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Terms of Trade and Economic Growth in Pakistan: An Empirical Analysis

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ABSTRACT

This paper evaluates the impact of terms of trade on economic growth for Pakistan economy. We divided our analysis into two parts. Firstly, this study estimates the relationship between terms of trade and economic growth and further the impact of volatility in terms of trade on economic growth. Secondly, focuses on the export demand and import demand elasticities for Marshall Lerner condition. The ARDL test is used to estimate long run and short run relationship. In empirical estimation, no evidence of significant impact of terms of trade and volatility terms of trade on economic growth in the long run as well as in the short run is found although Marshall Lerner condition holds in Pakistan. A movement in terms of trade can be explained in terms of export demand elasticities and import demand elasticities. Despite of satisfaction of Marshall-Lerner condition; only devaluation of currency may not be advantageous. Under situations where export demand and import demand elasticities are not fully elastic separately; devaluation may not be successful.

Key Words: Terms of trade, economic growth, trade elasticities, Marshall Lerner Condition

1. Introduction

The link between terms of trade and economic growth is becoming important in economic assimilation or dissimilation while export prices converge or divert globally. The variations and volatility of terms of trade is also getting more significant for trade policies of developing and developed countries. The researchers think that there exists a remarkable

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impact of increasing terms of on economic growth is positive. Jawaid et al., (2012), Wong (2010), Bleaney and Greenaway (2001), Blattman (2003), Grimes (2006) provide evidence in support the proposition that an increase in terms of trade raise the levels of investment and thus speedy economic growth YASMEEN et al., (2018). The volatility in terms of trade leads to decrease in investment and hence lowers economic growth Bleaney and Greenway (2001), Mendoza (1997). In contrast to other empirical studies Tehseen et al., (2011) inference that economic growth positively responds to volatility terms of trade.

Economists believe, both terms of trade and volatility in terms of trade are related with the country's growth Duasa and Jarita (2011). But concentrating on primary products and unpredictability of their prices, exporters of these items practiced larger precariousness of export profits causing little growth in the export sector of the developing countries Bleaney (2001). At this point, it is important to talk about the traditional pattern of Pakistan's international trade. The main feature of Pakistan foreign trade is its imports i.e. comprises on machinery, electronics, computers, intermediate goods and consumer durables, which have higher income and price elasticity of demand. Whilst on the other side its exports consist on primary goods which have low elasticity of demand. Consequently, these disturbances of low export and high import ratio are source of trade deficit. The trade balance is directly related to the export demand and import demand elasticities. Marshall Lerner Condition states that export demand could be increased to remove the trade deficit by the devaluation of the currency only if the sum of import and export demand elasticities in absolute value is greater than one. But this is only possible if export and import supply are completely elastic (Haberler, 2007). There is an immense literature YASMEEN et al., (2018), Naryan (2010), Stern et al., (1976), Afzal (2004) that comprises empirical estimations of trade elasticities and Marshall Lerner condition. For deep analysis it would also be important to estimate the Marshall Lerner Condition to understand the changes in trade balance.

Primarily this study empirically estimates the effects of terms of trade and its volatility on Pakistan's economic growth. However, it also estimates the elasticity of export demand and import demand to verify the Marshal Lerner Condition. The next section reviews the existing literature that is relevant to the objective of the study. The section 3 focuses on the model and data sources while section 4 comprises on suitable methodology to be applied for the analysis. The section 4 consists on estimation and results interpretation and the last section based on concluding remarks and policy implications.

2. Literature Review

This study tries to evaluate three aspects of international trade i.e. Terms of Trade and economic growth, Volatility in Terms of Trade and economic Growth and Marshal Lerner Condition. This section briefly discusses the literature on the topics in following paragraphs.

Most of the literature is on the effects of terms of trade on economic growth is cross country. It illuminates the association of terms of trade and output performance for developed and developing countries. Cakire (2009) scrutinizes 18 emerging economies and infers that terms of trade have positive effect on growth. The other cross-country empirical studies e.g. Blattman et al., (2003), Hadass et al., (2001), Bleaney et al., (2001), Mendoze (1997), Barro et al., (1995) also conclude that economic growth is positively affected by terms of trade.

The second emphasis is about the literature on the volatility terms of trade. Here most of the studies conclude that there is negative association between volatility terms of trade and growth. Wong (2010) empirically estimated the association of terms of trade and its volatility on growth for Japan and Korea, Samimi et al., (2011) studied 20 oil exporting countries, Jawaid and Raza (2012) conducted the study about India to find the relationship of terms of trade and volatility terms of trade with growth. In empirical estimation it is

established that volatility terms of trade have negative affect and do not lead to growth. In contrast of above-mentioned empirical studies Tehseen et al., (2011) study shows a positive relationship between volatility terms of trade and economic growth.

The third dimension of this section is about export and import demand elasticities. Based on previous literature it is suggested that Marshall Lerner Condition is satisfied for Pakistan, as well as, inferences that devaluation may effective in improving trade balance in long run (Asif and Rashid, 2011) and Afzal (2004). In cross country analysis Khan (1974) for Pakistan and Arize (1986) for nine African countries determine that Marshall Lerner Condition holds in most of their sample countries.

3. Model and Data Sources

The primary focus of the study is on the relationship between terms of trade and economic growth and volatility terms of trade and economic growth while it also tries to estimate Marshal Lerner condition (ML). For ML condition it is important to estimate export and import demand elasticities. Therefore, the distinguish features of this study are the estimation of the terms of trade model, volatility in terms of trade model, export demand model and import demand model. In growth analyses following two models are estimated:

$$\ln Y_t = \alpha_{11} + \alpha_{12} \ln K_t + \alpha_{13} \ln L_t + \cdot\alpha_{14} \ln TOT_t + \alpha_{15} \ln EG_t + \mu_{1,t} \ldots\ldots\ldots\ldots\ldots\ldots (1)$$

$$\ln Y_t = \alpha_{21} + \alpha_{22} \ln K_t + \alpha_{23} \ln L_t + \cdot\alpha_{24} \ln VTOT_t + \alpha_{25} \ln EG_t + \mu_{2,t} \ldots\ldots\ldots\ldots\ldots (2)$$

This study uses the production function to examine the relationship between economic growth and terms of trade. In cross countries analysis Harrison (1996) use a production function with GDP function of capital, labor openness to international trade, years of secondary education and years of primary education. Therefore, it provides us a logical ground to construct terms of trade model and volatility terms of trade model using

economic growth as a function of per capita GDP. i.e. Y_t (constant 2005 US$). K_t symbolizes the capital and it is expected economic growth will be increased by capital. The Capital is formulated by real gross fixed capital formation via following function: $K_t = (1-\sigma)K_{t-1} + I_t$, Where, K_t is sign of capital, σ stands for depreciation rate, and It is Gross Fixed Capital Formation; Average (1972-2011) of Growth rate of Consumer Price Index is used as proxy for Depreciation rate which is δ = 0.08 for Pakistan. Labor is expressed by number of workers in manufacturing industries and expected sign of the coefficient to be positive. TOT is terms of trade taken as unit value of export index (2005=100) to unit value of import index (2005=100). EG is Economic Globalization (KOF Index 2013). 1Volatility Terms of Trade is estimated via moving standard deviation (MSD) with order three.

Following export demand and import demand models are estimated for the determination of trade elasticities.

$$\ln X_{dt} = \beta_{31} + \beta_{32}\ln(PX)_t + \beta_{33}\ln GW_t + \beta_{34}\ln TOT_t + \mu_{3,t} \text{.....(3)}$$

$$\ln M_{dt} = \beta_{41} + \beta_{42}\ln(PIM)_t + \beta_{43}\ln G_t + \beta_{44}\ln TOT_t + \mu_{4,t} \text{.....(4)}$$

In trade elasticities models all variable are in natural logarithm form. In export demand model X_d is taken as real exports. Prices of exports are expressed by PX as unit value of exports Index (2005=100) to Unit value of world export Index (2005 = 100). GW is World GDP (Gross domestic product) constant 2005 US$ and TOT is terms of trade index

[1] MSD with order three = $\left[\frac{1}{3}\sum_{i=1}^{3}(\ln TOT_{t+i-1} - \ln TOT_{t+i-2})^2\right]^{\frac{1}{2}}$

obtained as TOT= $\frac{PX}{PM}\times 100$. β_{32} is the price elasticity and expected sign is negative; $\beta_{32}<0$ and β_{33} is the income elasticity which is expected to be positive; $\beta_{33}>0$. TOT expected to be positive in export demand. M_d is for real imports. PIM are prices of imports measure in term of unit value of imports index (2005=100) to wholesale price Index (2005 = 100). G is Pakistan's real GDP and TOT= terms of trade. β_{42} is the import price elasticity and expected sign is negative; $\beta_{42}<0$ and β_{43} is the income elasticity which is expected to be positive; $\beta_{43}>0$. TOT expected to be negative in import demand elasticities.

Marshall Lerner condition can be measured by adding up the import demand and export demand price elasticities in absolutes form i.e. $|\beta_{32}+\beta_{42}|$. It recommends that if $|\beta_{32}+\beta_{42}|>1$ then currency depreciation could efficiently improve the trade balance. All data are taken from WDI (2012), Pakistan Economic Survey and IFS (2013).

4. Methodological Framework

Annual data from1972 to 2011 is used for analysis. The Bounds F test of co-integration designed by Pesaran et al., (2001), Pesaran and shin (1997), under the Autoregressive Distributive Lag (ARDL) framework has been used to identify the long run correlation among the variables. The ARDL methodology is superior to other conventional co-integration procedures to approximate the long term and short-term elasticities. This technique has certain advantages. First, Pesaran et al. (2001) supported the procedure of the ARDL approach for the assessment of level associations as the model proposes that once the order of the ARDL has been acknowledged; then the association can be checked by OLS. Second, the bounds test allows a combination of I(1) and I(0) variables as detriments. Consequently, ARDL system has the benefit of not needing a definite

recognition of the order of the original information Atif (2013). The ARDL method captures short- and long- term dynamics while testing for the existence of co-integration. Third one, this method seems to be appropriate for limited sample size. All above mentioned characteristics motivate us to use ARDL approach for cointegeration analysis and ECM. In terms of trade model, an ARDL representation of equations (1) and (2) are as follows:

$$\Delta Y_t = \alpha_0 + \alpha_1 Y_{t-1} + \alpha_2 K_{t-1} + \alpha_3 L_{t-1} + \alpha_4 TOT_{t-1} + \alpha_5 EG_{t-1} + \sum_{i=1}^{n} \gamma_1 \Delta Y_{t-i} + \sum_{i=0}^{n} \gamma_2 \Delta K_{t-i} + \sum_{i=0}^{n} \gamma_3 L_{t-i} + \sum_{i=0}^{n} \gamma_4 \Delta TOT_{t-i} + \sum_{i=0}^{n} \gamma_5 \Delta EG_{t-i} + \mu_t \quad \text{.....1a}$$

$$\Delta Y_t = \phi_0 + \phi_1 Y_{t-1} + \phi_2 K_{t-1} + \phi_3 L_{t-1} + \phi_4 VTOT_{t-1} + \phi_5 EG_{t-1} + \sum_{i=1}^{n} \lambda_1 \Delta Y_{t-i} + \sum_{i=0}^{n} \lambda_2 \Delta K_{t-i} + \sum_{i=0}^{n} \lambda_3 L_{t-i} + \sum_{i=0}^{n} \lambda_4 \Delta VTOT_{t-i} + \sum_{i=0}^{n} \lambda_5 \Delta EG_{t-i} + \mu_t \quad \text{.....2a}$$

The trade elasticity equations (3) and(4) can be written with ARDL representation as:

$$\Delta X_{dt} = \beta_0 + \beta_1 X_{dt-1} + \beta_2 (PX)_{t-1} + \beta_3 GW_{t-1} + \beta_4 TOT_{t-1} + \sum_{i=1}^{n} \eta_1 \Delta X_{dt,t-i} + \sum_{i=0}^{n} \eta_2 \Delta (PX)_{t-i} + \sum_{I=0}^{n} \eta_3 \Delta GW_{t-i} + \sum_{i=0}^{n} \eta_4 \Delta TOT_{t-i} + \mu_t \quad \text{.....3a}$$

$$\Delta M_{dt} = \varpi_0 + \varpi_1 M_{dt-1} + \varpi_2 (PIM)_{t-1} + \varpi_3 G_{t-1} + \varpi_4 TOT_{t-1} + \sum_{i=1}^{n} \psi_1 \Delta M_{dt,t-i} + \sum_{i=0}^{n} \psi_2 \Delta (PIM)_{t-i} + \sum_{I=0}^{n} \psi_3 \Delta G_{t-i} + \sum_{i=0}^{n} \psi_4 \Delta TOT_{t-i} + \mu_t \quad \text{.....4a}$$

In case of equations (1a) and (2a) the null hypothesis: $H_0 = \gamma_1 = \gamma_2 = \gamma_3 = \gamma_4 = \gamma_5 = 0$, $H_0 = \lambda_1 = \lambda_2 = \lambda_3 = \lambda_4 = \lambda_5 = 0$ are to be tested against the alternate hypothesis as there are co-integration among the variables. The null hypothesis of equations (3a) and (4a)

$H_0 = \eta_1 = \eta_2 = \eta_3 = \eta_4 = 0$, $H_0 = \psi_1 = \psi_2 = \psi_3 = \psi_4 = 0$ are to be tested against the alternate hypothesis as there are co-integration among the variables.

Two bound sets of critical values are following to reject or accept the hypothesis for instance: if calculated F statistic value exists above upper bound critical values designed by Pesaran et al., (2001) and Narayan (2005a) then do not accept the null hypothesis of no co-integration and determine that the long run relationship exists among the variables. In contrast, if calculated F-statistical value is much lower than tabulated values, then null of no co-integration would not be rejected; and if computed F-statistic exists among upper bounds and lower bounds, at that time the result is indecisive. Once a long run relationship exists among the variables of the equations; then short run analysis can be estimated by following error correction models.

$$\Delta Y_t = \alpha_0 + \delta(ECT)_{t-1} + \sum_{i-1}^{n} \alpha_1 \Delta Y_{t-i} + \sum_{i=0}^{n} \alpha_2 \Delta K_{t-i} + \sum_{i=0}^{n} \alpha_3 L_{t-i} + \sum_{i=0}^{n} \alpha_4 \Delta TOT_{t-i} + \sum_{i=0}^{n} \alpha_5 \Delta EG_{t-i} + \mu_t \quad \text{.....1a1}$$

$$\Delta X_{dt} = \beta_0 + \delta(ECT)_{t-1} + \sum_{i-1}^{n} \beta_1 \Delta X_{dt-i} + \sum_{i=0}^{n} \beta_2 \Delta(PX)_{t-i} + \sum_{i=0}^{n} \beta_3 \Delta GW_{t-i} + \sum_{i=0}^{n} \beta_4 \Delta TOT_{t-i} + \mu_t \quad \text{.....3a1}$$

$$\Delta Y_t = \alpha_0 + \delta(ECT)_{t-1} + \sum_{i-1}^{n} \alpha_1 \Delta Y_{t-i} + \sum_{i=0}^{n} \alpha_2 \Delta K_{t-i} + \sum_{i=0}^{n} \alpha_3 L_{t-i}$$
$$+ \sum_{i=0}^{n} \alpha_4 \Delta VTOT_{t-i} + \sum_{i=0}^{n} \alpha_5 \Delta EG_{t-i} + \mu_t \text{.....2}b1$$

$$\Delta M_{dt} = \beta_0 + \delta(ECT)_{t-1} + \sum_{i-1}^{n} \beta_1 \Delta M_{dt-i} + \sum_{i=0}^{n} \beta_2 \Delta PIM_{t-i} +$$
$$\sum_{i=0}^{n} \beta_3 \Delta G_{t-i} + \sum_{i=0}^{n} \beta_4 \Delta TOT_{t-i} + \mu_t \text{.....4}a1$$

The estimated (ECT)t-1 term indicate that how much quickly the instability corrected in the long run after a short run disequilibrium.

5. Results

The time series data are often integrated, so to identify order of integration of each series Augmented Dickey Fuller (ADF) unit root test has been performed. Table-1 presents the result of the Augmented Dickey Fuller for each variable.

Table 1: Unit Root Results

Variables	LEVEL	1st DIFFERENCE	Order of Integration
Y	-2.48 (-2.93)	-3.51 (-2.96)	I(1)*
K	-10.61 (-2.94)	–	I(I)*
L	-0.052 (-2.93)	-6.72 (-2.94)	I(1)*
TOT	-0.70 (-2.93)	-6.23 (-2.94)	I(1)*
EG	-0.60 (-2.93)	-7.10 (-2.94)	I(1)*

VTOT	-3.53 (-2.94)	–	I(0)
Xd	-0.49 (-2.93)	-6.56 (-2.94)	I(1)*
PX	-0.52 (-2.94)	-5.59 (-2.94)	I(1)*
WG	1.30 (-2.93)	–	I(0)
Md	-1.06 (-2.93)	-6.47 (-2.94)	I(1)*
LN PIM	-1.53 (-2.93)	-5.93 (-2.94)	I(1)*
LNG	-2.48 (-2.93)	-4.40 (-2.94)	I(1)*

Note: All the variables are in natural logarithmic form. The SBC has been used for the selection of lag length. * Indicates that null hypothesis of non-stationarity is rejected at 5% level of significance and t-statistics are given in parenthesis

Results point out that all the variables, except world income, in export demand model and import demand model are non-stationary at level i.e. I (0). In terms of trade model, except volatility terms of trade, each variable is non-stationary at their level. Thus the non-stationary variables, except world income and volatility terms of trade, became stationary after taking the first difference. All the variables in all models are either integrated at order zero or one. In such situation the ARDL technique would be preferable for estimation.

Table: 2 Test for Cointegration Relationships

Estimated model	Export demand Model	Import demand Model	Terms of trade Model	Volatility Terms of trade Model

F-test for cointegration	9.98	10.08	5.596	5.40
Critical values of Pesaran et al (2001)	5%	5%	5%	5%
Lower Bound Value	3.23	3.23	2.86	2.86
Upper Bound Value	4.35	4.35	4.01	4.01
Critical values of (Narayan (2005)	5%	5%	5%	5%
Lower Bound Value	3.548	3.548	3.202	3.202
Upper Bound Value	4.803	4.803	4.544	4.544
Diagnostic tests				
R2	0. 99	0.94	0.99	0.99
Adjusted R2	0.98	0.93	0.93	0. 99
DW	2.3	2.0	2.3	2.3

Note: * Pesaran et al., (2001) table use for critical values

*Critical Values mentioned from Narayan (2005) table:

*To critical values we follow the unrestricted intercept and no trend.

*Indicates the rejection of null hypothesis of no cointegration at5%significance level Long run Trade Elasticities.

Under the ARDL framework, bound testing method has been executed to confirm the presence of the long run relationship and, then F- test is conducted for joint significance of lagged level variables to compare against critical bounds for sample size T=42. Critical values of Narayan (2005)2 and Pesaran et al., (2001) are used to verify the results. The analysis provides the evidence that there is long run relationship among the variables of terms of trade model, volatility terms of trade model, export demand model and import demand model. Above table (2) presents the test for cointegrating relationships for all four models. The results show that F- test values are much higher than upper bounds at 5% level of significance for all four models. So, null hypothesis is rejected, and it is determined that there is long run relationship between the variables.

[2] Narayan tabulated values seems to be preferred for small sample size.

a. Terms of Trade

The bound testing approach depicts that there exist long-run relationships among the variables in terms of trade model and volatility terms of trade model. In each model, the optimal 2 lags are used i.e. imax = 2, which is based on SBC criteria. The long run elasticities results based on ARDL technique are reported in the table (3) show that capital and labor significantly contribute to increase the output of the country. As it is shown in the terms of trade model that one percent increase in capital and labor cause to increase output by 0.59 percent and 0.21 percent of the country in the long run, respectively. Positive impact of capital and labor are similar to Yasmeen and Tufail (2015), Wong (2010). While replacing the terms of trade variable with volatility terms of trade variable the coefficients of both capital and labor remained unchanged. The coefficients of terms of trade and volatility term of trade are insignificant, which indicate that TOT has not significant role to boost up the output of the country.

Table: 3 Long Run Elasticities of TOT and VTOT

Variables	ARDL coefficients (t-Statistic)	Variables	ARDL coefficients (t-Statistic)
Terms of Trade Model		Volatility TOT Model	
K	0.59 (7.09)**	K	0.60(7.47)**
L	0.20 (2.85)**	L	0.20 (4.08)**
TOT	-0.0072(-0.11)	VTOT	-0.08 (-0.66)
EG	0.45 (2.79)**	EG	0.46 (2.88)**
C	7.77(4.44)**	Constant	7.56 (4.53)**
Diagnostic tests		Diagnostic tests	
χ2SC(1)	1.32[0.25]	χ2SC(1)	1.68 [0.19]
χ2FF (1)	0.13[0.71]	χ FF (1)	0.003[0.95]
χ2N (2)	1.66[0.43]	χ2N (2)	2.53 [0.28]
χ2H (1)	0.67[0.79]	χ2H (1)	0.002[0.95]

Note: ** significance levels at 5%. t-statistics values are given in parentheses

1. χ2 SC Lagrange multiplier test is the test of residual serial correlation,

2. χ2FF (functional form of the model) Ramsey's RESET test use the square of the fitted values,
3. χ2N (normality test) Established on a skewness and kurtosis of residualstest,
4. χ2H (Hetroscedacity) Constructed on the regression of squared residuals on squared fitted values of d.f are mentioned in parentheses.
5. P-values of LM test are given in brackets.

These results are not astonished for Pakistan economy and also consistent with Kalumbu and Sheefeni (2014) study who postulates that terms of trade is negative and insignificant in Namibia. The study finds that economic globalization is important variable to determine the growth. One implication of positive impact of economic globalization[3] is that economic connections of the countries across the world via rapid growth in cross country movement of capital, goods, services and technology is encouraging to increase the growth of the developing countries. Dependence on global trade links and foreign investments has become indispensable to maintain and boost the pace of economic growth due to the scarcity and misuse of domestic resources. An important implication of these results is that economic globalization is more important as compare to terms of trade for growth of a country.

Table: 4 The Short Run Elasticities of TOT and VTOT:

Variables	ARDL coefficients (t-Statistic)	Variables	ARDL coefficients (t-Statistic)
Terms of Trade Model		Volatility TOT model	
dK	1.68 (2.86)**	dk	1.77 (2.85)**
dK1	0.357 (2.96)**	dK1	-1.11 (-2.27)**
dL	-0.069 (-1.40)	dl	-0.076(-1.49)
dL1	-0.091 (-1.69)	dL1	-0.092 (-1.67)
dTOT	-0.0038 (-.11)	Dvtot	-0.048(-0.63)

[3] Economic globalization index has two measurements: 1: is actual Flows 50 %. In actual flows, trade percent of GDP is 21%, foreign direct investment, stocks (%of GDP) is 28 percent, portfolio investment (%of GDP) is 24 percent, income payments to foreign nationals (%of GDP) is 27 percent. 2: is Restrictions 50% and this includes hidden import barriers i.e is 24 percent, mean tariff rate is 27 percent, Taxes on International Trade (%of current revenue) is 26 percent and capital account restrictions is 23 percent.

dEG	0.034 (0.57)	Deg	0.041(0.66)
dEG1	-0.16 (-2.4)**	dEG1	-0.17 (-2.28)**
C	4.15 (4.21)**	C	4.31 (4.86)**
ECM(t-1)	-0.53 (-3.13)**	ECM(t-1)	-0.57(-3.23)**

Note : ** significance levels at 5%. T-statistics values are given in parentheses

The short run results reported in table 4 depict that the TOT and labor have no significant role to determine the growth. The co-efficient ECM_{t-1} which is speed of adjustment procedure back to long run is negative and statistically significant and illustrates that in both models more than 50 % instability is adjusted in every year.

b. Trade Elasticities

Table: 5 Long Run Trade Elasticities

Export Demand Model		Import Demand Model	
Variables	ARDL coefficients (t-Statistic)	Variables	ARDL coefficients (t-Statistic)
PIX	-0.73(-2.52)**	PIM	-1.32(-2.00)**
GW	4.49 (5.82)**	G	0.66 (8.03)**
TOT	1.075 (2.62)**	TOT	-0.96(-2.46)**
C	-122.21(-4.79)**	Constant	11.16 (5.19)**
Diagnostic tests4		Diagnostic tests	
χ2SC(1)	1.69[0.193]	χ2SC (1)	0.15[0.69]
χ2FF (1)	0.98[0.321]	χ2FF (1)	1.33[0.321]
χ2N (2)	0.97[0.953]	χ2N (2)	2.82[0.244]
χ2H (1)	0.67[0.42]	χ2H(1)	0.013[0.91]

[4] To evaluate the fitness of the model stability test as cumulative (CUSUM) and cumulative sum of squares (CUSUMSQ) are also tested, which shows that parameters of models are stable overtime compared to the critical bunds of the 5% significance level. In Diagnostic test we found that the probability of LM test is greater than 0.05 and determined no serial correlation, Ramsey's RESET of no miss- specification in the model, residuals are normally distributed and there is no auto-regressive conditional heteroscedastic (ARCH) effect in all models.

After the identification of the long run relationship among the variables of import demand model (equation 3) and export demand model (equation 4) long run elasticities are estimated. For selection of lag length Schwarz Bayesian Criterion is used. The criterion shows that optimal lag length is two i.e. imax = 2.

6. Conclusion

The study could not find significant impact of terms of trade and volatility of terms of trade on output in short run as well as in the long run. These results implied that terms of trade and volatility terms of trade do not play leading role in the determination of Pakistan's growth. These results are not surprising for Pakistan country which must face some internal and external crisis. The fact that Pakistan mainly exports primary goods like cotton; jute and imports consist on capital goods machinery; and must compete with other countries which exports similar goods.

A movement in terms of trade can be explained in terms of export demand elasticities and import demand elasticities. Despite of satisfaction of Marshall-Lerner condition; only devaluation of currency may not be advantageous. Under situations where export demand and import demand elasticities are not fully elastic separately; devaluation may not be successful. When currency devaluated, it means import prices are getting higher than export prices which results in deterioration of the terms of trade. On our empirical results, some important policy implications can be emerging. First, the devaluation has some other consequences which can negatively affect the terms of trade and economic growth. Low export capacity is another feature of Pakistan economy due to some internal crises as, energy crises, political issues, Government policies, which affect the export promotion activities negatively. Pakistan cannot curtail imports because of capital goods, machinery, oil, etc. So; terms of trade deteriorated in Pakistan because of higher imports and lower exports.

An important result that is found in this study is that economic globalization is more important for trade and development of Pakistan as compare to terms of trade and export and import prices. Therefore, it would be important to enhance confidence building measures for improvement in globalization. Furthermore, developed countries are not much concerned of developing countries' exports (availability of substitute). These factors affect the terms of trade through export and import elasticity which keeps import prices high and export prices low; these may be the reasons of the worsen terms of trade of Pakistan's.

No doubt some quality improvement in productivity of export sector has occurred but still need to take such steps that may lessen the problem of cyclical fluctuation in Pakistan's export sector. In this way not only, volume of export will increase, prices of exports goods may also be increased, finally terms of trade will increase and remove the trade deficit consequently the growth will increase.

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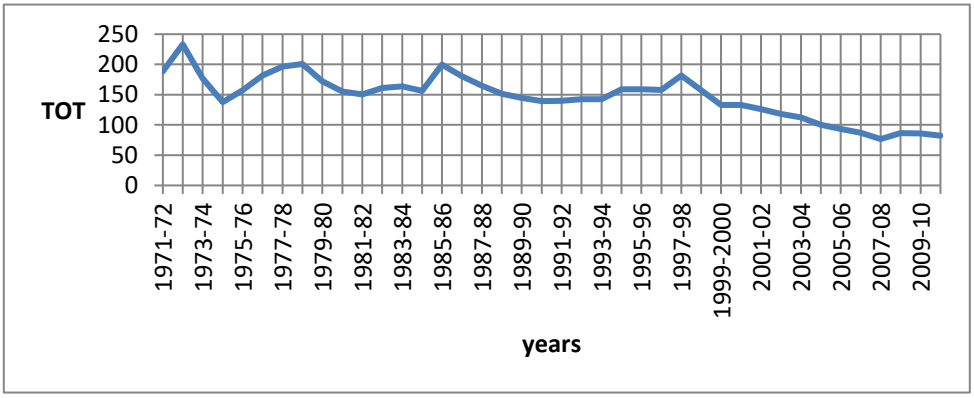
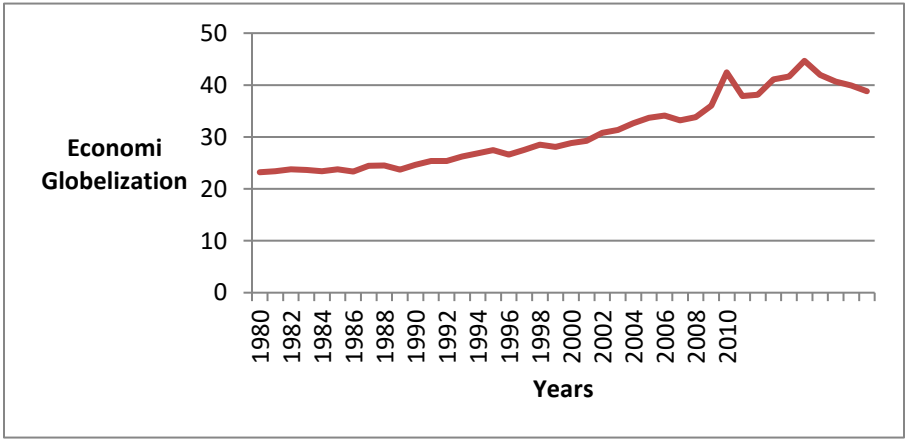
APPENDIX

Figure.1



Net barter terms of trade index (2005=100) (IFS 2013)

Figure.



Source: KOF Index of Globalization (2013)