

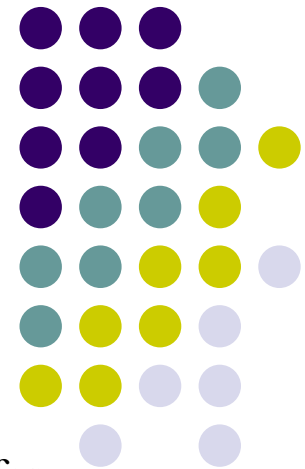
# Analytical Perspective on Critical Macroeconomic Features of Post-Reform India

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# ABSTRACT



Two decades of market–led economic reforms.

Industrial deregulations have taken place along with broad based financial sector reforms.

## **Outcome**

- Sustained and high rate of economic growth, huge foreign capital inflow, flourishing international trade and emergence as a global leader in IT enabled services.

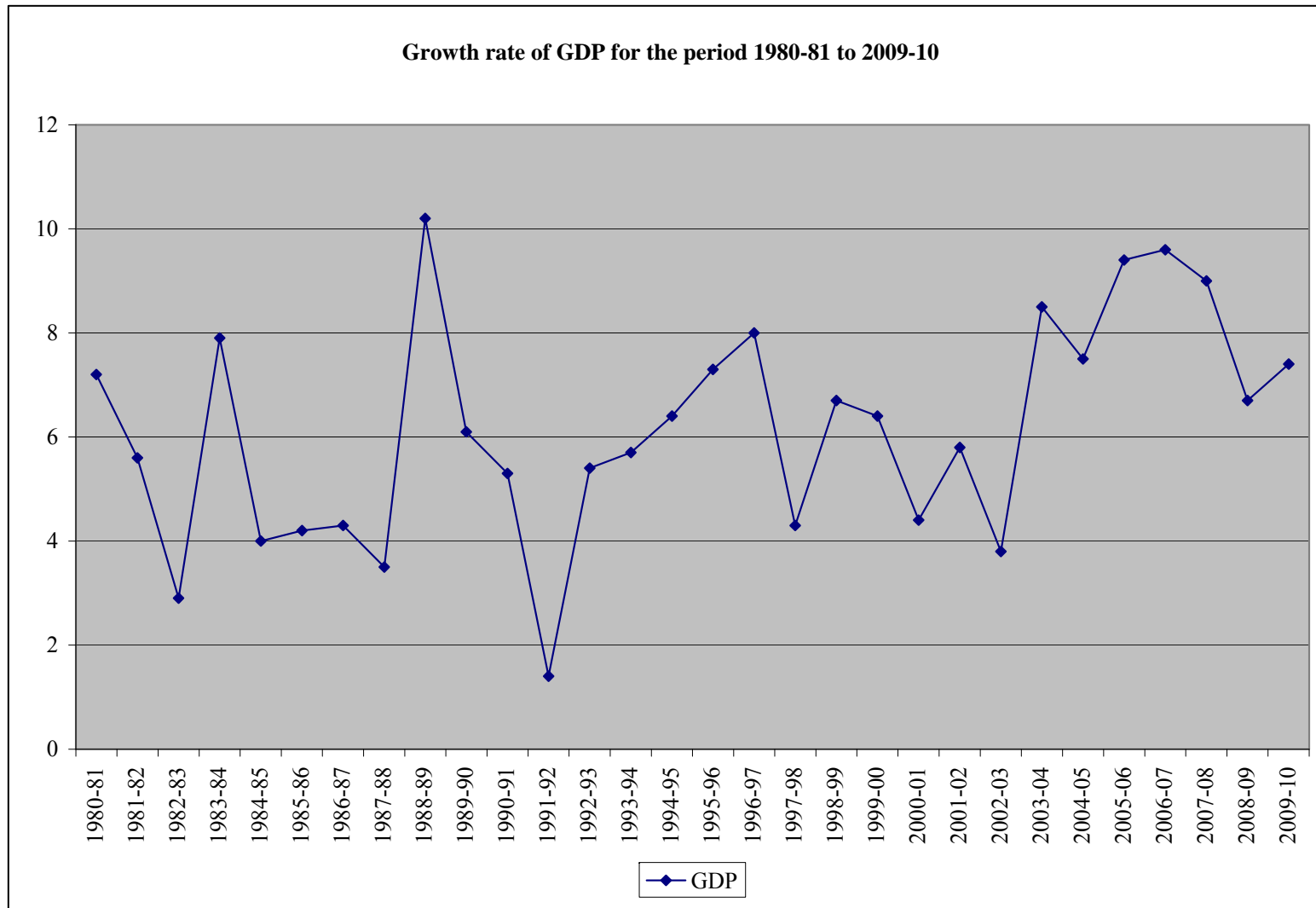
## **Problems**

- managing excessive capital inflow,
- low and fluctuating growth in agriculture and manufacturing,
- sustained and high rate of food price and general inflation,
- lack of fiscal prudence and infrastructure,
- economic immobility of rural population,
- political constraints against further reforms etc. are serious problems policy makers have to encounter.

This paper reflects on

- both these sets of issues
- tries to make some projections for the future  
keeping in view the theoretical perspective available in the existing literature and its modifications befitting the Indian scenario.

# Fig. 1: Annual GDP Growth Rate



**Source:** Summary of Estimates of GDP at Constant (1999-00) Prices, Central Statistical Organisation.

*Four issues will be addressed in this paper.*



1. Monetary Policy with excessive inflow of capital, problem of sterilization and resulting effects on inflation and interest rate policy.
2. Nature of recent inflationary experience.
3. Impact of the last financial crisis and the resulting global recession on India.
4. Problems and some future directions of the macroeconomy.

A structural model is proposed at the end that can be used for rigorous statistical testing of the thesis underlying this paper.

# Crisis leading to reforms of 1990s:

Current a/c deficit in 1990-91 **3.2%** of GDP

FOREX reserves of **\$1.1 billion** by end June 1991

Short term debt by end of Mar 1991 **146.5%** of foreign exchange reserve



As a policy reaction to the crisis reform process was initiated.

This led to

FOREX reserves accumulated to **\$ 4.4 billion** by the end of 1992

Composition of capital flow has shifted from international assistance to  
FDI, FPI, ECB, GDR, NRI deposits

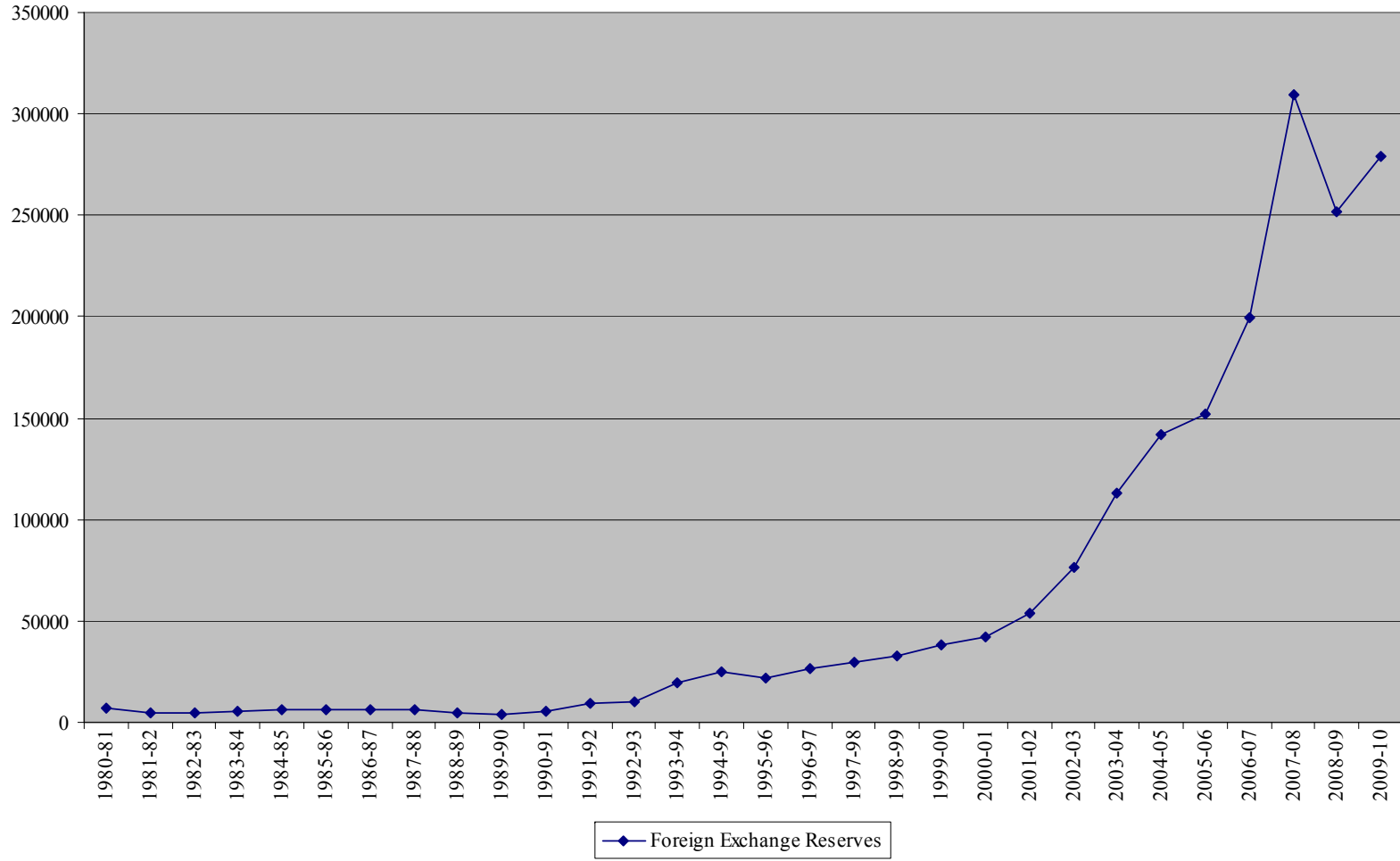
Since mid 1990s marked improvement in current a/c balance, FOREX reserve, foreign exchange market.

Foreign exchange reserve: March 2008 **US\$ 309.7 billion**, Sept 2010 **US\$ 292.9 billion**

2001-02 and 2003-04 current a/c deficit improved into current a/c surplus

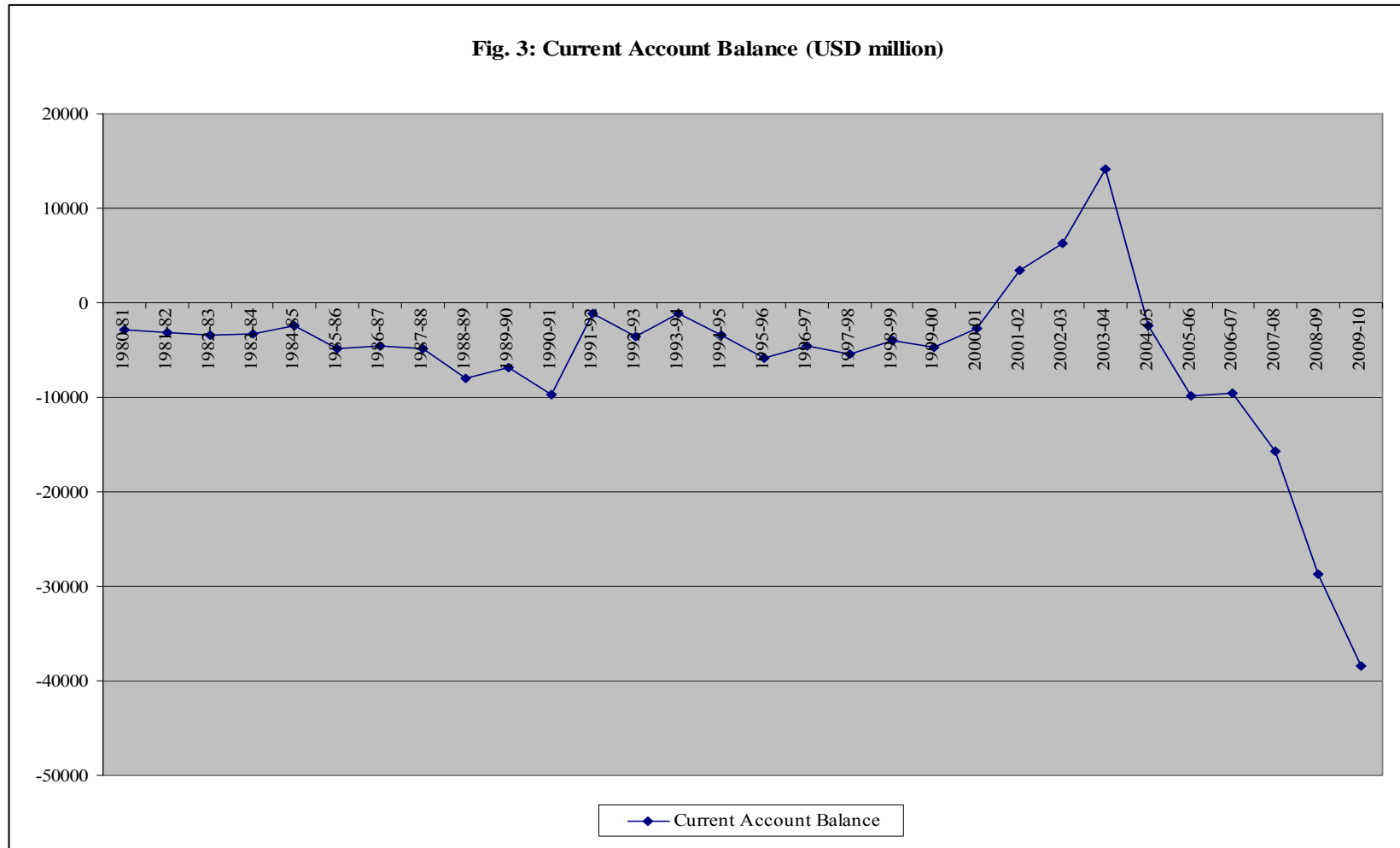


**Fig. 2: Foreign Exchange Reserves (USD million)**





**Fig. 3: Current Account Balance (USD million)**





# Aftermath of global financial crisis

Current a/c deficit increased from 1.3 per cent of GDP in 2007-08 to 2.4 per cent of GDP in 2008-09 and further to 2.9 per cent in 2009-10.

Increasing openness of the economy makes it **vulnerable** to financial instability. Hence the need to hold adequate FOREX reserves.

[Mohan, Rakesh (2007): “India’s Financial Sector Reforms: Fostering Growth While Containing Risks”, *RBI Bulletin*, 14 December, 2199-2226]

Reddy, Y. V. (2007): “Evolving Role of the Reserve Bank of India: Recent Developments”, *RBI Bulletin*, 14 December, 2199-2226]

Holding of FOREX reserve in US Govt. Securities (**low yield**).

This has **cost to the economy**.

[Rakshit, M. K. (2003): Managing Capital Flows and Foreign Exchange Reserves: Some Lessons from India’s Experience, **ADB India Economic Bulletin**, 1, 4, 15-25]

Question of **optimal** FOREX reserve as a precaution against foreign exchange crisis (external shock).



## **Twin objectives of foreign exchange management – stability and liquidity**



The foreign exchange flows have implications for the conduct of domestic monetary policy and exchange rate management.

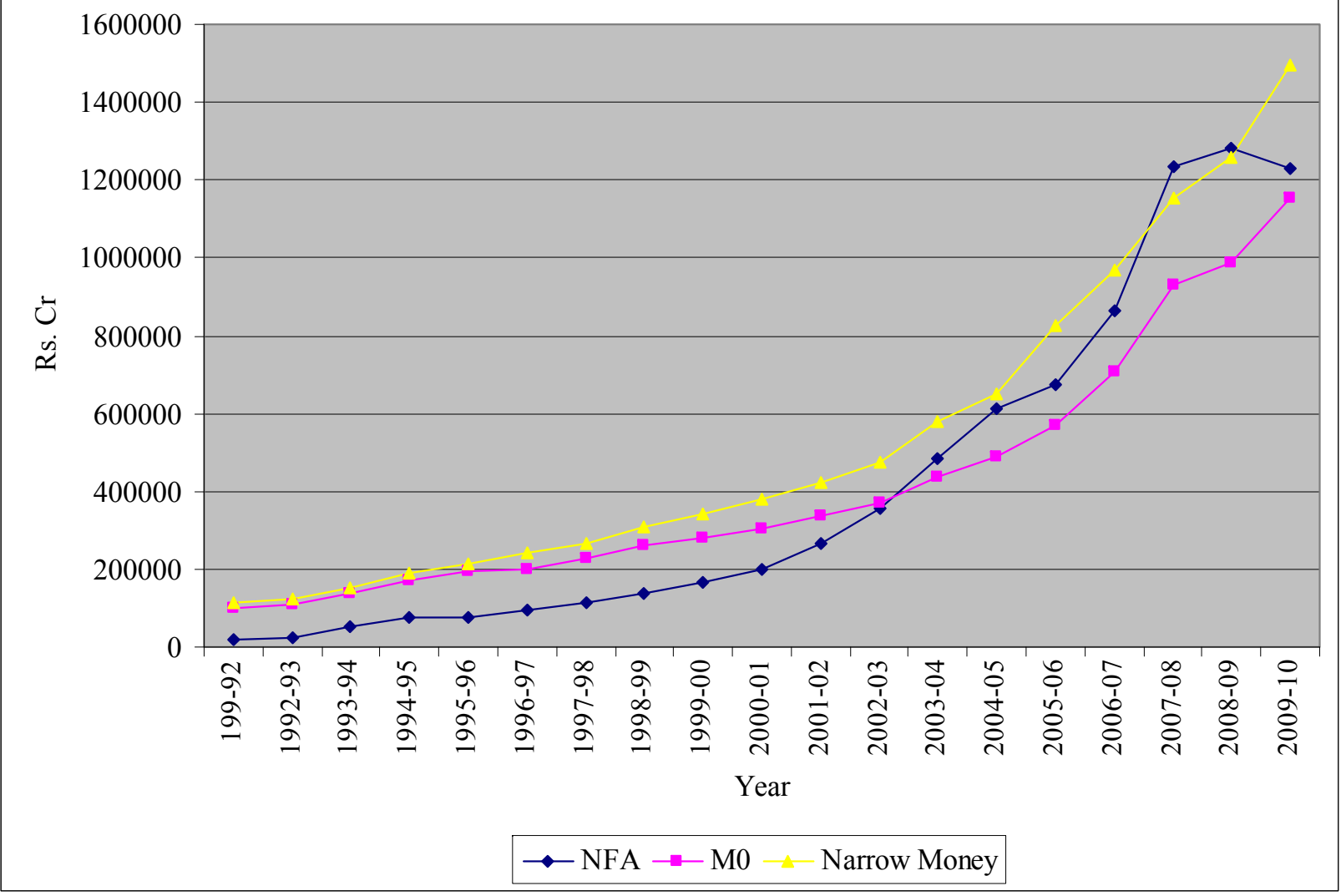
In an economy with open capital account, the reserves accumulation and standard structures for policy responses are the ‘impossible trinity’ (Mundell’s work in the 1960s).

Too much of FOREX reserves resulting into problem of foreign exchange management especially in respect of monetary policy.

Increased FOREX reserve leads to increased money supply.



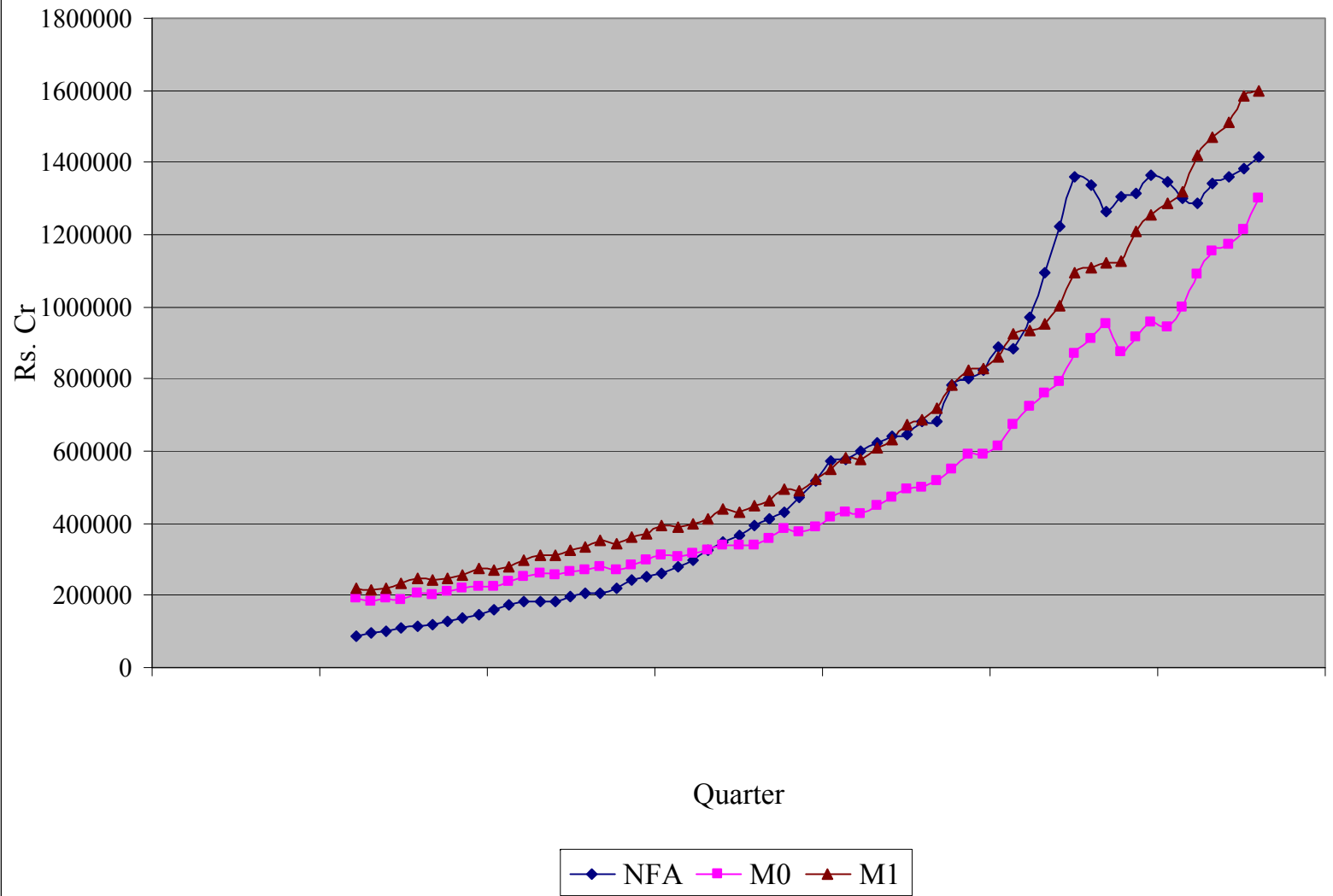
**Fig. 4: NFA and Money Supply - Annual**



NFA = Net Foreign Exchange Asset of RBI, M0 = Reserve Money, Narrow money = M1



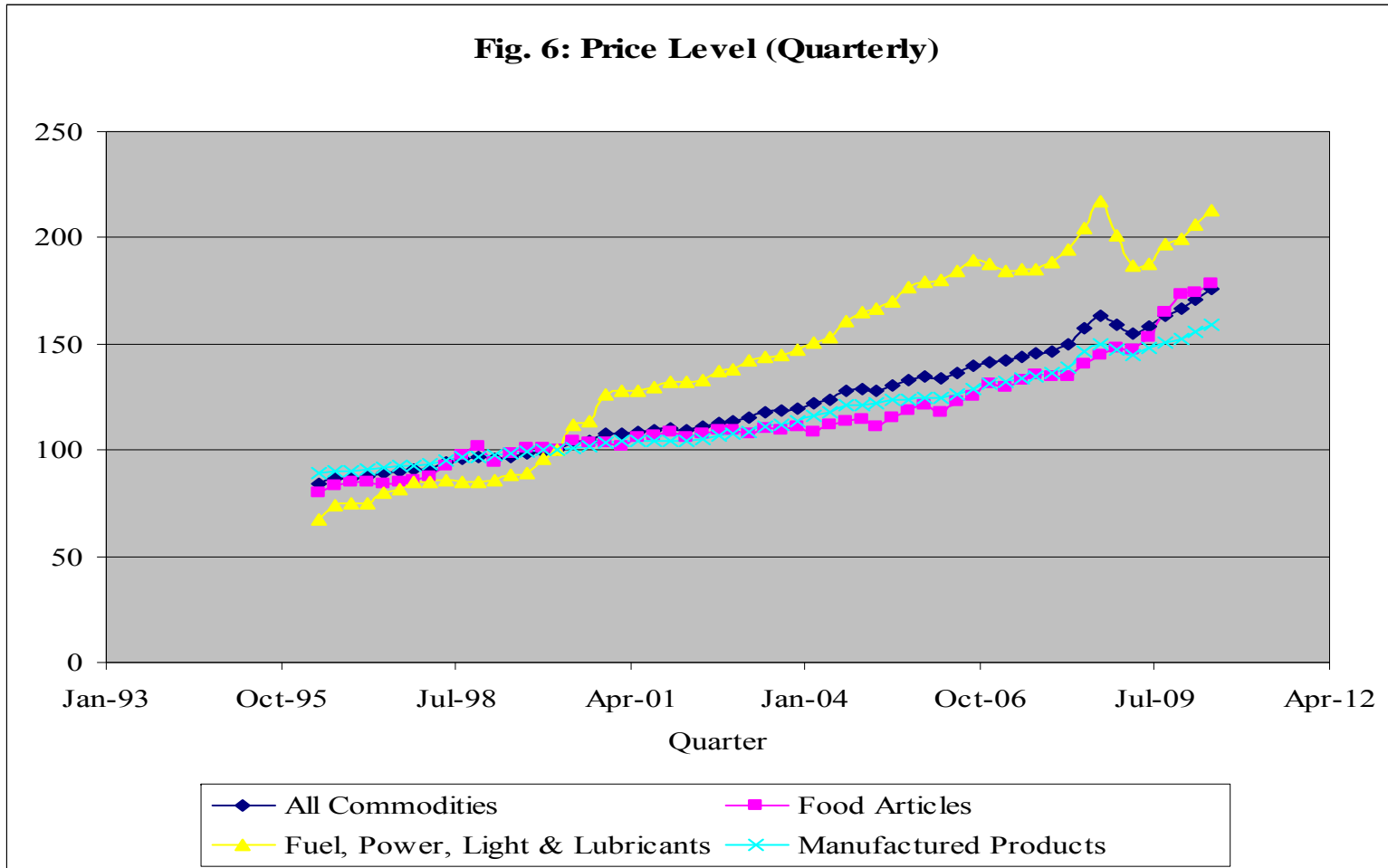
**Fig. 5: NFA and Money Supply (Quarterly)**



# 2. Nature of Recent Inflationary Experience



**Fig. 6: Price Level (Quarterly)**





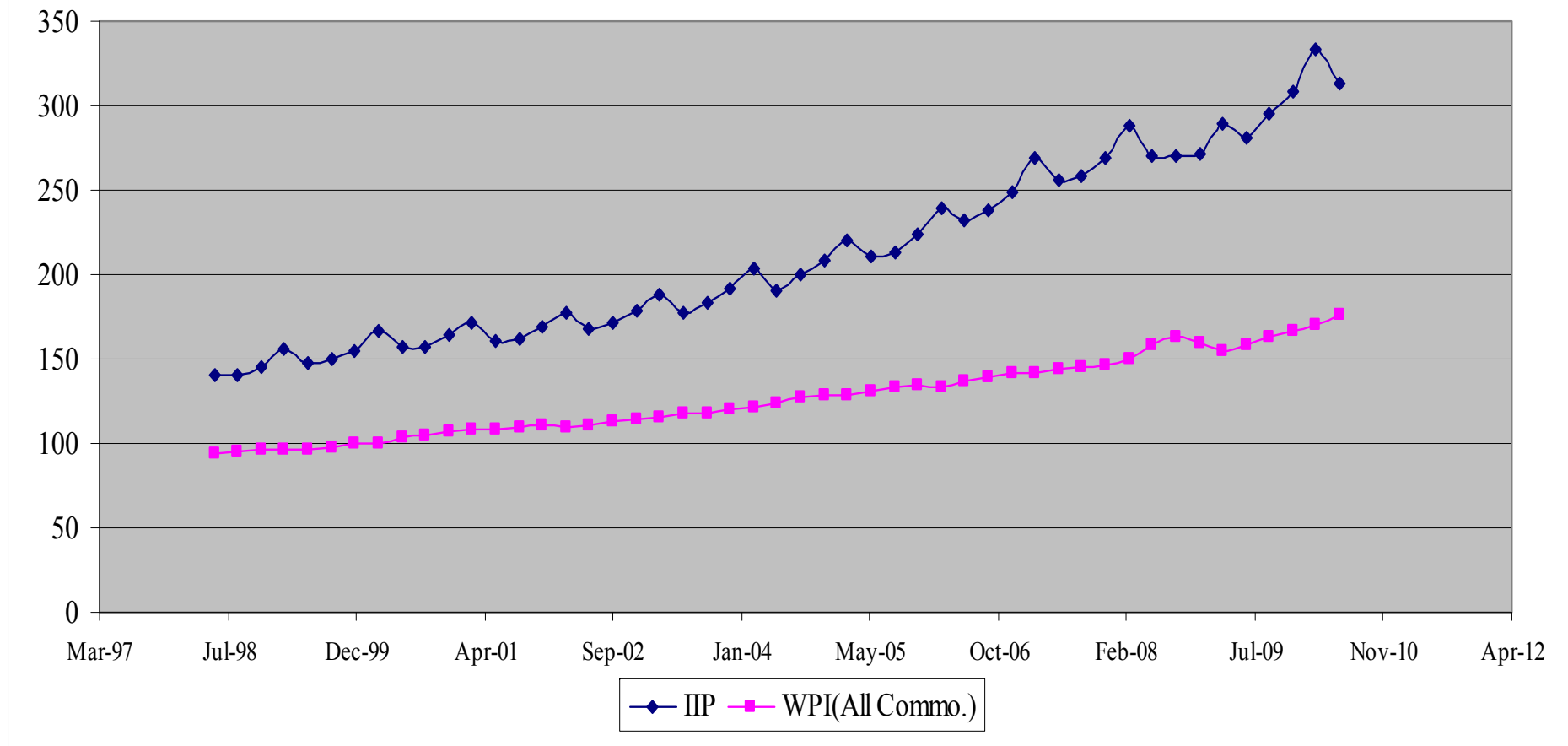
WPI (All Commodities) and WPI (Food articles) move together all along while these along with WPI (Fuel) move together till 2000, thereafter movement in WPI (Fuel) has been much more than in the rest two.

- Corrl (inflation of all commo., inflation of food) = 0.53.
- Corrl (inflation of all commo., inflation of fuel) = 0.77.
- Corrl (inflation of all commo., inflation of Mfg.) = 0.86.
- Corrl (WPI (All Comm.), M0) = 0.97.
- Corrl (WPI (All Comm.), NFA) = 0.98.

# Demand conditions in manufacturing (non-agriculture) and WPI



Fig. 7: IIP and WPI (All) (Quarterly)



## Rakshit (2010) observes:

[Rakshit, M. K. (2010): Inflation and Relative Prices in India 2006-10: Some Analytical and Policy Issues, Economic and Political Weekly, 46, 16, 41-54]



- Between 2006-Q1 and 2010 – Q2
  - GDP growth has been exceptionally high and stable (2006-Q1 to 2007 – Q2) followed by sharp deceleration (post 2007-Q2 to 2008-Q4) and then rapid recovery.
  - WPI inflation was relatively modest in the first phase, then a fall in the second phase and then cyclical behaviour with a sharp upturn from Apr 2009.
  - CPI inflation showed two phase – relatively stable during Jan 2006 and Feb 2008 (average 6%) and then a steeply rising phase (peaking 16.2% in Jan 2010) with double digit level.
- Core inflation for CPI and WPI show divergent path and their volatility show a very high order.

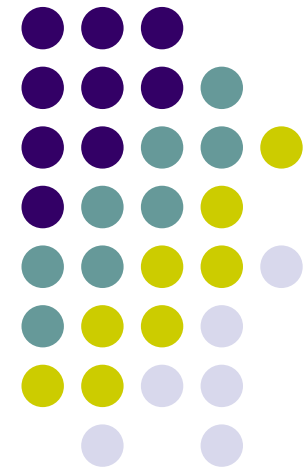
(Core inflation is obtained after stripping the general price levels of their volatile components. It is relevant to assess the overall demand –supply condition, devoid of the random shock to demand or supply.)

## Rakshit (2010) contd.

- Because of differential rates of inflation for CPI and WPI and also between core and headline the central bank faces a dilemma in conducting monetary policy.

Rakshit on the basis of some preliminary regressions concludes that

- Current and lagged fuel prices explain WPI inflation while food price has no role though both have similar weights in the WPI index.
- CPI inflation is explained by current and lagged agricultural output and food price but the latter are non-significant in explaining non-agricultural GDP or core WPI including manufacturing WPI.
- Inflation in India is more **structural in nature** with little scope for central bank monetary policy.





## Raha (2011) observes:

[Raha, Reshmi (2010): Are Capital Flows to Indian Economy Inflationary? **M.Sc. Dissertation**, Presidency College, Calcutta]



- Foreign capital inflow has significant role in explaining money growth with a sterilization coefficient of 0.64, but the impact is short term in nature.
- WPI(FOOD) is highly correlated with foreign capital inflow but the correlation between WPI (FUEL) with foreign capital inflow is much lower.
- In fact foreign capital inflow has no significant role in explaining WPI (FUEL) though for WPI (ALL) and WPI (FOOD) it is significant.
- Causality tests confirm the unidirectional causality from inflow of foreign capital to different measures of price level.
- WPI (Fuel) is basically global driven. Possibly it has caused global return to falter relative to Indian return and hence **encouraged** capital inflow.

# Role of Expansionary Fiscal Policy:



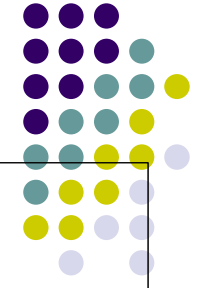
Aftermath of financial crisis of 2007-08 **expansion** in govt. exp.

Implementation of NREGA throughout the country also led to increased govt. exp.

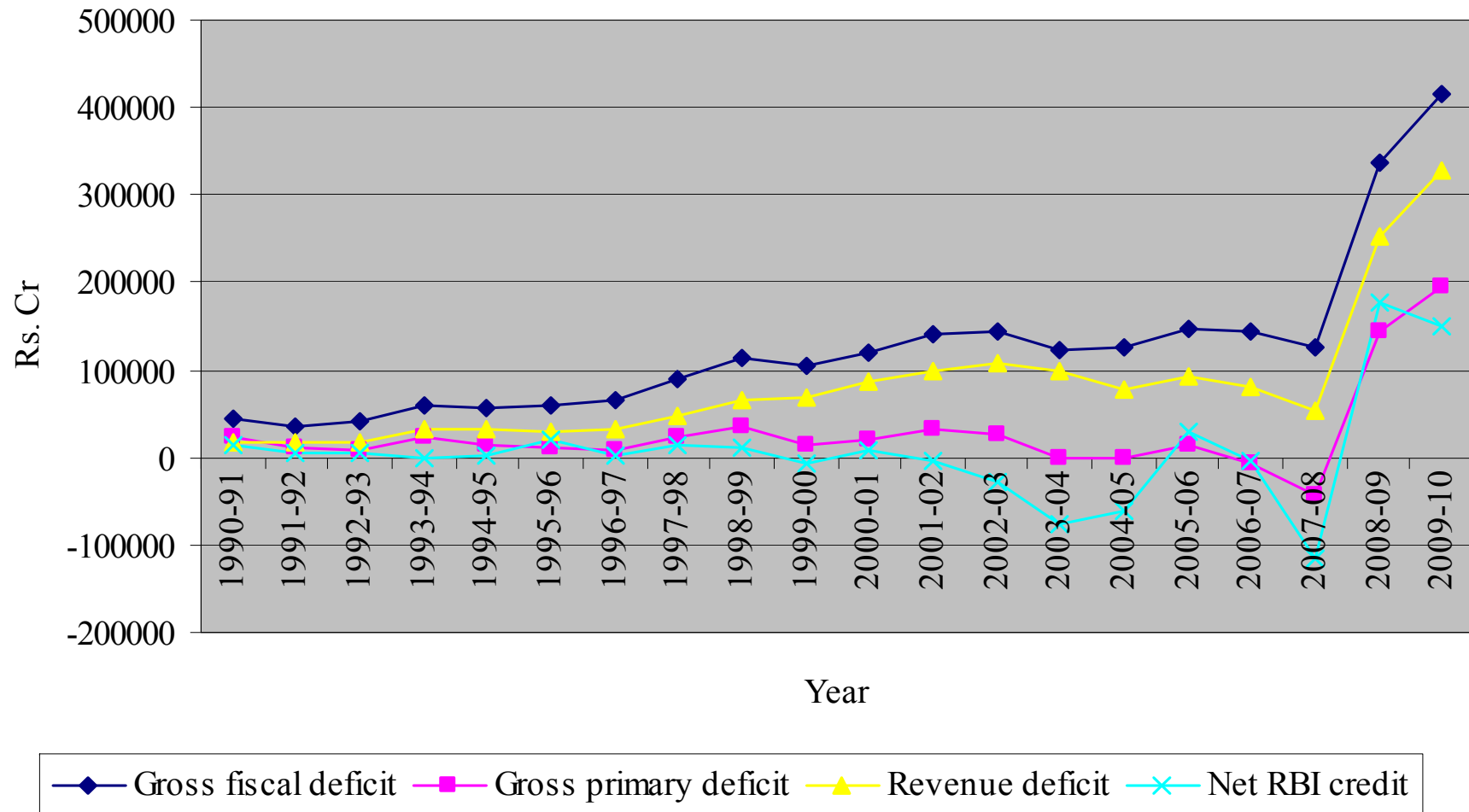
These led to **fiscal deficit** leading to increased money supply and also increased demand for food, especially NREGA.

Net RBI Credit to govt is the primary source of **deficit** financing for all practical purpose.

Though govt. deficit moves together with Net RBI credit and consequently M0, it has very little relation with broad measure of money, M3.



**Fig. 8: Deficits & Money Creation**





A **characteristic change** in the operation of the transmission mechanism from real to financial sector. It is the investment in residential construction.

It has been fuelled by **housing loan**. Share increased from 2.43% of total bank credit in 1990-91 to 12.5% in 2006-07.

Share of **personal loan** (includes car loan) increased from 6.42% in 1990-91 to 24% in 2006-07.

In neither case the rise of interest rates has any effect.

It alleged that the housing boom is due to the presence of bubble fuelled by bank loans.

This has also fuelled inflation operating via **wealth effect**.

At the same time loans to **small scale sector** has decreased from 12.38% in 1990-91 to 4.13% in 2006-07.

### 3. Impact of the last financial crisis and the resulting global recession on India



Major features

- Growth rate came down drastically in 2008-09, but did not fall below 5%.

No sign of recession (two consecutive quarters of negative growth).

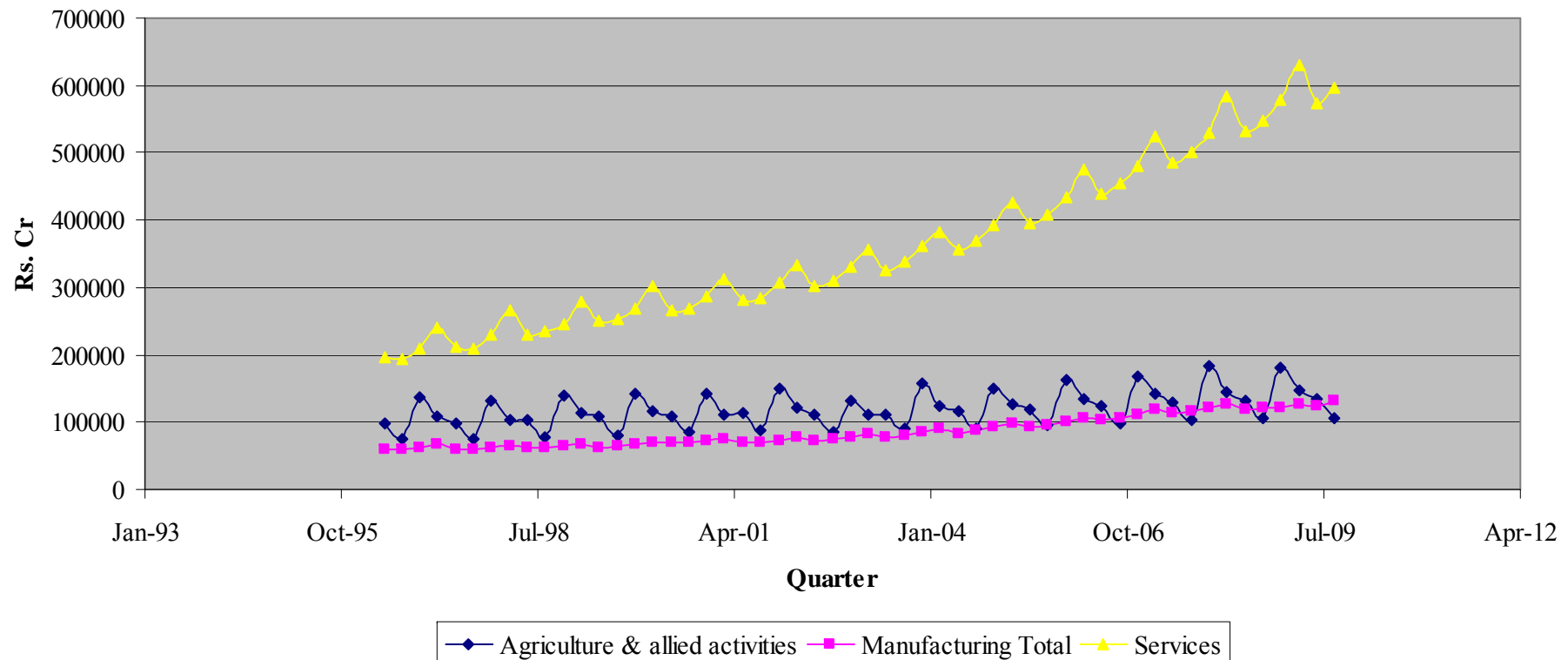
- The service sector did not falter substantially.
- Growth rate bounced back quickly.

In general the financial crisis and global recession has **no significant impact** on the Indian economy.

# Components of GDP: 1996 – 2010 (Quarterly)



**Fig. 9: Sectoral GDP at 1999-00 Prices (Quarterly)**



## 4. Problems and some future directions of the macroeconomy



Agriculture has a very significantly large share in GDP. In terms of employment the share is around 60%.

Agriculture is dependent on monsoon.

There has been very little public investment in large and medium irrigation post second year plan.

Though investment-GDP has been increasing, albeit slow, but public investment to GDP ratio has been stagnant if not a decreasing trend.

With an empirical fact that there is crowding in effect of public investment in India it has serious implications.

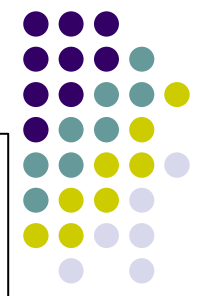


Dearth of infrastructure facilities creates supply bottlenecks.

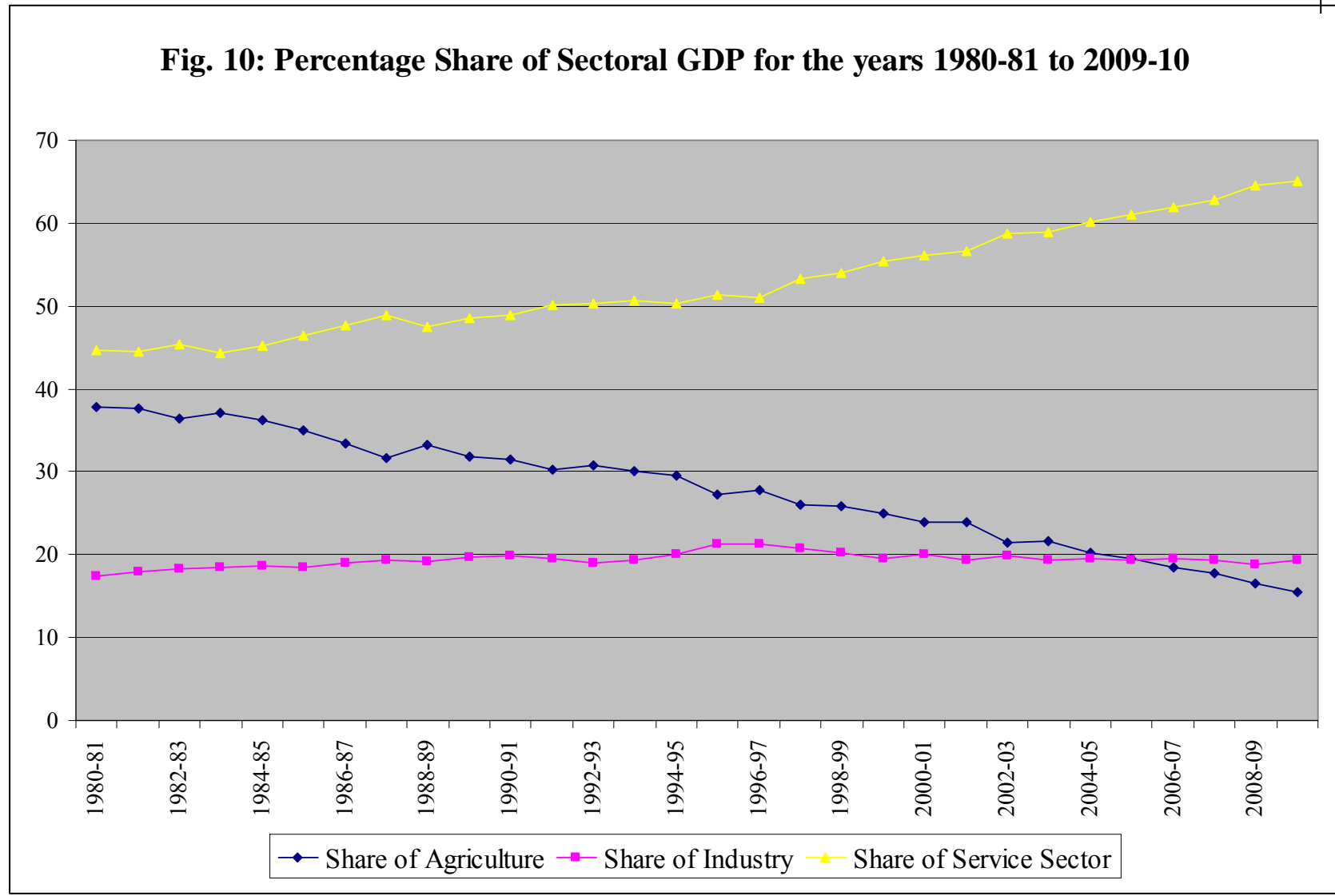
While share of agriculture in GDP has a declining trend, manufacturing has remained stagnant, it is only service sector that shows a rising trend in share of GDP.

Incentives, Revenue and Corruption – Inadequate understanding of sophisticated Regulatory System.





**Fig. 10: Percentage Share of Sectoral GDP for the years 1980-81 to 2009-10**



Source: *Summary of Estimates of GDP at Constant (1999-00) Prices, Central Statistical Organisation.*

# Conclusion – Road Ahead



- a) India mimics the feature of chronic underdevelopment as well as a very mature capitalist economy.  
Rural sector accommodates 60% of people and service sector commands 60% of GDP.  
Both Arthur Lewis and Simon Kuznets will be at a loss.
  
- b) While the government continue to rely on subsidies and fiscal deficits, the incentive mechanisms underlying public policies are backdated leading to low-quality outcomes.
  
- c) Structural bottlenecks, inadequate marketed supply of food lead to “monetarist” conclusions whereas the ethos of policy making is fundamentally “Keynesian”.

## Conclusion – contd.



- d) Inflation should be modeled as a two state Markov switching (MS) process. In a regime of price stability money growth is not necessarily useful for predicting inflation in future periods while in the other regime money growth is allowed to play an important role in signaling the probability that the economy will move from a low to a high inflation regime. In some of the studies transition probabilities are allowed to depend on other variables.

[Abiad, A. G. (2003): Early warning systems: a survey and a regime switching approach, **Working Paper Series No. 03/32**, IMF.

Ayuso, J., G. L. Kaminsky and D. Lopez-Salido (2003): Inflation regimes and stabilization policies: Spain 1962-2001, **Investigaciones and Economicas**, 615-631. Ricketts, N. and D.

Rose (2007): Inflation, learning and monetary policy regimes in the G-7 economies, **Working Paper Series No. 95-6**, Bank of Canada.]

- e) Infrastructure, Agriculture and Incentives

# A Baseline Model for Estimation



$$\alpha(PY_F(P) + Y_N) + \alpha\theta G + B_F(P_W, P) = D_F$$

$$PY_F(P) - \Delta FS(P_c, Y_g^S) = S_F$$

$$\text{also } P_M \quad P_c =$$

$$\text{or } PY_F(P) - \Delta FS(P_c, Y_g^S) - B_F(P_W, P) - \alpha\theta G = \alpha[PY_F(P) + Y_N] \quad (1)$$

$Y_F$  = Food Production,       $Y_N$  = Production in mfg.

$P_F$  = Price of food,       $P_N$  = Price of mfg.

$P =$

Exogenous/ Policy parameter

$P_W$  = World food price relative to home

$P_C$  = Procurement price

FS = Stock of food

$Y_g^S$  = Govt. procurement of food

G = Govt. exp.

$\theta$  = Share of pub. exp. works in G

$\alpha$  = Share of food in total consumption



$$(1 - \alpha)[PY_F(P) + Y_N] = Y_N$$

$$Y_N = \frac{1 - \alpha}{\alpha} PY_F(P) \quad (2)$$

$$M_S = \kappa(i)[P_F Y_F + P_N Y_N]$$

$$= \kappa(i) \left[ P_F Y_F + P_N \cdot \frac{1 - \alpha}{\alpha} \cdot \frac{P_F Y_F}{P_N} \right]$$

$$= \frac{\kappa(i)}{\alpha} [P_F Y_F]$$

$$\text{or } P_F = \frac{M_S \alpha}{\kappa(i) Y_F} \quad (3)$$

$i$  = interest rate



From (1)

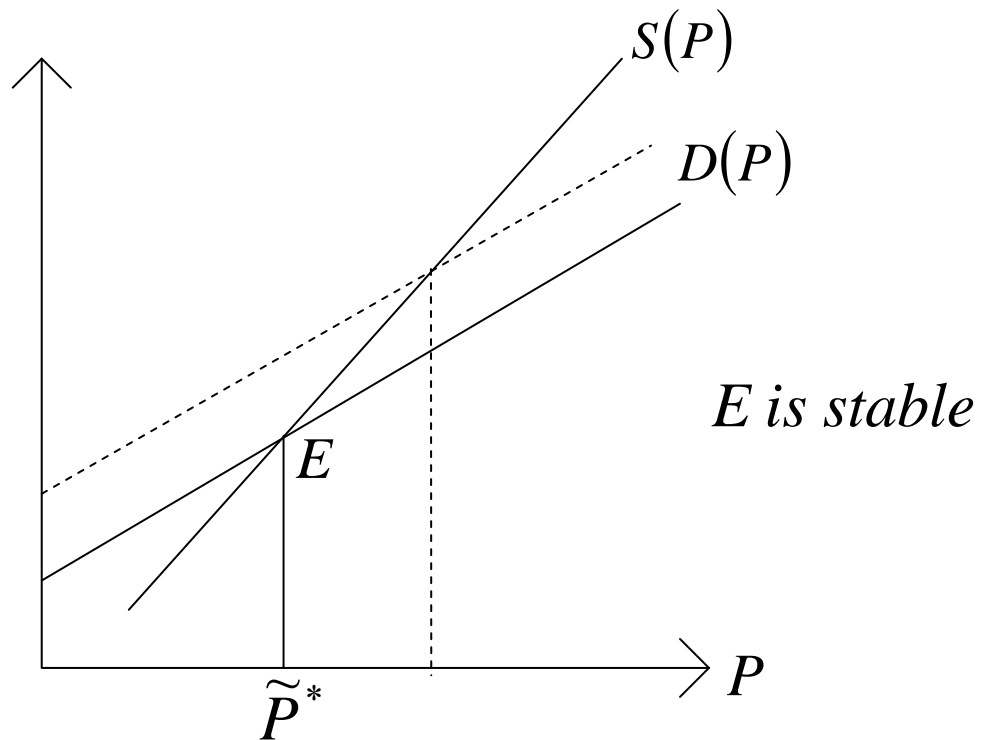
RHS of (1) Define  $D(P)$

LHS of (1) Define  $S(P)$

$$S'(P) = \frac{\delta(PY_F(P))}{\delta P} - \frac{\delta B_F}{\delta P} > 0, \quad \frac{\delta B_F}{\delta P} < 0$$

$$D'(P) = \alpha \frac{\delta(PY_F(P))}{\delta P} \quad Y'_F(P) > 0$$

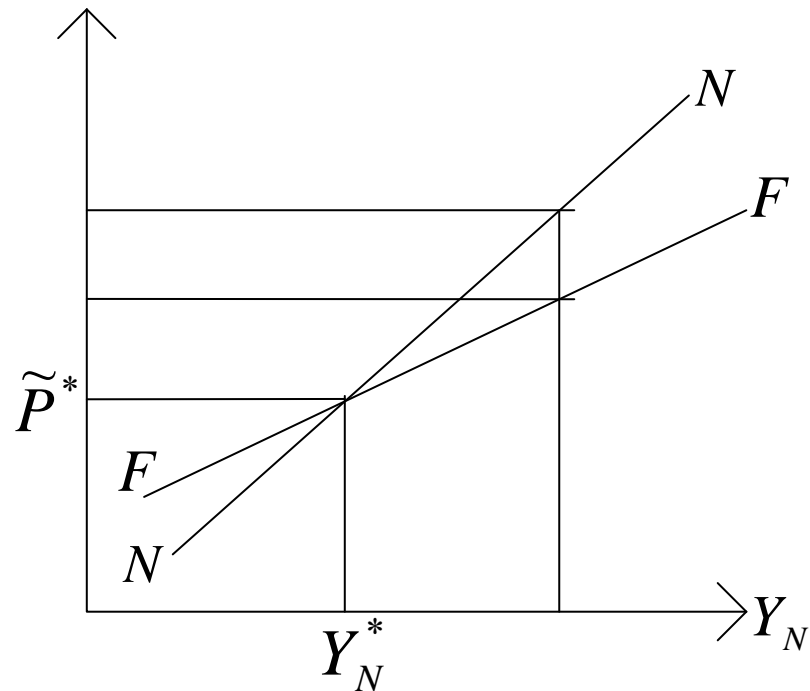
$$D'(P) < S'(P)$$



If  $Y_N \uparrow$ ,  $\tilde{P}^* \uparrow$

From (2)

If  $P^* \uparrow, Y_N \uparrow$



$$\left. \frac{dP}{dY_N} \right|_{NN} > \left. \frac{dP}{dY_N} \right|_{FF}$$

$$P_F = \frac{M_s \alpha}{\kappa(i) Y_F(P^*, \psi)} \quad \delta \tilde{P}^*$$

$$S'(P) \frac{dP}{dY_N} - D'(P) \frac{dP}{dY_N} = \alpha$$

$$\left. \frac{dP}{dY_N} \right|_{FF} = \frac{\alpha}{S'(P) - D'(P)} > 0$$

$$1 = \frac{1-\alpha}{\alpha} \cdot \frac{d(PY_F(P))}{dP} \frac{dP}{dY_N}$$

$$\frac{\alpha}{1-\alpha} \cdot \frac{dP}{d(PY_F(P))} = \frac{dP}{dY_N} \Big|_{NN}$$

$$D'(P) = \alpha \cdot \frac{d(PY_F(P))}{dP}$$

$$\frac{\alpha}{1-\alpha} \cdot \frac{dP}{d(PY_F)} = \frac{\alpha}{S'(P) - D'(P)}$$

$$\frac{D'(P)}{1-\alpha} = \frac{\alpha}{S'(P) - D'(P)} > 0$$

$$D'(P)[S'(P) - D'(P)] > \alpha(1-\alpha) > 0$$

