Dynamisms of Twin Deficit and Pakistan: Empirical Analysis

Khawar Hassan[1] Atta Muhammad Baber[2] Muhammad Abdul Rehman [3] Muhammad Usman[4] Uzma Arshed Mughal [5*]

[1] Ph.d Scholar, Department of Economics, PMAS Arid Agriculture University Rawalpindi, PAKISTAN, Email: Khawarpk@yahoo.com

[2] Assistant Professor Department of Agriculture Economics Baluchistan Agriculture College Quetta, PAKISTAN, Email: atta.muhammad@gmail.com

[3] Lecturer Departments of Economics, PMAS Arid Agriculture University Rawalpindi, PAKISTAN, Email: arahman@uaar.edu.pk

[4] Ph.d Scholars Department of Economics, PMAS Arid Agriculture University Rawalpindi, PAKISTAN, Email: usmanhsp56@gmail.com

[5] Assistant chief (Reserch& Policy) planning & Development Board, civil secretariat, Lahore PAKISTAN, Email: Uzma_arshad17@yahoo.com
Corresponding Author, Uzma Arshed Mughal

Abstract

The problem facing both developed as well as developing countries duringthe present and previous turmoilis twin deficit. So similar to many other developing Pakistan is also facing fiscal deficit as well as current account deficit. This research is carried in Pakistan to test that, whether the phenomena of twin deficits prevail or the Ricardian equivalence hypothesis is accepted in Pakistan. The annual data is used to measure the relationship among these two deficits with help of auto regressive distributed lag model in presence of some policy variables. The stationarity and causality also checked through Augmented Dickey Fuller and multivariate causality test. For estimation of short run coefficients' error correction model is used. The findings of study provide the evidence of positive relationship between current account deficits and acceptedthe hypothesis of twin deficit in Pakistan. The multivariate causality test confirms the bi-directional causality between these deficits. The findings supports the twin deficits hypothesis in Pakistan where reject the Ricardian equivalence hypothesis which suggest no relationship between these two. The government tries to reduce its unproductive expenditures and increase its revenue to decrease the deficit. Some other variables also affect the current account deficit, like exchange rate, interest rate; saving and investment etc. policy changes also affect these two deficits.

Introduction

The global problem of present turmoil is twin deficit which is highlighted in developed and developing economies. The main reason behind this twin deficit is linked with the high payment of

debt servicing and fiscal deficit. Wickens and Uctum (1993) said that this is threating the worldwide economic parameters current days due to the pressure of repayment of these debt over the globe.

The increase in fiscal deficit increases the pressure on government to borrow more from domestic money market and international markets. This is observed that developed economies borrow from domestic and developing from international as well as domestically. The frequently increase in fiscal deficit play important role for high accumulation of debt for meeting the unaltered financial requirements for authorities by (Hakkio and Rush, 1991) and (Haug, 1991). The long duration existence of current account deficit (CA) puts few bad influences on country with the increase in interest rate in economy compare to foreign interest rate. So this phenomenon put debt burden on future generation and their living standards effect.In USA many works are conducted to clarify this claim like (Liu and Tanner, 1995), (Tanner and Liu, 1994) along with (Husted, 1992).

Similar to many low income economies Pakistan also suffering from this global problem which is harmful for economy progress. As for concern during last thirty years variation in fiscal deficit is 2.4 to 7.3 GDP percentages and CA is about 0.7 to 8.2 percent. The fiscal policy changes put some significant impact of economy's CA is controversial issue. In Pakistan prospective fiscal deficit shows different variations in different regimes. In period of 1980 the fiscal deficit was 7.1 where in 1985 it 6.5, 1990 6.9, 1995 5.5, 2000 4.4, 2005 3.3, 2010 6.2% of GDP. In counter to this the behavior of CA is 3.7 in 1980, 5.4 in 1985, 4.7 in 1990, 4.1 1995, 0.7 2000, 1.6 2005 and 2.2 in 2010 according to GOP (2013). Like other economies in Pakistan the CA and FD have very important economic parameters and have relationship.

Twin deficit means the situation where direct relationship is exists between these two important indicators of economic performance. The hypothesis of twin deficit is not new one as we trace it in the earlier scholar like Fleming (1962) along with Mundell (1963). This idea is also highlighted in Ricardian equivalence hypothesis (REH) and theories of Keynesian. So these are the previous approaches and nexus which suggest building the link between these two deficits FD and CA.

According to Mundell and Fleming consistent increase in FD leads to increase CA through many channels. When government is facing deficit and having expenditure greater than earrings, it start borrowing from domestic money institutions and pull the domestic interest rate higher than the international interest. This borrowing and increasing the domestic interest send the signal to foreign investers and increase the foreign capital flows which appreciate the exchange rate. The appreciation in exchange affects the trade behavior as the exports are expensive now and imports cheaper than the earlier which leads to expansion in CA. Friedman (2000) suggests that the use of these deficits is rationally with purpose to facilitate growth and control unemployment.

The links among the fiscal deficit and current account deficit has been tested by many researchers. Researchers like Darrat (1988) Saleh et (2005), Leachman and Francis (2002), Vamvoukas (1999), Kearney and Monadjemi (1990),Anjum and Nishat (2000,) Mundell (1963), Fleming (1962), Kawai (1985), Dornbusch (1976), Marston (1985),Ibrahim and Kumah (1996), provide the evidence to conventional view that worsen fiscal deficit leads to higher current account deficit. Hutchison and Piggot (1984) stated that higher fiscal deficit put pressure on domestic interest, and increase the value of domestic currency which affect the imports positively and exports negatively and leads to higher current account deficit. The positive relation and bi-directional causality is present between CAD and FD Shastri (2019), Banday& Aneja (2019), Bilmana&Karaoglan (2020)

Dynamisms of Twin Deficit and Pakistan: Empirical Analysis

In contrast of these studies there are some other studies like Evans (1985) Holelsher (1983) Dwyer (1982) and Dewald (1983), **Sunde&** Stephanus (2019) (stated that the fiscal deficit does not affect the real interest rate. So these studies provide the empirical evidence that there is no any type of relation among these two deficits. Pakistan is always suffering from higher current deficit which is putting mounting stress on economic growth. The worsen current account deficit of Pakistan always put predetermined effect on the economic conditions of country. There are many variables which responsible to raise the current account deficit in Pakistan scenario like price level fiscal deficit and high trade deficit (Government of Pakistan 2009).

In this regard a lot of work done on twin deficit in Pakistan.In Pakistan scenario research work is undertaken to empirically estimate the link amongthese two deficits FD and CA. Under this scenario the following studies are(Burney and Akhter.1992),(Burney and Yaseen 1989), Zaidi (1995), and Kazim (1992) with the estimation technique OLS using annual data find the presence of link between these twin deficitsalong some policy variables. Aqeel and Nishat (2000) Mukhtar et al (2007) and Hakro (2009) provided the empiricalevidence for existence of bi-directional link among these deficits FD and CAD in Pakistan.These researches are carried to investigate validity of twin deficit in Pakistan case in the presence of some controlled variables.

This study is consider little bit preferable than previous work because mores studies use data as percentage to GDP but in this work we are using the data in real farm. We introduce the new additional variable which is saving investment gap which was missing in previous work along with some other important variables like, real interest rate, real exchange rate, FD and dummy variable. For empirical analysis we use (ARDL) bound Cointegration model developed by Pesaran et al, (2001). This methodology is more advance and more suitable for Cointegration analysis when the time series have different integration orders. We use dummy variable to measure the unexpected shock which influence the CAD. This work also has little deficiencies regarding the inclusion of few important variables like, money supply and debt which influence these two deficits. This paper is divided in to four sections: 1 is explanation 2nd is review of literature 3rd is methodology and data sources 4th are results and discussion.

METHODOLOGICAL FRAME WORK AND MODEL SPECIFICATION
Methodological work is divided in to two parts theoretical work and econometric techniques.

THEORETICAL BACK GROUND
We trace the link between these two deficits like FD and CAD from the national income identity which is expressed below in expression 1.
$$Y = C + I + G + NX \quad (1)$$
Description of (CA)
$$CA = EX - IM + net\ flows \qquad (2)$$
EX-IM indicate the net trade volume and plus net flows equal to the current account where EX for exports and IM for imports. According to open economy the national savings of economy is express as
$$S = Y - C - G + CA \quad (3)$$
The investment of the open economy is I= Y-G-C and total savings of the nation is expressed through following expression
$$Ns = I + cA \quad (4)$$

The national savings of country depends upon the actions taken by the government and private sectors. So the national saving is

$$Ts = Ps + Sg \quad (5)$$

This expression tells us the total savings of country where p_s private savings and S_g represents Government savings. The private savings are expressed as

$$ps = y - c - t \quad (6)$$

This expression give us the total amount of private savings here Y for income C for consumption and T for taxes

The other part on national savings consists of public savings which expressed as

$$Sg = t - g - tr \quad (7)$$

The expression give the amount of Government savings T stands for tax revenue G for government expenditure and TR for transfer payments

$$S = I + CA \quad (8)$$

So the national saving equation can be written is this form

$$Ps + sg = I + CA \quad (9)$$

The expression (9) also written in this form $p_s = I + CA - S_g$ and from (7) using value of S_g this becomes as $Ps = I + CA - (t - g - tr)$ (10)

By making arranging in expression (9) we find obtained CA as express in below

$$CA = Ps - I - (g + tr - t) \quad (11)$$

So in previous expression (tr+g-t) indicates the budget deficit and the national savings is preceded with minus sign. How much amount the government needs to borrow for financing its expenditure depends upon the value of budget deficit. From expression (10) we learn that where we can use the private savings like to invest for domestic capital, to finance the government debt (tr+g-t) and last for purchase of financial assets from foreign market.

From the expression based theoretical aspects we understand that there are two possible scenarios. We assumed the case where over the period the private saving and investment gap is constant. If the fluctuations in FD are fully translated to CA then we assure that the hypothesis of twin deficit is prevailed in the economy. The second scenario is related to the hypothesis of (REH). The (REH) hypothesis suggests that the variations in FD are offset completely with variations in savings. So the real world phenomena is quite difficult then the scenarios which are previously highlighted. So we need to describe and highlight the ways through those ways we assured that the phenomena of twin deficit is present and FD is affecting the CA.

The economic theory says that the fiscal deficit can affect the level of investment, private saving and the balance of current account by it itself. The absolute impact of fiscal deficit on investment current account balance and saving depends upon how this deficit is financed by government. There are different possible channels through the fiscal deficit is financed like, increasing supply of money into economy, borrowing from domestic sources, using foreign exchange reserves, borrowing from external sources and by the receipts of privatization of the state enterprise.

The relationship between the budget deficit and current account deficit is very close when the exchange reserves and the external borrowings are used for the purpose to finance the fiscal deficit. The excessive utilization of exchange reserves lead to crisis in balance of payments of an economy in the period of fixed exchange rate. The use of more reserves for deficit financing is cause to the appreciation of exchange rate. This option shows that there is clear indication of capital flight and

payment crisis. The collapse of reserves would be related with the devaluation of currency in the period of fixed exchange rate.

From the previous discussion we come to know that the link between fiscal deficit and current account are very complex. We know that the decision of government to finance its fiscal deficit affect the level of private saving along the required level of investment and the current account balance. The more work is needed to identify the clear channels through the fiscal deficit is linked with current account deficit. Simply we must take into account the present exchange rate arrangements, openness of economy, present business conditions and the expected returns on the investment in economy. Beside these macroeconomic arrangements, we must identify the institutions in the economy and their procedure how they work. We take example, suppose the financial sector of the economy weak, the national savings of the country is also low and the domestically available resources to finance the fiscal deficit are also small. If the property rights are inadequately mention, the low private investment is accrued and in this situation the government need to increase its expenditure to meet the required level of investment. The private investment may be further decrease due to the crowding out effect.

ECONOMETRICT TECHNIQUES
Stationarity
The common issues which prevail in most of the time series that these are non-stationary. So before empirical estimation there is need to check the stationarity of data when we are using time series data for assessing the relationship between dependent and independent variables. The conventional measure which are used to check the stationarity are mean, variance and co-variance which is constant with the passage of time. So if any time series in which the mean, variance and co-variance does not remain the fixed that series is recognize as nonstationary. If we use conventional method and use OLS for analysis with nonstationary time series, it provide us unrealistic, braise, and meaning less estimates and this regression is identified as spurious regression. For time series analysis to identify the stationarity of data Dickey et al. (1979)) develop to test for measuring the stationarity of time series and their order of integration that after how many lag or difference the series is stationary.

Auto Regressive Distributed Lag Bound technique
In this research secondary annual data from 1980 to 2018 is used to measure the relationship between these two deficits FD and CAD in Pakistan from statistical year's book and WDI (world development Indicator). In this the dependent variables is CAD and independent variables are FD, exchange rate, interest rate, savings investment gap and dummy variable. So the regression equation for this analysis is expressed below

$$CAD_t = \beta_1 FD_t + \beta_2 ER_t + \beta_3 r_t + \beta_4 SI_t + (Dummy = 1 \; if \; year = 2001) + \beta_5 Trend_t + \varepsilon_t$$

There are many studies like (Burney and Akhter.1992), (Burney and Yaseen 1989), Zaidi (1995), and Kazim (1992) Aqeel and Nishat (2000) Mukhtar et al (2007) and Hakro (2009)use OLS estimation technique on annual data to find the presence of link between these twin deficits along some policy variables. In previous work there are other techniques which also used for these types of analysis but the following advantages which provide the ARDL bound technique over the other methods for many aspects. The ARDL is helpful and suitable when the time series has different order of integration like level I (0), and I (1).The advantage of ARDL is also that the lag modification of it

provides fair estimation of t-stat and long run coefficient under the indignity Pesaran et al. (2001). So these preferences justify the use of ARDL bound in this study, to measure the presence of twin with some controlled variables. So the equations of ARDL Bound are expressed in below.

$$\Delta CAD_t = \alpha_0 + \sum_{i=1}^{p1} \alpha_1 \Delta CAD_{t-1} + \sum_{i=1}^{p2} \alpha_2 \Delta FD_{t-i} + \sum_{i=1}^{p3} \alpha_3 \Delta ER_{t-i}$$
$$+ \sum_{j=1}^{p4} \alpha_4 \Delta RR_{t-1} + \sum_{k=1}^{p5} \alpha_5 \Delta RSI_{t-1} + \gamma_1 CAD_{t_{t-1}} + \gamma_2 FD_{t-1} + \gamma_3 ER_{t-1} + \gamma_4 RR_{t-1}$$
$$+ \gamma_5 RS\_I_{t-1} + \mu t$$

Where α is drift component and ε is white noise. For the selection of good model we used thesecriteria's (SBC) (AIC),(FPE), (HQ).

To estimate the short run coefficients we use following model (ECM)

$$\Delta CAD_t = \alpha_0 + \sum_{i=1}^{p1} \alpha_1 \Delta CAD_{t-i} + \sum_{i=0}^{p2} \alpha_2 \Delta FD_{t-i} + \sum_{i=0}^{p3} \alpha_3 \Delta ER_{t-i}$$
$$+ \sum_{i=0}^{p4} \alpha_4 \Delta RR_{t-i} + \sum_{i=0}^{p5} \alpha_5 \Delta R\,S - I_{t-i} + \alpha_6 \Delta(DUMMY) + \alpha_7 \Delta Trend + \eta 1 ECTt - i$$
$$+ \mu t$$

η Is the error correction term which indicates process of adjustment reverse to long run equilibrium followed by a short run shock? To check the goodness of fit of model we use diagnostic tests. Multivariate Granger causality test is used for causality for test the direction of causality.

Toda- Yamamto

$$CAD_t = \alpha_0 + \gamma_1 \sum_{i=1}^{k+d} CAD_{t-i} + \gamma_2 \sum_{j=1}^{k+d} FD_{t-j} + \gamma_3 \sum_{z=1}^{k+d} ER_{t-z} + \gamma_4 \sum_{h=1}^{k+d} R_{t-h} + \gamma_5 \sum_{m=1}^{k+d} SI_{t-m} + \varepsilon$$

$$FD_t = \alpha_0 + \gamma_1 \sum_{i=1}^{k+d} FD_{t-i} + \gamma_2 \sum_{j=1}^{k+d} CAD_{t-j} + \gamma_3 \sum_{z=1}^{k+d} ER_{t-z} + \gamma_4 \sum_{h=1}^{k+d} R_{t-h} + \gamma_5 \sum_{m=1}^{k+d} SI_{t-m} + \varepsilon$$

ESTIMATED RESULTS

UNIT ROOT

This study tested the presence of twin deficit in Pakistan with the help of annual time series data from 1980 t0 2018 of FD and CAD along with some controlled policy variables. So before the analysis we check the stationarity of the all the time series. Thestationarity is checked with help of (Augmented Dickey-Fuller) test develop by (Dickey and Fuller, 1979). The conclusion of stationarity test is shown in table 1.So the table 1 indicates that the different order on integration will provide evidence for use of Ardl bounding in empirical analysis.

Dynamisms of Twin Deficit and Pakistan: Empirical Analysis

Table 1: stationarity results

Variables	Stationarity test	I(0) level	I(1) first difference	Final decision
rcad	(Test ADF)		-3.02	I (1)
Fd	(Test ADF)	0.81	-6.39	I (1)
s-i gap	(Test ADF)	-3.10		I (0)
er	(Test ADF)	1.32	-3.19	I (1)
Ir	(Test ADF)	-O.46	-3.44	I (1)

5% level of significance is used for ADF test

Table no 2:Selection of Lag length criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-2872.442	NA	1.83e+63	159.8579	160.0778	159.9346
1	-2695.223	295.3647	3.96e+59	151.4013	152.7209*	151.8619
2	-2669.699	35.44951	4.18e+59	151.3722	153.7915	152.2166
3	-2621.023	54.08487*	1.42e+59*	150.0568*	153.5758	151.2850*

Table 2 provides the evidence regarding the selection of lags by using different criteria like SC, AIC and HQ. So for analysis we used 3 lags which suggested by AIC and HQ criteria.

Table 3: Bound testing

Test Stat	Value	K
F-stat	7.862799	4
Critical Bounds Value		
Level of Significance	Lower bound	Upper bound
5%	2.86	4.01

The critical bound values are 4.01 and 2.86 shown in tables 3 and f-stat value is 7.86 which is higher than critical so we conclude that co-integration exists.

Table 4 Heteroscedasticity and serial correlation tests

Auto correlation test (Breusch-Godfrey LM Tes:			
F-stat	0.758356	Prob. F(2,19)	0.6271
Obs*R-squared	2.268648	Prob. Chi-Square(2)	0.4206
Constant variance Test: (Breusch-Pagan-Godfre			
F-statistic	0.428153	Prob. F(13,21)	0.7815
Obs*R-squared	7.434938	Prob. Chi-Square(13)	0.6989

The results presented in table 4 suggest that there is no issue present regarding serial correlation and hetro.

Table 5: Long Run slop Coefficients by using (ARDL) model

Description of Variable	Slop Coefficient	t-Stat	Prob. value
Er	36.17	2.387011	0.0270
Fd	0.11	7.318537	0.0000

Ir	-46.27	-2.054117	0.0533
s-i gap	-0.37	-1.803419	0.0864
D	-930.61	-2.5911	0.0174
T	-7.46	-0.33669	0.7400

Table6: Goodness of fit estimates

R-squared	0.945514	Akaike info criterion	-44.989
Adjusted R-squared	0.904649	Schwarz criterion	-45.693
Log likelihood	-793.8087	H-Q criteria.	-45.235
F-statistic	23.13761	Prob of (F-stat)	0.0000

From table 5 we see the signs of estimated parameters and their significance at 5% level of significance. The fiscal deficit coefficient is 0.11which means that if fiscal deficit increase by one unit the current account deficit on average increase by 0.11 units by having same unit. The exchange rate slop coefficient36.17 which predicts that there is directlink prevail among exchange rate and CAD and if exchange rate appreciate the current account deficit increase and vice versa. The coefficients of interest rate and savings investment gap are negative which shows that there is negative relation between current account deficit and (interest rate and saving investment gap) in long run. The slop of dummy variable is negative which is used to measure the positive incentive in trade, if positive shocks increase the current deficit decrease and vice versa. The value of R^2 measure the variation in dependent due to independent variables and in this model, R^2 explain that CAD is explained by these variables 94% where 6% remain unexplained.The short run results are obtained with help of Error correction model and findings are expressed in table 7.

Table 7:   Findings of (Error correction modal)
Dependent variable is dRCAD

Variable	Coefficient	Prob.
d(er)	23.87	0.00
d(er(-1))	-87.51	0.00
d(er(-2))	18.99	0.00
d(fd)	0.05	0.14
d(fd(-1))	0.17	0.00
d(fd(-2))	-0.13	0.01
d(ir)	13.45	0.00
d(ir(-1))	48.62	0.00
d(ir(-2))	23.88	0.00
d(s-i)gap	1.00	0.00
CointEq(-1)	-0.71	0.00

The CointEq (-1) value is 0.71 which predict that 70% percent adjustment take place in the subsequent year if any shock accord.

Table 8: Multivariate Toda - Yamamoto Causality Test results

H₀=Null hypothesis	χ^2-square	prob-value
FD not cause CAD	175.61	0.030
CAD not cause FD	403	0.0285

5% significance level used

The findings of multivariate Toda Yamamoto testconfirm bi-directional causality between these two deficits.
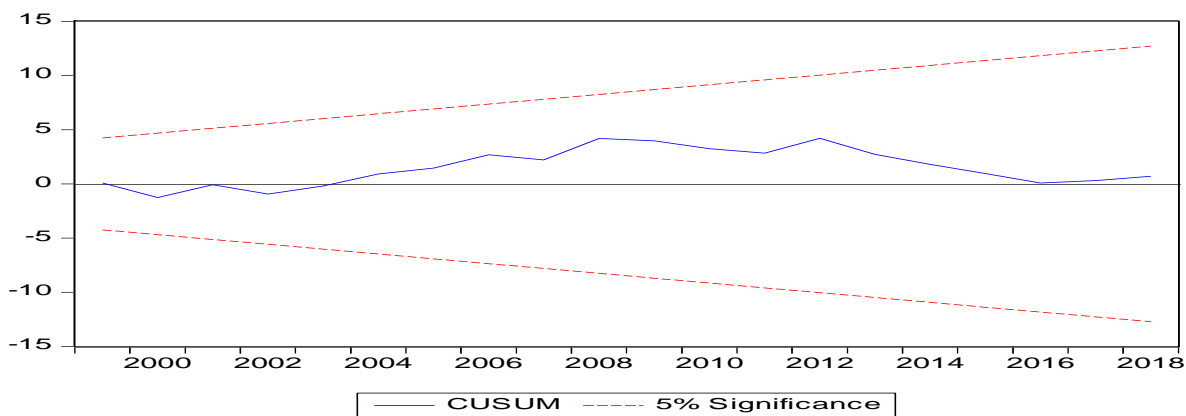
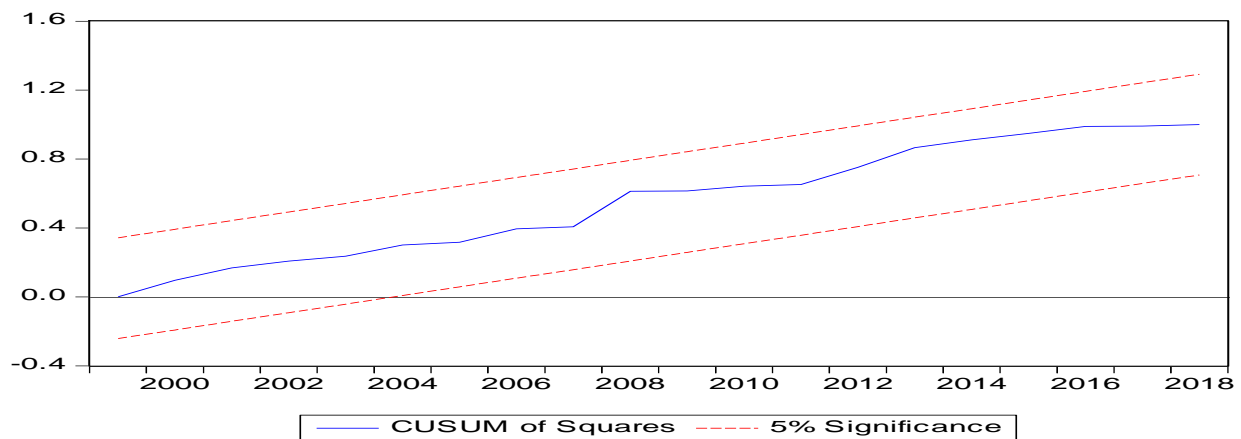**CUSUM STABILITY TEST**

Figure 1:

Figure 2:

In figure 1 and 2 the blue line remain within the two red lines which provide the significant evidence that these results are stable with cusum and cusum square test.

Conclusion and policy implications

This endeavor is made to explore the empirical relationship among the FD and CAD in Pakistan scenario covering time duration from 1980 to 2018 by using the real annual data of FD and CAD in presence of policy variables like saving investment gap),Interest rate and exchange rate. For analysis ARDL (autoregressive distributed lag model) Cointegration technique is used. The empirical results indicate that in Pakistan scenario (FD and ER and IR) has significant impact on CAD in long run. So these results suggest that in Pakistan scenario the Keynesian stance is valid and Ricardian hypothesis

is rejected that FD does not affect the CAD. To estimate the stability of relationship among these two deficits FD and CAD, CUSUM stability test used which provide the evidence that stable relationship among these two deficits exists.To reduce the FD government reduce its nonproductive expenditures and increase its revenue by increasing the tax base rather than tax rate. Further government needs to changes its trade policy to control the CAD by imposing the duties on imports of luxuries products. To achieve the higher economic growth government need to take some necessary steps to reduce these to deficits.

LITERATURE CITED

1. Abell, J. D. (1990). Twin deficits during the 1980s: An empirical investigation. *Journal of Macroeconomics*, *12*(1), 81-96.
2. Banday, U. J., & Aneja, R. (2019). Twin deficit hypothesis and reverse causality: a case study of China. *Palgrave Communications*, *5*(1), 1-10.
3. Bilman, M. E., & Karaoğlan, S. (2020). Does the twin deficit hypothesis hold in the OECD countries under different real interest rate regimes?. *Journal of Policy Modeling*, *42*(1), 205-215.
4. Burney, N. A., Akhtar, N., &Qadir, G. (1992). Government budget deficits and exchange rate determination: evidence from Pakistan [with Comments]. *The Pakistan Development Review*, *31*(4), 871-882.
5. Darrat, A. F. (1988). Have large budget deficits caused rising trade deficits?. *Southern Economic Journal*, 879-887.
6. Dewald, W. G., 1983, "Federal Deficits and Real Interest Rates: Theory and Evidence." Federal Reserve Bank of Atlanta, *Economic Review*, 20-29.
7. Dornbusch, R. (1976). Expectations and exchange rate dynamics. *Journal of political Economy*, *84*(6), 1161-1176.
8. Dwyer, G and P. J Roberson, 1982, Inflation and Government Deficits. *Economic Inquin*, 290-315.
9. Evans, P. 1985. Do Large Deficits Produce Higher Interest Rates? *American Economic Review,* 68-80.
10. Feldstein. M. 1982. Government Deficits and Aggregate Demand. *Journal of Monetary Economics*, 1-20.
11. Fleming, J. M. (1962). Domestic financial policies under fixed and under floating exchange rates. *Staff Papers*, *9*(3), 369-380.
12. Friedman, B. M. 2000. What Have we Learned from the Reagan Deficits and Their Disappearance? *National Bureau of Economic Research*. Working Paper Series
13. Hakkio, C. S., & Rush, M. (1991). Is the budget deficit "too large?". *Economic inquiry*, *29*(3), 429-445.
14. Hakro, A. N. (2009). Twin deficits causality link-evidence from Pakistan. *International Research Journal of Finance and Economics*, *24*, 54-70.
15. Haug, A. A. (1991). Cointegration and government borrowing constraints: Evidence for the United States. *Journal of Business & Economic Statistics*, *9*(1), 97-101.
16. Hoelscher, G. 1983. Federal Borrowing and Short-Term Interest Rates. *Southern Economic Journal,* 319-330.
17. Husted, S. (1992). The emerging US current account deficit in the 1980s: a cointegration analysis. *The review of Economics and Statistics*, 159-166.

18. Hutchison, M. M and Charles Piggott. 1984. Budget Deficits, Exchange Rates and the Current Account: Theory and U.S. Evidence. Federal Reserve Bank of San Francisco, *Economic Review*, 5-25.

19. Kawai, M. 1985. Exchange Rates, the Current Account and Monetary - Fiscal Policies in the Short Run and in the Long Run. *Oxford Economic Papers 37*.391-425.

20. Kazmi, A. A., & Shabbir, T. (1992). Ricardian Equivalence: Some Macro-econometric Tests for Pakistan [with comments]. *The Pakistan Development Review*, *31*(4), 743-758.

21. Kearney, C., & Monadjemi, M. (1990). Fiscal policy and current account performance: International evidence on the twin deficits. *Journal of Macroeconomics*, *12*(2), 197-219.

22. Liu, P., & Tanner, E. (1995). Intertemporal solvency and breaks in the US deficit process: a maximum-likelihood Cointegration approach. *Applied Economics Letters*, *2*(7), 231-235.

23. Mukhtar, R., M. Zakaria and M. Ahmad. 2007. An Empirical Investigation for the Twin Deficits Hypothesis in Pakistan. *Journal of Economic Cooperation.*, (24): 63-80.

24. Mundell, R. A. (1963). Capital mobility and stabilization policy under fixed and flexible exchange rates. *The Canadian Journal of Economics and Political Science/Revue canadienne L'économiqueet de Science politique*, *29*(4), 475-485.

25. Evans, P. (1985). Do large deficits produce high interest rates?. *The American Economic Review*, *75*(1), 68-87.

26. Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of applied econometrics*, *16*(3), 289-326.

27. Sunde, T., & Stephanus, B. K. Budget Deficit Persistence and the Twin Deficit Hypothesis Test in Namibia.

28. Tanner, E., & Liu, P. (1994). Is the budget deficit "too large"?: some further evidence. *Economic Inquiry*, *32*(3), 511-518.

29. Toda, H. Y., & Yamamoto, T. (1995). Statistical inference in vector auto regressions with possibly integrated processes. *Journal of econometrics*, *66*(1-2), 225-250.

30. Vamvoukas, G. A. (1999). The twin deficits phenomenon: evidence from Greece. *Applied economics*, *31*(9), 1093-1100.

31. Wickens, M. R., & Uctum, M. (1993). The sustainability of current account deficits: a test of the US intertemporal budget constraint. *Journal of Economic Dynamics and Control*, *17*(3), 423-441.