Old Wine in New Bottles: Testing the Keynesian Preposition of Twin Deficit in Case of Pakistan

Somia Iram, M. Phil
Applied Economics Research Centre University of Karachi, Karachi, Pakistan
E mail: Somia_irum@yahoo.com

Shahid Ali
Lecturer in Economics, Department of Economics, University of Swat, Pakistan
E mail: Shahid_aerc@yahoo.com

Mahpara Sadaqat
Senior Research Economist/Assistant Professor
Applied Economics Research centre University Of Karachi, Pakistan
E mail: mahparasadaqat@yahoo.com

Fazli Rabbi
Assistant Professor, Department of Economics, University of Swat , Pakistan
E mail: rabbi.fazli@gmail.com

Abstract

In this endeavor an attempt has been made to investigate the linkage between the current account deficit and budget deficit in Pakistan in order to test the validity of the Keynesian stance, which states that there is positive and significant relationship between the said variables. ***Autoregressive distributed lag model (ARDL)*** *is used for the robustness of long-run relationship between current account deficit and budget deficit in the presence of control variables. For short run dynamics* ***ECM (Error Correction mechanism)*** *has applied. To test the validity of the Keynesian proposition and the Ricardian equivalence in the case of Pakistan multivariate Granger causality test developed by* ***Toda and Yamamoto (1995)*** *has applied. The empirical analysis in this paper partially supports the Keynesian view that there is a positive relationship between current account deficit and budget deficit In terms of policy implication it is recommended that any policy measures to reduce the budget deficit in Pakistan could well assist in reducing the Pakistan's current account deficit, which will ultimately leads to sustain economic growth.*

Key words: Current account, budget deficits and Economic growth

JEL classification: B22, H62, E62, O40

1. Introduction

The problem of twin deficits has been one of the most disputed issues in economics. Different schools of thoughts have different ideas about the relationship between budget deficits and current account deficits in both developed and developing countries. Following McCoskey and Kao (1999), we define twin deficits as a long-run (positive) relationship between the current account and the budget deficit, including some other factors. The study of twin deficit phenomena got serious attention from researchers due the reason that in most of the situation, twin deficits may leads to economic harms and hurt economic growth. However, sometimes current account deficit is due to the investment opportunities created by technical transformation, while in sometimes it result from reduction in saving rate, which may be due to the change in consumer expenditures, changes in tax rate or changes in fiscal balance (Stockman 2000). The link between an economy's current account deficit and its budget deficit tickled extensive academic debate and empirical testing over the decades.

According to Friedman (2000), when deficits are used rationally, they are means of financing growth and reducing unemployment. The relationship between the budget deficit and current account deficit has examined by many economists. Researchers such as Darrat (1988), Saleh et al. (2005), Fleming (1962), Mundell (1963), Dornbusch (1976), Kawai (1985), and Marston (1985). Volcker (1987), Kearney and Monadjemi (1990), Smyth et al. (1995)Ibrahim and Kumah (1996), Hutchison and Piggott (1984), Islam (1998), Vamvoukas (1999), Anjum and Nishat (2000) Megarbane (2002), McCoskey and Kao (1999), Piersanti (2000), Leachman and Francis (2002), Fidrmuc (2003) and found support for the conventional view that a worsening budget deficit stimulates an increase in current account deficit. According to Hutchison and Piggott (1984) an increase in the budget deficit is likely to raise domestic real interest rates, which in turn, would raise the value of dollar and subsequently would increase the trade deficit, but Mohammadi and Skaggs (1996) in their study have found that the effect of the budget balance on the trade balance, if any, is modest.

Many researchers such as Dewald (1983), Dwyer (1982), Holelscher (1983), and Evans (1985) show that interest rates are not affected by the size of the budget deficit, and so there is no relationship between budget deficit and trade deficit. The current account deficit is always high in Pakistan and now it is serving a mounting pressure on economic growth of Pakistan. The repercussions of the Pakistan's worsening current account deficit have profound effect on the economic condition. A number of factors are responsible for high current account deficit in Pakistan, such as: a hike in general price level, mounting trade deficit and high budget deficit (Government of Pakistan, 2008). In case of Pakistan most of the work has been done on twin deficit phenomena. Our contribution to that work on twin deficit of Pakistan is to investigate the relationship between budget deficit and current account deficit with respect to so several control variables in multivariate analysis frame work in order to test the validity of the Keynesian stance that there is positive and significant relationship between the said variables.

Our work is different from other researchers in the sense that they investigate twin deficit phenomena in the presence of saving investment gap but we introduced GDP, interest rate and exchange rate as control variables. By omitting so many important variables can lead to spurious results because of the specification problem. Moreover, we have employed ARDL frame work of analysis in case of investigating Pakistan's twin deficit. ARDL is an advance technique of co integration and provide better results than Engle Granger and Johnson co integration techniques. This paper is designed as: section I2 explains the model and date collection procedure, section 3 explains the Methodology and section 4 investigates the empirical results and final section presents the conclusion and policy implication.

2. Modeling Data and Methodological framework

2.1 Modal Specification:

To capture the relationship between two variables (including control variables) in the multivariate model say trade deficit to budget deficit can be tested by estimating

$CADt = \lambda_o + \lambda_1 BDt + \lambda_2 GDPt + \lambda_3 ERt + \lambda_4 INTt + \mu$ ……..….. (1)

Where,

CAD = Current Account Deficit

BD = Budget Deficit

GDP = Gross Domestic product

ER = Exchange rate

INT = Interest rate

As μ is white noise term and summation λ are polynomials of appropriate orders. Data used for this analysis is of 36 years from 1972 to 2008 and collected from different sources as Statistical year book, Economic survey of Pakistan.

2.2 Methodology.

Due to several flaws in the conventional co-integration techniques, in terms of methodology, the study adopts the recently developed Autoregressive Distributed Lag (ARDL) framework by Pesaran and Shin (1995, 1999), Pesaran et al. (1996) and Pesaran (1997) [1]. The study we employed the Augmented Dickey–Fuller (ADF), Phillips–Perron (PP) and the Ng- Perron unit root tests to determine the order of integration for all the series. The error correction version of ARDL model is given below:

$$\Delta CAD_t = \alpha + \beta_1 \sum_{i=1}^{p} \Delta CAD_{t-i} + \beta_2 \sum_{i=1}^{p} \Delta BD_{t-i} + \beta_3 \sum_{i=1}^{p} \Delta GDP + \beta_4 \sum_{i=1}^{p} \Delta ER_{t-i} + \beta_5 \sum_{i=1}^{p} \Delta INT_{t-i}$$

$$+\lambda_1 CAD_{t-1} + \lambda_2 BD_{t-1} + \lambda_3 GDP_{t-1} + \lambda_4 ER_{t-1} + \lambda_5 INT_{t-1} + \mu \text{.....(2)}$$

Where α is drift component and μ white noise. Two well known Criteria for the selection of the modal are Schawrtz Bayesian Criteria (SBC) and Akaike's Information Criteria (AIC).

We utilize the following equation to estimate the short run coefficients:

$$\Delta CAD_t = \alpha + \beta_1 \sum_{i=1}^{p} \Delta CAD_{t-i} + \beta_2 \sum_{i=1}^{p} \Delta BD_{t-i} + \beta_3 \sum_{i=1}^{p} \Delta GDP + \beta_4 \sum_{i=1}^{p} \Delta ER_{t-i} + \beta_5 \sum_{i=1}^{p} \Delta INT_{t-i}$$

$$\eta EC_{t-1} \text{.....(3)}$$

η is the error correction term in the model indicates the pace of adjustment reverse to long run equilibrium following a short run shock. To ensure the goodness of fit of model, the study also conducted the diagnostic tests.

[1] The test is conducted within a multivariate framework to keep away from biases due to the omitted variables incident.

2.3 Multivariate Granger Causality Tests

The Toda and Yamamoto (1995) augmented Granger causality test has been obtained in the present study by estimating a two-equation method using the seemingly unrelated regressions (SUR) technique. The two equations, which are estimated, are given below:

$$CAD_t = \sum_{i=1}^{p} \beta_{11}\Delta CAD + \sum_{i=1}^{p} \beta_{12}\Delta BD + \sum_{i=1}^{p} \beta_{13}\Delta X + \mu \text{.....(4)}$$

$$BD_t = \sum_{i=1}^{p} \beta_{21}\Delta CAD + \sum_{i=1}^{p} \beta_{22}\Delta BD + \sum_{i=1}^{p} \beta_{23}\Delta X + \mu \text{.....(5)}$$

Vector X stands for control variables, k is the optimal lag order and d is the maximal order of integration of the series in the system.

3. Estimation results

3.1 Testing of the unit root hypothesis

To test the unit root hypothesis to all variables, ADF test, PP and Ng - Perron test were applied. Results show that the variables are having different order of integration which enables us to apply Auto Regressive Distributive Lag Modal (ARDL) framework.

Table 1: Unit Root results

	ADF (Drift& trend)		P- P (Drift& trend)	
	Level	1st diff:	Level	1st diff:
CAD	-4.24*	-7.98*	-4.26*	-9.04*
BD	-5.15*	-6.50*	-5.12*	-10.31*
ER	-2.84	-4.98*	-2.80	-5.01*
INT	-1.98	-5.46*	-2.04	-5.45*
G	-4.68*	-5.10*	-3.09**	-4.00*

Notes: *(**) shows significance at 1% (5%) level.

3.2 Autoregressive Lag distributed model (ARDL) Lag selection

In the first stage, the order of lag length is obtained from unrestricted vector autoregressive (VAR) via Schwartz Bayesian Criteria and Akaike Information Criteria. The progression of lag selection on the basis of ARDL gives the following results:

Table 2: Lag length Selection & Bound Testing for Co-integration

Modal 1					
Order Of the lags	AIC	HQ	SBC	F-test Statistics	Wald F-stat:
K = 1	-1.85	-0.48	1.61	4.67*	3.506*
K = 2	-1.12	-0.65	0.74	8.16**	7.25**
Short-run Diagnostic Test-Statistics					
Serial correlation LM, F = 0.55 (0.57)				Heteroscedasticity test F= 1.88(0.18)	
Ramsey RESET test F= 0.71(0.45)				Normality J-B value = 0.72(0.42)	

*(**) Significant at 10 % (5%) level of significant according to Pesaran et al (2001). and Narayan P (2005)

The results of bound testing approach show that calculated F statistics is 7.25 which is higher than upper bound critical value at 1% level of significant implying that there is indeed a long run relationship among the variables in the model. We also find a stable long run relationship between budget deficit and current account deficit as specified by the CUSUM stability test. In order to estimate the long run coefficients, we regressed the current account deficit on linear term of budget deficit along with control variables.

Table 3: Estimated Long Run Coefficients using the ARDL Approach

Model 1 Dependent Variable CAD ARDL(1,2,2,1, 2)		
Regressor	*Coefficient*	*Prob- value*
BD	0.03	0.00
G	0.01	0.04
ER	20.5	0.06
INT	-60.1	0.01
R^2 =0.97 R^2 adjusted = 0.96 F-statistics = 605 D-h Stat = 2.04		

As it is seen from table 3 that the estimated processed expected signs and significant at 5% level. The coefficient of budget deficit is 0.03 indicate that in long run a unit increase in budget deficit leads to 3 percent increase in current account deficit.

The coefficient of GDP is also positive and significant means that when economic activities in the country increases investment also increases which put upward pressure on interest rate, because of high interest rate inflow of foreign capital increases which deteriorate the trade balance. With the increase in economic activities demand for imports also increases leads to merchandise trade deficit in the economy. The coefficients of ER and INT are also negative and significant suggesting that a downward pressure in the magnitude of these variables leads to worsening current account deficit. The long run results also indicate that current account deficit is more sensitive to budget deficit and interest rate. For short run dynamics we apply Error correction mechanism. The results of ECM are given in table 4.

Table 4: Error correction representation of ARDL model

Model 1 Dependent Variable ΔCAD ARDL(1,2,2,1, 2)		
Regressor	***Coefficient***	***Prob- value***
ΔBD	**12.57**	**0.00**
ΔG	**0.03**	**0.04**
ΔER	**-12.34**	**0.06**
ΔINT	**-15.51**	**0.91**
CE(-1)	**-0.35**	**0.05**
R-Squared = 0.73 R-Bar-Squared =0.63 F-statistics = 11.16[.00]		

The estimated lagged error correction term ECt-1 is negative and highly significant. These results support the co integration among the variables represented by equation (1). The feed back co efficient is -0.35 suggests that about 35% disequilibrium is corrected in the current year. The result also suggests that in the short run government budget deficit has significant impact on the current account deficit.

Table 5: Multivariate Granger Causality Test; Toda - Yamamoto results

Null Hypothesis	**Chi-Square**	**P-Value**
BD does not Granger cause CAD	**24.32**	**0.00**
CAD does not Granger cause BD	**7.81**	**0.09**

The results of Toda - Yamamoto tests of Granger causality show that there is bidirectional causality between budget deficit and trade deficit.

4. Conclusion and policy implications.

This paper examines the empirical relationship between budget deficit and current account deficit in case of Pakistan over the period of 1971 to 2008, using autoregressive distributed lag (ARDL) approach in order to test the validity of the Keynesian stance, which, states that there is positive and significant relationship between the said variables. The results show that in case of Pakistan, the long run Coefficients of control variables (GDP, ER and INT) appeared to be significant and the most significant variable is budget deficit. Hence, the Keynesian stance is valid in case of Pakistan. The feedback coefficient is negative and significant suggesting that about 35% disequilibrium in the previous period is corrected in current year. We find a stable long run relationship between budget deficit and trade deficit as indicated by the CUSUM and CUSUMq stability test. In case of Pakistan trade deficit is showing varying trend mostly increased deficit while budget deficit is reducing the basic reason behind increased deficit can be day by day increasing oil prices which has not only increased cost of production but also freight charges. This dishearts the trade balance. In terms of policy implication it is recommended that any policy measures to reduce the budget deficit in Pakistan could well assist in reducing the Pakistan current account deficit that will ultimately leads to sustain economic growth. It is suggested that the government should curtail its non productive expenditures in order to reduce its budget deficit.

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APPENDIX 1: GRAPH 1.