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Abstract

The urbanization process of rural population is an increasing phenomenon all over the world. It is estimated that the major world population growth between 2000 and 2030 will be concentrated in urban areas and that too in developing countries (United Nations, 2005). Among developing countries, Pakistan exhibits one of the highest rates of urbanization. In the last few years, urban population growth has increased by 2.81%, ranging from 32.5% of the total population in 1998 to 38.4% in 2017. In Pakistan, increasing economic liberalism, integration into the global economy under China Pakistan Economic Corridor (CPEC) and the policies designed to support rapid economic growth are expected to favor fast urbanization and economic growth, especially in the regions/cities where the CPEC routes/alignments are passing through. Thus, it is expected that CPEC connectivity, infrastructure, and establishment of Special Economic Zones (SEZs) for industrial cooperation will becomes the dominant factors for rural to urban migration and urban development in Pakistan. A quantitative study is conducted to estimate the urbanization dynamics in Pakistan under the CPEC framework with comparison to the past urbanization path. A Vector Error Correction Mechanism (VECM) is applied for two scenarios to find out the causal relationship between CPEC and the urban development in Pakistan. One is pre-CPEC or baseline scenario and the second is after the inception of CPEC interventions. The study finds out that urbanization trend is being significantly influenced by CPEC through the channel of industrialization and unidirectional as well as bidirectional causality prevails. It is concluded that CPEC is disturbing the convergence of long-run equilibrium for urbanization while decreasing error correction term/speed of adjustment by 7% and the period of adjustment expands from 6 years to 13 years, which needs an active urban-policy intervention to ensure sustainable urban development and stabilize long-run equilibrium for urbanization in Pakistan.

Keywords: Urbanization, CPEC, Industrialization, VECM, IRF

JEL Classification: R11, R23, F21, F15, F43, J62

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1. INTRODUCTION

The urbanization and growth in the proportion of urban settlers is an increasing phenomenon all over the globe particularly in the developing world. In 1998, 45.40 percent of global population was urbanized and over the last two decades, change in urban population shows an increasing trend and a rise to 54.73 percent in 2017 (World Development Indicators (CD-ROM- 2017)). Alone in South Asia from 2001 to 2011 the urban population grew by 130 million, which is more than Japan's national population and is expected to reach 250 million by 2030 (WBG, Urbanization Review, South Asia-2015). This increasing trend of urbanization and population agglomeration in urban centres have drastically effected the quality of basic facilities and provision of social services to urban citizen despite their economic dividends. It is one of the fundamental reasons of deficiency of inadequate urban infrastructure, high population density, traffic congestions, and lack of affordable housing, lack social amenities, pollution and slums in the developing countries. Being a developing economy Pakistan is also facing such problems. In Pakistan the percentage share of urban population has grown from 32.5 percent in 1998 to 38.4 percent in 2017 at an annual rate of 0.2 percent (Pakistan Bureau of Statistics, Population Census-2017).

On the other hand, urbanization and cities are considered as the driver of economic growth through the development of backward and forward linkages with the productions-centres and labour market and thus provide the required skilled and unskilled labour force to manufacturing sector. Cities are hub for industrial agglomerations and economic activities such as services supplier and goods consumer. If we consider the developed economies around the global, they are highly urbanized and most of their population live in the cities. This urbanization was augmented during the process of industrialization of their respective economy. During 1950-1990 when OECD economics were passing through the phases of industrialization their urbanization growth rate was 1.5 percent to 2.4 percent. However, this growth has more than doubled as the urban share of the third world population rose from 17 percent in 1950 to 36 percent in 1990 (Anderi and Rogers-1982).

It is expected that in coming years urban growth of Pakistan may rapidly grow up because of development projects under CPEC framework which consists of one plus four portfolio (energy, infrastructure development, Gwadar smart port city development and Industrial cooperation for upgradation of domestic industrial sector). This entire portfolio is expected to act like a pull factor for urbanization which will lead to high population density and additional population burden on

the big cities especially Karachi, Lahore and Faisalabad as well as CPEC node cities particularly Gilgit, Peshawar, Islamabad, Multan, Sukkur, Quetta, Hyderabad, Dera-Islamil-khan and Gwadar. This excessive and rapid urbanization creates problems of urban infrastructure, affordable housing rent, pollution, slums development and create serious issues for existing and new citizen of the cities.

In the framework of CPEC, industrial cooperation and its sub-component SEZs are the most important factor which may plays the role of game changer for the domestic economic uplift and urban development across Pakistan. This is because the industrialization has a positive and significant impact on urbanization. With the rise in industrial production in an economy, a significant impact on the job market occurs. Job opportunities are created which result in people migration to cities and consequently the urban population grow (Gollin et al. 2013). These SEZs are planned in all over the country which includes, Gilgit Baltistan (GB), Federal Administrative Tribal Area (FATA), Azad Jammu and Kashmir (AJK), Khyber Pakhtunkhwa (KPK), Balochistan, Sindh and Punjab (for detail see appendix-A).

Pakistan is an agro-based country and its 38.4 percent population live in urban areas which shows a massive potential for urbanization during the sectoral shift from agrarian economy to industrial base economy. Whereas, in 2025 projected population of urban areas will be 50 percent (UN Report-2016). Due to this expected fast change in urban population, in future, our labour force will also shift from agricultural sector to non-agricultural sector which may increase unemployment. However, under this situation CPEC may provide a relief to economy to some extent for the unemployment problem. The change in urbanization trend has two main causes: the first one is rural-urban migration and the second one is population growth in the prevailing urban centres. Although, the increasing birth rates is the ultimate source and an important feature in under developed city growth, rural-urban migration plays an even more important role in the developing world than it does in the developed countries. Therefore, such migration has been the matter of concentrated study by economists, demographers, and others. The empirical literature suggests that rural to urban migration for the sake of better living standard is economically rational in third-word counties.

Apart from industrial agglomeration the literature also suggests some other determinants of urbanization like per capita GDP, education and health services, climate change, law and order.

However out of these factors industrialization is considered as the key determinant of urbanization. It is the industrial sector of an economy which provide maximum job opportunities and the people move from rural areas to urban areas for the sake of better employment and for a better standard of living and sustainable settlement. It is further accelerated by the accumulation of foreign direct investment (FDI) in the domestic industrial sector (Ming and Jung 2015) which bring variations in the skill-set and attract new labour-force and man-power to the industrial areas.

The faster impact of environment due to urbanization has become the challenge for governments and policy makers for the provision of pure drinking water, sanitation system and control pollution and waste. According to the UN report 2016 the half of the population of Pakistan in 2025 will be urbanized. Therefore, it is important to determine the pull and push factor of urbanization and take corrective action to save our cities from high population pressure and come up with planned urbanization strategy for sustainable development of the cities with assurance of social services for urban commuters. Hence, in this study we empirically test the impact of CPEC project on the urban development path of Pakistan through the channel of industrialization and foreign direct investment also check its long-term co-integration and persistence. The rest of the paper is arranged, as section 2 consist of past literature their theoretical framework, in section 3 and 4, we discussed the development of model and their respective estimation technique followed by the interpretation of the results. Conclusion and recommendation of the study are given in section 5.

2. REVIEW OF LITERATURE/ THEORETICAL FRAMEWORK

The rapid change in the urbanization trend from last few decades has become the hot issue of research and policy debate. The population of Central Asian republic is increasing rapidly. According to center of economic research report 2012 the population of Central Asian republic increased by 3.6 percent from 1950 to 1990. In 1950 the share of the urban population was 13.4 percent while in 1990 this share of urban population had reached to 45.6 percent. While increasing trend in the population and industrial output and decreasing trend in the mortality rate and birth rate remain on average of 34 percent. The demographic factors indicate that one of the possible rationale behind central Asian republic urbanization is industrialization which plays the role of pull factor for urbanization. Industrial concentration attracts the people of rural areas to migrate which increases the share of urban population. Furthermore, Harris and Todaro (1970) claim that rural to urban migration is associated with real wage rate and this real wage could be the one of

the rural push and urban pull factor of urbanization. There are many other rural push factors. If a country experiences green revolution then due to technology, food productivity increases and labour force release from agricultural sector, and this labour force shift towards modern sectors of production which leads to the migration of rural people to cities (Nunn and Qian 2011 & Motamed et al. 2013). Another rural push factor is rural poverty which comes through land pressure and natural disasters are also one of the rural push factors which in a result people move to cities (Henderson et al. 2013). While, in the urban pull factors the industrial revolution is one of the key factors of fast urbanization. This is because when an industrial revolution starts in country then the urban wage rate increases, which attracts the rural people to migrate in a cities (Cuadrado and Poschke, 2011).

After reviewing the literature, we found that urbanization not only depends on the industrialization and health. But there are some other factors that affect urbanization. (Alig et al. 2004) conducted a study in United States covering the period 1982 to 1997 by using the data from NRI Data set and USDC census bureau (2001) and used OLS and GLS as an estimation technique. They found the positive association between population density and urbanization. Moreover, it was also found that per capita income has a positive and significant impact on urbanization. They argue that urban land is a superior good therefore, increase in per capita income effect the consumer choice and they prefer to live in a developed areas such as urban centres. Similarly, Gyabaah (2003) analyzed that what are the causes behind the urbanization in Africa. He graphically showed how rapidly population of urban areas was increased as compare to rural areas. The study indicated that in 1950 urban population was 14.5% that increased to 34.5% in 1990. UN projected that by 2025 urban population will be 50 percent which will be four times more than 1950 urban population percentage. He explained three causes of urbanization. The first one was rural urban migration. The second one was high birth rate and low mortality rate and the third one was urban bias development strategies which was the driving force behind the migration of rural people.

Bairoch and Goertz (1985) analyzed the urbanization in 19th century in the developed countries by using long term data. They used descriptive analysis of urbanization for developed countries from 1300 to 1980. From 1300 to 1800 urbanization remains smooth but very low around 7 to 10 percent. After 1800 there was a consistent increase in urbanization in 1830 it was 12.3 percent in 1980 it was 66.4 percent. They argued that in nineteenth century urbanization was low and in that

era industrialization and agriculture productivity determined the level of urbanization. Furthermore, Hofmann and Wan (2013) analyzed the determinants of urbanization by using the data of 229 countries for the period of 1950 to 2010 (sources of data were 2011 revision of UN world urbanization prospects UN population prospects (2010 Revision) and World Development Indicator (Revision of 2011 and 2012)). They mainly focused on three important variables GDP growth industrialization and education to provide a picture, how these key variables play their role in determining the urbanization. For this analysis they used OLS and 2SLS as an econometric technique to estimate the model. Their findings indicate that GDP growth has a positive and significant impact on urbanization. They argued that the causality of urbanization run from GDP growth to urbanization rather than vice versa. They also find that education and industrialization have a positive and significant impact on urbanization.

3. DATA AND METHODOLOGY

The core objective of this study is to analyze causality impact of CPEC project on urbanization pattern in Pakistan and their long-term co-integration impact and persistence. The sample used is annual data covering the period from 1971– 2017 taken from the World Development Indicators (WDI-CD, 2017). Urban population as the share of total population is a proxy for urbanization, gross capital formations is the proxy for industrialization, natural-log of GDP per capita measures the economic growth, and secondary school enrollment is the indicator for education, trade volume as the proxy for economic openness and trade liberalization and unemployment rate is taking to capture the urbanization behavior with respect to change in employment. To apprehend the impact for CPEC projects, the FDI in-flows under the CPEC framework, in term of capital formation is incorporated in the model through the proxy of industrialization.

To test the order of integration of the variables, it is obviously important that we first test for this requirement to determine whether the series used in the regression process is a unit root, difference stationary or a trend stationary. The Augmented Dickey-Fuller (ADF) test is used; to test the stationarity of variables. We use the ADF test which is normally employed to test for unit root. Equation- 3.1 is used to check the stationarity of time series the data:

$$\Delta y_t = \beta_1 + \beta_1 t + \alpha y_{t-1} + \gamma \Sigma \Delta y_{t-1} + \varepsilon_t \qquad (3.1)$$

Where ε_t is white nose error term, with a null hypothesis that variable has unit root. The ADF regression test for the existence of unit root of y_t that represents all variables (in the natural logarithmic form) at time t. The test for a unit root is conducted on the coefficient of y_{t-1} in the regression. If the coefficient is significantly different from zero (less than zero) then the hypothesis that y contains a unit root is rejected. The null and alternative hypothesis for the existence of unit root in variable y_t is H0; $\alpha = 0$ versus H1: $\alpha < 0$. Rejection of the null hypothesis denotes stationarity in the series.

To test for cointegration, the Johansen and Juselius (JJ test-1990) multivariate tests was applied. Johansen (1991) demonstrates that the procedure involves the identification of the rank of the m*m matrix Π in the specification given by:

$$\Delta X_t = \delta + \sum_{i=1}^{k-1} \Gamma_i \, \Delta X_{t-i} + \prod X_{t-k} + \varepsilon_t \qquad (3.2)$$

In eq-3.2, X_t is a column vector of the m variables, Γ and $\prod$ represent coefficient matrices, is a difference operator, k denotes the lag length, and δ is a constant. If $\prod$ has zero rank, no stationary linear combination can be identified, means that the variables in X_t are noncointegrated. If the rank is r of $\prod$ is greater than zero, however, there will now exist r possible stationary linear combinations and $\prod$ may be decomposed into two matrices, α and β (each m × r) such that $\prod$ = αβ'. In this representation, β contains the coefficients of the r distinct cointegrating vectors that render β' X_t stationary, even though X_t is itself nonstationary, and α contains the speed-of-adjustment coefficients for the equation.

A standard linear equation is quite commonly used to examine a long-term relationship in two or more variables. However, if the variables of interest are individually non-stationary, a single estimation technique has been shown to have major shortcomings (Hendry, 1996, pp. 287-9). In this regard, when the data is non-stationary, and variables are co-integrated, a vector error correction model (VECM), which allows the short-run and long-run relationship to be modeled simultaneously, is preferred and according to the procedure of the application of VECM. Granger, (1969) pointed out that once the variables are co-integrated for long run relationship with same level of stationarity then the VECM Granger causality is most appropriate. This approach also enables the capture of valuable level information in the data (Hendry, 1996, pp. 287-9). Starting

from a Vector Autoregressive Estimation (VAR) specification, an initial representation is given as;

$$y_t = c + \emptyset_1 y_{t-1} \dots\dots \emptyset_k y_{t-k} + \varepsilon_t \quad (3.3)$$

Where the VAR is vector of I (1) variables, c denotes the deterministic part of the equation and k is the lag length while ε_t is a Gaussian error term. Writing (3.3) as a vector error correction model of order (k-1), this representation can be denoted as:

$$\Delta y_t = c + \sum_{i=1}^{k-1} \Gamma \Delta y_{t-i} + \prod y_{t-k+1} + \varphi z_{t-1} + \varepsilon_t \quad (3.4)$$

$$z_{t-1} = y_{t-1} - c - \Gamma \sum_{i=1}^{k-1} y_{t-1} \quad (3.5)$$

Where the term Δ denotes the first difference operator, Γ is a matrix representing the short-run dynamics (coefficient matrices) and y_t include all variables of the model. Importantly, the matrix Π gives us the co-integration properties of the model, z_{t-1} is the error correction term and φ speed adjustment term. Thus, in the above equation, with the existence of r co-integrating relationships where the matrix Π has a rank r < n, a dynamic representation of Π can be written as the product:

$$\prod = \alpha\beta' \quad (3.6)$$

Given that α and β are n*r matrices where r is the co-integrating rank of the system. Considering the multivariate context of this work and the possible interaction between urbanization, industrialization, per capita GDP growth, education, trade volume and unemployment. Their VAR equations can be defined as;

urb = f (lnind, lnGDP, lnedu, ue, lntv) (3.7)

lnind = h (urb, lnGDP, nedu, ue, lntv) (3.8)

lnGDP = i (urb, lnind, lnedu, ue,lntv) (3.9)

lnedu = g (urb, lnind, lnGDP,ue, lntv) (3.10)

ue = k (urb, lnind, lnGDP, lnedu, lntv) (3.11)

lntv = m (urb, lnind, lnGDP, lnedu, ue) (3.12)

Where in equation 3.7, “urb” stands for Urbanization, “lnind” natural log of industrialization, “lnGDP” represent the growth in per capita GDP, “lnedu” means annual growth rate of secondly school enrollment, “ue” is unemployment rate in the economy while “intv” shows natural log of trade volume, so on so forth to equation 3.12.

4. RESULTS AND DISCUSSIONS

Table 4.1 consists of the descriptive statistics of the data set in which the mean, median max and mini values are given to get detail insight about the data set. However, Table-4.2 reports the empirical results of the ADF tests for unit root. Our findings indicate the stationarity properties of the full sample. The empirical evidence reported in Table-4.2 shows that all variables are found to be non-stationary at level. The variables are found to be stationary at 1st difference i.e. integrated of order one I(1).

Table-4.1: Descriptive Statistics

	Urb	ln Ind	ln CPECInd	ln GDP	ln Edu	Ue	ln tv
Mean	31.84255	9.732419	9.740183	6.631117	15.37894	4.585064	23.58279
Median	31.58200	9.907988	9.907988	6.680391	15.56198	4.648001	23.71632
Maximum	39.22400	10.45103	10.58216	7.072251	16.34900	7.830000	25.06802
Minimum	25.08400	8.755313	8.755313	6.117636	14.19576	1.670000	21.35812
Std. Dev.	4.040668	0.514744	0.526015	0.290167	0.705923	1.765922	1.042968
Skewness	0.149292	-0.577469	-0.494041	-0.292512	-0.226939	-0.102088	-0.332037
Kurtosis	1.988507	2.097172	2.128305	1.906044	1.517434	2.092823	2.319395
Sum	1496.600	457.4237	457.7886	311.6625	722.8102	215.4980	1108.391
Sum Sq. Dev.	751.0419	12.18822	12.72781	3.873060	22.92306	143.4501	50.03797
Observations	47	47	47	47	47	47	47

Table-4.2: Unit Root Analysis

Variables	**ADF test at level**		**ADF test at 1st Difference Results**	
	T-Statistics	**Probability value**	**T-Statistics**	**Probability value**
Urb	0.205192	0.9701	-2.289705***	0.0179
lnInd	-1.431929	0.5586	-6.084376*	0.0000
lnCPECInd	-0.798226	0.8102	-6.016256*	0.0000
lnGDP	-1.250442	0.6444	-5.630328*	0.0000

lnEdu	-1.077297	0.7169	-6.661760*	0.0000
Ue	-1.925761	0.3179	-7.255729*	0.0000
lnTv	-1.801626	0.3752	-7.322035	0.0000
Note: *, ** and *** show significance at 1, 5 and 10 per cent levels respectively.				

Using the optimal lag selected by information criteria tests, Johansen's method of cointegration is estimated. Table- 4.3 presents the summary of Johansen cointegration test (Johansen 1995) by max-eigenvalue and trace methods. Based on 5 percent significance in the results shown in table-4.3, we strongly reject the null hypothesis that there is no cointegration in long run relationship among the subject variables for at most four cointegrating equations. Thus, we accept the alternative hypothesis that there are four cointegrating equations in the multivariate system.

Table-4.3: Johansen Cointegration Test

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	Maximum Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
$R \leq 0$	0.724560	165.4141	95.75366	0.0000
$R \leq 1$	0.610755	107.3919	69.81889	0.0000
$R \leq 2$	0.476151	64.93224	47.85613	0.0006
$R \leq 3$	0.428398	35.83742	29.79707	0.0089
$R \leq 4$	0.207867	10.66837	15.49471	0.2327
Trace test indicates 4 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

Reference to this study objectives, we analyzed the dynamics of urbanization in Pakistan under the CPEC projects. The pre-diagnostic tests recommends the use of VECM as an econometric technique for estimations of our model. Thus, to capture the impact of CPEC project and their causal effect for urbanization and other control variables, we estimated the model in two phases for two different scenarios, one for the baseline scenario or pre-CPEC regime, while for the second scenario, we incorporated CPEC through the channel of industrialization and estimated the model. The economic rationale of such modality is that the key objective of the CPEC framework is the industrial cooperation of Pak-China and Pakistan industrial sector upgradations through different

policy initiatives for instance the establishment of nine SEZs across Pakistan, labour intensive industrial relocation from China and the worth mentioning point is the removal of the key bottlenecks of the economy such as energy shortfall and lack of infrastructure and connectivity. Table-4.4 represent the short-run and long-run outcomes of the VECM estimator and their error correction term (ECT), in which we see the unidirectional as well as bidirectional causality between urbanization and industrialization in Pakistan. The industrial agglomeration and the policy initiative for industrial concentrations leads to higher rural to urban migration because increase in the industrial production would have more the labour demand and the labour force which is previously engaged in the rural agrarian economy would transform to the urban industrial based economy (Hofmann and Wan -2013).

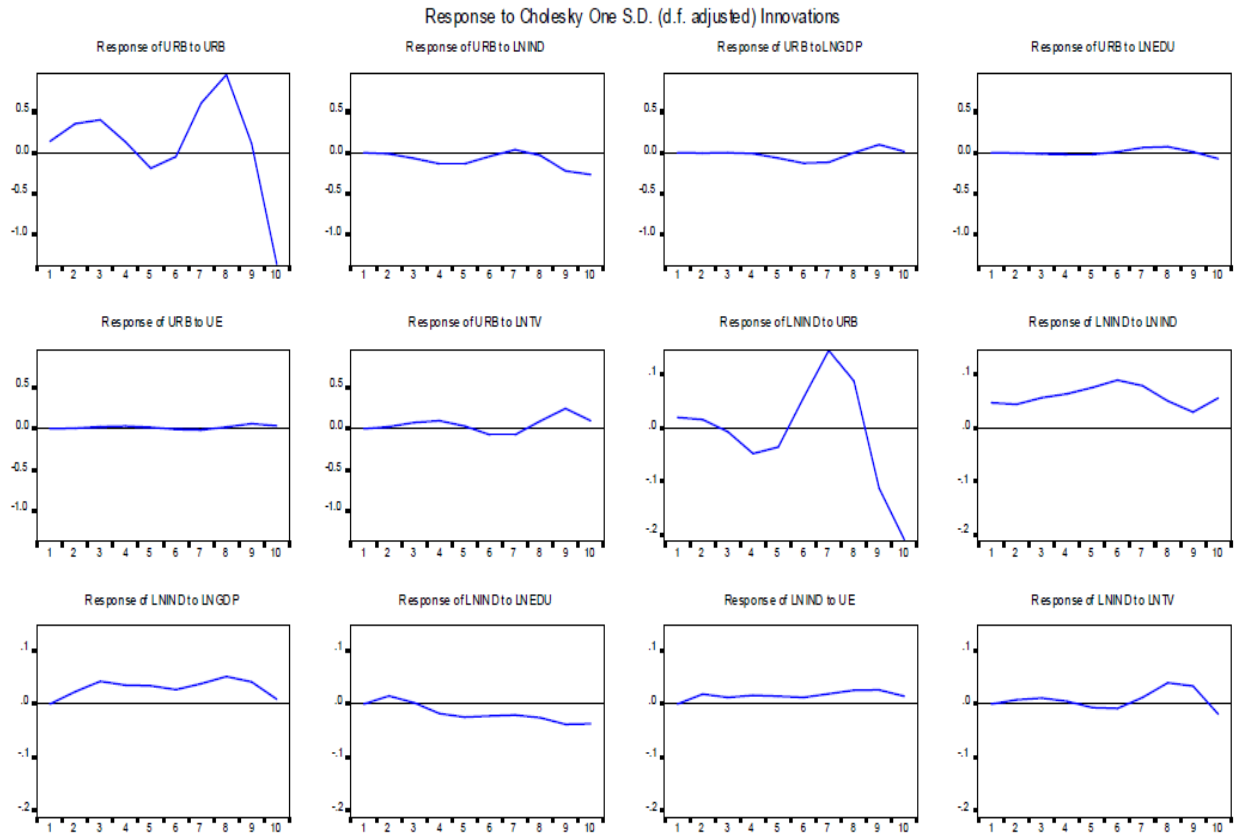
The outcome of first equation states that the coefficient of lagged industrialization term is statically significant at level 5 %, while the coefficients of lagged of economic growth, education, unemployment and change of trade volume are also significantly affecting the industrialization which implies that the urbanization and industrialization do not just have unidirectional casually relationship rather the bidirectional causality also exists with reference the other control variables. Economic openness and trade liberalization have certain dividend for export and import enhancement, which are considered as the fresh oxygen for industrial production and demand accelerator (Ahmed at all 2008). Error correction Term (ECT) for our first equation is (-0.160003) which is statistically significant and shows the convergence period of 6-7 years, that is if any shock occurs in industrial sector, the urbanization will adjust itself within the mentioned period of time to meet the long-run equilibrium and fulfill the opportunities and challenges that arise under such change and shock.

Table-4.4: VECM Analysis (Baseline Sample)

Dependent Variables	Independent Variables (Sources of Causation)							
	Short-run						Long-run	
	Δ urb	Δ lnind	Δ lngdp	Δ lnedu	Δ ue	Δ lntv	Error correction term (ECT)	Δ urb
Δ urb	----	-0.052943* [-0.08565]	-0.026330** [-0.12141]	-0.383652* [-0.26631]	-3.993231* [-0.35603]	-0.199458* [-0.21142]	-0.160003** [-1.08029]	1.000000*
Δ lnind	-0.514217** [-1.17716]	----	-0.036699* [-0.66350]	-0.415492* [-1.13085]	4.815179** [1.28176]	-1.130073** [-3.57620]	-0.005069*** [-0.94807]	17.27298* [2.37010]
Δl ngdp	-0.776827* [-0.51581]	1.868201 [-2.90430]	-----	0.793625* [0.62652]	-15.85578* [-1.35853]	-0.433463* [-0.44152]	-0.000787** [-0.41949]	9.925743** [0.63720]
Δl nedu	-0.094125* [-0.39467]	-0.004169* [-0.04737]	-0.088146** [-2.85461]	-----	-0.191316* [-1.06005]	0.102468 [0.76284]	-0.007048* [-0.56564]	-7.309362* [-3.98206]
Δ ue	-0.001655* [-0.06010]	-0.001240* [-0.12482]	-0.001190* [-0.34144]	-0.008085* [-0.34879]	-----	0.012232 [0.80571]	-0.046763** [-0.48207]	0.541273* [1.97865]
Δ lntv	-0.203508* [1.11251]	0.020741 [0.31417]	0.002790* [0.12047]	-0.028547* [-0.18554]	-0.512533* [-0.42787]	----	-0.047359*** [-0.58040]	-12.69738** [-6.23748]

Note: *, ** and *** show significance at 1, 5 and 10 per cent levels respectively.

Figure-4.1: Impulse Response Functions (Baseline Sample)



Considering the above given Cholesky impulse response function (IRF) for our baseline model in which it is also clearly shown that the response of urbanization to industrialization are stable in converging to the long-run equilibrium. Similarly, the other control variable are also behaved stable and converged in their long-run equilibrium.

Table-4.5 presents the results for control sample (sample with CPEC intervention) VECM. The results indicate that industrialization has a significant positive impact on urbanization in short-run as observed in the baseline sample but insignificant impact in long-run. There ECT value are also very small (-0.095380) which shown that due to CPEC the urban development in Pakistan is not just disturbed and detracted but become unstable and convergence period become more than a decade.

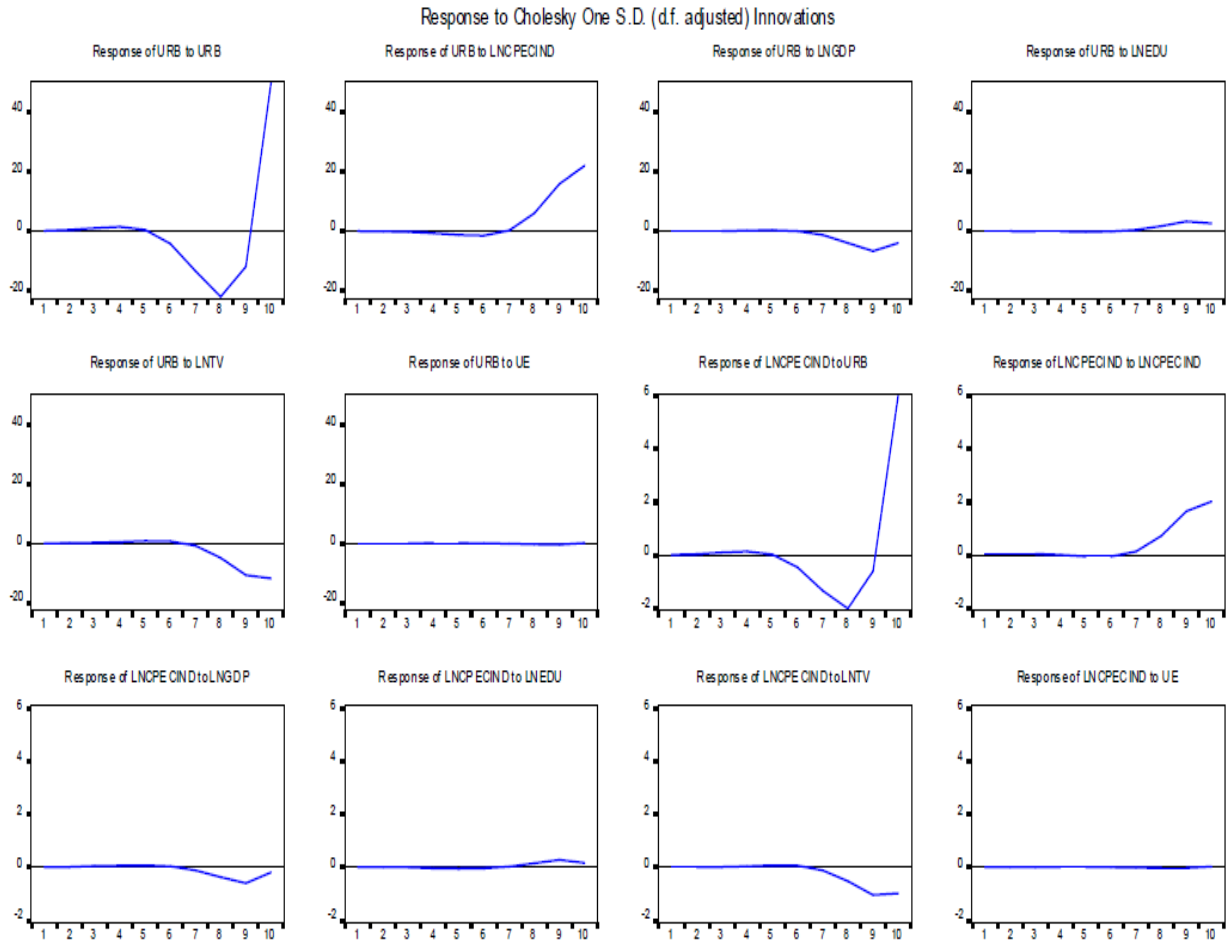
Table-4.5: VECM Analysis (CPEC Sample)

Dependent Variables	Independent Variables (Sources of Causation)							
	Short-run						Long-run	
	Δ urb	Δ lncpecind	Δ lngdp	Δ lnedu	Δ ue	Δ lntv	Error correction term (ECT)	Δ urb
Δ urb	----	-0.108332** [-0.02350]	-0.084241* [-0.32960]	-1.603036** [-0.96897]	0.922625* [0.72364]	0.158326* [0.01201]	-0.095380** [-3.21219]	1.000000***
Δ lncpecind	-0.281817* [-0.74285]	----	-0.038931* [-0.66424]	-0.205032* [-0.54045]	-0.799192* [-2.73349]	3.930750* [1.30016]	-0.017391 [-0.77046]	18.693678* [5.40677]
Δl ngdp	0.008410* [0.00573]	1.870889* [2.70153]	-----	1.713732* [1.16661]	0.901852* [0.79662]	-17.36430* [-1.48329]	-0.006152* [-0.83169]	-11.54256** [-3.20843]
Δl nedu	-0.254143* [-1.19264]	-0.026080 [-0.25961]	-0.089698** [-2.72466]	-----	0.209517 [1.27580]	-1.204079** [-0.70905]	-0.064981* [-1.35714]	-1.744930* [-3.96068]
Δ ue	0.003327* [0.14774]	-0.002905* [-0.27362]	-0.000943* [-0.27093]	0.004668 [0.20728]	-----	-0.140357* [-0.78201]	0.156489* [4.24083]	-3.939645* [-8.03633]
Δ lntv	-0.018693* [-0.11163]	-0.067235** [-0.85172]	-0.001856** [-0.07176]	-0.137375* [-0.82042]	0.329195 [2.55099]	----	-0.208661*** [-0.54685]	0.015210** [0.23408]

Note: *, ** and *** show significance at 1, 5 and 10 per cent levels respectively.

Similarly, IRF for control sample also shows the same interpretation that the response of urbanization to industrialization becomes unstable and divergent to long-run equilibrium that CPEC will further accelerate urbanization through industrialisation. Under CPEC nine industrial zones, Gwadar port city development and establishment of connectivity would fast-track the existing urbanization pattern such as human resource that will be the basic requirement of these industrial zones which will lead to increase in the rural to urban migration along with the development of new port city of Gwadar. According the to master plan for Gwadar port city in 2035 the city population will reach 1.5 million due to high industrial and trade related opportunities in the new emerging city, while the current population is only 0.038 million. That is why CPEC can rightly be called the accelerating factor of urbanization.

Figure-4.2: Impulse Response Functions (CPEC Sample)



Moreover, per capita GDP is also one of the most important determinants of urbanization. Results show that GDP has a positive and significant impact on urbanization. The increase in the level of per capita income directly effects the standard of living. Therefore, as the per capita income increase then people shift from rural to urban areas for better standard of living, high health and education facilities. On the other hand, one can justify these findings as follows. Urban residential areas are considered as superior goods than the rural urban areas. Therefore, as the income level increase people shift from normal goods to superior goods. Thus simply we can say that GDP has a direct effect on the urbanization growth and our results are consistent with the findings of Alig et al. (2004).

Education also has a significant positive impact on urbanization. In our basic needs, education is one of the important needs of human being. Normally, in rural areas education facilities are very rare as compared to urban areas. Although, governments try to provide facilities in rural areas but still it is not of satisfactory level. Therefore, for the sake of better schooling people initially move temporarily from rural to urban areas. Finally, they permanently shift to urban areas, in this way the better education facilities in urban areas as compared to rural areas attract rural people which play a vital role in determining urbanization growth.

Trade volume is also one of the important determinants of urbanization. The upward trend in trade volume indicate that trading activities within the boundaries are growing up which are normally performed in urban areas. These activities create job opportunity in trading center which also plays the role of pull factor for urbanization. Table 4.1 show that unemployment has a negative and significant impact on urbanization because when unemployment rate increases it adversely effect on the rural urban migration. Therefore, unemployment has a negative impact on urbanization. Normally, rural urban migration is based on employment opportunity which playas a significant role in urban growth while, in contrast unemployment has a negative impact on urbanization.

5. CONCLUSIONS

The objective of this study was to analyze the key determinants of urbanization and their long-term behaviour. Furthermore, we also test the impact of mega development project of CPEC on urban growth. For this analysis, we used time series data from WDI and Pakistan Bureau of Statistics for the period of 1971 to 2017 and applied Vector Error Correction model (VECM) as

an econometrics technique. Our results in Table 4.4 indicate that industrialization has a significant and positive impact on urbanization. While, the results of Table 4.5 also indicate that industrialization has a positive significant impact on urbanization but the ECT value of industrialization in table 4.4 is greater than ECT value of industrialization in table 4.5. Because Table 4.5 captures the impact of CPEC which indicate that CPEC will further accelerate the urbanization in Pakistan through industrial cooperation between the two countries in which nine SEZs would be developed, new world class port city of Gwadar development, enhancement of the connectivity infrastructure which is directly effecting the transactions cost of goods and services and overcomes the key bottlenecks of energy for industrial sector, through which the Pakistan industrialist were negatively effect and loss their competitiveness in the global market. All this factor are have positive dividend for urban development in Pakistan. But keep in consideration all other control variables, those have also influences on urbanization. The CPEC project make the urban development path unstable and create room for policy interventions to ensue sustainable urbanizations.

Similarly, to identify the impact of CPEC we draw impulse response function which indicate that urbanization trend is diverging from the long-run stability due to CPEC. The proxy which we used for industrialization is gross capital formation, it attracts the investor to invest in special economic zones. As these special economic zones grow the population in these economic zones would also grow through their radiation effect. The effect can also be observed in the China special economic zones development that to date Shenzhen is the first SEZ of the China to become the world second largest port city with population density around 5963 people per sq-km, with a total population of 11.9 million. Moreover the results also indicate that other control variables education, trade volume, unemployment and per capita GDP has impact on urbanization.

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Appendix

Appendix-A: Special Economic Zones under CPEC

Sr. No	Name of Zone	Location
1	ICT Model Industrial Zone	Islamabad-Federal Government
2	Industrial Park- Port Qasim	Karachi- Federal Government
3	Mohmand Marble City	Federal Administrative Tribal Area (FATA)
4	China Economic Zone/Quaid-e-Azam Apparel Park (QAAP)	M-2-District Sheikhupura-Punjab
5	Rashakai, Economic Zone (REZ)	M-1-Khyber Pakhtunkhwa (KPK)
6	China Special Economic Zone	Dhabeji-Thatta-Sindh
7	Boston Industrial Zone	Boston- Baluchistan
8	Moqpondass Special Economic Zone	Gilgit Baltistan (GB)
9	Bhimber Industrial Zone	Azad-Jammu and Kashmir (AJK)

Sources: Ministry of Planning, Development and Reforms