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Understanding the Empirical Dynamics of Urbanization and Urban Unemployment in Pakistan

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ABSTRACT

With 226 million people, Pakistan is the 6th largest country in the world and has a 38% urban population. We have noted urban unemployment as a percentage of overall unemployment. In order to account for consumer price index, foreign direct investment, and trade openness in Pakistan, this study examines the empirical association between urbanization and urban unemployment using a time series covering the years 1980–2024. Through promoting resource use, information sharing, and approach to new technical inventions and innovations, trade openness and foreign direct investment have the potential to have a favorable impact on employment possibilities in metropolitan areas. The Augmented Dickey-Fuller (ADF) pre-estimation econometric model selection test, which tests the order of integration, determines the Stationarity of a series. The ADF's findings suggest applying the auto-regressive distributive lag model (ARDL). According to long-term regression with a level coefficient in the first stage of ECM, Pakistani urban unemployment rises significantly because of urbanization. The short-run ECM model provides a largely settled long-term error correction term. The study's conclusions show that the CPI, trade, and FDI are all considerably lower urban unemployment. The government ought to enact laws that would encourage foreign investors to make investments in our nation so that to increase FDI. Policymakers may implement effective plans like encouraging labor-intensive technologies and controlling population expansion to enhance urban development and reduce urban unemployment.

Introduction

Urbanization is the formation and growth of villages and cities as more people migrate to urban regions for residence and employment, as defined by Merriam-Webster. Urbanization has both appealing and worrisome aspects. Urbanization leads to societal issues, including unemployment and destitution due to limited resources, with urban unemployment being a significant concern. For any economy it is important to generate job availability for the growing workforce to achieve economic policy objectives. Reasonable employment opportunities are considered the main factor affecting household income. (Habees & Rumman, 2017). The rise of new job prospects fosters economic growth, lowering the likelihood of economic depression. Unemployment has severe and far-reaching impacts on economies (Maqbool, 2013). Unemployment is leading to a rise in psychological problems in societies, such as frustration, dread, and family conflicts. The government is responsible for creating opportunities and ensuring the eradication of social issues.

Industrialized and non-industrialized countries face the widespread and serious issue of urban unemployment. Unemployment, as defined by the Economic Survey of Pakistan (2014-2015), is the annual calculation of the proportion of the labor force without a job. In 2014, Pakistan had an unemployment rate of 6.0%. Unemployment in developing countries is affected by supply issues (Berhanu, 2005; Getnet, 2003; Okojie, 2003). They stated that supply-side issues encompass demographic factors, including rapid population increase and rural-urban mobility, and that education and training policies adversely affect economic unemployment. Urban unemployment significantly affects macroeconomic issues.

The urban economy's success and expansion rely significantly on the city's capacity to attract a skilled workforce, connect them with suitable jobs, and improve their abilities. Urbanization is the primary postwar demographic phenomenon, with the most significant potential for expansion being the rapid growth of cities in non-industrialized countries (Todaro, 1997). Urban job opportunities attract individuals regardless of socioeconomic challenges and contribute to achieving the Millennium Development Goals (MDGs). However, if these opportunities are not utilized effectively, they can increase squalor, pollution, unemployment, and criminality (GMR, 2013). Urbanization is the migration of individuals from rural to urban regions, leading to an annual rise in urban population (Grant, 2012). Urbanization arises from regional economic growth, especially industrial advancement, or due to rural socioeconomic issues. In rising states, the proportion of urban people rises from 27% to 40%.

Urbanization in emerging nations is occasionally associated with economic progress, but it is often fueled by swift population increase, internal strife, joblessness, and environmental concerns. There is significant unpredictability in urban growth within and between metropolitan areas, with smaller urban centers playing a major role in propelling urbanization. As per Melamed et al. (2011) based on enterprise surveys by the World Bank, the main obstacles hindering African enterprises' growth and higher labor needs include inadequate infrastructure and a poorly skilled workforce. Urban inhabitants present a significant challenge to the government in creating new job opportunities. The increase in urban unemployment poses challenges for economies, particularly for the reemployment of deindustrialized individuals in alternative sectors following job loss. The fact claims that there is need to conduct research on the issue arising with massive flow of labor to the urban centers in county like Pakistan where a large share of economic outputs come from urban markets.

This study tries to make an impactful knowledge on understanding the role of urban population growth in urban unemployment in the long run. Present research extends the understanding about

the trends of joblessness in urban areas of Pakistan, and the potential role of urbanization growth in forming urban unemployment. The rapid increase in the urban population in developing countries has a dominant role in the job market and the urban rural migration is mostly linked to seeking better job opportunities. According to World Bank (2023) the regional inequalities in the developing and emerging economies have fueled the labor migration from agriculture sector to industrial section. Labor market share of agriculture sector has reduced significantly, while the service sector and manufacturing sector have increased their contribution in jobs market share. Since the industry and service sector belongs to the urban areas so the tendency to take part in labor activities a higher proportion of workers are in high competition which raises the pressure on increasing urban unemployment. The significance of this study has multiple aspects, first, Pakistan is said to be an agrarian economy with 60% population belonging, however, the share in the GDP for agriculture sector is only 20%, with 42% employment contribution. The overall unemployment in Pakistan may not provide a true picture of the jobless rate, so the urban unemployment should be considered as key indicator for employment policy. Second, the rise in the population in the metropolitan cities has put pressure on the access to decent work for all, which is a big challenge for the policy makers and academia to provide sustainable solutions to achieve sustainable development goals. Third, the literature has limited sources on the relationship between urban population growth and urban unemployment with special reference to Pakistan, such that this study has a significant role in the extending knowledge in the study area.

Further study is divided into four sections; literature review on the subjective of the study, methodology for empirical analysis is given after the literature review, results including descriptive and regression analysis are presented before the conclusion section.

Literature Review

The literature on Urban scholarship is rich and published in renowned journals. A large set of literature has examined the impact of urbanization on socio-economic and environmental outcomes, and many have investigated the factors behind rapid growth in urban population. In addition, the existing knowledge the current study holds reasonable place in under the urban unemployment trends with increased urban population in Pakistan by controlling the factors like trade openness, consumer prices, and foreign direct investments.

Only the Harris-Todaro model and Lewis's two-sector development model address urban unemployment in literature. The Lewis model needs to be revised to illuminate migration-induced unemployment and under-employment. Michael Todaro developed a model in 1969 to explain rural-to-urban migration, predicting a rise in urban unemployment as people sought better job prospects. Todaro and John Harris developed the Harris-Todaro model to study the impact of funding on cities' labor services on wages and unemployment rates.

Several theoretical frameworks have been created to elucidate global migration patterns. Nevertheless, they all have a shared basis in the push-pull hypothesis. Neoclassical economic theory suggests a connection between international migration and the worldwide labor supply and demand (Abreu, 2012). Nations with a labor shortage and an increase in demand are expected to provide increased wages, attracting immigrants from nations with excess labor. Furthermore, according to Piore's (1979) segmented labor market theory, industrialized nations' economies are structured in a way that requires immigration at a specific level. The idea reveals that industrialized multi-level economic structure with a stable, well-paid primary labor market and a secondary market offering low-wage jobs. According to the segmented labor market idea, immigrants hold essential roles in the economy's effective operation. According to Sassen's world systems theory 1988, international migration results from global capitalism. Current global

migration trends typically involve movement from less developed to more developed countries due to the impact of industrial advancement in wealthier nations on the economic structure of less affluent nations.

In case of Pakistan Arif (2005) gathered data from economic survey 2001 and using Census, revealing that almost 40.01% of migrants are moving from rural to urban areas, with the majority of males (60%) stating economic motives for their migration. Conversely, family-related matters like marriage are usually the focus for females. Urban migrants were younger and had higher education levels than rural migrants.

Thomas Malthus forecasted that global resources would not keep up with population expansion. Food production will need to catch up to population growth, leading to casualties in the competition for nourishment. Inflation often leads to urban unemployment due to the common association between the two, as the Philips curve shows a relation between unemployment and inflation as a tradeoff. The Phillips curve illustrates the negative correlation between unemployment and inflation in an economy. Increased employment in an economy correlates with elevated inflation rates.

Several studies have demonstrated a persistent, causal relationship between inflation and unemployment over an extended period, as evidenced by research conducted by various scholars such as Rogerson (1988), Cooley and Hansen (1989), Shi (1997), Pissarides (1999), Lehmann (2006), Berentsen, Menzio, and Wright (2008), and Menzio and Wright (2008). Shabu (2006) stated that urbanization is important in developing countries as they are in the progressing stages of urbanization, and it plays a crucial role in establishing developed economies. The study elucidates the limited correlation between urbanization and economic progress, highlighting the improved economic conditions in urban areas compared to rural areas. Zenou (2007) contends that government programs aimed at creating jobs in cities are ineffective in reducing urban unemployment. To decrease urban unemployment, one approach is to lower unemployment benefits, while another is to provide subsidies to unemployed workers. The paper suggests that integrating subsidies and programs could successfully decrease urban unemployment after discussing their limits.

This study is the first to explore the relationship between trade openness and unemployment in developing countries, contrasting with research on high-quality OECD countries by Mitra et al. (2009) and Felbermayr et al. (2011). The researchers found a negative association between the level of trade liberalization and the unemployment rate. More open economies are predicted to have a lower average jobless rate in the future. Wright and Milner (1998) analyzed trade liberalization's impact on Mauritius's manual labor market. Non-industrialized occupations had a large surge in the years after the 1983 trade liberalization. Although long-term service increases grew more than those right after trade liberalization, the short-term impact on employment was significant and favourable. Rama (1994) discovered that trade liberalization had a detrimental effect on employment in Uruguay throughout the 1970s and early 1980s.

The studies by Tarr & Matusz (1999) and Revenga & Harrison (1995) offered more proof of non-industrialized countries. Signs of growth in industrial employment have been discovered after trade liberalization periods in Peru, Costa Rica, and Uruguay. Conversely, certain established economies such as Poland, Czechoslovakia, and Romania witnessed a decrease in services throughout the transition phase. Aside from economic openness, these countries were also undergoing substantial other enhancements. Pallis (2006) examined the empirical link between the rate of inflation and unemployment rate European Union member states. The study investigated the assertion that

conventional economic techniques are questionable because of their varied impacts on inflation and unemployment.

Menzio et al. (2008) identified the connection between inflation and unemployment in the US from 1955 to 2005. Examining sophisticated incidence patterns revealed a direct relationship between inflation and unemployment. Germany. Beyer and Farmer (2007) conducted a study examining the relation between unemployment and inflation using data from the United States from 1970 to 1999. An enduring and substantial relationship between inflation and unemployment in the United States has been recognized. In 2007, Wolters and Schreiber published a paper examining the possible long-term relationship between inflation and unemployment in Germany, while Franz did the same in 2005. Both investigations show a negative link between inflation and unemployment in Germany. In 2009, Gillani and colleagues' analysis found a consistent co-integration relationship between crime, unemployment, deprivation, and inflation. The authors clarified that a correlation exists between diminished financial opportunities and higher unemployment rates, leading to a greater probability of persons participating in corrupt behavior.

Ejaz and Ghani (2010) researched the rapid urbanization expansion in developing countries such as Pakistan. Urbanization has increased from 17% in 1951 to 36% in 2010, surpassing the pace in South Asia. This rapid urbanization presents major difficulties related to sovereignty, urban scarcity, and the delivery of public services. Hence, the government necessitates enhanced urban planning, accessible administration of inner cities for inhabitants, reformation of land markets, and improved public service delivery.

Bakare (2011) examines the factors influencing urban unemployment in Nigeria. Time series secondary data examines the correlation between the unemployment rate and several factors, such as labor demand, supply, population, inflation, utilization capacity, gross capital formation (GFCF), and nominal wage rate. The main reasons for Nigeria's high unemployment rate are the rise in small income and faster population growth, which have led to a significant expansion in the labor force on the supply side. The econometric findings suggested that the government should take immediate action to create jobs by focusing on industrial growth and modernizing agriculture.

Gebeyaw (2011) studied the socioeconomic elements contributing to urban unemployment. Data gathered from 1995 to 2005 shows that women and young individuals, especially those with lower than tertiary education, are the most impacted by unemployment and need specific focus. Jiangang et al. (2012) showed through a panel threshold model that urbanization negatively impacts economic development in the presence of a substantial rural-urban income discrepancy but has a positive effect when the income gap is minor. The study suggested that eliminating the salary gap would help improve economic well-being.

Kugelman (2013) studied the origins and consequences of urbanization in Pakistan. The study concluded that there was a rise in the percentage of urban dwellers compared to the country's overall population. Furthermore, urbanization poses substantial economic concerns. Current employment markets cannot meet the growing demand for new jobs due to the issue of creating new occupations as demand increases. Aqil and Seemab's (2014) study show a negative correlation between population and unemployment. Urbanization and urban unemployment are increasing in Pakistan.

The literature review that was done above offers important new information and highlights the significance of looking at the connection between urban unemployment and population increase. Existing studies have a variety of knowledge to extract another study in the similar context with special reference to a developing country from global south. The literature on Pakistan has rich

facts about the role of urbanization on multiple sectors of the economy, including trade, economic growth, inflation, and industrialization. However, the role of urbanization in rising urban unemployment is rarely studied which indicates a gap in existing literature, so the current study is important role in the existing literature to enhance knowledge for the policy makers and academia to achieve full urban employment in the country under consideration.

Methodology

The empirical relationship between urban unemployment and urbanization has been tested with the control variables such as consumer price index for inflation, foreign direct investment for and total trade to percentage of GDP for external sector. The data for all the variables has been extracted from the World Bank data bank of World Development Indicators. The definitions and the proxies used for the analysis are taken from the existing literature. From existing studies a large set of rich literature suggested factors that theoretically influence the rate of unemployment, such as the famous Philips curve; a tradeoff between inflation and unemployment, and the well-known Harris-Todaro model, which addresses urban unemployment.

By following the existing literature, we have developed a model to study how urbanization affects urban unemployment by analyzing empirical literature and theoretical studies. Now, the model's functional form is as follows:

$$UR_t = f(UP_t, FDI_t, CPI_t, TO_t)$$

The particulars of the linear regression model are.

$$UR_t = \beta_0 + \beta_1 UP_t + \beta_2 FDI_t + \beta_3 CPI_t + \beta_4 FTODI_t + \varepsilon_t$$

The description of the variables is given below,

Variable	Description	Data Source
Urban Unemployment (UR)	The ratio of unemployed labor force to total urban labor force	Pakistan Economic Survey
Urban Population (UP)	The percentage of urban Population to total population	World Bank
Trade Openness (TO)	Total trade (exports + Imports) as percentage of GDP	World Bank
Foreign Direct Investment (FDI)	Net inflows of FDI in US dollars (Billion)	World Bank
Consumer Price Index (CPI)	The consumer price index	World Bank

A regression model is eventually created for variables that exhibit substantial correlation. The augmented Dickey-Fuller unit root test assesses the stationarity of a time series. The ADF recommends using an autoregressive distributive lag model.

The study is based on the standard time series analysis for the empirical estimations of the objectives. The data for all the variables are sources from World Bank and Statistical Supplements from Economic Survey of Pakistan (the data is from 1980 to 2024). The variables of interest are; urban unemployment rate as dependent variables and urban share or population as independent variable which is a close proxy for urbanization. The control variables are included in the model

from all the sectors of the economy; Trade openness (TO), Foreign Direct investment (FD), and the Consumer Price Index (CPI).

Variables

Urban unemployment

The main variable of concern is the urban unemployment rate which is defined as the rate of unemployment in urban areas. This form of unemployment is detrimental to the economy on both a personal and a social level. In empirical analysis the UR represents this variable for urban unemployment; $UR = (UP/ULF) \times 100$ is the formula used to calculate it. Urban unemployment rate peaked at 9.92% in 2000 and reached a minimum of 4.51% in 1986. Pakistan Economic Survey provides information on urban unemployment.

Consumer Price Index (CPI, Inflation)

For controlling the role of short run and long Philips curve impact the study used the inflation rate; the changes in CPI, which reveals changes in the average consumer's cost of a basket of products and services, which may be stable or fluctuate at a specified interval, such as annually. CPI is the symbol for the consumer price index. We are utilizing the Lapsers formula, which estimates the growth in the CPI from base year to the present time, the data was collected from world development indicators.

$$P_L = \sum (P_n . q_o.) / \sum (P_o . q_o.)$$

In 2014, the consumer price index reached a high of 141.7, while it reached a low of 10.8 in 1982, according to the data we have compiled. The World development indicator provides data on the consumer price index.

Urban population (Percentage of total Population)

Urban population is the share of population living in the cities proportion to the total population, in many studies this concept is known as urbanization. It is worked out using the world's population figures from the World Bank and urban ratios from the UN's World Urbanization Prospects. The numbers for the urban population come from the World growth indicator. The lowest value for the urban population was 28% in 1982, gradually increasing and the highest was 38% in 2024.

Foreign direct investment (% of GDP)

FDI is the net intake of money to buy a long-term stake in a business that operates in a country other than the investor's own. FDI is calculation as the total equity capital, reinvestment of wages, other long-term investments, and short-term investments, these given in balance of payments table. Foreign direct investment is the amount which normally means to be money that came in from outsider investors in the country and which plays a vital role the GDP growth and rate of employment (Chowdhury and Mavrotas, 2006).

It is the total of neutrality capital, reinvested earnings, and other long-term and short-term capital, as shown in the balance of payments. The sequences show how much money comes in from foreign companies and how much is shared by GDP. World growth indicators, on the other hand, collect information about foreign direct investment. Between 1982 and 2014, the highest FDI was 3.71% in 2007, and the lowest was 0.11% in 1983.

Trade openness (Total Trade % of GDP)

Trade openness is the amount of imports and exports as a share of GDP. You can determine how to open a country's trade using the formula.

TOP= [(Total volume of trade)/GDP] 100.

Data on trade openness from 1982 to 2020 reveals that it peaked in 1990 at 38.91% and declined to 28.1% in 2000. The Pakistan Economic Survey gathers information on trade openness.

Results and Discussion

Descriptive analysis

The study analyzed 45 observations from six measures of Pakistan's time series data from 1980 to 2024. The study examines the mean, minimum, maximum, median, standard deviation, sum, and sum of the squares. The main focus is on urban unemployment (UEMP), which is influenced by the urban population proportion (UP), trade openness (TO), foreign direct investment (FDI), and the consumer price index (CPI). Table 1 contains descriptive data.

Table 1: Descriptive Statistics

	UR	UP	FDI	CPI	TO
Mean	7.634	34.048	1.1359	62.478	33.688
Median	7.950	34.000	0.800	45.900	32.990
Maximum	10.490	40.420	3.700	141.700	38.90
Minimum	4.510	28.000	0.100	9.100	28.129
Std. Dev.	2.036	3.818	0.844	45.881	2.4077
Skewness	-0.164	0.065	1.147	0.404	0.3308
Kurtosis	1.564	1.735	3.928	1.573	2.7197
Jarque-Bera	4.063	3.028	11.485	5.045	0.968
Probability	0.131	0.219	0.0032	0.080	0.616
Sum	343.550	1532.168	51.115	2811.531	1515.977
Sum Sq. Dev.	182.547	641.6335	31.398	92626.83	255.076
Observations	45	45	45	45	45

According to Table 1, 7.63% was the mean unemployment rate (UEMP) for the given time period. 9.92% was the highest UEMP, while the lowest was 4.51%. An average of 34 percent of the population lived in urban areas during the data period. There was a minimum of 28% and a maximum of 40%. It shows that the proportion of people living in cities is rising. With an average of 33.62 percent, Pakistan's trade as a percentage of GDP ranged from 28.13 to 38.91 percent. With a maximum of 3.67 and a minimum of 0.10, the average net FDI as a percentage of GDP was 0.94.

Unit root test results

Researchers have employed numerous methods to evaluate the stationarity of a time series. However, the researchers solely discuss the Dickey-Fuller unit root test, a method that is widely used in scholarly research. The main application of the unit root is to determine whether a series is stationary with a unit root (1) and a random trend or stationary without a unit root (I (0)) and a specific trend. Dickey and Fuller (1979) looked at the data to see if Stationarity was present. Table 2 presents the results of the unit root using ADF, which include Stationarity at first difference, at

first difference with trend, at level, and at level with trend. Further empirical research has been conducted using the findings of the unit root test as the foundation.

Table 2 Unit root test

ADF for unit root results					
Variables	At level		At difference		Decision
	With intercept	Intercept and trend	With intercept	Intercept and trend	
Urban unemployment	-1.25[0] (0.62)	-1.52[0] (0.82)	-4.12[0] (0.00)***	-4.05[0] (0.02)**	I(1)
Urban Population	2.07[0][4] (0.93)	0.45[4] (0.93)	-1.33[5] (0.64)	-4.53[3] (0.00)***	I(1)
CPI	-2.86[0] (0.05)*	-2.94[0] (0.16)	-	-	I(0)
Trade Openness	-2.86[0] (0.05)*	-3.12[0] (0.14)	-	-	I(0)
FDI	-2.71[1] (0.083)*	-5.32[6] (0.00)***	-	-	I(0)

***, **, * indicates significance at 1%, 5% and 10% respectively.

Several studies have been carried out to determine the Stationarity of the data. But the researchers only talk about the augmented Dickey-Fuller (ADF) unit root test, which is a popular technique in academic studies. Finding out if a series is stationary with a unit root (1), random stationary without a unit root (I (0)), and following a particular trend is the primary purpose of the unit root. The data were examined by Dickey and Fuller (1979) to determine whether Stationarity exists.

Autoregressive Distributed Lag (ARDL)

The initial stage of the ARDL approach for co-integration involves verifying the best lag selection for subsequent analysis. For testing the optimal lags for estimating ARDL the study has used the technique of unrestricted Vector Autoregression (VAR) model which is supported with the Akaike Information Criterion (AIC) to determine the appropriate lags for the Autoregressive Distributed Lag (ARDL) model. Table 3 displays the data regarding the optimal method for selecting a lag in the VAR model.

Table 3: lag selection

Endogenous variables: Urban Population FDI, Trade Openness, and Consumer Price Index						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	-34.13	NA	233.45	22.94	22.17	23.022
1	-16.94	29.06	0.12	13.12	13.49*	12.57
2	-13.15	40.41	0.10	12.75	14.27	12.59
3	-95.057	38.09*	0.063*	10.94*	14.60	12.15*

* indicates the number of lags selected by the given criterions

The different criteria from VAR estimation the results reveals that the AIC lag selection criterion indicated that the ARDL model should incorporate three delays. In the second phase of ARDL, co-integration among the variables was examined using the following model for bond testing.

$$\begin{aligned}
 DUEMP_t = & \beta_1 + \beta_{2i} \sum_{i=1}^3 DUEMP_{t-i} + \beta_{3i} \sum_{i=0}^3 DUP_{t-i} + \beta_{4i} \sum_{i=0}^3 DFDI_{t-i} \\
 & + \beta_{5i} \sum_{i=0}^3 CPI_{t-i} + \beta_{6i} \sum_{i=0}^3 DTO_{t-1} + \beta_7 UEMP_{t-1} + \beta_8 UP_{t-1} + \beta_9 FDI_{t-1} \\
 & + \beta_{10} CPI_{t-1} + \beta_{11} TO_{t-1} \varepsilon_t \dots \dots (1)
 \end{aligned}$$

In equation 1, there are two types of coefficients: short run and long run coefficients. The Wald test was applied to the following hypothesis to assess the existence of cointegration.

$$H_0: \beta_7 = \beta_8 = \beta_9 = \beta_{10} = \beta_{11} = 0$$

(No co-integration) the equation reveals that there is no cointegration exist

$$H_1: \beta_7 \neq \beta_8 \neq \beta_9 \neq \beta_{10} \neq \beta_{11} \neq 0$$

(There is Co-integration) the alternative hypothesis reveals that there is long run association.

The findings of the Wald test demonstrate cointegration among the variables by rejecting the null hypothesis H_0 . The F-statistic is 9.93, and the p-value is 0.0039, suggesting statistical significance at a significance threshold of 1%. The F-critical values supplied by Pesaran et al. (2001) are compared to the F-statistics. Table 4 shows the results of the bond test.

Table 4: ARDL: Bond Test

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	9.931519	10%	2.2	3.09
k	4	5%	2.56	3.49
		2.5%	2.88	3.87
		1%	3.29	4.37

The results from Bond test reveals that the F-statistics is significant which reject the non existing of cointegration and the value is greater than the 1% level upper bond value, indicating existence of co-integration among the model's variables.

Long Run and Short Run; Error Correction Model (ECM)

In the ECM we have first long-term projections indicate that urbanization benefits urban unemployment rates, whereas trade openness, foreign direct investment, the consumer price index negatively affect urban unemployment rates. Table 5 illustrates the long-term outcomes.

The long-term data indicate that UB is extremely significant, displaying a positive sign with significance level of 1% and a t-statistic of 4.68. A one percentage point rise in UP results in an average increase of 1.001 in UEMP. An increase of one percentage point in TO will result in a drop of 0.259 in UEMP. If Foreign Direct Investment (FDI) increases by one percentage point, Unemployment (UEMP) will decrease by 0.539 percentage points. Long-term evidence indicates that UP positively and significantly impacts UEMP, while other variables in the model hurt

UEMP. Subsequently, an unconstrained error correction mechanism (UECM) guarantees the accuracy of long-term outcomes.

Table 5: ARDL: Long Run Results

Dependent Variable: UR				
Method: Least Squares				
Included observations: 45				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
UP	1.001334	0.196861	5.086514	0.0000
FDI	-0.539092	0.262347	-2.054880	0.0465
CPI	-0.049624	0.014578	-3.404090	0.0015
TO	-0.259895	0.073480	-3.536932	0.0010
C	-13.99088	6.647009	-2.104838	0.0416
R-squared	0.800758	Mean dependent var		7.634462
Adjusted R-squared	0.780834	S.D. dependent var		2.036859
S.E. of regression	0.953560	Akaike info criterion		2.847210
Sum squared resid	36.37107	Schwarz criterion		3.047951
Log likelihood	-59.06223	Hannan-Quinn criter.		2.922044
F-statistic	40.19017	Durbin-Watson stat		0.664305
Prob(F-statistic)	0.000000			

Next, an error term known as ECM is derived from the long-run regression, followed by doing a unit root test on it. The ADF test findings indicate that the Error Correction Model (ECM) is stationary at the level, so it is included in the short-run estimates with the initial lag. Table 6 displays the immediate results.

The short-run ECM models indicate that ECM (-1) is both significant and negative in the regression, confirming the link's authenticity in long-run forecasts. The short-term impact of repressors is minimal due to the gradual pace of urbanization. Urbanization is a gradual process as people transition from rural areas to urban centers over an extended period, making it impossible to pinpoint a specific peak within only one or two years. Short-term outcomes may vary from long-term outcomes. Researchers focus solely on long-term characteristics and their significance using the ARDL process and the Angle Granger approach. Only the Error Correction Term is utilized in the short term to verify the accuracy of the results. In our model, the short-term lagged Error Correction Model (ECM) term is negatively correlated and has a statistically significant impact. The long-term outcomes can be utilized to inform policy decisions. Other repressor factors, such as FDI and CPI, are crucial and exhibit consistent short- and long-term behavior. The model's diagnostics indicate an R-squared of 0.70, demonstrating the explanatory strength of the independent variables. The F-statistic is 14.98 with an F probability of 0.0009, confirming the model's overall significance and strong fit. Some diagnostic tests recommended by the researcher are partially included. These tests can validate more precise diagnostic tests and assess the model's validity in the short term.

Table 6: ARDL: Error Correction Regression

Dependent Variable: D(UR)

Selected Model: ARDL(2, 2, 3, 0, 3)

Sample: 1980 2024

Included observations: 42

ECM Regression

Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(UR(-1))	-0.356130	0.098655	-3.609848	0.0012
D(UP)	0.101352	0.111211	0.911351	0.3702
D(UP(-1))	-0.599232	0.129494	-4.627504	0.0001
D(FDI)	-1.090892	0.152907	-7.134363	0.0000
D(FDI(-1))	-0.015465	0.151446	-0.102113	0.9194
D(FDI(-2))	-0.288123	0.135782	-2.121961	0.0432
D(TO)	0.014721	0.034276	0.429470	0.6710
D(TO(-1))	-0.143937	0.034319	-4.194116	0.0003
D(TO(-2))	-0.132746	0.031738	-4.182561	0.0003
CointEq(-1)*	-0.100199	0.011923	-8.403817	0.0000
R-squared	0.795156	Mean dependent var		0.111672
Adjusted R-squared	0.737543	S.D. dependent var		0.669083
S.E. of regression	0.342775	Akaike info criterion		0.900771
Sum squared resid	3.759827	Schwarz criterion		1.314502
Log likelihood	-8.916187	Hannan-Quinn criter.		1.052420
Durbin-Watson stat	2.135199			

Diagnostics test

In the second stage analysis of ECM, we have estimated the elasticities and the correction term. To justify the results significance and consistence of the model, we have applied some standard diagnostic tests. The following table presents the findings for testing normality, Heteroskedasticity, serial correlation and regression specification.

Table 7 displays an LM f-statistics value of 0.94 and a probability value 40.76. There is no serial connection in the short-run ECM model. The model does not exhibit Heteroskedasticity, as indicated by the low chance F-statistic of 0.4219, which may be insufficiently significant. The Jarque-Bera test indicates that there are no health issues. The misspecification test is deemed unimportant due to the Ramsey RESET f-statistic of 0.78 and the associated p-value of 0.4464. The results indicated the accuracy of the short-term ECM model.

Table 7: ARDL: Post Estimation Diagnostics

Serial Correlation LM Test (Breusch-Godfrey)			
F-statistics	0.612556	Probability	0.5499
Obs*R ²	1.962040	Prob. Chi-Square	0.3749
Ramsey RESET Test			
t-statistic	1.234887	Probability	0.2279
F-statistic	1.524947	Probability	0.2279
Heteroskedasticity Test ("Breusch-Pagan-Godfrey")			
F-statistics	0.992191	Probability	0.4868
Obs*R ²	14.26752	Prob. Chi-Square	0.4300
Test of Normality (Jarque-Bera)			
Jarque-Bera	0.46	Probability	0.7921

Stability tests for ECM (Short Run Model)

By following the literature, we have used the frequently employed stability test of recursive OLS; CUSUM and CUSUM squared tests for stability of time series model. The results are depicted in the graphs in Figure 1.

Figure 1 ARDL: Stability Test

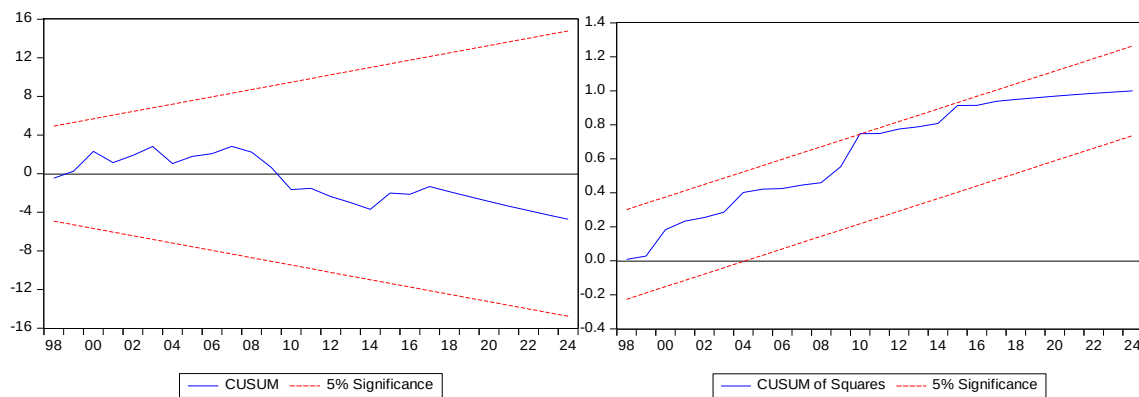


Figure 1 demonstrates that the CUSUM and CUSUM squared lines fall comfortably within the 5% significance level, indicating that the short-run ECM results reveals to be stable for policy implications for the long period. The study's conclusions are consistent with those of other previous studies on the subject. According to recent studies, the rate of unemployment in urban regions is significantly influenced by the growth in urbanization as well as other macroeconomic factors. The study's tested hypothesis was validated by the research findings.

Conclusion

Urbanization can either positively or negatively impact the economic prosperity of any nation. Urbanization in Pakistan is considered a primary factor contributing to the increase in urban unemployment. This paper examines the impact of urbanization on unemployment in Pakistani cities. The study demonstrates that urbanization and unemployment in cities are typically the result of a combination of social and economic variables. The primary challenge of urbanization is unemployment, which needs to be addressed. Urbanization can be analyzed from various perspectives. This study specifically examines the impact of urbanization on unemployment rates in metropolitan areas.

Urbanization exacerbates unemployment in cities, and foreign direct investment compounds this issue, as previously mentioned. Our research indicates a correlation between trade openness and unemployment in cities, where an increase in trade openness leads to higher levels of unemployment. Individuals transitioning from rural areas to urban areas may secure employment at a later time. The salary may fall below their initial expectations if they are fortunate enough to secure employment. Urbanization in Pakistan is rising as rural residents migrate to urban areas. Unemployed individuals living in poor conditions become a burden on society. The study opens a debate for considering the importance increase in the labor force in urban areas while decreasing the share of labor force working in the agriculture sector. The rise in the urban labor force needs more jobs and need more activities to enhance the country's output.

The study's conclusions are crucial for academics and policymakers to comprehend how Pakistan's urban unemployment problem is impacted by the country's growing urban population. The long-term significant coefficient reveals the key insight for the concern to make sustainable solutions for the job opportunities in the urban big centers. The government must implement measures to foster urban development and eradicate unemployment. To reduce the urban unemployment rate, advancing and enhancing trade openness and foreign direct investment is essential. Lawmakers are advised to implement laws that reduce urban unemployment and decrease the rate of urban population increase.

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