

Impact of Urbanization on Economic Growth: Four Sector Analysis in Case of Pakistan

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ABSTRACT

The study analyses the impact of urbanization on economic growth of Pakistan from 1975-2012. Conceptual framework of the present theory is based on the theory of Lewis (1954) and Tadaro (1976). Co-integration analysis is used to examine the impact of urbanization on economic growth of four sectors namely agriculture, manufacturing, industrial and services sector of the economy. Results show that urbanization affect economic growth significantly and they have a long run relationship. It was found that urbanization is an important determinant of economic growth but it has negative impact on economic growth in agriculture sector. However, it has positive impact on economic growth in industrial, manufacturing and services sector.

Keywords: *Urbanization, economic growth*

INTRODUCTION

From the start of 19th century the world has been experiencing an increase in urbanization. Process of urbanization is experienced all over the world from agriculture sector to the industrial sector. Therefore, different level of urbanization affects different degree of economic development. The countries that had an industrial revolution in the 19th century have a more proportion of population living in urban areas and are therefore more developed. However, the underdeveloped countries still have the majority of their population depending on agriculture sector (Dixon, 2001).

According to Tadaro (1977) people migrate from rural to urban region because the expected wage rate in urban areas is higher than the current wages in rural areas. Since urbanization indicates rational behavior of individuals in order to maximize their lifetime utility, it occurs only if expected gains are higher than the returns at the origin. Now-a-days urbanization is considered as a rational human capital investment decision, in order to have higher net benefits and better opportunities. People mainly migrate in search of better paid job opportunities and better socio-economic conditions (Arif, 2005). Similarly high wage rate and high returns to education, prevailing in urban areas force people to migrate from rural areas (Funkhouser, 1998). World Bank report (2010) indicates that the total urban population of the world is about 51 percent. In Latin America and Caribbean, 79 percent of total population lives in urban areas (2010), whereas almost 30 percent population lives in urban areas in south Asian countries (World Development Indicators, World Bank (2010)).

It has been observed that rural and urban migration takes place in many developing countries. Due to this migration the proportion of the urban population as a percentage of total population increases and the size of the cities are also expanding. Pakistan has recently become the most urbanized region is South Asia. There is a rapid increase in urban population and growth. Currently, urban areas contribute almost 75 percent of total GDP of Pakistan (Maqbool, 2014). The process of urbanization can be divided into four phases in Pakistan. The first phase started at the time of independence when six million people migrated from India to Pakistan. Majority

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of the migrants settled in urban areas of Pakistan. The second phase started in mid-1950, when government adopted the policy of industrialization. Therefore, people living in rural areas were attracted to urban regions for better job opportunities and good standard of living. The third phase appeared during the war of 1971 when East Pakistan separated from West Pakistan. Many people were forced to leave Bangladesh and they settled in the urban areas of Pakistan. The fourth phase took place during 1980s due to Soviet Invasion in Afghanistan. Many refugees migrated from Afghanistan to Pakistan at that time. The process of urbanization is still continuing in Pakistan.

It is observed that almost 50 percent of rural-urban migration takes place in Punjab. This type of migration is for economic well-being as well as for better social facilities. The second type of pattern that is urban-urban is also observed in Pakistan. Almost half of urban-urban migration occurs in Punjab followed by in Khyber Pakhtunkhwa. This migration is mainly due to infrastructure pull and economic factors. The urban population of Punjab is 32 percent; Sindh is 49.8 percent 17.2 percent in KPK and 25 percent in Baluchistan. Whereas the urban sector population of Islamabad is 66.7 percent (Government of Pakistan 2008 Provincial Census Report, Pakistan Census, and Islamabad). Many studies show that urbanization has positive impact on economic growth (Henderson, 2003; Lewis, 2010; Martin, 1991, 1992; Robert, 1989; Wo et al., 2001; Ying, 2011; etc) whereas Moonaw (1996) and Ades (1995) report negative impact of urbanization on economic growth. Studies of Afzal (2009) and Arif and Hamid (2009) investigated the impact of urbanization on economic growth in case of Pakistan but none of the studies have examined the impact of urbanization on growth of different sectors of Pakistan namely agriculture, industrial, manufacturing and services.

The aim of current study is to analyze the impact of urbanization on economic growth in Pakistan by using the data from Pakistan Economic Survey (1975-2012). The study analyzes two aspects of urbanization and economic growth. The first aspect is to investigate the contribution of urbanization to rapid economic growth. The second aspect analyses the impact of urbanization on different sectors of Pakistan economy. Section 2 presents the situation of urbanization in Pakistan; section 3 provides review of literature. Data and methodology are presented in section 4 and section 5 deals with empirical results and Discussion and last section concludes the study.

Situation of Urbanization in Pakistan

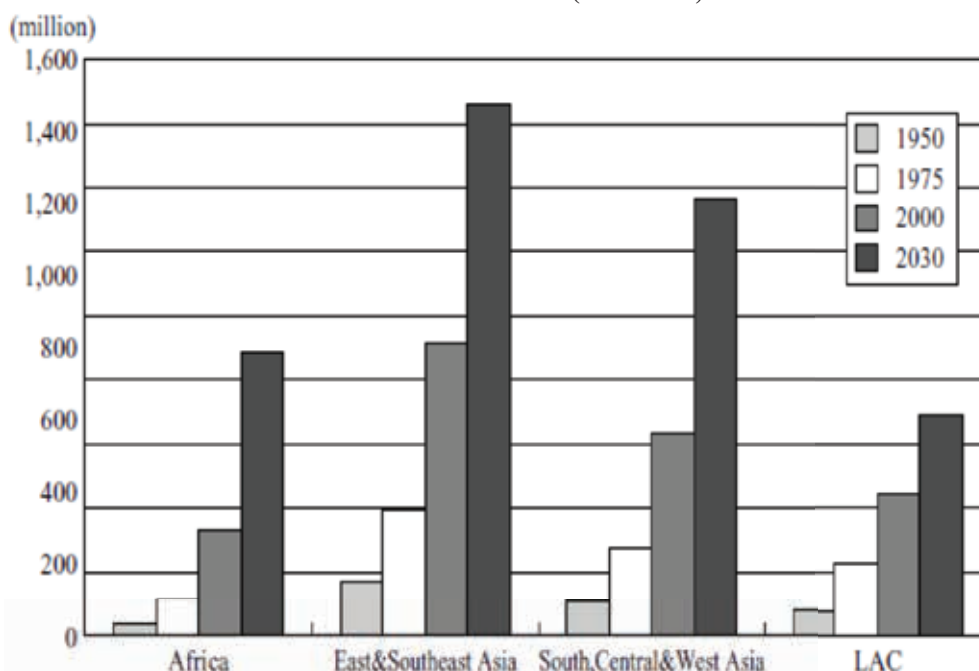
In this section the trends of urbanization at national as well as international level is discussed. Since urbanization and economic growth go side by side, it is not possible to achieve the middle-income status without shifting the population to urban areas. Therefore, urbanization is necessary for development (Annez and Buckley, 2009).

Trends of Urbanization in the World

According to United Nations Habitat Report (2010), half of the world population lives in urban areas. Asia and Africa are relatively less urbanized regions, but are expected to urbanize highly by 2030 because of increasing trend of urbanization in these region. Global trends show that urbanization is an indicator of a high wealth. The more urbanized areas in the world indicate higher per capita income. People in urban areas have higher opportunities to assess better jobs and services. Urbanization has positive impact on technological innovation and economic progress which leads to higher standards of living.

Recent studies like (Cohen, 2004; Hamid, 2010; Robert, 1989; Zhen et al., 2008) show that there is positive relationship between urbanization and economic development in Africa and Asia. Urbanization leads to reduce overall poverty rates. In developed countries like Latin America, urbanization is an indicator of industrialization and modernization. Europe, northern and southern Africa, western Asia and America have achieved 50 percent urban population before 2010(World Urbanization Prospect, 2010). Figure-1 shows the trends of urbanization in Africa, Asia and Latin America (LAC) from 1950 to 2030. The figure shows that the trends of urbanization indicate almost similar pattern in Africa and Asia countries.

Figure-1
Trends of Urbanization (1950-2030)



Source: Urbanization and Development of Infrastructure in the East Asian Region, United Nations (2002).

World population has increased rapidly during the 20th century. Population growth rates are higher in developing countries as compared to that in developed countries. In 1950, about 30 percent of total world population lived in urban areas and 58 percent of which belonged to developed region. The population growth rate is higher in urban areas than in rural areas. Urban population will become 4981 million in 2030. Large amount of investment in infrastructure will be required for the settlement of this urban population. It will also require creation of more job opportunities and construction of more houses (World Bank, 2002).

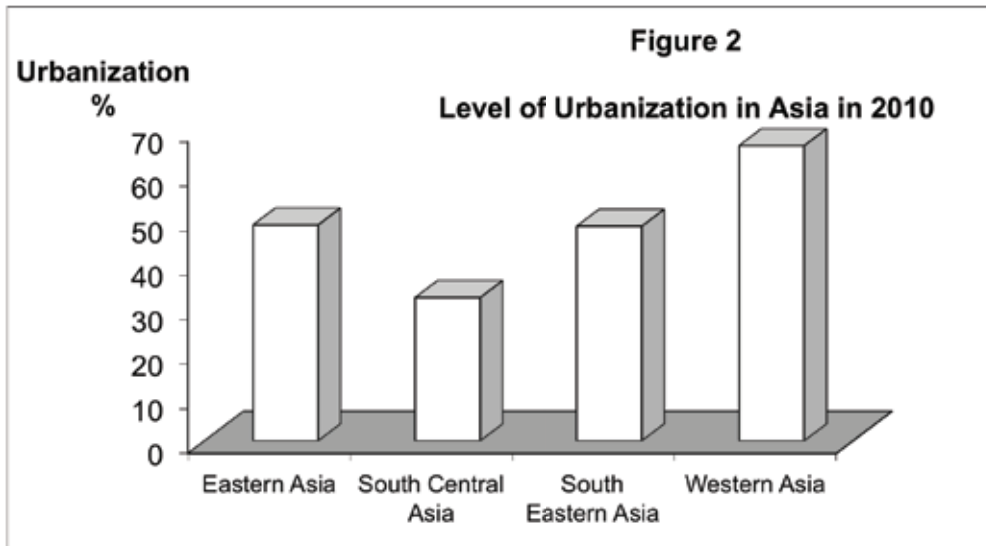
During 2000s, almost 24 percent of urban population belonged to high-income countries and about 76 percent of urban population to middle and low-income countries. Percentage of urban population will reduce to 16 percent in high-income countries and will increase to 83 percent in middle and low-income countries in 2030 (United Nation, 2002). This is because developing countries are more populated than developed countries.

Population growth rates are higher in urban areas than rural areas of middle and low income countries during 1950 to 2000. Growth rate of rural population is negative during 1950 to 2000 in Europe. It will be negative in North America, East Asia and Pacific and Central Asia during 2000-30. There is highest growth rate (3.6 percent) in urban areas of Sub-Saharan Africa. Better job opportunities and facilities available in urban areas force People to move (United Nations, 2002).

Trends of Urbanization in Pakistan

Process of urbanization is basically the settlement of human beings to the urban areas. It is projected that almost 12 to 13 million population majority lying in age group of 16 to 35 years will move from rural areas to urban areas in next 20 years. This is mainly because of job opportunities available in industrial sector of urban areas attract people to have better employment and better facilities of life. Educated people migrate on permanent basis in India (World Bank, 2010). The level of urbanization in Asia for 2010 is presented in figure 2.2. It shows that level of urbanization is more than 50 percent in Eastern and Western Asia and it is almost 50 percent in South Eastern Asian region. The level of urbanization in South Central Asian is expected to increase from 32.2 percent in 2010 to 57.2 percent in 2050. Over last two decades, rate of internal migration is increased due to increase in job opportunities in urban areas. This has reduced poverty and increase development level in Asia (World Bank, 2010).

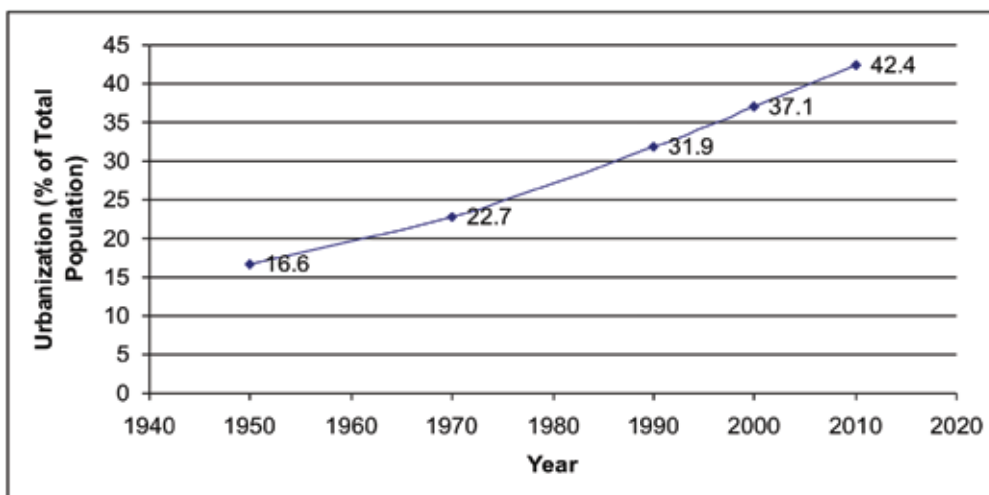
Figure-2
Level of Urbanization in Asia in 2010



Source: World Development Indicators, World Bank (2010).

Figure-3 shows overall pattern of urbanization in Asia. The figure indicates that urban population in Asia has increased quickly from 1950's to 2010. Main reason is the process of industrialization in urban region and migration of people from rural areas to urban areas in order to have access to better health and education facilities.

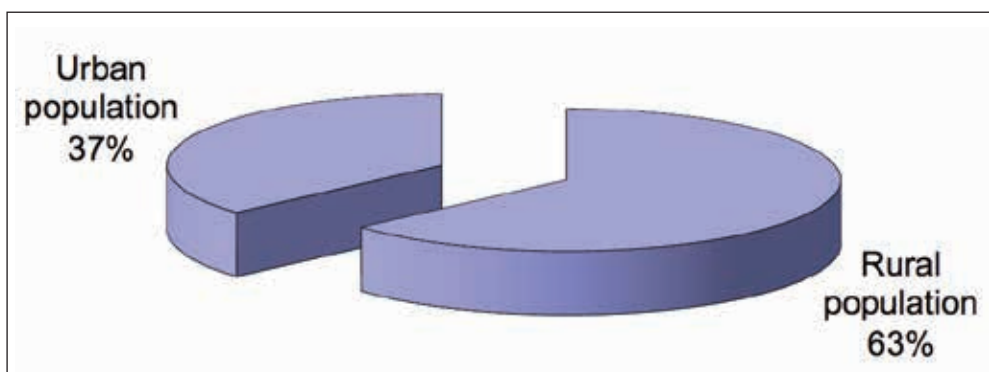
Figure-3
Level of Urbanization in Asia in 2010



Source: World Development Indicators, World Bank (2010).

In case of Pakistan structure of rural-urban population for 2010 is presented in figure 4. It shows that 37 percent of total population lived in urban areas in 2010. There will be dramatic increase in urban population of Pakistan during next 25 years. It is estimated that 80 million population will belong to urban areas by 2030. It mean total urban population will become 130 million in 2030 which is 50 percent of total population. People will be having access to new opportunities. Prosperity and growth will be created through urbanization. This will lead to produce skilled workers and expand domestic market for goods and services (Haider, 2006).

Figure-4
Rural-Urban Population of Pakistan



Source: World Development Indicators, World Bank (2010).

Table-1 shows rural-urban population of Pakistan as percentage of total population during 1975 to 2010. Percentage of urban population has increased and that of rural population has decreased over time. Rapid increase in industrialization has forced people to migrate from rural areas to urban areas.

Sample Selection

A sample is a subset from a larger population, sampling involve any procedure that uses a portion of a population to infer conclusion about the population Zikmund (2003). We have selected companies from financial and non-financial sectors listed on Karachi Stock Exchange for a period of fourteen years from 2000-2013. Firms that were delisted from KSE during the period from 2000 to 2013 were excluded. Also we excluded all those firms for which data was unavailable on the variables of the study. At the end of this elimination process, 70 financial and 120 non-financial companies were left in the sample for further analysis. Secondary data is extracted from firm's annual reports. Sources like SBP publications; Bloom burgee business week and KSE were used to collect data.

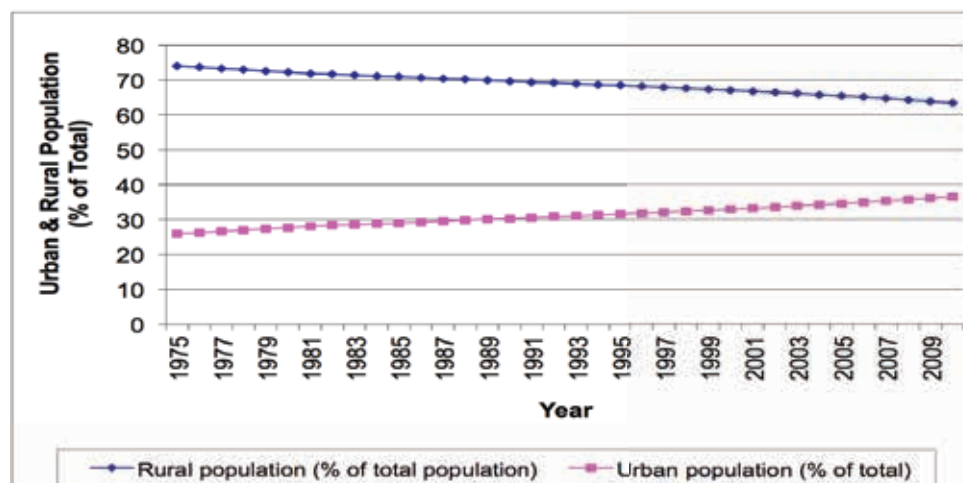
Table-1
Rural and Urban Population of Pakistan (1975-2010)
(As % of total population)

Year	Urban population	Rural Population
1975-80	26.67	73.33
1980-90	28.94	71.06
1990-00	31.46	68.54
2000-10	34.64	65.36

Source: World Development Indicators, World Bank (2009).

Figure-5 shows the graphical presentation of Table-1. It clearly indicates that urban population is increased from 26 percent to 35 percent during 1975-10 and rural population is declined from about 73 percent to about 65 percent during this period.

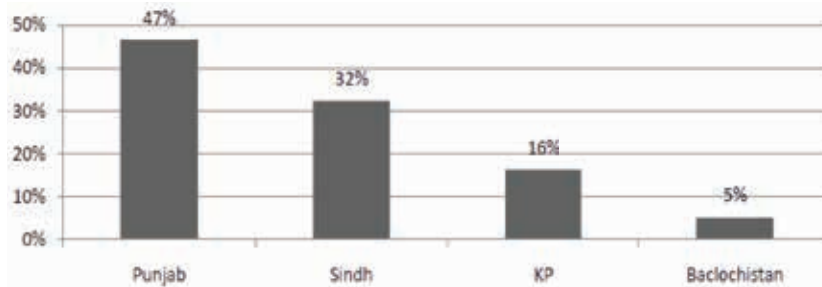
Figure-5
(% of Total) **Rural and Urban Population of Pakistan (1975-2010)**



Source: World Development Indicators, World Bank (2009)

Figure-6 examine province-wise rural-urban migration in Pakistan. It is observed that about 60 percent of migration takes place either from rural to urban areas or from urban to urban areas of the country. Almost 50 percent of rural-urban migration occurs among Lahore, Faisalabad and Karachi which are considered big metropolitan regions in Pakistan. Migration mainly takes place due to economic reasons in these areas. Similarly, the migration from southern Punjab (Multan and Bahawalpur) is the result of various economic factors like search of better job opportunities, good health facilities and social factors including marriages and better living standards (Mehreen, 2011).

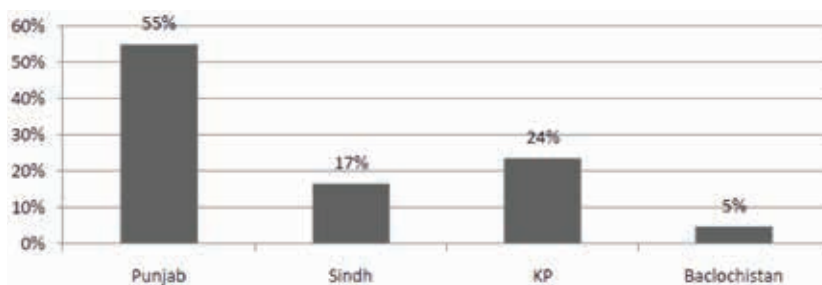
Figure-6
Province Wise Rural-Urban Migration in Pakistan



Source: Labour Force Survey of Pakistan (2009-10)

Figure-7 shows the province wise urban-urban migration in Pakistan. Usually urban-urban migration occurs due to prevailing differences in living standards of urban areas. That is people migrate from less developed urban areas having less social and economic opportunities to the more developed urban areas having more social facilities and economic opportunities. Ratio of urban-urban migration is higher than rural-urban migration in Punjab (Mehreen, 2011).

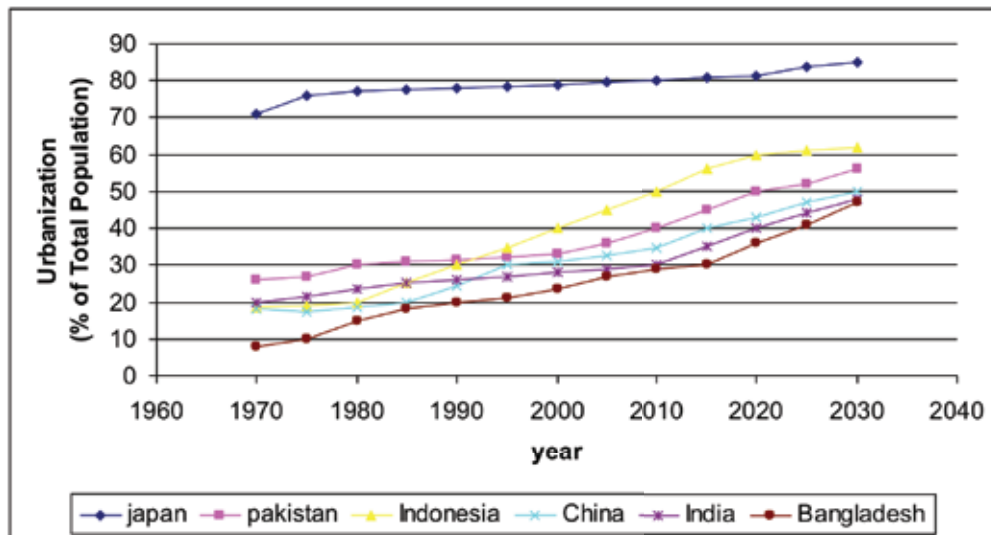
Figure-7
Province Wise Urban-Urban Migration in Pakistan



Source: Labour Force Survey of Pakistan (2009-10)

The trends of urbanization in Asian countries are presented in Figure-8. All the countries in Asia show increasing trends of urbanization but the rate of urbanization is different for different countries. In 1970, highest percentage (70 percent) of population of Japan followed by more than 25 percent of total population of Pakistan lived in urban areas of the respective countries. Almost 20 percent of total population of Indonesia, India and China lived in urban areas. Lowest percentage of total population of Bangladesh lived in urban areas at that time. The figure shows that urbanization has increasing trends over the time. It is expected that about half of the population in Asia will start living in urban areas during 2020-30.

Figure-8
Trend of Urv banization in Asian Countries



Source: Labour Force Survey of Pakistan (2009-10)

LITERATURE REVIEW

Earliest work on the issue of urbanization is associated with Lewis (1954) and Fei-Rains (1961). These studies identify that migration of labour mainly takes place due to differences in relative productivity of certain factors and to the areas where returns are higher. Integration between microeconomic theory of migration and general equilibrium is found in the work of Tadaro (1969) and Harris & Tadaro (1970). These studies analyzed that migration decision of a rational agent depends on the comparison of expected wage rate prevailing in urban sector with current wage rate in rural sector. Refinements in the theory of urbanization have been introduced by Stiglitz (1974); Cordon and Findlay (1975); Fields (1975); Khan (1979, 1980) and Cole and Sanders (1985).

Many studies give evidence that urbanization and economic growth are interlinking phenomena (Thanh, 2007; Dharmendra, 2010 and Zhen, 2008;). Urbanization is a key element in the process of economic growth and development. According to some studies urbanization has positive impact on economic growth (Beeson et al., 2001; Cohen, 2004; Deshingkar, 2006; Dharmendra et al., 2010; Glaeser, 1995; Henderson, 2003; Junius, 1999, Lewis, 2010; Martin, 1992, 1999; Robert (1989), Sato and Yamamoto, 2005; Thanh, 2007; Ying, 2011). Some other studies conclude that urbanization has negative impact on economic growth (Ades, 1995; Moonaw, 1996). Therefore, it is important to determine the relationship between urbanization and economic growth in Pakistan.

Review of National Studies

Irfan (1983) analyzed the internal and international migration flow in Pakistan for the year 1979-80. Mainly three patterns of internal migration are observed in Pakistan. Migration usually takes place over short, medium and long distances. The results show that migration flow is significantly found from rural to urban areas of Pakistan. The results also indicate that there is positive association between education level and decision to migrate. Haider (2006) discussed outline of urban challenges would be faced by Pakistan in next 25 years. The study projected that the urban population of Pakistan will become 50 percent of the total population in year 2030. The study concludes that urbanization is key factor for economic growth, innovation and development.

Khan (2008) provided the overall framework of urbanization in Pakistan from 1951 to 2005. The study discussed rural and urban life style and the consequences of urbanization in Pakistan. The result shows that rural poverty, lack of education, health facilities and lack of job opportunities force people to migrate to urban areas. Afzal (2009) discussed the consequences of rapid population growth, rural-urban migration on economic development in Pakistan. The study examined that there is increase in rural-urban migration due to rapid increase in population growth rate. Consequently, level of urbanization is increased. The study found that rapid population growth has negative and significant effect on economic development whereas urbanization has positive impact on it.

Arif and Hamid (2009) examined the trends of urbanization and quality of life in Pakistan from 1949 to 2005. The result shows that there is continuous rural-urban migration which affects the growth rate of urbanization as well as the level of urbanization. Mahmud et al. (2011) used Pakistan Labour Force Survey 2010 to analyze the pattern of migration in four provinces of Pakistan. The study concludes that majority of people migrate towards capital city of Pakistan. Two types of migration pattern namely rural-urban and urban-urban are usually observed in the country. Migrants are usually attracted by pull factors like better job opportunities and standards of living. Ikramullah et al. (2011) analyzed the impact of various socio-economic factors on urbanization. The study was based on Survey of North-West Pakistan 2010. The study shows that economic factors have important effect on the decision of migration. The results show that the rural population is moving towards the urban region in order to have access to higher living standards and better socio-economic facilities.

DATA AND METHODOLOGY

The conceptual framework is based on the theory of Lewis (1954) and Tadaro (1976). Lewis (1954) presented the Theory of Development and formulated a basic model of migration for underdeveloped economies. According to this theory, underdeveloped countries being overpopulated have surplus of labor and therefore, exhibit marginal productivity of labour equal to zero. This theory explains that surplus labor can be withdrawn from agriculture sector to industrial sector without loss of output. The movement of labor from rural sector to urban sector is associated with growth of output and employment level. Expansion of urbanization is determined by the rate of industrial investment and capital stock in urban areas. Consequently it leads to rapid economic growth.

According to the model for urbanization presented by Tadaro (1976), migration is considered an economic phenomenon. It takes place as a result of difference between expected income and actual earning of individuals. The study explains urbanization and industrialization are same phenomena. Economic growth of a country results from re-allocation of labor out of agriculture

sector towards industrial sector through rural-urban migration. This migration includes both internal and international rural-urban migration. Theory assumes that labor force compares its expected incomes in the urban sector with prevailing average rural incomes for a given time horizon and migrate if the former exceeds the latter. In developing countries it is more likely that on entering the urban labor market, many uneducated and unskilled migrants either become totally unemployed or seek casual and part-time employment as vendors, hawkers and repairmen laborers in the urban traditional or informal sector.

Therefore individuals who undertake migration decision are required to balance probabilities and risks of being unemployed or underemployed for a considerable period of time against the positive urban-rural real income differentials (Tadaro, 1976). The study analyzes the mutual relationship between economic growth and urbanization in Pakistan using annual time series data for the period of 1975-2012. Data is collected from various issues of Pakistan Economic Survey, World Development Report and World Urbanization Prospector. In order to analyze the economic growth we have used real per capita income growth as a function of urbanization, inflation rate, government expenditure as a percentage of GDP, capital stock as a percentage of GDP and lagged per capita income. Table 2 provides the description of variables.

Table-2
Definition of Variables

Dependent Variables	Description	Measurement of variables
RPYG	Real per capita income growth	(Current real per capita income-previous real per capita income)/ previous real per capita income $\times 100$
Independent Variables		
UR	Urbanization	(Urban population / total population) $\times 100$
G	Government expenditure	Government expenditure as a percentage of total GDP
INF	Inflation	Inflation rate
KS	Capital stock	Total amount of capital stock as a percent of total GDP
Lagged independent variables		
RPYG-1	Lagged Real per capita income growth	Real per capita income growth in time period t-1
ξ_1	Error term	

Selection of Variables

Our dependent variable is real per capita income growth.

Independent Variables

Urbanization

It is assumed that the level of urbanization plays an important role to increase economic growth of a country. According to the theory of Northan Curve (1975) when the level of urbanization lies between 30 percent to 70 percent there is time of development in the economy. The level of urbanization is less than 30 percent indicate the starting stage of development and that more than 70 percent indicate mature stage of development. Therefore, urbanization is an important determinant of economic growth.

Government Expenditure

According to Keynesian economics, government expenditure has positive relationship with economic growth. However, government expenditure may also have negative effect on economic growth. Barro (1999) finds that, mostly in developing countries, any increase in government expenditure can have negative effect on the economic growth due to crowding out effect. Therefore government expenditure is also a function of economic growth.

Capital Stock

Accumulation of capital is expected to positively affect the economic growth of an economy. Growth theory of neoclassical suggests that increase in capital stock will have positive effect on productivity level. Similar argument is presented by a number of studies like DeLong (1991); Mankiw (1992) and Romer (1992). According to these studies, increase in capital stock has a positive effect on the economic growth rate. Therefore, economic growth is a function of capital stock.

Inflation

Inflation has a negative impact on economic growth in developing countries. We have two type of explanation for this negative relationship. Firstly, supply side theory of classical economics explains that high inflation rate increases consumption expenditure thereby reduces saving and investment level. Secondly, inflation rate leads to increase the cost of production (due to expensive factor of production) and therefore, reduces investment level. Consequently, productivity levels falls.

Lag Value of Real per Capita Income Growth

The lagged value of real per capita income growth (RPYG-1) is also added in order to find out the impact of economic growth of previous year on current year economic growth. High economic growth in previous year is expected to have positive impact on the economic growth in current year.

Model-1

Model 1 is developed to analyze the relationship between economic growth and urbanization. Real per capita income growth rate is a function of urbanization, government expenditure as a percentage of GDP, total amount of capital stock as a percentage of GDP, inflation rate and lagged value of real per capita income.

$$RPYG = F(UR, G, KS, INF, RPYG-1)$$

Specification of relationship is as,

$$RPYG = \gamma_{11} + \gamma_{12}UR + \gamma_{13}G + \gamma_{14}KS + \gamma_{15}INF + \gamma_{16}RPYG-1 + \xi_1 \dots \dots \dots (1)$$

Where γ_{11} is intercept and $\gamma_{12}, \gamma_{13}, \gamma_{14}, \gamma_{15}, \gamma_{16}$ are co-efficient.

Impact of Urbanization on Economic Growth in Different Sectors

Four models are developed to determine the impact of urbanization on different sector of economy. Log are taken in these four models to overcome the problem of drastic fluctuation and Heteroskedasticity.

Model-2

This model analyzes the effect of urbanization on agriculture sector output.

$$\ln Y-a = \alpha_0 + \alpha_1 \ln UR + \mu_1 \dots \dots \dots (2)$$

Where $\ln Y-a$ is the log of share of output of agriculture sector as percentage of total GDP and α_0 and α_1 are intercept and slope co-efficient respectively.

Model-3

This model investigates the impact of urbanization on industrial sector output.

$$\ln Y-i = \beta_0 + \beta_1 \ln UR + \mu_2 \dots \dots \dots (3)$$

β_0 and β_1 are intercept and slope co-efficient respectively.

Where $\ln Y-i$ is the log of output of industrial sector as percentage of total GDP and

Model-4

In this model we have analyzed the impact of urbanization on output in manufacturing sector.

$$\ln Y-m = \pi_0 + \pi_1 \ln UR + \mu_3 \dots \dots \dots (4)$$

and π_0 and π_1 are intercept and co-efficient respectively

Where $\ln Y-m$ is the log of output of manufacturing sector as percentage of total GDP

Model-5

Following equation analyzes the relationship between urbanization and output in services sector.

$$\ln Y-s = \lambda_0 + \lambda_1 \ln UR + \mu_4 \dots \dots \dots (5)$$

where $\ln Y-s$ is the log of output of services sector as percentage of total GDP and λ_0 and λ_1 are intercept and co-efficient respectively. First the stationary of data is checked by using ADF test developed by Dickey and Fuller (1979). Table 3 presents the result of unit root ADF test for variables in equation (1). We have found that all the variables are integrated of level 1.

Table-3
UNIT ROOT TEST

Variable	ADF at Level			ADF First Difference Integration				
	ADF Statistics	Probability	Conclusion	Constant	Probability	Constant & trend	Probability	Conclusion
RPYG	-0.055544	0.6564	Non-stationary I(o)	-2.9498	0.0062	-4.2243*	0.0002	Stationary I(1)
UR	-0.780528	0.3706	Non-stationary I(o)	-0.8247	0.4163	-5.7025*	0.0007	Stationary I(1)
INF	-0.726173	0.8255	Non-stationary I(o)	-4.4972*	0.0004	-2.7807	0.0858	Stationary I(1)
G	-1.836858	0.6651	Non-stationary I(o)	-4.1514*	0.0003	-4.0838	0.0003	Stationary I(1)
KS	-2.288220	0.1824	Non-stationary I(o)	-4.2763*	0.0002	-4.1215	0.0003	Stationary I(1)

Note: Author's calculations; [H0 is rejected at 1 % (*) and 5 % (**)].

We adopted co-integration analysis in order to examine the relationship between urbanization and economic growth. Table 4 shows the ADF test of the model 2, 3, 4&5. Data is non-stationary and the series are integrated of first order difference.

Table-4
ADF First Difference Integration

Variable	Constant	Probability	Conclusion
LnYa	-4.704941*	0.0001	Stationary I(1)
LnYi	-4.823653*	0	Stationary I(1)
LnYm	-3.446769**	0.0017	Stationary I(1)
LnYs	-5.156181*	0	Stationary I(1)
LnUR	-3.199818**	0.0057	Stationary I(1)

Source: Author's calculations; [H0 is rejected at 1 % (*) and 5 % (**)].

We adopted co-integration analysis in order to examine the relationship between urbanization and economic growth of different sector of the economy.

Johansen Co-integration Test

The theory of co-integration was presented by Engle and Grange (1978). Co-integration is used to determine the relationship between series of two or more non-stationary time sequence. The time sequence might be non-stationary and it becomes stationary through linear combination. To find linear combination among series, OLS estimation method is used. If co-integration exist between two variables, the variables indicate long-run equilibrium relationship (Johanson, 1988, 1991, and 1995) (Mainly three methods namely Engle and Granger (1987) two-stage method, Wickens and Brevsch (1988) one-stage method and Peasaran and Shin (1995) ARDL model are used in respect of co-integration test).

Hypothesis for co-integration is.

H₀: Series are not co-integrated

H₁: Series are co-integrated

Vector Error Correction Model

If variables in the system are non-stationary and co-integrated, it is appropriate to exploit the error-correction framework. Error-correction framework provides short run dynamics and error adjustment towards its long run equilibrium value if there is short run disequilibrium. It showed time that economy would take to reach the long run equilibrium.

ESTIMATION RESULTS AND DISCUSSION

Since all the variables are stationary at first difference, OLS estimation technique is applied to find the residuals.

$$RPYG=6.2659+0.0744 UR+0.0954G + 0.0823KS -0.0046INF+ 0.0835RPYG-1+\xi_1.....(6)$$

We obtained residuals for Error Correction Model (ECM) from equation 5.

$$ECM=RPYG - 6.2659 - 0.0744 UR - 0.0954G - 0.0823KS + 0.0046INF - 0.0835RPYG-1...(7)$$

The null hypothesis regarding to non-stationary residuals are rejected so that residuals are stationary at level. Since all the residuals are integrated at level, all the residuals are I (0) process. On the basis of above equations, error correction model used to determine the economic growth and short run fluctuation of urbanization are established.

Results of Johansen Co-integration Test

The results for co-integration of variables in equation 5 are reported in Table-5. Results indicate the existence of long run relationship between urbanization and economic growth. The table shows that there exit co-integration in the series (This indicates that null hypothesis that series are not co-integrated is rejected). If the series are co-integrated, we use vector error correction model for long-run adjustment purpose.

Table-5
Results of Johansen Co-integration Test

Eigen values	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of cointegrated equation(s)
0.658512	84.26403	68.52	76.07	None **
0.584144	48.80740	47.21	54.46	At most 1 *
0.263884	19.85264	29.68	35.65	At most 2
0.222066	9.742529	15.41	20.04	At most 3
0.043156	1.455798	3.76	6.65	At most 4

Note: * and ** denotes rejection of the hypothesis at 5% and 1% significance level

The normalized co-integration equation is reported in Table 6. It shows that the key variable of the study is urbanization which carries positive sign suggesting that it has significant impact on economic growth in Pakistan. This can be due to the reason that urbanization leads to greater industrialization and therefore helps to increase the income level of the people. Consequently, it increases the economic growth in the country. According to Shahbaz (2011), greater productive activities in urban areas require more skillful and educated people to perform these activities. People from rural areas are also attracted to urban areas to find better jobs and play their role in economic activities. In this way, government expenditure also reported significant effect on economic growth. According to Keynesian school of thought that increases in government expenditure increases the demand for funds. It leads to increase the interest rate that discourages private sector investment. Our results are compatible with the finding of Barro (1999). The study found that increase in government expenditure leads to expansion in economic growth.

Capital stock has significant effect on economic growth. This is because, that higher capital stock requires higher investment level which increases the productivity level in the economy. According to Summers (1991) and Romer (1992) an increase in capital stock will lead to increase capital to labor ratio which increases the productivity level and economic growth consequently. The results show that inflation has negative impact on economic growth as inflation increases it decreases real GDP by 0.983045 units. That is, the increase in prices of goods leads to decrease the purchasing power. It leads to decrease aggregate demand and real income consequently. Briault (1995) also found the same relationship between inflation and economic growth.

Table-6
Results of Normalized co-integrating coefficient

Variable	Coefficient	Std-error	Conclusion
RPYG	1.0000		
UR	-1.224843*	(0.15050)	Significant
G	-1.006170*	(0.30901)	Significant
KS	-0.934891*	(0.37405)	Significant
INF	0.983045*	(0.41089)	Significant

Note: * and ** denotes rejection of the at 5% and 10% significance level.

$$RPYG = 3.5795 + 1.224843 UR + 1.006170G + 0.934891KS - 0.983045INF \dots\dots\dots(8)$$

Dynamic Short Run Relationship

As urbanization and economic growth are co-integrated, there exists long run relationship between the two variables. Table 7 shows the speed of adjustment coefficients. The adjustment coefficient of per capita income is negative which shows there is reversal adjustment. Similarly in urbanization the speed of convergence is about -0.00022 and government expenditure, inflation and capital stock have reversal adjustment.

Table-7
Error Correction Model

Error Correction:	CointEq1	S.E	t-Value	Conclusion
D(GDP)	-0.297647	(0.05531)	(-5.38142)*	Significant
D(UR)	-0.000222	(8.4E-05)	(-2.65318)*	Significant
D(G)	-0.006496	(0.00374)	(-1.73578)**	Significant
D(K)	-0.027251	(0.02043)	(-1.33371)	Insignificant
D(INF)	-0.251881	(0.04419)	(-5.69999)*	Significant

Note: * and ** denotes rejection of the at 5% and 10% significance level.

Impact of Urbanization on Economic Growth in Different Sector of Pakistan Economy

In this section we study the impact of urbanization on economic growth in different sector. These sector include agriculture, manufacturing, industry and services sector of Pakistan economy. For this purpose model 2, model 3, model 4 and model 5 are developed.

AGRICULTURAL SECTOR

Consider model 2 (Equation 2) that analyzes the effect of urbanization on the output of agriculture sector. Since all the variables are integrated of level 1. Therefore, OLS technique is applied to determine the linear combination among series. Equation 5.4 shows that one percent change in urbanization level will lead to decrease GDP growth rate of agriculture sector by 1.36 percent.

$$\ln Y_{-a} = 3.453316 - 1.362437 \ln UR \dots \dots \dots (9)$$

Table 8 indicates unit root test on the residuals sequence. We find null hypothesis of non-stationary residuals is rejected and residuals are stationary at level.

Table 8
ADF Test for Residuals

Variable	Constant	Probability	Conclusion
$\hat{U}1$	-2.729483**	0.0104	Stationary I(0)

Source: Author's calculations [H0 is rejected at 1 % (*) and 5 % (**)]

As residuals are I(0) process so we can get a long run balanced residual as follows:

$$ECM_{-a} = \ln Y_{-a} - 3.453 + 1.362 \ln UR \dots \dots \dots (10)$$

Result of Error correction model is presented in Table-9, which is used to determine the economic growth and short run fluctuation of urbanization. We find that short time fluctuations of economic growth are not only influenced by urbanization but also by error correction term. In long run, there is an automatic reversal adjustment. Results show that adjustment is -0.334 in agriculture sector.

Table-12
ADF Test for Residuals

Variable	Constant	Probability	Conclusion
\hat{U}_3	-2.755252**	0.0097	Stationary I(0)

Source: Author's calculations [H0 is rejected at 1 % (*) and 5 % (**)]

We can get a long run balanced residual as follows

$$ECM_{-m} = \ln Y_{-m} - 0.645 - 0.381 \ln UR \dots \dots \dots (13)$$

We find from result that short time fluctuations of economic growth are not only influenced by urbanization but also by error correction term. Table 13 shows that in long run, there is an automatic reversal adjustment. There is adjustment of -0.326 in manufacture sector.

Table-13
Results of Error Correction Model

Coin Eq	Constant	ECM (-1)	$\Delta \ln UR$	$\Delta \ln Y(-1)$	$\Delta \ln UR (-1)$
$\Delta \ln Y_{-m}$	0.006	-0.326	13.17	0.261	-12.94

SERVICES SECTOR

Equation 5 is used to analyze the relationship between urbanization and output in services sector. Variables is stationary at first difference. Therefore, OLS is used to determine the linear combination among sequences.

$$\ln Y_{-s} = 0.898672 + 0.531430 \ln UR \dots \dots \dots (14)$$

Regression results show that one percent change in urbanization level will lead to 0.53 percent increase in GDP growth rate of services sector. Applying unit root test on the residuals sequence, we find it I(0) process in table 14.

Table-14
ADF Test for Residuals

Variable	Constant	Probability	Conclusion
\hat{U}_4	-3.390163**	0.0019	Stationary I(0)

Source: Author's calculations [H0 is rejected at 1 % (*) and 5 % (**)]

Long run balanced residual are obtained as follows

$$ECM_{-s} = \ln Y_{-s} - 0.898 - 0.531 \ln UR \dots \dots \dots (15)$$

Result shows that short time fluctuations of economic growth are not only influenced by urbanization but also by error correction term. In long run, there is an automatic reversal adjustment. Table 15 indicates that there is adjustment of -0.589 in services sector.

Table-15
Results of Error Correction Model

Coin Eq	Constant	ECM (-1)	$\Delta \ln UR$	$\Delta \ln Y(-1)$	$\Delta \ln UR (-1)$
$\Delta \ln Y_{-s}$	0.0098	-0.589	-0.64	0.322	-1.27

Finally, we can conclude that urbanization is an important determinant of economic growth. Urbanization has negative impact on economic growth in agriculture sector. However, it has positive impact on economic growth in industrial, manufacturing and services sector

SERVICES SECTOR

The study analyzes two aspects of urbanization. Model 1 determines the impact of urbanization on overall economic growth. The results show that urbanization affect economic growth and they have long run relationship. In addition it was analyzed the impact of urbanization on economic growth of four sectors namely agriculture, manufacturing, industrial and services sector of the economy. We have used co-integration estimation method. The results show that urbanization has negative effect on economic growth of agriculture sector in Pakistan. We found that urbanization is an important determinant of economic growth of manufacturing, industrial and services sector. Therefore, level of urbanization needed to be increased to accelerate development in the economy. So government can hold this opportunity to push Pakistan's urbanization level in the country.

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