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Analyses of Fiscal and Current Account Balances: Do Deficits Matter in Lower and Middle-Income Countries?

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Abstract: *This research investigates the nexus between current and fiscal account deficits in selected lower and middle-income countries (LMC) by applying panel data from 2000 to 2020. Autoregressive Distributed Lag (ARDL) is applied to check the long-run (LR) and short-run (SR) affiliation between selected variables. The findings revealed that REER, GDPPCG, and trade affect CAB positively, while FD and GFCF influence the CAB negatively in the LR. The SR estimation results show that FD and GFCF are significant in positively affecting CAB. Moreover, this paper proved that the Theory of Ricardian-Equivalence-Hypothesis (REH) is more appropriate for LMC. From the policy perspective, the authorities should follow policy measures such as raising taxes, declining government expenditures, and promoting economic growth to decline the current account deficit. Similarly, the Government of LMC should also improve the investment rate by controlling the high birth rate, inflation rate, and poverty.*

Introduction

LMC nations are those whose Gross National Income (GNI) stays in the range of 1,046 to 4,095 USD. The total value contributed by all domestic producers and production taxes, which are excluded in the valuation of output, plus foreign income, is known as the gross national income (GNI). In order to keep the Balance of Payments (BOP) in balance, the current account is crucial. Maintaining the current account balance is a major challenge for any nation. Many developing nations' balances of payments (BOP) display the current account deficit (CAD) as lower- and middle-income countries. Fiscal deficit is also interrelated with CAD. Historically, the position of the current account of lower and middle-income countries has deficits. Ultimately neutral fiscal deficit gives way to a trade deficit and creates a huge foreign debt stock. If this aspect related to the role between budget deficit and CAD is declared to be inaccurate, the strategy tries to decrease the govt. Expenditure or widening the taxes, private savings or government investment, etc. not reduce the CAD. However, the discarded struggle and failure resources could have been turned into a more stable and favorable policy option. Although in developing countries, many studies have tried to decrease the twin-deficit.

The correlation between the CAD and the budget deficit (BD) is of wider concern in the existing literature. In the USA, the argument on this relationship emerged under the "Reagan Fiscal Experiment" 1980s, when both deficits increased simultaneously.

The positive correlation between BD and CAD is known as the Twin-Deficit Hypothesis (TDH). Since the 1980s, the TDH has become an interesting research area for an economist. To comprehend the relationship between the CAD and the fiscal deficit, proper construction is required. The important supposition of the model is that a BD leads to a trade deficit (TD). The twin-deficit came into consideration

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due to fundamental problems, i.e., poor governance system, market failure, poor real-sector performance, and trade imbalances, which are the primary causes of the twin deficit hypothesis for specified low-income and middle-income countries (Jackson and Jabbie, 2019).

Two major theories, i.e., Keynesian-Proposition Theory and Ricardian-Equivalence-Theory, are used to elaborate the causal connection between BD and CAD. According to Keynesian theory, BD affects the CAD significantly and positively. It also states that BD comes into being due to an expansionary financial strategy that improves local expenditures. Thus, the continuous rise in imports leads to an increase in CAD. It can be extrapolated that BD is likely to generate CAD. On the other hand, Barro's (1989) Ricardian Equivalence Hypothesis (REH) looks into the link between BD and CAD. It shows that BD does not cause CAD; in simple words, BD and CAD are both neutral. This neutral association between BD and CAD exists because the government cuts taxes in expansionary financial planning. The result is an increase in disposable income and private savings, which stimulates internal investment. Consequently, exports increase domestic output, and the economy has no external deficit.

This paper investigates whether the Keynesian Theory of Proposition (KTP) or the Ricardian Equivalence Hypothesis (REH) holds true for LMC. It also investigated the causal association between budget deficits and CAD. Findings of the panel ARDL model differ from country to country. Some economies like (Bangladesh, Cambodia, Egypt, Ghana, Indonesia, Morocco, Philippines, and Sri Lanka) support the Keynesian theory of proposition. Nevertheless, there is no evidence of Keynesian theory for some other economies. In addition, eight countries (Cambodia, El Salvador, Honduras, Kenya, Kyrgyz Republic, Sri Lanka, Tunisia, and West Bank and Gaza) have faced a negative current account balance out of 26 economies from 2000 to 2020. The determination of this research is to assess the validity of TDH in a selection of low- and middle-income nations.

1. To determine the linkage between internal and external deficits in the LMC's zone and appropriate macroeconomic policies.
2. To determine the impact of the internal deficit on the external deficit and vice-versa for selected lower and middle-income economies.
3. To suggest policy suggestions based on the findings.

In this paper, we have taken CAD as the dependent variable and fiscal deficit, real effective exchange rate, gross fixed capital formation, GDP per capita growth, and trade as the independent variable. This research paper is diverse from other research papers due to different data ranges and econometrics techniques. This paper utilized the cross-sectionally augmented IPS (CIPS) and panel ARDL tests to investigate the relationship between regressors and regressands for selected low-income and middle-income countries from 2000 to 2020.

Review Of Literature

Since the 1980s, the twin deficit hypothesis (TDH) has been generally high, particularly in selected lower and middle-income countries. Abell (1990) proved the existence of TDH Twin deficits during the 1980s. Similarly, Vyshnyak (2000), Mann (1999), Mann (2002), Corsetti and Muller (2006), and Onafowora and Owoye (2006) proved the presence of the twin deficit hypothesis in various developed countries. Additionally, numerous researchers like Kulkarni and Erickson (2001), Rauf and Khan (2011), Iyidogan (2013), Perera and Liyanage (2012), Van Bon (2014), Martin (2015), Coban and Balikcioglu (2016) also pointed out the existence of TDH in lower and middle-income countries. In this paper, two major theories are designated, i.e., Keynesian theory and Ricardian Equivalence theory, which elaborate the twin deficit hypothesis (TDH) in selected lower and middle-income countries. Some studies support the Keynesian arguments, such as Mundell (1963), Fleming (1962), Latif and DaCosta (1990), Volcker (1987), Bachman (1992), Kearney and Monadjemi (1990), Aqeel and Nishat (2000), Smyth and Hsing (1995), Vamvoukas (1999), Lau and Haw (2003), Kim and Roubini (2008), Onafowora and Owoye (2006), Corseti and Muller (2006), Muller (2008), and Jawaid and Raza, (2013). On the other hand, Rahman and Mishra (1992), Evans and Hasan (1994), Miller and Russek (1989), and Wheeler (1999) support the Ricardian theory.

Shahbaz et al. (2022) used GMM approaches to depict the TDH evidenced from developing and middle-income nations from 2009 to 2018, concluding that budget consolidation recovers the CAD by giving

support for TDH. Furthermore, Shahbaz et al. (2022) also concluded that long-term external debt stability is excited by current account improvement. Mukhtar et al. (2021) examined the asymmetries in Pakistan's TDH during 1980–2018. Incorporating Non-Linear Autoregressive Distributed Lag (NARDL) econometrics techniques, it was determined that the fiscal deficit had an asymmetric impact on the CAD both in the short term and the long term, supporting the Keynesian theory that the two deficits are closely related. Furthermore, Rehman et al. (2020), Yasmin (2015), Tufail et al. (2014), Saeed and Khan (2012), and Iram et al. (2011) pointed positive connection between internal and external deficits in Pakistan. Furthermore, in the context of the Indian economy, a positive correlation exists between the current and fiscal side deficit, like Nautiyal et al. (2022), Ramu (2017), and Mitra and Khan (2014). However, a negative association is also found between these two variables, as reported by Badaik and Panda (2020) and Suresh and Gautam (2015) for the same country. Mohanty (2018) demonstrated the short- and long-term existence of TDH in India from 1970-71 to 2013-14 using the ARDL regression estimation technique.

Based on Granger causality, Ayinde et al. (2021) identified the TDH for Nigeria from 1981 to 2018 and demonstrated that the budget deficit caused CAD. However, Samotu and Orisadare (2020) showed no Granger causality between the two variables. Similarly, Amaghionyeodiwe and Akinyemi (2015) pointed out the LR cointegration between the two balances. Furthermore, the Granger-causality test showed no causality between BD and CAD; however, CAD causes BD in Nigeria. Shastri (2019) tested the THD ranging the data from 1985 to 2016 for the context of South–Asian-Economies by applying the ARDL test. The findings indicated that fiscal balance had a favorable impact on the current account balance, except for Nepal. However, the Yoda Yamamoto causality technique results express bidirectional causality for Bangladesh and India among the two balances, THD for Pakistan and Sri Lanka, and reverse causality goes from CAD to fiscal deficit for Nepal. Dey and Tareque (2021) investigated the TDH for Bangladesh by applying the ARDL and Granger causality econometrics techniques and revealed a positive association between the two balances. In addition, there was unidirectional causality between the fiscal deficit and the CAD. Alam et al. (2014) demonstrated that fiscal deficit Granger causes CAD by employing the Granger causality test with Bangladesh economic data from 1972 to 2012. Similar outcomes have also been presented by Anas (2013)

Madjidov and Omonov (2021) highlighted the association between BD and CAD in Uzbekistan by applying ARDL and OLS econometrics techniques during the data from 2000 to 2020 and pointed out the positive connection between BD and CAD. Different researchers, such as Hashemzadeh and Wilson (2006) and Marinheiro (2008), present contradictory evidence for the Egyptian economy; both studies refute the twin deficit hypothesis, while Helmy (2018) applied the Granger-causality test and discovered the short-run reverse causation flows from CAD to BD. On the other hand, Martin (2015) used the data from 1980-2009 through a cointegration approach and pointed out the positive twin deficit hypothesis. However, El-Baz (2014) illustrated the negative connection between BD and CAD in Egypt by employing the Vector Error Correlation Model from 1990 to 2012.

Mahuni (2016) examined the validity of TDH in the context of the Zambian case from 1980 to 2014, employing the consideration test and pointing out the LR cointegration in the two deficits. Furthermore, the Granger-causality test shows the existence of TDH in the Zambian case. Perera and Liyanage (2012) examined the TDH evidence from Sri Lanka by employing the Pesaran and Shin cointegration and Granger-causality test to determine the causality between the variables, and they found that fiscal deficit caused CAD from 1960 to 2009. In contrast, Chowdhury and Saleh (2007) pointed out the positive association between CAD, saving-investment, and BD by using the ARDL model for the context of the Sri Lanka period from 1970 to 2005. Sakyi and Opoku (2016) examined the TDH for Ghana; the budget deficit improved the CAD over the period from 1960 to 2012 through the use of the cointegration technique. Lam's (2012) paper explored the TDH and Feldstein Horioka Puzzle (FHP) for Vietnam. The researcher revealed that TDH exists in Vietnam and the presence of FHP data ranging from 1990 to 2011. On the other hand, the Granger causality traveled from BD to CAD during the short and long run by adopting the Granger-causality test.

Njoroge et al. (2014) evaluated the validity of TDH for the Kenyan economy using quarterly data from 1970 to 2012 and discovered the existence of the twin-deficit hypothesis. They also noted that BD has no direct effect on CAD. BD to INR (interest rate), INR to exchange rate (EXRATE), and EXRATE to CAD all have indirect effects. Lau and Tang (2009) examined the TDH for Cambodia from 1996 to 2006. They

concluded that the short-run budget deficit causes a CAD, but these two deficits move together in the long run. In conclusion, several studies have empirically reviewed TDH in selected LMCs. There are mixed results found due to the different econometrics techniques and data. Some researchers pointed out the positive association between variables, and some disagreed. Other studies represent the different directions of causality between two balances. Therefore, this study is initiated to analyze the latest verdict on the relevant topic of TDH.

Model, Data, and Methodology

Following the analysis of the empirical studies on TDH, a number of studies pertaining to the twin deficit hypothesis have been recognized for their ability to explain the link between the twin deficit hypothesis and various macroeconomic factors.

Model Specification

The literature of TDH regarding selected lower and middle-income countries recognized the nexus between fiscal deficit (FD) and current account balance (CAB) in different phases. Based on this literature, this study establishes a model to attain the objectives of this paper.

$$CAB = f\ (FD, REER, GFCF, GDPPCG, TRADE) \tag{1}$$

The extended multi-variable model is as under:

$$CAB_{it} = \alpha_0 + \beta_1 FD_{it} + \beta_2 REER_{it} + \beta_3 GFCF_{it} + \beta_4 GDPPCG_{it} + \beta_5 TRADE_{it} + e_{it} \tag{2}$$

Where,

CAB   = Current Account Balance (% of GDP)

FD   = Fiscal Deficit (% of GDP)

REER   = Real Effective Exchange Rate (index (2010 = 100))

GFCF   = Gross Fixed Capital Formation (annual %)

GDPPCG = GDP Per Capita Growth (annual %)

TRADE = Trade (% of GDP)

     To evaluate the model as mentioned above, we would apply the different econometrics techniques to attain the objective of this paper such as descriptive statistics analysis, correlation analysis, panel-unit root test to check the stationarity of the variables, and LR and SR panel ARDL estimation.

     The paper used the cross-sectionally augmented IPS (CIPS) unit root test to determine the variables' stationarity. In the case of panel data, it is a more suitable test than other tests. The formula is provided below:

$$\Delta W_{i,t} = \emptyset_i + \emptyset_i Y_{i,t-1} + \emptyset_i \bar{Y}_{t-1} + \sum_{l=0}^{p} \emptyset_{il} \Delta \bar{W}_{t-1} + \sum_{l=0}^{p} \emptyset_{il} \Delta W_{i,t-1} + \mu_{it} \tag{3}$$

In equation (3), $\bar{W}$ Shows the mean "cross-section" and is given below:

$$W^{i,t} = \emptyset^1 \overline{FD}^{i,t} + \emptyset^2 REER^{i,t} + \emptyset^3 \overline{GFCF}^{i,t} + \emptyset^4 GDPPCG^{i,t} + \emptyset^5 \overline{TRADE}^{i,t} \tag{4}$$

Therefore, the CIPS is given below:

$$\widehat{CIPS} = N^{-1} \sum_{i=1}^{n} CADF_i \tag{5}$$

Where CADF denotes cross-sectional augmented dickey fuller (ADF) test

Data

This research examines the existence of the twin-deficit hypothesis and its influence on lower and middle-income countries using panel data ranging from 2000 to 2020. The World Development Indicator (WDI) was used as a source for data collection.

Methodology: Panel ARDL

The ARDL model was introduced by (IPS) Im-Pesaran and Shin ([1999](#), [2001](#)) to investigate the LR and SR correlation between variables. ARDL applies when some variables are stationary at the level, and some are at 1st difference. For this study, the ARDL equation is as under:

$$\Delta CAB_t = \alpha_0 + \sum \delta_1 \Delta CAB_{t-1} + \sum \delta_2 \Delta FD_{t-1} + \sum \delta_3 \Delta REER_{t-1} + \sum \delta_4 \Delta GFCF_{t-1} + \sum \delta_5 \Delta GDPPCG_{t-1} + \sum \delta_6 \Delta TRADE_{t-1} +$$
$$\varphi_1 CAB_{t-1} + \varphi_2 FD_{t-1} + \varphi_3 REER_{t-1} + \varphi_4 GFCF_{t-1} + \varphi_5 GDPPCG_{t-1} + \varphi_6 TRADE_{t-1} + \varepsilon_t \qquad (6)$$

Econometrics Analysis

Based on the discussion above, we study the relationship between BD and CAD for selected lower and middle-income countries using different macroeconomic variables. In this study, we will apply different econometrics techniques to evaluate the relationship between variables. First, we would apply the IPS-CIPS test to check the stationarity of the variables. Secondly, we would employ the panel-ARDL test to check the LR and SR relationship between variables.

Descriptive Statistics Analysis

Descriptive statistics examination is the first part of the econometrics techniques, representing the summary of descriptive statistics of key variables for lower and middle-income countries—data of all the variables collected from the World Development Indicator (WDI) from 2000 to 2020.

Table 1
Descriptive Statistics

	CAB	FD	REER	GFCF	GDPPCG	TRADE
Mean	−3.64	1.67	86.34	6.78	3.22	80.76
Maximum	32.54	29.46	150.36	66.17	30.36	184.69
Median	−2.98	1.80	95.21	6.30	3.25	76.27
Minimum	−43.77	−27.01	10.00	−50.50	−14.70	21.12
Skewness	−0.82	−0.44	−1.17	0.23	0.31	0.44
Std. Dev.	8.24	7.57	23.73	13.38	3.57	32.89
Kurtosis	7.88	6.09	4.13	6.25	13.79	2.59
J-B Prob.	0.00	0.00	0.00	0.00	0.00	0.00
Sum	−1586.90	727.33	37645.96	2956.76	1405.66	35213.46
Sum Sq. Dev.	29523.18	24927.09	245041.60	77841.12	5544.57	470623.50

Source: Author's calculations

In Table 1. above, mean, median, maximum, minimum, and standard deviation are existing, current account balance (CAB), fiscal deficit (FD), the real effective exchange rate (REER), gross fixed capital formation (GFCF), GDP per capita growth (GDPPCG) and trade in the columns 2, 3, 4, 5, 6 and 7 separately.

On average, CAB, FD, REER, GFCF, GDPPCG, and trade are −3.64, 1.67, 86.34, 6.78, 3.22, and 80.76 over the period from 2000 to 2020. CAB's maximum and minimum values stayed within 32.54 (Nigeria) and −43.77 (Mongolia) from 2000 to 2020. Likewise, FD remained between 29.46 (Lesotho) and −27.01 (West Bank and Gaza), REER 150.36 (Bolivia) and 10.00 (Kyrgyz Republic and Lesotho), GFCF 66.17 (Mongolia) and −50.50 (Ukraine), GDPPCG 30.36 (Nigeria) and −14.70 (Armenia) and trade remain between 184.69 (Vietnam) and 21.12 (Nigeria).

The correlation coefficients of CAB, FD, and REER have negative Skewness. However, GFCF, GDPPCG, and trade have positive Skewness from 2000 to 2020 for LMCs. Similarly, the standard deviation value of coefficient variable CAB is 8.24, FD 7.57, REER 23.73, GFCF 13.38, and GDPPCG 3.57, and these coefficient variables are leptokurtic with CAB is 7.88, FD 6.09, REER 4.13, GFCF 6.25 and GDPPCG 13.79 value of kurtosis for selected lower and middle-income countries. Whereas the kurtosis value represents, the distribution of data for trade is platykortic (the value of the standard deviation of trade is 32.89, and the kurtosis value is 2.59.

Correlation Analysis

Correlation examination represents the relationship between dependent and explanatory variables. Data of all the variables accumulated from the World Development Indicator (WDI) from 2000 to 2020.

Table 2

Correlation Matrix

	CAB	FD	REER	GFCF	GDPPCG	TRADE
CAB	1.00					
FD	−0.06	1.00				
REER	0.05	−0.11	1.00			
GFCF	−0.08	−0.05	0.01	1.00		
GDPPCG	0.02	−0.22	−0.12	0.06	1.00	
TRADE	−0.52	0.36	−0.06	−0.02	0.02	1.00

Source: Author's calculations

Table 2. expresses the correlation matrix of key variables for the lower and middle-income countries given the period from 2000 to 2020. CAB has a positive correlation with REER and GDPPCG, while there is a negative correlation with FD, GFCF, and Trade. FD has a positive correlation with trade, while on the other hand, there is a negative correlation with REER, GFCF, and GDPPCG. REER has a positive correlation with GFCF, while there is a negative correlation with GDPPCG and trade. GFCF has a positive correlation with GDPPCG, while on the other hand, there is a negative correlation with trade. GDPPCG has a positive correlation with trade. Finally, trade has a positive correlation with all other variables.

Panel Unit Root Test

In panel data, checking the stationarity of the variables from 2000 to 2020 for lower and middle-income countries is compulsory. This study applies the following test, i.e., IPS-CIPS, to see the variables' integration and stationarity. The upcoming Table 3 represents the panel unit root test of all the variables, i.e., CAB, FD, REER, GFCF, GDPPCG, and trade.

Table 3

Results of Panel Unit Root Test

	I (0)		1st Difference I(1)	
Variables	CIPS	M-CIPS	CIPS	M-CIPS
CAB	−3.654***	−3.902***	− − − −	− − − −
FD	−3.271***	−3.887***	− − − −	− − − −
REER	−2.389***	−3.287***	− − − −	− − − −
GFCF	−3.992***	−2.198***	− − − −	− − − −
GDPPCG	− − − −	− − − −	−5.454***	−5.784***
TRADE	− − − −	− − − −	−6.909***	−6.456***

Source: Author's calculations

The result of the panel unit root test is shown in Table 4.3, which shows that variables CAB, FD, REER, and GFCF are found stationary at level I (0). In contrast, from 2000 to 2020, some variables, i.e., GDPPCG and Trade, are stationary at the first difference I (1). The cointegration assessment represents that ARDL econometric techniques can evaluate long and short-run associations between variables.

Long Run Analysis

This section shows the long-run relationship between CAB, FD, REER, GFCF, GDPPCG, and trade variables. Table 4 Long run ARDL estimates of a twin deficit model. The variables REER, GDPPCG, and trade affect the CAB positively. On the other hand, FD and GFCF negatively affected the CAB from 2000-2020 for selected lower and middle-income countries.

Table 4

Long Run ARDL Estimates of Twin Deficit Model

CAB: Regressand				
Variable	Coefficient	Std. Error	t-Statistic	Prob.*
FD	−1.0431	0.3620	−2.8813	0.0042
REER	14.7690	7.7192	1.9133	0.0567
GFCF	−1.1556	0.1671	−6.9167	0.0000
GDPPCG	1.2060	0.3055	3.9476	0.0001
TRADE	0.1910	0.0409	4.6705	0.0000

Source: Author's calculations

According to the findings above, the FD coefficient carries out negative signs, i.e., −1.0431. This means that if a 1% increase in FD leads to a decline in CAB by 1.04%, El-Khishin and El-Saeed (2021) proved the negative association between FD and CAB for non-oil-rich economies. Damalie and Daniel (2019) also found an inverse relationship between FD and CAB both in the long-run and short-run. This finding also pointed out that there is no evidence of Keynesian proposition in selected lower and middle-income countries from 2000 to 2020. Similarly, Sakyi and Opoku (2016), Van Bon (2014), Anas (2013), Nazier and Essam (2012), and Merza et al. (2012) also concluded a negative relationship between FD and CAB. Opposite to this finding, El-Khishin and El-Saeed (2021) pointed out the positive connection between FD and CAB for oil-rich economies. Likewise, Shastri (2019) proved that FD positively affects the CAB for major South Asian Economies except for Nepal. Furthermore, Mukhtar et al. (2021), Abbasi et al. (2021), Rehman et al. (2020), Samotu and Orisadare (2020), Magoti et al. (2020), Jackson and Jabbie (2019), Ramu (2017), Bakarr (2014), Tufail et al. (2014), Jawaid and Raza (2013), Saeed and Khan (2012), Iram et al. (2011), pointed out the positive relationship between FD and CAB.

The coefficient variable of REER has a linear and significant impact on the CAB. A 1 % increase in REER will lead to CAB by 14.76%. Theoretically, a decline in domestic currency will encourage exports and discourage imports. As a result, it will improve the external sector performance. Our outcomes are compatible with El-Khishin and El-Saeed (2021), which proved the positive and significant relationship between REER and CAB for oil and non-oil-rich economies. Ramu (2017) proved that increasing the currency will improve the CAB. Khan et al. (2017), Bakarr (2014), Van Bon (2014), and El-Baz (2014) have all pointed out the positive association between REER and CAB. Contrary to this finding, Tandon (2014) proved that a decrease in REER will increase the CAB. This result is also in line with Damalie and Daniel (2019), Banday and Aneja (2019), Oshota and Badejo (2015), Tufail et al. (2014), Iram et al. (2011), Even and Zubaidi (2006). Gross fixed capital formation (GFCF) is an essential tool in the budget and CADs. The other remaining regressors also concentrate on expected outcomes. For example, GFCF shows an adverse impact on the CAB. The negative coefficient of GFCF shows that if there is a 1% increase in it. As a result, CAB declined by 1.1%. These results are in consist with Abbasi et al. (2021), Rehman et al. (2017), Saba (2015), against this outcome Ramu M.R (2017), Oshota and Badejo (2015), Chowdhury and Saleh (2007), Parikh and Rao (2006).

The GDP per capita growth coefficient variable is positive and statistically significant with CAB. 1% increase in GDPPCG than CAB is also increased by 1.20%. This outcome attained here is related to the result concluded by Oshota and Badejo (2015). Furthermore, the last coefficient variable, trade, positively and significantly impact CAB. A 1% increase in trade will increase the CAB by 0.19%. El-Khishin and El-Saeed (2021) proved the positive relationship between trade and CAB for non-oil-rich economies. Our findings are supported by Chowdhary and Saleh (2007) and Tufail et al. (2014) concluded that an increase in trade leads to an increase in CAB. Khan et al. (2017) pointed out that the impact of trade liberalization depends on the degree of liberalization. For instance, a decrease in tariff obstacles will improve the CAB. On the other hand, low non-tariff barriers will deteriorate the CAB. In contrast, El-Khishin and El-Saeed (2021) pointed out the negative relationship between trade and CAB for oil-rich economies. Mukhtar et al. (2021) and Van Bon (2014) pointed out the negative relationship between trade and CAB.

Short Run Analysis

This segment shows the short-run association between dependent (CAB) and independent variables (FD, REER, GFCF, GDPPCG, and trade). Table 5 shows the short-run ARDL estimates of twin deficits for LMCs. The main purpose of the error correlation model (ECM) is to evaluate the speed of adjustment. ECM represents how quickly the variables are converting near to equilibrium.

Table 5

Short Run ARDL Estimates of Twin Deficit Model

Dependent Variable: CAB			
Variable	Coefficient	Std. Error	t–Statistic	Probability
COINTEQ01	−0.1874	0.0409	−4.5823	0.0000
D(FD)	0.0857	0.3352	0.2558	0.7983
D(REER)	0.0210	0.0234	0.8974	0.3711
D(GFCF)	0.0924	0.0297	3.1159	0.0020
D(GDPPCG)	−0.1814	0.0973	−1.8634	0.0634
D(TRADE)	−0.1201	0.0439	−2.7384	0.0065
C	−7.3827	1.8045	−4.0913	0.0001

Source: Author's calculations

Table 5 represents the short-run ARDL estimates for lower and middle-income countries. Results show the co-integrating equation, which is negative −0.1874 and probability = 0.0000. These findings suggest that the variable meets the long-run equilibrium with a convergence speed of 18.74%. The equation for lower and middle-income countries −0.1874 shows that long-run equilibrium observed short-run shock, which is corrected within one month. The results represent that FD, REER, and GFCF affect the CAB positively and significantly. FD, REER, and GFCF are the most significant variables influencing the CAB. We also pointed out that the coefficient of the intercept is negative (−7.3827), and the probability is 0.0001. The findings also represent that the error correction term is statistically significant, along with a negative coefficient. The level of the coefficient shows that about 38.0 percent of any previous dis-equilibrium in the long run CAB connection is adjusted in the current year, indicating a high speed of adjustment.

Conclusions and Policy Recommendations

This study stated the affiliation between fiscal deficit and CAD in selected LMCs by applying the panel data ranging from 2000 to 2020. This paper is considered significant because the theory of the twin deficit hypothesis is controversial. Some authors pointed out the positive and significant connotations between fiscal deficit and CAD, while others found a negative relationship between the two balances. In this paper, we analyze TDH in selected LMC by first employing the IPS-CIPS test to check the stationarity among the variables. The test of IPS-CIPS shows that few variables are stationary at the level I (0), and few are at the first difference I (1). So, we applied the ARDL test for empirical analysis. One model is refurbished to represent the association between dependent and controlled variables. The outcome showed REER, GDPPCG, and trade affect the CAB positively, while FD and GFCF influence the CAB negatively in the long run. The result of short-run estimation shows that FD and GFCF are the most significant variables that affect the CAB from 2000 to 2020 by using the panel data. This study also proved that the Ricardian-Equivalence-Hypothesis (REH) theory is more appropriate for selected lower- and middle-income countries. From the policy perspective, in order to decrease the fiscal deficit, the authorities should follow the policy measures such as raising taxes, declining Govt. expenditures, and promoting economic growth that could decline the CAD. Similarly, Govt. of LMC should also improve the investment rate by controlling the high birth rate, inflation rate, and poverty.

References

Abbasi, M. A., Amran, A., Rehman, N. A., and Ali, A. (2021). Twin Deficit and Macroeconomic Indicators in Emerging Economies: A Comparative Study of Iran and Turkey. *The Journal of Asian Finance,*

Economics and Business, 8(5), 617-626. https://www.dbpia.co.kr/Journal/articleDetail?nodeId=NODE10630122

Abell, J. D. (1990). Twin deficits during the 1980s: An empirical investigation. *Journal of Macroeconomics*, 12(1), 81–96. https://doi.org/10.1016/0164-0704(90)90057-h

Akinyemi, O., Alege, P. O., Amaghionyeodiwe, L. A., & Ogundipe, A. A. (2014). Fuel subsidy reform and environmental quality in Nigeria. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.2489904

Alam, K. J., Ghosh, B. C., Islam, M., & Hossain, M. E. (2014). Empirical analysis of twins' deficits in Bangladesh. *IOSR Journal of Humanities and Social Science*, 19(1), 65-72. https://doi.org/10.9790/0837-191126572

Anas, M. (2013). Twin deficits in Morocco: an empirical investigation. International *Journal of Business and Social Research*, 3(7), 160-172. https://doi.org/10.18533/ijbsr.v3i7.257

Aqeel, A., Nishat, M., & Qayyum, A. (2000). The Twin Deficits Phenomenon: Evidence from Pakistan [with Comments]. *The Pakistan Development Review*, 39(4), 535–550. http://www.jstor.org/stable/41260283

Ayinde, T. B., Nicholson, C. F., & Ahmed, B. (2023). Multiple-year farm-level assessments of trade-offs between GHG emissions and income: case examples of two farming systems in Northern Nigeria. *Environmental Science and Pollution Research*, 1-11. https://doi.org/10.1007/s11356-023-27534-9

Badaik, S., & Panda, P. K. (2020). Impact of fiscal deficit on macroeconomic variables in India. *VISION: JOURNAL OF INDIAN TAXATION*, 7(2), 17-33. https://doi.org/10.17492/jpi.vision.v7i2.722036

Bakarr, T. A. (2014). Fiscal deficits and current account imbalances: Evidence from Sierra Leone. *International Journal of Business and Social Science*, 5(8), 256-269.

Banday, U. J., & Aneja, R. (2019). Twin deficit hypothesis and reverse causality: a case study of China. *Palgrave Communications*, 5(1), 1–10. https://doi.org/10.1057/s41599-019-0304-z

Barro, R. J. (1989). The ricardian approach to budget deficits. *Journal of Economic Perspectives*, 3(2), 37-54. https://doi.org/10.1257/jep.3.2.37

Batchman, D. D. (1992) Why Is the US Current Account Deficit So Large: Evidence from Vector Auto Regressions. *Southern Economic Journal*, 59, 232-240. http://dx.doi.org/10.2307/1060527

Chowdhury, K., & Saleh, A. S. (2007). Testing the Keynesian proposition of twin deficits in the presence of trade liberalization: Evidence from Sri Lanka. Economics Working Paper Series 2007. https://ro.uow.edu.au/commwkpapers/174

Çoban, H., & Balikçioğlu, E. (2016). Triple deficit or twin divergence: A dynamic panel analysis. *Ekonomik ve Sosyal Araştırmalar Dergisi*, 12(1), 271-280. https://dergipark.org.tr/tr/download/article-file/528632

Corsetti, G., & Muller, G. J. (2006). Twin deficits: Squaring theory, evidence and common sense. *Economic Policy*, 21(48), 598-638. https://doi.org/10.1111/j.1468-0327.2006.00167.x

Damalie, N., Daniel, A. (2019). The Twin Deficit Hypothesis: An Empirical Analysis for Uganda. *North American Academic Research*, 2(7), 239-271. https://zenodo.org/record/3357228

Dey, S. R., & Tareque, M. (2021). Twin deficits hypothesis in Bangladesh: An empirical investigation. *International Journal of Emerging Markets*, 17(9), 2350-2379. https://doi.org/10.1108/ijoem-06-2020-0628

El-Baz, O. (2014) Empirical Investigation of the Twin Deficits Hypothesis: The Egyptian Case (1990-2012). *Munich Personal RePEc Archive*, Paper No. 53428. https://mpra.ub.uni-muenchen.de/53428/

El-Khishin, S., & El-Saeed, J. (2021). The twin deficit hypothesis in the MENA region: Do geopolitics matter? *Economies*, 9(3), 124. https://doi.org/10.3390/economies9030124

Evans, P., & Hasan, I. (1994). Are consumers ricardian? Evidence for Canada. *The Quarterly Review of Economics and Finance*, 34(1), 25-40. https://doi.org/10.1016/1062-9769(94)90051-5

Even, L., & Zubaidi A., B. (2006). Twin Deficits Hypothesis in SEACEN Countries: A Panel Data Analysis of Relationships between Public Budget and Current Account Deficits. *Applied Econometrics and International Development*, 6(2), 213-226. https://www.usc.gal/economet/reviews/aeid6215.pdf

Fleming, J. M. (1962). Domestic Financial Policies under Fixed and under Floating Exchange Rates . *Staff Papers - International Monetary Fund*, 9(3), 369. https://doi.org/10.2307/3866091

Hashemzadeh, N. & Wilson, L., (2006). The dynamics of current account and budget deficits in selected countries in Middle East and North Africa. International Research *Journal of Finance and Economics*, *5*(2006), 112-129.

Iram, M. P. S., Shadid, A., Mahpara, S., and Fazli, R. (2011). Old Wine in New Bottles: Testing the Keynesian Preposition of Twin Deficit in Case of Pakistan. *International Journal of Business and Social Science*, *2*(5), 209.

Iyidogan, P. V. (2013). The Twin Deficits Phenomenon In Turkey: An Empirical Investigation. Journal of Business Economics and Finance, 2(3), 36-42. https://dergipark.org.tr/en/pub/jbef/issue/32415/360486

JACKSON, E., & JABBIE, M. (2020). Twin deficits hypothesis as an indication of government failure in Sierra Leone: An empirical investigation (1980-2018). *İktisat Politikası Araştırmaları Dergisi – Journal of Economic Policy Researches*, 7(1), 43-68. https://doi.org/10.26650/jepr658440

Jawaid, S. T., & Raza, S. A. (2012). Dynamics of current account deficit: A lesson from Pakistan. *Transition Studies Review*, *19*(3), 357-366. https://doi.org/10.1007/s11300-012-0251-5

Kearney, C., & Monadjemi, M. (1990). Fiscal policy and current account performance: International evidence on the twin deficits. *Journal of Macroeconomics*, *12*(2), 197-219. https://doi.org/10.1016/0164-0704(90)90029-a

Khan, M. A., Jaffri, A. A., Abbas, F., & Haider, A. (2017). Does trade liberalization improve trade balance in Pakistan? *South Asia Economic Journal*, *18*(2), 158-183. https://doi.org/10.1177/1391561417713128

Kim, S., & Roubini, N. (2008). Twin deficit or twin divergence? Fiscal policy, current account, and real exchange rate in the US *Journal of International Economics*, 74(2), 362-383. https://doi.org/10.1016/j.jinteco.2007.05.012

Kulkarni, K. G., & Erickson, E. L. (2011). Twin deficit revisited: Evidence from India, Pakistan and Mexico. *Journal of Applied Business Research (JABR)*, *17*(2). https://doi.org/10.19030/jabr.v17i2.2076

Lam, N. X. (2012). Twin deficits hypothesis and Feldstein-Horioka puzzle in Vietnam. *International Research Journal of Finance and Economics*, *101*(9), 169-179. https://se.ueh.edu.vn/wp-content/uploads/nghien-cuu/6-Twin-deficits-hypothesis-and-Feldstein-Horioka-puzzle-in-Vietnam-Nguyen-Xuan-Lam.pdf

Latif-Zaman, N., & DaCosta, M. N. (1990). The Budget Deficit and the Trade Deficit: Insights into This Relationship. *Eastern Economic Journal*, *16*(4), 349–354. http://www.jstor.org/stable/40325309

Lau, E. & Haw, C. T. (2003). Transmission mechanism of twin deficit hypothesis: Evidence from two neighboring countries. *INTI Journal*, *1*(3), 159-166.

Lau, E. & Tang, T.C. (2009). Twin deficits in Cambodia: an empirical study. *Economics Bulletin*, *29*(4), 2783-2794.

Madjidov, B., & Omonov, N. (2021). Twin Deficit Hypothesis: An Empirical Study in Uzbekistan. *Экономика: анализы и прогнозы*, (2), 22-27.

Magoti, E., Mabula, S., & Ngong'ho, S.B. (2020). Triple Deficit Hypothesis: A Panel ARDL and Dumitrescu Hurlin Panel Causality for East African Countries. *African Journal of Economic Review*, *3*(1), 144-161.

Mahuni, K. (2016). *Validating Twin Deficit Hypotheses*: The Zambian Case.

Mann, C. (2002). Electronic commerce, networked readiness, and trade competitiveness. *The Global Information Technology Report 2001–2002*. http://livernspleen.com/wp-content/uploads/2012/12/readiness-for-the-networked-world.pdf#page=106

Mann, C. L. (1999). *Is the US trade deficit sustainable?* Peterson Institute.

Marinheiro, C. F. (2008). Ricardian equivalence, twin deficits, and the Feldstein–Horioka puzzle in Egypt. *Journal of Policy Modeling*, *30*(6), 1041–1056. https://doi.org/10.1016/j.jpolmod.2007.12.001

Martin, L. L. (Ed.). (2015). *The Oxford handbook of the political economy of international trade*. Oxford University Press.

Merza, E., Alawin, M., & Bashayreh, A. (2012). The Relationship between Current Account and Government Budget Balance: The Case of Kuwait. *International Journal of Humanities and Social Science*, *2*(7), 168-177. https://www.ijhssnet.com/journals/Vol_2_No_7_April_2012/19.pdf

MILLER, S. M., & RUSSEK, F. S. (1989). ARE THE TWIN DEFICITS REALLY RELATED? *Contemporary Economic Policy*, 7(4), 91–115. https://doi.org/10.1111/j.1465-7287.1989.tb00577.x

Mitra, P., & Khan, G. S. (2014). Impact of trade openness, FDI inflows and total exports on economic growth of India: An econometric approach. *IOSR Journal of Economics and Finance*, 4(5), 60-68. https://doi.org/10.9790/5933-0456068

Mohanty, D. J., Kumar, R. S., & Goswami, A. (2018). Trade-credit modeling for deteriorating item inventory system with preservation technology under random planning horizon. *Sādhanā*, 43(3). https://doi.org/10.1007/s12046-018-0807-0

Mohanty, R. K. (2018). An empirical investigation of twin deficits hypothesis: Evidence from India. *Journal of Quantitative Economics*, 17(3), 579-601. https://doi.org/10.1007/s40953-018-0136-5

Mukhtar, T., Jehan, Z., and Maryam, K. (2021). Asymmetries in Twin Deficits Hypothesis: An Empirical Assessment for Pakistan. *Pakistan Economic and Social Review*, 59(2), 253-285. http://pu.edu.pk/images/journal/pesr/PDF-FILES/5-v59_2_21.pdf

Müller, G. J. (2008). Understanding the dynamic effects of government spending on foreign trade. *Journal of International Money and Finance*, 27(3), 345-371. https://doi.org/10.1016/j.jimonfin.2008.01.005

Mundell, R. A. (1963). Capital mobility and stabilization policy under fixed and flexible exchange rates. *Canadian Journal of Economics and Political Science*, 29(4), 475-485. https://doi.org/10.2307/139336

Nautiyal, N., Belwal, S., & Belwal, R. (2022). Assessment, interaction and the transmission process of twin deficit hypothesis: Fresh evidence from India. *Business Perspectives and Research*, 11(2), 269-286. https://doi.org/10.1177/22785337211070378

Nazier, H., & Essam, M. (2012). Empirical Investigation of Twin Deficits Hypothesis in Egypt (1992-2010). *Middle Eastern Finance and Economics Journal*, 17(2012), 45-58. https://mpra.ub.uni-muenchen.de/53428/

Njoroge, E. K. (2014). Testing the twin deficit hypothesis for Kenya 1970-2012. *International Journal of Business and Economics Research*, 3(5), 160. https://doi.org/10.11648/j.ijber.20140305.11

Onafowora, O. A., & Owoye, O. (2006). An empirical investigation of budget and trade deficits: The case of Nigeria. *The Journal of Developing Areas*, 39(2), 153-174. https://doi.org/10.1353/jda.2006.0009

Oshota, S. O., & Badejo, A. A. (2015). What drives current account balance in west africa states: Evidence from panel ardl. *Journal of International and Global Economic Studies*, 8(2), 91-105.

Parikh, A., & Rao, B. (2006). "Do fiscal deficits influence current accounts? A case study of India". *Review of Development Economics*, 10(3), 492-505. https://doi.org/10.1111/j.1467-9361.2006.00370.x

Perera, A., & Liyanage, E. (2012). An empirical investigation of the twin deficit hypothesis: Evidence from Sri Lanka. *Staff Studies*, 41(1), 41. https://doi.org/10.4038/ss.v41i1.4683

Pesaran, M. H., & Shin, Y. (1999), *An Autoregressive Distributed Lag Modelling Approach to Cointegration Analysis. In: Econometrics and Economic Theory in the 20th Century: The Ragnar Frisch Centennial Symposium.* Cambridge: Cambridge University Press.

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. https://doi.org/10.1002/jae.616

Rahman, M., & Mishra, B. (1992). Cointegration of US budget and current account deficits: Twins or strangers? *Journal of Economics and Finance*, 16(2), 119-127. https://doi.org/10.1007/bf02920112

Ramu, A. (2016). "Twin Deficits" Hypothesis. *Foreign Trade Review*, 52(1), 15–29. https://doi.org/10.1177/0015732516650825

Rauf, A., & Khan, A. Q. (2011). An empirical study to find the relationship between Trade deficit and Budget Deficit in Pakistan. *Academic Research International*, 1(3), 36.

Rehman, A., & Saeed, S. (2017). Validity of twin deficit hypothesis in case of Pakistan: Using different cointegration techniques. *Economics, Commerce and Trade Management: An International Journal,* 1(1), 45-57. https://airccse.com/ectij/papers/1117ectij04.pdf

Rehman, N. A., Shamshir, M., & Shakir, K. (2020). Correlation of Macroeconomic Variables with Twin Deficit in Pakistan. *IBT Journal of Business Studies* (JBS), 16(1), 16-1. https://ibtjbs.ilmauniversity.edu.pk/journal/jbs/16.1/1.pdf

Saba, S. (2015). The Effect of Inflation Uncertainty on Budget Deficit: Evidence from Iran. *Developing Country Studies*, 5(11), 41-46. https://www.iiste.org/Journals/index.php/DCS/article/viewFile/23092/23611

Saeed, S. & Khan A. (2012). Twin deficit hypothesis: the case of Pakistan 1972-2008. *Natural and Applied Sciences*, 3(2), 155-162. http://www.savap.org.pk/journals/ARInt./Vol.3(2)/2012(3.2-20).pdf

Sakyi, D. & Opoku, E.E.O. (2016). The twin deficits hypothesis in developing countries: Empirical evidence for Ghana. Working Paper, International Growth Centre (IGC).

Samotu, I. A., Orisadare, M. A., & Olaoye, O. (2020). Twin Deficit Hypothesis In The Presence Of Structural Breaks In Nigeria. *Ilorin Journal of Economic Policy*, *7*(1), 35-48.

Shahbaz, M., Nasir, M. A., & Lahiani, A. (2020). Role of financial development in economic growth in the light of asymmetric effects and financial efficiency. *International Journal of Finance & Economics*, *27*(1), 361-383. https://doi.org/10.1002/ijfe.2157

Shastri, S. (2019). Re-examining the twin deficit hypothesis for major South Asian economies. *Indian Growth and Development Review*, *12*(3), 265-287. https://doi.org/10.1108/igdr-11-2018-0124

Smyth, D. J., & Hsing, Y. (1995). In search of an optimal debt ratio for economic growth. *Contemporary Economic Policy*, *13*(4), 51-59. https://doi.org/10.1111/j.1465-7287.1995.tb00731.x

Suresh, K. G. & Tiwari, A. K. (2014). A Structural VAR (SVAR) analysis of fiscal shocks on current account in India. *Macroeconomics and Finance in Emerging Market Economies*, *7*(1), 140-153. https://doi.org/10.1080/17520843.2013.828764

Suresh, K. G., & Gautam, V. (2015). Relevance of twin deficit hypotheses: an econometric analysis with reference to India. *Theoretical Economics Letters*, *5*(02), 304. https://doi.org/10.4236/tel.2015.52036

Tandon, S. (2014). Trade balance and the real exchange rate. *Foreign Trade Review*, *49*(2), 117-139. https://doi.org/10.1177/0015732514525222

Tufail, M. K., Anwar, S., & Abbas, K. (2014). Effect of budget deficit on trade deficit in Pakistan (a time series analysis). *Journal of Finance and Economics*, *2*(5), 145-148. https://doi.org/10.12691/jfe-2-5-2

VAMVOUKAS, G. A. (1999). The twin deficits phenomenon: Evidence from Greece. *Applied Economics*, *31*(9), 1093-1100. https://doi.org/10.1080/000368499323571

Van Bon, N. (2014). Current Account and Fiscal Deficits Evidence of Twin Divergence from Selected Developing Economies of Asia. *Southeast Asian Journal of Economics*, *2*(2), 33-48.

Volcker, P. A. (1987). Facing up to the twin deficits, In R. Fink, and J. High, (Eds), A nation in debt: economists debate the Federal budget deficit, Maryland: University Publications of America.

Vyshnyak, O. (2000). Twin deficit hypothesis: The case of Ukraine. *Kyiv: National University Kyiv, Mohyla Academy.*

Wheeler, M. (1999). The macroeconomic impacts of government debt: An empirical analysis of the 1980s and 1990s. *Atlantic Economic Journal*, *27*(3), 273–284. https://doi.org/10.1007/bf02299578

Yasmin, A., Tasneem, S., & Fatema, K. (2015). Effectiveness of Digital Marketing in the Challenging Age: an Empirical Study. *The International Journal of Management Science and Business Administration*, *1*(5), 69–80. https://doi.org/10.18775/ijmsba.1849-5664-5419.2014.15.1006

Appendix

List of countries which data are taken from WDI

Sr. No.	Country Name	Sr. No.	Country Name	Sr. No.	Country Name
1	Bangladesh	10	Honduras	19	Nigeria
2	Bhutan	11	India	20	Pakistan
3	Bolivia	12	Indonesia	21	Philippines
4	Cambodia	13	Kenya	22	Sri Lanka
5	Cameroon	14	Kyrgyz Republic	23	Tunisia
6	Cote d'Ivoire	15	Lesotho	24	Ukraine
7	Egypt, Arab Rep.	16	Mongolia	25	Vietnam
8	El Salvador	17	Morocco	26	West Bank and Gaza
9	Ghana	18	Nicaragua		