

## Trade, Poverty and Inequality Nexus: The Case of Pakistan

<sup>1</sup>Rana Ejaz Ali Khan and <sup>2</sup>Hafiza Nadia Bashir

<sup>1</sup>Department of Management Sciences, COMSATS Institute of Information Technology, Sahiwal, Pakistan

<sup>2</sup>Department of Economics, The Islamia University of Bahawalpur, Pakistan

---

**Abstract:** The paper attempted to see the relationship between trade liberalization and poverty and inequality in Pakistan. For trade liberalization, volume of trade as ratio of GDP, head count ratio for poverty and Gini-coefficient has been used for income inequality. The granger causality technique is applied to time series data for the years 1975-2010. The results indicate that trade liberalization has no significant effect on poverty but poverty has negative effect on trade. However, trade has increased inequality in the country. It explained that gains from trade are not equally distributed among the rich and poor. Trade liberalization may be beneficial for the economy if it leads to a reduction in poverty and income inequality.

**Key words:** Pakistan • Trade liberalization • Income distribution • Poverty

---

### INTRODUCTION

The idea of trade liberalization is to follow neo-classical paradigm of free markets in order to achieve a variety of economic as well as social objectives. Free markets are assumed to be one of the key catalysts for growth and its determinants. Many studies have shown that trade is not only the engine of growth but it sustains growth [1, 2, 3]. Several plausible links in trade, poverty and inequality chain are postulated in theory, yet the reality is far more complicated and many links are absent in some countries. A number of studies argue that trade liberalization adversely affects the poor and threatens employment and living standards of the poor. For instance, Anwar opined that globalization did not lead to poverty reduction in Pakistan [4]. On the other hand, numerous studies claim that globalization reduces poverty [5, 6]. Besides showing a merely positive or negative relationship between poverty and trade liberalization researchers have revealed a more subtle relationship, which explains that in some cases trade liberalization may favor poverty reduction but in some other situations it may worsen poverty.

The researchers argue that poor do not share in the gains from trade particularly in countries with an abundance of unskilled labor. They may be more likely to share in the gains from trade liberalization when they enjoy maximum mobility, especially from contracting

sectors of the economy into expanding ones. In agrarian economies, gains likewise arise when poor farmers have access to credit and technical know-how, when they have social safety nets like income support and when food aid is well targeted.

Pakistan enjoyed historically unprecedented average annual growth rate of GDP and remained engaged in opening the economy to foreign trade and investment over 1980 to 2010. The effect is not entirely attributable to trade liberalization as it introduced domestic economic reforms allowing a greater role for markets and the private sector in the economy, but trade liberalization no doubt has played a large role. The country may be a good specimen to analyze the relationship between trade liberalization, poverty and inequality and to see whether poor have gained from trade or not. The precise objective of the study is to see the causal relationship between trade and poverty as well as trade and inequality in Pakistan.

**Literature Review:** The empirical evidence on the relationship between globalization (broadly defined) and poverty in the developing countries is discussed by Figini and Santarelli [7]. To measure globalization they used, among others, standard indices of trade openness, financial openness and privatization. For poverty they used both indices of relative and absolute poverty averaged over five and ten years. Both descriptive

statistics and econometric analysis have been used to sketch the complex framework of relationships. They concluded that trade openness has not significantly affected relative poverty, while financial openness tended to be linked with higher relative poverty.

Rama reviewing the literature on trade openness concluded that wages have grown faster in economies that integrated with the rest of the world. Trade openness could have a negative impact on wages in the short-run but it may take a few years to change the sign [8]. Jaumotte, et. al. examined the role of trade and financial globalization towards inequality in a group of countries. The study concluded that trade resulted into a reduction in inequality, while financial globalization (and foreign direct investment in particular) increased it [9]. Hussain, *et al.* concluded that openness of economies have positively affected the distribution of income in developing countries. However, the change in countries' trade exposure and world market may negatively affect the distribution of resources with in the countries [10].

Majority of the studies concerning trade liberalization are panel data studies of groups of countries. A few studies existed on time series analysis of a particular economy. One of them is the analysis of trade, growth and inequality in Bangladesh by Nath and Al-mamun [11]. The empirical results from vector autoregression (VAR) model evidenced that trade has accelerated growth in Bangladesh. But it is also evidenced that trade has affected income distribution.

**Data and Model Specifications:** We are concerned with the relationship between trade liberalization, poverty and inequality in Pakistan. For trade openness we used the proxy of (Imports + Exports) as share of GDP. Head count ratio has been used for poverty and Gini coefficient for income inequality. The annual time series data for the years 1975-2010 has been taken from Economic Survey of Pakistan by State Bank of Pakistan. Such type of data is usually non-stationary, for meaningful results, first difference of all variables should be stationary. If variables are non-stationary, they inflate  $R^2$  and  $t$  scores, in this condition regression known as spurious regression means the results become meaningless. Augmented Dickey-Fuller test (ADF) is a standard unit root test. It analyzes the order of integration of the data series.

Engle and Granger pointed out that only variables with the same order of integration could be tested for cointegration [12]. Having established that all of these variables are integrated at one level, we proceeded to determine the order of integration of series for the analysis of long-run relationships between trade,

poverty and inequality. Johansen cointegration test [13, 14] is used to test the long-run movement of the variables. It is based on the maximum likelihood estimate of the K-dimensional vector Auto regression.

Two tests for cointegration have been given in the literature [12, 14]. In the multivariate case, if the  $I(1)$  variables are linked by more than one co-integrating vector, the Engle-Granger procedure is not applicable. The test for cointegration used here is the likelihood ratio forward by Johansen and Juselius [14], indicating that the maximum likelihood method is more appropriate in a multivariate system. Therefore we used this method to identify the number of co-integrated vectors in the model.

Finally, we used the Granger causality test to analyze the causality between variables which are integrated order one,  $I(1)$  and there is cointegration relationship between them. It is based on error correction model (ECM) in which the movement of the variables in any period is related to previous period. ECM measures the correction from disequilibrium of the previous period. ECM is formulated in term of first difference which typically eliminates trends from the variables which may raise the problem of spurious regression. ECM comes from the fact that the disequilibrium error term is stationary variable.

For the short-run, causality is tested by using Toda and Yamamoto's technique [15]. It has some advantages, i.e. it proposed a simple procedure requiring the estimation of VAR and the Wald Statics is valid regardless whether a time series is cointegrated or not. In this method first we set the optimal lag from VAR system then we use Toda Yamamoto technique to check the causality. The optimal lag is  $(k+d_{\max})$  where  $d$ =maximum order of integration while  $k$ =optimal lag determine by VAR. The Wald Test Static asymptotically distribute chi-square, with degree of freedom equal of the number of "zero restriction", irrespective of  $I(0)$ ,  $I(1)$ , or  $I(2)$ .

**Empirical Results:** We empirically estimated whether a statistically significant relationship exists between trade liberalization, poverty and inequality in the long-run. The preliminary step in this analysis was establishing the degree of integration of each variable. For the existence of a unit root in the level and first difference of each of the variables of our sample we used the Augmented Dickey Fuller (ADF) test. ADF test statistics check the stationarity of series. The results presented in Table 1 reveal that all variables are non-stationary in their level data. However, stationary is found in the first differencing level of the variables trade, poverty and inequality.

Table 1: Results of Unit Root Test for Trade, Poverty and Inequality

Variables	Level		First difference	
	T-values	Critical value	T value	Critical value
Trade	-4.377315	-3.548490	-6.618301*	-3.548490
Poverty	-1.307299	-3.544284	-4.377315*	-3.548490
Inequality	-3.418531	-3.544284	-7.216408*	-3.548490

\* significant at 5 percent level of significance

Table 2: Results of Lag Order Selection Criteria for Trade and Poverty

Lag	AIC	SC
0	11.43648	11.52717
1	8.731472*	9.003564*
2	8.756100	9.209588
3	8.827693	9.462575

\* indicates lag order selected by the criteria

AIC: Akaike information criterion. SC: Schwarz information criterion

Table 3: Result of Selection of Optimal Model for Trade and Poverty

Rank or no of CEs	Akaike's Information Criteria	Schwartz Bayesian Criteria
	None intercept no trend	None intercept no trend
0	9.255225	9.434796
1	8.919857*	9.323894*
2	8.984995	9.613497

\* Optimal model in both AIC and SC criteria.

Table 4: Results of Cointegration Test for Trade and Poverty

Null-Hypothesis	Trace-Test values	5 Percent Critical Value	Maximum Eigen- values	5 Percent Critical Value
None * R=0	29.18779	20.26184	21.40250	15.89210
At most 1	7.785291	9.164546	7.785291	9.164546

Trace test and Max-eigen value indicates 1 cointegrating eqn(s) at the 0.05 level

\*denotes rejection of the hypothesis at 5 percent level of significance

Table 5: Result of Short-run Causality for Trade and Poverty (Wald Test Statistics)

Dependent variable: Trade			
Excluded	Chi-sq	df	Prob.
Poverty	6.642365	2	0.0361
All	6.642365	2	0.0361
Dependent variable: Poverty			
Excluded	Chi-sq	df	Prob.
Trade	1.762453	2	0.4143
All	1.762453	2	0.4143

Table 6: Results of Long-run Causality between Trade and Poverty based on ECM

Hypothesis	EC term (T-statistics)
Trade does not effect poverty	0.08761
Poverty does not effect trade	-5.17165*

\*denotes rejection of the hypothesis at 5 percent level of significance

Table 7: Result of Lag Order Selection Criteria for Trade and Inequality

LAG	AIC	SC
0	10.42090	10.51159
1	7.007229	7.279321
2	6.563459*	7.016946*
3	6.590247	7.225129

\* indicates lag order selected by the criteria

AIC: Akaike information criterion. SC: Schwarz information criterion

Table 8: Results of Selection of Optimal Model for Trade and Inequality

Rank or No of CEs	Akaike's Information Criteria	Schwartz Bayesian Criteria
	Linear intercept trend	Linear intercept trend
0	6.876294	7.329781
1	4.877217*	5.557448*
2	5.086642	5.993616

\* Optimal model in both AIC and SC criteria

Table 9: Results of Cointegration Test for Trade and Inequality

Null-Hypothesis	Trace-Test values	5 Percent Critical Value	Maximum Eigen- values	5 Percent Critical Value
None *	79.05854	25.87211	75.96954	19.38704
At most 1	3.088997	12.51798	3.088997	12.51798

Table 10: Results of Short-run Causality for Trade and Inequality

Dependent variable: Trade			
Excluded	Chi-sq	df	Prob.
Inequality	1.562217	2	0.4579
All	1.562217	2	0.4579
Dependent variable: Inequality			
Excluded	Chi-sq	df	Prob.
Trade	14.69536	2	0.0006
All	14.69536	2	0.0006

Table 11: Results of Long-run Causality between Trade and Inequality

Hypothesis	EC term (T-Statics)
Trade does not effect inequality	14.2538*
Inequality does not effect trade	1.63874

\*denotes rejection of the hypothesis at 5 percent level of significance

**Trade and Poverty:** The results of lag under selection criteria for trade and poverty in Pakistan are shown in Table 2. The optimal lag is 1 here. The results of selection of optimal model for trade and poverty are shown in Table 3.

For the cointegration between trade and poverty, the results of Johansen Cointegration analysis are shown in Table 4 where both the maximum Eigen value and trace-test value examine the null hypothesis of no-cointegration against the alternative of cointegration. For the null hypothesis of no-cointegration ( $R = 0$ ) among the variables, the trace-test statistics is 29.18, which is above the 5% critical value of 20.26 and the Maximum Eigen value statistics is 21.40 that is above the 5% critical value of 15.89. Hence null hypothesis is rejected in favor of the general alternative. It reveals that there exists cointegration (long-run relation) between trade and poverty.

The analysis supports the proposition that there exists a stable long-run relationship among trade and poverty in Pakistan. Once cointegration is established, then VAR causality can be estimated to determine the cause and effect behavior of trade liberalization on

poverty. The results of the short-run and long-run causality are presented in Tables 5 and 6.

The estimates in Table 5 and 6 show that trade has no significant impact on poverty however poverty affects the trade in the long-run.

**Trade and Inequality:** The results of the lag under selection criteria for trade and inequality are shown in Table 7 and the results of selection of optimal model for trade and inequality are shown in Table 8. The results show that optimal lag is 2 in both AIC and SC criteria.

Trace test and Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level\*denotes rejection of the hypothesis at the 0.05 level.

The results of Johansen cointegration analysis are shown in Table 9. The trace-test statistics is 79.05, which is above the 5% critical value of 25.87 and the Maximum Eigenvalue statistics is 75.96 that is above the 5% critical value of 19.38. Hence it rejects the null hypothesis in favor of the general alternative. It explains that there is cointegration (long-run relation) between trade and inequality.

The Table 10 and 11 show that trade has an impact on inequality in the short as well as long-run.

## DISCUSSION AND CONCLUSION

In the present study we have focused on a key issue of economic development, i.e. the effect of trade liberalization on poverty and inequality in Pakistan.

Our results have shown that trade liberalization has no significant effect on poverty in Pakistan, although theoretically free markets should provide the opportunities for poor. The postulated link between trade liberalization and poverty is missing in reality. On the other hand the poverty has a significant negative impact on trade. The low capital formation, low investment, poor human capital resulted into high cost of production and lower production level. It requires extensive reforms to be made by the government in all areas of economic as well as social sector, including health, education and social safety to reduce poverty and ultimately boost the trade.

Trade liberalization may be beneficial for the economy if it lead to reduction in income inequality. Our results have shown that trade liberalization has negatively affected the income equality in the economy. It makes the relationship between trade liberalization, poverty and inequality more complicated. If the government tries to eliminate poverty and ultimately augment the trade, there would be an increase in income inequality. Such type of results explains the differing structure of the economy to others. Pakistan is an agrarian with a bulk of unskilled labor force, mounting fiscal deficit, heavy burden of foreign debt, poor infrastructure, political instability along with deteriorating law and order situation. All of them may contribute to negative impact of trade on income inequality. Trade liberalization has affected different sectors of the economy differently. The agriculture sector along with informal sector and small and medium enterprises which absorb bulk of the unskilled labor force have been worsely affected by liberalized trade. Anwer explained that consumers benefited from cheaper imports but non-poor consumers benefited more from import liberalization [4].

## REFERENCES

1. Dreher, A., 2002. Does Globalization Affect Growth. *App. Econ.*, 38: 1091-1110.
2. Dollar, D. and A. Kraay. 2000. Trade Growth and Poverty. *The Econ. J.*, 114(493): 22-49.
3. Craft, N., 2000. Globalization and Growth in the Twentieth Century. IMF Working Paper No. 00/44. Research Department, International Monetary Fund (IMF), Washington, D.C.
4. Anwar, T., 2002. Growth and Sectoral Inequality in Pakistan: 2001-02 to 2004-05. *Pak. Econ. and Soc. Rev.* 45(2): 141-154.
5. Dollar, D. and A. Kraay, 2001. Growth is Good for Poor. *J. of Int. Econ.*, 55: 391-409.
6. Neutel, M. and A. Hesmati, 2006. Globalization, Inequality and Poverty Relationship: A Cross Country Evidence. IZA Discussion Paper No.2223. Institute for Study of Labor (IZA), Germany.
7. Figini, P. and E. Santarelli, 2006. Openness, Economic Reforms, Poverty and Globalization in Developing Countries. *J. Dev. Areas.*, 39(2): 129-151.
8. Rama, M., 2003. Globalization and Workers in Developing Countries. Policy Research Working Paper 2958. Development Research Group, The World Bank, Washington, D.C.
9. Jaumotte, F., S. Lall and Papageorgiou, 2008. Rising Income Inequality: Technology or Trade and Financial Globalization. IMF Working Paper No. 08/185. International Monetary Fund (IMF), Washington, D.C.
10. Hussain, S., I.S. Chaudhary and M. Hassan, 2009. Globalization and Income Distribution: Evidence from Pakistan. *European Journal of Social Sciences*, 8(4): 683-691.
11. Nath, H. and K. Al-mamun, 2004. Trade Liberalization, Growth and Inequality in Bangladesh: An Empirical Analysis. Working Paper, Department of Economics, Southern Methodist University, Dallas.
12. Engle, R. and C. Granger, 1987. Cointegration and Error Correction: Representation, Estimation and Testing. *Econometrica*, 55: 251-276.
13. Johansen, S., 1988. Statistical Analysis of Cointegration Vectors. *Journal of Economic Dynamics and Control*, 12: 213-254.
14. Johansen, S. and K. Juselius, 1990. Maximum Likelihood Estimation and Inference on Cointegration with Application to the Demand for Money. *Oxford Bulletin of Economics and Statistics*, 52: 169-210.
15. Toda, H.Y. and T. Yamamoto, 1995. Statistical Inference in Vector Autoregression with Possibly Integrated Processes. *The Journal of Econometrics*, 66: 225-50.