LEX LOCALIS-JOURNAL OF LOCAL SELF-GOVERNMENT
ISSN:1581-5374 E-ISSN:1855-363X
VOL. 23, NO. 11(2025)

MACROECONOMIC DETERMINANTS OF CURRENT ACCOUNT BALANCE IN POST-LIBERALISED INDIAN ECONOMY: A TIME-SERIES ANALYSIS

Navin Kumar[1]*, Vijay Kumar Yadav[2]

[1]Assistant Professor, University Department of Economics, Lalit Narayan Mithila University, Darbhanga, Bihar, India-846004,
[2]Professor, University Department of Economics, Lalit Narayan Mithila University, Darbhanga, Bihar, India-846004,

navinky@gmail.com[1]
vijayyadav.eco@gmail.com[2]

Abstract
This paper analyses the determinants of India's Current Account Balance after 1991 economic reforms. Variables taken for the analysis are current account balance, growth rate, foreign direct investment, inflation, gross fiscal deficit, exchange rate, external debt and crude oil price. The time series data for these variables are taken for the period 1991-2022. Vector Error Correction Model has been applied for the empirical analysis. Empirical study shows that exchange rate, external debt, gross fiscal deficit and crude oil price have negative impact on current account balance in the short-run whereas foreign direct investment, growth rate and inflation have positive impact on current account balance in the short-run. Foreign direct investment and inflation have negative impact on current account balance in the long-run whereas gross fiscal deficit and growth rate have positive impact on current account balance in the long-run. The findings of this study will provide valuable insights for researchers and policymakers in the formulation of effective policies to manage India's current account balance both in the short term and in the long term.

Keywords: Fiscal Deficit, Exchange Rate, Inflation, Forecasting
JEL Classification Code: F32, F41, C32, O53

1. Introduction

Current Account Balance (CUAB) is a component of the Balance of Payments. CUAB mainly consists of balance on merchandise trade and services; primary income and secondary income. Primary income records primary income flow between residents of a country to the residents of the rest of the world. It consists of compensation of employees; income from investing in financial assets and income earned from renting property. Secondary income considers current transfer of income from residents of domestic country to the residents of rest of the world. CUAB is an important indicator of India's external imbalances. In the beginning of the year 1991, India had been facing severe balance of payment crisis. Current account deficit was also too high at the end of the fiscal year 1990-91. To avoid this crisis, India initiated major economic reforms by adopting macroeconomic stabilisation programme and structural reforms. The measures taken under macroeconomic stabilization programme were to control inflation, fiscal adjustment and balance of payments adjustment. The important measures taken under the structural reforms were trade and capital flows reforms, industrial deregulations, disinvestment and financial sector reforms. India liberalised its economy by adopting these reforms. Despite these reforms**,** India's current

[1]Assistant Professor, University Department of Economics, Lalit Narayan Mithila University, Darbhanga, Bihar, India-846004, E-mail - navinky@gmail.com

[2] Professor, University Department of Economics, Lalit Narayan Mithila University, Darbhanga, Bihar, India-846004, E-mail - vijayyadav.eco@gmail.com

* Corresponding Author

account balance has been experiencing persistent deficits most of the years. Alog with domestic and global factors CUAB had also been affected by some unanticipated shocks in the Indian economy.

There are various economic factors that affect current account balance. According to Sahoo, Mallick, Mahalik and Bekiros (2020) India's CUAB was affected by real exchange rate in both the long-run and the short-run for the time period from 1980-81 to 2014-15. Depreciation of rupee improves trade balance in the short-run, while inflation negatively affected trade balance in the post-liberalized Indian economy during the period 1991 to 2020 (Parray, Wani & Yasmin, 2022). Mehta and Mallikarjun (2023) observed that fiscal deficit and exchange rate had positive impact on current account deficit in Indian economy during 1981-2021.
This research aims to analyse and identify major macroeconomic determinants that have affected India's current account balance since the beginning of the liberalization. The Vector Error Correction Model (VECM) has been applied to analyse the time-series data of macroeconomic variables. Only a limited number of research studies have examined the impact of macroeconomic variables on the CUAB of the Indian economy. But none of these studies were focused to identify those macroeconomic variables which influenced India's CUAB in the post liberalisation period. This study applied VECM to investigate those macroeconomic variables which influenced CUAB in both the short-run and the long-run simultaneously in post-liberalised Indian economy.
It is of a great interest for policymakers, economists, and researchers to understand the factors affecting CUAB in the post-liberalized Indian economy. It will help in managing CUAB and maintaining economic stability in the face of global uncertainties. The structure of this research paper is as follows. A review literature has been provided in section 2. Section 3 explains data and econometric methodology. Empirical findings and their analysis have been discussed in section 4. Section 5 provides conclusion.

2. Literature Review

Mehta and Mallikarjun (2023) observed that fiscal deficit and exchange rate had positive impact on current account deficit (CAD) in both the short-run and long-run in the Indian economy during the time period 1981-2021. Pandikasala et al. (2021) analysed the quarterly data during the time period 1996-2019 to find out macroeconomic determinants of remittances in India. They applied ARDL cointegration method to examine the factors of remittances in India. It was observed that depreciation of Indian rupee reduces the inflow of remittances in the long run, while increase in domestic output increases the inflow of remittances in the long run. Behera & Yadav (2019) found that India's large is mainly due to gold and crude oil imports. It was also found that high CAD is due to lower domestic savings and less corporate investments. Lower domestic savings was caused by higher inflation. The econometric analysis suggests that gross fiscal deficit and inflation have positive impact on CAD in India.

Sumiyati (2022) analysed to examine the determinants of Indonesia's CAD in the time period 1980-2021. The VECM model was applied to analyse CAD in Indonesia. It was observed that GDP growth rate, real effective exchange rate (REER) and inflation had affected positively to CAD in both the short run and long run. Andini et al. (2024) applied VECM on panel data of

developing countries in ASEAN region. It was observed that interest rate had negative impact on CUAB in the long-run. Inflation and GDP affected CUAB negatively in the long-run. Exchange rate and FDI affected CUAB positively in both the short-run and the long-run. Guellil et al. (2022) applied panel logit model and found that there are several macroeconomic variables that influence CAD. They observed that GDP, unemployment rate, public expenditure and foreign trade affect CAD positively in MENA countries during 1980-2017.

Furceri and Zdzienicka (2020) applied panel data for developing countries during the time period 1990-2015 and found that if the government budget balance increases by 1% of GDP, it improves the CUAB by 0.8 % of the GDP on an average. Higher macroeconomic stability in developing countries causes higher current account deficit due to higher capital inflow (ÇETREZ & Altaylıgil, 2022). Manu (2022) conducted econometric analysis on Ghana's trade balance data during the time period 2000-2019 and observed that exchange rate had negative impact on trade balance in the long-run, but had positive impact in the short-run. The interest rate exerted a positive influence on the trade balance in the long run, whereas its impact was negative in the short run. Inflation negatively affected the trade balance in the short run but had a positive effect in the long run. Kwalingana and Nkuna (2009) analysed the dynamics of current account deficit of Malawi during the year 1980-2006. They applied VECM model and found that external debt had significant influence on current account balance. Chinn and Prasad (2002) used large sample of industrial and developing countries, and applied cross section and panel data model to analyse the dynamics of current account balance. It was found that Government budget balances were positively related to CUAB in developing countries.

.

Duarte and Schnabl (2015) took data of 86 countries to analyse the impact of exchange rate, monetary policy and fiscal policy on current account balance. It was found that interest rate cuts coupled with sterilization operation improves CUAB in East Asian countries. In the Middle east and the CIS (oil exporting countries), it was observed that improving Government budget balances improves current account balance. Altayligil and Çetrez (2020) investigated to find out macroeconomic determinants of CUAB of 97 developed and developing countries during the period 1986-2013. It was found that REER had negative influence on CUAB in all countries except industrialise countries and fiscal balances have positive impact on CUAB except industrialised and high-income countries.

Muharremi (2016) studied the sustainability of CUAB in the selected western Balkan countries during the year 2008-2013.This study was focused to examine the factors that influenced the sustainability of CUAB. It was observed that a rise in export and steady inflow of FDI were main factors to improve CUAB in Balkan countries. Hassan (2006) applied Engle and Granger cointegration model to investigate the determinants of CAD of Bangladesh during 1976-2003. It was observed that the real GDP growth rate had a positive relationship with the current account deficit (CAD) in the long run.

Das (2016) examined the factors of CUAB for the developed, developing and emerging economies during 1980-2011. The study applied dynamic GMM panel model. It was found that REER and real GDP growth rate had negative effect on CUAB in developing and developed countries. However, real GDP growth rate had positive effect and REER had negative effect on CUAB in

emerging economies. Soo et al. (2023) conducted a study to examine the determinants of CUAB in 48 Asian countries during the year 1990-2021. The analysis employed the panel cointegration test along with the pooled mean group (PMG) estimation method. The study revealed that fiscal balance and public debt had positive impact on CUAB. Although, it was found that real GDP had negative impact on CUAB. Chinn et al. (2013) found that only fiscal consolidation cannot reduce current account deficit in USA. Financial development coupled with financial liberalisation may reduce surplus in current account in China. Global imbalance in CUAB can be reduced by appropriate policy changes. Ariyani et al. (2018) studied the factors that affect CUAB in six ASEAN countries during the year 2001-2016. Panel Vector Error Correction Model (PVECM) was applied to analyse CUAB. It was observed that interest rate, foreign direct investment and exchange rate negatively affect CUAB in the long-run while GDP negatively affects CUAB in the short-run.

3. Data and Econometric Methodology

3.1 Data

Variables taken for the analysis are Current Account Balance (CUAB), exchange rate, external debt, net inflow of FDI, Gross Fiscal Deficit (GFD), inflation, crude oil price of OPEC Reference Basket (ORB) and growth rate. Current account balance is taken as a percentage of GDP. Net inflow of Foreign direct investment is taken as a percentage of GDP. Annual percentage change in GDP deflator is taken as inflation. Spot price($/b) of OPEC Reference Basket and corresponding components is taken as Oil price. Annual average of rupee-dollar exchange rate is taken as exchange rate. External liabilities of India, is taken as external debt. Data of CUAB, GFD, exchange rate and external debt are taken from Handbook of statistics on the Indian economy, RBI. Data of FDI and annual percentage change in GDP deflator, are taken from World Development Indicators, World Bank. Spot price($/b) of OPEC Reference Basket and corresponding components, is taken from Annual Statistical Bulletin, OPEC. The time series data for these macroeconomic variables are taken for the period 1991-2022.

Table 1. Variables and Sources of Data

Variable	Variable Description	Source
CUAB	Current account balance (% of GDP	WDI, World Bank
Exchange Rate	Annual average of rupee-dollar exchange rate	RBI
External debt	External liabilities of India (% of GDP)	RBI
FDI	Net inflow of foreign direct investment (% of GDP)	WDI, World Bank
GFD	Gross fiscal deficit (% GDP)	RBI
Inflation	Annual % change in GDP deflator	WDI, World Bank
Crude Oil Price (ORB)	Spot price($/b) of OPEC Reference Basket (ORB) and corresponding components	OPEC
Growth rate	Annual Gross Domestic Product (GDP) growth rate	RBI

3.2 Econometric Methodology

3.2.1 Augmented Dickey-Fuller (ADF) Test

ADF test has been applied to test the stationarity of the time series variables.
The general form of the ADF regression equation is:

$$\Delta X_t = \alpha + \beta t + \gamma Y_{t-1} + \sum_{i=1}^{p} \delta_i \Delta X_{t-i} + \varepsilon_t \quad (1)$$

Where,

Δ = First difference of time series data,
α = Constant
βt = Deterministic trend,
γ = Coefficient of the lagged value,
δ_i = Coefficient of the lagged differenced terms,
ρ = Number of lagged difference terms, and
$\mathcal{E}_t$ = error term.

H_0: $\gamma = 0$
H_1: $\gamma < 0$

A rejection of the H_0 will indicate that the time series is stationary.

3.2.2 Johansen's Vector Error Correction Model (VECM)

VECM has been applied to find out long run equilibrium relationship and short-run dynamics among time series variables. Long-run equilibrium relationships are shown by the cointegrating vectors and short-run dynamics are expressed by lagged differenced terms. If a Vector Autoregressive (VAR) model is non-stationary then time series are cointegrated. VECM is a special form of Vector Autoregressive (VAR) model for time series variables that are cointegrated.
The equation for VECM is:

$$\Delta \mathbf{X}_t = \Pi \mathbf{X}_{t-1} + \sum_{i=1}^{k-1} \Gamma_i \Delta \mathbf{X}_{t-i} + \varepsilon_t \quad (2)$$

Where,
X_t = Vector of endogenous variables
Δ = First difference
Π = Long-run impact matrix
Γ_i = Short-run dynamic coefficient matrices
$\mathcal{E}_t$ = White noise error terms
The VECM decomposes the matrix Π into α and β'

$$\Pi = \alpha \beta' \quad (3)$$

Where,
β is the cointegrating vectors. α represents the adjustment coefficients.
The maximum eigenvalue test has been applied to know the exact number of cointegrating relationships among the time series endogenous variables.

4. Empirical Results and Analysis

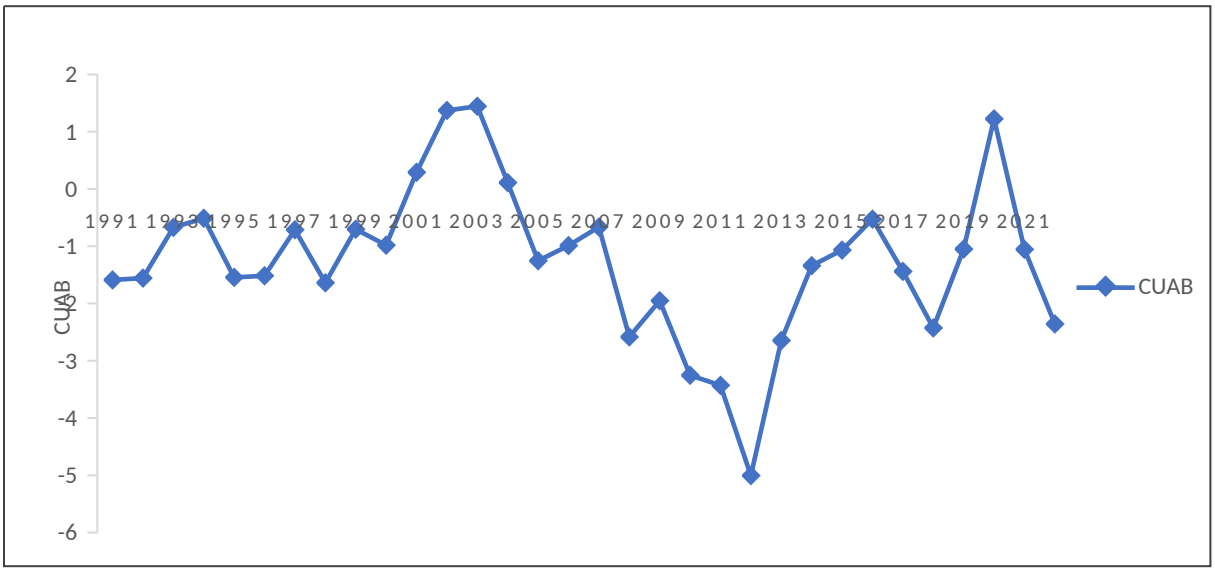

Fig. 1 Trend of Current Account Balance

In Fig.1, Current Account Balance (CUAB) falls sharply after the Global financial crisis (2007-08). Again, after implementation of demonetisation in November 2016, CUAB falls sharply in the year 2017 and 2018. But it rises sharply in the year 2020 after Covid-19. Despite these shocks, Current Account Balance (CUAB) is a stationary time-series.

4.1 Test of Stationarity

Table 2. Unit Root Test Results

Variable	Order of Integration	t-statistic	p-value
CUAB	I (0)	-3.804	0.034
Exchange Rate	I (1)	-4.891	0.002
External debt	I (1)	-5.164	0.001
FDI	I (1)	-6.464	< 0.001
GFD	I (0)	-3.091	0.037
Inflation	I (0)	-4.726	0.004
Crude Oil Price of OPEC Reference Basket (ORB)	I (1)	-4.267	0.011
Growth rate	I (0)	-5.490	< 0.001

In Table 2, ADF test suggests that CUAB, Growth rate, GFD and inflation are stationary time series. These are I (0) series. It indicates that these variables don't have unit root. External debt, FDI, Exchange rate and ORB are stationary at first difference. These series are I (1) series. It indicates that these variables have unit root.

4.2 Lag Length Selection criteria of VAR

Table 3. Order of Lag

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-538.4857	NA	917640.6	36.43238	36.80603	36.55191
1	-333.9089	286.4075*	90.91213	27.06060	30.42347*	28.13641
2	-240.2389	81.18074	36.39727*	25.08259*	31.43469	27.11468*

In Table 3, FPE, AIC and HQ criterion shows that this VAR model has 2 lags.

4.2.1 Non-stationarity of VAR

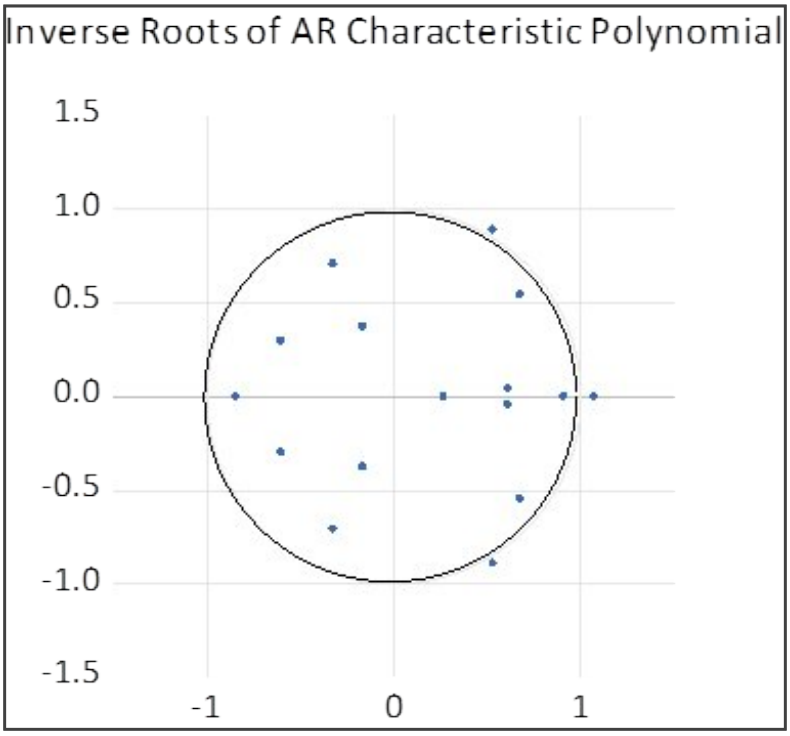

Fig 2. Inverse Roots of AR Characteristic Polynomial

In Figure 2, Three inverse roots of Autoregressive (AR) characteristic polynomial are outside the Unit root circle. It indicates that this VAR is non-stationary. Therefore, there will be co-integration between one or more time series variables.

4.3 Co-integration Test

Table 4. Max- Eigenvalue Test

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.879688	63.53008	52.36261	0.0025
At most 1 *	0.853277	57.57621	46.23142	0.0021
At most 2 *	0.780818	45.53564	40.07757	0.0110
At most 3	0.624466	29.38220	33.87687	0.1567
At most 4	0.442191	17.51214	27.58434	0.5362
At most 5	0.342453	12.57716	21.13162	0.4918
At most 6	0.269558	9.423145	14.26460	0.2526
At most 7	0.042053	1.288890	3.841465	0.2563

In Table 4, Results indicate that there are 3 cointegrating vectors in this Vector error correction model.

4.4 Estimation and Analysis of VECM

Table 5. VECM Estimates

Cointegrating Equation	Cointegrating Equation 1	Cointegrating Equation 2	Cointegrating Equation 3			
CUAB(-1)	1.000000	0.000000	0.000000			
EXCHANGE RATE(-1)	0.000000	1.000000	0.000000			
EXTERNAL DEBT(-1)	0.000000	0.000000	1.000000			
FDI(-1)	0.643732	-12.19346	0.329782			
	(0.29422)	(7.43510)	(0.90631)			
GFD(-1)	-0.536447	17.09750	-1.435545			
	(0.17959)	(4.53832)	(0.55320)			
GROWTH RATE(-1)	-0.568685	24.14942	-2.342147			
	(0.10457)	(2.64257)	(0.32212)			
INFLATION(-1)	0.513771	-2.192838	-0.005327			
	(0.05641)	(1.42553)	(0.17377)			
ORB(-1)	-0.013510	0.366845	0.051620			
	(0.00743)	(0.18767)	(0.02288)			
C	4.004042	-271.4292	12.16982			
Error Correction	D(CUAB)	D(EXCHANGE_RATE)	D(EXTERNAL_DEBT)	D(FDI)	D(GFD)	D(GROWTH_RATE)

Coint. Eq1	-1.650755	-0.906210	-0.293430	-0.382386	-0.655738	1.545908
	(0.37161)	(0.72758)	(0.20574)	(0.24944)	(0.72497)	(1.62818)
Coint. Eq2	-0.056316	0.053415	-0.020901	-0.008706	-0.043526	0.056922
	(0.02096)	(0.04105)	(0.01161)	(0.01407)	(0.04090)	(0.09185)
Coint. Eq 3	0.043139	0.850126	-0.133357	0.049156	-0.117905	0.354559
	(0.11291)	(0.22107)	(0.06251)	(0.07579)	(0.22028)	(0.49471)
D(CUAB(-1))	0.359620	-0.920182	0.223031	0.136006	0.120105	-0.818125
	(0.21666)	(0.42420)	(0.11995)	(0.14543)	(0.42268)	(0.94927)
D(EXCHANGE RATE(-1))	-0.092902	-0.529464	-0.025447	-0.183827	-0.280500	0.467988
	(0.12487)	(0.24449)	(0.06913)	(0.08382)	(0.24361)	(0.54712)
D(EXTERNAL DEBT(-1))	-1.333325	2.178291	0.091316	-0.421635	0.022375	1.397815
	(0.49857)	(0.97615)	(0.27603)	(0.33465)	(0.97265)	(2.18443)
D(FDI(-1))	1.441075	0.105891	-0.271593	0.209372	0.426112	-0.985055
	(0.37508)	(0.73437)	(0.20766)	(0.25176)	(0.73174)	(1.64338)
D(GFD(-1))	-0.095142	0.663955	0.072954	-0.102756	-0.190322	0.252588
	(0.24193)	(0.47369)	(0.13395)	(0.16239)	(0.47199)	(1.06002)
D(GROWTH RATE(-1))	0.345402	0.218132	0.038855	0.061339	0.181323	-0.280154
	(0.12376)	(0.24232)	(0.06852)	(0.08307)	(0.24145)	(0.54226)
D(INFLATION(-1))	0.463057	-0.258101	0.064695	0.078092	-0.136828	0.267137
	(0.14382)	(0.28159)	(0.07962)	(0.09654)	(0.28058)	(0.63014)
D(ORB(-1))	-0.011860	-0.024051	0.008667	-0.003892	0.009688	-0.051319
	(0.01360)	(0.02662)	(0.00753)	(0.00913)	(0.02652)	(0.05957)
C	-0.524811	3.559686	-0.351650	0.167548	0.428135	0.147294
	(0.25917)	(0.50743)	(0.14349)	(0.17396)	(0.50561)	(1.13553)
R^2	0.778778	0.819707	0.614376	0.526060	0.359450	0.604457
Adj. R^2	0.643587	0.709528	0.378717	0.236430	-0.031997	0.362737
Sum sq. resids	9.424165	36.12700	2.888699	4.246076	35.86846	180.9150
S.E. equation	0.723578	1.416706	0.400604	0.485688	1.411628	3.170305
F-static	5.760565	7.439765	2.607058	1.816317	0.918259	2.500645

Standard errors in ( )

VECM Equation of Target Variable CUAB is -

D(CUAB) = - 1.651*[CUAB(-1) + 0.644*FDI(-1) - 0.536*GFD(-1) - 0.569*GROWTH_RATE(-1) + 0.514*INFLATION(-1) - 0.014*ORB(-1) + 4.004] - 0.0563*[EXCHANGE_RATE(-1) - 12.193*FDI(-1) + 17.0975*GFD(-1) + 24.149*GROWTH_RATE(-1) - 2.193*INFLATION(-1) + 0.367 *ORB(-1) - 271.429] + 0.043*[EXTERNAL_DEBT(-1) + 0.330 *FDI(-1) - 1.436*GFD(-1) - 2.342*GROWTH_RATE(-1) - 0.005*INFLATION(-1) + 0.051*ORB(-1) + 12.170] + 0.360*D(CUAB(-1)) - 0.093*D(EXCHANGE_RATE(-1)) - 1.333*D(EXTERNAL_DEBT(-1)) + 1.441*D(FDI(-1)) - 0.095*D(GFD(-1)) + 0.345*D(GROWTH_RATE(-1)) +

0.463*D(INFLATION(-1)) - 0.012*D(ORB(-1)) - 0.525 (4)

D(CUAB) = -1.651(Coint. Eq1) – 0.0563(Coint. Eq 2) + 0.043(Coint. Eq 3) + 0.360*D(CUAB(-1)) - 0.093* D(EXCHANGE_RATE(-1)) - 1.333*D(EXTERNAL_DEBT(-1)) + 1.441*D(FDI(-1)) - 0.095 *D(GFD(-1)) + 0.345* D(GROWTH_RATE(-1)) + 0.463*D(INFLATION(-1)) - 0.012*D(ORB(-1)) - 0.525 (5)

Table 6. Test of Significance for Long-run Parameters (β coefficients)

Variable	Coefficients of Cointegrating Equation1	p-value	Coefficients of Cointegrating Equation2	p-value	Coefficients of Cointegrating equation 3	p-value
FDI (-1)	-0.64 *	0.038	12.19	0.116	-0.33	0.72
GFD (-1)	0.54 **	0.007	- 17.1 **	0.001	1.43 *	0.02
GROWTH RATE (-1)	0.57 **	< 0.001	-24.15 **	< 0.001	2.34 **	< 0.001
INFLATION (-1)	-0.51 **	< 0.001	2.19	0.137	0.005	0.98
ORB (-1)	0.01	0.082	-0.37	0.063	-0.05 *	0.04

Table 7. Test of Significance for Error Correction Terms (α coefficients)

Cointegrating Equation	Coefficient (α)	t-statistic	p-value
Cointegrating Equation 1	–1.651 **	–4.442	< 0.001
Cointegrating Equation 2	–0.056 *	–2.686	0.014
Cointegrating Equation 3	0.043	0.382	0.706

Table 8. Test of significance for Short-run dynamics (Lagged first difference)

Variable	Coefficient	t-statistic	p-value
D(CUAB (-1))	0.360	1.660	0.112
D(EXCHANGE_RATE (-1))	–0.093	–0.744	0.464
D(EXTERNAL_DEBT (-1))	–1.333 *	–2.674	0.014
D(FDI (-1))	1.441 **	3.842	0.001
D(GFD (-1))	–0.095	–0.393	0.698
D(GROWTH_RATE (-1))	0.345 **	2.791	0.010
D(INFLATION (-1))	0.463 **	3.220	0.004
D(ORB (-1))	–0.012	–0.872	0.392
Constant	–0.525 *	–2.025	0.05

Note: ** and * indicate significant at 1% and 5% level of significance respectively.

Interpretation of VECM results

Impact in the long-run: FDI negatively affects CUAB in the long-run. This finding is consistent with the outcome of (Ariyani et al., 2018) and inconsistent with the finding of (Andini et al., 2024). Gross fiscal deficit positively affects CUAB in the long run. This result is consistent with the outcome of (Mehta & Mallikarjun, 2023) but contradicts the outcome of (Altayligil & Çetrez, 2020). GDP growth rate has positive effect on CUAB in the long run. This result corroborates the findings of (Sumiyati, 2022; Hassan, 2006; Das, 2016). Inflation negatively affect CUAB in the long- run. It supports the findings of (Andini et al. 2024) and (Parray et al., 2022) that a rise in domestic price reduces current account balance, but contradicts the finding of (Sumiyati, 2022).
Adjustment coefficients of cointegration equation 1 and cointegration equation 2 are statistically significant. This indicates that if CUAB deviates from its long-run equilibrium, then it is corrected in subsequent years. It shows that CUAB is mean reverting.

Impact in the short-run: Depreciation of Indian rupee worsens CUAB in the short run. This finding supports the outcomes of (Mehta & Mallikarjun, 2023; Sahoo et al., 2020) and contradicts the findings of (Andini et al., 2024). However, exchange rate coefficient is statistically insignificant. The coefficient of FDI is positive and significant. It reveals that FDI affects positively to CUAB in the short run. This outcome is supported by the findings of (Andini et al., 2024). Coefficient of external debt is negative and statistically significant. It reveals that a rise in external debt reduces current account balance.
Coefficient of Gross fiscal deficit is negative and insignificant. Coefficient of growth rate is positive and statistically significant. It indicates that growth rate positively affects CUAB in the short-run. A rise in GDP growth rate improves CUAB in the short-run. This result supports the finding of (Sumiyati, 2022) and contradicts the outcome of (Ariyani et al., 2018). Coefficient of inflation is positive and statistically significant. It indicates that inflation has positive effect on CUAB in the short-run. It is consistent with the outcome of (Mehta & Mallikarjun, 2023; Parray et al., 2022). Coefficient of ORB is negative and insignificant. It shows that an increase in crude oil price decreases CUAB in the short-run. The value of $R^2 = 0.778$ refers that 77.8% variation in CUAB is explained by this VECM model. The value of the F-statistic = 5.76. This high value of F-statistic shows that overall VECM is highly significant.

4.5 Stochastic Forecasting of Current Account Balance (CUAB)
4.5.1 Stochastic Forecasting with static parameters

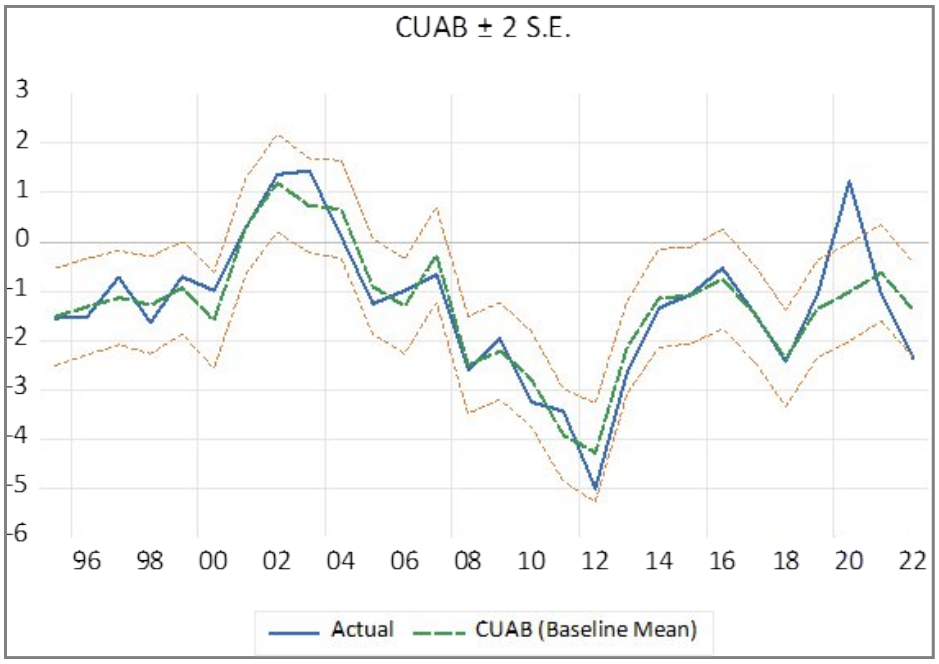

Fig. 3 Out of Sample Static Forecasting of CUAB

Fig (3) presents out of sample forecasting of CUAB when the estimated parameters are static. This is stochastic forecasting with static parameters. It suggests that the chosen regressors and coefficients remain relevant even outside the sample used for estimation. It is evident that forecasted value (represented by baseline mean) is very close to the actual value. The closeness of the baseline mean to the actual CUAB indicates high forecast accuracy under static parameters. Actual value of CUAB remains within ± 2 S.E. confidence bounds except the year 2020. The CUAB in the year 2020 falls outside the ±2 S.E. confidence bounds. It reflects an unanticipated shock due to the global COVID-19 pandemic, that static parameters could not capture.

4.5.2 Stochastic Forecasting with dynamic parameters

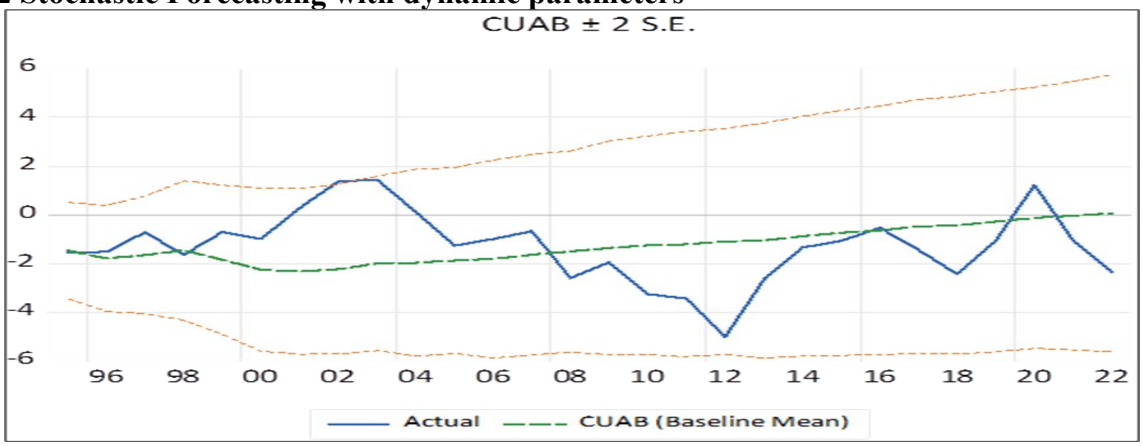

Fig. 4 Out of Sample Dynamic Forecasting of CUAB

Fig 4 presents out of sample forecasting of CUAB when estimated parameters are dynamic. This is stochastic forecasting with dynamic parameters. Baseline mean is the forecasted value of actual current account balance. In stochastic forecasting with dynamic parameters, ± 2 S.E. confidence bounds capture both the uncertainty in forecasted mean and the uncertainty of parameters. Since, actual CUAB line remains within these confidence bounds, it indicates that this VECM model has reliable forecasting power at the 95% confidence interval level. The model's dynamic parameters allow it to capture unanticipated shocks in the Indian economy.

4.6 Diagnostic Testing

4.6.1 Serial correlation LM tests

Table 9. VEC residual serial correlation LM Test

H_0: There is no serial correlation at lag h						
Lag	LRE* stat	df	Prob.	Rao F-stat	df	Prob.
1	52.69019	64	0.8427	0.600764	(64, 23.8)	0.9448
2	56.81473	64	0.7261	0.676797	(64, 23.8)	0.8899
H_0: There is no serial correlation at lags 1 to h						
Lag	LRE* stat	df	Prob.	Rao F-stat	df	Prob.
1	52.69019	64	0.8427	0.600764	(64, 23.8)	0.9448
2	NA	128	NA	NA	(128, NA)	NA
*Edgeworth expansion corrected likelihood ratio statistic.						

In the table 9, P-value for likelihood ratio statistic at lag 1 is 0.9448. Therefore, we can't reject the Null hypothesis. It shows that there is no serial correlation.

4.6.2 Stability Diagnostic

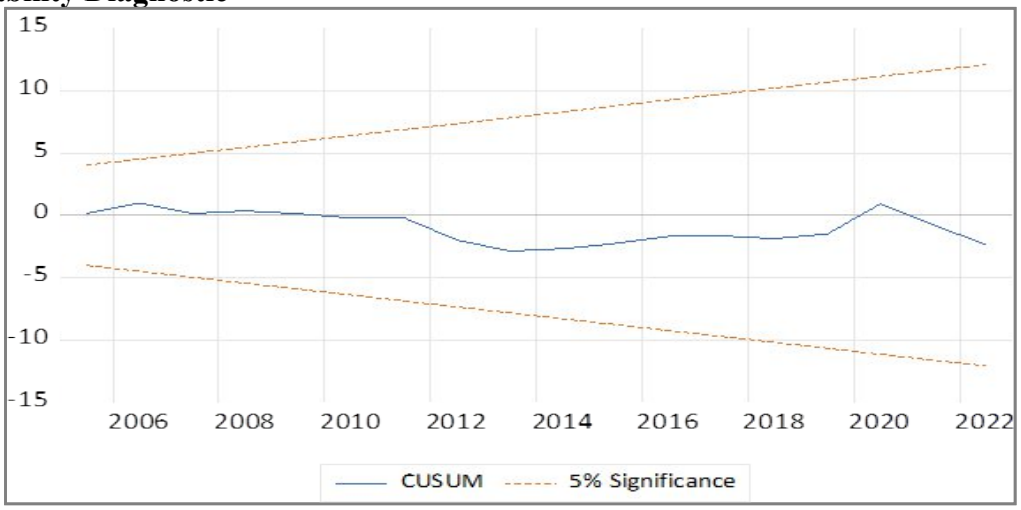

Fig. 5 CUSUM Test

In Fig 5, the plot of the cumulative sum (CUSUM) of recursive residuals lies between the critical bounds at the 5% level of significance, it show that VECM is dynamically stable.

5. Conclusion

India initiated liberalising its economy in the year 1991 to correct severe deficit in Balance of payments and mainly to correct deficit in current account balance (CUAB). An empirical study has been done to examine the determinants of CUAB in post liberalised Indian economy. The macroeconomic variables taken for the analysis are current account balance, foreign direct investment, inflation, gross fiscal deficit, growth rate, crude oil price, exchange rate and external debt. The time series data for these macroeconomic variables have been taken for the period 1991-2022. The Vector Error Correction Model has been applied for the empirical analysis. It was found that inflation and FDI have negative effect on CUAB in the long- run whereas gross fiscal deficit and growth rate have positive effect on CUAB in the long-run. The significant value of adjustment coefficients indicates that CUAB is mean reverting. It was further observed that exchange rate, external debt, gross fiscal deficit and crude oil price have negative impact on CUAB in the short-run whereas FDI, growth rate and inflation have positive effect on CUAB in the short-run. However, the influence of exchange rate, gross fiscal deficit and crude oil price is not statistically significant in the short-run. Stochastic forecasting with static parameters captures the shocks of Global financial crisis and demonetisation but it doesn't capture the shock of Covid-19. Dynamic forecasting captures all the shocks in the economy.

This empirical analysis will be very helpful for the researchers and policy makers to frame the long-term and short-term policy to manage India's current account balance effectively.

References

Altayligil, Y. B., & Çetrez, M. (2020). Macroeconomic, institutional and financial determinants of current account balances: a panel data assessment. *Journal of Economic Structures*, *9*(49), 1-23. https://doi.org/10.1186/s40008-020-00225-1

Andini, S. T., Zahara, V. M., & Suci, S. C. (2024). The Impact of Monetary Policy and Macroeconomic Indicators on the Current Account in Developing ASEAN. *8th Sriwijaya Economics, Accounting, and Business Conference*, *KnE Social Sciences*, 207-229. https://doi.org/10.18502/kss.v9i14.16101

Ariyani, N., Prianto, F. W., & Yuliati, L. (2018). Current account determinants in ASEAN six countries. *Journal of Economics, Business, and Accountancy Ventura*, *21*(2), 169–176. https://doi.org/10.14414/jebav.v21i2.1419

Behera, H., & Yadav, I. S. (2019). Explaining India's current account deficit: a time series perspective. *Journal of Asian Business and Economic Studies*, *26*(1), 117-138. https://doi.org/10.1108/jabes-11-2018-0089

ÇETREZ, M., & Altaylıgil, Y. B. (2022). The Role of Macroeconomic Stability in Current Account Balances. *İstanbul İktisat Dergisi- Istanbul Journal of Economics*, 1-29. https://doi.org/10.26650/istjecon2022-1172316

Chinn, M., Eichengreen, B., & Ito, H. (2013). A forensic analysis of global imbalances. *Oxford Economic Papers*, *66*(2), 1-53. https://doi.org/10.1093/oep/gpt027

Chinn, M., & Prasad, E. (2002). Medium-term determinants of current accounts in industrial and developing countries: an empirical exploration. *Journal of International Economics*, *59*(1), 1-42. https://doi.org/10.1016/s0022-1996(02)00089-2

Das, D. K. (2016). Determinants of current account imbalance in the global economy: a dynamic panel analysis. *Journal of Economic Structures*, *5*(8), 1-24. https://doi.org/10.1186/s40008-016-0039-6

Duarte, P., & Schnabl, G. (2015). Macroeconomic Policy Making, Exchange Rate Adjustment and Current Account Imbalances in Emerging Markets. *Review of Development Economics*, *19*(3), 1-30. https://doi.org/10.1111/rode.12168

Furceri, D., & Zdzienicka, A. (2020). Twin Deficits in Developing Economies. *Open Economies Review*, *31*(1), 1-41. https://doi.org/10.1007/s11079-019-09575-1

Guellil, M. S., Hassoun, S., Chica-Olmo, J., & Saraç, M. (2022). What are the main factors driving behind the MENA countries current account deficit? A panel logit approach analysis. *Revista de Métodos Cuantitativos Para La Economía y La Empresa (33),134-153*. https://doi.org/10.46661/revmetodoscuanteconempresa.4473

Hassan, A. F. M. K. (2006). Determinants of Current Account Deficit in Developing Countries: The Case of Bangladesh. *Studies in Business and Economics*, *12*(1), 5-23. https://doi.org/10.29117/sbe.2006.0012

Jijin, P., Mishra, A. K., & Nithin, M. (2021). Macroeconomic determinants of remittances to India. *Economic Change and Restructuring*, *55*, 1229-1248. https://doi.org/10.1007/s10644-021-09347-3

Kwalingana, S., & Nkuna, O. (2009). The Determinants of Current Account Imbalances in Malawi. *RePEc: Research Papers in Economics*, 1-21. https://EconPapers.repec.org/RePEc:pra:mprapa:14694

Lin, S. X., & Kueh, J. (2019). Determinants of Current Account Balance in Six ASEAN Countries: A Panel Analysis Approach. *International Journal of Economics and Finance*, *11*(7), 129-143. https://doi.org/10.5539/ijef.v11n7p129

Manu, C. A. (2022). The Dynamism of Trade Balance in Ghana. *Journal of Economics, Finance and Management Studies,* 5(4), 1110-1121. https://doi.org/10.47191/jefms/v5-i4-20

Mehta, D., & Mallikarjun, M. (2023). Impact of fiscal deficit and trade openness on current account deficit in India: new evidence on twin deficits hypothesis. *EconomiA*, *24*(2). https://doi.org/10.1108/econ-07-2022-0091

Muharremi, T. I. (2015). Factors Affecting Current Account in the Balance of Payments of Selected Western Balkan Countries. *Journal of Accounting and Management*, *5*(3), 61-68. https://EconPapers.repec.org/RePEc:dug:jaccma:y:2015:i:3:p:61-68

Parray, W. A., Wani, S. H., & Yasmin, E. (2022). Determinants of the Trade Balance in India. Evidence from a Post-Liberalisation Period. *Studia Universitatis „Vasile Goldis" Arad – Economics Series*, *32*(4), 16-37. https://doi.org/10.2478/sues-2022-0017

Sahoo, M., Mallick, H., Mahalik, M. K., & Bekiros, S. (2020). Factors influencing India's current account balance: Implication for achieving its external sector sustainability. *Journal of Public Affairs*, *22*(1), 1-14. https://doi.org/10.1002/pa.2311

Soo, X.-L., Kueh, J., Ab-Rahim, R., &Yau, J. T.-H. (2023). Current Account Imbalances in Asia's Countries: The Contributing Elements. *International Journal of Academic Research in Business and Social Sciences*, *13*(6), 2245-2258. https://doi.org/10.6007/ijarbss/v13-i6/17378

Sumiyati, E. E. (2022). Macroeconomic Factors and Current Account Deficit in Indonesia. *Economics and Business Quarterly Reviews*, *5*(4), 8-18. https://doi.org/10.31014/aior.1992.05.04.455