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Hassan Zafar

Dr. Faisal Jamil

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School of Social Sciences and Humanities (S3H)
National University of Sciences and Technology (NUST)
Sector H-12, Islamabad, Pakistan

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Hassan Zafar
Graduate, School of Social Sciences and Humanities,
NUST E-mail: hassan.mse21s3h@student..nust.edu.pk

Dr. Faisal Jamil
Professor of Economics & HOD Research, School of Social Sciences and Humanities, NUSTE-mail: faisal.jamil@s3h.nust.edu.pk

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School of Social Sciences and Humanities (S3H)
National University of Sciences and Technology (NUST)
Sector H-12, Islamabad, Pakistan

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Abstract

Pakistan has been facing macroeconomic imbalances for the last couple of decades. There are widening fiscal and current account deficits. In this background, the study finds the possibility of budgetary deficit causing current account imbalances using Pakistan's annual data covering the period 1987-2022. Specifically, we examine the validity of the twin-deficit hypothesis and check whether Ricardian equivalence or Keynesian absorption theory best explains Pakistan's economy. The study estimated Bernheim's consumption function to validate the theoretical framework and to test the impact of IMF reform policies on aggregate consumption. Estimation results show that economic activity, budget deficit, debt, and the government expenditures have a statistically significant relationship with consumption. The restriction employed represents two viewpoints i.e. Keynesian claim (BD=Y) and Ricardian view (BD=0). The findings report accept the Ricardian equivalence exist in case of Pakistan. Further, we applied the Granger causality in VAR, and the results indicate that there is no relationship between the two deficits, validating the existence of Ricardian equivalence in Pakistan. Finally, the IMF policy indicates an insignificant impact on consumption. The findings imply that the government should increase taxes on bondholders rather than on non-bond holders to reduce the burden on those who did not save in good time (when the government uses expansionary fiscal policy).

Keywords: Keynesian Absorption Theory; Ricardian Equivalence; IMF Interventions; Budget Deficit; Current Account Deficit

1. Introduction

The large current account deficits cause major currency crashes worldwide. The budget and current account deficit variability in developing and developed countries is very high over time (Forte & Magazzino, 2015). Various traditional theoretical frameworks exist that explain the relationship between budget and current account deficits. Keynesian absorption theory explains that an increase in budget deficit boosts the aggregate demand and hence increases imports, worsening the current account deficit (Johnson, 1976). The Keynesian absorption theory suggests that a rise in budget deficit increases domestic consumption, contributing to the current account deficit (Siničáková et al., 2017). However, Ricardian equivalence theory challenged the Keynesian view. Barro (1974, 1989) presented the Ricardian equivalence theory which states that substitution of debt for taxes does not affect aggregate demand for a given expenditure path. In this way, increasing taxes would reduce the budget deficit but would not vary the external account.

Different policies are devised based on the relationships between current and fiscal accounts. If there is a relationship between current and budget deficit or occurrence of twin-deficit hypothesis, the best action would be to raise taxes to reduce the budget deficit. Owing to the fall in import demand brought on by the decrease in private after-tax incomes, fiscal consolidation would reduce the budget deficit directly and so indirectly decline the external deficit (Normandin, 1999). Conversely, Summers, (1988) provide the explanation of the reverse causality (causality running from current account deficit to budget deficit) may indicate a negative exogenous shock, like a taste shock, which may cause a decline in exports or a raise in imports, which is a natural explanation for this reverse causality. Other things being equal, deteriorated external balance negatively influences the domestic output, which is reflected in the substitution of domestic production by comparatively cheaper imports. This results in lower tax receipts and a worsening of the budget balance. The increase in the external account balance led to a reduction in the budget deficit by the persistence of export-led growth. On the other hand, Kim & Roubini (2008) mentioned that a twin divergence is likely to happen, that is, when fiscal accounts worsen, the current account improves, and vice versa. Kim & Roubini (2008) have also posed policy recommendation for such a relationship, and imply that an expansionary fiscal policy shock, or a budget deficit shock, improves the current account and depreciates the real exchange rate.

Pakistan has been facing current fiscal and current account deficits for many years. For this reason, Pakistan has consecutively approached the IMF for bail-out packages to keep track of both accounts since 1980. Various observers argue that usual complications related to debt issues

include social and development spending, the balance of payment issues, and a rise in constraints on macroeconomic policy management (Eken et al., 2000). Some IMF reports (IMF, April 2001; July 2004; Aug. 2009; Jan. 2010; Dec. 2014) discussed measures to meet budget and current account targets. These measures include restraining expenditures, non-tax revenues, an increase in foreign remittances, a rise of exports and a decrease in imports. Hence, the current study used IMF as policy intervention to get insight about its implication as theoretically and practically in Pakistan. Holmes et al. (2010) state that the relationship between the budget and current account deficits determines macroeconomic stability, including budget and current account deficits. How the two deficits are related is equally interesting, even if their time-series features may affect adherence to the intertemporal budget constraint and sustainability.

The twin deficit hypothesis has been disputed, particularly in developing countries, because different schools of thought have varying guiding principles for devising the relationship between the two deficits. A twin deficit is considered the long-run positive relationship between the current account and budget deficit; however, the Ricardian equivalence demonstrates that a budget deficit has no role in the economy in the long run (Ogbonna, 2013). Moreover, Ogbonna, (2013) informed the existence of conventional wisdom, which stated that a huge budget deficit is a source of instability. In contrast, an increase in the current account deficit leads to rising interest rates, declining aggregate demand, a reduction in investment, and subsequent consequences in unemployment, ultimately decreasing economic growth. Furthermore, ~~the~~ other ~~related~~ issues were related to twin irregularities in a persistent large deficit, including increased indebtedness by borrowing externally and internally and imposing a burden on future generations. Lastly, there is more concern to sort out the current account and budget deficit issues to set the path toward economic growth and stability. Policymakers have always been interested in the current account and budget deficit relationship.

The current study aims to identify the issues associated with the current account and budget deficits in Pakistan. The research reflected the budget and current account deficit problems and provided implications for required measures. The data collected from various sources (ESP, WDI, SBP) indicates the correlational research design using time series analysis. The research entails the factors influencing consumption, which mediate in validating the Ricardian equivalence or Keynesian absorption theory. The chosen factors indicate whether Pakistan is a Ricardian or Keynesian economy. The data collection and analysis help to identify the problems or occurrences of a theoretical framework to propose the relevant solutions and guidelines. Therefore, the study aims to investigate the existence of Ricardian equivalence or Keynesian absorption theory in Pakistan. The objective includes the role of consumption and IMF policy in

validating the occurrence of either Ricardian equivalence or Keynesian absorption theory in Pakistan.

1.1 Research Objectives

The study's main objective is to investigate the existence of Ricardian equivalence or Keynesian absorption theory in Pakistan. We split the primary objective into two objectives.

- To investigate the role of consumption in validating Ricardian equivalence or Keynesian absorption theory.
- To investigate the role of IMF policy in validating the occurrence of Ricardian equivalence or Keynesian absorption theory.

Rest of the research paper is organized as follows: second chapter ~~discuss~~ discusses about the literature review which provide comprehensive overview of past related research studies about variables, models and IMF policy interventions; third chapter provide provides insights about theoretical framework, and in-depth insights of framework linked to the model; fourth chapter highlighted highlights the data sources, methodology involves as theoretical model and analysis tools; fifth chapter provide provides insights about findings and discussion using unit root test and VECM and causality; seventh chapter provide provides policy implications to stakeholders based on findings; and lastly references given references are given at the end of this paper which helps help in research work.

2. Literature Review

2.1 Explanation and Empirical Evidence of Theories

Various traditional theoretical explanations exist for the relationship between current account deficit and budget deficit. The Keynesian absorption became popular for analysis when Ronald Reagan pledged to restore the free-market economy to eliminate the government's role. Reagan called for a massive decrease in taxes and government expenditures to incentivize investment and affirm free international trade. The spending did not decrease with the reduction of taxes, even though defense expenditures went up as a result of tax failure to stimulate the economy, and both the annual deficit and federal deficit mounted in 1981-82 (Yergin & Stanislaw, 1998). The main objective of tax reform was to encourage saving by increasing tax cuts on property income and encourage investment through the decrease in taxes. However, Keynesians were largely skeptical of this approach as incentives to invest may not increase investment until the rise of savings (Rothbard, 2004). Keynesian absorption theory states that an increase in the budget deficit boosts the aggregate demand and , hence, increases imports, worsening the current account deficit (Johnson, 1976). The twin deficit phenomenon pledges that budget deficit led to

current account deficit. The rising government expenditure cannot be immediately and fully satisfied by domestic production. The rise in immediate demand for the given supply led to a current account deficit. The Keynesian absorption theory postulate that an increase in the budget deficit increases domestic consumption, contributing to the current account deficit (Siničáková et al., 2017).

Eregha et al. (2022) employed a panel analysis of twelve African oil-producing countries to study the twin deficit phenomenon, and the findings validate the twin deficit hypothesis. In addition, Janko (2020) also substantiates the twin deficit hypothesis for the analysis of Canada, indicating both the long-run and short-run positive relation between external deficit and fiscal deficit. In the case of Pakistan, various studies examined the relationship between the current account deficit and the budget deficit. Hassan et al. (2021) assessed the occurrence of Keynesian absorption or Ricardian equivalence theory in the case of Pakistan. The findings reveal the twin deficit phenomenon, which suggests the relationship between two deficits in Pakistan.

However, Barro (1974, 1989) challenged the traditional review and presented the theoretical framework as Ricardian equivalence, which states that substituting debt for taxes does not influence aggregate demand for a pre-determined expenditure path. Increasing taxes reduces the budget deficit but would not modify the external account. Little empirical evidence validates the theoretical framework, as Algieri's (2013) findings support the Ricardian theory and suggest no clear relationship between fiscal account and trade account balance. Helmy (2018) also included one component of the current account, a merchandise trade deficit that reflects the previous and current economic development with more glaring. The result shows the rejection of the twin-deficit hypothesis while causality runs from trade deficit to fiscal deficit. Lastly, Sobrino (2013) attempted to investigate the relationship between the external and fiscal accounts for a commodity-based economy, Peru. The empirical evidence rejected the twin deficit hypothesis; however, statistical findings have endorsed reverse causality. The rationale of negative causality is due to the responsiveness of fiscal spending to the current account rather than fiscal revenues.

2.2 Policy Perspective of IMF Interventions

The following are IMF reports that encompassed (IMF, April 2001; IMF, July 2004; IMF, Aug 2009; IMF, Jan 2010; IMF, Dec 2014; IMF, October 2016; IMF, Mar 2021), which discuss the measures taken by the authorities to meet the budget and current account target. IMF (April 2001) stated that the first review under the stand-by arrangement highlighted that fiscal account performance was satisfactory due to the consolidated federal and provincial deficit being less than projected by 0.7% of GDP. The main contribution to control over fiscal deficit was the restraints

of expenditures rather than revenue. On the other hand, the lower external deficit was mainly due to increased exports and foreign remittances. IMF (July 2004) is about the review under the three-year arrangement that depicts the inclining trend of exports and imports with declining private transfers. As a result, the current account deficit, excluding official transfers, is estimated at 2% of GDP in 2003/04 compared to 4.5% in 2002/03. Whereas keeping in view the fiscal side, revenues are expected to be met, somewhat higher than projected, mainly owing to non-tax revenues, and the fiscal deficit was restricted to 4% of GDP in 2003/04. IMF, Aug (2009) discussed the decline of the current account deficit by 3 percent of GDP due to a significant decline in imports, higher worker remittances, and increased support from the US in terms of military assistance for FY 2008/09. IMF, Jan (2010) demonstrates the shrinking current account deficit mainly due to the high remittances and private transfers.

On the other hand, authorities revised the fiscal deficit target as 4.9 percent of GDP. IMF, Dec (2014) discussed the fourth and fifth review, which shows that the budget deficit shrunk from 8.3 percent of GDP in FY-2012/13 to 5.5 percent in FY-2013/14. IMF, October (2016) also represents that the overall budget deficit (excluding foreign grants) decreased by 3.9 percent of GDP. International reserves will probably continue to strengthen despite an anticipated increase in the current account deficit that remained under control at 0.9 percent of GDP. IMF (Mar 2021) also showed that the current account deficit decreased to 1.1 percent of GDP in FY-2020 and turned into a surplus of 0.4 percent of GDP in the first half of FY-2021. In FY-2020, the report published by IMF Mar (2021) also mentioned that primary deficit decreased to 1.8 percent of GDP, and authorities were able to meet targeted fiscal measures totaling 1.7 percent of GDP to address COVID-related demands due to the early-year strong fiscal performance, which enabled authorities to absorb a COVID-19 shock by a decline in tax collection by 1.4 percent of GDP.

On the contrary, some of the reports (IMF, Nov 2005; IMF, 2010; IMF, Jan 2011; IMF, Sep 2013; IMF, Dec 2014; IMF, Jun 2019; IMF, Sep 2022) mentioned the target missing of both current account and budget account due to various reasons. IMF (2005, Nov.) demonstrates that the current account situation worsened over time due to decreased exports and a 1 percent increase in the fiscal deficit, which was reflected in lower non-tax revenue in FY-2004/05. IMF (Jun 2010) reported that the fiscal deficit target was exceeded by 0.4 percent of GDP due to revenue shortfall in the first three quarters of 2009/10. IMF, Jan (2011) stated that the staff report, and Post-Program Monitoring presented a weak external position, mainly reflecting lower exports. Pakistan's fiscal deficit rose to 6.6 percent in FY-2010/11, which was at its peak since the 2008 crisis. The report by IMF (Sep 2013) indicated that the fiscal deficit increased to 8.5 percent of GDP due to revenue and expenditure slippages. IMF (Dec 2014) demonstrates the rise of the

current account deficit due to an increase in imports compared to exports. IMF (Jun 2019) discussed the extended arrangement under the extended fund facility where the fiscal deficit increased to over 7 percent of GDP in FY 2019, primarily due to revenue shortfall. The external position is still precarious and far weaker due to the depreciation of the currency and tightening of monetary policy in FY 2019 at over $13 billion (4.5 percent of GDP) because of rising oil imports and sluggish export growth. IMF (Sep 2022) exhibits worsening external conditions due to the trade imbalance ballooning to US$40.1 billion (10.7 percent of GDP) in the first 11 months of FY-22. Additionally, the Remittance inflows (around US$2.5 billion per month) could only partially balance the growing trade deficit. As a result, the current account deficit increased five times over FY-21 to nearly US$15 billion (4.5 percent of GDP) in FY-22. Gradually increasing the primary balance was one of the EFF's main objectives to ensure fiscal sustainability, solidify macroeconomic stability, and increase resilience, which could be achieved by extending the tax base and generating more tax revenue through a fair and effective tax system.

2.3 Literature Gap

The conceptualization of variables is based on a narrative literature review, which helped to formulate a conceptual framework by identifying the key factors influencing consumption to investigate the Ricardian Equivalence and Keynesian absorption theory. The existing studies (Marinheiro, 2008; Pickson & Ofori-Abebrese, 2018; Banday & Aneja, 2019; Ricciuti, 2003) help to construct the model in which the explanatory variables were GDP, budget deficit, government expenditure, and debt while consumption is the dependent variable to investigate the validity of either Ricardian equivalence or Keynesian absorption theoretical framework. The studies conducted by (Nickel & Vansteenkiste, 2008; and Roehn, 2010) examined the relationship between fiscal policy and current account balance and identified Ricardian equivalence theory. The findings indicate the existence of Ricardian equivalence. Conversely, the findings given by the studies (Meissner & Rostam-Afschar, 2017; Banday & Aneja, 2019; Kim & Roubini, 2008) rejected the Ricardian equivalence. Literature provides disputed results, which enable us to conduct more research to gain insights into theoretical development. Moreover, the existing studies (Normandin, 1999; Kim & Roubini, 2008; Ogbonna C., 2013; Eregha et al., 2022; Janko, 2020; Algieri, 2013; Helmy, 2018; Sobrino, 2013) have not included IMF dummy to get insight as of policy intervention which shows the untapped area to understand that whether Pakistan is Ricardian or Keynesian economy, and so receive comprehensive policy guidelines based on findings. Hence, the current study used the Bernheim consumption function using IMF as a policy intervention to investigate the Ricardian equivalence or Keynesian absorption theory.

3. Theoretical Framework

The twin deficit hypothesis arose to describe the US experience during 1980s. It was observed that trade deficit and budget deficit increased and fell together, although causal relationship in the movements between two deficits was ambiguous. American were concerned particularly about budget deficits at that time as congress enacted the Economic Recovery Tax Act in 1981, but Reagan administration did not decrease spending commensurately. Some economist wondered if the observed twin deficit model might assist countries control their budget deficits. Thinking was that US trade deficit reduction may also lower budget deficit, assuming linkage between two deficits (Muris, 2000).

3.1 Keynesian absorption theory

The Keynesian provide insights about the demand-side approach where government impact the economy through aggregate demand which was raised by budget deficit increase. However, they did not differentiate between budget deficit either caused by tax cut or increase in government expenditure. On the contrary, supply siders economist demonstrates the difference whether budget deficit increase due to tax cut or increase in government spending. Government is pre-empting more goods and services from private sector in case of increase government expenditure. However, tax cut may not expect more goods and services from private sector as it may create revenue, underground economy to shrink, reduce incentive for non-productive investment and increase in saving. Therefore, the supply-side economist emphasizes on tax cut to raise budget deficit which does not imply the crowding out effect, while budget deficit due to government expenditure may create crowding effect and hence lead to the raise of current account deficit given by Keynesian absorption theory (Bartlett, 1982).

There are some traditional theoretical frameworks that explain the relationship between budget deficit and current account deficit. According to the Keynesian absorption theory, an increase in budget deficit boosts the aggregate demand and hence increases imports which leads to the worsening of the current account deficit (Johnson, 1976). The twin deficit phenomenon claim that budget deficit causes current account deficit. The raising government expenditure cannot be immediately and fully satisfied by domestic production. The raise in immediate demand against given supply led to current account deficit. The Keynesian absorption theory is based on the principle that rise in budget deficit increases domestic consumption that contribute to raise of current account deficit (Siničáková et al., 2017).

However, this view was challenged by the Ricardian equivalence theory. As Ricardian equivalence theory states that, for a given expenditure path, the substitution of debt for taxes has

no effect on aggregate demand. In this way, increasing taxes-reduces the budget deficit but would not alter the external account.

In the case of Ricardian equivalence does not hold, there is the possibility of a relationship between the fiscal account deficit and the current account deficit. The first possibility is the unidirectional causality running from the current account to the fiscal account. This case suggests that government improve the current account which will sort out the fiscal deficit issues indirectly. The second case is the occurrence of reverse causality that runs from the fiscal account to the current account. As a result, the government sort out the current account deficit by using fiscal deficit as an instrument.

3.2 The Ricardian equivalence theory

(Barro, 1989) state that the Ricardian modification to the standard analysis begins with the observation that, for a specific course of government spending, a deficit-financed cut in current taxes results in higher future taxes with a present value equal to the initial cut. This outcome is a direct result of the government's budgetary constraint, which equates total expenditure (including interest payments) for each period to tax or other income receipts and the net issue of interest-bearing public debt. The current value of taxes (and other income) cannot change unless the government modifies the present value of its expenditures, apart from chain-letter scenarios where the public debt can grow at the rate of interest or higher. This argument essentially argues that there is no such thing as a free lunch and that government expenditure must be paid for either now or in the future, with the entire present value of receipts being determined by the total present value of spending. Hence, A rise in the present value of future taxes must be equal to a decrease in today's taxes, holding the trajectory of government spending and non-tax receipts constant.

Assume that households' demands for products are based on the expected present value of taxes; in this case, each household would deduct its portion of this present value from its expected future income to calculate its net wealth position. Then fiscal policy would affect aggregate consumer demand only if it modified the anticipateted present value of taxes. The antecedent argument, however, was that as long as the present value of spending remained constant, taxes would remain at their current level. Therefore, the substitution of a budget deficit for current taxes (or any other rearrangement of the timing of taxes) has no impact on the aggregate demand for goods. In this view, taxation and budget deficits both have an equal impact on the economy, therefore the term, "Ricardian equivalence theorem. To put the equivalence, result another way, a decrease in the government's saving, that is, a current budget deficit) leads to an offsetting increase in desired private saving, and hence to no change in desired national saving.

4. Data and Methodology

4.1 Data Description

The quantitative research methodology is adopted from Bernheim (1987) and Marinheiro (2008) that involves quantifying the data and generalizing the findings from varied perspectives. The main goal of research methodology is to identify attributes and develop the statistical model. The current study employs annual time series data from 1987 to 2022 to achieve the abovementioned objectives. The study investigates the occurrence of the twin deficit in Pakistan using the following independent variables: GDP (Y), the budget deficit (BD), government expenditures (G), and debt (DT). Our dependent variable is private consumption (CO). The proposed study exhibits the longitudinal research design, which involves the study of the same subject or groups over an extended period to understand the data covers almost those years when Pakistan was in the IMF for a bail-out package to ameliorate the fiscal and external account imbalances. The data collected from the sources include Pakistan Economic Survey, World Development Indicators (WDI) and State Bank of Pakistan (SBP).

Table 1: Data Description

Variable	Definition	Source of Data
CO	Consumption	Pakistan Economic Survey, State Bank of Pakistan
Y	Gross Domestic Product (GDP)	Pakistan Economic Survey, State Bank of Pakistan
BD	Budget Deficit	Pakistan Economic Survey
G	Government Expenditure	Pakistan Economic Survey
DT	Debt	State Bank of Pakistan, World Development Indicators (WDI)
CA	Current Account	Pakistan Economic Survey

Source: PES, SBP, WDI

4.2 Methodology

The study adopted the theoretical framework and empirical methodology from Bernheim (1987) and Marinheiro (2008). Some traditional theoretical frameworks explain the relationship between budget and current account deficits. According to the Keynesian absorption theory, an increase in budget deficit boosts aggregate demand and hence increases imports, worsening the current account deficit (Johnson, 1976). On the contrary, the Ricardian equivalence theory states that the substitution of debt for taxes does not influence aggregate demand for a constrained expenditure path. In this way, increasing taxes diminish the budget deficit but would not alter the current account.

The current study used Bernheim's consumption function to investigate the private consumption response to government financing decisions for the RE hypothesis. The study will use reduced-form consumption functions, regarding as the specification of Bernheim (1987).

$$C_t = \beta_0 + \beta_1 Y_t + \beta_2(TX_t - G_t - r_t\, DT_{t-1}) + \beta_3 G_t + \beta_3 DT_t + \beta_4\, IMF + E_t \quad \text{..... (1)}$$

C denotes real consumption, TX is the tax revenues, G is the government expenditure, DT is the debt, r is the interest rate, and 'IMF' represents the policies, which comprises a dummy 0 or 1. AID and COVID represent the policies related to aid and the pandemic that reflect consumption and budget deficit fluctuations, respectively. The graphical representation of fluctuation in consumption for 2019-20 allows us to include 'COVID' as a dummy to converge the system in error correction terms. The study by Chen et al. (2021) demonstrates that offline consumption decreased due to the pandemic in 2019. Hence, the current study added a dummy where fluctuation occurred in series as a sudden decrease in consumption in 2019, followed by an increase in the next year. The Aid dummy also covers the fluctuations witnessed in the budget deficit series, which helps to cover the speed of adjustment or convergence of the system in the cointegration equation. Pakistan Economic Survey (2007) represented the fluctuation of project and non-project aid that may impact the budget account, and its data series also indicated the variation for the period 2000-05. Haque and Mehmood (2024) showed that foreign aid is consistently rising from 2013 with some fluctuations up to 2017. The 'AID' dummy covers the short-run fluctuations in the data series to ensure convergence of the system in the error correction term. Therefore, the AID and COVID dummies were used in the analysis tools. The empirical model is estimated to be using Johansen's approach. As given by Marinheiro (2008), $TX_t - G_t - r_tDT_{t-1}$ is the government budget surplus, BD_t can be considered a symmetric budget surplus. The log has been employed to all variables labelling as lC, lY, lBD, lG and lDT.

$$lC_t = \beta_0 + \beta_1 Y_t + \beta_2 lBD_t + \beta_3 lG_t + \beta_4 lDT_t + \beta_4 IMF + E_t \quad \text{..... (2)}$$

The consumption function is regarded as Bernheim's (1987) function included in investigating the validity of Ricardian equivalence or Keynesian absorption theory. The primary role of the given model is to identify the role of budget deficit on consumption, which informs about consumer rationality or immediately reacts to an increase in budget deficit. Hence, the model provides insight into whether absorption occurs in the economy or whether consumers behave rationally, which helps to identify the validity of Ricardian equivalence or Keynesian absorption theory. The null hypothesis is $\beta_2(BD)=0$ related to the Ricardian equivalence viewpoint, while $\beta_2(BD)= \beta_1(Y)$ indicates the Keynesian absorption perception. Therefore, the β_2 measures the effect of 1RS tax-for-debt-swap on consumption. The IMF dummy included related

policy implementation, such as IMF = 1 and 0 otherwise. For policy implementation, the time constraint has been set for at least nine months; conversely, less than nine months was not included as policy implementation and labeled i.e. IMF=0. The historical data on lending commitment for policy implementation collected from the IMF (2020) provides Pakistan's history with the IMF in seeking a bail-out package since 1958.

The current research used analysis tools to test the data to achieve the objectives. The augmented Dickey-Fuller (ADF) and Philip Perron (PP) tools were used in the current study to investigate the stationary in the long-run series or order of integration. The Johansen two-step procedure examines whether a cointegration relationship occurs between the series. The VECM tool examines the long-run and short-run relationship between GDP, government final consumption, debt, and budget deficit, regressing the variable as consumption. Subsequently, the restriction is employed to examine whether Ricardian equivalence or Keynesian absorption theory exists in the case of Pakistan. The ARDL model was used because of the different order of integration between BD and CAD, and we examined the cointegration relationship between these two series. Finally, causality in VECM was employed to investigate the direction of causality between budget deficit and current account deficit to validate the findings based on the model.

5. Results and Discussions

5.1 Unit Root & Johansen Cointegration

Table 2 below shows the result of the Philips Perron and ADF test applied to the seven variables: lC, lY, lBD, lG, lDT, and lCA. The P-value is determined based on the hypothesis; if the P-value is <0.05, showing the significance level of the interval and reject the null hypothesis. The p-values of lCO, lY, lBD, lG, and lDT were >.05, more significant than the significance interval, indicating non-stationary at the level. On the contrary, the p-values of CO, Y, BD, G, and DT were <.05, less than the significance interval, indicating stationary at the first difference.

Johansen and Juselius (1990) provide Johansen's framework as a widely used technique for examining cointegration analysis. Johansen's cointegration method characterizes a cointegration series and enables examining more than one cointegration relationship. Johansen's null hypothesis for cointegration indicated that there is no cointegration relationship between series, while the alternative hypothesis states at least one cointegration relationship.

Table 1: Result of Unit Root Test

	ADF				Philips-Perron			
			First				First	
	Levels	P-value	Difference	P-value	Levels	P-value	Difference	P-value
L(CO)	-2.59	0.28	-5.08*	0.00	-2.61	0.27	-7.54*	0.00
L(Y)	-2.87	0.18	-4.55*	0.00	-2.53	0.31	-4.42*	0.00
L(BD)	-2.23	0.45	-6.28*	0.00	-2.27	0.43	-6.32*	0.00
L(G)	-1.61	0.76	-5.51*	0.00	-1.67	0.74	-5.51*	0.00
L(DT)	-1.10	0.91	-10.59*	0.00	-2.61	0.27	-11.13*	0.00
(LCA)	-5.17*	0.00			-5.17*	0.00		

Notes: The ADF test used the Akaike Information Criterion (AIC)with automatic lag selection for unit root analysis. The Philips-Perron test used the Newey-West Bandwidth method and automatic lag selection in unit root analysis to measure the order of integration

Table 2: Johansen cointegration test

Rank (r)	Trace Statistic	0.05 Critical Value	Prob.	Max-Eigen Statistic	0.05 Critical Value	Prob.
0	86.13	79.34	0.01	45.45	37.16	0
r ≤ 1	40.67	55.24	0.48	26.03	30.81	0.17
r ≤ 2	14.64	35.01	0.95	8.46	24.25	0.96
r ≤ 3	6.17	18.39	0.85	6.13	17.14	0.8
r ≤ 4	0.03	3.84	0.85	0.034	3.84	0.85

The trace statistics (λ trace) examine the null hypothesis of r cointegrating vectors against the alternative hypothesis of g cointegrating vectors. The maximum eigenvalues (λ max) investigate the null hypothesis of r cointegrating vectors against the alternative hypothesis of r + 1 cointegrating vectors. (Asteriou & Hall, 2016; Brooks, 2019). The dummy variables like 'AID' and 'COVID' are also included in the analysis in the exogenous variable section. The optimum lag length before the analysis was determined as the lowest AIC with lag-2. Table 3 reports the findings of Johansen cointegration in which the trace statistics and maximum eigenvalue exceed the critical value (5%) and reject the null hypothesis, indicating no cointegration vector in the system at the level.

Conversely, the next step mentioned the trace statistics and maximum eigenvalue is lower than the critical value (5%), indicating the acceptance of the null hypothesis. Therefore, the result states that the one cointegration vector in the system exists at that level. The Johansen cointegration presents the long-run relationship between variables, which may be disequilibrium in the short run. The error correction model (ECM) is the short-run relationship among these variables. The error of equilibrium or disequilibrium can be used to combine the short-run to the long-run period. The method used in such a combination is called ECM.

5.2 Basic VECM, Restrictions and Dummies

Table 4 below indicates that the pure Keynesian view implies $\beta_2(BD)= -\beta_1$ the Ricardian view represents the irrelevance of budget deficit implies $\beta_2 (BD)=0$ given in equation 2. Therefore, $\beta_2(BD)$ measures the effect on consumption of a 1RS tax-for-debt swap. The long-run test results reject the Keynesian viewpoint that budget deficit and GDP present the same coefficient. On the contrary, the pure Ricardian viewpoint, implying that budget deficit has no role in the economy implying a nil coefficient for the deficit, is accepted by the data reported as p-value is .06. Notwithstanding, the findings reported do not indicate the non-existence of partial Keynesian absorption which may occur due to partial absorption of consumer to the effect of government expenditure. The data report that Pakistan is a Ricardian economy, meaning that an increase in private savings fully compensates for an increase in the budget deficit for a given expenditure path. As a result, an increase in deficit financing from external financing causes more savings than consumption, leading to a Ricardian equivalence phenomenon.

The dummy variable is IMF_i, where 1= for policy implications while 0= for without policy implications in the year. Table 5 below indicates the findings about the influence of the IMF

policy on variables. The reported finding indicates that the dummy variable of IMF indicates an insignificant impact on consumption. According to Ricardian equivalence, the budget deficit does not lead to a current account deficit because consumers are rational and tend to increase savings over consumption. The IMF policy has an insignificant impact on consumption, indicating that consumption does not mediate between two deficits, and so validates the Ricardian equivalence viewpoint. The reports by (IMF, April 2001; IMF, July 2004; IMF, Nov 2005; IMF, Aug 2009; IMF, Jan 2010; IMF, Jan 2011; IMF, Jan 2014; IMF, Oct 2015; IMF, Mar 2016; IMF, Jun 2019) indicating the IMF sort out imbalances of both deficits through tax measures, limit expenditures, export promotion and restricting imports. Hence, it suggests that the IMF sort out both deficits through distinct measures, meaning there is no relationship between the current and budget deficits. The IMF policy also has an insignificant impact on GDP, which means that it does not create absorption by increasing aggregate demand and so does not lead to raising the current account deficit. It clarifies that IMF policies validate the Ricardian equivalence theoretical phenomenon.

Table 3: Vector Error Correction Model (VECM)

Variables	Basic (VECM)	Keynesian Restrictions	Ricardian Restrictions
$\boldsymbol{Y_t}$	1.29 (0.03) [33.10]	-6.09	-28.28
$\boldsymbol{BD_t}$	0.14 (0.04) [3.44]	-6.09	-0.00
$\boldsymbol{G_t}$	0.48 (0.06) [8.06]	0.88	11.15
$\boldsymbol{DT_t}$	0.17 (0.05) [3.16]	4.79	-7.16
$\boldsymbol{BD_t}$=$\boldsymbol{Y_t}$		(0.00)	
BD=0			(0.06)
Constant	1.90	5.96	44.93
$\boldsymbol{R_2}$	0.47	0.25	0.38
F-Statistics	2.86	1.09	1.96

Notes: The values in () and [] represent the standard errors and t-statistics respectively. The second column is about the basic VECM using 'AID' and 'COVID' as dummies, which helps system convergence in the error correction term. The Keynesian restriction (BD=Y) and Ricardian equivalence restriction (BD=0) are employed on basic VECM to get insight into the validity of

any theoretical framework.

Table 4: Cointegration vector and Dummy on the long- and short-run

Variables	D (LCO)	D (LY)	D(LBD)	D (LG)	D(LDT)
ECT (Basic VECM)	-0.50	-0.10	0.42	-0.33	0.28
	(0.14)	(0.08)	(1.03)	(0.43)	(0.55)
	[-3.47]	[0.41]	[0.41]	[-0.75]	[0.56]
IMF	-0.01	-0.01	-0.20	-0.10	-0.002
	(0.01)	(0.007)	(0.08)	0.03	(0.05)
	[-1.24]	[-1.82]	[-2.43]	[-2.92]	[-0.04]

Notes: The COVID and AID dummy is included in the basic VECM, which helps to converge the system in error correction terms. The dummies are brought back to equilibrium whenever the system deviates from the long-run equilibrium due to shock. The second column represents the IMF dummy, which shows its policy implications on theoretical and policy guidelines.

5.3 ARDL & Causality in VAR

Pesaran and Shin (1999) state that auto-regressive distributive lag (ARDL) is beneficial over another cointegration test due to implementing and interpreting the results of a single equation and assigning different lag lengths to different variables in the model. The ARDL approach is applicable whether underlying regressors are mainly I (1), I (0), and mutually cointegrated. If the F-sat is greater than the upper bound value, there is cointegration between the various series in the model. On the contrary, if the F-stat value is less than the lower bound value, it demonstrates that variables are not cointegrated in the long run. Finally, the F-stat values lie between the upper and lower bound, indicating that the result is inconclusive. Table 6 represents the F-statistics accounted for 4.22, which is less than the lower bound value of 6.56 at 5%, indicating no cointegration relationship among variables.

Table 5: Auto-regressive distributive lags

Dependent Variable	Test Statistics	Value	Critical Value Bound			Conclusion
			Significance	I (0)	I (1)	
CO	F-statistics	4.22	10%	5.59	6.26	
	K	1	5%	6.56	7.3	There is no
			2.5%	7.46	8.27	cointegration
			1%	8.74	9.63	relationship

a) I (0) show a lower bound value
b) I (1) indicate upper bound value

The current section demonstrates the Granger causality in VAR, which demonstrates the causality between two deficits captured in the long run. Table 7 demonstrates the regression estimate of VAR and the Granger causality test for the variables, i.e., for coefficient $\alpha_{2,1}, \delta_{1,1}$ of equations (3) and (4). The VAR Granger Causality test results indicate no causality between budget and current account deficits. Since this is a VAR model, examining which variable set to the deviation from the long-run equilibrium is essential. The causality is the joint test for the null of coefficients mentioned below.

$$BD_t = \alpha_0 + \sum_{i=1}^{p} \alpha_{1,i} \Delta BD_{t-1} + \sum_{i=1}^{q} \alpha_{2,i} \Delta CA_{t-1} + \xi_{1t} \ldots\ldots \text{(3)}$$

$$\Delta CA_t = \delta_0 + \sum_{i=1}^{p} \delta_{1,i} \Delta BD_{t-i} + \sum_{i=1}^{q} \alpha_{2,i} \Delta CA_{t-i} + \xi_{2t} \ldots\ldots \text{(4)}$$

Where Δ is the difference operators, The testing hypotheses are:

The causality in VAR reported that data does not accept the null as budget deficit does not granger-cause to current account deficit. Similarly, data also reports that the acceptance of null hypothesis comprising current account deficit does not cause budget deficit. It clearly shows that the granger-causality relationship between budget deficit and current account deficit does not run in either direction, or there is no relationship between the two deficits.

Table 6: Causal Relationship between Budget Deficit and Current Account using VAR

Dependent	Constant	$\boldsymbol{LBD}\ (-1)$	$\boldsymbol{LCA}\ (-1)$	$\boldsymbol{R^2}$	VAR Granger Causality	
					LBD	LCA
LBD	1.47	0.80	0.013	0.77	------	0.20 (0.65)
	(0.78)	(0.10)	(0.03)			
	[1.88]	[7.80]	[0.45]			
			-0.14		2.13(0.14)	------
LCA		0.92	(0.18)			
	0.63	(0.63)	[-0.78]			
	(4.78)	[1.46]				
	[0.13]					

Findings from the studies (Nickel & Vansteenkiste, 2008; Roehn, 2010) validate our research findings, indicating that consumption patterns do not change over the period despite the change in fiscal policy leading to Ricardian equivalence. The study by Nickel and Vansteenkiste (2008) investigated the association between current accounts and fiscal policy and considered how Ricardian equivalence influences their relationship. The findings indicate that the relationship could be more significant, i.e., the budget deficit increase does not enhance the current account deficit in highly-debted countries and intends to become Ricardian. In addition, the study by Roehn (2010) also investigates the Ricardian through fiscal policy influence on the economic

activity shock following private agent reaction. The findings demonstrate that private saving offset accounts for 40% in both the short and long run. Disaggregate estimates of the budget constraint indicate that changes in current revenue are fully offset. The findings validate through full offset of private savings indicate the occurrence of Ricardian equivalence.

Findings from the studies (Meissner & Rostam-Afschar, 2017; Banday & Aneja, 2019; Drakos, 2001; Hayo & Neumeier, 2017; Marinheiro, 2008) rejected our study's findings indicating that Ricardian equivalence does not exist or the possibility of the occurrence of twin deficit. Meissner and Rostam-Afschar (2017) investigate whether Ricardian equivalence occurs in a consumption life cycle. The findings demonstrate that Ricardian equivalence does not hold, and tax changes significantly impact consumption patterns. Banday and Aneja (2019) examined the validity of Ricardian equivalence using the time series period of 1990-2016 in China. The findings demonstrate that consumption has a long-run relationship with interest rate, government spending, budget deficit, and interest rate. The study by Drakos (2001) investigates the relationship between government domestic borrowing and private savings in EU countries. The research attempts to test the relevance of Ricardian equivalence in Greece. The results reveal that private savings only partially offset the increased government debt. The findings ensure the validity of Ricardian equivalence in Greece. The study conducted by Hayo and Neumeier (2017) examined the validity of Ricardian equivalence using data from a German population survey. Multinomial logit regression found that individual consumption responses are significantly associated with time frame, education, age, and economic condition. Lastly, Marinheiro (2008) investigated the occurrence of Ricardian equivalence or Keynesian absorption theory in the case of Egypt. The results reject Ricardian equivalence and accept the Keynesian absorption theory, indicating that twin deficits occur.

6. Conclusion

The budget and current account deficit variability in the time series dimension in developing and developed countries is very high. The study's main objective is to investigate the existence of Ricardian equivalence or Keynesian absorption theory in Pakistan. The first objective is to investigate the role of consumption in validating Ricardian equivalence or Keynesian absorption theory. The second objective is to investigate the role of IMF policy on consumption to validate the occurrence of Ricardian equivalence or Keynesian absorption theory. The study examined the IMF interventions to determine the impact on the budget deficit, government expenditure, and debt. The methodology used in the current study includes augmented dickey fuller ADF, Philips-Perron (PP), Johansen cointegration, VECM, ARDL, and causality in VAR.

The ADF findings report that all variables, including consumption, GDP, government expenditure, budget deficit, and debt, are stationary at I (1) except the current account, which is stationary at I (0). Similarly, the Philips-Perron also validates the findings, indicating that all variables are stationary at I (1) except the current account, which is at I (0). The model incorporates the variables of consumption, GDP, budget deficit, government expenditure, and debt, which are stationary at I (1). Hence, the Johansen cointegration test was employed to test the order of integration among variables. The findings report that variables are cointegrated at I (0). Subsequently, the vector error correction model (VECM) is employed to estimate the long and short-run relationship between dependent variables and explanatory variables. The t-stat of GDP, budget deficit, government expenditure, and debt were>2, indicating the significant short and long-run relationship with consumption. Subsequently, restrictions were applied to VECM, where findings reject the Keynesian viewpoint that the budget deficit and GDP present the same coefficient (the p-value of null has .00%). Conversely, the pure Ricardian viewpoint accepted by data implying irrelevance of budget deficit. In a nutshell, the data does not validate the Keynesian viewpoint for Pakistan, meaning that an increase in savings fully compensates for an increase in the deficit given the expenditure. The budget and current account deficits were stationary at I (1) and I (0). Hence, the ARDL approach is appropriate for testing the order of integration between two deficits. The long-run bound test employed on ARDL indicates that the F-statistics value is less than the lower bound value, indicating the non-existence of cointegration between two deficits. Hence, VAR in causality was employed to test the causal relationship between two deficits. The findings suggest the acceptance of null that budget deficit does not cause to current account and vice versa. There is no causal relationship between the current account deficits and budget deficits. Therefore, the causality in VAR validates the model findings, demonstrating that the Ricardian view exists in the case of Pakistan.

7. Policy Implications

Ricardian also sought to underscore that for a closed economy, or only domestic residents purchase bonds; the burden would be only on the principal rather than the interest incurred (Ahiakpor, 2013). Barro (1974) mentioned that the principal is about the government spending withdrawn from the community's savings. At the same time, interest is only a transfer from public creditors or non-bond holders to public creditors by future taxes. Therefore, our findings imply that non-bond holders will face a tax burden in the future by paying taxes. Ricardian also argued that the government would pay interest expenses through taxes. People unable to pay taxes by share of their income would borrow from others in the community. In the case of a lump sum

amount of tax, regardless of social class, it would be more exploitative than taxes on bond finance. The current study also has implications for the poor class when some taxpayers do not increase their saving rate while others may remove their capital outside of the country to prevent taxes in the future income from wealth. In this case, the burden would be faced by the non-bond holders rather than bondholders who remove their capital from the country to avoid taxes on income from wealth. According to Seater (1993), various liquidity constraints, including credit rationing and differences in policy rates, led to the Ricardian equivalence. Credit rationing creates an inability for households to borrow against their future income. The difference in policy rates is also a stumbling block in liquidity constraint that leads to the Ricardian equivalence. The government may resolve the problem of fiscal efficacy due to Ricardian equivalence by overcoming the issues associated with liquidity constraints. According to Bartlett (1982), the supply-side economist emphasizes tax cuts to raise the budget deficit, which does not imply the crowding out effect, while a budget deficit due to government expenditure may create a crowding effect and hence lead to the rise of the current account deficit mentioned by Keynesian absorption theory. Therefore, the findings imply that the government is more focused on tax increases than government expenditure reduction, which does not lead to a crowding-out effect and less possibility of a twin deficit.

The IMF policies have an insignificant impact on consumption, which also validates the occurrence of Ricardian equivalence. The findings imply that IMF policies reduce the absorption in Pakistan's economy, which does not raise the current account deficit. IMF policies are negatively related to government expenditure, and the government should prioritize the high-value-added sectors, ensuring that every rupee spent gains the highest return, which may assist in negating the adverse effects of the government spending cuts. The IMF policy negatively affected the budget deficit through expenditure cuts and tax measures. The IMF reports related to Pakistan (IMF, April 2001; IMF, July 2004; IMF, Aug 2009; IMF, Jan 2010; IMF, Dec 2014) validated findings that the institution's emphasis is to allow Pakistan's stakeholders to reduce the budget deficit by reducing government expenditure, broadening tax-base and administrative measures.

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