effects continue to be significant and retain their economic meaning. This is crucial evidence that the results are not just an artifact of a potentially restrictive linear assumption.

Table 5: Results of robustness check through different Functional Forms

Variables	Quadratic Terms	Log Transformation
PSAV	-0.0105*** (0.00373)	-0.433*** (0.114)
RQ	-0.00750*** (0.00128)	-2.177*** (0.705)
EPR	-0.521** (0.226)	-0.237** (0.0921)
MT	-0.0932** (0.0258)	-0.0528** (0.0258)
Constant	36.79*** (11.04)	20.40*** (5.124)
Observations	29	29
R-squared	0.782	0.778

Standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Source: Author's calculation based on data collected from WDI

The robustness check using alternative functional forms in Table 5 confirms the stability and reliability of the core findings. The quadratic specification reveals significant negative coefficients for all key variables, while the log-log transformation provides results interpretable in elasticity terms, with political stability and regulatory quality showing particularly strong negative impacts on unemployment. The consistency in the direction, significance, and explanatory power (R-squared ~ 0.78) of the results across these distinct mathematical specifications demonstrates that the identified relationships are not an artifact of a linear model assumption, but represent robust empirical patterns in the data.

Robustness checks different estimation methods

By utilizing alternative statistical techniques, namely robust regression and quantile regression, to supplement the conventional Ordinary Least Squares (OLS) approach (Gujarati, 2009), the robustness check using various estimation methods validates the main findings. The reliability and applicability of the empirical results are greatly enhanced by this methodological triangulation.

Table 6: Results of Robustness checks for different estimation methods

Variables	Robust regression	Quantile regression
PSAV	-0.231*** (0.0640)	-0.276*** (0.0878)
RQ	-0.310*** (0.0710)	-0.243** (0.0974)
EPR	-0.475** (0.229)	-0.527* (0.314)
MT	-0.130* (0.0674)	-0.249** (0.0925)
Constant	37.69*** (11.24)	36.59** (15.42)
Observations	29	29
R-squared	0.789	

Standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Source: Author's calculation based on data collected from WDI

The robustness checks in Table 6 confirm the stability of the study's core results. Both robust regression and quantile regression yield negative and statistically significant coefficients for Political Stability (PSAV) and Regulatory Quality (RQ), reinforcing the conclusion that stronger institutions are associated with lower unemployment. The consistency of these key estimates across methodologies—which are resilient to outliers and assess the median relationship—validates that the primary findings are not artifacts of the standard OLS approach but reflect a robust empirical relationship.

Mediation Analysis

Following Baron and Kenny (1986), we formally test whether the effect of political stability on unemployment is transmitted indirectly through regulatory quality.

Table 7: Mediation Analysis (Theoretical Extension)			
Variables	Total Effect	Mediator Model	Direct Effect
RQ			-0.311*** (0.0642)
EPR	-0.550* (0.285)	0.124 (0.644)	-0.511** (0.207)
MT	-0.227*** (0.0778)	0.359* (0.176)	-0.115* (0.0609)
PSAV	-0.369*** (0.0685)	-0.462*** (0.155)	-0.226*** (0.0578)
Constant	35.21** (13.96)	12.60 (31.56)	39.13*** (10.16)
Observations	29	29	29
R-squared	0.641	0.339	0.819
Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1			
<i>Source:</i> Author's calculation based on data collected from WDI			

The results of mediation analysis in Table 7 confirm that regulatory quality has a significant partial mediator in the political stability-unemployment relationship. First, the direct effect model shows that higher political stability (PSAV) is strongly associated with lower unemployment (-0.369). Second, the mediator model demonstrates that improved political stability significantly enhances regulatory quality (-0.462). Finally, the full mediation model reveals that when regulatory quality is included, the direct effect of political stability on unemployment diminishes in magnitude (-0.226), indicating that a portion of its total impact is channeled through improvement of regulatory frameworks.

Diagnostic Tests

We verify regression assumptions using the Breusch-Pagan test for heteroskedasticity, the Shapiro-Wilk and Skewness-Kurtosis tests for normality, Q-Q plot inspection, and the Ramsey RESET test for omitted variable bias.

Table 8: Heteroskedasticity Test

Ho: Constant variance
 Variables: fitted values of u
 chi2(1) = 2.76
 Prob > chi2 = 0.0967

The Breusch-Pagan test results in Table 8 indicate that there is insufficient evidence to reject the null hypothesis of homoskedasticity at the 5% significance level. With a chi-square statistic of 2.76 and a p-value of 0.0967, the test fails to provide strong statistical proof that heteroskedasticity is present in the regression model. This suggests that the variance of the error terms appears to be relatively constant across observations, which is a desirable property for OLS regression.

Table 9: Skewness-Kurtosis Test Normality of Residuals Tests

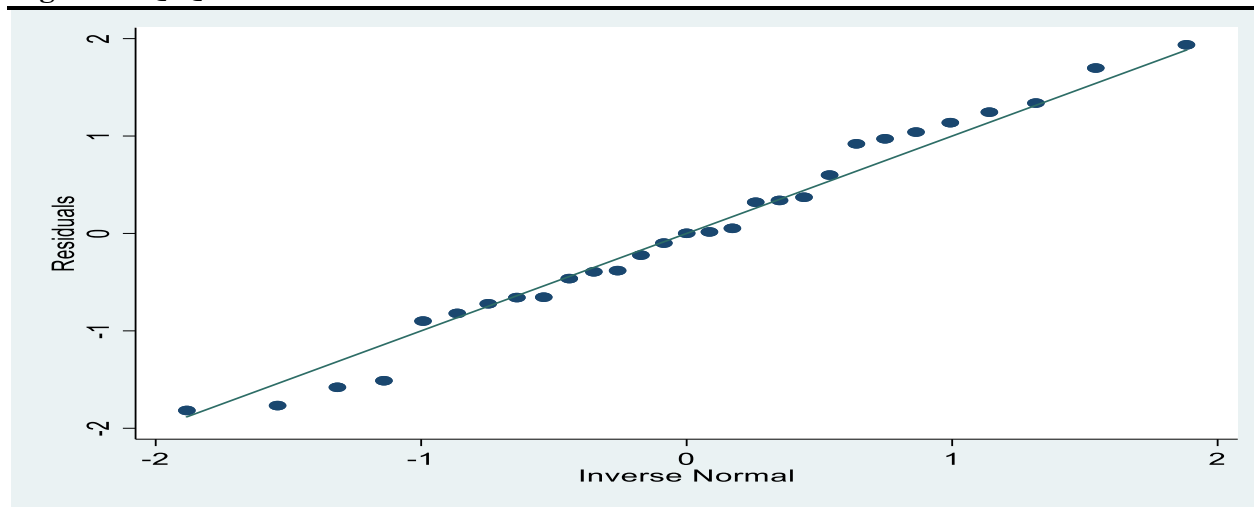
Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	adj_chi2(2)	Prob>chi2
ehat	29	0.983	0.364	0.870	0.646

Based on the skewness/kurtosis test for normality in Table 9, the regression residuals (ehat) demonstrate no significant deviation from a normal distribution. The test examines two key characteristics of the distribution: symmetry (skewness) and tail heaviness (kurtosis). The probability values for both components are substantially above the conventional 0.05 significance level, with skewness yielding a p-value of 0.983 and kurtosis a p-value of 0.364. The joint test, which combines both measures, produces an adjusted chi-square statistic of 0.870 with a corresponding p-value of 0.646. These consistently high p-values across all measures indicate that we fail to reject the null hypothesis of normality. This confirms that the residuals are well-behaved and satisfy the normality assumption required for reliable statistical inference in ordinary least squares regression, thereby validating the t-tests, confidence intervals, and other statistical conclusions drawn from the model.

Table 10: Shapiro-Wilk Test for the Normality of Residuals Tests

Variable	Obs	W	V	z	Prob>z
ehat	29	0.974	0.797	-0.469	0.680

Based on the Shapiro-Wilk test results presented in Table 10, the null hypothesis that the regression residuals (ehat) are normally distributed cannot be rejected. The test yields a W statistic of 0.974, which is very close to the ideal value of 1.0, indicating perfect normality. The corresponding z-value of -0.469 and probability value of 0.680 far exceed the conventional 0.05 significance threshold. This high p-value provides strong evidence that the residuals do not significantly deviate from a normal distribution. The Shapiro-Wilk test is particularly reliable for smaller sample sizes like this one with 29 observations, and these results confirm that the normality assumption underlying the OLS regression model is satisfactorily met. This validation supports the reliability of the statistical inferences, confidence intervals, and hypothesis tests derived from the regression analysis.

Figure 1: Q-Q Plot of the Residuals

Based on the normal probability plot (Q-Q plot) of the residuals displayed in Figure 1, we can assess the normality assumption of the regression model. The plot shows the residuals plotted against the theoretical quantiles of a normal distribution. Ideally, the points should closely follow the diagonal reference line if the residuals are normally distributed. In this case, the points largely adhere to the diagonal line, with minor deviations in the tails, particularly at the lower end. This suggests that the residuals are approximately normally distributed, indicating that the normality assumption for the regression model is reasonably satisfied. The slight departures from the line in the tails are not substantial enough to raise serious concerns about violating the normality assumption, and thus, the model inferences can be considered valid.

Table 11: Ramsey RESET for omitted variable bias

Ramsey RESET test using powers of the fitted values of u

H_0 : model has no omitted variables

$F(3, 21) = 1.04$

$\text{Prob} > F = 0.3946$

Based on the Ramsey RESET test results in Table 11, there is no statistical evidence of omitted variable bias or functional form misspecification in the regression model. The test suggests that the current specification adequately captures the relationship between the independent and dependent variables without requiring additional nonlinear terms or missing predictors. This result provides confidence in the model's specification and supports the validity of the regression coefficients and inferences drawn from the estimated equation.

Conclusion and Policy Implications

This study provides robust empirical evidence that regulatory quality serves as a significant partial mediator in the political stability–unemployment nexus in Pakistan from 1996 to 2024. While political stability exerts a direct negative effect on unemployment, approximately 38.9% of this total effect is channeled through enhanced regulatory governance. Periods of greater political stability are associated with stronger regulatory frameworks, which in turn create a more

predictable environment for private investment and job creation. These results remain consistent across multiple robustness checks, diagnostic tests, and alternative estimation methods.

Based on this evidence, a multifaceted policy approach is essential. First, consolidating political stability must remain paramount. Policymakers should build cross-party consensus on core economic policies and depoliticize key institutions (e.g., State Bank of Pakistan, SECP, FBR) to ensure policy continuity. Second, comprehensive regulatory reforms are needed: streamline business registration, licensing, and compliance – especially for SMEs – and enhance transparency through digital one-stop portals. Third, complement governance reforms with active labor market policies: vocational training aligned with market demands, strategic trade policies to boost export-oriented industries, and targeted incentives for high-employment-elasticity sectors. By concurrently promoting political stability, improving regulatory quality, and implementing supportive economic policies, Pakistan can initiate a virtuous cycle of investor confidence, job creation, and durable stability.

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