



CAD, EXCHANGE RATES ADJUSTMENT AND GROWTH

Evidence from India

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OBJECTIVE

HOW DO CURRENT ACCOUNT DEFICITS
INTERACT WITH EXCHANGE RATE
ADJUSTMENTS AND FOREIGN INVESTMENT
FLOWS IN INDIA



WHY THIS RESEARCH QUESTION IS RELEVANT

- India has experienced persistent but fluctuating CADs, making external sustainability a key macroeconomic concern.
- Exchange rate depreciation has been significant, yet export responses remain muted, raising doubts about standard adjustment mechanisms.
- Volatile capital flows expose the economy to sudden reversals, with implications for growth and policy autonomy.
- Policymakers face a trade-off between stabilizing inflation, supporting growth, and managing external balance.

CURRENT ACCOUNT DEFICIT

Meaning

- Occurs when a country's imports exceed its exports
- Indicates the economy is spending more than it earns internationally

Simple Analogy

- Like a household expenses > income
- The shortfall is met by borrowing or using savings

Components of Current Account

- Trade Balance (Goods): Exports - Imports
- Services: IT, tourism, banking, software
- Net Primary Income: Investment income received - paid
- Net Transfers: Remittances, foreign aid

Current Account = Exports - Imports + Net Income from Abroad + Net Transfers



EXCHANGE RATE



- The exchange rate is the price of a country's currency in terms of another currency
- It is determined by the demand and supply of foreign currency in the foreign exchange market
- Key drivers include Current Account Deficit (CAD), foreign capital flows (FPI/FDI), inflation, and interest rates
- A higher CAD increases demand for foreign currency, leading to depreciation of the domestic currency
- Foreign capital inflows increase currency supply and support appreciation
- The exchange rate acts as an automatic adjustment mechanism to external imbalances
- India follows a managed floating exchange rate system, with RBI intervention to control excessive volatility

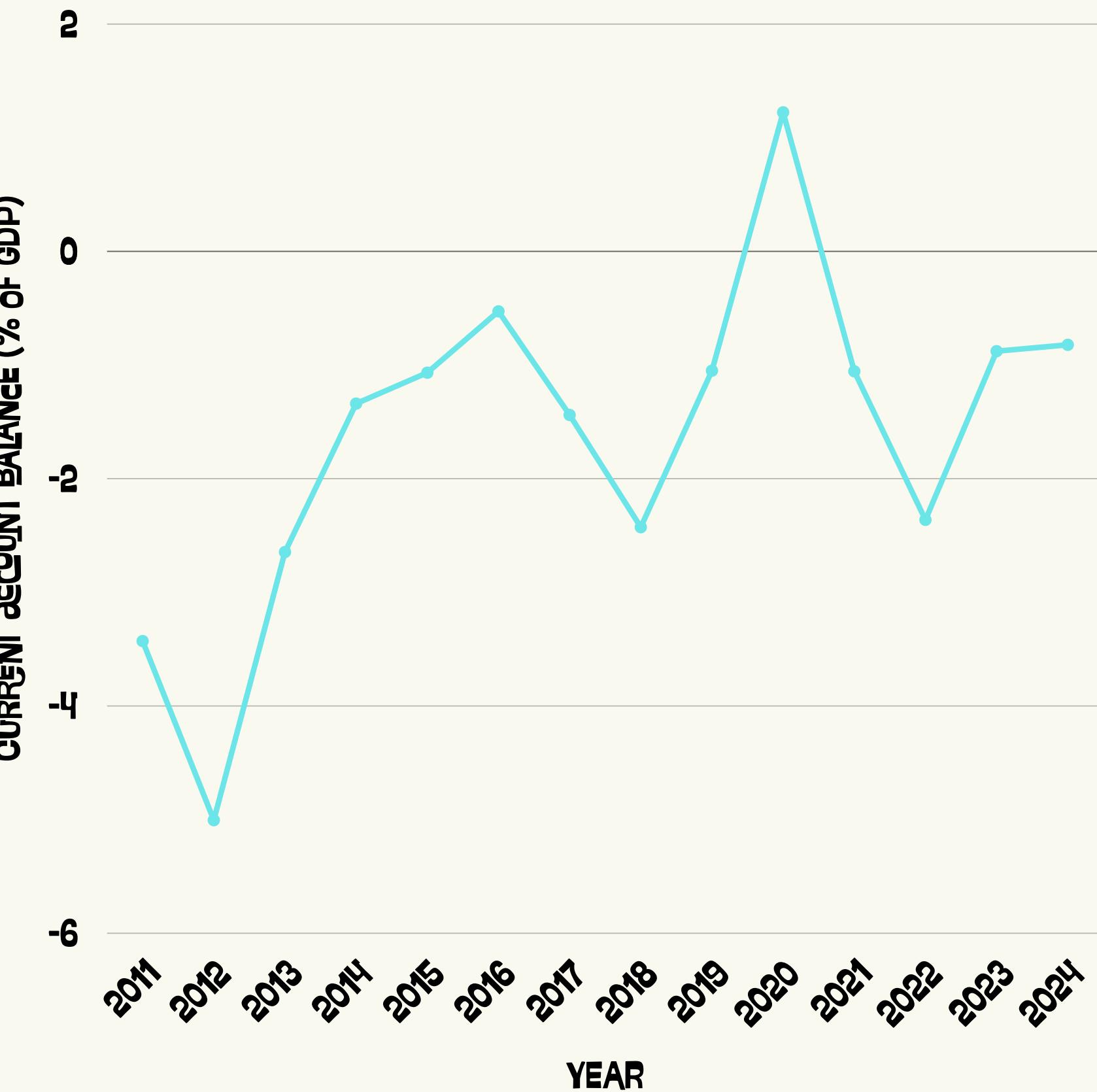
FOREIGN PORTFOLIO INVESTMENT

- Foreign Portfolio Investment (FPI) refers to investments by foreign entities in a country's financial assets, such as equities and bonds
- FPIs are short-term and highly sensitive to interest rates, exchange rate expectations, and global risk sentiment
- Capital inflows through FPI increase foreign currency supply and support domestic currency appreciation
- Sudden FPI outflows reduce currency supply, causing exchange rate volatility and depreciation pressure
- FPIs play a stabilising role during strong inflow periods but amplify shocks during global uncertainty

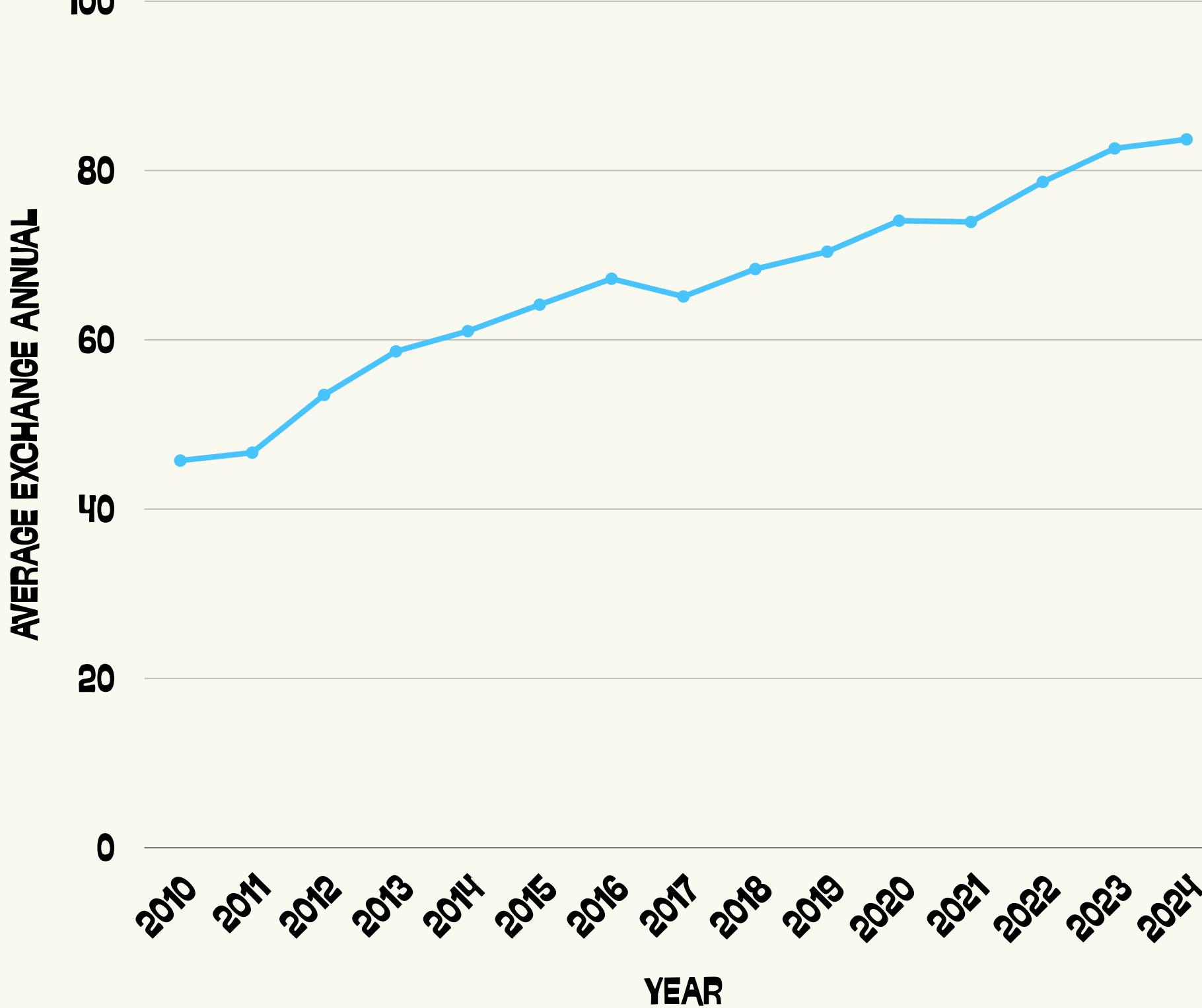


CURRENT ACCOUNT BALANCE (% OF GDP)

Country Name	India
Country Code	IND
Indicator Name	Current account balance (% of GDP)
YEAR	Current account balance (% of GDP)
2011	-3.429284686
2012	-5.004889718
2013	-2.645667117
2014	-1.339508965
2015	-1.067549072
2016	-0.527880606
2017	-1.439488203
2018	-2.426975458
2019	-1.049612039
2020	1.22362111
2021	-1.055241668
2022	-2.362474815
2023	-0.878262847
2024	-0.822243209



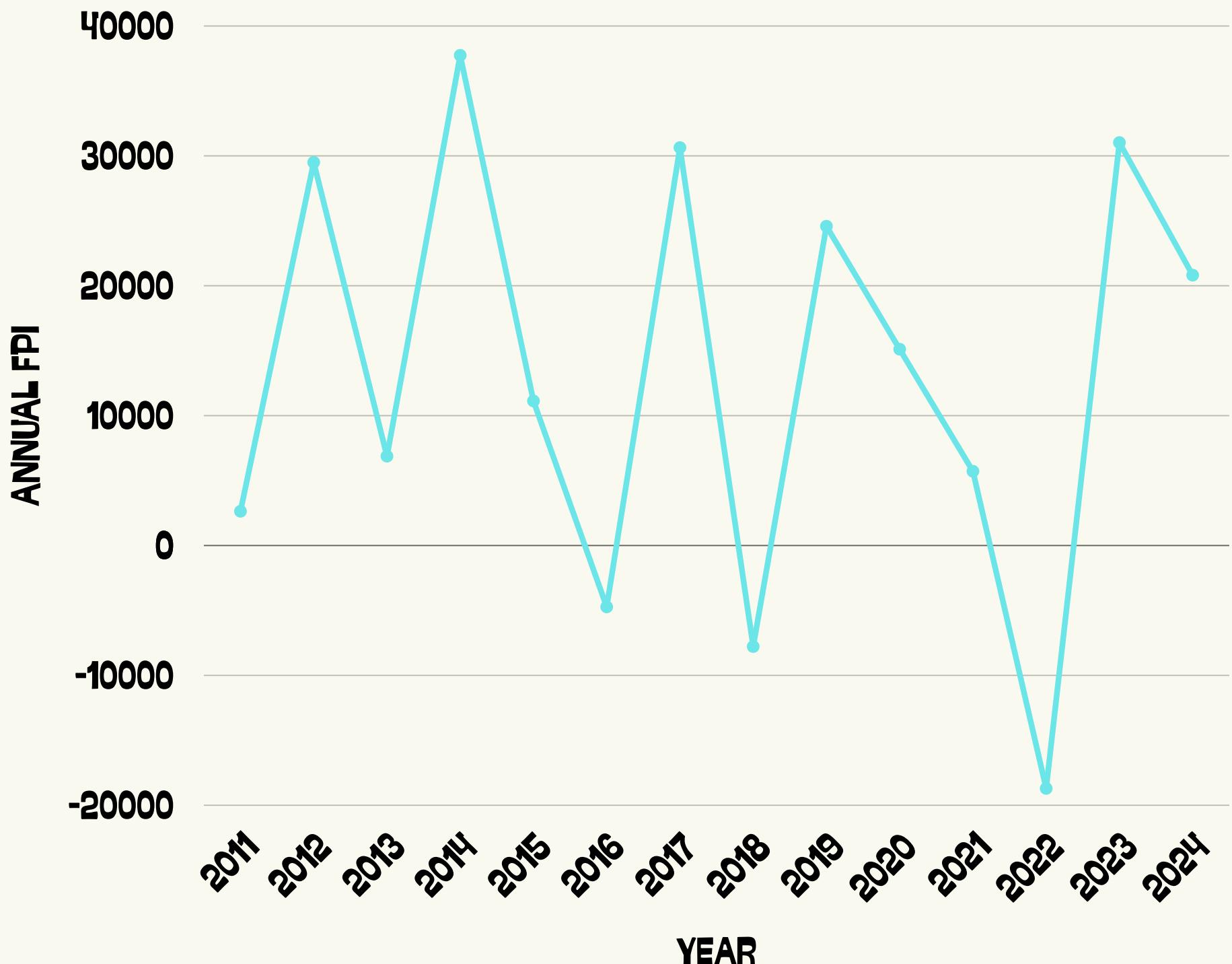
ANNUAL EXCHANGE RATE (INR/USD)



YEAR	AVERAGE EXCHANGE ANNUAL	AVERAGE EXCHANGE ANNUAL RATE (%)
2010	45.73727642	
2011	46.67154	2.0426743
2012	53.49445413	14.619004
2013	58.63469796	9.6089285
2014	61.02754619	4.0809424
2015	64.15248257	5.1205342
2016	67.2131722	4.7709605
2017	65.11625909	-3.119795
2018	68.36288458	4.9858907
2019	70.40858223	2.9924098
2020	74.07008519	5.2003646
2021	73.92653208	-0.193807
2022	78.65309012	6.3935882
2023	82.60836292	5.028757
2024	83.67863542	1.2955982

FOREIGN INVESTMENT INFLOWS

YEAR	ANNUAL FPI
2011	2636.260001
2012	29502.74
2013	6878.430059
2014	37740.3225
2015	11130.71589
2016	-4725.209439
2017	30637.78496
2018	-7777.939592
2019	24584.11988
2020	15111.70675
2021	5718.199365
2022	-18702.83637
2023	31025.32477
2024	20814.571



STATISTICAL TESTS: CAD × EXCHANGE RATE × CAPITAL OUTFLOW (INDIA)

TEST 1: CORRELATION ANALYSIS

Purpose

- To examine pairwise relationships between:
 - CAD (% of GDP)
 - Annual exchange rate change (Δ EXR)
 - Annual net FPI flows

	CAD (% of GDP)	ANNUAL EXCHANGE RATE
CAD (% of GDP)	1	
ANNUAL EXCHANGE RATE	-0.508409781	1
	ANNUAL EXCHANGE RATE	ANNUAL NET FPI
ANNUAL EXCHANGE RATE	1	
ANNUAL NET FPI	-0.061654562	1
	ANNUAL NET FPI	CAD (% of GDP)
ANNUAL NET FPI	1	
CAD (% of GDP)	0.084494092	1

- Widening current account deficits are associated with rupee depreciation
- Capital flows alone do not explain exchange rate movements
- CAD does not directly cause portfolio outflows
- External imbalance becomes risky only under adverse capital flow conditions

TEST 2: t-TEST (CAD & CAPITAL FLOWS)

Research Question

- Does the rupee depreciate more when CAD coincides with capital outflows?

NULL HYPOTHESIS:

There is no significant difference in average rupee depreciation between CAD periods with capital inflows and those with capital outflows.

ALTERNATE HYPOTHESIS

Average rupee depreciation is significantly higher during CAD periods accompanied by capital outflows compared to CAD periods with capital inflows.

Test Used

- Independent sample t-test (unequal variances, one-tailed)

	ΔEXR_Inflow	$\Delta EXR_Outflow$
Mean	4.464405306	5.383479809
Variance	27.21607691	0.77678798
Observations	9	3
Hypothesized Mean Difference	0	
df	9	
t Stat	-0.507246882	
P(T<=t) one-tail	0.312088438	
t Critical one-tail	1.833112933	
P(T<=t) two-tail	0.624176875	
t Critical two-tail	2.262157163	

- Average depreciation is higher during CAD + outflow periods
- However, the difference is not statistically significant
- Null hypothesis cannot be rejected
- **Key Insight**-Capital outflows alone do not systematically intensify exchange rate depreciation during CAD periods

TEST 3: Regression – Core Interaction Test

Model Specification

$$\Delta EXR(t) = \alpha + \beta_1 \cdot CAD(t) + \beta_2 \cdot FPI(t) + \beta_3 \cdot [CAD(t) \times FPI(t)] + \varepsilon(t)$$

Purpose

- To test whether capital flows condition the impact of CAD on exchange rates

Regression Statistics	
Multiple R	0.642606486
R Square	0.412943095
Adjusted R Square	0.236826024
Standard Error	3.693604982
Observations	14

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	5.6666967	2.76810835	2.047137	0.067833	-0.50103306	11.83443	-0.50103306	11.83442646
ANNUAL NET FPI	-0.000196968	0.000133486	-1.47557	0.170837	-0.000494393	0.0001	-0.000494393	0.000100457
CAD (% of GDP)	0.28033422	1.272209918	0.220352	0.83003	-2.554326127	3.114995	-2.554326127	3.114994567
CAD x FPI	-0.0000959332	0.0000592097	-1.62023	0.136251	-0.000227861	0.000036	-0.000227861	0.0000359943

Net FPI

- Negative coefficient
- Capital outflows associated with rupee depreciation
- Effect is directionally correct but statistically weak

CAD (% of GDP)

- Insignificant on its own
- CAD alone does not destabilize the exchange rate

CAD x FPI

- Negative coefficient
- Indicates exchange rate pressure intensifies when CAD coincides with capital outflows
- Statistically weak but economically meaningful

IMPLICATIONS OF THIS INTERACTION FOR MACROECONOMIC STABILITY AND ECONOMIC GROWTH



Implications for Macroeconomic Stability

- Sharp depreciation of the rupee
- Increase in inflationary pressures
- Monetary tightening by the RBI through higher repo rates
- Slowing of economic growth
- Decline in stock market valuations
- Erosion of investor confidence
- This combination of outcomes reflects macroeconomic instability

India has experienced such episodes during the 2013 “taper tantrum” and the 2020 COVID-19 shock

WHY A WEAKER RUPEE DOES NOT ALWAYS CORRECT THE CAD

- In theory, a weaker rupee makes exports cheaper, increases export volumes, and helps reduce the current account deficit
- In India's case, a large share of imports consists of essential and inelastic items such as crude oil, gold, and capital machinery
- Demand for these imports does not decline significantly even when prices increase due to depreciation
- Export volumes do not respond immediately because of structural and capacity constraints
- As a result, the rupee often depreciates first, while improvement in the CAD is delayed, limited, or may not occur at all



IMPLICATIONS FOR ECONOMIC GROWTH

Short Term

- A weaker rupee increases input and import costs, reducing consumption
- Higher interest rates dampen private investment
- Overall economic growth slows

Medium Term

- If the CAD is financed by stable capital such as FDI, growth can recover
- If the CAD is financed by volatile FPI, the economy faces repeated shocks and unstable growth
- Consequently, economic growth is adversely affected when the CAD is financed through unstable capital flows



CONCLUSION

A moderate CAD can be sustainable for a fast-growing economy like India when financed through stable capital inflows. current account deficit is manageable and sustainable on its own. However, when financed by volatile portfolio flows or accompanied by capital outflows, it intensifies pressure on the exchange rate. It can trigger rupee depreciation, as seen during episodes such as 2013 and the COVID-19 pandemic.





THANKYOU!