Nexus of Trade, Investment and Poverty: Evidence from Pakistan

Amber, Fatima and Muhammad, Shahbaz and Faridul, Islam

Federation of Pakistan, COMSATS Institude of Information
Technology, Lahore, Pakistan, Utah Valley University

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Amber Fatima
Economist
Federation of Pakistan
Chambers of Commerce and Industry
Email: amber_aerc@hotmail.com

Muhammad Shahbaz
COMSATS Institute, Lahore, Pakistan
Email: shahbazmohd@live.com
Phone: +92-334-366-4657

Faridul Islam
Professor of Economics
Woodbury School of Business
Utah Valley University
Orem, UT 84058-5999
Email: Faridul.Islam@uvu.edu
Phone: 801-863-8858

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ABSTRACT

Poverty alleviation, a complex multidimensional phenomenon, is among the most formidable challenges for policymakers in developing nation. Despite mixed results on the long term impact on poverty, the general view is that if implemented and managed carefully, trade and investment can help promote economic growth and alleviate poverty. The paper empirically examines the impact of trade and investment on poverty alleviation in Pakistan by employing the Johansen-Juselius (1990) approach to cointegration for a long run relation; and the error correction mechanism for the short run dynamics. The results suggest that poverty alleviation policy has brought fruition in Pakistan and helped achieve the objective both in the short and the long run. The findings should help policymakers determine appropriate strategy in addressing the economic growth vis-à-vis poverty. While investment is a key to promoting economic growth, trade openness can also help by improving business climate through access to modern capital and technical know-how; and lead to sustained economic growth in Pakistan.

1. Introduction

Poverty alleviation is a major goal of development policy. However, achieving the goal is among the most formidable challenges facing developing nations. Recent experience from many developing economies, notably in the south Asian region[1], suggests that trade expansion combined with enhanced investment have been central to alleviating poverty (Gillson and Page, 2004). The Millennium Development Goals (MDGs) list poverty alleviation as an important policy objective, which has won the support of the international agencies (Cicowiez and Conconi, 2008).The nations that have implemented and carefully managed liberal market policy are flying in the high tide of globalization. By opening markets to the world, these nations have created ground for increased exports; align imports to the stated domestic goals; and promote investment–domestic and foreign–thereby boosted per capita income and reduced poverty (Short, 2000). The East Asian miracle is often cited as evidence for the theory.

Success in poverty reduction goals depends on how the gains from trade and investment are distributed among different sectors (Gillson and Page, 2004). Investment, trade, and poverty reduction nexus works through different channels e.g., expansion of agricultural and industrial production; employment generation; and efficient resource allocation to support pro-growth trade regimes, *inter alia*. Cockburn and Giordano (2008) argue that trade helps technology diffusion; increases specialization; brings institutional changes; promotes innovation; and adds to global competitiveness. Dodzin and Vamvakidis (2004) note that trade openness leads to increased industrial value added[2], something that conflicts with the long cherished infant industry argument. Winters (2002) demonstrated that trade can affect poverty through economic growth-enhancing effects[3]. Dynamism in a growing economy can be brought through trade which leads to better utilization of resources and expansion of productive capacities. As the economy grows, interaction with imported modern technology and managerial skill helps expansion of output and domestic skill formation. Investment in lowers transport cost and helps economic growth and thus reduces poverty[4]. Good physical infrastructure links production centers with markets and thus eliminates the need for middlemen.

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[1]Trade can reduce poverty if trade led growth is inclusive and broad based.
[2]The literature on trade openness and growth is extensive (see Krishna, 2003, e.g., for a review).
[3]Authors such as, Bhagwati and Srinivasan (2002) have provided a sound theoretical argument on this.
[4]An emerging literature points to the export (and import) led growth and growth led export as viable policy option.

The effects of trade policy, particularly on export expansion and higher investment on poverty reduction are neither automatic nor straightforward. The ability of a nation to benefit from trade and investment depends on a number of factors e.g., extent of trade and financial openness, productive capacity, access to global market, and presence of complementary domestic environment, among others. While trade-openness is a major conduit for enhancing incomes and living standards, additional efforts are needed to alleviate mass poverty [Winters, 2000; David and Schott, 2005]. The idea of pursuing economic growth via trade and investment falls broadly under what is known as globalization. "Economic globalization constitutes integration of national economies into the international economy through trade, direct foreign investment (by corporations and multinationals), short-term capital flows, international flows of workers and humanity generally, and flows of technology…" (Bhagwati, 2004, p. 440). However, in most cases, the relative roles and perspectives in the context of under-utilized resources in developing nations are not well understood.[5]

The objective of the present paper is to empirically investigate a long run relation among investment, trade and poverty alleviation in Pakistan by implementing Johansen and Juselius (1990) approach to cointegration and the error correction techniques. The theoretical basis for the relationship derives from the macroeconomic-growth literature where investment is seen as an important determinant of economic growth. Also, the effect of export earnings on the economy is similar to investment. However, despite the importance placed on the series, the literature on the dynamics of trade and globalization and how they impinge on the evolving inequality within and among nations is less clearly understood. This relationship has been under scrutiny in recent times, but the answer is best left to empirical determination. The paper provides further evidence on the relationship from Pakistan, an emerging nation of 175 million people in the Indian Sub-continent. The impact of liberalization policies on the trend in income disparity in Pakistan has been less than satisfactory, despite remarkable economic growth. A sizeable part of the population is still living in abject poverty– in some cases desperate –without a real sign of abating in the foreseeable future. The research will help to identify viable strategy for economic growth and cope with rising poverty which is a social evil and needs be brought down.

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[5]Export expansion requires a viable investment–export nexus. In developing economies the presence of a large informal sector and balance-of-payments problems can pose serious constraints in expanding import capacity which in turn can impede export.

Hasan and Siddiqui (2010) examined the effect of trade on poverty reduction in Pakistan by incorporating economic growth, investment, inflation, urbanization and growth in the agriculture sector. Agriculture accounts for over a fifth of the GDP in Pakistan. Thus inclusion of agriculture in addition to GDP can potentially cause multicollinearity which casts serious doubt on the inferences. Despite the econometric shortcoming, their results showed cointegration among the series. The findings suggest that economic shocks, economic growth and inflation exert positive impact on poverty; but investment and urbanization reduce poverty. Growth in the agricultural sector directly benefits the rural population who happen to be mostly poor. They also found that trade significantly reduces poverty which lends support to the trade led poverty reduction hypothesis. Our paper carefully avoids the econometric challenges; and the specification appears well justified in the context of Pakistan. Pakistan has been a major recipient of FDI in recent decades which makes the series particularly relevant for inclusion as a variable. We find that investment, exports and foreign direct investment lowers poverty. A rise in inflation and population adds to poverty. Economic growth and education lowers poverty in the short run; and the long run relationship holds over the study period. As export-oriented economy, exports offer better measure for economic growth compared to trade (exports + imports). Hassan and Siddiqi (2010) ignored the role of population, education and foreign direct investment which can be major players in poverty alleviation in Pakistan; something we included in our model. While Hassan and Siddiqi (2010) reported absence of trickle-down effect, we find the opposite.

The rest of paper is organized as follows. Section-2 briefly describes the Pakistan economy. Section-3 reviews the literature on investment-poverty and trade-poverty nexus. Section-4 describes sources of data and empirical methodology. Section-5 reports the results. Conclusion and policy prescriptions are offered in section 6.

2. The Economy of Pakistan

Pakistan's economy is predominantly agricultural with limited industrial base. The national investment policy aims at creating a friendly climate to encourage foreign direct investment (FDI) by further opening of the economy. Pakistan suffered a major political and economic setback from the civil war in 1971. The war ended with the creation of an independent nation, Bangladesh out of the ruins of what was formerly known as East Pakistan.

Pakistan was among the few developing nations in the region with an annual average real economic growth rate of 4.8% in the 1970's. The decade was hallmarked by a policy of broad

nationalization. During this period public investment doubled; but at the expense of crowding out of private investment. Military dictatorship came to power in 1977, which destroyed the political institutions. The military rulers overturned the nationalization policy to encourage private sector. Pakistan adopted export promotion as the strategy for sustainable economic growth in the 1970s and the 80s, marking a major shift away from the earlier policy of import substitution. Pakistan's economy performed remarkably well in the 1980s when the economy grew at 6.5% as a result of significant export growth and FDI inflow. Poverty reduced by 7%.

Table -1 Poverty in Pakistan

Poverty Estimates	1990-91	1998-99	2000-01	2004-05	2005-06
Poverty line (Rs)	276.7	673.54	748.56	878.6	944.47
Poverty Head count (percent)					
Pakistan	26.1	30.6	34.5	23.9	22.3
Urban	26.6	20.9	22.7	14.9	13.1
Rural	25.2	34.7	39.3	28.1	27.0
Poverty Gap					
Pakistan	NA	6.4	7.0	4.8	4.0
Severity of Poverty					
Pakistan	3.1	1.5	2.1	1.5	1.1

Source: Pakistan Integrated Household Survey, Economic Survey of Pakistan (various issues).

Early in the 1980's the Pakistan government borrowed heavily to finance its expenditure. The huge budget deficit coupled with chronic adverse balance of payment forced the government to seek International Monetary Fund's (IMF) assistance in the form of Structural Adjustment Program in 1987. The democratic government restored in 1988 after prolonged military rule, initiated policies of liberalization, deregulation and privatization. Poor federal policies and endemic government corruption reversed the declining trend of poverty late in the 1990s. Under the directive of the IMF, Pakistan prepared an Interim Poverty Reduction Strategy Paper outlining a set of measures to be taken. In line with the IMF guideline, Pakistan pursued three structural adjustment programs between 1988 and 1999. The ongoing political instability and chaos stood on the way of poverty alleviation. As an upshot of these programs, Pakistan ended up with a huge burden of external debt in the 1990's and continued much beyond.

Before 1997, only manufacturing sector was opened to foreign investment. With the liberalization policy in full throttle, other sectors were added to the list. In the wake of Pakistan entering the nuclear club in 1998, the international community froze foreign currency accounts and imposed sanctions which cast a dark cloud over investment prospects. The economic revival

plan of 1999, aimed at boosting investors' confidence, required strict adherence to the IMF guidelines. Political instability and poor governance during the decade raised poverty from 26.1% in 1990 to 35% in 2001. This shows that trickle down impact of increased investment could not reach the poor due to poor implementation of policies. In 2001 government again adopted a poverty reduction strategy in response to the rising trend in poverty of the 1990s. The strategy also aimed at accelerated economic growth by maintaining macroeconomic stability, investing in human capital, identifying areas for improved governance, and expanding social safety nets. As for the relevance of macro policy in general, Bhagwati and Srinivasan (2002) wrote, "We believe that this is the correct causal way to regard the link between macroeconomic stability and trade performance: there are several cases of macroeconomic stability and absence of a policy of outward orientation, such as the Communist countries and India, but none of successful outward orientation and absence of macroeconomic stability."[6] (fn. 3, p 180).

Table- 2 Investment and Trade Scenario in Pakistan

| Years	Private investment as % of GDP	Public Investment as % of GDP	FDI as % of GDP	Export as % of GDP	Import as % of GDP	Poverty
1980-81	7.8	9.4	0.30	10.0	19.8	28.23
1985-86	7.9	8.5	0.32	9.23	18.7	22.47
1990-91	8.5	8.5	0.69	13.0	18.5	26.1
1995-96	9.0	8.2	1.10	13.2	19.0	30.6
2000-01	10.2	5.7	0.82	12.4	14.2	34.5
2004-05	13.1	4.3	1.38	13.2	17.1	23.9
2005-06	15.7	4.8	2.76	13.0	19.4	22.3
2006-07	15.4	5.6	3.60	11.9	18.5	23.9
2007-08	15.0	5.4	3.13	12.2	21.5	23.9
2008-09	13.2	4.9	2.21	9.6	16.1	21.0

Source: Economic survey of Pakistan (various issues) and Handbook of Statistics on Pakistan Economy, **2010**, State Bank of Pakistan (the central bank).

After the events of 9/11, Pakistan joined the US in the war on terror. In response, the foreign governments increased assistance to Pakistan; and the economy began to show positive changes. Sizeable foreign capital inflows helped produce 6% average real GDP growth. Foreign

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[6]For explanation of why outward orientation produces better outcome in overall economic performance than without it, is the required macroeconomic stability see Bhagwati's (1978) synthesis volume for the Bhagwati-Krueger NBER project in the 1970s on trade strategy in developing countries. This also counters the Rodrik's argument on the importance of macroeconomic stability, not outward orientation, for better performance. Bhagwati (2001) argues that Rodrick got the causality wrong.

exchange reserves rose to record highs, something not seen in the entire history; and poverty again declined to 22% in 2008. The economic reforms in Pakistan initiated in 2003 attracted a large portion of the global private equity investments. This outcome was possible largely due to the government assurances of economic stability, and guarantee to repatriate profits. These assurances boosted foreign investors' confidence; and foreign funds began to flow to Pakistan.
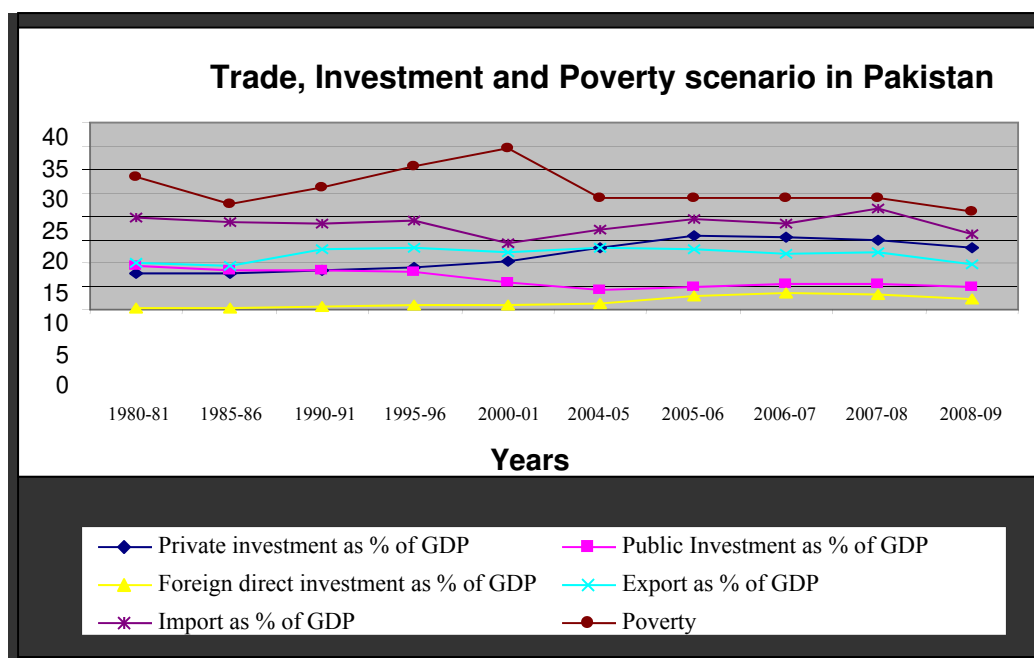
The challenges to poverty alleviation are staggering. Pakistan targeted to halve poverty by 2015 as part of achieving the MDG goal. Pakistan ranks among the lowest third in the Global Competitiveness Index (GCI), an appalling 101 out of 134 countries, compared to 74th it held in 2006. The reasons are: internal inefficiencies, high cost of capital and of doing business, poor governance, a lack of export diversification, low productivity, poor quality control standards, and poor infrastructure. Pakistan's low ranking mirrors the struggle by many export industries. The global financial meltdown, energy crisis, rise in insurgency and extremism, political infighting contributed to further damage of any remaining optimism about investment opportunities.

3. Review of Literature

A body of theoretical and empirical literature supports the hypothesis that trade and investment help poverty alleviation. In this section we review some relevant literature under two broad heads: (a) investment and poverty; and (b) trade and poverty.

3.1 Investment and Poverty

Among the time series studies Fan et al. (1999, 2000, 2002 and 2004), Thorat and Fan (2007) examined the effects of different types of government expenditure on rural poverty and economic growth.[7] They found that government spending on agricultural R&D, irrigation, rural education and infrastructure (roads, electricity, and communication) contributes to agricultural growth and also lowers rural poverty[8].

Using household survey data, Fan et al. (2005) examined the impacts of public investment on poverty in Tanzania. They reviewed region specific investment to identify sectors where the returns were the highest. In many localities returns to investments are still high; without any sign of diminishing marginal returns set in. Fan and Zhang (2008) estimated the effects of government expenditure on agricultural growth and rural poverty in Uganda[9]. The authors found that public spending on agricultural research and extension work increased agricultural production substantially; had the highest returns and the largest assessed impact on poverty reduction. Spending on rural roads also had significant marginal impact on rural poverty reduction.

Okpe and Abu (2009) examined the effects of FDI on poverty in Nigeria during 1975-2003. They found that foreign loan to Nigeria significantly alleviated poverty. They suggested that policy should encourage improvement in infrastructural facilities, particularly in the rural areas; and inflow of foreign resources[10]. Tanga (2009) found that China's investment and trade with Lesotho played significant role in reducing poverty of the latter.

Among the cross section studies, Torm (2003) noted that strategy for poverty reduction and economic growth should be employment-intensive. Economic growth should focus on the high-productivity sectors such as, industry and services. History shows that economic growth and expansion of employment have moved hand in hand alongside growth in productivity and real wages in the transitional economies. Anwar (2004) argues that national saving should be invested efficiently in physical infrastructure and human capital formation. Both have helped to generate employment and reducing poverty in Pakistan and other south Asian nations. Anderson et al (2006) explored the linkages among public investment, economic growth and poverty

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[7]Thorat and Fan (2007) investigated for China and India, Fan et al (1999) investigate evidences for India and Fan et al (2000) & (2004) investigated for china.
[8]Different types of investments yield different poverty and production effects, and these impacts vary greatly across regions.
[9] They used district-level data for 1992, 1995, and 1999.
[10] Foreign loan should be highly discouraged because it has negative impact on economy.

reduction in developing countries. They found that public capital is more effective in reducing poverty and helping growth by complementing private capital and other factors of production[11].

Khan (2007) explored the nexus of employment growth, economic growth and, the rate of change in poverty for 16 sample countries[12]. He found that reduction in poverty has consistently been below its potential perhaps, due to low rate of employment intensity and economic growth. Using cross-sectional data for 87 countries from 1980-94, Addison and Wodon (2008) found that macroeconomic volatility depresses investment, lowers economic growth and worsens poverty. In comparing Nigeria to other high growth nations, they found that much of the growth differential can be attributed to Nigeria's higher macroeconomic volatility.

3.2 Trade and Poverty

Economists however, are split on the effect of 'openness' on poverty reduction. The favorable effects of trade liberalization on poverty reduction depend upon the specific country conditions. Berg and Krueger (2004) studied the significance of trade policy on poverty reduction. They considered the changes in average income growth; and its effect on income distribution for a given rate. They found that trade openness contributes to economic growth. Trade policy is a major determinant of economic growth and is helpful in poverty reduction. Decades ago, Robertson (1940) characterized trade as an "engine of growth". "… the central argument has proceeded in two steps: trade promotes growth; and growth reduces poverty. In regard to the former, there are ample precedents for this hypothesis." (Bhagwatiand Srinivasan 2002, p.180). Winters et al., (2004) note that the impact of trade liberalization on poverty depends on the environment in which it is carried out, including the presence of supporting policies. Harrison and McMillan (2007) examined the linkages between globalization and poverty.[13] They conclude that the poor are more likely to gains from globalization if complementary policies are in place.[14] Trade and foreign investment reforms can benefit the poor who are engaged in the export sectors, or sectors that receive foreign investment. However, financial crises can be devastating on the poor.

There are also others who are concerned at the worsening of poverty in many parts of the world. Bhagawati (2001) writes, "While freer trade, or "openness" in trade, is now widely

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[11]There is a need to be careful about the choice of optimal investment level and allocation across sectors.
[12] This study was carried out by the United Nations Development Program and the International Labour Organization.
[13]They focused on two measures of globalization: trade and international capital flows.
[14] Simple interpretation of general equilibrium trade models is misleading.

regarded as economically benign, in the sense that it increases the size of the pie, the recent anti-globalization critics have suggested that it is socially malign on several dimensions, among them the question of poverty. Their contention is that trade accentuates not ameliorates, deepens not diminishes, poverty in both the rich and the poor countries. The theoretical and empirical analysis of the impact of freer trade on poverty in the rich and in the poor countries is not symmetric, of course." (p. 180).

Annabi et al. (2005) developed an integrated dynamic CGE model to examine poverty, inequality and trade liberalization in Senegal. They found that tariff removal increases poverty and inequality in the short run. In long run capital accumulation brings substantial welfare gain by reducing poverty. A decomposition of poverty by urban and rural shows that income distribution worsens if the gains favor the urban dwellers. Biswas and Sindzingre (2006) examine the relationship between export promotion, import substitution and poverty management for the post-reform India by using trade indices. They found that a combination of export-promotion and import-substitution policies is good for managing poverty, relative to an exclusively inward or outward looking policy. The states in India that adopted a mixed policy performed better in poverty management compared to those who adopted one or the other.

Malik (2006) argues that trade and investment policies alone may fall short in achieving poverty reduction goals in Pakistan. Developing nations need to ensure competitiveness in a global world[15] and be aware that in a globalized world new institutions and processes can help achieve efficiency. The forward and backward market linkages –domestic or global–are needed to create favorable investment climate; and an inclusive approach to economic growth. Shahbaz et al., (2007) examined the relationship between trade liberalization and poverty in Pakistan[16]. They found that the former has cumulative effect on poverty reduction in the long-run; but not in the short run. Low poverty is associated with lower tax and high FDI inflow. Shahbaz (2008) also found that globalization can help to reduce poverty.

Agenor (2004) investigated the impact of globalization on poverty in developing nations. He explored various channels of trade openness and financial integration that affect the poor. He found an inverted-U relationship between globalization and poverty; i.e., globalization increases

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[15] This requires reasonably good investment climates in which firms, particularly small domestic ones can start up, prosper, and expand. Good governance—control of corruption, well-functioning bureaucracy and reasonable regulation, contract enforcement, and protection of property rights —is an important pre-condition without which globalization cannot achieve the twin objectives of growth and poverty reduction.
[16] To measure trade liberalization, they used standard indices of trade openness, financial openness and public intervention in the country, the other variable for used for poverty measurement (head count ratio) and GDP per capita controlled for economic growth.

poverty initially, but declines after the economy is fully integrated. Tasi and Huang (2007) found direct and indirect impact of trade on poverty reduction in Taiwan, but did not find FDI helpful in reducing poverty of the bottom 20% population.

Cicowiez and Conconi (2008) examined the link between trade, growth and poverty in developing nations. They argue against openness as a policy tool to reduce poverty; but advocate barrier removal so that the poor can participate in economic activity. Gauci and Karingi (2008) studied the effect of trade on poverty in Africa. They found that Africa's share in world trade has been falling despite the claim that trade liberalization is necessary for economic growth and poverty reduction. The magnitude of poverty is not homogenous across and within nations; rather dependents on access to resources, physical infrastructure, and vertical and horizontal integration of the export sector, and the extent of subsistence sector in the economy.

Mujeri and Khondker (2002) applied general equilibrium approach to examine the impact of trade liberalization on poverty reduction in Bangladesh. They found that the former reduces the latter. The income distribution improves due to the trickle-down effect. Osmani (2005) found that reduction in poverty takes effect by increasing demand for both skilled and unskilled labor. The rise in wages enables the poor to come out of poverty cycle which lends support to Mujeri (2002). Raihan (2008) found that trade liberalization creates employment opportunities in the export industries and thus reduces poverty; but and import-substituting industries may suffer. Rahman (2005) argues that Bangladesh should implement effective reforms, promote communication infrastructure, encourage private-public collaboration, manage available resources efficiently and even take advantage of globalization through trade blocks. Lola (2009) examined globalization and poverty alleviation in Bangladesh and Nigeria. The findings suggest that the former reduces poverty, although is policy dependent. Policy aimed at structural changes can help the poor to take advantage from emerging employment opportunities through globalization. Nahar and Siriwardana (2009) applied simulated computable general equilibrium model and found that tariff removal benefits export sector; and trade liberalization reduces poverty in general. Trade liberation has reduced the absolute poverty in Bangladesh, but the gap and the severity of poverty have widened in urban areas.

4. Data Sources, Model and Empirical Strategy
4.1 Data and Definition

Data for this paper has been taken from various issues of International Financial Statistics (IFS), Economic Survey of Pakistan, and the Statistical Yearbook of Pakistan. The data on poverty is taken from Jamal (2006) who covers data period 1973-2003. Using the same methodology we extended the series to 2008. To explore a long run relation among poverty, trade and investment, we include other theoretically justified variables as deemed appropriate for Pakistan in specifying the empirical model as follows (in log linear form).

$$LPOV = \beta_0 + \beta_1 LPOP_t + \beta_2 LINV_t + \beta_3 LEXP_t + \beta_4 LEDU_t + \beta_5 LCPI_t + \beta_6 LGDP_t + \beta_7 FDI_t + \nu_t - (1)$$

where, *POV* measures the poverty index (head count ratio).[17] The headcount ratio is defined as the percentage of the population whose income is below a given poverty line. *INV* is investment as % of GDP, a proxy for physical capital (public + private) and external shocks (increase in imported input price, duties, and official transfer receipts). A priori, we expect a negative relation. *POP* refers to total population which measures market size, and important for economies of scale. Large population creates pressure on limited resources, impedes capital formation, lowers capital-labor ratio and thus raises poverty. The expected sign is positive.

EXP is the export to GDP ratio, a measure of trade openness. We expect a negative relation[18]. Growth in *GDP* per capita is a proxy for economic growth. Economic growth enlarges the pie which should reduce poverty[19]. We expect a negative sign. *EDU* refers to the level of education, measured by secondary school enrollment rate. The expected sign is negative. Education helps human capital formation, allows growth of entrepreneurship, and thus reduces poverty [Demeke et al. (2003)]. According to a World Bank report (1996) the lack of human capital is a major reason for perpetuation of poverty.

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[17] Jamal (2006) constructed a poverty index of head count ratio for 1973-2003. Rest observations for poverty are extrapolated.

[18] Vietnam and Uganda are interesting examples. In Vietnam, a ten-year experience with greater global integration has seen decline in poverty rate from 75% to 37%. Dollar (2001, p.17) argues that the developing countries which have seen poverty decline have also integrated faster into the world economy on the dimensions of trade and direct investment. This dispels the notion of the many critics who argue that freer trade (and direct foreign investment) has used heavy hand of such globalization casting its evil spell on the poor of the poor countries. However, the empirical truth seems to be exactly the opposite.

[19] For discussion on how models of exogenous and endogenous growth are affected by trade policy, please see Bhagwati andSrinivasan (2002). Generally speaking, the effects of trade policy on growth must proceed through accumulation and innovation in the use and productivity of resources.

CPI, the consumer price index, is a measure for inflation. Inflation worsens the condition of the poor [Kalim and Shahbaz (2008, 2009), Shahbaz (2008), Shahbaz and Naveed (2007, 2008)]. Much of the empirical evidence suggests that inflation hurts the poor. It is clear that, to pursue export promotion, rather than import-substitution strategy, i.e., opting for freer trade, it will be necessary to maintain macroeconomic stability. Such stability must be regarded as endogenous (Bhagwati, 2002). We expect a positive relation. *FDI* measures inflow of foreign capital. FDI promotes technology transfer; complements domestic investment; generates employment, boosts economic growth and thus reduces poverty. The expected sign is negative.

4.2 Unit Root Test

Before examining the existence of a long run relation among the series (investment, trade, poverty, education, inflation, economic growth and FDI) we explore the stationarity properties of each series. We use the ADF (1979) and the Phillips and Perron (PP, 1988) unit root tests[20]. The following regression is estimated for this purpose.

$$\Delta Y_t = \beta_1 + \beta_2 t + \delta Y_{t-1} + \lambda_i \sum_{i=1}^{m} \Delta Y_{t-1} + \varepsilon_t ------(3)$$

where, Δ represents first difference i.e., $\Delta Y_{t-1} = Y_{t-1} - Y_{t-2}$ etc., and ε_t is a white noise process. The null hypothesis $\delta = 0$ (i.e., unit root), is tested against the alternate $\delta < 0$ (i.e., stationarity). The test of hypothesis is carried out by comparing the calculated t-statistic which with the McKinnon (1991) table. The lagged values of Y_t are used to induce white noise property of the error term.

If the tests show that each of the series is first difference-stationary, it sets the stage for exploring a long run relation by estimating the cointegrating relationship(s) among the variables. We use the trace test *a la*, Johansen-Juselius (1990). We examine the short run dynamics by incorporating lagged error correction term (ECM_{t-1}) within the error correction model (ECM). We subjected the model to several diagnostic tests; e.g., serial correlation (Godfrey, 1981); and White (1980) heteroskedasticity test. The ECM augmented OLS regression is as follows.

$$\Delta LPOV_t = \beta_0 + \sum_{i=1}^{m} \beta_1 \Delta LPOP_t + \sum_{i=1}^{m} \beta_2 \Delta LINV_t + \sum_{i=1}^{m} \beta_3 \Delta LEXP_t + \sum_{i=1}^{m} \beta_4 \Delta LEDU_t + \sum_{i=1}^{m} \beta_5 \Delta LCPI_t +$$

$$\sum_{i=1}^{m} \beta_6 \Delta LGDP_t + \sum_{i=1}^{m} \beta_7 \Delta LFDI + \xi ECM_{t-1} + \psi ECM_{t-2} + \nu_t --------(4)$$

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[20] Lag length for all variables in ADF test statistic is 2.

where, *ECM* is the error-correction term, and ECM_{t-1} and ECM_{t-2} refer to one and two period lags obtained from the cointegrating regression. This term captures the movement of the series from disequilibrium in the previous period to the long run equilibrium. In the ECM, β_i's capture the short-run dynamics; and ξ and ψ the long-run coefficient; v_t is a white-noise process. The values of ξ and ψ determine the speed of adjustment needed to restore equilibrium.

5. Empirical Results

The results of ADF (1979) and PP (1988) tests, presented in Table-3 with and without a trend, show that all the variables are first-difference stationary.

Table 3 Unit Root test

	ADF test statistic[21]				Phillips - Perron test			
	Level		First difference		Level		First difference	
Variable	With out trend	With trend	With out trend	With trend	With out Trend	With trend	With out trend	With trend
LPOV	-2.2136	-2.0077	-4.9948*	-4.9603*	-2.2411	-2.0555	-5.0171*	-4.9851*
LPOP	-2.0746	-1.6876	-5.5546*	-6.0819*	-2.6158	-1.3370	-5.5528*	-6.0819*
LINV	-3.2809***	-3.269***	-4.4519*	-4.2485*	-2.3031	-2.2884	-3.7650*	-3.4893*
LEXP	-1.2734	-0.3107	-4.9801*	-5.6736*	-1.3220	-0.1386	-4.9579*	-5.7330*
LEDU	-0.3205	-2.4699	-4.1377*	-4.0666*	-0.1154	-2.1039	-4.1377*	-4.0666*
LCPI	-2.1015	-1.8579	-5.7561*	-5.9320*	-2.1607	-1.8848	-5.7561*	-5.9326*
LGDP	-1.2876	-0.4544	-4.1306*	-4.2790*	-1.2015	-0.7558	-4.0997*	-4.2227*
LFDI	-2.3028	-3.5392***	-5.7229*	-5.8256*	-2.2366	-3.407***	-5.2040*	-5.7287*

*, **, *** refer to significance at the 1 percent, 5 percent 10 percent levels.

Using SBS, lag length of 2 is selected. The results of Max eigenvalue and trace statistics are obtained from the Johansen-Juselius (JJ) method; in the presence of a linear deterministic trend. Trace test suggests that there are 4 cointegrating equations, significant at the 1 and 5 percent levels. Max-eigenvalue test suggests 4 cointegrating equations at the 1 and 5% levels. The results (Table 4) support a long-run relationship among poverty index and economic growth, growth in population, investment, exports as percent of GDP, inflation rate (CPI), and FDI.

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[21] Lag length is based on AIC and lag difference for all series is 2.

Table 4 Johansen Cointegration test results

Null Hypothesis	Alternate Hypothesis	Max[22] Statistics	Critical value		Trace statistics	Critical value	
			1%	5%		1 %	5%
r =0	r =1	151.73*	48.65	42.77	320.18*	121.74	111.78
r ≤1	r =2	64.91*	42.23	36.63	168.44*	92.71	83.93
r ≤2	r =3	43.88*	35.72	30.43	103.52*	67.63	60.06
r ≤3	r =4	31.27*	29.06	24.15	59.64*	46.57	40.17
r ≤4	r =5	15.62	22.25	17.79	28.36**	29.51	24.27
r ≤5	r =6	9.26	15.09	11.22	12.74**	16.36	12.32
r ≤6	r =7	3.48	6.94	4.12	3.48	6.94	4.12

Note: *, **, *** refer to significance at the 1 percent, 5 percent 10 percent levels.

Table-5 presents the estimated long run coefficients,[23] derived from normalized coefficients of the first cointegrating vector on poverty index (head count ratio). All the coefficients are significant at the 1 percent level, except per capita income and human capital which are not significant, although the signs are as expected. Although statistically insignificant, the coefficient for per capita income can be interpreted as the long held dichotomy of efficiency and equity issues of economic growth. In other words, this implies that growth does not necessarily translate into better income distribution, nor does it automatically alter the poverty measure of a nation. However, results suggest that poverty index is determined by the growth of population, investment, inflation rate, exports as percent of GDP, and FDI. The estimated elasticities are, 14.88, -4.43, -2.89, 0.585, and -0.318 respectively.

Table-5 Normalized Coefficients of First Cointegrating Vector

	LPOP	LINV	LEXP	LEDU	LCPI	LGDP	LFDI
Coefficient	14.885	-4.435	-2.893	-0.183	0.585	-0.425	-0.318
T- statistics	13.792	-10.70	-9.509	-0.617	5.388	-0.818	-4.384

The negative relation between investment and poverty in the long run implies that investing in public works, electricity, gas, transport and communication makes better resources utilization and creates favorable   economic environment. Public and private sector investment help to alleviate poverty through employment generation. The estimated coefficient of per capita income and education is negative, but not significant. The coefficient of population is positive

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[22]Max-Eigen statistics
[23] Lag length for long run model is based on SIC criteria base.

suggesting that rise in population increases poverty. The negative exports-poverty relationship suggests that exports can be a tool to generate employment and thus reduce poverty. A negative and significant coefficient of FDI implies that FDI complements domestic investment, helps job creation and alleviates poverty. The positive coefficient of CPI indicates that inflation aggravates poverty.

Table 6: Short Run Error Correction Model

Explanatory Variables	Coefficient	T-statistics
Constant	-0.101	-1.28
ΔLPOP	1.765	4.02*
ΔLINV	-0.241	-2.12**
ΔLINV$_{t-1}$	-0.387	-2.45**
ΔLEXP	-0.381	-3.79*
ΔLEXP$_{t-1}$	-0.255	-1.58
ΔLGDP	-0.981	-6.24*
ΔLGDP$_{t-1}$	-0.232	-1.66***
ΔLEDU	-0.383	-4.84*
ΔLCPI	0.043	1.44
ΔLFDI	0.015	0.94
ECM$_{t-1}$	-0.419	-2.10**
ECM$_{t-2}$	-0.652	-3.21*
R- squared = 0.94		D-Watson= 1.72
F-statistics	9.159	(0.000)

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

Table-6 reports the ECM results**.** According to Engle-Granger (1987), existence of cointegration implies that the variables must have an ECM representation. The latter helps understand the short run dynamics of the relation. ECM measures the speed of adjustment to restore the long run equilibrium from any short run deviation. Overall, our results support the hypothesis that trade and investment alleviates poverty both in the long and the short run. The negative coefficient of EXP is significant which supports openness as a tool for competitiveness in a globalized world. INV creates job opportunities, boosts production and thus reduces poverty. The coefficient is positive and statistically significant. Economic growth and education lowers poverty in short run; the latter helps human capital formation. The impact of inflation and foreign direct investment is positive on poverty but it is statistically insignificant in short run. The estimates of ECM$_{t-1}$ and ECM $_{t-2}$ are statistically significant, suggesting long run corrections in the initial and the subsequent years. ECM$_{t-1}$ indicates that 42% of the disequilibrium is corrected

immediately and 65% in the subsequent year. The residual passes the diagnostic test of no autocorrelation [χ^2 (2) = 14.031], and no heteroskedasticity [χ^2 (4) =17.587] at the 5 percent level of significance. The results indicate that international trade and investment alleviate poverty, and thus stimulate economic growth.

6. Conclusion and Policy recommendation

The paper examines a long run relationship among trade, investment and alleviation of poverty in Pakistan by applying the J-J cointegration approach. The error correction model is used for the short run dynamics. ADF and P-P unit root tests show that all the series are I(1); and also cointegrated. Our results suggest that trade; investment; exports and FDI help reduce poverty. Inflation compounds poverty by lowering purchasing power of the poor. Economic growth, investment and human capital formation reduce poverty in short run.

Pakistan should use investment and trade promotion as a tool to alleviate poverty. Investment in infrastructure and transportation allows the poor access to better markets opportunities for their products; and benefit from openness (Bannister and Thugge, 2001]. Sound infrastructure helps economic activities and services which helps the poor (Mujeri, 2002). Human capital formation helps growth and reduces poverty in Pakistan.

Professionals generally agree that openness promotes economic growth as exemplified by the East Asian miracle. China, Hong Kong, Korea, Malaysia, Indonesia, Singapore and Taiwan recorded an annual average growth rate of 5.5% in per capita real income during 1990 to 2008 (World Bank, 2010). Stiglitz (2003) argues that openness may not be the issue, rather how the policy is prosecuted. The impact of free movement of goods and inputs across borders on economic growth has raised eyebrows of some top economists, e.g., Bhagwati (2004), Stiglitz (2004) among others. Liberalization of labor market to allow movement of workers from the developing to the developed, as well as among the developing nations could bring greater benefits for all (Spanu, 2003, p.2). Despite the potential for trade to improve economic growth, disagreement persists over the stage at which market should be opened to foreigners. Some feel that the thrust of liberalization of trade has been pushed on the developing countries through structural adjustment loans conditionalities by the international organizations, under the veneer of the World Trade Organization negotiation framework. Over the last couple of years, better understanding has emerged among the industrialized nations' protectionist trade policies at the

expense of both the developing and the least developed ones. The World Bank, IMF, and UNCTAD have shifted their focus from liberalization to eliminating tariff and non-tariff barriers in developed countries, e.g., Canada, the EU, Japan, and the US. (See Stiglitz, 2002 for more).

Bangladesh can learn from the experience of Pakistan. The message is unambiguous. Export led strategy works; and so does openness under the veneer of globalization. However, an word of admonition for those who try to take easy ride to success without giving proper consideration to the pros and cons of the policy; and whether or not the economy is prepared for the changes to be wrought. The point is to strike a balance between equity and efficiency – growth with distributive justice – a challenge that some policymakers find bewildering. The latter is often sacrificed at the altar of the former; forgetting that perpetual poverty and absence of social justice can produce corrosive chemistry and pernicious outcome; and hurt sustainability in the long run. Extreme inequality is a recipe for social tension and distrust which creates backlash. Policymakers should heed the concerns of Stiglitz (2003) and others who may not sing chorus and yet may be closer to reality. For success, Bangladesh may revamp policies, encourage private-public ventures, and join effective trade blocks, although success will depend on policies adopted. Emphasis on export can generate employment opportunities and thus help the poor.

Aim of public policy should be to promote economic growth and at the same time address poverty. Globalization has polarized income distribution across nations. While this is troubling, proper measures are needed to insure that sectors are opened to foreign competition when the economy is ready for such change; and the timing will vary by country conditions. Failure to achieve distributional objectives will defeat the long run growth objective.

Debate in public forums can raise awareness about the consequences of liberalization policy and help narrow the widening divide between the governments of the industrialized world and developing countries, NGOs, and interest groups. The post-Seattle era shed new light on the need for changes. Economists are still searching for answers to reconcile the conflicting issues of development.

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