Capital Flows and Monetary Policy

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Current Account Balance = CA
Capital Account Balance = KA

Overall Balance = (CA + KA)

Official Reserves, R = - (CA + KA)
<table>
<thead>
<tr>
<th></th>
<th>(Rupees Billion)</th>
<th>2001-02</th>
<th>2005-06</th>
<th>Share</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Exports</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agriculture</td>
<td>2133.45</td>
<td>281.44</td>
<td>4642.33</td>
<td>9.7</td>
</tr>
<tr>
<td>Gems &amp; Jewellery</td>
<td>348.45</td>
<td>348.45</td>
<td>688.30</td>
<td>14.8</td>
</tr>
<tr>
<td>Chemicals &amp; Related Products</td>
<td>288.62</td>
<td>288.62</td>
<td>642.55</td>
<td>13.8</td>
</tr>
<tr>
<td>Engineering Goods</td>
<td>331.83</td>
<td>331.83</td>
<td>953.97</td>
<td>20.5</td>
</tr>
<tr>
<td>Textiles</td>
<td>486.77</td>
<td>486.77</td>
<td>710.12</td>
<td>15.3</td>
</tr>
<tr>
<td><strong>Imports</strong></td>
<td>2683.00</td>
<td>667.70</td>
<td>1946.40</td>
<td>28.1</td>
</tr>
<tr>
<td>Petrol, Oil &amp; Lubricants</td>
<td>667.70</td>
<td>667.70</td>
<td>1946.40</td>
<td>28.1</td>
</tr>
<tr>
<td>Capital Goods</td>
<td>471.30</td>
<td>471.30</td>
<td>1402.45</td>
<td>20.3</td>
</tr>
<tr>
<td>Chemicals</td>
<td>133.52</td>
<td>133.52</td>
<td>305.01</td>
<td>4.4</td>
</tr>
<tr>
<td>Pearls, precious &amp; semi precious stones</td>
<td>220.46</td>
<td>220.46</td>
<td>404.69</td>
<td>5.8</td>
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<tr>
<td>Gold &amp; Silver</td>
<td>218.54</td>
<td>218.54</td>
<td>495.40</td>
<td>7.2</td>
</tr>
<tr>
<td></td>
<td>Year →</td>
<td>2001-02</td>
<td>2005-06</td>
<td></td>
</tr>
<tr>
<td>----------------------</td>
<td>--------</td>
<td>---------</td>
<td>---------</td>
<td></td>
</tr>
<tr>
<td><strong>Trade Balance</strong></td>
<td></td>
<td>-549.55</td>
<td>-2279.63</td>
<td></td>
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<tr>
<td><strong>Invisibles (Net)</strong></td>
<td></td>
<td>713.81</td>
<td>1811.07</td>
<td></td>
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<tr>
<td>Foreign Travel</td>
<td></td>
<td>158.89</td>
<td>60.85</td>
<td></td>
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<tr>
<td>Transport</td>
<td></td>
<td>-61.60</td>
<td>-49.80</td>
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<tr>
<td>Insurance</td>
<td></td>
<td>.35</td>
<td>2.21</td>
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<tr>
<td>Investment Income</td>
<td></td>
<td>-183.43</td>
<td>-224.33</td>
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<tr>
<td>Private Transfers</td>
<td></td>
<td>733.63</td>
<td>1068.30</td>
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<tr>
<td>Software Exports</td>
<td></td>
<td>328.36</td>
<td>986.78</td>
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<tr>
<td><strong>Current Account Balance</strong></td>
<td></td>
<td>164.26</td>
<td>-468.56</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2001-02</td>
<td>2005-06</td>
<td></td>
<td></td>
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<tr>
<td>---------------------------------</td>
<td>----------</td>
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<td></td>
<td></td>
</tr>
<tr>
<td><strong>Year →</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Current Account Balance</strong></td>
<td>164.26</td>
<td>-468.56</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foreign Investment (net)</td>
<td>319.20</td>
<td>807.59</td>
<td></td>
<td></td>
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<tr>
<td>(a) FDI</td>
<td>226.30</td>
<td>254.24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(b) Portfolio Investment</td>
<td>92.90</td>
<td>553.35</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Banking Capital (incl. NRI Deposits)</td>
<td>137.78</td>
<td>57.95</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commercial Borrowing &amp; Ext. Assistance</td>
<td>-75.28</td>
<td>204.23</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total Capital Account Balance</strong></td>
<td>410.80</td>
<td>1085.21</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Overall Balance</strong></td>
<td>565.93</td>
<td>658.96</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Monetary Movements</strong></td>
<td>-565.93</td>
<td>-658.96</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(a) IMF (net)</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(b) Foreign Exchange Reserves [↑(-),↓(+)]</td>
<td>-565.93</td>
<td>-658.96</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Figure 2.2: Exchange Rate and Balance of Payments

Flow of Dollars

Exchange Rate E_{Rs/$}
Figure 2.2: Exchange Rate and Balance of Payments

Importers demand for dollars
Figure 2.2: Exchange Rate and Balance of Payments

Exchange Rate $E_{Rs./}$

$D_M$

$S_X$

Exporters supply of dollars

Flow of Dollars
Figure 2.2: Exchange Rate and Balance of Payments

Supply of dollars from capital inflows, $M_K$. 
Figure 2.2: Exchange Rate and Balance of Payments

Demand for dollars from capital outflows, $X_K$. 
Figure 2.2: Exchange Rate and Balance of Payments

Equilibrium exchange rate

\[ D_M + X_K = S_X + M_K \]
Figure 2.2: Exchange Rate and Balance of Payments

Exchange Rate $E_{Rs./S}$

$D_M$ $D_{M+X_K}$ $S_X$ $S_{X+M_K}$

Exchange rate fixed at $\bar{E}$

AC = Current Account deficit
Figure 2.2: Exchange Rate and Balance of Payments

Exchange Rate $E_{Rs./S}$

$D_M$, $D_M + X_K$, $S_X$, $S_X + M_K$

Exchange rate fixed at $E$

$E$

$E$

$A$, $B$, $C$, $D$

Flow of Dollars

$M_K$ = Capital inflows

$X_K$ = Capital outflows

$CD - AB = \text{capital account surplus/deficit}$
Figure 2.2: Exchange Rate and Balance of Payments

- $D_M$: Domestic demand
- $S_X$: Supply of exports
- $S_{X+M_K}$: Supply of exports and imports
- $AC$: Current Account deficit
- $CD - AB$: Capital account surplus/deficit
- $AC + (CD - AB)$: Overall deficit
- $E$: Exchange Rate $E_{Rs/S}$
- Flow of dollars
Figure 2.2: Exchange Rate and Balance of Payments

The diagram illustrates the relationship between the exchange rate and the balance of payments. The horizontal axis represents the flow of dollars, while the vertical axis shows the exchange rate in Rs./$. The demand for dollars (DM) and supply of dollars (SX) are depicted by the lines DM and SX, respectively. The intersection point indicates the equilibrium exchange rate (E). The lines DM+XK and SX+MK represent changes in the demand and supply due to changes in imports and exports, respectively.

The area between the lines represents the official financing ( Forex Reserves).
Balance of Payments

Current Account Balance = CA
Capital Account Balance = KA

Overall Balance = (CA + KA)

Official Reserves, R = - (CA + KA)

What happens if the exchange rate is managed at $E$ ?
Figure 2.2: Exchange Rate and Balance of Payments

Exchange Rate $E_{Rs./S}$

Accumulation of forex reserves

Flow of Dollars
Figure 2.2: Exchange Rate and Balance of Payments

Note that exchange rate is prevented from appreciating by accumulating forex reserves.
**Benefit** of Intervention in Exchange Rate market -

Exchange rate does not appreciate

Cost?
## Central Bank Balance Sheet

<table>
<thead>
<tr>
<th>ASSETS</th>
<th>LIABILITIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credits to domestic banks</td>
<td>Currency in Circulation (C)</td>
</tr>
<tr>
<td>Central Bank credit to govt. (incl. loans to govt.) less govt. deposits $(G_{b/CB})$</td>
<td>= Currency with public $(C^p)$ + Currency with banks $(C^B)$</td>
</tr>
<tr>
<td>Advances (Credits) to Commercial Private Sector $(A_{CB})$</td>
<td>Reserves and Central Bank balances of domestic banks</td>
</tr>
<tr>
<td>Foreign Exchange Assets $(F_{E_CB})$</td>
<td>Net Non Monetary Liabilities of Central Bank $(NML_{CB})$</td>
</tr>
</tbody>
</table>

DC

\[ M_0 = R \]
Simplified Central Bank Balance Sheet

<table>
<thead>
<tr>
<th>Assets</th>
<th>Liabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central Bank credit to government (DC)</td>
<td>Currency in circulation</td>
</tr>
<tr>
<td>Central Bank credit to private sector</td>
<td>( M_0 = R )</td>
</tr>
<tr>
<td>Foreign Exchange Assets (( FE_{CB} ))</td>
<td>Reserves and central bank balances of domestic banks</td>
</tr>
</tbody>
</table>

Liquidity

Liquidity
Ignoring Net Non monetary liabilities,

\[ \text{FE}_{CB} = M_0 - DC \]

Or, \[ \Delta \text{FE}_{CB} = \Delta M_0 - \Delta DC \]
Ignoring Net Non monetary liabilities,

\[ FE_{CB} = R - DC \]

Or,

\[ \Delta FE_{CB} = \Delta R - \Delta DC \]

Money Supply is \[ M^S = mM_0 \]
Ignoring Net Non monetary liabilities,

\[ FE_{CB} = M_0 - DC \]

Or, \[ \Delta FE_{CB} = \Delta M_0 - \Delta DC \]

Money Supply is \[ M^S = mM_0 \]

\[ \Delta M^S = m\Delta M_0 \]

\[ \Delta M^S = m[\Delta FE_{CB} + \Delta DC] \]
Ignoring Net Non monetary liabilities, 

\[ FE_{CB} = M_0 - DC \]

Or, \[ \Delta FE_{CB} = \Delta M_0 - \Delta DC \]

Money Supply is \[ M^S = mM_0 \]

\[ \Delta M^S = m\Delta M_0 \]

\[ \Delta M^S = m[\Delta FE_{CB} + \Delta DC] \]

If there is no **sterilization**, then an increase in foreign exchange reserves results in an increase in reserve money and so the money supply.

Intervention in the forex market results in a rise in liquidity and a potential inflation build up.
To avoid this cost of increased liquidity what can the monetary authority do?
To avoid this cost of increased liquidity what can the monetary authority do?

It can sterilize the liquidity impact of the capital flow.

Sterilization is the policy of altering the domestic credit extended by the central bank in an equal and opposite direction to the variation of foreign exchange reserves so that the monetary base remains unchanged.
**Simplified Central Bank Balance Sheet**

<table>
<thead>
<tr>
<th>Assets</th>
<th>Liabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central Bank credit to government (DC)</td>
<td>Currency in circulation (M₀)</td>
</tr>
<tr>
<td>Central Bank credit to private sector</td>
<td>Reserves and central bank balances of domestic banks (R)</td>
</tr>
<tr>
<td>Foreign Exchange Assets (FE\textsubscript{CB})</td>
<td></td>
</tr>
</tbody>
</table>

Sterilization involves \( \Delta DC = -\Delta FE\textsubscript{CB} \) so that \( \Delta M₀ = 0 \)
Capital Flows

- Allow currency to appreciate
- Intervene in forex market and accumulate foreign exchange assets
- Allow money supply to increase
- Sterilize

What are the instruments of sterilization?
Capital Flows

- Allow currency to appreciate
- Intervene in forex market and accumulate foreign exchange assets

Allow money supply to increase

- Cash reserve ratio
- Outright open market operations
- Reverse Repo sales
- Sterilize
  - Market stabilization bonds
An **outright open market operation** involves the definitive **sale or purchase of securities** by the central bank with the objective of absorbing or injecting liquidity in the system.

From the second half of the 1990s to 2003-04 OMOs were used by the RBI to manage the impact of capital flows.

Sustained large capital flows, however, led to a decline in the RBI’s holdings of government securities.

Finite stock of government securities held by RBI and also legal restrictions on RBI on issuing its own paper placed constraints on sterilization operations.
Due to shortage of government securities for liquidity management, the Market Stabilisation Scheme was introduced on April 1, 2004.

Under the MSS the government issues short-term (91-day, 182-day and 364-day) Treasury Bills and medium term (with residual maturity up to 2.5 years) dated government securities to mop up liquidity.

The proceeds from the securities is parked in a separate identifiable cash account maintained and operated by the RBI.
Under the MSS the **government issues** short-term (91-day, 182-day and 364-day) Treasury Bills and medium term (with residual maturity up to 2.5 years) dated government securities to mop up liquidity.

The proceeds from the securities is parked in a separate identifiable cash account maintained and operated by the RBI.

The RBI **decreases** the net **Reserve Bank credit to government** in response and this nullifies the expansionary impact of increase in net foreign exchange assets with RBI due to capital inflows.
Funds parked in the cash account operated by the RBI can only be appropriated for the purpose of redemption and/or buyback of paper issued under the MSS.

Impact on government of issuing MSS securities is limited to the discount on Treasury Bills and coupons on dated securities issued. Interest payments under MSS were Rs. 29.69 billion in 2004-05.
The **Liquidity Adjustment Facility (LAF)** introduced in June 2000 enables the RBI to manage day to day liquidity and ensure stable conditions in the overnight money market.

The LAF operates through reverse repo and repo auctions and sets a short term interest rate consistent with policy objectives.

The LAF is essentially an instrument of day to day liquidity management as it absorbs/injects liquidity in the overnight money market.

However, due to large capital flows the LAF has also been relied on for sterilization since 2004-05.
The **cash reserve ratio** is the fraction of deposits that the commercial banks are required to hold as deposits with the central bank.

This is a direct instrument of monetary control unlike the indirect instrument of the LAF.

Though the monetary authority is moving towards indirect instruments the CRR continues to be used to augment/absorb liquidity and influence interest rates when there is huge capital flows.
Private Transfers (mainly remittances) have been larger than capital account surplus flows till recent past (2003-04).
Share of Net capital flows

Coefficient of Variation:
- FDI: 83.8
- Portfolio Investment: 112.8
- NRI Deposits: 85.0
- External Borrowings: 203.1

Year

Per cent of Total Capital Account


FDI, Portfolio Investment, NRI Deposits, External Commercial Borrowings
Financing of Overall Balance

Overall Balance = IMF + Foreign Exchange Reserves

Year


Rupes Billion

-200 0 200 400 600 800 1000 1200 1400 1600 1800

Overall Balance IMF financing
Accumulation of forex assets increases the stock of reserve/base money.
RBI used a combination of instruments – OMO sales, reverse repos, market stabilisation bonds, and CRR to mop up domestic liquidity.
As liquidity increased in the recent past direct instruments of policy such as CRR hikes were also used.
Hikes in reverse repo rates were also used to absorb liquidity
It is sometimes suggested that a way of handling capital flows is to discourage inflows by putting restrictions or procedural impediments to their entry.

This has the limitation that it may be seen as a signal of going back on liberalizing the capital account.
Chronology on easing of controls on portfolio flows

1992-93

Foreign Institutional Investors permitted into the country including pension funds, mutual funds, etc. proposing to invest in India as a broad based fund with at least 50 investors and no investor with more than 5%. Permitted access to primary and secondary Market for securities, and products sold by mutual funds with a minimum 70% investment in equities.

Ceiling upon one FII of 5% ownership of any firm, and ceiling upon total of all FIIs at 24%
1996-97

New concept of 100% debt FIIs permitted, which could invest in corporate bonds but not government bonds

1997-98

Ceiling upon ownership by one FII in one firm raised from 5% to 10%. FIIs permitted to partially hedge currency exposure using the currency forward market. FIIs permitted to trade on the equity derivative market in a limited way.

1999-2000

Requirement that FII must have at least 50 investors eased to 20 investors.
1999-2000

Foreign firms and individuals permitted to access Indian market through FIIs as “sub accounts”. Local fund managers also permitted to do fund management for foreign firms and individuals through sub accounts. Requirement that no investor can have over 5% of the FII fund eased to 10%

Ceiling upon total ownership by all FIIs of local firms raised from 30% to 40% (required shareholder resolution)

2000-01

Ceiling upon total ownership by all FIIs of local firms raised from 40% to 49% (required shareholder resolution)
2001-02

Ceiling upon total ownership by all FIIs of local firms raised from 49% to “the sectoral cap for the industry” (required shareholder resolution)

2003-04

Limitations on FIIs hedging using the currency forward market removed

Twin approvals for FIIs at both SEBI and RBI replaced by single approval at SEBI

2004-05

New ceiling placed upon total ownership by all FIIs of corporate bonds of $0.5 billion
2006-07

Range of international entities that can invest in stock market in India widened to include institution established as incorporated outside India as a pension fund, MF, investment trust, insurance company and reinsurance company as registered FIIs.

The list would also include international or multilateral agencies, foreign government agencies, or foreign central banks.
SEBI also allowed registration by an asset management company, investment management advisor, banks or institutional portfolio manager, established or incorporated outside India and preparing to make investments in India on behalf of broad based proprietary funds.
2006-07

Foreign investment up to 49 percent allowed in infrastructure companies in securities market. Separate cap of FDI of 26 percent and FII of 23 percent also fixed.
Macroeconomics of the Open Economy: Mundell Fleming

\[ Y = C + I + G + X - M \]
Macroeconomics of the Open Economy: Mundell Fleming

\[ Y = C + I + G + X - M \]

\[ Y - C - G - (X - M) = I \]
Macroeconomics of the Open Economy: Mundell Fleming

\[ Y = C + I + G + X - M \]

\[ Y - C - G - (X - M) = I \]

\[ (Y - T) - C + (T - G) - (X - M) = I \]

\[ S_{pvt} \quad S_{govt} \]
Macroeconomics of the Open Economy: Mundell Fleming

\[ Y = C + I + G + X - M \]

\[ Y - C - G - (X - M) = I \]

\[ (Y - T) - C + (T - G) - (X - M) = I \]

\[ S_{\text{pvt}} - (X - M) = I \]

\[ S = S_{\text{pvt}} + S_{\text{govt}} \]
Macroeconomics of the Open Economy: Mundell Fleming

\[ Y = C + I + G + X - M \]

\[ Y - C - G - (X - M) = I \]

\[ \underbrace{(Y - T)}_{S_{pvt}} - C + \underbrace{(T - G)}_{S_{govt}} - (X - M) = I \]

\[ S - (X - M) = I \quad S = S_{pvt} + S_{govt} \]

Open Economy IS Curve

\[ S\left( Y, \frac{r}{(+) (+)} \right) - NX\left( E, \frac{Y}{(+)(-)} \right) = I\left( \frac{r}{(-)} \right) \]
1) $Y \uparrow$ results in $NX \downarrow$ and an increase in $(S - NX)$

2) If $E \uparrow$ then $NX \uparrow$ and IS curve shifts to right
\[ Y > (C + I + G) \Rightarrow (X - M) > 0 \]

If the country is spending less than its income then it must be building up claims against the rest of the world, or, adding to its net foreign exchange assets.

\[ \Delta FE = X - M = (S_{pvt} - I) + (T - G) \]
Central Bank Balance Sheet

**ASSETS**

Credits to domestic banks

Central Bank credit to govt.

= Holdings of govt. debt (incl. loans to govt.) less govt. deposits

Central Bank credit to Commercial Private Sector

Advances (Credits) to Commercial Private Sector

Net Non Monetary Liabilities of Central Bank (NML_{CB})

Foreign Exchange Assets

**LIABILITIES**

Currency in Circulation (C)

= Currency with public (C^P) + Currency with banks (C^B)

Reserves and Central Bank balances of domestic banks

M_0 = R
Financial Market: \( LM \) Curve

\[
\frac{M^D}{P} = L(i,Y), \quad L_i < 0, L_Y > 0
\]

\[
M^S = m(\text{FE}_{CB} + DC)
\]

\[
M^D = M^S = M
\]
Capital Mobility

Capital flows will depend on which destination offers higher rates of return. Let $r^*$ be the foreign interest rate that includes any expected depreciation of the domestic currency.

Then, $NKI = K(r - r^*) = K(r)$ \quad $K'(r) > 0$
Capital Mobility

Assume $P = P^* = 1$ so that $\pi^e = 0$ and $i = r$

Then, $\displaystyle NX\left(\frac{E P^*}{P}, Y \right) = NX\left(E, Y \right)$

Capital flows will depend on which destination offers higher rates of return. Let $r^*$ be the foreign interest rate that includes any expected depreciation of the domestic currency.

Then, $\displaystyle NKI = K(r - r^*) = K(r) \quad K'(r) > 0$

Balance of Payments:-

$\displaystyle BP = NX(Y, E) + NKI(r - r^*) = \Delta FE$

A pure float requires that a surplus on one account is balanced by a deficit on the other.

$\displaystyle NX(Y, E) + NKI(r - r^*) = 0$
Regime I: **Capital Immobility**: \( NKI(r - r^*) = 0 \) as \( \frac{\Delta NKI}{\Delta r} \to 0 \)

\( BP = NX(Y, E) = \Delta FE = 0 \)

Regime II: **Perfect Capital Mobility**: \( \frac{\Delta NKI}{\Delta r} \to \infty \)

Large flows of capital for small deviations from \( r = r^* \)

Regime III: **Imperfect Capital Mobility** \( 0 < \frac{\Delta NKI}{\Delta r} < \infty \)

(a) Limited supply of arbitrage funds
(b) Risk aversion that results in risk premium increasing with flow of funds
(c) Capital Controls

\( r \) not necessarily equal to \( r^* \)
Flexible Exchange Rates

\[ NX(Y, E) + NKI(r - r^*) = 0 \]

Or, \[ NX(Y, E) = -NKI(r - r^*) \]

Three unknowns: \( r, Y, E \)
Flexible Exchange Rates

\[ NX(Y, E) + NKI(r - r^*) = 0 \]

Or, \[ NX(Y, E) = -NKI(r - r^*) \]

Three unknowns: \( r, Y, E \)

Slope of BP line depends on how elastic capital inflows are with respect to interest rates. Our diagram is for imperfect capital mobility. \( \frac{\partial r}{\partial Y}_{E} = -\frac{\partial NX/\partial Y}{\partial NKI/\partial r} \)

\( E \uparrow \) then \( NX \uparrow \) which must be offset by a decline in capital inflows as \( NX = -NKI \) and requires \( r \downarrow \)
Rise in $r$ results in $NKI = M_K \uparrow$
Rise in $r$ results in $NKI = M_K \uparrow$

$FF(Y = Y_0)$

$S_X + M_K$

$D_M + X_K$
Rise in $Y$ to $Y_1 = \hat{D}_M$
Rise in $r$ results in $NIK = M_K \uparrow$

Rise in $Y$ to $Y_1 = \tilde{D}_M$

$\textit{NX}(Y, E) = 0$

$Y \uparrow$ implies imports $\uparrow$ and so exports must also $\uparrow$ for $NX = 0$ which occurs when $E \uparrow$
Figure II: Balance of Payments under Imperfect Mobility of Capital
Figure IV: Monetary Policy with Flexible Exchange Rates
Figure IV: Monetary Policy with Flexible Exchange Rates

- LM($M_0$)
- BP($E_0$)
- IS($E_0$)
- $BP < 0$
- LM($M_1$)

- $r$ and NKI
- $Y$ and NX

- $r \downarrow$ and NKI
- $Y \uparrow$ and NX

- $E_0$ and $E_1$
Increase in imports implies $D_M + X_K$ shifts right
Reduction in capital inflows implies $S_X + M_K$ shifts to left.

Exchange Rate depreciates to $E_1$
BP curve shifts downwards to the right
Figure IV: Monetary Policy with Flexible Exchange Rates
Figure IV: Monetary Policy with Flexible Exchange Rates
1) $r \downarrow$
2) $Y \uparrow$
3) $E \uparrow$
4) $NX > 0$

Figure IV: Monetary Policy with Flexible Exchange Rates
Figure V: Fiscal Policy with Flexible Exchange Rates
At M, \( BP > 0 \)

\( r \uparrow \) results in \( NKI \uparrow > NX \downarrow \) due to \( Y \uparrow \)

Figure V: **Fiscal Policy** with Flexible Exchange Rates
$r \uparrow$ results in $NKI = M_K \uparrow > D_M \uparrow = NX \downarrow$ due to $Y \uparrow$

Exchange Rate appreciates

BP curve shifts upwards to the right
Figure V: **Fiscal Policy** with Flexible Exchange Rates
$E \downarrow$ shifts IS to the left as $NX \downarrow$

Figure V: **Fiscal Policy** with Flexible Exchange Rates
As \( Y \uparrow \), FF curve shifts right

Figure V: Fiscal Policy with Flexible Exchange Rates
Figure V: Fiscal Policy with Flexible Exchange Rates
Crowding Out:

Closed Economy due to \( i \uparrow \)

Open Economy in addition \( E \downarrow \) and \( NX \downarrow \)

Fiscal expansion associated with a deterioration of current account balance.

Hence, \textit{monetary policy is more expansionary in a floating exchange rate regime.}
Figure VI: Monetary Policy with Fixed Exchange Rates
Expansion of domestic credit to $DC_1$

Figure VI: Monetary Policy with Fixed Exchange Rates
Figure VI: Monetary Policy with Fixed Exchange Rates

BP goes into deficit

LM(DC₀,FE₀) = LM(DC₁,FE₁)

NX < 0

NX = 0
Figure VI: Monetary Policy with Fixed Exchange Rates
Monetary Policy under Fixed Exchange Rates

**Short run impact:-**

1. $r \downarrow$
2. $Y \uparrow$
3. $NX \downarrow$
4. $NKI \downarrow$
   \[ \{ \text{BP} \downarrow \] 

**Long run impact:-**

1. Decline in $FX$ to $FX_1$
2. No change in $r$, $Y$, $BP$
Figure VII: **Fiscal Policy with Fixed Exchange Rates**
At M, $BP > 0$

$r \uparrow$ results in $NKI \uparrow > NX \downarrow$ due to $Y \uparrow$

Figure VII: Fiscal Policy with Fixed Exchange Rates
Capital Inflow causes FE to rise to $FE_1$

LM shifts right

Figure VII: Fiscal Policy with Fixed Exchange Rates
Fiscal Policy with Fixed Exchange Rates

**Short run:-**

1. $r \uparrow$
2. $Y \uparrow$
3. $NX \downarrow$
4. $NKI \uparrow$

\[ BP \uparrow \text{ as } NKI \uparrow > NX \downarrow \]

**Long run:-**

1. Decline in $r$ from short run level
2. $Y$ increases further from that at short run level.
3. $NX$ deteriorates further
4. $NKI$ declines from short run position

\[ \text{No change in } BP \]
1. Unemployment, $Y < Y_f$

2. Balance of Payments Surplus, $BP > 0$

Figure VIII: Demand Deficiency and a Payments Surplus
Contractionary fiscal policy restores balance of payments equilibrium

Figure VIII: Demand Deficiency and a Payments Surplus
Expansionary monetary policy can also restore external equilibrium at higher income $C' > B'$. 

Figure VIII: Demand Deficiency and a Payments Surplus
If full employment is the goal, then expansionary fiscal policy results in $B''$ with $BP > 0$.

Figure VIII: Demand Deficiency and a Payments Surplus
Expansionary monetary policy takes economy to $C^\parallel$ with $BP < 0$. 

Figure VIII: Demand Deficiency and a Payments Surplus
<table>
<thead>
<tr>
<th>Objective</th>
<th>Full employment goal</th>
<th>External equilibrium</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monetary policy</td>
<td>BP &lt; 0</td>
<td>Y ↑</td>
</tr>
<tr>
<td>Fiscal policy</td>
<td>BP &gt; 0</td>
<td>Y ↓</td>
</tr>
</tbody>
</table>
Monetary and fiscal policy used simultaneously

Figure VIII: Demand Deficiency and a Payments Surplus