



Journal of Applied Sciences

ISSN 1812-5654

science
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External Debt: Some Experience From Turkish Economy

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Abstract: The study pin downs vital role of the emerging field of external debt and debt indicators in Turkish economy with emphasis on empirical relationship of external debt, debt indicators between growth, investment and exports over the period 1983-2002. Present results suggest that the substantial raise in the stock of external debt put negative effect on investment, positive effect on exports and has no effect on growth. Present results imply that if policy maker wants to increase social welfare and growth, then it may be necessary to endow the political, military and social environment with appropriate enforcement devices with respect to the economy's targets, choices and preferences. Results suggests that external debt and debt indicators has low effect on the improvement of Turkish economy, which is dominantly, influenced by political authorities and bureaucracy. In nut shell, the conclusion supports the idea that the setting of external debt by authorities must be disciplined which, in some instances is possibly over ruled by the structural adjustment programmes, which can remove economic distortion, accelerate exports, growth and encourage external debt management.

Key words: External debt, debt indicators, growth, investment, export, Turkey

INTRODUCTION

Turkey, like other semi-industrialized countries, has been deficient in domestic resources to finance the investment necessary to sustain a rising per capita income and thus relied heavily on external economic assistance to bridge resource gap since the early 1930s. The foreign external debt has, therefor, played a key role to accelerate the economic growth, investment and export however, persistent inadequacy of domestic capital has perpetuated dependence on external borrowing. Over time, the volume of debt has also piled up with increased liability of debt service payments. Under the period of consideration, the chemistry of external debit has changed from time to time and form grant and grant like assistance to hard term loans, repayable in foreign exchange.

The external debt burden has assumed great importance in the economy and require due attention of the policy makers as it stands on top in the budgetary allocation as the expenditure outlay and consumes a huge portion of the GDP. The growing public debt and its servicing are indeed very serious macroeconomic problems facing the economy, which lead to high inflation, low savings, sovereignty of the country, other sundry problems and causing a huge drain on the national economic resources and must be reduced by debt retirement through the proceeds of privatisation and improvement in public debt management. In principle the external debt is raised for financing long term

development expenditure but in Turkey these debts are being used for financing fiscal deficits which invariably crop up due to imbalance in the revenue budgets. The history of elucidative theoretical approach of the effects began with the MacDougall^[1] study for the external debt and a detailed empirical research conducted by Aigner and Sprenkle^[2]. In subsequent paper, Hershlag^[3] suggested that balance of payments crises are not new for the Turkish economy. The debts problem was already playing a central role in Turkey's external relations when the Ottoman Empire was breaking up. Wolf^[4] argued that a self financed, inward oriented development strategy was pursued by Turkish Republic from its formation in 1923. Since Turkey began to lower its external barriers in the 1950s, the various phases in the economic development of Turkey featured periodic balance of payments crises. Over the period under consideration, Turkey has had turbulent political, democratic and economic history^[5]. Consequently, the evidence suggests that the spread between the average cost of deposits and the average cost of credits rose rapidly, more than doubling between 1982 and 1986^[6]. According to report of World Bank^[7] political, military and social environment has a significant effect on the performance of Turkish economy.

Jung and Marshal^[8] point out that there is an inverse correlation between external debt and economic growth. Levy^[9] found that external economic aid and economic growth are positively correlated. Fry^[10] suggested that foreign debt adversely affects savings and investment in

developing countries. Islam^[11] contended that foreign resources, in highly aggregative form, do not show any significant contribution to economic growth in Bangladesh. However, loans and food aid appear to exert a stronger influence on economic growth than other categories. He also finds that domestic resources exert a much stronger effect on economic growth than foreigner resources. Levine and Ramamurthi^[12] concluded that studies which analyse the relationship between economic growth and exports implicitly examine the link between growth and the broader definition of trade as well as proportion of investment in GDP. Ukpolo^[13] supports that hypothesis of positive linkage between the growth of non-fuel primary exports and economic growth. However, his results cast some doubt on the significance of the positive contribution of the manufactured exports sector to the growth process of low income African countries. Rapid accumulation of debt can also be accompanied by increasing capital flight if the private sector fears imminent devaluation and/or increases in taxes to service the debt^[14]. Murthy *et al.*^[15] apply the technique of unit root testing and Johansen's maximum likelihood procedure to show that foreign aid had positive contribution to economic growth in Cameroon during 1971 to 1990.

In middle-income countries, Warner^[16] concluded that the debt crisis did not depress investment, while Elbadawi, Ndulu and Ndungu^[17], Deshpande^[18] and Chowdhury^[19], on the other hand, find evidence in support of the debt overhang hypothesis. Fosu^[20], in his empirical study of thirty-five sub-Saharan African countries, also finds support for the debt overhang hypothesis. In contrast, Hansen^[21] finds that in a sample of 54 developing countries (including 14 HIPC's), the inclusion of three additional explanatory variables (the budget balance, inflation and openness) leads to rejection of any statistically significant negative effect of external debt on growth. In a similar studies, Savvides^[22] finds that the ratio of debt to GNP has no statistically significant effect on growth. Krugman^[23] review a number of studies on the "debt overhang" hypothesis and conclude that the empirical evidence is inconclusive. Pattillo *et al.*^[24] find that the average impact of external debt on per capita of GDP growth is negative for net present value of debt levels above 160-170% of exports and 35-40% of GDP. These results are robust across different estimation methodologies and specifications and suggest that doubling debt levels slows down annual per capita growth by about half to a full percentage point. In a follow-up paper, Burnside *et al.*^[25] apply a growth accounting framework to a group of 61 developing countries in sub-Saharan Africa, Asia, Latin America and the Middle East over the period 1969-98. Their results suggest that on average, doubling debt reduces by almost 1 percentage point, both growth in per capita physical capital and growth in total factor productivity.

To cut a long story into short, the existing empirical literature provides limited evidence on how the stock of external debt and debt indicators affect growth, investment and exports particularly in low-income countries. Not with standing, more work is needed to explore the channels through which external debt and debt indicators affects growth, investment and export. This study attempts to fill this gap in the literature, with special attention being paid to the effects of external debt and debt indicators on growth, exports and investment.

Consequently, our empirical analysis attempts to shed light on the channels through which how external debt and debt indicators affects economic growth, investment and exports in Turkish economy. Following the earlier literature and to assist in comparing our results with other studies. We then go on to examine in more detail the potential channels through which, how, external debt and debt indicators work for Turkish economy.

External debt and Turkish's economy-an empirical

analysis: Here, we extended new model to assess the impact of external debt and debt indicators on growth, investment and exports under the light of Roderik^[26] model. The theory predicts for Turkish economy that external debt, growth, investment and exports move in same directions while, budget deficit is purely financed by external debt. Moreover, we assume that other factors remain constant throughout the period under consideration. We use four widely used indicators of the external debt stock burden: Etd is the face value of the stock of external debt as a share of export of goods and services (%); Ipe is the interest payments to exports (%); Ipcr interest payments to current account revenues (%) and Dste is the debt service to export (%). Consequently, the equations of budget deficits is represented as:

$$Def = Exd (\Delta Exd/Exd) \tag{1}$$

Where, Def is the deficit to GNP ratio, Exd the net present value of the stock of external debt as a share of GNP ratio and $\Delta Exd/Exd$ shows change in external debt during each and every year. The proportional change in demand for external debt and investment, real growth and export can be expressed in the following manner:

$$\Delta Exd/Exd = Inv + Yg + Ex \tag{2}$$

Where, Inv is investment to GNP ratio, Yg is the real growth rate of GNP and Ex is export to GNP ratio. Consequently, we can write (1) such as:

$$Def = Exd (Inv + Yg + Ex) \tag{3}$$

The composition of the above equation shows that Exd, Inv, Yg and ex consistent with an exogenous level of deficit. Nevertheless, we solve the above equation for real growth (Yg) such as:

$$Yg = Def/Exd - Inv - Ex \quad (4)$$

This equation interpreted that an increase in the deficit of one percent of GNP will increase the real growth rate by 1/Exd percent. Similarly, we again (1) solve for investment; then (1) captures the essence of deficit finance view of real growth rate can be written as;

$$Def = Exd (Yg + Inv + Ex) \quad (5)$$

$$Inv = Def/Exd - Yg - Ex \quad (6)$$

The mechanism of this equation shows that an increase in the deficit of one percent of GNP will increase the investment to GNP ratio by 1/Exd percent. And for exports (Ex):

$$Ex = Def/Exd - Inv - Yg \quad (7)$$

The same conclusion is obtained as mentioned as above, that is, an increase in the deficit of one percent of GNP will increase the exports by 1/Exd percent.

The model is expressed in the following functional form:

Model:1

$$Yg = \beta_0 + \beta_1 (Def/Exd - Inv - Ex) + \mu_1 \quad (8)$$

where, the dependent variables is real growth and the regressors are the Def/Exd-Inv -Rer. The equation states that when the budget deficit is financed by external debt, then external debt put positive effect on real growth. And

Model:2

$$Inv = \eta_0 + \eta_1 (Def/Exd - Inv - Yg) + \mu_2 \quad (9)$$

Model:3

$$Ex = \alpha_0 + \alpha_1 (Def/Exd - Yg - ex) + \mu_3 \quad (10)$$

Now estimate debt indicators' models into regression form:

Model:4

$$Yg = a_0 + a_1 Etd + a_2 Ipe + a_3 Dste + a_4 Ipca + \mu_4 \quad (11)$$

Where, Etd is the ratio of export to total external debt, Ipe is the interest payments to exports (%) Ipce interest

payments to current account revenues (%) and Dste is the debt service to export(%)

Similarly;

Model:5

$$Inv = b_0 + b_1 Etd + b_2 Ipe + b_3 Dste + b_4 Ipca + \mu_5 \quad (12)$$

And

Model:6

$$ex = c_0 + c_1 Etd + c_2 Ipe + c_3 Dste + c_4 Ipca + \mu_6 \quad (13)$$

METHODOLOGY AND DATA

Before testing the cointegrating regressions as given above, we need to examine the stationarity of respective time series. For this purpose, we test each series by well known Augmented Dickey-Fuller unit root test.

$$\Delta X_t = \alpha + (\rho - 1) X_{t-1} + \sum \Phi_i \Delta_{t-1} + v_t \quad (14)$$

Where, Δ is the first difference operator; v_t is represents the stationary random errors and ρ is chosen to ensure serially uncorrelated residuals. The null hypothesis is that X_t is non stationary and is rejected if $(\rho - 1) < 0$ and statistically significant. The alternative hypothesis is that X_t is integrated of order zero, $I(0)$, hence stationary in levels. The variables containing in Table 1 are examined for stationary.

Table 1 displays the results of the ADF unit root test for each variable. All variables are stationary at first-difference, integrated of order one $I(1)$, except Yg and Etd which are stationary at level, that is, integrated order of zero $I(0)$.

Regression results: The empirical analysis addresses two major issues: (I) Has Turkey's external debt burden negatively or positively affected investment, exports and growth? (ii) Has debt indicators resulted in increased or decreased investment, exports and growth? Consistent with the theoretical framework discussed above, we will use cointegration method to analyze the impacts of external debt and debt indicators on Turkey's investment, export and income growth. For empirical analysis, the study utilizes mostly secondary data obtained from the State Planning Organization (DPT), covering 1983-2002 period. Lags are selected on the basis of minimum error.

The results obtained from the basic estimation of growth, investment, exports, external debt and debt indicators are shown in Table 2. The results of the regressions are not fully consistent with the theoretical framework discussed above except in case of export in model 3, export to total debt ratio and interest payments

Table 1: ADF unit root test

Variables	Level	First difference
Def	0.284	-4.870 ^a
Exd	-0.560	-4.072 ^a
Yg	-5.69 ^a	-8.95 ^a
Inv	-1.243	-5.527 ^a
ex	-1.06	-5.416 ^a
Ipca	-1.876	-4.822 ^a
Etd	-2.820 ^b	-4.356 ^a
Ipe	-2.065	-4.801 ^a
Dste	-1.087	-4.859 ^a

Critical values for the ADF statistics from Fuller^[27]. Table 8.5.2. p:373.
^a denotes 1% (-3.58), ^bdenotes 5% (-2.93), ^c denotes 10% (-2.60)

Table 2: Equilibrium regression results for given models

Models	α_1	St. error	t-statistic
Model: 1	0.469	0.226	0.907
Model: 2	-0.271	0.035	-3.059 ^b
Model: 3	0.239	0.168	3.635 ^a
Models: 4 (Variables)			
Etd	-1.114	0.809	-3.366 ^b
Ipe	0.540	1.88	0.789
Dste	-0.122	-0.516	-0.822
Ipca	-3.472	2.35	-3.399 ^b
Model: 5 (Variables)			
Etd	-0.239	0.199	-1.266
Ipe	-0.30	0.464	-0.759
Dste	-0.096	0.088	-1.134
Ipca	-0.469	0.581	-0.803
Model: 6 (Variables)			
Etd	0.550	0.707	4.501 ^a
Ipe	-0.560	1.643	-2.209 ^c
Dste	-0.049	0.311	-0.898
Ipca	1.770	0.208	4.693 ^a

t-statistics significant at the 5% level

to current account revenue. Turning to the growth equation we get a positive relationship between growth and the Turkey's total external debt, but the value of coefficient is not significant at 95% level, which shows external debt has no impact on growth., but signs of coefficient insistent with the foundation of model. On the basis of these findings, we can reject hypothesis of a one-one link between growth and external debt. In investment equation, the investment and external debt move in opposite direction and the value of coefficient α_1 is less than unity and is significant at 95% level. The export equation is significant at 95% level. On other hand the relationship between export and external debt is positive, confirming the positive impact of the external debt overhang on export.

Debt indicators: Debt indicators are examined as follow: four indicators of external debt are used in this study: Export to total debt ratio (%) (Etd), Interest payment to export (%) (Ipe), Debt service to export (%) (Dste), Interest payments to current account revenues (%) (Ipca). In model 4, there are two variables statistically significant at 95% level and have negative signs, which shows that debt indicators have negative impact on Turkish

economy, while two variables are not significant, that is, Interest payment to exports (Ipe) and interest payments to current account (Dste), which emphasis that these indicators have no impact on economy. Similarly, in model 5 there is no variable significant at 95% level and suggests that debt indicators have null effect on economy, this is so because, in Turkish economy, solvency of feudalism, military and politicians is at higher scale. When we take into consideration model 6, two variables are significant at 95% level and positive sign suggest that these debt indicators accelerate export. On other hand one variable is significant at 95% level with negative signs suggesting that negative impact on export. In contrast, fourth variable is not significant, which shows no impact on economy. These findings are consistent with the World Bank-IMF view that unless drastic actions are taken by the Turkey to reduce her external debt, economic growth will suffer.

Concluding remarks: In this study we have looked the impact of external debt and debt indicators on growth, investment and exports of Turkish economy. The results are suggestive of a series of interesting relationships, it must be emphasized that they are not based on explicit theoretical model of interactions between growth, investment, exports and external debt. Thus, policy implications should be drawn with great care. As of the results of the exploratory regressions, they can be summarized as follows:

Empirical evidence presented in this article suggests that external debt has positive impact both on the growth and the exports but the growth equation is insignificant, however, on investment, it reports strongly negative effects. Similarly, in the equation of growth, debt indicators Export to external debt ratio (Etd) and Interest payments to current account revenues (Ipca) have strongly negative effect, nevertheless, Interest payment to export (Ipe), Debt service to export (Dste) have no impact on growth. On the other hand, the impact of debt indicators on investment could not be detected, this is so because, explanatory variables are not significant. Notwithstanding, debt indicators like export to external debt ratio and interest payments to current account revenues have robust positive effect on exports. In contast, interest payment to exports has negative effect on exports, while debt service to export has no effect on exports. In sum, present results are partially compatible with those of Roderik^[26]. Easterly and Islam^[11]. Lastly, we suggest that structural adjustment programmes can remove economic distortions and encourage regular repayment of the external debt can increase export, investment and economic growth of Turkish economy.

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