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AN EMPIRICAL STUDY TO FIND THE RELATIONSHIP BETWEEN TRADE DEFICIT AND BUDGET DEFICIT IN PAKISTAN

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ABSTRACT

In this paper an attempt has been made to investigate the relationship between trade deficit and budget deficit in case of Pakistan. Annual data has been used for the period from 1980 to 2009. Also causality between the two has been checked via Granger Causality test to find that which variable is responsible for causing the other. While for simple regression OLS technique is used in the study. The result of the study showed that in case of Pakistan the budget deficit is mainly caused by trade deficit and causality run from trade deficit to budget deficit.

Key words: Budget deficit, Trade deficit, Pakistan

INTRODUCTION

Both budget deficit and trade deficit are known as the twin deficit, which is a concept from macroeconomics and this discuss the relationship between government budget balance and current account balance. Both had very close relationship and it says that reduction in budget deficit is a necessary and sufficient condition for improving the performance of current account.

Twin deficit had very important implication for economy because if there is consistency in budget to remain in deficit it will lead to borrowing both internally and externally. And also it impose burden on future generation.

The previous work shows four alternative hypotheses which say that 1- budget deficit cause trade deficit, 2- trade deficit cause budget deficit, 3- both are bidirectional and 4- there is found no causality between the two. Common belief is that budget deficit in an economy is signal to trade deficit but also trade deficit may cause budget deficit. We know that if there is budget deficit in a country that mean that the expenditures are greater than the revenues and greater expenditures mean that the country imports are in high proportion than what she exports. So it is a phenomenon of trade deficit. To minimize the trade deficit country needs to expand its exports but if the export of a country belongs to the weaker sector of the economy then revenue collection will decline and as we said that the expenditures of the government are already increased so the result will be budget deficit thus here the trade deficit caused budget deficit. Now if both shows no relation then the reduction in budget deficit will not solve the problem and this will divert the attention from more urgently needed policy options which address productivity competitiveness in foreign market and export promotion programs.

Almost all the developing countries face a phenomenon of twin deficit which mean that there is both trade deficit and budget deficit in the economy. Pakistan being a developing country also faced the same problem persistently throughout its history.

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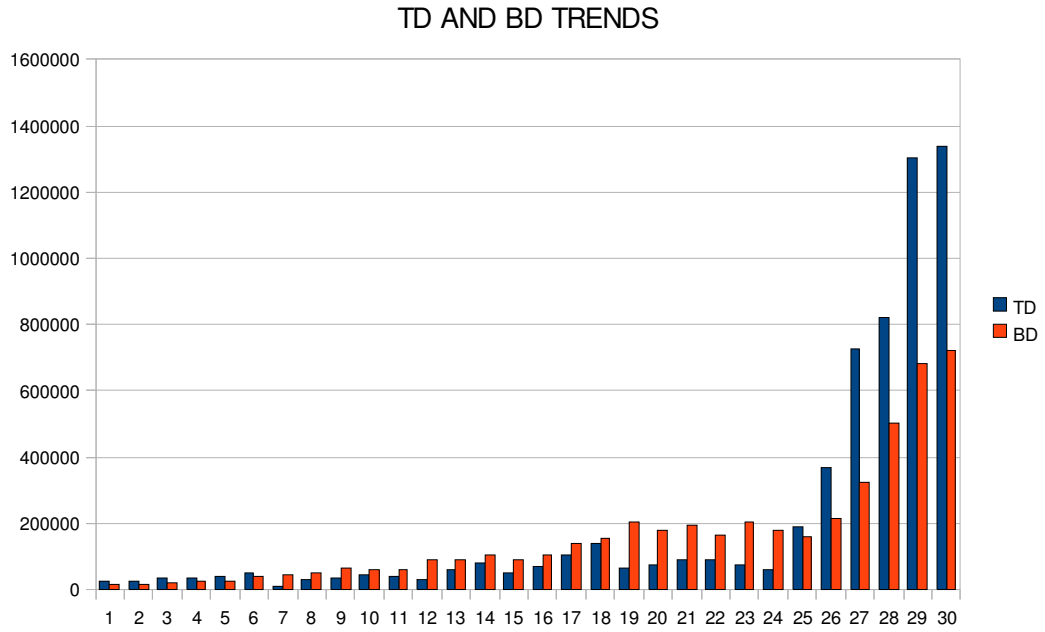
The budget deficit in Pakistan varies with a great proportion and it was13065 million in 1980 and in 2009 it was 722051 million, similarly the trade deficit also varies largely and it was 23519 million in 1980 and 1339254 million in 2009.



The historical performance of budget deficit and trade deficit is given in the above diagram, the bars of gray color represent the budget deficit while the bars in blue represent trade deficit. One can see in the above diagram that the trends in both budget and trade deficit is ever increasing with the passage of time and this created a lot of problems for the economy of country.

Pakistan constitutes a valuable case study for investigating the movements of high rates of both the deficits. Several attempts have been made to find the causal link between the twin deficit and between the twin deficits and other macroeconomic variables. Burney and Yasmeen (1989), Burney and Akhtar (1992), Kazmi (1992), Anjum et al (2000), Tahir et al(2007), Ahmad Nawaz Hakro (2009). The technique applied in these studies are varies from Johanson cointegration approach to simple OLS application. All these attempts are extremely important in understanding the link between twin deficits.

The present study is an attempt to show empirically the relationship between the twin deficits with respect to Pakistan economy. In this study an attempt has been made to cover the period from 1980 to 2009. In previous studies usually the quarterly data has been used and also they applied more advance technique. e.g. Ahmad Nawaz Hakro who took the sample period from 1948 to 2005. He uses the quarterly data and apply VAR model to estimate the data with respect to Pakistan economy. While in present study there is annual data and it will be tried to find the causality through Granger Causality test and simple OLS will be applied for further estimation of the data.

The rest of the paper will be as follow, next is the brief view of the previous studies which were done on the said subject by many researcher, then there will be theoretical discussion on

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twin deficit next I will discuss methodology and after that there will be estimation of the data and finally some policy implication if any, and at the last there will be references.

LITERATURE REVIEW

There is huge literature written on the topic of twin deficit all over the world. This literature has many forms, find on both theoretical and empirical basis. These studies applied different techniques to find the relationship between budget deficit and trade deficit, like single equation ordinary least square model, two stage least square model, some used the unconstrained autoregressive model while other researchers used co- integration and vector error correction.

Some of the literatures to whom we have studied on the said topic findings are following:

THEORETICAL DEBATE

Fieldstein and Horioka (1980), they said that there is positive relationship between savings and investment and this lead to the current account deficit and budget deficit in the country. The alternative view is that the relationship from budget deficit to current account deficit is nonexistent, so it is said that there may be rank relationship between the two deficits given that there could be a large number of other factors that lead to twin deficit.

Fieleke (1987), find that an increase in government borrowing lead to increase in interest rate other things being equal, so when interest rate is high that lead to foreign investment in the country when the foreign investment increase there will be increase in the money supply in the country when the money supply increase there will be inflation in the country, the domestic people will buy the foreign goods so the import will increase, which lead to current account deficit. The same approach has been discussed by the Keynesian in their absorption approach and said that if there is increase in budget deficit that will lead to induce domestic absorption that lead to import expansion and decrease export and that lead to current account deficit.

Barro (1989) discuss the Ricardian Equivalence Hypothesis and said that this hypothesis nullify the relationship between the two deficits.

Mundell-Fleming (1963-1962), increases in budget deficit lead to increase in trade deficit because the consumer pending increase and that mean that the import of the country will increase and the export will decrease.

EMPIRICAL DEBATE

Abell (1990), study the US economy from the period of 1979:2-1985:2. in his study he used the monthly data for the said period. In this era there was dollar appreciation. He study those variables, money supply, merchandise trade balance, budget deficit, moody bond yield, trade weighted dollar exchange rate, real disposable income, consumer price index. He fined the indirect influence of budget deficit on trade deficit.

Kearny and Monadjemi (1990), they took quarterly data to see the relationship between the twin deficits in eight countries. Their study periods range from 1972:1-1987:4. They used the vector autoregressive technique. Their findings were that there is significant relationship of

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temporary twin deficit which link between the stance of fiscal policy and performance on the current account balance of payments.

Tallman and Rosensweig (1991), noted that some studies using Mundell-Fleming framework point out that twin deficit concept is consistence with the data, while other studies find no underlying link between government and trade deficits, are consistent with the Ricardian equillance. Also data selection affects the results and the option of variables to include in the equation is important. They said that to maximize the chances of finding a twin deficit relationship come out to be greater if the variables are entered to GNP rather of as first difference.

Mohammad (2000), took the sample of 67 countries and used the cross sectional data. His study period was from 1975-1995. His study was important to show the significant relationship between the trade deficit and budget deficit. He concludes that there is positive relationship between the budget surplus and the trade balance.

Chaudhry and Shabbir (2005), tried to show the impact of budget deficit on money supply, foreign reserve and balance of payments. They used the annual data and took the sample period from 1965-1999 and used the 2SLS technique. Their findings were that changes in money supply affect the trade balance through output and further say that increase in government budget deficit increase money supply and this lead to outflow of income.

Anjum Aqeel and Moh. Nishat use annual data for Pakistan from 1973 to 1998 and use the co integration technique to find the relationship between budget deficit and trade deficit. Their conclusion was that budget deficit shows positive relationship with trade deficit in the long run while in short run the relation is negative.

Tahir Mukhtar, Moh. Zakaria and Mehboob Ahmad use the quarterly data from 1975 to 2005 and use the co integration technique to investigate the short run and long run relationship between the twin deficits in Pakistan. They find that the relationship between budget deficit and trade deficit is partially significant in the long run. Also find that the trade deficit effects on budget deficit is stronger compare to the effects of budget deficit on trade deficit.

THEORETICAL BASIS FOR THE TWIN DEFICIT HYPOTHESIS

We have the national identity which best explain the importance of twin deficit and this identity is used in different articles e.g. Aqeel and Nishat, that is,

$$Y = C + I + G + X - M \quad \text{.....1}$$

Where

The current account is the difference between X and M, so

$$CA = Y - (C + I + G) \quad \text{.....2}$$

C + I + G is a domestic absorption.

In closed economy S = I and given that Y- C = S, so

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S = I + CA……3

We can differentiate the national savings into private savings and government savings, where the private savings is equal to

Sp = Y – T- C……4

and the government savings are

Sg = T-G……5

Using equation 4 and 5 and substituting it into equation 3, we get

Sp = I + CA + (G – T)……..6

By rearranging, CA = Sp – I- (G –T)……7

This shows the relation between budget deficit and trade deficit. T stands for direct taxes collected from household firm; government deficit is (G-T).

Increase in government deficit leads to increase in trade deficit and decrease the national savings.

Now if S increase with the same increase in investment that will offset the savings, so S – I remain same, so there is positive relation between current account deficit and budget deficit. So budget deficit due to increase in expenditure decrease national savings. An increase in current account deficit due to budget deficit is one aspect of twin deficit.

On another way due to budget deficit there is increase in interest rate which leads to increase in money demand, increase in money demand leads to appreciation of currency and that is a cause of trade deficit (cheap M and expensive X).

Ricardian and Keynesian have different view about effects of budget deficit due to tax cut. Ricardian say that tax cut leads to no better off feeling because of future increase in tax burden imposed by government to retire debt which was get to finance the tax cut so according to them no major changes occur in the economy. Keynesian say that tax cut policy affects the current consumption pattern of an individual who expects high future tax burden and now increase in consumption which discourage national savings so the current account deficit increases and also affect all macroeconomics variables, so leads to twin deficit.

Another view is that increase budget deficit leads to increase in government borrowing that leads to increase in interest rate when interest rate increase the inflow of foreign capital increases whose resulted to appreciate the currency and finally the appreciation of currency increase the demand for imports as the income of the people increases by the increase of the value of money thus demand for domestic goods decreases which result in trade deficit.

MODEL SPECIFICATION FOR THE STUDY

In this paper our model will be

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$Y_t = \alpha + \beta X_t + U_t$……..A

Where Y_t is budget deficit and X_t is trade deficit while α and β are the coefficient to be estimated and the U_t is error term. But because we will use the difference form of the data so our estimated model will be,

$dY_t = \alpha + \beta dX_t + U_t$

Here the variables specifications are as above.

DATA, METHODOLOGY AND INTERPRETATION OF THE RESULTS

In this paper annual data from 1980 to 2009 has been used to find the relationship between trade deficit & Budget deficit in case of Pakistan economy. It is believed that effect of one deficit on the other is more significantly estimated in yearly data than monthly data or quarterly data[1]. The data is collected in Rs millions from various issues of economic survey of Pakistan and hand book of statistics 2005 published by SBP.

For any time series data it is necessary to check that whether the data is stationary or nor. In case of non stationary data the estimated results are called spurious results and leads to wrong policy conclusions. Therefore to avoid this spurious regression we applied both ADF and PP test for checking the stationarity with both intercept and trend and intercept at level and at first difference. At level the data was not stationary while taking the first difference the data became stationary. The results of the ADF and PP tests are given at the end of the paper.

To find the relationship between budget deficit and trade deficit OLS technique has been applied. At level when the data estimated, the results were found significant but there was a problem of autocorrelation in the data (Durbon Watson is less than R^2). To remove autocorrelation from the data we use the method of generalized least square (when p is not known). At first difference method it was suggested by Maddala that use the first difference form whenever Durbon Watson is less than R^2 as in our case. So we take the difference at level and run the regression again. When we rerun the regression it is found that there are no autocorrelation in the data and also the results are highly significant. Now for further confirmation of the presence of no autocorrelation in the data we use LM test and find that there is no autocorrelation at 5% and 10%. Similarly we check the problem of heteroscadasticity through White test and find that at 5% and 10% there is no heteroscadasticity in the data.

The results show that if there is one unit increase in the budget deficit, the contribution of trade deficit in that one unit increase is 31%. Tables of OLS estimation (at level and at first difference) are given at the end of the paper.

Granger causality test is applied to check the causality between the budget deficit and trade deficit. Here this test was applied upto 5 lag periods. The following four hypothesis were tested in the paper:

a. Budget deficit cause trade deficit
b. Trade deficit cause budget deficit
c. The causality is bidirectional
d. Both are independent of each other.

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The results show that the hypothesis that budget deficit does not granger cause trade deficit were accepted at lag periods 1, 2, 4, and 5, while at all the lag periods the hypothesis that trade deficit does not granger cause budget deficit is rejected. The hypothesis that both does not granger cause each other was rejected at lag periods 3. The results of Granger causality test is also given at the end of the paper.

CONCLUSIONS AND RECOMMENDATIONS

An attempt has been made to investigate the twin deficit phenomenon in Pakistan. For this the study period was taken from 1980-2009 and the annual data was taken from economic survey of Pakistan and handbook of statistics published by SBP. This study based on OLS technique and Granger Causality test. The results show that the budget deficit is mainly caused by trade deficit in case of Pakistan. Therefore for the authorities that deal with the fiscal discipline of Pakistan it is suggested in light of this study that to curb budget deficit trade deficit must be minimized.

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ANNEXURE

MODEL 1

$$Y_t = \alpha + \beta X_t + U_t$$

Here Y_t is budget deficit, X_t is trade deficit,α and β are coefficients and u_t is error term.

$Y_t = 67646.84 + 0.477035X_t$ R^2 0.913149

(11313.57) (0.027803) DW 0.550427

[5.979265] [17.15782]

F-Stat: 294.3908

Prob(F-Stat): 0.000000

In small brackets the values are the st. errors while in large there is "t" statistics.

MODEL 2

$$\Delta Y_t = \alpha + \beta \Delta X_t + U_t$$

Here Y_t is budget deficit, X_t is trade deficit, α_o and β are coefficients and u_t is error term.

$\Delta Y_t = 9841.520 + 0.319608X_t$ R^2 0.521712

(7192.120) (0.058893) DW 2.103632

[1.368375] [5.426908]

F-Stat: 29.45133

Prob(F-Stat): 0.000010

In small brackets the values are the st. errors while in large there is "t" statistics

Autocorrelation:

LM Test:	Probability	
F-statistic	0.104579	0.748990
Obs*R-squared	0.116178	0.733217

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Heteroscadasticity:

White Test:	*Probability*	
F-statistic	**1.014601**	**0.376456**
Obs*R-squared	**2.099485**	**0.350028**

UNIT ROOT TEST RESULT

Variable	**AT LEVEL**		
	ADF-STAT		**PP-STAT**
	Intercept	**Trend and Intercept**	**Intercept**
TD	2.772964	2.044036	2.816477
BD	0.096847	-2.084839	2.664035
Variable	AT 1st DIFFERENCE		
	ADF-STAT		**PP-STAT**
	Intercept	**Trend and Intercept**	**Intercept**
TD	-4.14902*	-4.534378*	-6.25803*
BD	-3.01589**	-2.95193**	-5.20623*

*1%level of significance and ** 5% level of significance

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Granger Causality Tests:

Null Hypothesis:	Obs	F-Statistic	Probability
DLTD does not Granger Cause DLBD	28	5.23828	0.03082
DLBD does not Granger Cause DLTD		0.65483	0.42603
DLTD does not Granger Cause DLBD	27	3.00086	0.07041
DLBD does not Granger Cause DLTD		0.35354	0.70611
DLTD does not Granger Cause DLBD	26	3.38014	0.0397
DLBD does not Granger Cause DLTD		2.44259	0.09566
DLTD does not Granger Cause DLBD	25	2.21354	0.11356
DLBD does not Granger Cause DLTD		2.40937	0.09222
DLTD does not Granger Cause DLBD	24	2.60054	0.07665
DLBD does not Granger Cause DLTD		1.66511	0.21212

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