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Puzzles in Indian Performance: Deficits without disasters

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Abstract

The paper explores puzzles in Indian growth performance such as the prolonged period of below potential growth in the late nineties. Uneven investment was a major explanation. Risk aversion and adverse expectations prevented investment from rising. Since sufficient domestic and foreign savings were available to compensate for government borrowing, the high fiscal deficit did not crowd out private investment or raise risk and interest rates. A sign of the absence of excess demand was that the fiscal deficit did not lead to a current account deficit. The problem was that, partly because of structural rigidities, monetary-fiscal policy was unable to create the conditions to absorb the foreign savings made available. High volatility in nominal interest and exchange rates raised risk and amplified exogenous shocks. The second factor raising uncertainty was that exposing manufacture to international competition was delayed too long. The smooth fall in Indian nominal interest rates after 2001, and rise in infrastructure spending, succeeded in stimulating higher industrial growth by 2003, and lowering fiscal deficits. Macropolicies can stimulate growth, make it easier to undertake deep reform, and the latter can reinforce growth, allowing it to reach potential.

JEL codes: F43, F32

Key words: growth, open economy, twin deficits, volatility, macroeconomic policy

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Introduction

Risk aversion and adverse expectations resulted in the absence of a vigorous investment boom explaining the uneven growth and the slowdown of the Indian economy after the mid nineties. The chapter examines two alternative explanations for this. Did the high fiscal deficit raise interest rates, risk and crowd out private investment or were shocks and the absence of compensating policy responsible?

We start by examining broad macroeconomic parameters, and the relationship between the three sectors--agriculture, industry, and services, in order to establish if there has been a change in the trend rate of growth or if shocks are responsible for the ups and downs. Each section of this chapter brings out an anomaly, since puzzles offer an opportunity to learn, and suggest ways in which standard paradigms must be stretched in order to understand events, and design policy. The puzzles are either deviations from a theoretical benchmark or just outcomes that are difficult to explain.

Our conclusion is that more than the fiscal deficit, the belief in its disastrous consequences, was a disaster. Since domestic plus foreign savings together exceeded investment and compensated for government borrowing the fiscal deficit did not put pressure on Indian interest rates. Rather foreign inflows led to rising foreign exchange reserves and the current account deficit shrank as imports stagnated. It cannot be that the fiscal deficit absorbed too much of savings when savings were unutilized. The policy choices that impounded foreign savings must be held responsible.

There is an argument that higher growth cannot occur unless deep second generation reforms take place. The analysis in this paper suggests an incremental position, counter to the argument: macropolicies can stimulate growth, make it easier to undertake deep reform, and the latter can reinforce growth, allowing it to reach potential. Some evidence comes from the success of the stable softening interest rate regime, and rise in

infrastructure spending, in stimulating higher industrial growth in 2003 and lowering the fiscal deficit (to 4.8 percent) for the first time in many years.

Lower interest rates have encouraged housing construction and consumer expenditure, which, along with road building, has helped industry. The demand for good infrastructure rises in an economy that is opening out and facing export opportunities. India's political parties have realized that delivering this can now win more votes than the earlier narrowly targeted subsidies. Thus the BJP coined a successful new slogan "*Bijli Sadak Pani*" for the State elections. The structure of the argument and the main conclusions are summarized in Box 12.1, to serve as a road map for those who would like to work through the detailed supporting analysis that follows and as a shortcut for others.

Box 12.1: The Structure of the Argument and the Main Conclusions

Our thesis that macro policies can stimulate growth, make it easier to undertake deep reform, and the latter can reinforce growth allowing it to reach potential is supported from the growth stimulus following the stable softening interest rate regime, rise in infrastructure spending, and from a systematic examination of the causes of the uneven growth and the slowdown of the Indian economy after the-mid nineties.

The results of simulations with a dynamic model suggest that the economy was ready to move to higher trend rates of growth by the end of the century, but shocks delayed the higher growth phase. Although excess demand was absent, the fall in inflation was due more to a fall in costs and improvements in productivity. Therefore a revival in demand need not be inflationary.

Moreover, nominal interest and exchange rates have shown much larger relative variation in the reform period and *correlations of private investment with nominal interest rates are high and negative*. A steep rise in nominal interest rates reduces the net worth of firms and raises risk aversion. High and fluctuating nominal rates may have added to shocks and their endogenous amplification, coordinated expectations to low growth paths, and thus reduced private investment. In the nineties, short-term nominal interest

rates were raised in periods of expected depreciation of the currency, and affected long-term rates with a lag that is reducing. Reducing volatility in nominal exchange rates was achieved initially at too great a cost in terms of monetary tightening and adverse expectations. *The second factor raising uncertainty was that exposing manufacture to international competition was delayed too long.*

Indian nominal interest rates fell smoothly especially since 2001, despite high government deficits, and aggressive sterilization, showing the leeway that existed to reduce interest rates. But inflation fell even faster so that real interest rates remained high, even as growth still did not recover. *Arbitrage gaps and continuing poor absorption are part of the reason for the huge accumulation of forex reserves after January 2002.*

Despite widespread reforms higher risk aversion also affected the financial system, so that it could not fully contribute to diversify risk, improve credit availability to industry, and intermediate savings effectively for investment. The share of industry in annual non-food gross bank credit fell drastically over the period, while stock markets suffered from a series of scams and the absence of the small investor.

The key to using inflows more productively are mechanisms that lower risk and uncertainty facing firms and households. The improvement in macroeconomic policy has begun to yield results. Robust business expectations and a fall in risk aversion of firms and financial institutions, as net worth rose with the fall in nominal interest rates, offer a window of opportunity. A fall in nominal interest rate helps even if real interest rates do not follow fully. The boom in share markets can be used to attract retail investors back by offering PSU shares at attractive prices, while leveraging the improvement in microstructure and regulation. Improving credit delivery to small enterprises, stimulating activity, lowering import tariffs, smoothing interest rates close to international rates, keeping exchange rates competitive and encouraging hedging of exchange risk will absorb reserves and bring us closer to our potential growth. The focus should be on reducing the revenue deficit while infrastructure spending is maintained. If interest rates are low and tax revenues rise with activity the revenue deficit will improve, thus reducing

the fiscal deficit. The rise in real interest rates and fall in growth rates were responsible for its stubborn rise over the past few years, just as reverse trends have allowed the fiscal deficit to fall for the first time in years.

Trend or Shocks

Over the period 1997-03 the average real GDP growth rate was 5.3 per cent per annum compared to 7.4 in the three preceding years. So our first puzzle is:

P1: Is the new trend rate of growth of the economy around 5 percent or is it above 7 percent?

To begin addressing this question we will first examine whether there has been a fall in the trend rate of growth, or if the decline in performance was due to shocks.

Table 12.1 shows the fluctuations in growth, aggregate as well as sectoral, the secular fall in inflation, and in interest rates.

Place Table 12.1 about here

Table 12.2 documents the range of shocks that hit the economy after the mid-nineties. But they were absorbed without a major slump. It is a sign of a mature economy that asymmetric or sectoral shocks do not have aggregate effects. Since we are still not fully mature the shocks were able to lower growth rates below potential, although the intensity of their effects has been falling, especially after 2000 (see Box 12.2).

Place Table 12.2 about here

"Diversity plus shocks" is a useful framework for interpreting India's performance¹. The hypothesis is that increasing diversity has helped us grow despite repeated shocks over 1995-2002. One sector covered for shocks affecting another; openness and the size of the country both increased its diversity. Openness can be a source of shocks itself, but it is also a source of diversity. Even so better policy could have moderated the shocks.

Countercyclical macro policy can be used to neutralize temporary shocks, but it has not really been practiced in India. The fall in public and fluctuations in private investment are one factor that has prevented us from reaching our full growth potential. Monetary policy has also been periodically tightened to defend the exchange rate. Business has been waiting for stability in order to begin investing, and the government could have done more to provide it. Even so, business has begun to believe in the future, after waiting so long in fear of a collapse that did not come. Our model (Box 12.2) shows that the economy was ready to shift to a higher growth trend in 1999-00, industrial growth had also revived (Table 12.1), but a number of shocks hit the economy from 1999 (Table 12.2), including a temporary monetary tightening in July 2000.

Growth estimate for 2003-04 is 8.1%, since all three sectors did well. Exports began to rise even when the global slowdown was not fully reversed because firms had been restructuring, raising firm level efficiency and competitiveness, and turning to global markets when domestic demand was insufficient. This is especially evident in the sunrise sectors, but also holds more generally. The pick up in global demand will benefit industry. The view that Indian manufacturing would collapse under competition was too hasty. The production and import of capital goods has also perked up, a sign that the excess capacity built in the mid-90s has been absorbed, and investment may rise.

Agricultural exports have not done as well as expected and fluctuations have occurred, but fruits and vegetables exports seem to have been consistently growing. These have good employment potential. Private investment in agriculture has been rising in the

¹ The term was first used in comments as a discussion on NCAER's Mid-year Review of the Indian Economy 2002-2003 (see Vohra (ed.) 2003), and in Goyal (2002).

nineties, after a fall in the eighties. Agriculture's good performance in 2001-02, after two preceding lean years, and the 9 percent growth in 2003-04, counters those who saw structural problems, and doubted if agriculture would grow rapidly again unless these were removed. This is not to deny that major reforms are required in agriculture.

Services have consistently done well. But there is a view that the boom in services is temporary, due to the Fifth Pay Commission bonanza (Acharya, 2002). But banking and financial services are the part of services whose share has increased the most comparing the 80s to the 90s, while the share of public administration remains the same. Therefore there are long-term changes in services, due to these new growth sectors.

Other structural factors are favourable. There is a sharp improvement in the literacy rate, which is now above 65 percent. The poverty ratio has also fallen, narrowing the gap from East Asia in these basic attributes of human capital. Demographic changes also favour India. The proportion in the age group 20-59 has been at 35% for the past two decades. An ADB study estimates that it will increase to about 47% by 2010. This is the most productive age group and countries with a higher share of population in this group have done well if they are equipped with skills and jobs.

The endogenous growth literature finds that on starting modern growth, countries grow at rates similar to industrial country growth rates. But when they reach a critical threshold² if the country is far behind the current industrial leader, it grows rapidly. Reasons for such faster catch up are openness to new technology and more efficient forms of organisation. At the threshold level there is sufficient critical mass; networks of markets and associations are dense, so that transaction costs fall. Tacit hands on learning and quality can rise rapidly. Moreover information and communication technology (ICT), in which India has developed some expertise, helps in the rapid spread of best practices, and can improve transparency and governance. ICT allows independence and networking to go together. New decentralised yet efficient forms of organisation become feasible. The

² Prescott identifies this as around ten per cent of the 1985 US per capital income level. In purchasing power parity terms China reached this in 1992, India in 1999 (see Goyal, 2001a).

association of India with poor quality has changed as Indians learn from, benchmark and compete with the best in the world.

Therefore our answer to P1 is that shocks lowered the rate of growth below trend, the economy is showing greater resilience to shocks, but support is required from countercyclical policy.

Another indication that the economy has been performing below potential is the absence of excess demand pressures. There has been a decline in the inflation rates in this period (Table 12.1). The second puzzle is:

P2: Is the fall in inflation due to low demand or is it due to a fall in costs and improvements in productivity?

Among components of demand, broad money growth has been flat in the nineties. The fiscal deficit is large but since the government spends more on non-tradables, this and foreign inflows, should raise non-tradable prices, and appreciate the real exchange rate. But the latter has largely depreciated. Among cost-push factors, in the late nineties, food prices were steady (Table 12.1), since they approached falling world prices and buffer stocks were large. Table 12.1 shows the inflation peak in 2001-02 coinciding with the rise in oil prices. The table and Figure 12.1 show industry's falling contribution to inflation, which indicates a rise in industrial productivity since the weight of manufacturing in WPI has risen from about 50 to 64 in the current series with base 1993-94. The sensitivity of industrial inflation to agricultural inflation is further evidence of cost-push factors affecting inflation. Our tentative answer to P2 is that excess demand was absent, but supply side factors were important implying that inflation could continue to be low even if demand rises. With higher growth, more activity will shift to better technology and more efficient processes; costs will continue to fall. As these trends are understood, and low inflation rates persist, inflationary expectations will also fall.

In 1998-99 the decision not to tighten monetary policy when inflation peaked with certain food prices turned out to be correct as inflation fell (Jalan, 2000). Similarly inflation fell again as the oil shock wore out, without a sharp tightening in monetary policy, both in 2000-01 (Table 12.1), and in early 2003-04.

Place Figure 12.1 about here

We have seen some of the beneficial effects of openness. These are examined systematically below.

Openness and the Current Account

A key post reform feature was the availability of foreign capital to boost domestic savings and make higher investment possible. With more access to international capital markets it was possible for investment to exceed domestic savings. Of course foreign inflows contribute through technology spillovers and improvements in efficiency, apart from boosting resources for investment.

Using foreign savings requires a temporary³ widening of the CAD of the balance of payments. But this has not happened. On the contrary, the current account (CA) moved into surplus for the first time in 2001-02, partly because of the large inflow of invisibles from exports of services.

P3: Why have foreign inflows lead to a shrinking CAD and rising foreign exchange reserves rather than contributed to a rise in investment?

This is a central puzzle facing the economy and we will keep returning to it. In order to address it, we first need to develop the rudiments of the determinants of the CA.

³ The period can be shorter under a vigorous export boom. For example China ran a deficit in the eighties but a substantial surplus thereafter.

The CA is defined as the acquisition of foreign assets by domestic residents minus foreign residents' acquisition of domestic assets. If this is positive the CA is in surplus (CAS). The basic macroeconomic identity, that income must equal expenditure, implies that the CAS must equal both net exports of goods and services, and also gross national saving (GNS) minus investment (I). GNS is calculated by subtracting consumption from gross national product (GNP). That is, from gross domestic product (GDP) with income payments to abroad subtracted from it. The popular conception of CAS is identified with the net exports of goods and services.

Modern theory brings out the underlying determinants of CAS in the forward-looking decisions of consumers and firms⁴. The latter's investment decisions depend on the discounted present value of future profits (or Tobin's q), so that expectations of the future are important. Consumers seek to smooth income over time, if capital markets permit it. Savings fluctuate to smooth consumption and therefore absorb temporary shocks to income. Any permanent positive income shock should result in a rise in smoothed consumption while, with any temporary shock, savings will also adjust in order to maintain smoothed consumption levels.

It is also a tautology that a CAD must equal the capital account (comprising all types of capital inflows) minus any rise in foreign exchange reserves. The latter are the balancing component and are affected by the monetary and exchange rate policy being followed both directly and indirectly through the effect of these policies on investment and consumption. Investment is the most volatile component of expenditure and expectations of the future can be particularly volatile in a reforming economy. The major shift in perspective the intertemporal approach to the BOP brings is that it makes clear that the CA depends on macro policies affecting GNS and I, and not on trade policies.

Place Table 12.3 about here

⁴ Sachs (1981) first worked out this theory, in the context of the large CA deficits that some nations ran in order to smooth consumption, after the oil shocks. The area is surveyed in Obstfeld and Rogoff (1995). They were instrumental in developing it further.

Thus in Table 12.3 the trade balance and net invisibles add to the CA, which in turn must equal capital inflows (the capital account) plus monetary adjustments including changes in reserves. The table shows the steady rise in non-debt creating foreign investments such as foreign direct investment (FDI), foreign portfolio investment (FPI) and also debt creating inflows such as NRI balances. The latter are more volatile. Ever since 1991-92 the capital account surplus has been larger than the current account deficit (CAD) thus adding to the reserves.

In a developing country with incomplete capital markets, without full capital account convertibility, or access to world capital markets, forward looking decisions will be severely constrained. Intertemporal optimization theory can give only a rough benchmark, but still it can help explain a more open India's CA. In the 1950s and 60s there were some aid inflows but foreign inflows into the economy really started with the influx of remittances from the mid-seventies.

Heightened uncertainty under reform implies that the precautionary motive for savings dominates. But if reform is credible and successful, it is associated with a positive productivity shock. This should raise investment financed by foreign inflows that come in to take advantage of the higher productivity. Since future incomes are expected to be higher, current consumption will also rise to higher smoothed levels. Box 12.2 briefly outlines a model that makes possible an analysis of the effects of openness on investment and savings behaviour. It shows that both savings and investment are affected, and in times of high growth both rise together, with the rise in investment exceeding that in savings. Openness makes the latter feasible.

Box 12.2: Modeling India's openness to the rest of the world.

A general equilibrium model with optimizing risk averse firms yields insights on the effect of Indian reforms on consumption and investment decisions and therefore on changes in the CAD over time. In the model, high investment may lead to instability but choice of a mark up (which decides the profit share) restores stability and maximise

expected profits for the risk averse representative firm. The model is reduced to two dynamic simultaneous differential equations, one based on goods market clearing (whereby savings are equated to investment), and the other giving the firm's pricing decision. The model is calibrated using Indian macroeconomic time series from the sixties onwards. Foreign inflows, which affect S, I, and close the gap between them, play a major part. The discipline comes from the necessity of reproducing the historical series. The latter gives endogenous estimates of the parameters. Changes in savings and investment coefficients imply a change in the output growth rate. Large shocks and endogenous responses can imply a switch from a high to a low growth path. A coordinated switch of business expectations magnifies the effects of the shocks. This makes the model relevant to our debate trend versus shocks. Work on extending the model for the current period is going on, but some preliminary results are reported. Table 12.4 reports changes in some key coefficients of the model.

Place Table 12.4 here

Points to note are:

- Calibrated parameters values were stable for much longer periods before the nineties. More frequent parameter changes in the nineties indicate the presence of shocks large enough to affect trends. The pre-nineties break periods were also all associated with changes in the degree of openness and foreign inflows (for example, remittances in the seventies), suggesting the usefulness of the dynamic CA approach and foreign savings in understanding Indian economic performance.
- The decline and stagnancy in public investment, with a minor reversal towards the end of the century; the large fluctuations in both domestic savings and investment in the reform period.
- Private investment rises when expected future output and productivity rise. Savings should fall if consumption is smoothed under these conditions of a credible rise in future incomes. But the rise in consumption, in a developing country, would be moderated by the lack of access to credit, and the precautionary motive for savings. Therefore despite the availability of foreign savings domestic savings and investment

would be positively correlated (they do move together, that is, there is a positive correlation of 0.6).

- The best conditions for growth occur when rise in calibrated investment parameters exceeds that in savings. Such conditions were there during the growth burst in the mid-nineties and during the end of the century. If growth continued to falter in the new century the reason may lie in the concentrated series of external shocks and financial scams that hit the economy in this period (see Table 12.2). Increasing ability of the economy to absorb shocks implied that growth remained positive, the changes in parameters and the endogenous magnification of shocks was reduced.

The model was initially calibrated for the pre reform ending in 1984-85. In the first extension to the post reform period (see Goyal, 1999) data to calculate historical profit shares for the non-agricultural sector was not available. Assuming that the reforms would lead to a rise in competitiveness, a fall in the competitiveness parameter was built in, which implied decreasing profit shares. Total profits could still rise if capacity utilization rose. Recent survey data from the NSSO (2001)⁵ allowed a calculation of the profit shares. It was a surprise to find that these had actually risen in the nineties and were just beginning to fall in 1998-99. Therefore in the new simulations, the estimated competitiveness parameter was raised. This implied a fall in competitiveness or rising profit shares (Table 12.4).

Perhaps productivity had improved in the reform period, but competitiveness had not. Since the manufacturing slowdown had continued over 1997-2002, there were many reports that Indian manufacturing was dying from fear of the Chinese dragon. But its reversal in 2003 was characterized by Indian companies that had restructured, improved quality, and become fit for global competition (see, for example, Ninan, 2003). The simulations suggest that the problem was not too much competition but too little. Continued high duties as well as the blanket depreciation protected Indian industry, and only as the deadline for reduction in duties approached and quantitative trade restrictions

⁵ I am grateful to Jeemol Unni for sending me this data and to Arvind Kumar Jha who did the calculations.

were removed in 2000, Indian manufacturing woke up and showed what it could do. Faster duty reduction may have brought about this desirable outcome earlier.

This section suggests that the central issues to answer P3 are risk aversion and adverse expectations resulting in the absence of a vigorous investment boom. The key to using inflows more productively would seem to be mechanisms that lower risk and uncertainty. Before addressing this, we turn to the role of the government deficit. Did it contribute to adverse expectations or crowd out private investment?

The Twin Deficits

In an open economy, a fiscal deficit should spread to a current account deficit but it has not. The absence of these twin deficits is the next puzzle.

P4: Why has the large fiscal deficit not led to a rise in the current account deficit?

On introducing government, a static derivation from macroeconomic identities gives the CAD as the excess of I over S plus the excess of government expenditure over taxes. So as government expenditure exceeds taxes, unless I falls or S rises, the CAD will widen.

Under simplifying assumptions of low holding of international wealth by domestic residents, a one good economy, and a rate of discount equal to the international interest rate, the theory of the dynamic CA gives the following equation (Obstfeld and Rogoff, 1995):

$$CA_t = (Y_t - \bar{Y}_t) - (G_t - \bar{G}_t) - (I_t - \bar{I}_t) \quad (1)$$

Bars over the variables denote average values. Thus when government expenditure (G) is above its average level the CA should go into deficit (become negative) as citizens borrow abroad to smooth their consumption during the period of higher than average

government expenditure. But if the increase in government expenditure is regarded as permanent, smoothed consumption should fall.

Under credible reform and a permanent productivity shock both C and I would rise and S may rise or fall depending on the size of the productivity shock and the degree of incompleteness of markets. In India of the nineties the adjustments in S and I (see Box 12.2) dominated the rise in G. Moreover, the rise in government spending took the form of subsidies and transfers to households, which in the reform environment may have been regarded as temporary. In order to smooth consumption over time, savings should rise if subsidies are regarded as temporary. Savings did rise in some periods, and investment did not rise as much as it could have, suggesting risk aversion and poor credibility of reform.

Apart from the distinction between temporary and permanent shocks, changes in taxes and subsidies, it is necessary to move beyond the one -good assumption and bring in the presence of non-traded goods to understand the absence of the twin deficits (Baxter, 1995). Since traded goods dominate in I a rise in I would have required a widening of the CAD. But I was low, and Government spending, which falls more on non-tradables was high. All these arguments explain P4.

P5: Did the high fiscal deficit raise interest rates and crowd out private investment?

P5 is a very common assertion. But since sufficient domestic and foreign savings were available in the economy to compensate for government borrowing the latter was not the reason for higher Indian interest rates. G did not directly crowd out private I. Moreover, the forward looking optimization approach implies that to the extent agents foresee the implications of government spending, and compensate for it, fiscal deficits have no effect on interest rates. Government expenditure on non-tradables and foreign inflows should have raised non-tradable prices, but inflation fell. This again points to the absence of excess demand in the economy. It is not surprising that the fiscal deficit did not cause a disaster.

The arguments in Box 12.3 suggest that a reduction in real interest rates and a rise in growth is the best way to reduce government deficits and it was the converse movements in these two variables that were responsible for rising fiscal deficits in the late nineties. Indian interest rates have fallen, especially since 2000, despite high government deficits, and aggressive sterilization, showing the leeway that existed to reduce interest rates.

Box 12.3: What is the Government's Primary Deficit?

Since there are many problems in data and definitions and these also affect measured values of deficits, we obtain a simple aggregate measure of the primary deficit (PD), which helps to bring out the contribution of changing real interest and growth rates. The public debt income ratio $b = B/PY$, where B nominal debt is divided by nominal GDP (at market prices to the base 1993-94, denoted by PY). Public debt increases in any year by nominal interest payments on debt plus the primary deficit $PDPY$, where PD is the ratio of the primary deficit to nominal income. $PDPY$ is defined as the non-interest budget deficit, while the fiscal deficit includes interest payments and is the total government borrowing requirement, or excess of expenditure over taxes.

Simple algebraic manipulations using the definition of B , of PD , and that the real interest rate (r) equals the nominal interest rate (i) minus inflation; imply that the change in b equals $b(r-g) + PD$, where g is the growth rate of real GDP. The relationship is intuitive since it says that the public debt ratio will rise with the PD , the real interest rate paid on past debt, and fall with the rate of growth of GDP, which is its denominator⁶.

This relationship gives a simple way to calculate the PD ratio as the change in b minus $b(r-g)$. We calculate this ratio for two estimates of r . One derives i from actual government interest payments iB divided by B , and the second uses annual weighted average data on the interest rate on government securities (RBI, 2003). Inflation calculated from the GDP deflator is then subtracted from both estimates of i , in order to

⁶ See Dornbusch and Fischer (1998) chapter 19, Appendix, pp. 595-6, for this simple derivation.

get r . The two calculated series are graphed, together with the Gross PD reported in government budget documents, in Figure 12.2. Points to note are:

- The Gross PD lies approximately between the two calculated series until before 2001-02, after which it is considerably higher than both. It needs to be investigated why the reported figure fails this simple consistency check.

Place Figures 12.2, 12.3 here

Perhaps Figure 12.3 can provide part of the answer. This graphs rb (with both the calculated real interest rates) and gb as percentages of the Gross Fiscal Deficit ratio (GFD). The first gives the contribution of real interest payments towards raising the GFD, and the second gives the contribution of the growth rate towards lowering it. The change in b already includes, and partly arises from PD. Therefore br which raises the PD has to be subtracted from the change in b , and bg which reduces the PD has to be added to the change in b , in order to estimate the PD from the change in b . Interest payments recorded in the budget document are lower than those calculated from weighted average interest the government pays, accounting for the ordering of our two r series. It is in 2000-01 that the effects of rising real interest rates (in both the calculated series) in raising the GFD decisively overtake the contribution of growth towards lowering it. Therefore the negative adjustment in our calculation rises from that year. The PD has to be lower than that reported by the government to be consistent with the recorded change in government debt. Therefore the following puzzle arises:

P6: If the government actually paid out any of the two calculated interest series, the change in debt should have been much higher.

If the PD as reported is correct, then the Government must be paying less interest on its debt than either of our two interest series. Perhaps some of the government interest payments are to its own departments, and therefore do not add to its debt. In order to

answer P6, how much interest the Government actually pays out needs to be investigated more fully.

Other points to note are:

- Although nominal interest rates on government securities have been falling steadily (see table 12.1), the real interest rates have risen sharply over 1998-02, as inflation fell, and their average is above 6 percent. During the same period average growth was 5.6 percent. Thus in this period the rise in r and fall in g explain the rising GFD. This point is brought home even more starkly with the implicit r calculated from actual government interest payments. This was negative earlier, became positive in 1996-97, and averaged 4.43 over 1999-02. Everyone was emphasizing the benefit to the government of falling nominal i in this period, but the government was actually paying the highest real interests in the decade!
- The government acquired cheap credit in the repressed financial system earlier but its borrowings are much more expensive now. This is reflected in a debt ratio which fell to a low of 0.49 in 1996-97 (coinciding with peak growth rates) but rose after that, more rapidly in the last few years, reaching 0.6 in 2001-02. PD calculated with government securities interest rate lies below that calculated with interest payments, and lies above the other in contributions to GFD. This suggests the government is still using some cheap credit options.
- The main culprits for the rise in b are rising r and falling g , not current government profligacy in high PDs. Moreover, the tax ratio has fallen although expenditure has been contained. But in a regime of more variable interest rates active management of government borrowing can reduce its interest costs.
- It follows that lowering r and raising g will help to substantially improve the GFD.
- A small primary surplus and $g > r$ will make the government debt sustainable. It is easy to see this using the figures from the vote on account 2004. The PD ratio was 0.3, $r = 6$, $g = 8$. Our formula implies that in the steady-state when b is not changing, $b = PD/g-r = 15$ percent. Contrast this with the current b of above 60 percent! Improved growth can easily reverse outcomes.

Investment Fluctuations

Since investment fluctuations have been traced as the primary explanation for P3, and it has been established that these were not due to crowding out by government borrowing, we want to look for other factors affecting these. One way of finding these factors is a comparison across decades.

P7: What caused the uneven behaviour of investment in the post reform period?

Place tables 12.6, 12.7 about here

Summary statistics for the 1980s and 1990s⁷ (Table 12.6) show the qualitative changes that have taken place between the two decades. Public sector investment has been trending downwards in the 1990s. It was around 10 per cent as a ratio to GDP in the late eighties and had fallen to six per cent by the end of the decade. Was this decay compensated by a rise in private investment? The average decadal share of investment in GDP went up from 12.06 in the 1980s to 15.33 in the post ninety period, partially compensating for the fall in the corresponding public investment share from 9.98 to 7.59. But since private investment was already at around 14 per cent in the last years of the 1980s, the rise in the 1990s has not been that much. And there have been much more fluctuations. The standard deviation of the decadal ratio has gone up from 1.39 to 1.53 (1.6 for the period 1990/91-1998/99). The standard deviation and coefficient of variation of public investment was also higher in the reform period.

What has caused these fluctuations? The fall and fluctuation in public investment was first due to ideology, and continues due to the lack of resources with the Government. But what affected private investment? Two variables, whose fluctuations have influenced macroeconomic outcomes in the past, are agricultural output and oil prices. But the

⁷ Similar statistics were presented in Goyal (2000) although in those calculations the data for the nineties were available only until 1998-1999. Since the later years were smoother the fluctuations were even more pronounced in the earlier calculations. Moreover, the data used now consistently have 1993-94 as the base year; the base earlier was 1980-81.

variation in both of these was lower in the 1990s compared to the 1980s. Therefore they cannot serve as the explanation. And correlations of current and lagged private investment with agricultural rates of growth are indeed lower in the 1990s compared to the 1980s. Correlations measure the extent to which variables move together and whether they move in the same (positive) or opposite (negative) direction.

The factors that have shown much larger relative variation in the reform period are nominal interest and exchange rates. Since nominal interest rates were rigid in the 1980s, variation in real interest rates was entirely due to that in inflation. This variation was larger in the 1980s, since nominal interest rates were not free to respond to expected or past inflation. Industry is concerned with purchasing power of the goods it produces. Therefore real and not nominal interest rates should influence investment. If interest rates rise, investment should fall, so that the correlations are expected to be negative.

Correlations of private investment with the lagged nominal call money rate and the nominal and real prime lending rate of the Industrial Development Bank of India are shown in Table 12.7. They throw up a puzzle.

P8: In the post reform period, correlations of private investment with nominal interest rates are high and are negative.

P8 suggests a possible answer for P7 in the effect of nominal interest rates on investment, but P8 is itself a puzzle. P8 can be explained if a steep rise in nominal interest rates raises uncertainty and reduces the net worth of firms. Under asymmetric information and the inability to fully diversify risk, a fall in the net worth would reduce activity. Stiglitz and Greenwald (2003) argue that nominal interest rates often outperform real interest rates if both are included in an investment regression, for these reasons. High nominal rates may have added to shocks and their endogenous amplification, coordinated expectations to low growth paths and thus reduced private investment. In the 1990s, short-term nominal interest rates were raised in periods of expected depreciation of the currency, and affected

long-term rates with a lag that is reducing. The correlation of both the nominal interest rates with rupee depreciation is above 0.6.

Real interest rates are positively correlated with investment because with rigidities in nominal rates, real interest rates rise when inflation falls, and inflation is negatively correlated with investment. The latter correlation is further support for cost-push being the dominant cause of Indian inflation.

Our results are preliminary since bi-variate correlations do not necessarily imply causality. But they do suggest that excessive interest rate volatility may have harmed investment. Monetary authorities may have done better with an exchange rate policy that would have reduced the necessity to resort to frequent monetary tightening.

Monetary Policy, the Term Structure of Interest Rates, and Expectations

Monetary policy is committed to a soft interest rate regime, and especially since 2001, after the implementation of the liquidity adjustment facility (LAF) domestic short-term interest rates drifted downward steadily. This spread to long-term rates and flattened the yield curve by 2003. The bank rate was reduced from 11 per cent to the current 6 per cent over a period of five years.

But the other prime aim of monetary policy has been to prevent volatility in the exchange rate. Bi-annual policy statements carried stern warnings that interest rates could be reversed whenever necessary depending on the evolving situation or adverse external circumstances. In practice reversals were carried out only to defend the exchange rate⁸. The last such episode occurred under pressure on the rupee, from mid-May to early August 2000, when the rupee depreciated by about 3 per cent against the dollar, together with a net outflow by FIIs. The RBI reversed direction drastically in July. The Bank Rate, the CRR and short-term repo rates were all increased.

⁸ The severe credit squeeze that followed the first episode of exchange rate volatility in 1995-96 helped trigger off the sustained slowdown (see Goyal, 1997).

There is a tradeoff between variability of nominal exchange and interest rates. Although the Reserve Bank wants to be free to raise nominal interest rates sharply anytime to quell excess volatility in exchange rates; it could make it clear that such a rise, if at all it occurs, will hold only for a very short time, which is sufficient to contain speculative activity against the exchange rate.

Sudden sharp changes in interest rates disturb financial markets too much. Greenspan, for example, cuts the nominal interest rate only 25-50 basis points at a time. The advantage of smoothing, or successive cuts in the same direction, is that markets internalise future cuts, the expected real interest rates fall, and stimulatory effects of lower interest rates are realised even before the rates themselves fall. Thus taking markets into confidence helps monetary policy achieve its purpose⁹. In the Annual Monetary Policy Statement for the year 2002-03 (Jalan, 2002) a warning was given of a possible future 50 basis point cut, and this did help nudge the longer-term interest rates downwards. The statements rightly warn that most countries make frequent changes in response to events, and this should be expected here also. But other countries adjust monetary policy to suit internal requirements. Since our interest rates have been too vulnerable to exchange rate fears, policy was unable to remove self-fulfilling pessimism that has the economy performing below its potential.

Current international research is supporting managed exchange rate regimes compared to the earlier emphasis on floating or currency boards. To that extent the RBI's "muddling" regime, is validated. A muddling regime is not like an exchange rate target and gives some flexibility to achieve other targets. The RBI's interventions did successfully quell excess volatility but they led to a steady accumulation of reserves and to one way movement of the rupee. More genuine two way movements in exchange rates would develop the forex market and give the RBI more freedom to tailor interest rates to domestic needs. If low managed exchange rate volatility makes smoother interest rates more feasible it would be better for markets and activity. It is easy to hedge small

⁹ Some of these arguments were made in a series of articles on monetary policy, largely in the Economic Times. They are available at <http://economictimes.indiatimes.com/search.cms> and at www.igidr.ac.in/~ashima. The point on interest smoothing was first made in Goyal (2001b).

exchange rate movements, and interest rates have a much wider impact. Markets see what the RBI does, not only what it says, so the softened tone, together with the absence of a reversal since 2000, has contributed to expectations of lower interest rates and an upswing in activity.

The RBI is open to ideas and welcomes the debate on exchange rate regimes. There is, however, a genuine fear of excess volatility in shallow Indian forex markets (Jalan, 2003). But the RBI has such large reserves and clout in the market, that any intervention by it would be respected as a credible signal of future movement.

P9: What explains the huge accumulation of forex reserves of above 30 billion dollars in 18 months over January 2002 to August 2003?

The answer to P9 is partly that arbitrage occurred at different points of the interest rate spectrum, and aggressive sterilization maintained positive interest gaps, thus attracting more inflows, but reducing the stimulus to activity that would have absorbed some of the inflows. Even the LAF was used largely for absorbing liquidity.

Movements in Indian interest rates continue to be uneven with banking spreads, prime lending rates (PLRs) and savings deposit rates resisting downward movement. In an open economy the gap between Indian and foreign interest rates also affects foreign inflows, and if rigidities prevent the gap from closing it further encourages the accumulation of reserves. But the size of the gap, its resistance to policy and its effect on arbitrage vary at different points on the interest rate spectrum. If domestic short interest rates exceed international rates (see Box 12.4), arbitrage occurs at the short end of the interest rate spectrum. It is possible to make money by borrowing dollars, selling them spot for rupees, lending the rupees, and then selling the proceeds in the forward market for dollars. At the longer end, two major sources of arbitrage are corporates borrowing abroad, and NRI's depositing money in India¹⁰.

¹⁰ These arguments were first made in Goyal (2003).

Despite the downward drift in the call money rate, ever since the US recession international interest rates fell faster--so the gap between domestic and international rates rose. Since the end of 2001, the excess of our annual call money rates over those of the US, at plus 4%, was back to 1998 levels. In October 2001 the average gap in monthly rates became double its average value over the past year. It is probably not a coincidence that in 2001/02 the increase in forex reserves as a percentage of GDP doubled to 2.5 compared to 1.3 in the previous year. Since forward premiums also fell this year, the interest gap minus the forward premium became positive for the first time. Transaction costs and other barriers have been falling therefore there were probably some opportunities for riskless arbitrage at the short end. Even if some interest rates are resistant the RBI can affect short rates through indirect market based instruments that have become more sophisticated.

Box 12.4: Arbitrage at the short end

Arbitrage implies two relationships that must hold in forex markets. *Covered interest parity* (CIP) implies that the forward premium (fp) on any currency must equal the interest gap between the two currencies. Thus $fp = i - i^*$, where both refer to the same time period. If $i > fp + i^*$, riskless profit can be made by borrowing the foreign currency at i^* , buying the domestic currency spot, investing it at i , and then selling in the forward market. There is a band determined by transaction costs, and profit opportunities lie outside this band. In Figure 12.4, the $i - i^* - fp$ graph, for one-month rates, lies close to the X-axis. This normally lay below the axis since the fp was large. Since actual depreciation was less than the fp sellers of dollar forwards made money. From March 2003 the curve is consistently above the x-axis because the fp fell and world interest rates were softer than domestic. Since transaction costs were also falling there were opportunities for riskless arbitrage, although the latter were limited by quantitative restrictions that were increased. Moreover, arbitrage occurs only for i , i^* and fp involved in actual dealer transactions not the average values reported in Figure 12.4 or in Table 12.5.

Place Figure 12.4 here

If prices fully reflect market information so that no trader can earn excess returns from speculation *uncovered interest parity* (UIP) must hold. That is, expected depreciation (ed) must equal the interest gap, $ed = i - i^*$, again for the same time horizon. UIP implies that the opportunity cost of holding the two currencies is equal. Assuming CIP, UIP implies $fp = ed$, since the $i - i^*$ term cancels out.

But market efficiency is actually a joint hypothesis of rational expectations and risk neutrality of market participants. If a risk premium is allowed for then it becomes a joint hypothesis of equilibrium returns including a risk premium (rp), and rational expectations. Including rp , UIP is written as, $ed + rp = i - i^*$. Now if CIP holds, UIP implies, $fp - ed = rp$. Assuming depreciation equals its expected value, ed , Figure 12.4 graphs both $fp - d$, and $i - i^* - d$, giving two estimates of rp . To the extent expectations are not rational, or lack of full capital account convertibility puts restrictions on transactions, the estimates measure something apart from a pure risk premium. The graph shows that the two rp series are very close. It also shows the decline in the volatility of rp over the years. This reduction in risk and volatility has been a major success for monetary policy.

Place Table 12.5 here

In Table 12.5, at the one-year frequency, the two estimates of rp are not that close because even more averaging is involved. But the table clearly shows that the gap under CIP is higher than it has been since 1998, suggesting arbitrage opportunities and explaining the rise in quantitative restrictions imposed by the RBI. It shows the reduction in volatility and amount of depreciation, and the appreciation in 2003. The fp was steadily falling and so was i , but since the fall in i^* was even higher, $i - i^*$ rose above its 1998 level. The annual rp in 2003 was as high as it has been in 1995. If rp was constant then UIP together with a positive interest differential implies an expected future depreciation, which is equally dangerous and raises risk.

Depreciation had largely exceeded the gap in domestic and foreign inflation, $p-p^*$, so that the rupee remained competitive, but if appreciation continues, overvaluation becomes a possibility.

At the longer end, blue chip firms can access cheap loans abroad. A fixed or appreciating currency, domestic interest rates that exceeded international ones, implying large short-term foreign borrowing by domestic entities, was the recipe for the Asian currency crisis. In 2003 the RBI was forced to put a ceiling of 100 million dollars on the amount that firms could borrow abroad.

Second, NRI's can hold money in Indian banks either in foreign currency deposits (FCNR (B)), or in rupee NR (E) deposits. In the first banks bear the exchange risk, in the second the NRIs do. Since the rupee was appreciating in 2003, there were huge inflows into NR (E) deposits. FCNR (B) deposit interest rates were subject to a ceiling of global rates, but for NR (E), on July 10, BOI was offering the same interest rate (of 5 percent for less than 3 years and 5.25 for 3 to 5 years) as on domestic deposits. An NRI could earn much more compared to very low US rates, as well as gain from rupee appreciation. Lower deposit rates reduce costs for banks, but one bank will not cut rates unless others do, competition affects other services offered. On 17th July the RBI imposed an interest ceiling, 250 basis points above the libor/swap rates for US dollars of the corresponding maturity, on NR (E) deposits. Pensioners deserve to be protected but NRIs should be content with the interest rates close to those available in their country of residence. At a time of foreign exchange scarcity these deposits met a social objective. In today's time of glut a large interest differential cannot be justified. Table 12.3 shows that NRI deposits had the highest coefficient of variation compared to FPI, and FDI. One of the most desirable components of foreign investment, FDI, does not require a large interest gap. Indeed, insofar as lower domestic interest rates stimulate profitability this attracts more FDI.

Reducing domestic interest closer to foreign is a more effective way of reducing arbitrage and reserve accumulation, compared to clumsy quantitative restrictions that impede the

working of markets. It will also serve to stimulate investment and thus absorb foreign inflows productively.

Credit and Finance

We have examined the effect of volatility in interest rates and in expectations. Although the cost of credit fell, with a fluctuating trend, what happened to its quantity, and other aspects of quality? Was the financial sector able to successfully intermediate household savings and diversify risk for its participants?

Table 12.8 clearly shows the substitution of foreign assets for credit to the government in the RBI's portfolio, and the slight rise in commercial bank's credit to the government as a result. But priority credit to the small-scale sector fell only marginally, and non-food credit has actually risen. Moreover, since large companies are able to access cheap credit abroad there is probably no fall in aggregate credit availability. There is, however, some change in its composition.

Non-performing assets (NPAs) have fallen, and successful voluntary retirement schemes (VRS) together with the securitisation bill have lowered costs for banks. Profits have improved, but spreads between deposit and lending rates remain high and banks continue to neglect the credit needs of small firms.

P10: Why has the share of bank loans going to industry fallen?

Table 12.10 shows that the share of industry in annual non-food gross bank credit has been falling drastically over the period, while the share of other sectors has almost doubled. Prominent among these other sectors are housing and personal loans, reflecting the boom in retail banking. Old customers are being squeezed because of new more profitable avenues. The uncertainty and slowdown in industry may have made banks more cautious. It also reduced the demand for loans. Under re-structuring and improvements in efficiency many firms had become cash-rich and reduced their need for

loans. Since their best customers could raise loans abroad¹¹, banks may have been reluctant to take on the high risk ones remaining. They were now accountable to markets, and had to make provision for high-risk loans. These new trends are impacting credit outstandings more slowly, but small-scale priority sector industries are the major sufferers since they cannot access foreign markets. The answer is to make information intensive local finance available and to remove reservations so that these industries can restructure and become profitable in their own right.

Place Tables 12.8, 12.9, 12.10 about here

Equally serious, in this period, has been the failure of equity markets. Table 12.8 records the fall in market capitalisation and new capital issues since the mid-nineties. The rise in non-transparent private placements, together with the collapse in equity, implied a dangerous rise in leverage and sensitivity to a rise in interest rates in India's corporate sector. Table 12.9 captures the reflections of these changes on the household's savings choices, with a drastic fall in shares and debentures, linked to the fall in the BSE index of stock prices.

P11: What explains the sustained slump in stock markets?

Part of the reason was the succession of scams in the financial sector, documented in Table 12.2. Adverse expectations and the continuing industrial slowdown contributed. Stock indices reflect expectations of future performance, although they do tend to over-react. The thorough reforms in regulation and modernization in market microstructure did reduce transaction costs, but were unable to overcome the negative aspects, partly because of a neglect of the small investor. For example, the fee structure in paperless trading made it very expensive for the small player to dematerialize shares and enter the market. Although regulatory rules were now of international standards their implementation was not adequate to win the confidence of the investor.

¹¹ Goyal and Dash (2000) show that in the presence of a large interest differential, low risk firms raise money abroad, and since high-risk firms are left, banks find it more difficult to reduce loan rates of interest.

In 2003 there was a robust broad based revival with the recovery in industry, as softening nominal interest rates and government spending on roads compensated for continuing shocks. Stock indices rose, the Maruti IPO was a big success and many more IPO's are slated to follow. In December Indraprastha Gas IPO gave a reward of 150 percent premium over the issue price to subscribers. It is instructive that part of the reason for the success of the Maruti IPO was that a large part was reserved for the household sector. Savers are more willing now to return to equity and share more risk, as interest rates have fallen sufficiently to lower returns from debt and deposits. It is necessary to provide them with an adequate array of instruments offering a combination of risk and return. Consumers should be able to choose from a spectrum of low return-low risk to high return-high risk assets.

As households become ready to share more risk, firms and banks have become willing to undertake more risk. The steady fall in nominal interest rates has raised the net worth of both banks and firms, reducing risk aversion. There are huge cash reserves with firms, and banks have reduced NPAs with large treasury profits. Although firms have begun to invest, they still do not need large bank loans. Banks can target households and small firms with innovative instruments, credit delivery mechanisms, and lower PLRs. At last the real and financial sectors may be ready to work in tandem, under watchful regulators, to yield steady and robust growth.

Conclusion

In summary we can say that part of the fall below potential growth was caused by the repeated shocks the economy faced, but the level of diversity has reached levels such that the shocks can be absorbed with less damage. The results of simulations with a dynamic model suggest that the economy was ready to move to higher trend rates of growth by the end of the century, but shocks delayed the higher growth phase. Government policies smoothed some shocks, such as supply-side inflation pressures, but they multiplied others and macropolicies were not sufficiently counter-cyclical.

Although the fiscal deficit is pointed at most often as the source of problems, we find it did not cause crowding out or excess demand pressures, since growth was below potential, and domestic savings rose, while investment did not rise to match the resources available. Other government policies could have played a greater role in smoothing the uncertainties that reduced investment. Reducing volatility in nominal exchange rates was achieved initially at too great a cost in terms of monetary tightening and adverse expectations. Exposing manufacture to international competition was delayed too long.

The softening and smoothing of nominal interest rates helped contribute to the revival, as did government spending on infrastructure. The softening was helped by the fall in international interest rates, but Indian rates did not follow fully and some rigidities remain, which are partly responsible for the accumulation of reserves. A fall in nominal interest rate can have a beneficial effect even if real interest rates do not follow fully. Because we are below potential growth, the reserves are best absorbed by stimulating activity, lowering import tariffs, smoothing interest rates close to international rates, and keeping exchange rates competitive. Lower tariffs will raise imports and make Indian industry even more competitive, and are a good alternative for rupee appreciation which can harm exports. The focus should be on reducing the revenue deficit while infrastructure spending is maintained. If interest rates are low and tax revenues rise with activity the revenue deficit will improve. Robust business expectations and a fall in risk aversion of firms and financial institutions, as net worth rose with the fall in interest rates, offer a window of opportunity. In a more open economy behaviour changes and policy has to evolve, in order to keep pace.

References

Acharya, S., 2002, 'Macroeconomic Management in the Nineties', *Economic and Political Weekly*, April 20, 1515-1538.

Baxter, M., 1995, 'International Trade and Business Cycles', Chapter 35 in *Handbook of International Economics*, vol.III, ed. G.M. Grossman and K. Rogoff, Amsterdam: North-Holland.

Dornbusch, R. and S. Fischer, 1998, *Macroeconomics*, 6th Edition, New York: Tata-McGraw Hill.

Goyal, A., 1997, "Inflation, Exchange and Interest Rates; A Macroeconomic "Rashomon"", in the *India Development Report 1997*, Kirit S. Parikh (ed.), Indira Gandhi Institute of Development Research and Oxford University Press.

Goyal, A., 1999, *Developing Economy Macroeconomics: Fresh Perspectives*, Allied Publishers, New Delhi.

Goyal, A., 2000, 'Why Has Investment Fluctuated in the 90s?', *The Economic Times*, November 2.

Goyal, A., 2001a, 'Reasoned Optimism', *The Economic Times*, June 19.

Goyal, A., 2001b, 'Beyond Money Illusion', *The Economic Times*, November 20.

Goyal, A., 2002, 'A Decade of Diversity and Shocks', *The Economic Times*, November 5.

Goyal, A., 2003, 'Arbitrage and the Interest Rate Spectrum', *The Economic Times*, August 12.

Goyal, A., and S. K. Dash, 2000, 'Real and Financial Sector Interaction under Liberalisation in an Open Developing Economy', *Meteroeconomica*, 15, 3, 257-283.

Jalan, B., 2000, "Mid-Term Review of Macroeconomic and Monetary Developments in 2000-01", *Statement by Dr. Bimal Jalan, Governor, Reserve Bank of India*, April, available at www.cpolicy.rbi.in.

Jalan, B., 2002, "Monetary and Credit Policy for the Year 2002-2003", *Statement by Dr. Bimal Jalan, Governor, Reserve Bank of India*, April, available at www.cpolicy.rbi.in.

Jalan, B., 2003, 'Exchange Rate Management: An Emerging Consensus?', Keynote address at the 14th National Assembly of Forex Association of India, Mumbai, August 14.

Ninan, T.N., 2003, Manufacturing will be Tomorrow's Star, January 11, <http://www.rediff.com/money/2003/jan/11guest.htm>

NSSO 2001, Employment and unemployment Situation, Part II, 55th round (July 1999-2000), May.

Obstfeld, M., and K. Rogoff, 1995, 'The Intertemporal Approach to the Current Account', Chapter 34 in *Handbook of International Economics, vol.III*, ed. G.M. Grossman and K. Rogoff, Amsterdam: North-Holland.

RBI (Reserve Bank of India), 2003, *Handbook of Statistics on the Indian Economy*, Mumbai: RBI.

RBI, *Report on Currency and Finance*, and *Annual Report and Handbook of Economic Statistics*, Mumbai: RBI, various issues.

Sachs, J.D., 1981, "The Current Account and Macroeconomic Adjustment in the 1970s", *Brookings Papers on Economic Activity* 1, 201-268.

Stiglitz, J. and B. Greenwald, 2003, *Towards a New Paradigm in Monetary Economics*, The Raffaele Mattioli Lecture Series, Cambridge: Cambridge University Press.

Vohra, N.N. (ed.), 2003, *Mid-year Review of the Indian Economy 2002-2003*, by Suman Bery and NCAER, New Delhi: Shipra and India International Centre.

Table 12.1: Price and output trends (percent per year)

	Growth rate of real GDP at factor cost				Wholesale Price Index (average basis)					Govt. securities interest	Profit share
	Real GDP at factor cost	Agriculture and allied	Industry	Services	All commodities Inflation	Manufacturing (Weight 63.75)	Fuel, power, light, lubs (wt. 14.2)	Primary articles (wt. 22)	Food articles (wt. 15.4)		
1990-91	5.6	4.6	7.4	5.6	10.3	8.4	12.3	13	11.9	11.41	0.538
1991-92	1.3	-1.1	-1	5.7	13.7	11.3	13.2	18.1	20.2	11.78	0.553
1992-93	5.1	5.4	4.3	5.4	10.1	10.9	14.1	7.4	12.4	12.46	0.567
1993-94	5.9	3.9	5.6	7.7	8.4	7.8	15.5	6.9	4.9	12.63	0.579
1994-95	7.3	5.3	10.3	7.1	12.5	12.2	8.9	15.7	12.7	11.9	0.589
1995-96	7.3	-0.3	12.3	10.5	8.1	8.6	5.1	8.3	8.4	13.75	0.596
1996-97	7.8	8.8	7.7	7.2	4.6	2.1	10.4	8.4	12.4	13.69	0.601
1997-98	4.8	-1.5	3.8	9.8	4.4	2.9	13.8	2.7	3	12.01	0.602
1998-99	6.5	5.9	3.8	8.4	5.9	4.4	3.2	12	12.7	11.86	0.601
1999-00	6.1	0.6	5.0	10.1	3.3	2.7	9	1.1	3.8	11.77	0.598
2000-01P	4.4	-0.4	6.5	5.7	7.2	3.3	28.5	2.9	3	10.95	
2001-02Q	5.6	5.7	3.2	6.5	3.6	1.8	9.0	3.6	3.4	9.44	
2002-03R	4.3	-3.2	5.7	7.1	3.4	2.8	5.6	3.4	1.7	7.34	

Source: Calculated from RBI (2003)

Notes: 1. Inflation rates are calculated from the index numbers of wholesale prices, on an average basis – Base 1993-94 = 100

2. P, Q, R: Provisional, quick and revised estimates from the CSO, source RBI, Annual Report, 2003, and Economic Survey, 2002-03.

3. Profit share calculated as a weighted average of formal and informal sector data on wages and productivity from NSS (47-55th rounds) see NSSO (2001).

Table 12.2: Shocks hitting the Economy after the mid-nineties

Incidents	Date	Details
Exchange rate volatility	October 1995 – March 1996	Sharp extended rise in interest rates and short lived credit squeeze
Asian Currency Crisis	1997	Hightened fear of volatility in currency markets and of capital flight
India's Bomb	May 11, 1998	India conducts three nuclear explosions at its Pokhran nuclear test-site. These include a fission-device, a low-yield device, and a thermonuclear device.
	May 13, 1998	India conducts tests of two sub-kiloton nuclear devices at Pokhran
Sanction	May 13, 1998	President Bill Clinton reported to Congress that he had imposed sanctions on India under Section 102 of the Arms Export Control Act, otherwise known as the Glenn Amendment.
Earthquake	March 29, 1999	Chamoli U.P.
War	May 31, 1999 – June 28, 1999	Kargil War
Cyclone	Oct 18-19, 1999	Orissa, Andhra Pradesh, and West Bengal states
Global Price Shock	October 2000	Oil Price Hike
US Recession	Last quarter 2000 - First quarter 2001	Triggers global slowdown
Stock Prices Fall	Early 2001	Dot Com Burst
Scam	March 2001	Sebi restrains Anand Rathi from trading
Earthquake	January 26, 2001	Gujarat Earthquake
Scam	March 13, 2001	Tehelka.com tapes released
Scam	March 30, 2001	Madhavpura Mercantile Co-operative Bank in trouble
Enron Dispute	May 2001	Work Stops at Dabhol
Financial crisis	May 2001	Software Slowdown
Scam	May 2001	Home trade CEO held for fraud
Scam	August 2001	Arvind Johari, promoter of Lucknow-based Cyberspace Infosys Ltd (CIL), held on the charge of misappropriating Rs 32.08 crore from Unit Trust of India (UTI),
International terrorism	September 11, 2001	WTC Bombing In New York
War	November 2001	Afghan War
Terrorism in India	December 13, 2001	Bombing at the parliament
Price Shocks	February 7, 2002	Gold Prices zoom to 5 year High
Riot	February 27 to March 16, 2002	Riots in Gujarat after Godhra Incident
Tension	June 2002	Indo-Pak Tension at the border
Monsoon Failure	June 2002	
Scam	July 20 02	Worldcom Scandal
War	March 2003	Iraq War
Epidemic	April 3, 2003	SARS hits Asia
Strike	April 3, 2003	Truckers Strike
Source: Various news portals and Economic Times April 28, 2003		

Table 12.3: Items in India's BOP as a percentage of GDP

	Trade balance	Net Invisibles	Current Account	Capital Account	Reserves, inc-, dec+	Estimated FDI	FPI	NRI deposit inflows
1990-91	-3.0	-0.1	-3.1	2.3	0.4	0.1	0.0	0.7
1991-92	-1.0	0.7	-0.3	1.5	-1.4	0.1	0.0	0.2
1992-93	2.3	0.6	-1.7	1.6	-0.3	0.2	0.1	0.9
1993-94	-1.5	1.1	-0.4	3.5	-3.2	0.4	1.3	0.4
1994-95	-2.8	1.8	-1.0	2.8	-1.4	0.7	1.2	0.3
1995-96	-3.2	1.6	-1.7	1.3	0.8	1.0	0.8	0.3
1996-97	-3.8	2.7	-1.2	3.0	-1.5	1.2	0.9	0.9
1997-98	-3.8	2.4	-1.4	2.5	-0.9	1.4	0.4	0.5
1998-99	-3.2	2.2	-1.0	2.0	-1.0	1.0	0.0	0.2
1999-00	-4.0	2.9	-1.0	2.5	-1.4	0.8	0.7	0.3
2000-01	-3.1	2.6	-0.5	1.9	-1.3	0.9	0.6	0.5
2001-02	-2.6	2.9	0.3	2.2	-2.5	1.3	0.4	0.6
Mean94/95-01/02 (Rs. Crs)						17741.57	10441.75	7687.38
Std dev94/95-01/02						5947.12	3978.58	3717.61
Coeff. of variation 94/95-01/02						0.34	0.38	0.48

Source: Calculations based on data in RBI (2003)

Note: Using the percentage increase in the revised RBI (June 30, 2003) figures for FDI of the last two years FDI is estimated by scaling up FDI reported by the factor (1+0.66).

Table 12.4: Percentage changes in the parameters of the model in one simulation period compared to the previous

Simulation periods	Savings parameter	Private investment parameter	Public investment parameter	Competitiveness parameter
1975/76-84/85	11.66	24.03	40.00	0.00
1985/86-90/91	-42.42	-26.52	-14.29	7.83
1991/92-92/93	37.06	-1.76	-16.67	15.79
1993/94-95/96	14.81	64.24	0.00	0.00
1996/97-98/99	-15.58	-20.56	0.00	0.00
1999/00-2000/02	25.00	27.74	4.00	0.00

Note: positive values in the last column indicate that competitiveness fell or profit shares rose

Year	Re depreciation (d)	Forward premium (fp)	i - i*	p - p*	Risk premium		
					fp - d	i - i* - d	i - i* - fp
1995	3.35	9.236	9.73	8.08	5.88	6.38	0.498
1996	9.27	12.140	5.98	1.56	2.87	-3.29	-6.156
1997	2.48	5.047	-0.17	2.28	2.57	-2.65	-5.217
1998	13.62	8.333	4.13	4.21	-5.29	-9.49	-4.201
1999	4.35	4.965	3.89	1.32	0.61	-0.47	-1.078
2000	4.38	3.755	3.03	2.84	-0.62	-1.35	-0.726
2001	5.00	4.803	3.41	2.37	-0.20	-1.59	-1.396
2002	3.01	4.716	4.48	0.87	1.70	1.46	-0.238
2003	-2.47	2.672	4.36	1.15	5.14	6.83	1.686

Source: Calculated from RBI (2003)
Federal Reserve Bank of New York, <http://www.newyorkfed.org/http://minneapolisfed.org/research/data/us/calc/hist1913.cfm>
Note: 1. i, Indian call money rate, i*, US federal funds rate, p, Indian WPI, p* US CPI
2. All variables are in percentage changes per annum

Variable	Annual average		Standard deviation		Coefficient of variation	
	1980/81-1989/90	1990/91-2000/01	1980/81-1989/90	1990/91-2000/01	1980/81-1989/90	1990/91-2000/01
Private investment as percentage of GDP	12.06	15.33	1.39	1.53	0.11	0.1
Public investment as percentage of GDP	9.98	7.59	0.78	1.04	0.08	0.14
GDP annual growth, (1993-94 to 2002-03)	6.55	5.97	1.74	1.3	0.27	0.22
Call Money rate (%)	9.46	11.13	1.01	4.29	0.12	0.39
IDBI PLR (%)	14.0	15.32	0	2.07	0	0.14
Real IDBI PLR (%)	6.03	7.65	3.69	2.65	0.62	0.35
% Re depreciation	7.6	9.6	5.8	10.23	0.76	1.07

Source: Calculated with data from RBI (2003)
Note: PLR is the prime lending rate

Table 12.7: Correlations among private investment (PI), interest, exchange and inflation rates

	1980/81-1989/90	1990/91-2000/01
PI, lagged CMR	0.43	-0.48
PI, lagged IDBI PLR	0	-0.32
PI, IDBI PLR	0	-0.17
PI, real IDBI PLR	0.33	0.43
PI, lagged real IDBI PLR	-0.1	-0.15
PI, inflation	-0.34	-0.45
PI, Re depreciation	0.39	-0.36
CMR, Re depreciation	--	0.67
Nominal IDBI PLR, Re depreciation	--	0.63
Real IDBI PLR, lagged CMR	--	0.14
Real IDBI PLR, inflation	--	-0.78
Nominal PLR, inflation	--	0.60

Source: Calculated with data from RBI (2003)
Note: PLR is the prime lending rate, CMR is the call money rate

Table 12.8: Indicators of credit and financial markets as % of GDP

	Net Bank Credit to Government	Net RBI Credit to Central Government	Foreign Currency Assets	Market Capitalisation of BSE	Priority Credit going to Small Scale Industries	Gross Bank non-food Credit	Resource Mobilisation in Private Placements	New Capital issues – Non-Govt. Public Ltd. Cos.
1990-91	24.7	15.3	0.8	16.0	3.0	20.0	0.0	0.8
1991-92	24.2	14.1	2.2	49.5	2.8	18.6		0.9
1992-93	23.5	12.9	2.7	25.1	2.7	18.8		2.6
1993-94	23.7	11.3	5.5	42.8	2.6	17.0		2.2
1994-95	22.0	9.8	6.5	43.0	2.7	18.2		2.6
1995-96	21.7	10.0	4.9	44.3	2.7	18.7	1.1	1.3
1996-97	21.1	8.8	5.9	33.9	2.6	18.4	1.1	0.8
1997-98	21.7	8.8	6.7	36.8	2.9	18.9	2.0	0.2
1998-99	22.2	8.4	7.2	31.3	2.8	18.7	2.9	0.3
1999-00	22.8	7.2	7.9	47.1	2.7	19.4	3.2	0.3
2000-01	24.3	7.0	8.8	27.2	2.7	20.4	3.2	0.2
2001-02	25.5	6.2	10.8	26.7	2.5	21.0	2.8	0.2

Source: Calculated from RBI (2003)

Table 12.9: Household savings choices			
Percentage distribution over	2000-01	1998-99	1994-95
Deposits	44.3	39.2	45.5
Shares and debentures	2.7	3.6	11.9
Small savings (claims on government)	11.6	12.8	9.0
Insurance funds	12.8	11.2	7.8
Provident and pension funds	20.7	22.1	14.7
BSE sensitive index (% changeover past year)	-22	-13.6	37.13
Source: RBI Annual Report 2001-02			

Table 12.10: Credit to selected sectors as a percentage of non-food gross bank credit									
	Outstandings in March		Variations during						
	2002	2000	2001-02	2000-01	1999-2000	1998-99	1997-98	1996-97	1995-96
SSI (priority sector)	11.85	13.8	2.23	5.9	6.63	13.3	20.78	13.85	11.37
Medium, large industry	35.7	39.2	17.7	28.72	33.4	34.72	39.27	32.57	49.2
Non-priority sectors apart from industry and trade:	23.76	21.17	38.52	27.58	26.63	22.89	16.41	26.81	19.50
Of which: Housing	4.63	3.76	11.58	3.78	5.37	6.28	--	--	--
Personal Loans	4.85	4.11	9.96	4.9	6.25	5.77	--	--	--
Source: RBI Annual Reports, various issues. Data relate to about 50 Scheduled Commercial Banks, which account for about 90-95% of bank credit.									
Note: SSI is small scale industry									

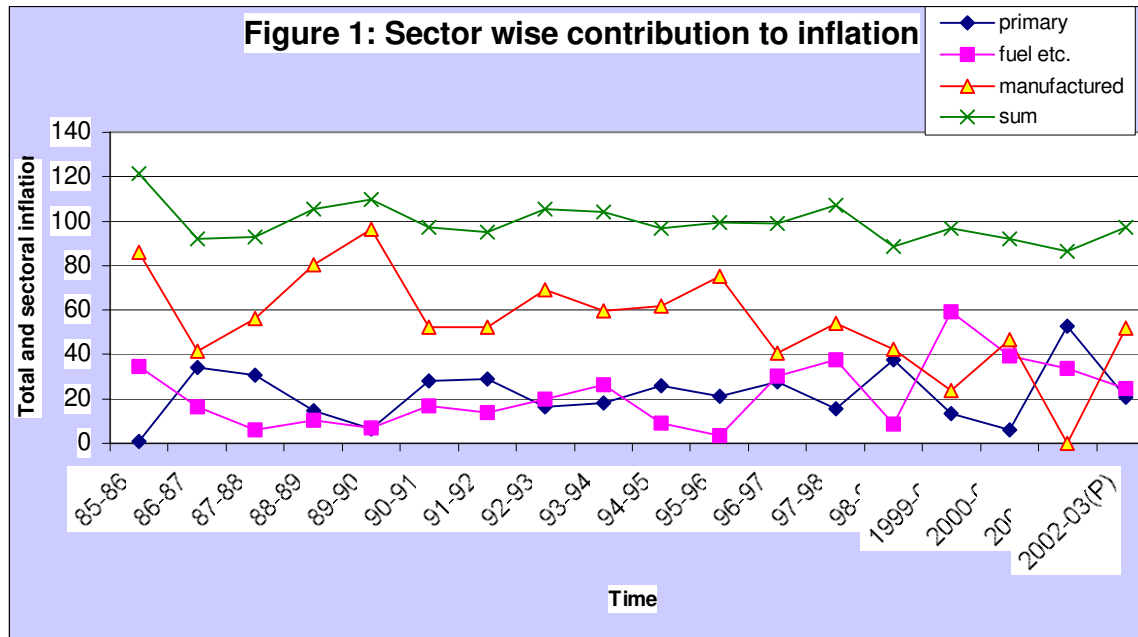


Figure 2: Is the primary deficit as large as it seems?

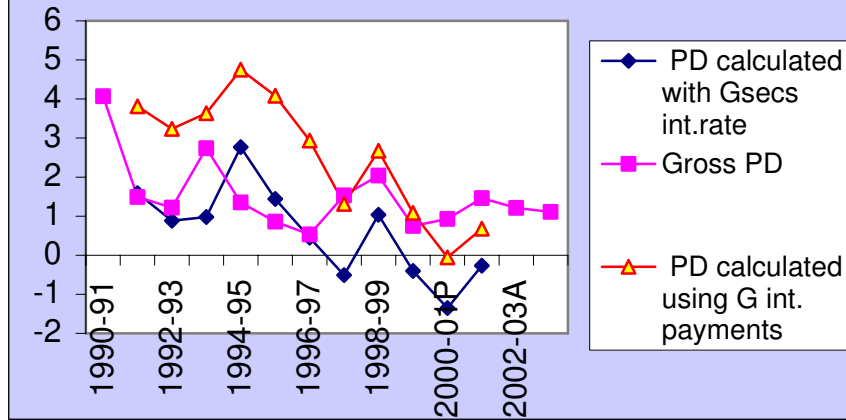


Figure 3: Contribution of growth and real interest rates to the fiscal deficit

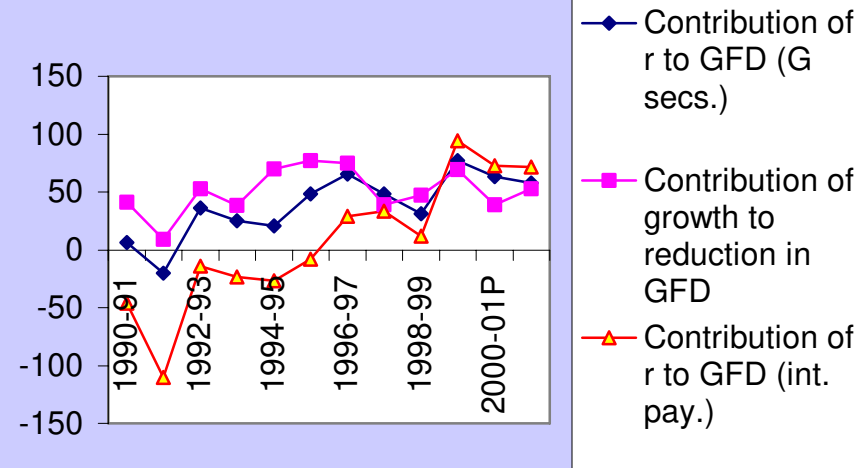


Figure 4: The risk premium in Indian currency markets

