Inflation, Income Inequality and Economic Growth in Pakistan: A Cointegration Analysis

by
Sharafat Ali
Bahauddin Zakariya University Bahadur Campus Layyah, Pakistan
sharafat.ali.rana@gmail.com

Abstract. The study is an attempt to explore the impact of inflation and income inequality in Pakistan. The study also analyzes the effect of foreign direct investment, workers' remittances and manufacturing value added on growth. Annual time series data from 1972 to 2007 was used for the analysis. After finding all of the time series stationary at first difference, Johansen cointegration approach and vector error correction models are applied for the long run and short run analysis, respectively. The cointegration test results confirmed growth increasing impact of income inequality in Pakistan. Foreign direct investment, remittances and manufacturing valued added are found to have positives and significant impact on growth in Pakistan. The study also suggests some policy implications.

1 Introduction

Pakistan economy is one of those economies that have experienced volatility in growth and price levels. This economy is endowed with human and natural resources. But it has not shown robustness in setting up the growth track. Income distribution in Pakistan economy is much skewed. Employment generated opportunities are not enough to combat the miseries of poverty and income inequality. Furthermore, ours economy, on the average, has faced higher levels of inflation rate and volatility in general price level. Higher level of inflation has its adverse effect on the poor and deprived household. The arguments about the impact of inflation, in economic theoretical literature and empirical studies are inconclusive. Some of the studies are in favor of inflation for the generation of economic growth but some studies conclude negative impact of inflation on economic growth. Inflation showed a positive impact on economic growth in a cross-section of industrialized economies, whereas inflation exerts a negative effect on a cross-section of 7 developing countries (Thirlwall and Barton, 1971). According to Fischer (1993) inflation exerts negative impact on economic growth by reducing investment and productivity growth. The cross-sectional analysis of Barro (1995) concluded negative impacts of inflation on

growth in the economies of high-inflation keeping the characteristics like education, fertility rate etc. constant. This analysis of Barro (1995) covered the data of more than hundred economies for the period 1960-90. Bruno and Easterly (1995), in empirical analysis, used the annual inflation rate measured by CPI to check the determinants of economic growth of 26 economies for the period of inflation crises. This study considered 40 percent of inflation rate as threshold level for inflation crises. The authors, excluding the economies with high inflation, found no evidence of relationship between inflation and growth. The study, beyond the threshold level, suggested a temporal negative relationship between inflation and economic growth. Discrete high inflation crises caused no permanent negative impact on growth and the economies recover pre-crises rates of growth after reduction in inflation rate.

Due to the severe price hike of 1970s the inflation has been witnessed to have negative impact on economic growth where as before the inflation crises the inflation empirical studies suggested positive impact of inflation on economic growth (Sarel, 1995). Andres and Hernando (1997) used convergence equations to find no evidence of long run positive correlation between inflation and growth in OECD economies. Inflation reduces the investment and efficiency with which factors were used.

Inflation showed a negative impact on growth temporarily. The authors observed diminishing marginal costs of inflation with the rate of inflation. Malla (1997) found, after controlling the labor and capital inputs, a negative and significant impact of inflation and its first difference on growth in OECD countries. The positive impact of first difference of inflation on growth was insignificant for developing economies of Asia. The author termed the adjustment in country sample and time period to be basic problem for the cross-country relationship between inflation and growth in the long run. The comparison of cross-country time series regressions gives little information about the relationship of inflation and growth in different regions and time periods.

Khan and Sehnadji (2000) confirmed the threshold level of inflation beyond that threshold level inflation showed adverse impact on growth. The authors used the data of 140 developing and developed countries for the period from 1960 to 1998. The study, depending on the estimation method, found that threshold of 1-3 percent in industrialized economies was lower than the threshold of 7-11 percent in developing countries. Malik and Chowdhry (2001) applied cointegration and error correction models to analyze the short run and long run relationship between inflation and growth for four South Asian economies. The study suggested positive and statistically significant relationship between inflation and economic growth for all the economies included in the examination. Further, the study found that the sensitivity of growth to changes in rate of inflation as smaller than the changes of inflation to changes in rates of growth. According to the authors the four of the economies were on the turning point of the relationship between inflation and growth.

Lee and Wong (2005) found one threshold rate of inflation in the relationship between inflation and growth in Taiwan, where as there were two threshold values the economy of Japan. According to the results the inflation rate below the threshold level of 7.25 percent in Taiwan and 9.66 percent in Japan financial development promoted growth. The threshold levels in both of the countries appeared during high inflation period of energy crises of 1970s. Mubarik (2005) used annual data of Pakistan economy for the period 1973 to 2000 to estimate the threshold level of inflation. The threshold model and sensitivity analyses of the author found 9 percent inflation rate to be threshold level beyond that level inflation showed adverse impact on the growth of the economy and below 9 percent the inflation has been favorable for the economic growth. The Granger causality test confirmed the unidirectional causality from inflation to growth.

Ahmad and Mortaza (2005) exploring the relationship between inflation and growth through the cointegration and error correction models found statistically significant long run relationship between inflation and economic growth. The authors estimated a threshold level of 6 percent beyond that level inflation showed adverse effects on growth. Bullar and Keating (2005) concluded the similar effects of inflation on growth but the authors applied VAR analysis in this study. Sergii (2009) investigated the inflation-growth relationship, using econometric techniques to estimate nonlinear effects and inference, for the CIS economies. The study confirmed the existence of threshold level of inflation in inflation-growth nonlinear relationship. Inflation at more than threshold level of 8 percent hampered growth but below the threshold level, inflation showed positive impacts on growth.

Bittencuort (2010) investigating the role of macroeconomic performance in terms of high inflation rates in the determination of economic growth in four Latin American economies for the 1970-2007 period found that inflation adversely affected growth in Latin America. Chimobi (2010) applied cointegration and Granger causality tests to examine the relationship between inflation and economic growth in Nigerian economy and found no long run relationship between inflation and growth. Granger causality test, applied on lag 2 and lag 4, confirmed unidirectional causality from inflation to economic growth. Subhan and Hayat (2000) discussed the impact of price instability on unemployment and growth of Pakistan economy for the period of 1980-2008. The results of the study confirmed the negative

relationship between inflation, unemployment and growth. The study also supported the results of Khan and Sehnadji (2000). Subhan and Hayat (2000) also found a negative relationship between unemployment and economic growth as stated by Okun's law.

The twofold objective study by Iqbal and Nawaz (2010) focused on the examination of the impact of inflation on growth with the possibility of two threshold levels of inflation and the nonlinear relationship between inflation and investment for the period 1961-2008. The study confirmed two threshold levels of inflation at 6 percent and 11 percent. Inflation showed positive but insignificant impact on growth when it was below threshold level of 6 percent. The impact of inflation on growth between the two threshold levels of inflation has been negative and significant but beyond the threshold level of 11 percent, there was diminishing marginal impact of additional inflation on growth. The impact of inflation was still negative and significant when inflation was more than second threshold level. Iqbal and Nawaz (2010) estimated threshold level of inflation for investment. The inflation below the threshold level of 7 percent effected investment positively but insignificantly, where the inflation above the threshold level showed negative and significant impact on investment. Investment may be one of the channels through which inflation may effect growth. The authors suggested the inflation to be kept less than 6 percent for growth and investment. Inflation has negative impact on economic growth (Ahmad *et al.*, 2013). Higher inflation rate hamper domestic private investment in Pakistan economy (Ali, 2013).

2 Model, Data and Methodology

Present study is an attempt to explore long run and short run impact of inflation and income inequality on economic growth in Pakistan from 1972 to 2007. Real GDP growth rate (GDP) is dependant variable in this analysis. Gini Coefficient (GINI), Inflation rate (I) measured by annual consumer price index, foreign direct investment (F), workers' remittances (W) and manufacturing value added (M) are explanatory variables. Foreign direct investment, workers' remittances and manufacturing value added are taken as percentage of GDP. The specified model is written as:

$$lnGDP_t = \gamma_0 + \gamma_1 lnGINI_t + \gamma_2 lnI_t + \gamma_3 lnF_t + \gamma_4 lnW_t + \gamma_5 lnM_t + v_t$$
(1)

The annual time series data for these variables is taken from the Economic Survey of Pakistan (1990-91, 2000-2001, 2006-07, 2011-12) issued by the Ministry of Finance Pakistan and the World Development Indicators (WDI, 2012) of the World Bank. The present study has used method of cointegration suggested by Johansen (1988) and Johansen and Juselius (1990). A prior examination about the level of integration of the variable has become routine practice. The test of sationarity check of the time series is prerequisite for the cointegration analysis. A time series that have time invariant mean, variance and covariance is called stationary time series. Unit root test serves as a pre-test to avoid spurious regression results (Granger, 1986). Two test statistics (trace value and Maximum likelihood ration) are estimated to make out existence of cointegrating vectors. Maximum likelihood ratio has been utilized to recognize the presence of long run association between the variables. Maximum likelihood ratio tests the null hypothesis of *r* cointegrating vectors against the alternative hypothesis of *r+1* cointegrating equations. The presence of cointegration equation reveals that there is a long run association between the variables and this association can be expressed as Error Correction Model (ECM) (Engle and Granger, 1987). Error correction model explores the short run dynamics of the variables. The present study estimates error correction equation and also utilize pair-wise Granger causality test to explore the causality relationship between the variables.

3 Results and Discussions
3.1 Descriptive Analysis

The descriptive statistics of the variables included the stud are reported in Table 1. Correlation matrix shows that the all the variables are positively correlated. The

correlation between growth and worker's remittances is moderate where as real GDP growth and manufacturing value added are highly positively correlated. Correlation statistics represent that inflation and foreign direct investment are weakly correlated with the real GDP growth in Pakistan. Descriptive analysis of the variables is evident that real GDP growth, in Pakistan, stood at the average of 5.17 percent during the 1972-2007. The real GDP growth increased from the 0.81 percent in 1972 to 10.22 percent in 1980. The skewness and kurtosis values of real GDP are -0.02 and 2.64 shows that real GDP normally distributed.

Table 1: Descriptive Statistics

	GDP	GINI	I	F	W	M
GDP	1.00					
GINI	0.26	1.00				
I	0.05	-0.31	1.00			
F	0.03	0.42	-0.14	1.00		
W	0.54	0.07	-0.21	-0.26	1.00	
M	0.65	0.38	-0.12	0.16	0.44	1.00
Mean	5.17	0.38	8.97	0.73	4.71	6.57
Median	5.01	0.39	7.88	0.50	4.02	6.98
Maximum	10.22	0.42	26.66	3.90	10.25	15.51
Minimum	0.81	0.34	2.91	-0.06	1.45	-0.07
Std. Dev.	2.16	0.02	5.30	0.84	2.36	3.83
Skewness	-0.02	0.12	1.73	2.43	0.63	0.28
Kurtosis	2.64	1.69	6.11	8.98	2.27	2.67
Jarque-Bera	0.20	2.67	32.58	88.98	3.17	0.65
Probability	0.90	0.26	0.00	0.00	0.21	0.72
Observations	36.00	36.00	36.00	36.00	36.00	36.00

Gini coefficient has been 0.38 on the average in Pakistan during the 36 years. Gini coefficient increased from its minimum value of 0.34 in 1972 to its maximum value of 0.42 in 2000. Skewness and excess kurtosis of the Gini coefficient are closer to zero show that Gini Coefficient is also normally distributed. Consumer price index has been, on the average, 8.97 percent with its maximum value of 26.66 percent in 1974 and its minimum value of 2.99 percent in 2003 showing a decreasing trend in inflation in Pakistan. Skewness, kurtosis value and Jarque-Bera test confirms that consumer price index is not normally distributed. The mean foreign direct investment is 0.73 percent. Foreign direct investment is also not normally distributed as is depicted by Jarque-Bera test. Worker's remittances and manufacturing value added stood on the average at 4.71 percent and 6.57 percent respectively for the same period. Jarque-Bera test confirms that worker's remittances and manufacturing value added normally distributed. The trends of real GDP growth rate and consumer price index are displayed in the figure 1.
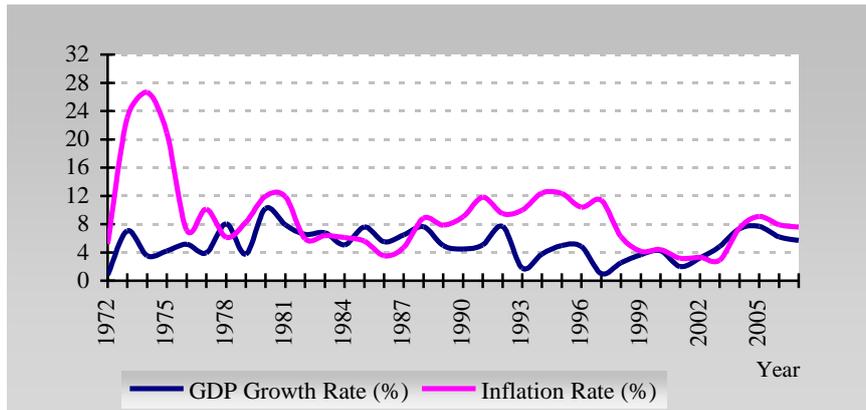
Figure 1: Trends of GDP Growth Rate and Inflation Rate in Pakistan

3.2 Unit Root Test

It is prerequisite to check the order of the time series variables for the cointegration analysis. We have used Augmented Dickey-Fuller (ADF) unit root test to check whether the time series variables included in the model are stationary or not. We have estimated the values of ADF statistic for each time series in the models without drift, with drift and with drift and trend at level and without drift at their 1st difference. The results of the ADF unit root test are displayed in Table 2.

Table 2: Augmented Dickey-Fuller (ADF) Unit Root Test

Variable	ADF Statistics			
	Level			1st Difference
	None	Constant	Constant and Trend	None
lnGDP	-0.46	-2.88	-2.96	-6.71
lnGINI	-0.71	-2.1	-2.66	-4.96
lnI	-1.12	-3.06	-2.98	-4.96
lnF	-1.24	-0.38	-251	-4.41
lnW	-0.4	-1.75	-2.13	-4.12
lnM	-0.82	-2.69	-2.85	-5.96

Source: Author
Note: Mackinnon critical values for the rejection of a unit root for without drift,
with drift and with drift and trend at 5% are -1.95, -2.95 and -3.55 respectively.
All the time series variables, without drift, are I(0) at their 1st difference.

The results of ADF test show that all the variables are non-stationary without drift, with drift, and with drift and trend at level. The null hypothesis of a unit root (i.e. time series is non-stationary) for each of the variable is rejected at 5 percent level of significance at the first difference of the time series. So ADF unit root test concludes that all the time series are stationary at their first difference. When all the time series are proved to be stationary at the same level it means there exists a long run relationship between them.

3.3 Johansen's Cointegration Test

The stationary time series that are integrated of the same order are cointegrated. This implies that there exists a long run equilibrium relationship between these time series. Our study employs Johansen's cointegration technique for the existence of a long run relationship between real GDP growth and the explanatory variables in the model. The results of Johansen's cointegration model are shown in

the Table 3. Johansen's cointegration test is applied on the assumption that there is not deterministic trend in the data. The appropriate

lag length of 2, for the cointegration, is selected on the basis of Akaike and Schwarz information criteria by using vector autoregressive model.

Table 3: Johansen's Cointegration Test

Null Hypothesis	Eigen-value	Likelihood	Critical Value	
			5 Percent	1 Percent
None **	0.95	172.56	94.15	103.18
At most 1 **	0.80	94.21	68.52	76.07
At most 2 *	0.61	50.92	47.21	54.46
At most 3	0.48	25.43	29.68	35.65
At most 4	0.24	7.75	15.41	20.04
At most 5	0.01	0.17	3.76	6.65

Source: Author
*Note: 1. *(**) denotes rejection null hypothesis at 5%(1%) significance level*
2. L.R. Test indicates 3 cointegrating equations at 5% significance level.

The Maximum Likelihood Ration (MLR), based on the Eigen-values of the stochastic matrix of the cointegration procedure of Johansen (1991) cointegration, is used to reject the null hypothesis of no cointegrating vector against at least one cointegrating vector. The null hypothesis of at least one cointegrating vector against the null hypothesis of at least two cointegrating vectors is rejected at 1 percent and 5 percent significance level. The null of at most two cointegrating vector against the alternative hypothesis of at least three hypothesis is rejected at 5 percent level of significance. So MLR test confirms 3 cointegrating vectors at 95 percent confidence level.

3.4 The Long Run and Short Run association among the Variables in Pakistan Economy

The coefficients of inflation and other explanatory variables for their long run relationship impact on growth in Pakistan for the period of 1972-2007 are shown in Table 4. We have reported and interpreted the normalized cointegrating coefficients with one normalized cointegrating equation with reversed signs as dependant and independent variable are on the same side of the Johansen's cointegrating equation (Johnston and Dinardo, 1997).

Table 4: Normalized Cointegrating Coefficients: 1 Cointegrating Equation Dependant Variable: lnGDP

Variable	Coefficient	Standard Error	t-Statistic
lnGINI	-2.05*	0.34	-6.11
lnI	0.14*	0.02	5.63
lnF	0.15*	0.03	4.68
lnW	0.37*	0.07	5.10
lnM	0.52*	0.06	8.24

*Note: * Significant at 5% significance level.*

The income inequality elasticity of the growth is -2.05 and it is significant at 5 percent significant level. It shows that one percent decrease in the Gini coefficient increases the real GDP growth by 205 percent. The income inequality in Pakistan exerts a negative and significant impact on the growth in the long run.

According to Voitchovsky (2005) income inequality changes can effect economic growth of the economy through economic and social channels. The higher income groups, in the economy with higher levels of income inequality, save higher income proportions. This higher level of savings results in higher

investment levels and thus higher economic growth. Higher income inequality may be helpful in generating higher levels of tax revenues. In contrast to Tabassum and Majeed (2008) our results are that higher income inequality is an impediment to growth.

The coefficient of inflation is 0.14 and it is also significant at 5 percent level of significance. The impact of inflation on economic growth is positive in the long run. The results are in correspondence with the economic theory that growth and inflation are positively associated. The argument of positive impact of inflation on growth in Pakistan is also supported by Ahmad and Joyia (2012) that inflation enhances productivity and output growth. The results of our study are supported by Mubarak (2005) that inflation shows conducive impact on growth when inflation is below the threshold level of 9 percent in Pakistan. We see that in our analysis the average of the consumer price index for the period of 1972-2007 has been 8.97 percent. The results of the study are also in strong agreement with the results of Malik and Chowdhry (2001).

The foreign direct investment elasticity of real GDP growth is evident that foreign direct investment significantly increases the growth in Pakistan over a longer period of time. Foreign direct investment, in economic theory, plays very important role in the growth of the host economies. The positive impact of FDI on growth is not only recognized in theoretical studies but also in empirical studies. FDI help to fill the resource gap between required investment and domestic savings. The inflows of FDI help the economies to benefit from modern knowledge, sophisticated production techniques, and transfer of modern machinery to capital-starved nations like Pakistan. So this transfer of sophisticated knowledge, modern skills and technology results in increased productivity of the recipient country, Khan and Kim (1999). FDI has positive and significant impact on growth (Bergten *et al.*, 1978; Kenedy, 1992; Khan, 2007, Ahmad *et al.*, 2012).

Table 5: The Results of Error Correction Model Dependant Variable: lnGDP(-1)

Variable	Coefficient	Standard Error	t-Statistic
D(lnGINI(-1))	-1.89	2.25	-0.84
D(lnGINI(-2))	-0.99	2.28	-0.44
D(lnI(-1))	0.50	0.37	1.32
D(lnI(-2))	-0.25	0.31	-0.80
D(lnF(-1))	0.05	0.25	0.22
D(lnF(-2))	0.12	0.21	0.59
D(lnW(-1))	0.49	0.53	0.92
D(lnW(-2))	0.62	0.45	1.38
D(lnM(-1))	-0.11	0.19	-0.60
D(lnM(-2))	-0.18	0.21	-0.89
E_{t-1}	-0.10	0.54	-0.56

R-squared = 0.71 Adjusted R-squared = 0.42
F-statistic = 2.45 Akaic AIC = 1.30 Schwarz SC = 1.97
Lok likelihood = -3.58

The workers' remittances also showed a positive and significant impact on growth in Pakistan in long run. The inflows of worker's remittances increase the economic growth of the Pakistan economy. The result is in agreement of the economic theory. The worker's remittances

increase the growth of the recipient economy as it reduces the current account deficit of the economy. Inflows of worker's remittances also help to reduce the external borrowing and thus reduce the external debt burden. Worker's remittances improve the foreign exchange

position as it is an important source of foreign exchange inflows. Its role in the improvement of the balance of payment and reduction in external dependence has positive impacts on the economy. A major portion of remittances, in Pakistan, is spent on consumption. There are some evidences that the remitted foreign exchange is also used as "productive investment" (Iqbal and Sattar, 2005). Therefore the inflows of worker's remittances increase growth of Pakistan economy by increasing consumption and investment in Pakistan. According to Iqbal and Sattar (2005), the inflow of worker's remittances is concluded to be third important source of the capital for the growth of Pakistan economy. Jongwanich (2007) argue that external remittances positively, but marginally, effect growth in Asian and Pacific economies through the improvement in human capital and investment. This may be the case for the Pakistan economy. It direly needs further research in this respect. Ahmad *et al.* (2013) also supports the argument of positive impact of worker's remittances on growth in Pakistan. Manufacturing value added is also concluded to increase the growth in the long run in Pakistan. The manufacturing value added elasticity of growth is 0.52 is significant at 5 percent level of significance. Manufacturing sector is very critical in the economic growth of the Pakistan economy. Manufacturing sector contributes 18.5 percent of the GDP in Pakistan and it provides 13 percent of the overall employment (Economic Survey, 2009-10). The growth of this sector, in long run, has a very robust impact on the long run growth trajectory of growth in the economy.

Table 6: Pair-wise Granger Causality Test

Null Hypothesis	Obs.	F-Statistic	Probability
lnGINIdoes not Granger Cause lnGDP	34	2.31	0.12
lnGDP does not Granger Cause lnGINI		0.05	0.95
lnI does not Granger Cause lnG	34	1.25	0.30
lnGDP does not Granger Cause lnI		0.57	0.57
lnF does not Granger Cause lnGDP	32	1.35	0.28
lnGDP does not Granger Cause lnF		0.28	0.76
lnW does not Granger Cause lnGDP	34	8.66*	0.00
lnGDP does not Granger Cause lnW		2.93***	0.06
lnM does not Granger Cause lnGDP	31	0.98	0.37
lnGDP does not Granger Cause lnM		1.01	0.37
lnI does not Granger Cause lnGINI	34	1.04	0.37
lnGINI does not Granger Cause lnI		1.01	0.38
lnF does not Granger Cause lnGINI	32	0.25	0.78
lnGINI does not Granger Cause lnF		1.06	0.36
lnW does not Granger Cause lnGINI	34	0.90	0.42
lnGINI does not Granger Cause lnW		0.15	0.86
lnM does not Granger Cause lnI	31	3.46**	0.05
lnI does not Granger Cause lnM		5.72**	0.01
lnWdoes not Granger Cause lnF	32	0.29	0.75
lnF does not Granger Cause lnW		3.23**	0.05
lnM does not Granger Cause lnF	29	4.73**	0.02
lnF does not Granger Cause lnM		0.45	0.64
lnM does not Granger Cause lnW	31	2.06	0.15
lnW does not Granger Cause lnM		2.14	0.12

Note: *(**) Significant at 1%(5%) significance level.***Significant at 0.10 level.

When the variables are cointegrated there exist an associated Error Correction Mechanism (ECM) between the variables (Engle and Granger, 1987). The ECM estimates are shown in Table 5. The error correction term is -0.10 implies that 10 percent of the adjustment towards the long run equilibrium occurs within a year through changes in economic growth. This value is insignificant. Over all significance of the model can be adjudged by the R-squared and F-statics values of 0.71 and 2.45 respectively. Pair-wise Granger causality test results reported in Table 6 are evident that there exists bidirectional causality between worker remittance and economic growth in Pakistan. Bidirectional causality between manufacturing value added and inflation is also confirmed by the causality tests. Causality test results reveal that a unidirectional causality runs from foreign direct investment to worker remittances, and manufacturing value added to foreign direct investment.

4 Conclusion

The present analysis was attempted to explore the impact of inflation and income inequality on economic growth in Pakistan economy. The impacts of foreign direct investment, workers' remittances and manufacturing sector value added on growth were also analyzed by using annual time series data. Johansen cointegration approach was utilized to examine the brunt of the variables on economic growth. The study concluded a negative association between income inequality and economic growth in Pakistan. Furthermore, there is a growth stimulating impact of inflation, FDI, remittances, and manufacturing value added in Pakistan.

The results of the investigation show that income inequality is better for growth but higher income inequality is helpful to trickle down the growth benefits to the poor in the economy. The government economic policies should be focused on the redistribution of income through progressive taxation. Moreover, there is a dire need to address the causes of income inequality in Pakistan. Government should adopt the economic policy to mobilize financial resources and ensure the fruits of government expenditures to contribute to inclusive growth. Inflation is concluded to have growth stimulating impact in the economy. But higher levels of inflation adversely affect the poverty alleviating impacts of growth. The macroeconomic policy to stimulate sustainable growth, generated employment but with stable price levels would more suitable. The development of infrastructure and developed financial sector would not only help increase the domestic investment but also increase the FDI inflows into the economy. The increased inflows of worker's remittances through the banking channels would also be beneficial to lessen the financial constraints. The stimulated domestic investment and increased FDI inflows would be helpful in setting up strong manufacturing sector base. Development of strong manufacturing sector would set up the long run growth track of the economy.

References

Ahmad, Arslan, Najid Ahmad and Sharafat Ali (2013). Exchange Rate and Economic Growth in Pakistan (1975-2011). *Journal of Basic and Applied Scientific Research,* 3(8): 740-746.

Ahmad, N., A. Ahmad and M. F. Hayat (2013). Foreign Remittances and Economic Growth in Pakistan: An Empirical Investigation. *Journal of Basic and Applied Scientific Research,* 3(7): 813-819.

Ahmad, N., M. F. Hayat, M. Luqman and S. Ullah (2012). The Causal Links between Foreign Direct Investment and Economic Growth in Pakistan. *European Journal of Business and Economics,* Vol. 6: 20-21.

Ahmad, Najid and U. S. Joyia (2012). The Relationship between Inflation and Economic Growth in Pakistan: An Econometric Approach. *Asian Journal of Research in Business Economics and Management,* 2(9): 38-48.

Ahmed, Shamim, and Md. Golam Mortaza (2005). Inflation and Growth in Bangladesh: 1981-2005. Working Paper No. 0604. www.bangladeshbank.org.bd/research/pau.html

Ali, Sharafat (2013). A Cointegration Approach to Estimate Private Investment Demand Function of Pakistan. *Asian Journal of Research in Business Economics and Management,* 3(9): 1-13.

Andres, Javier, and Ignacio Hernando (1997). Does Inflation Harm Economic Growth? Evidence for the

OECD. NBER Working Paper Series, Working Paper No. 6062.

Barro, Robert J. (1995). Inflation and Economic Growth. In NBER Working Paper Series.

Bergten, C. F., T. Horst, and H. Moran (1978). American Multinationals and American Interests. Washington, DC: Brookings Institute.

Bittencourt, Manoel (2010). Inflation and Economic Growth in Latin America: Some Panel Time-series Evidence. Department of Economics Working Paper Series, University of Pretoria.

Bruno, Michael, and Easterly, William (1995). Inflation Crises and Long-Run Growth. National Bureau of Economic Research , Working Paper No. 5209.

Bullard, James, and John W. Keating (2005). The Long Run Relationship between Inflation and Output in Postwar Economies. Journal of Monetary Economics, 36: 477-496.

Chimobi, Philip Omoke (2010). Inflation and Economic Growth in Nigeria. *Journal of Sustainable Development,* 3(2): 159-166.

Economic Survey (1990-91, 2000-2001, 2006-07, 2011-12). Ministry of Finance, Government of Pakistan: Islamabad.

Engle, R. R. K. and C. W. Granger (1987). Cointegration and Error Correction: Representation, Estimation and Testing. *Econometrica*, 55:251-276.

Fischer, S. (1993). The Role of Macroeconomic Factors in Growth. Journal of Monetary Economics, Vol. 32: 485-512.

Granger, C. W. J. (1986), Developments in the Study of Co-integrated Economic Variables. *Oxford Bulletin of Economics and Statistics*, 48, p. 26.

Iqbal, Nasir, and Saima Nawaz (2010). Investment, Inflation and Economic Growth Nexus. Pakistan Institute of Development Economics. Available at: http://mpra.ub.uni-muenchen.de/27163/

Iqbal, Zafar and Abdus Sattar (2005). The Contribution of Worker's Remittances to Economics Growth in Pakistan. PIDE Research Report No. 187, Pakistan Institute of Development Economics (PIDE): Islamabad.

Johansen , S. and Juselius K. (1990). "Maximum Likelihood Estimation and Inference on Cointegration – with Approach to the Demand for Money". *Bulletin*, Volume 52. pp. 169-210.

Johansen S. (1991). "Estimation and Hypothesis Testing of Cointegration Vectors in Gaussian Vector Autoregressive Models'", *Econometrica*, Vol. 59, pp. 1551-80.

Johansen, S. (1988). "Statistical Analysis of Cointegration Vectors". *Journal of Economic Dynamics Control*, Vol. 12, pp. 231-54.

Johnston, J. and Dinardo, J. (1997). Econometric Methods. McGraw Hill Companies, Inc. 4th Edition: 244-286.

Jongwanich, Juthathip (2007). Worker's Remittances, Economic Growth and Poverty in Developing Asia and the Pacific Countries. UNESCAP Working Paper No. 01: United Nations.

Kenedy, C. R. (1992). Relationship between Transnational Corporations and Governments of Host Countries: A Look to the Future. *Transnational Corporations* 1:1, 67-91.

Khan, A. H. and Kim, Yun-Hwan, Kim (1999). Foreign Direct Investment in Pakistan: Policy Issues and Operational Implications. EDRC Report Series No. 66, Asian Development Bank: Manila.

Khan, Mohsin S., and Sehnadji, Abdelhak S. (2000). Threshold Effects in the Relationship between Iflation and Growth. IMF Working Paper No. 10.

Khan, Muhammad Arshad (2007). Foreign Direct Investment and Economic Growth: The Role of Domestic Financial Sector. PIDE Working Paper No. 18, Pakistan Institute of Development Economics (PIDE): Islamabad.

Lee, Chien-Chiang, and Shih Chien Wong (2005). Inflationary Threshold Effects in the Relationship between Financial Development and Economic Growth: Evidence from Taiwan and Japan. *Journal of Economic Development,* Vol. 30: 49-69.

Malik, Girijasankar, and Chowdhry, Anis (2001). Inflation and Growth: Evidence from Four South Asian Countries. Asia-Pacific Development Journal, 8(1): 123-135.

Malla, S. (1997). Inflation and Economic Growth: Evidence from Growth Equation. mimeo, Department of Economics, University of Hawai'I Monoa, Honolulu.

Mubarik, Yasir Ali (2005). Inflation and Growth: An Estimate of the Threshold Level of Inflation in Pakistan. State Bank of Pakistan-Research Bulletin, 1(1): 35-44.

Sarel, M (1995). Nonlinear Impacts of Inflation on Economic Growth. IMF Working Paper WP/95/56: Washington, D. C.

Sergii, P. (2009). Inflation and Growth: The Non-Linear Relationship. Evidence from CIS Countries. MA Thesis in Economics, Kyiv School of Economics.

Thirlwall, A. P., and C. A. Barton (1971). Inflation and Growth: The International Evidence. Bonca Nazionale del Lavoro Quarterly Review, Vol. 98: 263-275.

Voitchovsky, Sarah (2005). The Effect of Inequality on Growth: A Review of the Recent Empirical Literature. DFID Commissioned Study.

WDI (2012). World Development Indicators, World Bank: Washington.