Does Trade Openness Cause Marginalization in Pakistan?

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Abstract

There has been much debate about how much poor people in developing countries gain from trade openness. The available evidence supports both positive and negative effect of trade on income distribution and poverty. This study aims to answer the crucial question "Does trade openness cause marginalization in Pakistan?" using the data from 1975 to 2013.Income inequality and poverty are used as indicators for marginalization while trade to GDP ratio as indicator for trade openness. For robustness analysis, we use international trade taxes, exports to GDP ratio, and imports to GDP ratio. The empirical results of the study show that one percent increase in trade openness leads to 0.05 units increase in Gini index that is trade openness causes significant positive effect on income inequality. However trade openness does not affect poverty significantly. The study concludes that trade openness causes marginalization in the case of Pakistan but only through increasing income inequality.

Keywords: Trade openness, marginalization, income inequality, and poverty

JEL Classification: F10, D33, I32

1. Introduction

Social exclusion and marginalization refers to the condition when individuals or people are systematically blocked from various rights, opportunities and resources that are normally available to members of a different group. The income inequality and poverty socially excludes individuals by restricting them from the income resources. Poverty is defined as the proportion of population whose incomes fall below a specified poverty-line (Amjad and Kemal, 1997), while income inequality refers to the unequal distribution of income across the various participating individuals in an economy. Thus the income inequality and poverty indicate the existence of marginalization in country.

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The high income inequality and poverty strengthen the political power of the rich. This power will be used to encourage outcomes favorable to them. Furthermore high inequality also facilitates rent seeking, excessive lobbying, large political donations, bribery, and cronyism (Todaro and Smith, 2009). Here the crucial question arises that what are the reasons for poverty and income inequality in the country. Literature found many reasons and one of them is that trade liberalization increases income inequality and poverty because it creates winners and losers simultaneously and the net welfare impact is negative (Burtless, 1995; Harrison, 2006; Meschi and Vivarelli, 2009; Majeed, 2011).

When developing countries open to trade, they become more exposed to technologies and innovations produced in more advanced countries. The trade with richer countries involve technological upgrading, a general shift of labor demand towards more skilled workers, a consequent increase in wage differentials and so an increase in inequality (Meschi and Vivarelli, 2009). Removal of trade barriers may cause developing economies to suffer in many aspects e.g. increased competition, ignorance to other sectors, unemployment in ignored and unspecialized sectors, resources utilized unequally, and unequal distribution of income. Thus trade openness can cause marginalization in economy by socially excluding poor labor.

In contrast, a part of the available literature also suggests that trade openness enables a country to specialize in particular sector where it has comparative advantage and this ultimately leads to the economic welfare gain. It also makes commodities available at cheaper rates and better in quality that cause consumer surplus gain. There is increased competition due to global integration which increases the incentive for efficient allocation of resources so that country can maintain its competitive advantage. Hence trade openness can foster social, political and economic gains (Sachs and Warner, 1995; Dollar and Krraay, 2004; Barro, 1991; Yanikayya, 2003).

This paper aims to address the crucial question that is "Does trade openness cause marginalization in Pakistan?" For this we investigate the effect of trade openness on income inequality and poverty in Pakistan during 1975-2013. Income inequality and poverty are used as indicators for marginalization. For trade openness trade to GDP[1] ratio is used as a proxy. For robustness analysis three more trade proxies are used i.e. exports to GDP ratio, imports to GDP ratio, and international trade tax revenue. The data for indicators is taken from Pakistan Economic Survey (various issues) and

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[1]Gross Domestic Product

World Development Indicators (2015). In this paper Ordinary Least Squares (OLS) technique, Johansen Cointegration approach, Error Correction Model and Granger Causality Test are applied. The stability, serial correlation, heteroscedasticity and autocorrelation of models are also tested. Additionally we have done robustness analysis by changing trade measures.

Remaining paper is structured as follows: Section 2 provides a brief overview of Pakistan economy, Section 3 provides literature review, Section 4 specifies the methodology, Section 5 is about data and its theory, Section 6 provides estimation and interpretation of the results, and Section 7 concludes the study.

2. An Overview of Pakistan Economy: Economic Growth, Income Inequality, Poverty, and Trade Openness

Official name of Pakistan is "Islamic Republic of Pakistan". It is located in South Asian region on the main location connecting Central Asia, China and Middle East. In 2016, annual growth rate of GDP was 4.7% but it is not enough to keep up with fast population growth of 2.07% annually. Main macroeconomic indicators have changed largely showing that Pakistan has changed in much extent not only socially, politically and geographically but also economically. Figure 1 below shows the trend of Per Capita GDP over time.

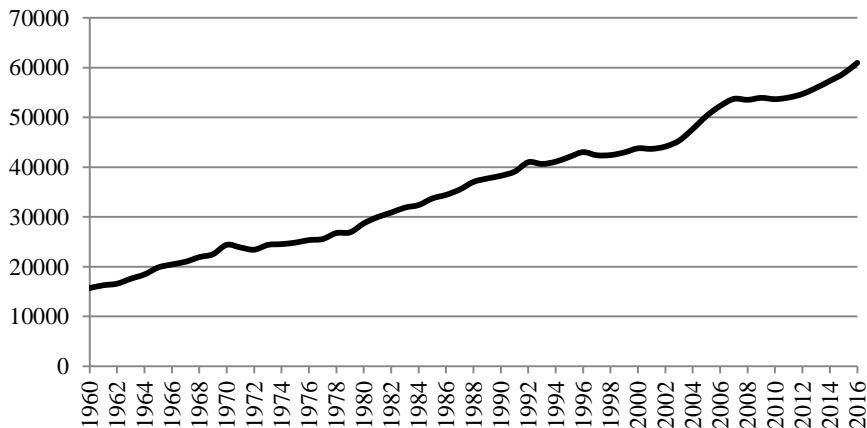**Figure 1.Per Capita GDP of Pakistan**

Figure 1 indicates that per capita GDP of Pakistan has increased but there is rise and fall in it. The main reason of these ups and downs can be the uncertain agricultural income. The large part of labor force depends on agriculture sector both directly and indirectly. To see trend of poverty we use the Head Count Index (poverty line $1.25) from Pakistan Economic Survey (various issues). Figure 2 shows the HCI trend overtime:

**Figure 2.Poverty Trend of Pakistan (Head Count Indices)**
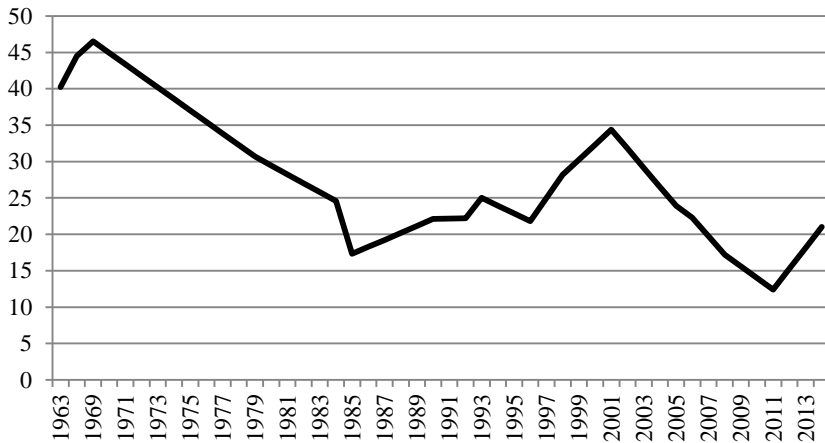
In Figure 2, we observe that there is no unidirectional trend of head count index. The initial increase in poverty can be due to war of 1965 and partition of country in 1971 as well as oil crisis of 1970. The decreasing trend of poverty is observed from 1970 to 1985. The private investment in agriculture reached at its peak due to government policy regimes and heavy migration from rural areas towards abroad resulted falling poverty. Further the increase in poverty is seen because of distribution asymmetry in 1990. In 1998 the major share of GDP was defense expenditures due to nuclear experimentation. Moreover, 9/11 incident caused global economy to take nose dive in crisis thus poverty was at its peak in Pakistan.

From 2002 onwards head count index has decreased due to substantial economic growth. There is increase of poverty after 2010 due to massive floods of 2010, which had long-lasting impact on socio-economic development of the country as

nearly 20 million people were impacted by the damages to economic activity. Income inequality trend is as shown:

Figure 3.Income Inequality in Pakistan (Gini Coefficient)
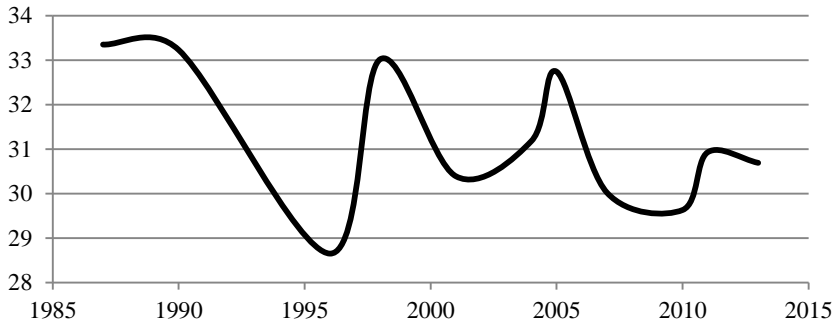
In Figure 3, we see many ups and downs of Gini Index overtime. Combining trend of income inequality and poverty it can be inferred that due to good growth performance during the period of 2000-2006, the number of poor has declined but economic growth has failed to put any distributional impact in Pakistan. Overall the trend is not showing any direction.

Further we observe the trade policies and situation in Pakistan. In early years, Pakistan was exporting agricultural and primary products while now its exports has been changed to manufactured and semi- manufactured products. Initially Pakistan managed exchange to a fixed level so its exports became expensive and export demand decreased. After Korean War started Pakistan's trade policy liberalized so demand for exports increased. The government liberalized trade to 85% of the imports was without license.

The liberal trade regime of Pakistan formally begin in 1977-88, the free list was increased by adding 91 more items in it. Trade liberalization under Structural Adjustment Programme 1988, was done extensively. The formation of WTO had not significantly affected trade side in Pakistan, as most trade reforms were made before it. The trade policy announced in 1996-1997 was encouraging exports and further liberalizing imports to improve trade balance situation in Pakistan.

The trade policy adopted in 2007-09 was also continuation of export led growth strategy in which emphasize was on; improved market access, trade promotion infrastructure strengthening, improving skill development and provision of state in art physical structure. Ministry of Commerce launched STPF[1] 2012- 2015 after the approval of the Cabinet on January 30, 2013. The trade policy of Pakistan has liberalized sharply after a period which caused loss to domestic producers as they faced higher competition. Analyzing the trade situation in Pakistan we see the trends of imports and exports overtime. The trends of exports and imports are shown in Figure 4. We observe that Pakistan has trade deficit most of the time. The imports are higher than exports overtime. There is only one point where exports and imports are equal. The reason for lower exports is that Pakistan's exports base and markets are extremely narrow, cotton group alone contributes 55% of share in it. While as a developing country Pakistan has some constraints and it has to import main commodities such as machinery.

Figure 4   Exports and Imports of Pakistan
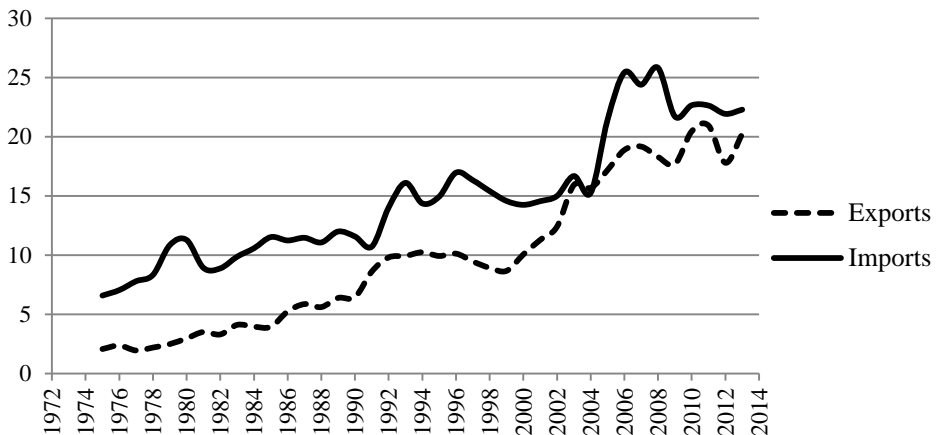
3. Literature Review

The literature analysis shows that there is not any unidirectional relationship between marginalization and trade openness. The positive association is revealed by some studies while other studies disagree. There is also research which explained the

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[1]Strategic Trade Policy Framework

offsetting effect of trade openness on income distribution. Spilimbergo*et.al.* (1999) studied the empirical links among trade, factor endowments, and income distribution. They did regression analysis using Gini coefficient as a measure for data of 34 countries for 28 years i.e. 1965-1992. They found that trade openness depends on factor endowment to show its impact on income distribution. In regression results trade did not affect personal income distribution due to two types of effect which offset each other i.e. trade worsens distribution through skills while trade enhances capital, the offsetting is done between these two effects.

Jaumotte *et.al.* (2013) examined the association between the rapid pace of trade and financial globalization and the rise in income inequality observed in most countries over the past two decades. They used panel data for 51 countries over the time period of 1981-2003. The study found lower effect of globalisation on income inequality. There are two offsetting effects of globalization on income inequality: increased trade tends to reduce income inequality while FDI tends to exacerbate it. Lawrence (2008) explored the relationships between slow US real wage growth, increased earnings inequality and trade. They argued that increased trade with developing countries have played some part in causing greater wage inequality in the 1980s, surprisingly, over the past decade the impact has been too small to show up in aggregate wage data on inequality.

Studying the impact of open trade on economic growth, poverty, and income inequality, Dollar and Kraay (2004) identified a group of developing countries that have had large cuts in tariffs and large increases in actual trade volumes since 1980. The analyses showed that globalisers are catching up with rich countries while the non-globalisers fall further and further behind. Additionally absolute poverty in the open trade developing economies had fallen sharply in the past 20 years. The results from individual cases and from cross-country analysis supported the view that open trade regimes lead to faster growth and poverty reduction in poor countries. Furthermore the results indicated that there is no significant correlation between changes in inequality and changes in trade volumes, controlling for changes in average incomes.

Pointing out different views in literature Bhagwati and Srinivasan (2002) investigated the impact of trade on poverty. The anti-globalization critics say that trade accentuates, not ameliorates, and that it deepens, not diminishes, poverty in both the rich and the poor countries. But both static and dynamic argument favors that trade openness reduces poverty. In former, the natural presumption following the Stolpher-Samuelson argumentation, trade openness should help in the decrease

of poverty in the poor countries which use their comparative advantage to export labor-intensive goods. In later, it is argued that trade promotes growth; and growth reduces poverty.

There is a part of research available which argues against the trade liberalization policy. There are many studies which argue on the basis of marginalizing effect of open trade through intensification of earning inequalities. Burtless (1995) studied the effect of trade liberalization on income inequality by arguments in the available literature. It found that large numbers of studies imply that liberal trade through skill advancement and technological progress can affect adversely the real earnings of a wide class of workers. In empirical evidence, Ravallion (2006) investigated that how much developing countries gain from trade openness. He used both macro level data (cross-country comparisons and aggregate time series data) and micro data (household-level data). Each of the empirical approaches used casted doubt on any presumption that greater openness to external trade is the key to rapid poverty reduction.

Harrison (2006) surveyed the evidence on the linkages between globalization and poverty by focusing on two measures of globalization: trade and international capital flows. Firstly it concluded that a simple interpretation of general equilibrium trade models is likely to be misleading. Secondly, the evidence suggested that if complementary policies are there, the poor are more likely to share in the gains from globalization. Thirdly, trade and foreign investment reforms have produced benefits for the poor in exporting sectors and sectors that receive foreign investment. Fourthly, financial crises are very costly to the poor. Finally, the collected evidence suggests that globalization produces both winners and losers among the poor. The last conclusion is also supported by Meschi and Vivarelli (2009). They used a dynamic specification to estimate the impact of trade on within country income inequality in a sample of 65 developing countries over the time period of 1980-1999. They found that trade with rich countries worsens income distribution in developing countries. These findings provide support to the hypothesis that technological differentials and the skill biased nature of new technologies may be important factors in shaping the distributive effects of trade.

Country specific studies for Pakistan are also supporting the argument of trade led marginalization view. Yasmin*et.al.* (2006) studied for Pakistan taken the time period of 1960-2003. The study investigated impact of trade liberalization on economic development in country. The effect has been studied with four variables for economic development i.e. per capita GDP, income inequality, poverty and

employment. The authors used simultaneous equation method with two Stages Least Squares (2SLS) technique due to the expected simultaneity between variables. The results for the study found that trade liberalization does not affect all of the indicators which are chosen in study. Trade liberalization has not shown any effect on poverty while its affect is positive on employment and negative on per capita GDP and income distribution.

Majeed (2011) studied the effect of trade liberalization on economic development indicators i.e. per capita GDP, inequality, poverty and employment. It used the time series data of Pakistan for time period 1970-2006. This study used General Method of Moments (GMM) econometrics technique. The findings are that trade liberalization has shown negative impact on development indicators i.e. increase in poverty; increase in income inequality while it's has no significant impact on PGDP. The study reveals that in case of Pakistan trade is not pro development.

Overall analysis of the literature shows that there are all sided arguments in it. We get motivation from the previous literature in two ways. Firstly, the literature lacks the separate definition of marginalization and social exclusion. We use income inequality as well as poverty to study the impact of trade openness on marginalization. Secondly, there is wide disagreement of available literature on this relationship, so we will analyze this association and contribute towards consensus of the literature.

4. Methodology and Estimation Technique

For exploring empirical results first of all we specify methodology and framework. We have taken the dependent variables income inequality and poverty, which are used as indicators for marginalization. We specify the models for each dependent variable. Trade to GDP ratio will appear in each model. Our first model is:

$$G_t = \beta_0 + PGDP_t\beta_1 + (PGDP_t)^2\beta_2 + T_t\beta_3 + EDU_t\beta_4 + INF_t + \mu_t \qquad (1)$$

Where; Gt is Income inequality (Gini coefficient), $PGDP_t$ is Per capita GDP,T_t is Trade to GDP ratio, EDU_t is Education (Secondary enrollment ratio) and INF_t is the Inflation rate.

In equation 1, income inequality is dependent variable. We denote income inequality by G because we are taking Gini coefficient for its measurement. The indicator of trade openness is represented by T. Following Kuznets (1955) functional form per capita GDP as well as square of Per capita GDP are incorporated into the equation 1.

Further inflation and human capital are also taken as control variables following the previous studies of Yasmin *et al.* (2006) and Majeed (2011, 2015a, 2016). We see the second model as:

$$POV_t = \alpha_0 + \alpha_1 YG_t + \alpha_2 G_t + \alpha_3 T_t + \alpha_4 EDU_t + \alpha_5 POV_{t-1} + \varepsilon_t \qquad (2)$$

Where, POV_t is Absolute Poverty (Head Count Ratio), YG_t is GDP Growth (annual percentage),G_t is Income inequality (Gini coefficient) and EDU_t education (Secondary enrollment ratio).

The poverty model is shown by equation 2. Trade liberalization and poverty relationship is our main focus in study; the relationship is both positive and negative according to previous literature (Dollar and Kraay, 2004; Majeed, 2011; Yasmin *et.al.*, 2006). We have economic growth indicator in equation as the dynamic argument of poverty reduction in an open economy suggests that poverty level of country is dependent upon the economic growth of country [Amjad & Kemal (1997), Roemer & Gugerty (1997), Ali & Tahir (1999), Majeed (2015b, 2017)]. Bourguignon (2004) shows that absolute poverty is function of income inequality and growth. For tackling problem of autocorrelation lag dependent variable is also used, this type of model is called Autoregressive model (Gujarati, 2003).

The specified models will be estimated with ordinary least squares analysis. Error Correction Mechanism (ECM) is used to study short run relationship between marginalization and trade openness. To check the cointegration among variables, Johansen Co-integration approach is used. Stationarity of data is checked by Augmented Dickey Fuller (ADF) test. The Granger causality test is used to study the causal relationship between variables. Further for investigating the stability of models Ramsey's Regression Specification Error test (RESET) and CUSUM test are applied. The Breusch Godfrey LM test is applied to test serial correlation.

5. Data

This study is using time series data from 1975 to 2013 for Pakistan. The data for variables is taken from Pakistan Economic Survey (various issues) and World Development Indicators (2015). For marginalization indicators we took income inequality and poverty. Income inequality is measured by Gini coefficient, and poverty is measured by Head count ratio. Trade openness is measured by trade to GDP ratio while for robustness analysis we have taken trade openness measures that are international trade tax revenue, exports to GDP ratio, and imports to GDP ratio. The variables with definitions and sources are listed in Table 1:

Table 1: Data Justification

Variable	Definition	Form	Sources
GDP Per Capita	GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products.	It is a ratio of GDP to total Population.	World Development Indicators (2015)
Trade to GDP ratio	Sum of imports and exports divided by GDP.	Ratio	
Poverty	A state or condition in which a person or community lacks the financial resources and essentials to enjoy a minimum standard of life and well-being that's considered acceptable in society.	Ratio of poor to total population. Below a benchmark i.e. Poverty line, people are called poor.	
Exports to GDP ratio	Exports divided by GDP.	Ratio	Pakistan Economic Survey (various issues)
Imports to GDP ratio	Imports divided by GDP	Ratio	
Inflation	GDP deflator e GDP deflator (implicit price deflator) is a measure of the level of prices of all new, domestically produced, final goods and services in an economy.	Percentage	
Income Inequality	The extent to which income is distributed in an uneven manner among a population.	Variation in distribution of income among total population. Gini coefficient (1912) is used, it is in ratio form.	Pakistan Economic Survey (various issues)
International trade tax revenue	Tax revenue collected from trade.	Million Rupees	
Education (secondary enrollment)	The number of people enrolled in secondary.	Ratio	

6. Empirical Results

In this section we will do the empirical analysis to address the research question of our study. We are using time series data which has expected unit root in it or in

other words they are not stationary at level form. After finding unit root and order of integration, we will check the existence of long run relationship by doing Error Correction Method and cointegration test. The indication of long run relationship will allow us to interpret the OLS results of our study models.

ADF Test:

Before doing estimations we check the stationarity of data. The order of integration is observed for all variables individually. We did Augmented Dickey Fuller test on variables, it suggests that all variables are integrated at first order, as they fail to reject the null hypothesis at level and rejects the null hypothesis at first difference form. The results are summarized in Table 2:

Table 2: ADF Test Results:

Variable	ADF at Level	ADF at First Difference	Conclusion
PGDP	-1.902222 (0.6332)	-4.829091 (0.0021)	I(1)
Income Inequality	-2.371921 (0.3875)	-8.936436 (0.0000)	I(1)
Poverty	-2.267507 (0.4403)	-3.481294 (0.0563)	I(1)
Trade To GDP Ratio	-2.900319 (0.1737)	-7.341150 (0.0000)	I(1)
Total Govt. Exp.	-1.824019 (0.6727)	-4.020181 (0.0166)	I(1)
Inflation	-0.983849 (0.2852)	-7.666852 (0.0000)	I(1)
Education	-2.058592 (0.5514)	-5.266724 (0.0006)	I(1)
GDP Growth	-0.886272 (0.3255)	-10.01026(0.000)	I(1)

Note: p-values are in parentheses.

Error Correction Model (ECM): The variables are not stationary at level so we need a justification that there exists a long run relationship so we can apply OLS on our models. In ECM, the coefficient of lag of error is the feedback effect which shows the extent to which any disequilibrium in the previous period effects any adjustment in dependent variable. It has negative sign in both models which shows that there exists a long run relationship, so we then apply OLS technique of estimation. The ECM estimated results for models are shown Table 3a:

Table 3a: Estimated Error Correction Model (Income Inequality)

Dependent Variable : Income Inequality		
Variables	**Coefficient**	**t-statistic**
Intercept	0.009299	1.516394
Per Capita GDP	2.080975	0.560435
Square of Per capita GDP	-0.186428	-0.623854
Trade to GDP Ratio	0.002719	1.611940
Education	-0.087455	-2.704883
Inflation	0.002547	3.673401
Lag of Error	-0.825842	-4.663574
R-squared	0.461010	
D-W stat	2.108624	

Table 3b: Estimated Error Correction Model (Poverty)

Dependent Variable: Poverty		
Variables	**Coefficient**	**t-statistic**
Intercept	0.067886	0.211945
GDP growth	-0.418031	-3.278290
Income Inequality	-3.929732	-0.394228
Trade to GDP Ratio	-0.001605	-0.013165
Education	1.840989	0.916222
Lag of Poverty	1.282870	4.494207
Lag of Error	-1.056966	-3.190683
R-squared	0.486201	
D-W stat	1.998974	

Johansen Cointegration Test:
Further we apply Johansen Cointegration test to check whether there is cointegration relationship among variables or not. The purpose of this test is to determine whether a group of non-stationary series is cointegrated or not. All variables are integrated of first order so the pre requisite of the test is fulfilled. The results are presented in Table 4.

Table 4: Johansen Cointegration Test:

Models	Hypothesized No. of CE(s)	Eigen value	Trace Statistic	0.05 Critical Value	Prob.
1.	None	0.682240	133.6340	95.75366	0.0000
2.	None	0.645733	91.83951	69.81889	0.0003

The results for cointegration test show that all of the models fail to accept the null hypothesis of no cointegration at 5% significance level. The conclusion is that variables have cointegration relationship so we move towards the OLS results after finding that there exist a long run relationship in focused variables.

OLS Results:

The OLS estimation is summarized in Table 5. The first column shows the variables which are included in model; second column is for equation 1 with dependent variable income inequality; and third column is for equation 2 with dependent variable poverty. The last row shows the value of R^2 i.e. 0.667 and 0.907, for equation 1 and 2 respectively. We will focus on impact of trade on dependent variables.

Table 5: Parameters Estimates of OLS model

Variables	Income Inequality	Poverty
	EQ1:G	EQ2:POV
Intercept	-15.40 (-3.54)	4.25 (0.49)
Per Capita GDP	4.99 (3.51)	-
GDP Growth	-	-0.33(-1.81)
Trade to GDP Ratio	0.0048 (2.32)	-0.09 (-0.56)
Income Inequality	-	16.28 (1.57)
Inflation	0.0023 (2.65)	-
Education	-0.042 (-1.45)	-0.45 (-0.51)
Square of Per Capita GDP	-0.39 (-3.37)	-
Lag of Poverty	-	0.85 (9.66)
R Squared	0.667378	0.907794

Note: t-statistics for coefficients are in parentheses. (10% significance level)

In Table 5, for equation 1 we observe the effect of trade to GDP ratio on income inequality is significant with positive sign. There is 0.0048 units increase in Gini index due to 1 percent increase in trade to GDP ratio. The result is consistent with previous literature where trade liberalization showed significant positive impact on

income inequality using trade to GDP ratio as proxy for trade openness i.e. Yasmin*et.al.*(2006) and Majeed (2011).

Our results are also consistent with the study of Meschi and Vivarelli (2009), which found that trade worsen income distribution in developing countries, both through imports and exports. The increase in income inequality may be due to the reason that trade creates winners and losers in the economy as indicated by Harisson (2006). The increased competition due to global integration creates higher demand for skilled and trained labor while the unskilled are left unemployed, this causes income distribution skewed towards one side.

The GDP per capita coefficient has positive and significant sign while square of GDP per capita has negative and significant sign. Thus Kuznets Curve inverted U hypothesis has been proved, that initially with increase in growth, income inequality increases, but after persistent increase in growth there is lower income inequality. Effect of inflation is positive and significant showing that inflation increases income inequality. The effect of education is negative and significant on Gini index, which shows that increase in education decreases income inequality.

The effect of trade to GDP ratio on poverty is negative and insignificant at 10% significance level. Thus trade openness does not affect poverty. This result is consistent with Yasmin*et.al.*(2006) and Ravallion (2006). The result might be due to the fact that in case of developing country like Pakistan true effects of open trade are not transferred to poor due to corruption and administrative inefficiency (Majeed, 2011). Thus complementary policies are needed to have poverty reduction through trade (Harrison, 2006). The main control variable GDP growth shows correct sign with poverty, the 1% increase in GDP growth decreases poverty by 0.331 percent in head count ratio, it is significant at 10% significance level. The effect of income inequality and education is insignificant. The lag dependent variable used in this model justifies the "Poverty Trap" (a situation which keeps poverty to persist) as it is showing positive significant effect on poverty.

Robustness Analysis:
The robustness analysis is also done to check the effect of some other trade measures on the marginalization indicators of our study. The proxies which we used are trade to GDP ratio, exports to GDP ratio, imports to GDP ratio, and international trade tax revenue. The first three proxies are volume side while fourth one is policy side measure of trade openness.

Table 6a shows the robustness analysis of first model of income inequality. It shows different conflicting results with different proxies. Trade to GDP ratio shows significant positive effect on income inequality while trade taxes also show significant positive effect. Trade to GDP ratio shows that openness of trade and trade taxes shows the trade restriction, the same sign of both measures means there is inconsistency.

Table 6a: Robustness Analysis for Income Inequality Model:

Variables	Income Inequality	Income Inequality	Income Inequality	Income Inequality
Intercept	-15.40 (-3.54)	-13.44 (-3.88)	-12.56 -(3.27)	-20.28 -4.67
Per Capita GDP	4.99 (3.51)	4.49 (4.02)	4.19 (3.36)	6.59 (4.72)
Square of Per capita GDP	-0.394 (-3.38)	-0.384 (-4.29)	-0.343 (-3.35)	-0.523 (-4.622)
Education	-0.0424 (-1.45)	-0.033 (-1.615)	0.0016 (0.059)	-0.027 (-0.885)
Inflation	0.0023 (2.649)	0.0023 (3.54)	0.0016 (1.85)	0.0023 (2.51)
Trade to GDP Ratio	0.0048 (2.321)	-	-	-
Int. trade Taxes	-	0.0817 (3.75)	-	-
Exports to GDP Ratio	-	-	0.0097 (4.26)	-
Imports to GDP Ratio	-	-	-	0.00143 (0.617)

Note: t-statistics for coefficients are in parentheses. (10% significance level)

Exports to GDP ratio shows significant positive impact on income inequality, the one percent increases in exports to GDP ratio increases income inequality by 0.0096 percent. Imports to GDP ratio show insignificant impact on income inequality.

Table 6b is for poverty model of our study. Poverty is negatively affected by trade to GDP ratio and positively affected by international trade taxes, but both coefficients are insignificant showing that poverty will tend to increase regardless of efforts made in any direction either making trade liberalized or restricting trade. Both exports to GDP ratio and imports to GDP ratio show insignificant impact on poverty

in Pakistan. From the robustness analysis we conclude that choice of measures of trade is important for the results (Greenway *et.al.,* 2002).

Table 6b: Robustness Analysis for Poverty Model:

Variables	Poverty	Poverty	Poverty	Poverty
Intercept	4.25 (0.489)	0.231 (0.029)	8.062 (0.877)	13.30 (1.261)
GDP Growth	-0.331 (-1.813)	-0.357 (-2.072)	-0.41 (-2.29)	-0.3195 (-1.861)
Income Inequality	16.28 (1.57)	7.597 (0.782)	2.33 (0.187)	11.523 (1.361)
Education	-0.452 (-0.506)	-2.36 (-1.32)	-1.485 (-1.252)	-1.261 (-1.282)
Lag of Poverty	0.849 (9.663)	0.852 (10.58)	0.828 (9.582)	0.774 (7.761)
Trade to GDP Ratio	-0.091 (-0.56)	-	-	-
Int. Trade Taxes	-	1.171 (1.171)	-	-
Exports to GDP Ratio	-	-	0.257 (1.192)	-
Imports to GDP Ratio	-	-	-	-0.249 (-1.529)

Note: t-statistics for coefficients are in parentheses. (10% significance level)

Tests and Diagnostics:

To check autocorrelation, heteroscedasticity, misspecification and stability, the diagnostic tests are applied. We have also applied Granger causality test to confirm the causality among variables. The serial correlation LM test is done for autocorrelation. Both models fail to reject the null hypothesis of no autocorrelation but there is always expected autocorrelation in time series data. Thus we applied Newey-West HAC in first equation while lag dependent variable is used in second model. The results are shown below:

Table 7a: Serial Correlation LM Test:

Model	F statistic	Prob. (F stat)	Conclusion	Solution
1.	0.694635	0.507108	No auto	Newey-West HAC
2.	1.940693	0.161214	No auto	Lag dep. Variable

We checked heteroscedasticity by White's Heteroscedasticity Test. The null hypothesis of this test is that homoscedasticity is there while alternative hypothesis is heteroscedasticity is there. All models did not reject the null hypothesis and residuals are homoscedastic. The results are shown below:

Table 7b: White's Heteroscedasticity Test:

| Model	F statistic	Prob. (F stat)	Conclusion	Solution
1.	1.123934	0.421123	No hetero	-
2.	0.466321	0.947742	No hetero	-

Ramsey RESET misspecification test is applied to check the specification of models. The null hypothesis of test is that model is correctly specified while alternative hypothesis is that model is miss-specified. All of models in this study fail to reject the null hypothesis at 5% significance level. The results are:

Table 7c: Ramsey RESET Test:

Model	F statistic	Prob. (F stat)	Conclusion
1.	2.026659	0.149426	No misspecification
2.	1.629552	0.212893	No misspecification

In CUSUM stability test, we check the stability of model. It plots the cumulative sum of recursive residuals of model together with the 5% critical lines. The test finds parameter instability if the cumulative sum goes outside the area between the two critical lines. In this study both of the models have shown stability as their cumulative sum of recursive estimates lies between the 5% critical lines. The graphical results are:
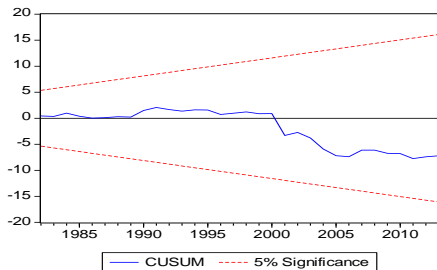
Model 1 | Model 2
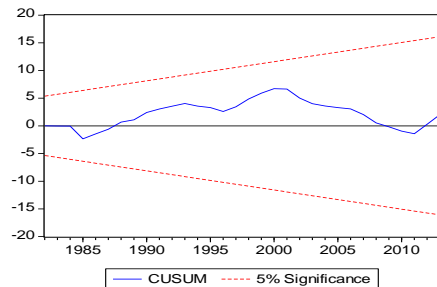
We have also done the Granger Causality test. The test has two equations with null hypothesis that there is no causality between selected variables and alternative

hypothesis is that there is causality from one variable to the other. Income inequality is Granger caused by trade as null hypothesis is not accepted at 5% significance level. There is unidirectional causality from trade to GDP ratio to income inequality measure. Poverty and trade measure have unidirectional causality from poverty to trade measure. This can be due to policies of country are towards trade for poverty alleviation. The results are:

Table 8: Granger Causality Test:

Null Hypothesis	Obs.	F-Statistic	Probability
T does not Granger Cause G	38	3.89917	0.05624
G does not Granger Cause T	38	0.07267	0.78907
T does not Granger Cause POV	38	0.84666	0.36380
POV does not Granger Cause T	38	3.15727	0.08428

7. Conclusions

The aim of this study was to find the answer of a crucial question that "Does trade openness cause marginalization in Pakistan?". The study used income inequality and poverty as marginalization indicators while trade to GDP ratio was used as indicator of trade openness. In the first model of the study, we found that the effect of trade to GDP ratio on income inequality is significant with positive sign. There is 0.0048 units increase in Gini index with one percent increase in trade to GDP ratio. The increase in inequality may be due to the reason that trade creates winners and losers in the economy. In addition the Granger causality test confirms the unidirectional causality from trade to income inequality. Thus we can say that trade openness is the reason for marginalization.

The second focused model results suggest that poverty is not affected by trade to GDP ratio as it has insignificant coefficient. Hence we conclude that trade openness has no effect on poverty and it does not create poor in country. From this we negate the argument that trade openness causes poverty. We observe that in our results one indicator of marginalization is affected by open trade but other is not. The effect of trade openness on income inequality is positive and significant while it is insignificant on poverty. This leads us to conclude that trade openness increases marginalization as one indicator is affected. Thus government needs complementary policies regarding income inequality when it opens trade.

The robustness results suggest that indicators show different reaction towards the different trade measures used in this analysis; so there is a need for further research

in this field. This study concludes that trade liberalization increases inequality while does not affect poverty in Pakistan. Thus trade openness does not affect both indicators of marginalization in our study. This study encourages for further research in this field by using more defined trade as well as marginalization indicators.

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