Assignment 1: Monetary Economics (HSN-302)

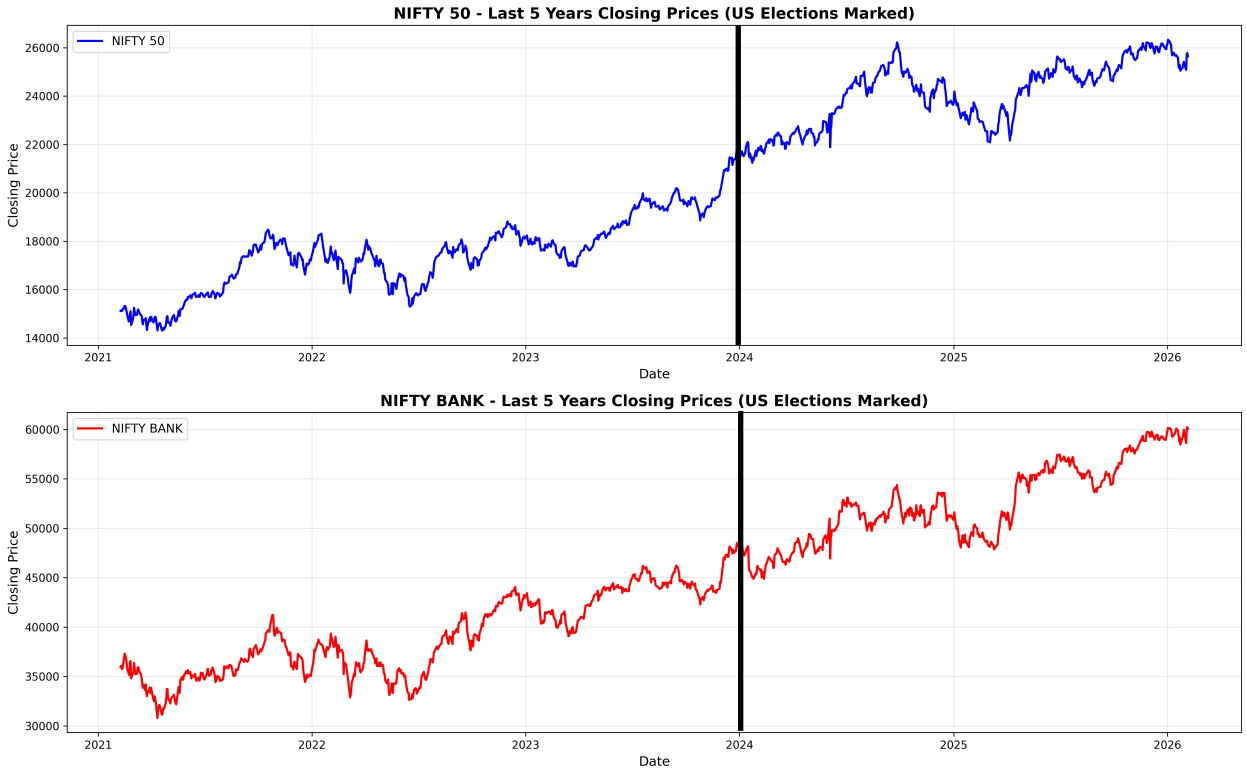
Tanmay Topkhanewale
Enrollment No: 23322033
Batch: HS1
Email: tanmay_t@hs.iitr.ac.in

Submission: 6 Feb 2026

1. Go to NSE historical data page and analyse NIFTY 50 and NIFTY BANK

Financial markets play a crucial role in the monetary transmission mechanism. Equity prices are forward-looking variables that incorporate expectations about future interest rates, inflation, output and liquidity conditions. According to Mishkin, asset prices are one of the primary channels through which monetary policy affects the real economy.

(a) Download and plot last 5-years closing price



Stock prices can be expressed as the discounted present value of expected future cash flows:

$$P_t = \sum_{i=1}^{\infty} \frac{E(D_{t+i})}{(1+r)^i}$$

Thus, any change in interest rates, inflation expectations or risk perception directly affects stock prices.

(i) How did the market behave during US elections?

The US elections influence global financial markets through expectations about:

- Future Federal Reserve policy
- Fiscal stimulus and global growth
- Trade policy and geopolitical risk

Under the **Global Liquidity Hypothesis**, emerging markets depend heavily on US monetary conditions.

When uncertainty rises:

- Risk aversion increases
- Capital flows move toward safe assets (flight to safety)
- Emerging markets face temporary outflows

This explains short-term volatility in Indian markets.

However, rapid recovery reflects the **Efficient Market Hypothesis (EMH)**:

Markets react to news immediately and adjust quickly.

(ii) Which index is more volatile and why?

NIFTY BANK is more volatile due to monetary transmission.

Banks lie at the center of the **credit channel of monetary policy**.

Transmission mechanism:

$$\text{Policy Rate} \rightarrow \text{Bank Funding Cost} \rightarrow \text{Loan Supply} \rightarrow \text{Investment} \rightarrow \text{Output}$$

Bank profits depend heavily on:

- Net Interest Margin (NIM)
- Credit demand
- Default risk

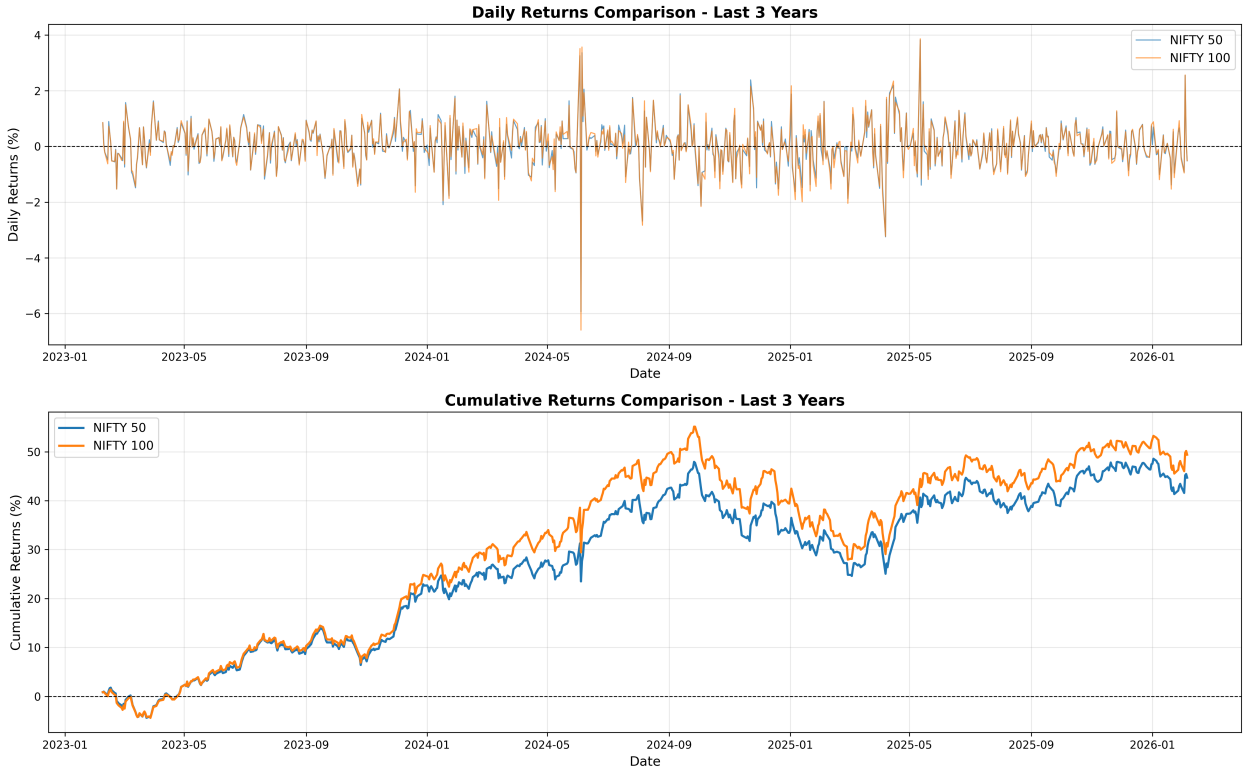
Hence banking stocks amplify macroeconomic fluctuations.

(b) Challenging problem

(i) Python code

```
import pandas as pd
import yfinance as yf
indices = ["^NSEI","^NSEBANK","^CNX100","^CRSLDX"]
data = {}
for idx in indices:
    data[idx] = yf.download(idx, period="5y")['Close']
df = pd.DataFrame(data)
df.to_excel("nse_indices.xlsx")
```

(ii) Compare returns of NIFTY 50, 100 and 500

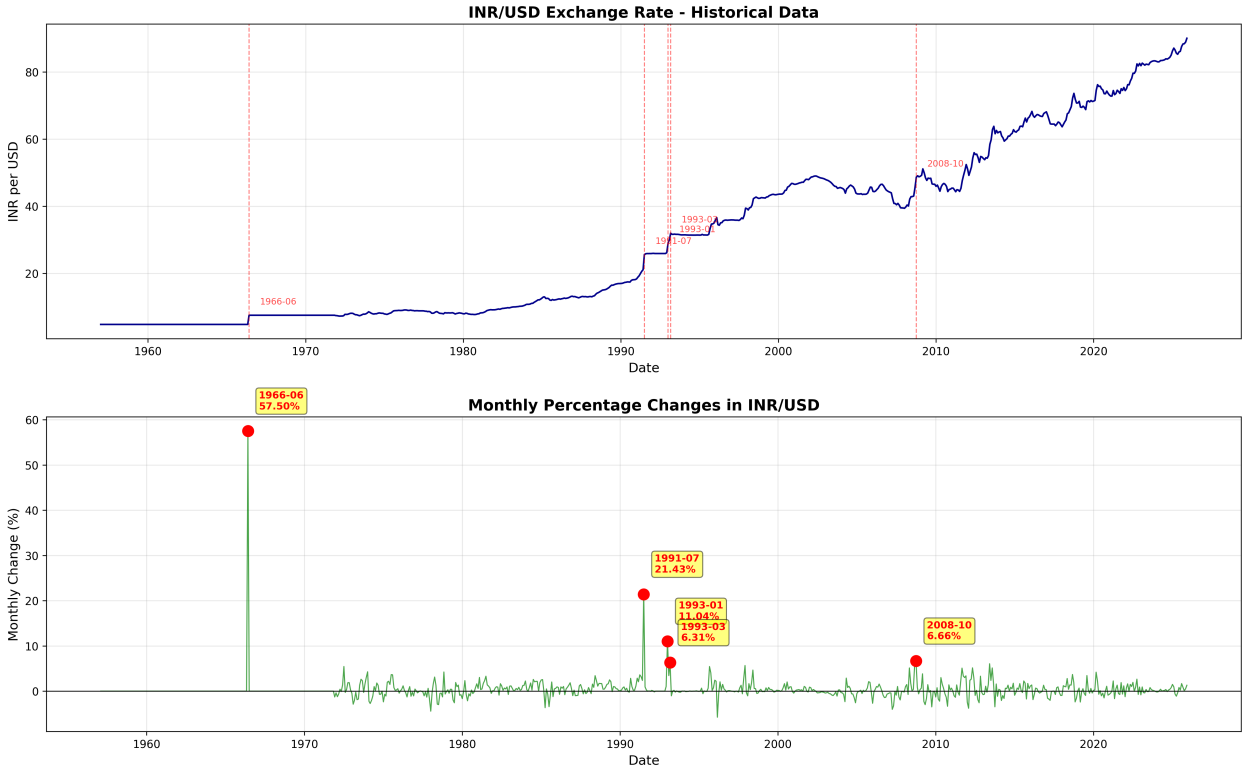


According to **Modern Portfolio Theory**:

$$\sigma_p^2 = w' \Sigma w$$

Broader indices reduce idiosyncratic risk and deliver better risk-adjusted returns.

2. INR/USD exchange rate analysis



Exchange rate determination is explained using multiple monetary models.

Monetary Model of Exchange Rates

$$E = \frac{M - M^*}{Y - Y^*} + \lambda(i - i^*)$$

Where exchange rates depend on:

- Money supply differentials
- Output differentials
- Interest rate differentials

(a) Five biggest monthly jumps

Major jumps correspond to currency crises triggered by balance-of-payments stress.

(b) Historical interpretation

These events reflect **Sudden Stop Theory**: capital inflows suddenly reverse, causing currency depreciation.

(c) Is INR depreciation good for households?

Using welfare analysis:

Real income:

$$\text{Real Income} = \frac{\text{Nominal Income}}{\text{Price Level}}$$

Depreciation raises import prices $\rightarrow$ inflation $\rightarrow$ fall in real income.
Hence short-run welfare loss dominates.

3. RBI Money Stock Analysis

According to Mishkin, understanding money supply is central to monetary policy.

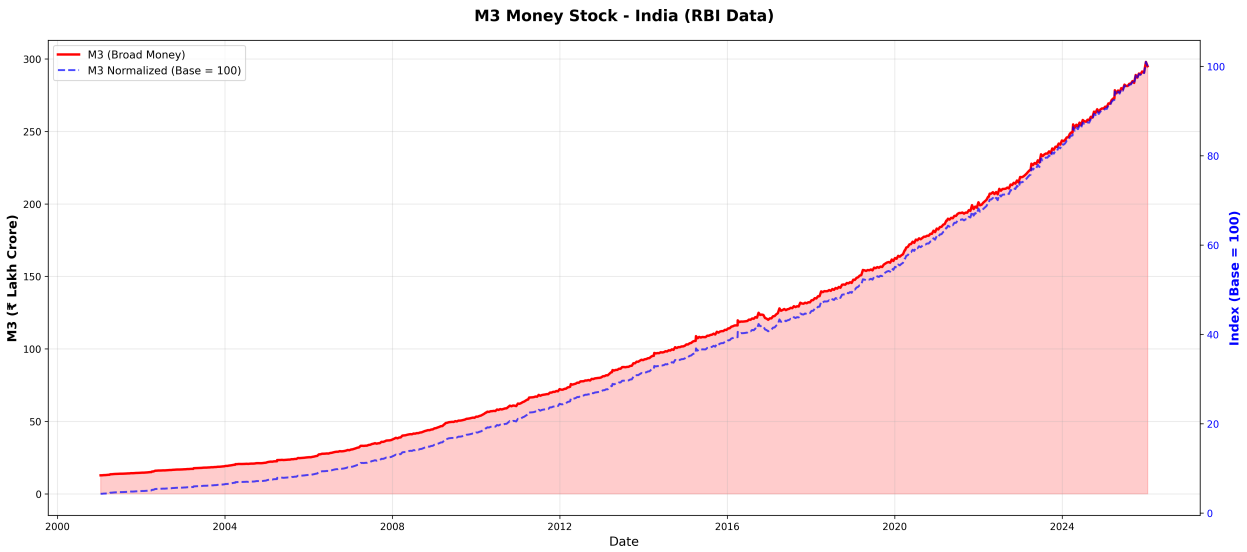
(a) Components of money stock

M1: Medium of exchange (transactions motive) **M2**: Savings deposits (precautionary motive) **M3**: Broad money (investment + saving motive) **M4**: Extended liquidity

Money demand theory:

$$M^d = f(Y, i)$$

(b) Plot of money stock



Money aggregates move together due to the **Money Multiplier**:

$$M = \frac{1+c}{c+r} \times MB$$

(c) Best measure of money

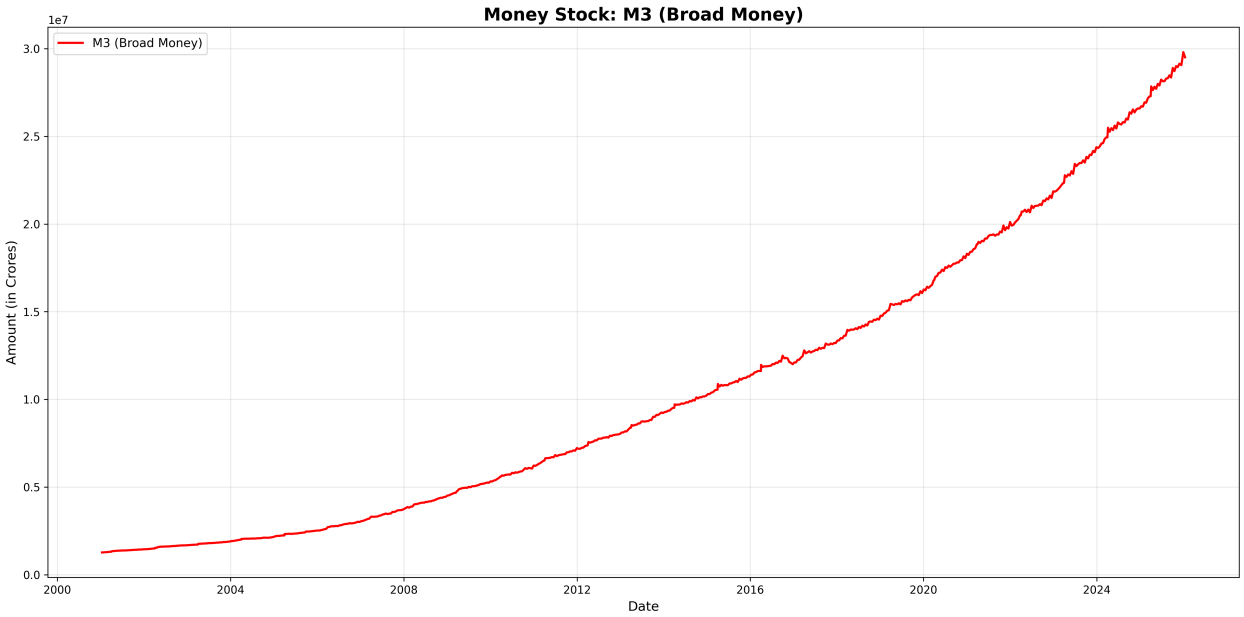
M3 is the best indicator of monetary conditions.

It best captures:

- Bank credit creation
- Liquidity conditions
- Inflation dynamics

(d) Challenging question

(ii) Money supply and interest rates



Four effects of money supply increase:

1. Liquidity effect (rates fall)
2. Income effect (rates rise)
3. Price-level effect (rates rise)
4. Expected inflation effect (rates rise)

Short run $\rightarrow$ liquidity effect dominates Long run $\rightarrow$ inflation effect dominates

END