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Extending Okun's Law to encompass the governance-unemployment nexus: New Insights from PMG/ARDL Approach

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ABSTRACT

This study has empirically aimed at estimation of the short-and long-term dynamics of financial and institutional factors with respect to unemployment rate in case of the selected developing economies over the period of 1996-2023. The second-generation empirical analysis such as cross-sectional dependence and unit-root analysis support the use of pool mean group regression analysis. The empirical outcomes of pool mean group regression have confirmed the existence of Okun's law in the influence of a rise of control of corruption, government effectiveness, and political stability to reduce unemployment rate in this region. Among the financial factors, economic growth-unemployment rate nexus significantly validates the existence of Okun's law. Further a rise of exchange rate is also highly significant to decrease the unemployment rate in this region. However, the negative impact of interest rate and positive effect of broad money growth are surprisingly significant to affect unemployment rate and contradicted to the literature. Surprisingly, the institutional factors are more responsive to unemployment rate comparing with financial indicators. These outcomes suggest important policy implications regarding institutional and financial factors to control unemployment rate in these economies.

1 Introduction

South Asia, a region with diverse economies, has experienced significant economic growth in sectors like IT services, manufacturing, textiles, and agriculture. However, high unemployment rates persist, with Nepal and Bhutan at the top and bottom, respectively (National Statistics Bureau of Bhutan. Labor Force Survey. 2024). The total unemployment rate in South Asia, according to the International Labor Organization (ILO) estimates, was 4.9% in 2023. The labor force participation rate has been declining, in South Asia over the past two decades, from 55.7% in 2000 to 51.3% in 2019. Projections indicate a further decrease to 53.6% in 2024 and 53.5% in 2025, following a temporary increase to 54.2% in 2023 due to the pandemic's impact. These facts highlight the challenges faced by the region in terms of employment and workforce participation ((ILO) 2024). Over the past few decades, this region has experienced substantial economic expansion. High and fluctuating unemployment rates, however, continue to be a problem, made worse by a number of financial and governance issues.

Financial Indicators and Unemployment Rate

Economic growth and unemployment are crucial macroeconomic variables, with the primary goals of all developed and developing countries to enhance growth and reduce unemployment. In quickly

expanding economies such as India and Bangladesh, substantial employment creation has been observed, in line with Okun's Law, as a result of high economic growth rates. India's Gross Domestic Product (GDP) has experienced significant growth in recent decades, which has led to big decreases in poverty rates and moderate decreases in unemployment rates. In contrast, nations such as Pakistan and Sri Lanka, which experience slower economic growth, have been found to have higher unemployment rates. This demonstrates the inverse correlation emphasized by Okun's Law. The structural makeup of South Asian economies influences the relevance of Okun's Law. Countries with substantial informal sectors, such as India and Bangladesh, may not have a significant Okun's coefficient because the underutilization of labor and informal employment are not correctly reflected in unemployment statistics. Conversely, economies with smaller and more structured systems, such as Bhutan, may exhibit a more evident correlation between the rise of Gross Domestic Product (GDP) and fluctuations in unemployment rates. Thus, the significance of Okun's Law in South Asian economies underscores the crucial function of economic expansion in diminishing unemployment (Hussain , 2024; Tenzin 2019; Ray, S., & Chatterjee 2015). Although the intensity of this link may fluctuate due to variances in structure and issues with data, the overall premise remains applicable. To fully capitalize on this link, policymakers in South Asia should prioritize the maintenance of economic growth, the advancement of employment-generating industries, and the enhancement of education and skills training. Okun's Law, coined by economist Arthur Okun, delineates the empirical correlation between unemployment and economic growth. According to this law, if the unemployment rate increases by 1%, a country's GDP will decrease by approximately an additional 2% compared to its potential GDP. This relationship emphasizes the significance of economic growth in diminishing unemployment and emphasizes the economic production lost due to unemployment (Okun 1963; Ayyubi et al., 2024).

The South Asian economies, which have distinct economic systems and different levels of development, provide an intriguing backdrop to analyze the consequences of Okun's Law. This discussion leads to the question that does Okun’s law exist in the empirical analysis of financial factors of unemployment rate in this region.

Governance indicators and Unemployment Rate

Extending Okun's Law to encompass the governance-unemployment nexus allows us to investigate how governance quality affects unemployment and, as a result, economic production. Governance indicators can have a substantial impact on economic conditions, particularly employment levels (Ibourk & Elaynaoui 2024). The 2009 Worldwide Governance Indicators (WGI) identified governance dimensions, including voice and accountability, political stability, government effectiveness, regulatory quality, rule of law, and corruption control. In this regard, Asia's performance is generally negative while India seems better in this region. However, they are performing poorly compared to the rest of the world (Tran et al., 2023). Thus, for a number of reasons, excellent governance is necessary for both lowering unemployment and promoting sustainable economic growth. First of all, it guarantees that economic policies are thoughtfully formulated, appropriately carried out, and their effectiveness is constantly assessed. It leads to better economic outcomes and the employment opportunities. It also promotes a predictable and steady investment environment. Environments that uphold property rights, enforce contracts, and have low levels of corruption are more likely to attract investors and generate employment. Thirdly, effective administration makes sure that resources are directed to the most productive areas, encouraging industries that create jobs. Fourthly, it enhances the provision of public services that are essential for a productive workforce, including infrastructure, healthcare, and education (“Worldwide Governance Indicators.” 2023).

Political stability diminishes ambiguity in the economy, fostering both domestic and foreign investments. Political instability can cause economic disruptions and a decline in investor confidence, resulting in higher unemployment rates. The principle of the rule of law guarantees that legal systems

are implemented without bias. The legal system safeguards property rights, ensures contract enforcement, and establishes a regulatory framework for corporate operations. The presence of a robust legal system decreases the expenses and uncertainties associated with transactions, so making it easier for businesses to operate and generate employment opportunities. Effective rules facilitate the establishment and growth of businesses, minimize the expenses associated with compliance, and encourage innovation and entrepreneurship, all of which contribute to the generation of employment opportunities. Competent governments have the ability to address economic difficulties with greater efficiency, bolster industries, and establish the essential infrastructure for economic operations. Corruption warps markets and erodes confidence in public institutions. Elevated levels of corruption can discourage investment, misallocate resources, and diminish the quality of public services, all of which have adverse effects on employment. Exerting control over corruption improves economic efficiency and promotes the development of jobs (International 2023; Ibourk & Elaynaoui 2024). This study will primarily investigate the influence of governance characteristics on the unemployment rate in selected emerging nations. The Table 1 below presents the correlation between three important governance indicators and unemployment rates in South Asian nations, as evidenced by the latest data from ("Worldwide Governance Indicators." 2023; (ILO) 2024).

Table 1

World Bank Governance Indicators (2023)

Country	Political Stability	Government Effectiveness	Control of Corruption	Unemployment Rate
India	-0.9	-0.2	-0.5	7.8
Pakistan	-1.5	-0.7	-1.1	6.3
Bangladesh	-0.4	-0.3	-0.8	4.2
Sri Lanka	-1.2	-0.4	-0.9	5.5
Nepal	-0.8	-0.6	-0.9	11.4
Bhutan	0.3	0.1	0.2	3.3
Maldives	-0.1	-0.2	-0.4	6.1

India's somewhat elevated unemployment rate is partially ascribed to moderate governance scores, which indicate difficulties in maintaining political stability, ensuring government effectiveness, and controlling corruption. The high unemployment rate in Pakistan is closely associated with low governance scores, suggesting that political instability and corruption have a substantial influence on the generation of jobs. Although facing some governance concerns, Bangladesh manages to maintain a comparatively low unemployment rate, indicating successful policy initiatives to address governance issues. The unemployment rate in Sri Lanka is affected by substantial governance issues, specifically in the areas of political stability and corruption control. Nepal experiences the greatest rate of unemployment in the area, which aligns with its low governance rankings, indicating the significant influence of governance problems on employment. The low unemployment rate in Bhutan is bolstered by favorable governance scores, underscoring the significance of effective governance in attaining low unemployment. The Maldives' moderate governance scores are seen in its comparatively high unemployment rate, highlighting the need for governance enhancements to address the issue of unemployment. This study also identifies a similar relationship in developed countries. For instance, Scandinavian countries with high political stability scores have unemployment rates below 6%. Germany and Canada exhibit lower unemployment rates, around 5% and 6% respectively, which can be attributed to their higher government effectiveness scores. Similarly, Singapore and New Zealand, with high scores in controlling corruption, have unemployment rates below 4% (OECD 2023). Countries that place a high importance on political stability, rule of law, government performance, and control of corruption are more likely to attain low and stable unemployment rates. Essentially, excellent governance promotes economic growth, attracts investments, and optimally distributes resources, leading to a large reduction in

unemployment rates. It also establishes a strong connection that informs policy interventions in other areas.

2 Literature Review

The following literature will justify the need of this study on the existence of Okun's law in the empirical analysis of financial and institutional factors of unemployment rate in case of our selected developing economies. In this regard, (Hussain et al., 2024) found empirical evidence supporting the validity of Okun's Law in South Asian economies. Specifically, they observed a consistent pattern where economic expansion coincided with a decrease in unemployment rates. Empirical research has demonstrated that periods characterized by robust GDP growth in nations such as India and Bangladesh have resulted in substantial employment generation (Nair 2020). (Aslam et al., 2023) provided empirical support for Okun's Law in South Asia, specifically in India and Bangladesh. These studies have shown that there is a positive correlation between economic growth and a decrease in unemployment rates in these countries while Ray and (Ray, S., & Chatterjee 2015) contend that the Okun's coefficient exhibits substantial variation among South Asian countries and during different periods. These studies emphasize the significance of taking into account country-specific factors and structural changes in the economy. Similarly, (Waiba & Bomjan 2023) also confirmed the existence of traditional Okun's law in case of Bhutan. (Karadzic, Backovic, & Streimikis 2021) used the Error Correction Model (ECM) and annual data from 2007 to 2019 to examine the short and long-term validity of Okun's Law in the Montenegrin economy. It has been determined that for every 1% rise in economic growth in Montenegro, the unemployment rate will fall by 0.27% in the short-term and 1.46 percent in the long-run. With these findings, it was concluded that the lowest Okun value was valid in Montenegro. Various past studies were conducted to estimate the impact of the governance factors on unemployment rate without specifying the existence of Okun's law in this nexus (Ronaghi and Scorsone 2024; Fagbemi, Fajingbesi, & Osinubi 2023; Oueghlissi & Derbali 2024) except (Ibourk & Elaynaoui 2024).

However, this study has firstly contributed to the existing literature by extending Okun's Law to estimate the governance-unemployment nexus controlling other financial factors i.e. interest rate, exchange rate and broad money in the selected developing countries. Secondly, this study has encompassed the both key financial and governance factors to overcome the higher rate of unemployment in this region. Thirdly, this study has used second generation empirical analysis on panel-data for cross-sectional dependence, unit root problem and estimation.

Further, this study contains the following sections. Section 2 deals with data and method while sections 3 and 4 are about results and discussion, respectively. Sections 5 and 6 represent conclusion and suggestions, respectively.

3(a) Data and Method

Firstly, this study has separately estimated the impact of financial and institutional factors on unemployment rate in case of south Asian countries in the two following specifications, respectively following (Farooq et al., 2024; Tran et al., 2023).

$$Un_{it} = \beta_0 + \beta_2 er_{it} + \beta_3 gdpg_{it} + \beta_5 irate_{it} + \beta_8 lnbrm_{it} + \varepsilon_{it} \quad (1)$$

$$Un_{it} = \beta_0 + \beta_1 curr_{it} + \beta_4 ge_{it} + \beta_6 ps_{it} + \beta_7 rl_{it} + \varepsilon_{it} \quad (2)$$

Secondly, this study has merged the both financial and institutional factors and estimated their effect on unemployment rate in the following equation.

$$Un_{it} = \beta_0 + \beta_1 curr_{it} + \beta_2 er_{it} + \beta_3 gdpg_{it} + \beta_4 ge_{it} + \beta_5 irate_{it} + \beta_6 ps_{it} + \beta_7 rl_{it} + \beta_8 lnbrm_{it} + \varepsilon_{it} \quad (3)$$

The detail description of the governance indicators and financial indicators is given the following Table 2.

Table 2

Description of Variables and Data Source

Variables	Description	Data Source	Status
UN	Unemployment rate	WDI	Dependent Variable
Curr	Control of corruption	WGI	
er	Exchange rate	WDI	Independent Variables
GDPg	GDP growth	WDI	
ge	Government effectiveness	WGI	
Irate	Interest rate	WDI	
PS	Political stability	WGI	
RL	Rule of law	WGI	
Ln brm	Log of broad money	WDI	
Control of Corruption		Control of Corruption reflects perceptions of the degree to which public power is used for private benefit, including both petty and grand corruption, and "capture" of the state by elites and private interests. Estimate is the country's value on the aggregate indicator, in units of a standard normal distribution, i.e. between roughly -2.5 and 2.5.	
• **Government Effectiveness**		Government Effectiveness reflects people's perceptions of the quality of public services, of the quality and independence of the civil service, of the quality of policy-making and implementation, and of the credibility of the government's policy commitment. Estimate is the country's score on the composite indicator, in units of a standard normal distribution, i.e. around -2.5 to 2.5.	
• **Political Stability and lack of violence**		Absence of Terrorism/Violence and Political Stability measures the probability of political-oriented violence and/or political instability, including terrorism.	
• **Rule of law**		Rule of Law measures the chances about whether agents trust and respect the rules of society, and specifically the enforceability of contracts, protection of property rights, the police, and the judiciary, as well as the odds of crime and violence. Estimate provides the country's score on the aggregate indicator, in units of a standard normal distribution, i.e. from roughly -2.5 up to 2.5.	

3(b) Estimation Methodology

3.1 Tests for Cross Sectional Dependency

The empirical analysis of this research has been started with cross-sectional independence test statistics. Cross-sectional dependence i.e. correlation between cross-sectional units, like countries, or firms, individuals arising from common shocks or spill over effects, is crucial in panel data analysis because it can more likely to influence the consistency and efficiency of the coefficients as well as the

power of inference. The presence of cross-sectional dependence has mostly resulted in biased and inefficient estimators, misleading inference, spurious regression results, dynamic panel biased. Pesaran, Fried man, and Frees cross sectional dependence tests are employed to detect this problem (Pesaran 2021).

Further, second-generation unit-root tests are used due to inability of first-generation unit root tests to represent cross-sectional dependence. Two distinguished second-generation unit root tests i.e. the Maddala and Wu (1999) test and the Pesaran (2007) Cross-Sectionally Augmented Im-Pesaran-Shin (CIPS) test are used for the process of short and long term analysis (Maddala & Wu 1999; Pesaran 2007). Stata package 14 has been used to see the existence of cross sectional dependence and second-generation unit root test statistics.

3.2 The Pooled Mean Group (PMG) estimator

This statistical tool firstly developed by (Pesaran, Shin, & Smith 1999) to report the issues arising from panels comprising of both time-series and cross-sectional dimensions. It is particularly beneficial in settings where long-run nexus among the variables of interest are supposed to be homogeneous through cross-sectional entities while short-term dynamics and error-variances are permissible to be heterogeneous. For dynamic panel models where lagged dependent variables included as regressors, the PMG estimator is appropriate. It is therefore especially helpful when investigating long-term relationships. An Error Correction Model framework, which captures both the long-term relationship and the short-term adjustment towards this equilibrium, is frequently used by the PMG estimator. It is consistent and efficient because of the above described characteristics. In addition, compared to solely pooled estimators, it is a more reliable estimator. This is especially helpful for studies on macroeconomic and financial issues, where these kinds of dynamics are common (Pesaran, Shin, & Smith 1999).

4 Results

This study has empirically investigated the short and long-term impacts of key financial and institutional factors on unemployment rate in the context of south Asian economies.

4.1 Average correlation coefficients & Pesaran (2004) CD test

Table 3

Findings of Average Correlation Coefficients

Variable	CD-test	p-value	Correlation	Abs(corr)
ps	5.00	0.000	0.223	0.332
curr	1.66	0.097	0.074	0.264
rl	1.71	0.088	0.076	0.443
ge	2.51	0.012	0.112	0.323
gdpg	6.93	0.000	0.381	0.393
irate	1.74	0.082	0.100	0.426
er	15.97	0.000	0.895	0.895
lnbrm	2.27	0.023	0.131	0.219
e	1.74	0.081	0.108	0.372

The significant estimated Pr values in the above reported cross-sectional dependence tests statistics show cross-sectional dependence among the given panel of interest. Further, average correlation coefficient and Pesaran (2004) test statistics also confirms the existence of cross-sectional dependence among the panel for all variables as reported in Table 2 and 3. The presence of cross-sectional dependence mostly gives us biased and inefficient estimators, misleading inference, spurious regression results, dynamic panel biased. It leads to the use of second generation unit root test statistics because 1st generation unit root tests are unable to represent cross-sectional dependence.

4.2 Friedman's Test of Cross Sectional Independence = 15.033, Pr = 0.0102

Table 4

Friedman's Test

4.3 Frees' test of cross sectional independence = 0.107
Critical values from Frees' Q distribution
alpha = 0.10 : 0.1612
alpha = 0.05 : 0.2116
alpha = 0.01 : 0.3125

4.4 First and Second Generation Panel Unit Root Tests

(A) Maddala and Wu (1999) Panel Unit Root test (MW)

Table 5

Panel Unit Root Test (A)

		Specification without trend		**Specification with trend**	
Variables	**lags**	**Chi-square**	**P-Value**	**Chi-square**	**P-Value**
gdpg	0	95.715	0.000	79.798	0.000
gdpg	1	55.217	0.000	42.166	0.000
ir	0	12.673	0.393	9.683	0.644
ir	1	24.213	0.019	24.166	0.019
er	0	1.048	1.000	3.729	0.988
er	1	1.319	1.000	10.415	0.580
bmg	0	131.895	0.000	126.772	0.000
bmg	1	52.397	0.000	55.200	0.000
ps	0	13.873	0.309	14.056	0.297
ps	1	15.405	0.220	19.203	0.084
curr	0	20.872	0.052	18.980	0.089
curr	1	20.324	0.061	18.973	0.089
rl	0	8.442	0.750	19.361	0.080
rl	1	7.702	0.808	27.447	0.007
ge	0	23.619	0.023	18.917	0.091
ge	1	26.785	0.008	21.946	0.038
un	0	8.626	0.734	7.330	0.835
un	1	8.294	0.762	6.245	0.903

(B) Pesaran (2007) Panel Unit Root test (CIPS)

Table 6

Panel Unit Root Test (B)

		Specification without trend		**Specification without trend**	
Variable	**lags**	**Zt-bar**	**p-value**	**Zt-bar**	**p-value**
gdpg	0	-4.258	0.000	-3.334	0.000
gdpg	1	-0.887	0.187	-0.801	0.211
ir	0	-0.787	0.216	0.214	0.585
ir	1	-2.558	0.005	-1.509	0.066
er	0	0.398	0.655	1.449	0.926
er	1	-0.347	0.364	0.082	0.533
bmg	0	-4.184	0.000	-2.677	0.004

bmg	1	-1.785	0.037	-0.203	0.420
ps	0	-0.176	0.430	0.583	0.720
ps	1	-1.758	0.039	0.001	0.500
curr	0	-2.094	0.018	-0.915	0.180
curr	1	-2.463	0.007	-2.413	0.008
rl	0	0.566	0.714	-0.544	0.293
rl	1	0.813	0.792	-0.574	0.283
ge	0	-0.601	0.274	1.373	0.915
ge	1	-1.110	0.134	1.542	0.938
un	0	0.627	0.735	1.024	0.847
un	1	1.085	0.861	0.247	0.597

The empirical results of second generation unit root statistics reported in table 4.4 disclose that at least some of the individual series in the given panel have no unit root problem at level or at first difference as described in their p-values. These empirics endorse the use of PMG estimation strategy to find out short and long time dynamics.

4.5 ARDL / PMG Regression Results

Table 7

ARDL/PMG Regression Results

Variable	PMG (1)	PMG (2)	PMG (3)	FE	RE
CURR	-1.22*** (-8.03)	-9.243** (-2.45)		-0.21 (-0.20)	-1.04** (-1.85)
ER	-0.07*** (-38.64)		-0.03 (-1.20)	0.02 *(1.15)	0.00 (0.51)
GDPG	-0.30*** (-24.60)		-0.19*** (-2.60)	-0.02 (-0.63)	-0.02 (-0.62)
GE	-0.96*** (-7.94)	8.173** (2.023)		-1.83** (-2.09)	-2.54*** (-3.33)
IRATE	-0.25*** (-21.58)		-0.46*** (-3.92)	-0.49 ***(-4.56)	-0.43*** (-4.41)
PS	-1.22*** (-21.47)	-0.428 (-0.327)		-1.63*** (-2.98)	0.01 (0.03)
RL	3.32*** (13.94)	0.547* (0.124)		1.47 (1.35)	3.68*** (4.82)
LNBRM	0.59*** (75.47)		0.51*** (4.66)	-0.14 (-0.48)	-0.27***(-2.66)
COINT. EQ.	-0.404*** (-3.17)	-0.033 (-0.713)	-0.22*** (-3.07)		
Wald Test F-statistic	20347.38***	7.133***	42.64***		
Chi-square	162779.0***	28.533***	170.52***	24.55***	

4.6 Kao Residual Co-integration Test

Table 8

Kao Residual Co-integration Test

Series: UNR CURR ER GDPG GE IRATE PS RL LNBRM				
Null Hypothesis: No co-integration				
Newey-West automatic bandwidth selection and Bartlett kernel				
			t-Statistic	Prob.
ADF			-2.072736	0.0191
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(RESID)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
RESID(-1)	-0.336645	0.069555	-4.839991	0.0000
D(RESID(-1))	0.153690	0.093675	1.640679	0.1039

4.7 VIF test Results

Table 9

VIF Test Results

Variable	VIF	1/VIF
curr	7.71	0.129632
ge	5.87	0.17042
rl	5.49	0.182044
ps	4.05	0.247158
ir	1.54	0.647507
er	1.39	0.71696
bmg	1.05	0.953754
gdpg	1.03	0.966779
Mean VIF	3.52	

The PMG regression results of model 1, 2, and 3 are shown in columns 1, 2, and 3 of Table 4.5, respectively. The estimated results of the first model disclose that all institutional factors are highly significant with negative sign except rule of law. The estimate of political stability (1.22) is highly significant with negative sign in model 1 while it is insignificant in the 2nd model. The estimate (-1.22) of control of corruption is also highly significant showing unemployment rate reduction by 1.22 units with 1 unit in control of corruption in these selected developing economies while its magnitude (-9.243***) in model 2 is relatively much greater than 1st PMG regression results. The estimate (-0.96) of government effectiveness is also highly significant showing 0.96 unit decrease in unemployment rate with 1 unit increase in government effectiveness in these selected developing economies. This estimate is also highly significant in model 2, but surprisingly positive against the literature. The significant and positive estimate (3.31) of rule of law indicates that 1 unit increase in rule of law helps to increase unemployment rate by 3.31 units. This outcome is quite unexpected. The similar astonishing outcome is estimated in the 2nd model with P<0.10. The estimated coefficient of GDP growth is -0.30 with a highly significant p-value. The estimate of exchange rate (-0.07***) indicates highly significant impact on unemployment rate. This estimate is relatively much less than other financial estimates. The empirical estimate of interest rate (-0.25) is highly significant at p-value of 0.001. The coefficient of broad money growth (0.59) is highly significant with the surprising positive sign. The similar empirical research outcomes are estimated in the 3rd model with same signs and significant levels except exchange rate has been measured insignificant with negative sign. The empirical estimates of FEM and REM are added in the 4th and 5th columns of the same table. The results of Hausman chi-square test suggest the preference of FEM for panel data analysis. FEM regression results partially give robustness to the PMG regression results.

The highly significant coefficient of error correction term (-0.404***) indicates that about 40% any short term deviation from long-term equilibrium is corrected in each year. In other words, negative sign of error-correction term tells the occurrence of long-term association among the variables of interest given in the model 1. The similar error-correction term estimates are measured in model 2 and 3 with lesser magnitude. Wald-test statistics confirm the existence of long-run dynamics as shown in the F-test statistics. Additionally, Kao Residual Co-integration Test also confirms the existence of long-run nexus among the variables of the interest given in the model. VIF test statistics validates no multicollinearity issue among the independent factors.

5 Discussion

The empirical results of this study show that political stability largely helps to reduce unemployment rate. It implies that a nation with stable political systems tends to draw in more international investment and promotes the growth of domestic companies which results in lower unemployment rate. Secondly, stable political climates frequently produce consistent policies that boost investor

confidence and motivate firms to prepare ahead, which lower the unemployment rate. Thirdly, because of protective labor laws, economies with political stability are more likely to have inflexible labor markets which give a reduction of unemployment rate. Although the purpose of these regulations is to protect workers' rights, they may also deter companies from hiring their staff or making workforce adjustments in response to changing market conditions (Singha & Singh 2022; Shabbir, Kousar, & Zubair Alam 2021). This outcome is also endorsed in the fixed effect regression estimates. This outcome is also aligned with (Shabbir et al., 2019).

Controlling corruption has significantly reduced unemployment rates with the following mechanisms. Firstly, investors become more confident in the economy when corruption is reduced. They are more inclined to fund initiatives that generate jobs. Additionally, anti-corruption measures draw foreign direct investment (FDI), which creates job opportunities across a range of industries. Secondly, resources are distributed more effectively when corruption is reduced. In the end, this creates jobs by enabling companies to spend in skilled people, technology, and expansion. Thirdly, there is an equal playing field when corruption is under control. Fair competition among small and medium-sized Enterprises (SMEs) creates a wider range of employment opportunities. Fourthly, improved education and skill development initiatives may result from anti-corruption initiatives. In knowledge-intensive industries, a skilled labor pool draws in investment and generates job opportunities. This outcome is greatly supported by (Oueghlissi & Derbali 2024). The similar significant estimate is measured in random-effect regression.

Government effectiveness has a negative impact on the unemployment rate by fostering economic growth and employment opportunities through sound economic policies, investments in public services, a supportive regulatory environment, strong social safety nets, and good governance. All of these factors work together to decrease unemployment rate (Khanthachai, 2020). This outcome is in line with (Thai 2024) and (Mendonca, L., Tyson 2019). The impact of rule of law has been noted highly significant to increase unemployment rate. This outcome is quite surprising not supporting to the existing and latest literature. The common literature work encloses that the unemployment rate is negatively impacted by the rule of law because a robust legal system creates a predictable and stable economic environment in which businesses are more likely to invest more and grow, and help to lower the unemployment rate. Similarly, property rights, contracts, and intellectual property protected by the law promote entrepreneurship and draw in both domestic and foreign investment. By this channel, productive activities increase employment chances and help to reduce unemployment level. Further, when labor rules are efficient and transparent, firms can fire and hire workers based on merit, giving a rise of more dynamic labor marketplace. A strong legal system deters non-formal employment and encourages the formal sector where workers enjoy greater job prospects, training, and social safeguards. Thus, formalization lowers unemployment rate and promotes GDP growth in general. In the financial market, trustworthy contract enforcement promotes borrowing and lending, fostering entrepreneurship and creates new jobs (Meyer and Tasci 2012). Our outcome is commonly contradicted to (Hegazy et al., 2024; Daly & Hobijn, 2010). In the empirical outcomes of PMG regression, the existence of Okun's law in the influence of a rise of control of corruption, government effectiveness, and political stability to reduce unemployment rate has been confirmed in this region.

Economic growth has significantly reduced the unemployment rate because it frequently results in higher incomes and purchasing power of customers, which increases demand for products and services and greatly lowers the unemployment rate. In response, businesses boost production and produce more employment opportunities. Another explanation for this link is that GDP growth incentivizes enterprises to invest in new capital, including machinery, technology and equipment. These investments frequently call for more workers to maintain and manage and lead to unemployment reduction. In addition, it promotes innovation and the growth of fresh markets and fields, like biotechnology, renewable energy, and technology. This scenario creates new employment

in these emerging industries (Blanchard & Sheen 2013). The similar supporting outcome has been estimated by (Samir Hegazy, Abd El-Aal, & Abdelsamiea, n.d.) and (Sekwati & Dagume 2023). This outcome is surprisingly contradicted to (Gómez & Irewole 2023).

The exchange rate has significantly reduced unemployment rate because currency depreciation (Increasing nominal exchange rate in developing economies clearly means that more of their currencies are required to purchase one dollar.) in the exchange rate makes a country's exports cheaper for foreign buyers. This boosts demand for domestic goods and services, leading to increased production and job opportunities in export industries (P 2019). Further, it improves the current account balance by increasing exports relative to imports. Elastic demand for exports over time enhances this effect. However, short-term inelastic demand may delay improvements in the current account (House, Proebsting, & Tesar 2020). This conclusion is similar to (Gómez & Irewole 2023).

The negative impact of interest rate on unemployment rate is highly significant, has been noted surprising. The similar outcome has been estimated by (Saptenno et al., 2024). In the literature and theoretical framework, a positive association between interest rate and unemployment rate has been commonly reported because by reducing the federal bank rate, the state bank indirectly cuts other interest rates, boosting up borrowing and spending. This encourages business ventures and results in more jobs being created (Ali, 2020). The central bank can deploy expansionary monetary policy to increase aggregate demand and lower unemployment during times of high unemployment. Similar to (Ali, 2020), when the pandemic caused an economic downturn, the Fed cut rates once more to aid in the revival of the economy (Alemu, 2025). Surprisingly, the positive effect of broad money on unemployment rate has been estimated with a highly significant sign. However, the common literature has reported a negative nexus of broad money growth with unemployment rate using the following channel such as when central banks increase the money supply which stimulates economic activities, potentially resulting in the reduced unemployment rate. Central banks can impact broad money growth via different tools such as reserve requirements and open market operations. Among the financial factors, exchange rate and economic growth-unemployment rate nexus significantly validates the existence of Okun's law. In our empirical outcomes, the estimates of governance factors show more responsiveness to unemployment rate.

6 Conclusion

The high and unstable unemployment rates in South Asian economies are a result of multifaceted factors including governance and financial factors. Addressing their contribution into unemployment rate, a comprehensive empirical analysis has been conducted for the selected developing economies using panel data analysis. The second-generation empirical analysis specially (cross-sectional dependence and unit-root analysis) supports the use of PMG regression analysis. The empirical outcomes of PMG regression have confirmed the existence of Okun's law in the influence of a rise of control of corruption, government effectiveness, and political stability to reduce unemployment rate in this region. Among the financial factors, economic growth-unemployment rate nexus significantly validates the existence of Okun's law. Further a rise of exchange rate is also highly significant to decrease the unemployment rate in this region. However, the negative impact of interest rate and positive effect of broad money growth are surprisingly significant to influence unemployment rate and contradicted to the literature. The discussion on the application of Okun's Law in South Asian economies highlights the need to take into account country-specific factors, structural changes, and the employment quality.

The research outcomes imply policy measures to reduce unemployment rate. In this regard, a stable economic environment and well-established good governance can make significant strides in reducing unemployment and ensuring sustainable economic development in South Asian countries. Measures to ensure political and economic stability to attract foreign and domestic investments can be recommended to reduce higher unemployment rate. The empirical outcomes consistent to Okun's

Law imply to prioritize implementing policies that foster consistent economic expansion in South Asian countries. This encompasses the allocation of resources towards the development of physical structures, the enhancement of conditions that facilitate economic activities, and the improvement of efficiency and output. An example of this is how Bangladesh's emphasis on the garment sector has greatly increased job opportunities. Further, establishing stable political settings through inclusive governance, accountability and transparency to boost investor confidence and economic activity will go a long way towards overcoming the region's growing unemployment rate. To reduce unemployment, strict anti-corruption measures, increased effectiveness of government, and the promotion of ethical standards in both the public and private sectors should be implemented. While economic growth and governance factors remain a vital component of job creation, policymakers must also address underemployment, informal employment, and job quality to ensure inclusive and sustainable development.

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Abbreviations

GDP	Growth Domestic Product
PMG	Pool Mean Group
ILO	International Labor Organization
IT	Information Technology
WGI	Worldwide Governance Indicators
CD	Cross-Sectional Dependency
VIF	Variance Inflating Factor
FEM	Fixed Effect Model
REM	Random Effect Model
FDI	Foreign Direct Investment
SMEs	Small and Medium-Sized Enterprises