Impact of Trade Liberalization on External Debt Burden: Econometric Evidence from Pakistan

Zafar, Sabahat and Butt, Muhammad Sabihuddin

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SABAHAT*

MR .MOHAMMAD SABIHUDDIN BUTT**

ABSTRACT

Pakistan's leading challenge today is to lessen its debt burden in order to pursue a path that leads towards sustainable and impartial growth for poverty diminution. The consequences of trade liberalization are of growing concern, mainly in the emerging economies with severe brim over effects on their debt situation. The major objective of this paper is to discuss the current external debt problem in Pakistan and analyze how its external debt is interrelated with trade liberalization policies and measures .Using data from the last three decades, this paper investigated whether there exist a momentous relationship between external debt and the trade liberalization variables or not. In this case study ARDL bounds testing approach is employed to investigate the long run relationships and Error Correction Method (ECM) for short run dynamics. After finding the order of integration through implementing the Augmented Dickey Fuller (ADF) and Phillips-Perron unit root tests, our finding suggested a significant long run positive association between external debt and trade liberalization is existed in case of Pakistan

Keywords: External Debt, Trade Liberalization, ARDL Bounds Testing, Error Correction Method
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*Corresponding Author at Applied Economics Research Centre. University of Karachi, Karachi 75270, Pakistan.
** Senior Research Economist at Applied Economics Research Centre, University of Karachi, Karachi 75270, Pakistan.

1. Introduction

Pakistan's one of the biggest development challenges today is to trim down its debt burden in order to chase a path that leads towards sustainable and impartial growth for poverty reduction. The external debt burden resulted from foreign borrowing, ideally driven by developing, especially the low income countries' desire to develop their economies. The accumulation of foreign debt is a common phenomenon among developing countries at the stage of economic development where domestic savings are low, current account (CA) deficits are high and capital imports are necessary to augment domestic resources. Today the burning issue for the policy makers around the country is the high external indebtness faced by the economy limiting the scope of growth and development. Accumulated external debt has an impact on the economy's capacity to reap the benefits of its participation in the multilateral trading system. Pattillo, et, al, (2002) found empirical support for a nonlinear impact of foreign debt on economic growth: at low levels, debt has positive effects on economic growth; but above particular thresholds or turning points, additional debt begins to have a negative impact on growth (*the debt Laffer curve)* Clearly, it is important that borrowed funds should be used for productive investment that generates a return – and economic growth – that is sufficient to cover debt repayment.

After the nuclear explosion carried out by Pakistan, western countries imposed certain economic sanctions, which directed the country towards a technical default on country's external debt. This might be the major reason for technical default on external debt, but we cannot ignore the role of other economic policies, which had been carried out during the same period. Monetary, fiscal, and trade policies were worsening the situation much.. According to Auboin Trade liberalization is among several factors that can improve the allocation of resources at national and international levels, and hence improve the resilience to external shocks. As a factor in improving productivity and the allocation of resources, trade liberalization can impact favorably on the debt servicing capacity of

economies, as it may result in increased sources of foreign exchanges such as net exports and foreign direct investment. Provided that trade liberalization and reforms are sequenced and timed properly, taking into account the special needs of developing countries, they could also reduce adjustment costs and enhance the ability of these developing countries to reap benefits from them.

Overseas market access restrictions can impede the ability of indebted countries to earn the foreign exchange they need to service their external debt, and to avoid resorting to further unsustainable borrowing. Virtually all developing countries agree that market access for their products is the prime instrument to reduce their huge foreign debts by generating trade surplus.(Tambunan and Kadin 2006) . While lack of access to markets can be a major reason why developing countries may not be able to exploit their comparative advantage, lack of trade liberalization by these countries can also play an important role. Inward-looking, restrictive trade policies raise the cost of imports, and hence exports, and tend to divert labor and capital from their most efficient uses, thereby leading to a suboptimal mix of production, investment and consumption.(UNCTAD 2001). So, in developing countries including Pakistan there is a need to highlight the importance of examining the inter-linkages between trade liberalization policy and external debt in an effort to find sustainable solutions to increase trade surplus and to resolve external indebtedness. From an analytical perspective the link between trade and debt appears less straightforward than that between other macro economic variables, or at least less direct.

This interlinkage between trade and debt possess entirely opposite sides of a same coin. The brighter side shows the picture where the external debt is inversely related to the trade liberalization measures, any attempt to open the economy would cause a decline in the external debt burden. As according to Lane and Milesi-Ferretti (2000), gains from trade typically stem from increased income for domestic consumers and industrial users of imported inputs. Liberalizing trade restrictions can therefore have a positive impact on external debt and debt servicing, as it tends to boost domestic growth, productivity and exports. It has been empirically found that the level of openness to trade had positive effects on the debt structure of countries, by attracting foreign direct investment (a cheaper source of foreign capital than debt) and hence foreign exchange reserves, which

in turn enabled countries to finance technology transfer and hence improve productivity, and to shift towards production with higher income-elasticity and better terms-of-trade.

In contrast to these arguments the darker side of the coin particularly for the developing countries shows a positive relationship between the external debt and the trade liberalization policy. Trade taxes are the important source of generating revenues for the developing countries, especially for the poorest ones, progressive trade liberalization requires the reduction or elimination of imports and export tariffs, and the resulting fiscal gap may then have to be filled with increased borrowing (Caliari A.2005). For example it has been found that in African countries, international trade taxes represented almost 30% of total revenue over the last decade, compared with 0.8% for OECD countries. (Economic Commission for Africa 2004).A recent study by IMF researchers, looking at the data from 125 countries, corroborates that middle income countries tend to recover only 35-55 cents for each dollar of tax revenue they lost, while low income countries recovered essentially none.(Baunsgaard and Keen2004).The most important factor that is responsible for this positive link between debt and trade liberalization, is the dependence of the developing countries' export on the primary commodities. The high dependence on commodity export is strongly connected with debt problem in two ways First the world prices of the commodities have been declining for the last four decades. Between the years 1977 and 2001, prices for 41 out of 46 leading commodities declined (after adjustment to general inflation). Second the prices of commodities are subject to sharp fluctuations. The variability of commodity prices makes countries that are highly dependent on commodities unable to plan on the basis of a predictable stream of income. It also makes them susceptible tot terms of trade shocks that introduces high levels of uncertainty to their balance of payments, and (indirectly) also impact negatively their fiscal positions, rates of growth, poverty and external debt. (Caliari A. 2005). As according to Khattry and J.Rao (2002) when several developing countries liberalize simultaneously, they could face lower export prices due to an excess supply of similar exports, worsening their terms of trade. This would adversely affect revenues directly through reduced export revenues, or indirectly through the lower income earned from exports and hence lower income tax receipts.

The relationship in the context of external debt and trade liberalization has not been very familiar in this region. To the best of our knowledge this study is the first attempt to start this particular path in the economic development in Pakistan. In this study, our concern is about the trade liberalization policy effect on external debt situation in the context of Pakistan's economy in ARDL frame work.

The Organization of the paper is as follows. Data description and model specification are given in section 2. Section three develops a framework illustrating the relevance of co-integration in testing for a long-run lead-lag relation, and discusses the ARDL approach to co-integration. Empirical results are reviewed in the forth section. The conclusion and policy recommendations are presented in the section five.

2. Data Description and Model Specification

Different variables are considered as determinant of the relationship between external debt and trade liberalization .In the context of trade liberalization, variables such as export to GDP ratio, import to GDP ratio terms of trade and exchange rate can be considered to reflect the impact of trade liberalization on external debt. Data source for this study is secondary in nature. Time series data is collected to cover 36 years (1972-2007).Data sources include Economic Survey of Pakistan, and World Development Indicators (WDI). To formulate this relationship between trade liberalization and external debt, the following equation is being adopted.

$$External\ Debt/GDP = f_0 + f_1 Exp/GDP + f_2 Imp/GDP + f_3 TOT + f_4 Exch + e_t \quad \ldots\ldots(1)$$

Where, external debt include all Government debt denominated in foreign currency, loans contracted by enterprises with Government ownership of more than 50%,as well as the external debt of the private sector which is with the SBP and benefits from a foreign exchange convertibility guarantee from the SBP .Expected signs of the of the coefficient $f_1$either may be positive or negative depending upon the nature of exports of the country,for industrial exporting economies it is desired to be negative ,and for primary

commodities exporting countries it is expected to be positive .similarly coefficient of $f_2$will either be negative or positive, again depending on the nature of imports . For capital imports, it is negative where as for consumer imports it is expected to be positive. Sign of f_3 may be positive or negative depends upon the magnitude of the change in exchange rate and its effect on country's exports. f_4 is expected to be positive as improved terms of trade may lead to a reduced export if the demand for the exported goods is price elastic, which will further exacerbate the debt burden or stress.

3. Econometric Methodology: ARDL framework

In the last two decades, several econometric procedures were adopted to examine the co - integration relationship among certain macroeconomic variables .With regard to univariate co-integration approaches, there are several examples including residual based Engle Granger (1987) and the fully modified OLS procedures of Phillip and Hensen(1990), where as Johansen(1988), Johensen and Juselius (1990), and Johansen's (1996) full information are some techniques of multivariate co-integration measures.

All of these co-integration procedures necessitate that variables in the system must be must be stationary at equal order of integration, whether it is of integration of order 0 or of 1.Nowadays a better alternative to these measures named as Auto Regressive Distributed Lag (ARDL) technique introduced by Pesaran et.al.(1996,2001) has become popular in the midst of the researchers. Various econometric advantages are associated with this ARDL approach. The main advantage of ARDL modeling lies in its flexibility that it can be applied when the variables are of different order of integration (Pesaran and Pesaran1997). Another advantage of this approach is that the model takes sufficient numbers of lags to capture the data generating process in a general-to-specific modeling framework (Laurenceson and Chai 2003). Moreover, a dynamic error correction model (ECM) can be derived from ARDL through a simple linear transformation (Bannerjee *et al.* 1993).The ECM integrates the short-run dynamics with the long-run equilibrium without losing long-run information. It is also argued that using the ARDL approach avoids problems resulting from non-stationary time series data (Laurenceson and Chai 2003).

As mentioned earlier, the variables considered in this study are a mix of I(0) and I(1) series. The co-integration test methods based on Johansen (1991; 1995) and the Johansen-Juselius (1990) require that all the variables be of equal degree of integration, i.e., I(1). , Therefore these methods of co integration are not appropriate and cannot be employed. Hence, we adopt the ARDL modeling approach for co-integration analysis in this study. In the ARDL framework the procedure as a first step involves estimating the following model.

$$?EXD/GDP = a_0 + \sum_{t=1}^{k} ?_i ?(EXD/GDP)_{t-i} + \sum_{t=1}^{k} f_i ?EXCH_{t-i} + \sum_{t=1}^{k} ?_i ?(EXPGDP)_{t-i} + \sum_{t=1}^{k} ?_i ?(IMP/GDP)_{t-1} + \sum_{t=1}^{k} ?_i ?TOT_{t-i} + \beta_1 EXD_{t-1} + \beta_2 EXCH_{t-1} + \beta_3 EXP_{t-1} + \beta_4 IMP_{t-1} + \beta_5 TOT_{t-1} + e_{1t} \quad \ldots\ldots\ldots\ldots\ldots\ldots (2)$$

Where ***EXD*** is the external debt burden, ***EXCH*** is the market exchange rate, ***EXP*** is the export of gods and services ***IMP*** is the import of goods and services, and ***TOT*** is the country's terms of trade.

In the above equations, the terms with the summation signs represent the error correction dynamics while the second part [terms with β**s** in equation)] corresponds to the long run relationship. In this process, one has to compute the usual F-statistic for testing the joint significance of $\beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5$, =0 . However, the asymptotic distributions of the standard Wald or F statistics for testing the significance of the lagged levels of the variables are non-standard under the null hypothesis that there exists no long-run relationship between the levels of the included variables. Pesaran and his co-authors provide two sets of asymptotic critical values; one set assuming that all the regressors are I(1); and another set assuming that they are all I(0). These two sets of critical values refer to two polar cases but actually provide a band, covering all possible classifications of the regressors into I(0), I(1) (fractionally integrated or even mutually co-integrated). In view of this result, we have to use the appropriate bounds testing procedure. The test is

consistent. For a sequence of local alternatives, it follows a non-central ?2-Distribution asymptotically. This is valid irrespective of whether the underlying regressors are I(0), I(1) or mutually co-integrated. The recommended proceedings based on the F-statistic are as follows. One has to compare the F-statistic computed in the second step with the upper and lower 90, 95 or 99 percent critical value bounds (FU and FL). As a result, three cases can emerge. If F > FU, one has to reject $\beta_1 = \beta_2 = \beta_3 = \beta_4 = 0$ and hence conclude that there is a long-term relationship between y and the vector of x's. However, if F < FL, one cannot reject $\beta_1 = \beta_2 = \beta_3 = \beta_4 = 0$. In this case, a long-run relationship does not seem to exist. Finally, if FL < F < FU the inference has to be regarded as inconclusive and the order of integration of the underlying variables has to be investigated more deeply. The second step of this approach involves estimating the ARDL form of 1 where the optimal lag length is chosen according to one of the standard criteria such as the Akaike Information Criterion (AIC) or the Schwartz Bayesian Criterion (SBC). Then the restricted version of the equation is solved for the long run solution. The third step involves the estimation of the error correction equation using the differences of the variables and the lagged long run solution and determines the speed of adjustment of equilibrium.

5. Empirical results

To ascertain the order of integration, the work begins through applying the Augmented Dickey–Fuller (ADF) and Phillips Perron (PP) unit root test. The ADF and PP tests suggest that all the variables are each integrated of order one or I(1). These results are reported here .

Table 1. Unit Root Estimation

Variables	ADF-TEST		Philip –Perron Test	
	Level	1st Difference	Level	1st Difference
DEBT	-1.38073	-5.14532**	-2.75876	-9.4865*
EXCH	-1.18337	-2.73616***	0.980081	-3.53506**
EXPOR	-1.12991	-4.66884**	-1.4275	-5.43958*
IMP	-1.0605	-5.54285*	-2.5419	-6.16597*
TOT	-0.91298	-4.49666**	-1.34841	-5.57186*

Note: *, ** ,*** represent level of significance at 1%, 5% and 10% having critical values as 5.419, 4.013 and 2.407 respectively

Table 2. Lag Length Selection Criteria

Order of lags	Schwartz Bayesian Criteria	Hannan-Quinn criterion
0	2.958566	2.802672
1	-1.485271*	-3.217136*
2	-0.503653	-3.159983

After finding the integrating order of all variables we performed the bounds testing approach. In the first stage of the ARDL procedure, the order of lags on the first – differenced variables for Eq. (2) is usually obtained from unrestricted vector auto regression (VAR) by means of Hannan-Quinn Information Criterion (HQC) and Schwarz Bayesian Criterion (SBC) which is 1 based on the minimum value as shown in above table. The total number of regressions estimated following the ARDL method in equation is $(1+1)^5 = 32$.

Table-3: ARDL Co-integration test

ARDL Co-integration				M.Hashem Pesaran	
Test-Statistic	Value	Lag	Significant level	Bound Critical Value	
				I (0)	I (1)
F-Statistic	5.34	1	1%	3.06	4.15
			5%	2.39	3.38
			10%	2.08	3.00

The table-3 shows the result of bound testing approach for co-integration which clarifies that the calculated F- statistics is higher than the upper level of bounds critical value at 1% level of significance. The results appear to provide evidence for the existence of a long-run relationship among the variables. These results also warrant proceeding to the second stage of estimation. Next we estimate the long-run coefficients of the ARDL model.One of the more important issues in applying ARDL is choosing the order of the distributed lag function. Akaike Information Criteria has been used . The optimal number of lags for each of the variables is shown as ARDL (1, 2, 2, 0, 2,). Table-4 shows the long run coefficients of the variables under investigation..

Table 4. The Long Run Results

Dependent Variable = EXD		
Regressor	**Coefficient**	**t- Ratio**
Constant	0.2599	1.2097
Exp	2.1614*	4.2420
Imp	-1.0239*	-2.0765
Exch	-0.0033676*	-2.8863
TOT	0.0014974**	1.8366
R^2 = 0.90522		
Adj. R^2 = 0 .85872		
F – stat = 19.1007		
Durbin-Watson stat. = 2.1683		

Note: *, ** represent level of significance at 1%and 5% respectively.

The empirical results in above table identified the existing long run relationship among the variables. The coefficient of export to GDP ratio shows a significantly positive impact

on external debt burden of our economy, indicate the evidence of the actuality that high dependence on low value added and primary goods export is strongly connected with external debt problem as the world prices of these commodities are steadily declining for the last four decades and they are subjected to the sharp fluctuations. The significant negative relationship between external debt and the import to GDP ratio lies in the fact that the improved capital intensity is usually associated with better productivity and higher returns over the investment up to a certain limit. In the developing countries higher importation of capital goods leads to increase in domestic output of goods and services, which ultimately result in the less dependence on the import sector and thus reduce the external debt burden. According to above results exchange rate negligibly affect the external debt burden but this relationship is significantly negative shows that the higher exchange rate would reduce the external debt through improved revenues earned from exports. Finally the coefficient of terms of trade is positively and significantly at 10% level of significance is associated with external debt burden, proved the fact that the deterioration of the terms-of-trade is the factor undermining a country's ability to access international markets on attractive terms. In practice, countries with a low level of development and of integration in world trade lack credibility in international capital markets, thereby failing to attract private capital flows and becoming reliant on external public debt.

After investigating the long run relationship between external debt and trade liberalization variables, following equation represents the short term dynamics of this interlinkage.

$$?EXD/GDP = a_0 + \sum_{t=1}^{k} ?_i ?(EXD/GDP)_{t-i} + \sum_{t=1}^{k} f_i ?EXCH_{t-i} + \sum_{t=1}^{k} ?_i ?(EXP/GDP)_{t-i} + \sum_{t=1}^{k} ?_i ?(IMP/GDP)_{t-I} + \sum_{t=1}^{k} ?_i ?TOT_{t-i} + \beta CE_{t-} + e_{It} \quad \ldots\ldots\ldots\ldots(3)$$

Short run coefficient estimates obtained from the ECM version of ARDL model is reported in table 5.

Table 5. Error Correction Corresponding to the ARDL (1, 2, 2, 0,2)

Dependent Variable = EXD		
Regressor	**Coefficient**	**t- Ratio**
Constant	0.16508	1.2478
D(Exp/GDP)	1.8753	4.3386*
D(Exp/GDP1)	-1.0195	-2.0772*
D(Imp/GDP)	-0.65012	-1.9787**
D(Exch)	-0.0021631	-0.79414
D(Exch1)	0.0086062	3.4924*
D(TOT)	0.0002442	0.49628
D(TOT1)	0.0006751	1.3761
ecm(-1)	-0.63494	-6.1033*
R^2 =	0.80439	
Adj. R^2 =	0 .70659	
F – stat =	11.3089	
Durbin-Watson stat. =	2.893	

Note: ARDL (1, 2, 2, 0, 2) selected on the basis of Akaike Information Criteria.

The ECM coefficient shows the speed of adjustment of variables return to equilibrium and it should have a statistically significant coefficient with negative sign. The error correction term *ecm*(–1), which measures the speed of adjustment to restore equilibrium in the dynamic model, appears with negative sign and is statistically significant at 1 percent level, ensuring that long run equilibrium can be attained. It has been confirmed that holds that a highly significant error correction term is further proof of the existence of stable long run relationship. Indeed, testing the significance of ecm_{t-1}, which is supposed to carry a negative coefficient *ecm* (–1), is relatively more efficient way of establishing Co-integration(Bannerjee *et al.*1998). The coefficient of is equal to (–0.6349) for short run model respectively and imply that deviation from the long-term

inequality is corrected by 0.6349 percent over the each year. The lag length of short run model is selected on basis of Akaike Information Criteria (AIC).

Short run dynamics outcome provide the empirical evidence that the coefficient of *Exp/GDP* is statistically significant at 1% level, implying that any increase in the ratio is likely to aggravate the external debt burden of the economy not only in the long run but also in the short run. In accordance to the long run results, short run coefficient of *Imp/GDP* also has negative sign which is significant too, implying that increases in domestic imports relative to GDP will decline the external debt burden. The impact of terms of trade TOT on the external debt burden of the country is consistent with the long run results but the results are not significant. Therefore, we can say that the increasing terms of trade has no significant impact on external debt burden. In contrast to the long run, Coefficient of exchange rate in short run has positive sign but insignificancy of this coefficient shows negligible impact on the external debt burden .The lagged of the exchange rate is positively linked with the dependent variable, the high level of significance implies that the devaluation of Pakistani Rupee against US dollar seems to perk up the country's external debt situation.

6. Conclusion and strategy Recommendation

The underlying objective emphasize throughout this paper has been to explore the interlinkages between external debt burden and the trade liberalization measures in the context of Pakistan. In recent research, not much attention has been given to the issue of impact of trade liberalization on external debt burden in Pakistan. In some cases trade liberalization may have favorable impact on the debt servicing capacity of economies, as it may result in increased sources of foreign exchanges such as net exports and foreign direct investment. But in other situation, when the economies are heavily dependent on the exports of primary commodities, the results are quite opposite because the progressive trade liberalization requires the reduction or elimination of imports and export tariffs, and the resulting fiscal gap may then have to be filled with increased borrowing.

Our study encompassed three decades of Pakistan economy and reached to the conclusion that overall, liberalization contributes significantly to external debt burden. In the empirical investigation of this nexus, ARDL model of co-integration and error correction modeling(ECM) approaches have been applied. The empirical results identified the existing long run relationship among the variables. The positive link between exports to GDP ratio and external debt found, indicating the evidence that high dependency on low value added and primary goods export is strongly connected with external debt problem. The significant negative relationship between external debt and the import to GDP ratio lies in the fact, that the improved capital intensity is usually associated with better productivity and higher returns over the investment up to a certain limit. Exchange rate negligibly affects the external debt burden but this relationship is significantly negative shows that the higher exchange rate would reduce the external debt through improved revenues earned from exports. In order to determine the short-term dynamics around the equilibrium relationship, we estimated an error correction model (ECM).In short run the results are consistent to the long run, similar results are found as export and imports are affecting the external debt in the similar manner.

In the light of this empirical investigation, we can conclude that in our country trade liberalization is acting as stimulator of external debt accumulation. The rationale at the rear of this phenomenon is the nature of exports, we are producing, primary, cheap and vulnerable pricing commodities are deteriorating the situation much. Without a system of trade policies that will enable our indebted country to a) advance the industrious structure to make the move into exports of more vibrant products with higher dexterity and expertise content; b) make certain greater value-added to exports; c) broaden the horizons of the economy and foster infant industries; d) provide ample levels of financing in reasonable stipulations, to the home-grown industrious sector; e).using debt indicators that detain the actual progress in using export as a source of foreign exchange, our economy will on no account be free of debt. As overseas development assistance and debt cancellation will not always be accessible to plug the gap between foreign exchange earnings and the outlay of import.

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