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**Development, fiscal constraint and the risk of a public debt trap:  
The case of India seen through a macro-econometric model**

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## 1- Introduction

The Indian macroeconomic situation has attracted a lot of attention during the past few years, in part because of a more systematic comparison with the other emerging giant China, but in part also because of the apparent contradiction or risks related to an apparent healthy economic development path and the growing fiscal imbalances and challenges. This contradiction has become even more relevant with the new Congress-led government took office, since the political structure of the governing coalition offers a vivid illustration of the divergences in possible economic policies, notably on the budget side.

It can fairly be said that India is at a crossroad in terms of economic development: it needs to boost economic growth to reduce a still daunting poverty, especially in rural areas, but also to raise expenditures in key sectors like education, health and infrastructure in order to promote more widespread development. The overall level of capital accumulation has also to be raised, and these issues and challenges all relate to key choices in terms of budget spending and overall fiscal balances.

This paper tries to provide inputs for such difficult choices by using a macro-econometric model on India that is integrating detailed fiscal accounts and relate them to other macroeconomic variables. The paper first provides a rapid overview of the current macroeconomic situation of the country, satisfactory enough to encourage some complacency vis-à-vis fiscal issues; the second part of the paper describes the fiscal issues in more detail; the third part presents TACEMI, the macro-econometric model designed on India, while the following part examines the results of long-term (2015) simulations and the likely consequences on fiscal balances and issues.

## 2- India's current economic situation: room for complacency...

The current situation of India is briefly examined here by using TAC's proprietary country-risk instrument<sup>2</sup>, based on a succession of "Fundamental Balances" trying to catch the key risk factors for a developing country. The most important macro equilibrium used in this methodology and relevant here are called the Structural Balances, and deal with (1) the ability of a country to register a sufficient economic growth without triggering excessive external deficits (the Growth Balance), and (2) the ability of a country to obtain a satisfactory external financing structure (the Debt Balance).

On these two structural balances, the Indian paths highlight a positive performance for economic activity (average annual GDP growth rate<sup>3</sup> between 1996 and 2003 has reached 5.9%), a clear improving trend in external accounts and a very low weight of external commitments in the Debt Balance. Indeed, recent years' performances in the Growth Balance reflect the combination of the sensitivity to agriculture output, the effects of oil prices fluctuations, changes in international environment and the positive consequences of the structural transformations that have been implemented for more than a decade. After showing a current account surplus for the first time in decades in 2001, the *external balance* pursued its upward trend in 2002 and 2003, before declining moderately in 2004 (surpluses of respectively USD 5.8 bn, 8.5 bn and 4.8 bn). Concerning the *economic growth*, the Indian path reflected the fluctuations in monsoon rains over the past period (very limited in 2002/03, very abundant in 2003/04, average in 2004/05), with movements amplified by the incorporation of an accelerator/decelerator effect in our index (therefore creating a sharp contraction in 2004/05 while the headline GDP growth slowed down more mildly, from 8.3% in

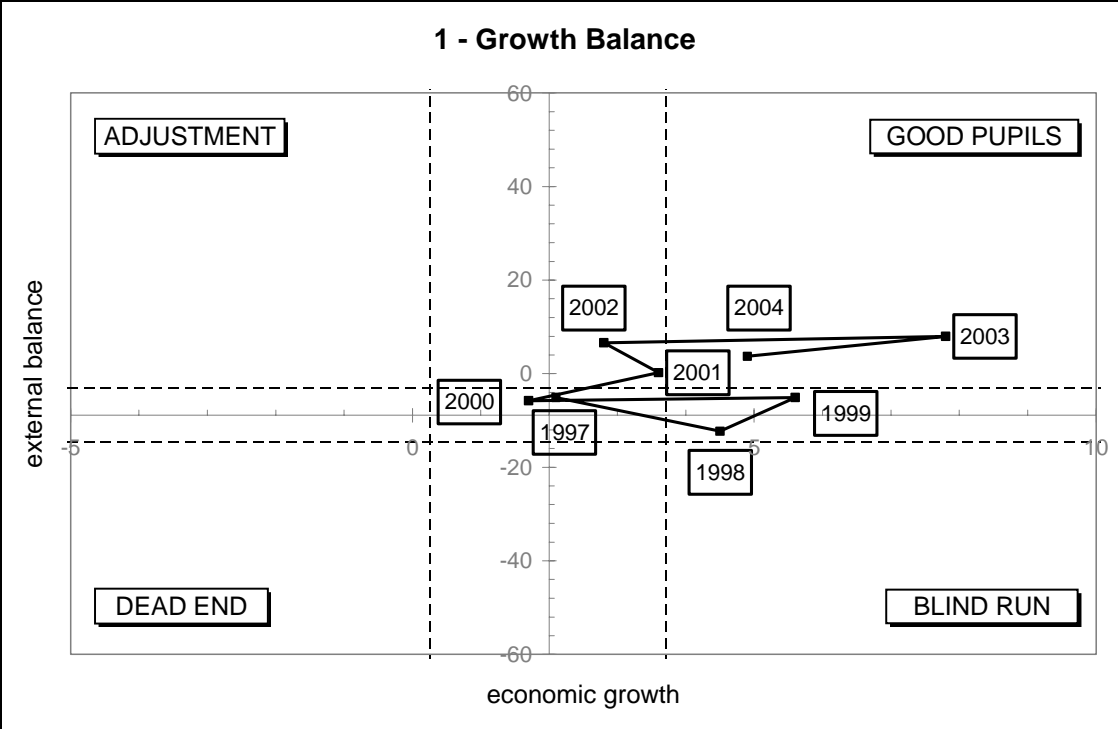
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<sup>2</sup> See TAC's paper "Predicting financial crises in emerging markets using a composite non-parametric data mining model", 2005

<sup>3</sup>This chart is made more difficult to read by the non-concordance of data, for GDP growth, in fiscal years (2004 meaning 1st April 2004 to 31st March 2005), and current account, in calendar years. The analysis is not impaired by this statistical bias.

2003/04 to 6.9% in 2004/05) and indicating that the non-agricultural part of the economy is playing both a stronger and a stabilizing role in overall economic development: indeed, both consumer demand and investment spending appear to be on a structurally higher growth level, and urban / middle-class developments are now a core element in the Indian economic growth. India has moved clearly into the *good pupils* area since 2000, indicating that political and social issues are very manageable whatever happens to political coalitions.

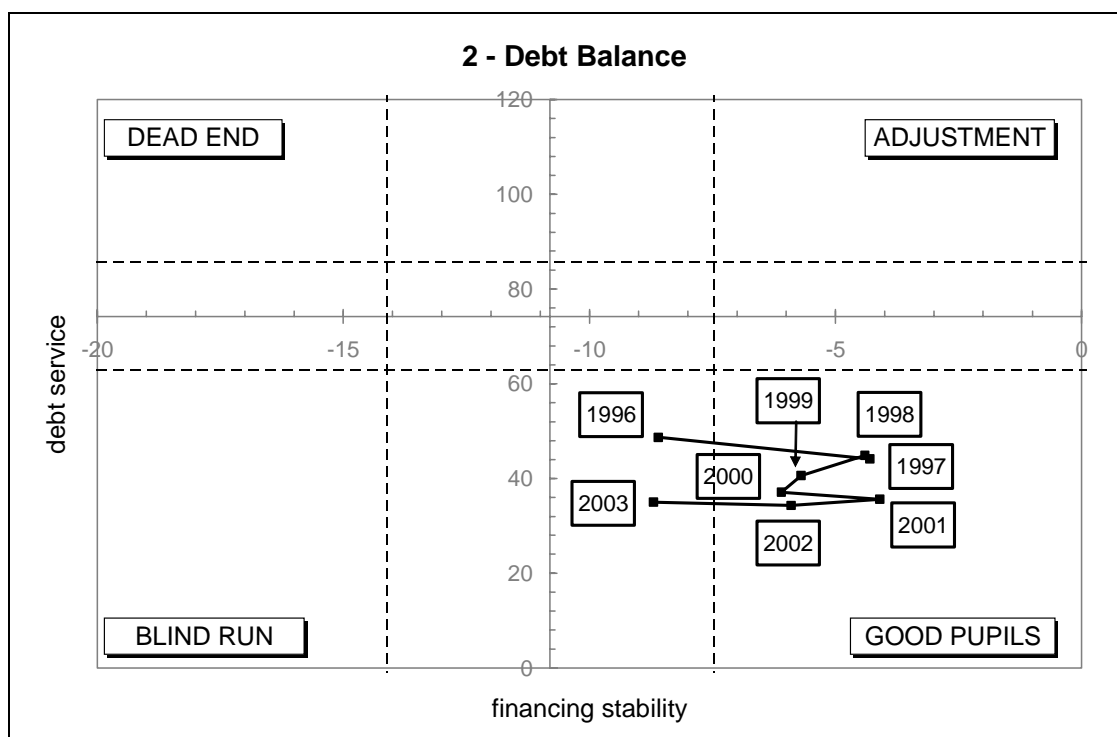
Chart 1 : India's Growth Balance, 1997-2004



Source: TAC

Simultaneously, the *debt service* indicator in our Debt Balance has significantly decreased over the period: this reflects both limited current account deficits - and even a large improvement between 2000 and 2003 - and the ability of the country to finance its external financing needs with foreign direct or portfolio investments, within a still highly regulated capital circulation. Indeed, total external debt has increased moderately over the past decade (from USD 94 bn at the end of 1993 to USD 130 bn at the end of 2003), while, on average, foreign currency revenues and GDP were recording much more rapid growth. Overall, the ratio of total external debt to exports of goods and services declined from 287% at end-1993 to 117% at end-2003; even when using a more stringent definition of external liabilities, including Non-Resident Indians (NRIs) deposits (estimated at around USD 15 bn at the end of 2004, and excluding NRIs' rupee denominated deposits), this ratio remains well below 150%. The *financing stability* indicator, which is assessing the relative weight of "stable" capital, i.e. foreign direct investment (FDI), compared to "unstable" capital (bank and portfolio capital), registered more ambiguous movements. Despite a continuous improvement in FDI inflows (from USD 2.6 bn in 1998 to USD 4.6 bn in 2003), the path has remained very close to the risk threshold between 2001 and 2003, indicating a higher increase in "unstable" capital inflows over the period, attracted by structural reforms on stock markets and the growing openness to international financial investors, while persistent administrative constraints let FDI inflows well below the country's potential.

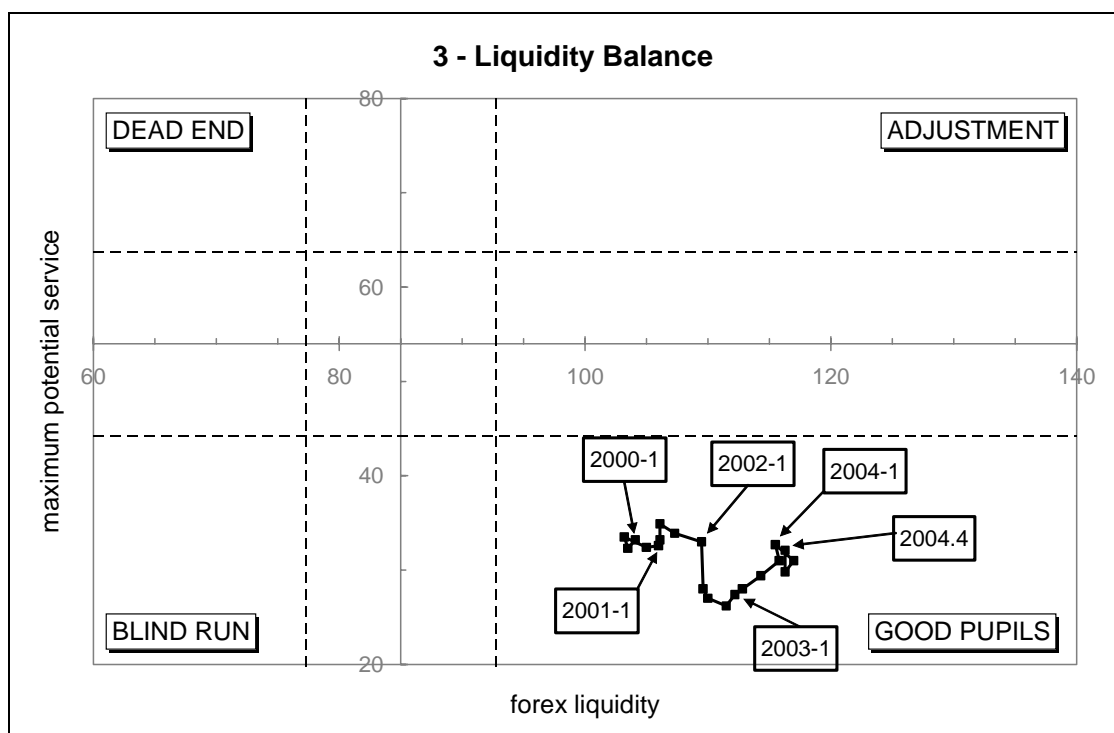
Chart 2 : India's Debt Balance, 1996-2003



Source: TAC

In the short-term, these very favourable positions in the Structural Balances are associated with an exceptional situation in terms of international liquidity, depicted through another Fundamental Balance, called the Liquidity Balance where an indicator of foreign currency reserves is crossed with a variable capturing the weight of short-term foreign currency liabilities. Indeed, the country remains in a strong and improving position of *good pupils* in this Liquidity Balance. With buoyant current account surpluses and capital inflows, official reserves represent more than 17 months of imports, pulling the gross external financing requirement to about 15% of foreign exchange reserves, from 100% in 1991. Simultaneously, the share of short-term debt in the total foreign currency liabilities has been reduced since the end of 1996 (USD 4.6 bn at end-2002, i.e. 4.4% of total debt or 6.8% of foreign exchange reserves (USD 14.6 bn if including foreign currency deposits of NRIs), positively impacting the *maximum potential service* indicator. However, it is important to note that the improvement in foreign currency official reserves is largely related to such capital movements, implying that any reversal in confidence could trigger significant capital outflows and a rapid decline in such official reserves.

Chart 3 : India's Liquidity Balance, 2000-2004

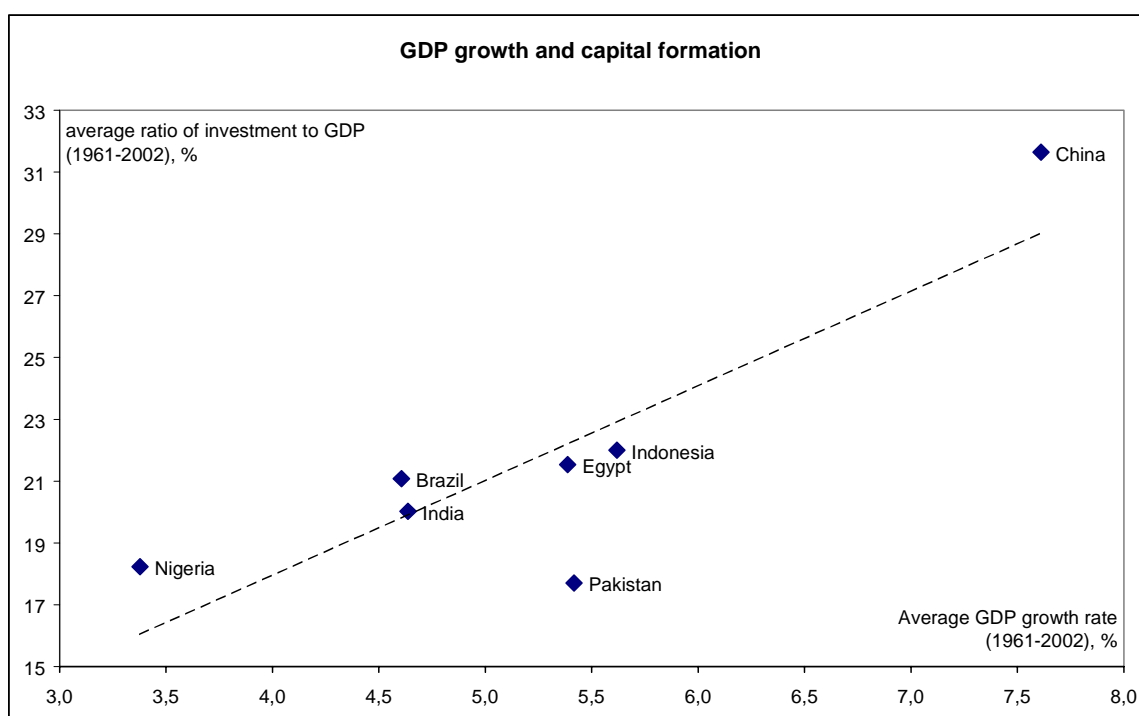


Source: TAC

This overall macroeconomic environment has led many observers to consider that the fiscal issues raised by persistent public deficits and a high level of public debt could be relegated to a second order of priority for the Indian authorities. The persistence of a positive current account indicates that the overall balance between aggregate savings and aggregate investment is satisfactory, suggesting therefore that the public deficit is a mere substitution for the inability of the private sector to move into higher investments. India's successes in some industries (software, pharmaceuticals, mechanical engineering, steel, automotive, to name a few), the growing outreach of its "national champions" (Reliance, Mittal, Ranbaxy...), its more forceful international economic diplomacy (WTO, relations with China,...), have also added to the sense of success and created this "feel good" factor that was so much aired prior to the last general elections.

However, from a broader perspective and an international comparison, the ability to maintain a high economic growth strongly suggests that a higher investment effort is required, itself pointing to a more delicate policy option in the future between the need to limit the fiscal deficit in order to avoid crowding-out effects and high current account balances, and the rigidities brought precisely by the inaction on budget issues for many years. In parallel, the issue of openness to foreign investment becomes more crucial, since higher FDI brings both higher investment and its financing, associated with technology and know-how transfers, but obviously with sensitive questions on the overall domestic control on the economy and the protection of the existing production base in India.

Chart 4 : Investment level and growth in some developing countries



Source: World Bank

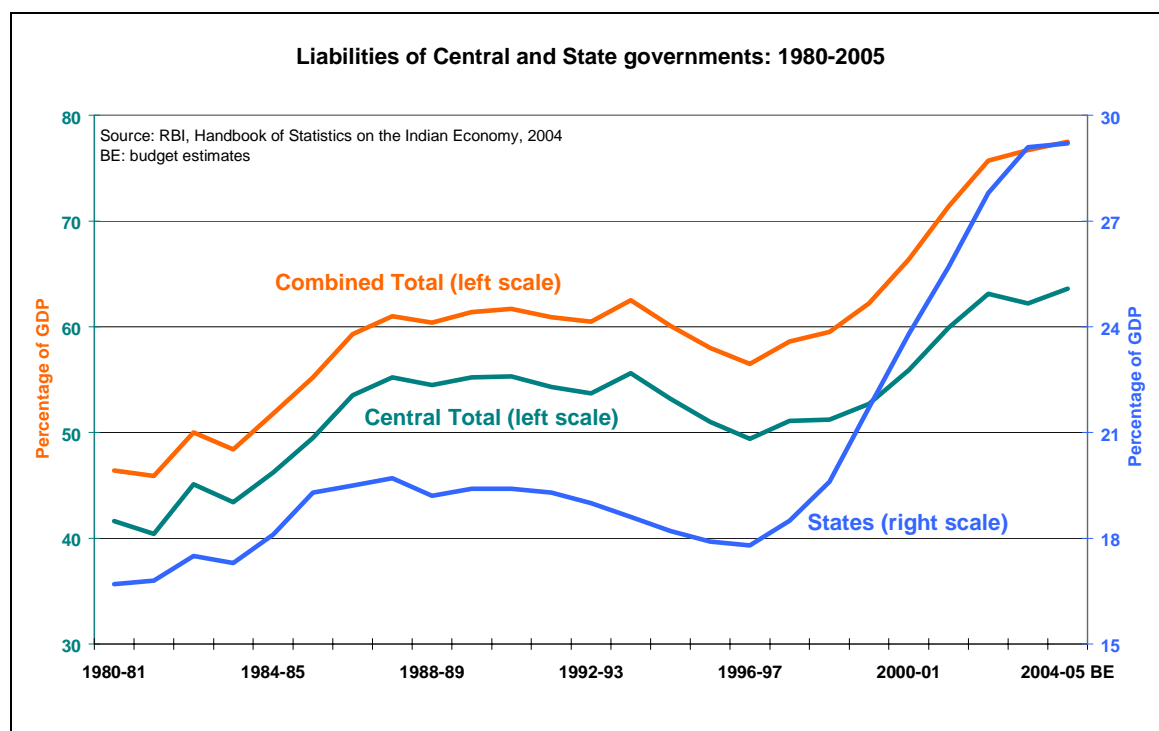
From a more anecdotal perspective, the unexpected victory (at least according to polls and most pundits) of the Congress party at the 2004 general elections came as a sign not only that democracy is well anchored in India but also that many people were not recognising themselves in this “feel good factor” that the fast developing India tried to impose to the rest of the country. The new coalition, which claimed it would promote a more social oriented budget, is now almost constantly faced with policy contradictions (FDI versus protection of state-owned firms, increasing spending on rural areas while continuing large project supporting industry-led infrastructures, improving India’s international competitiveness while allowing domestic firms to adjust to China’s competition and coping with declining tariff revenues, ...). Most of these contradictions have a relation with fiscal decisions and budget policies. Indeed, as presented in the next section part and as the Parliament acknowledged by passing the Fiscal Responsibility Act in 2003, fiscal issues in India are critical concerns, with the possibility of creating very adverse conditions in the medium-term.

### 3- The Indian fiscal conundrum

#### 3.1 A high fiscal deficit and a growing public debt

Fiscal deficit and government debt in India are higher than in many comparable emerging economies. Thus according to the RBI, the combined total liabilities of the Centre and States reached 76.7% of GDP in 2003-04 and have been increasing since 1996-97 and reaching all-time highs in 2003-04. This is obvious in the following chart, which shows that between 1996-97 and the budget estimates of 2004-05, central total liabilities as a percentage of GDP have increased by 14 points, while those of state governments’ grew by 12 points. The latter have moreover experienced a faster growth of these liabilities than the Central government and are thus contributing more and more to the combined total liabilities.

Chart 5 Liabilities of Central and State governments: 1980-2005

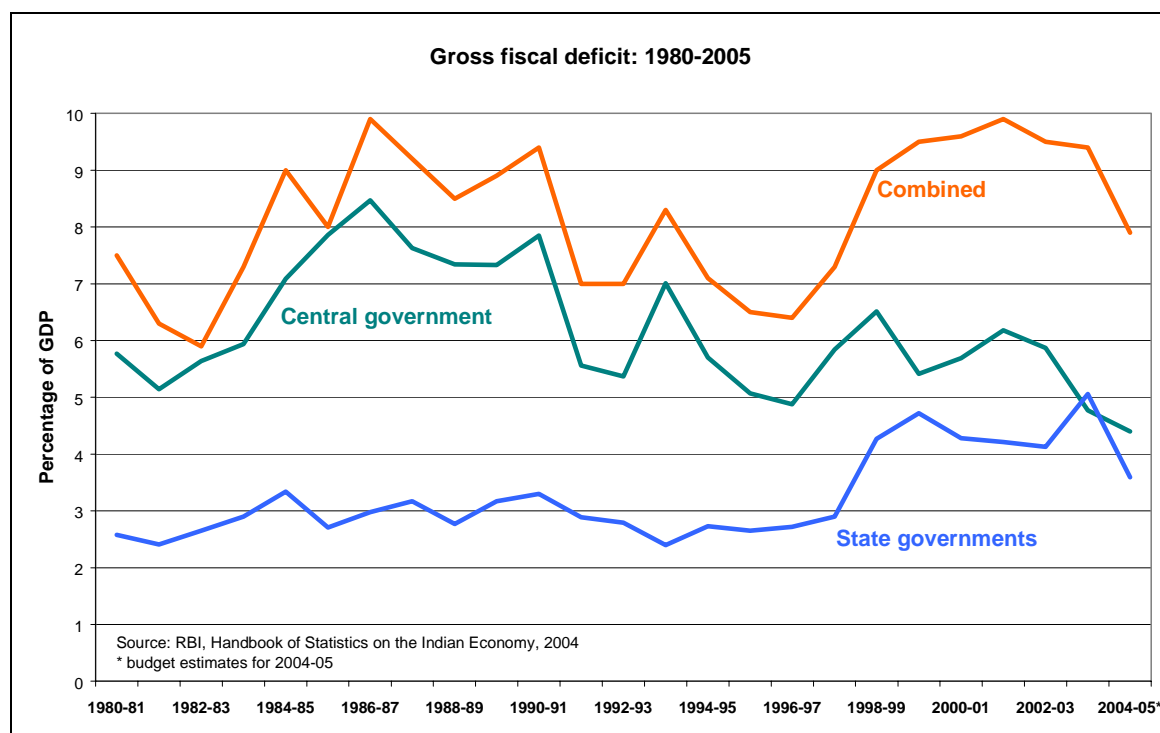


Source: RBI

The same analysis can be done when looking at the gross fiscal deficit over the same period and depicted in the following chart. Indeed, while the central government's fiscal deficit significantly decreased from its highest values at the end of the 1980s (4.77% of GDP in 2003-04 against 8.47% in 1986-87), the combined fiscal deficit has not experienced a parallel trend and has remained above 9% of GDP between 1998-99 and 2003-04. This decoupling of the two curves, which used to follow parallel trends until the mid-1990s is clearly due to the opposite movement of state governments' fiscal deficits. The latter, which amounted to 2.8% of GDP on average between 1980 and 1997, jumped to 4.4% of GDP on average between 1998 and 2004.

The relatively sharp decline in the curves in 2004-05 reflects the conservative estimates of the budget. Indeed, the authorities are well aware of the non-sustainability of the current fiscal deficit and have engaged in the 2004-05 budget to cut deficit to 4.4% of GDP for the central government. Furthermore, the Fiscal Responsibility and Budget Management law (FRBM) passed in 2003 aims at restoring fiscal sustainability by setting a medium-term target to guide fiscal policy. Under this law, the central government has to eliminate its revenue deficit by the end of FY2007. Although the law is imperfect (no explicit penalties, undefined accounting rules...) it shows that the Indian authorities acknowledge fiscal issues.

Chart 6 Gross fiscal deficit: 1980-2005



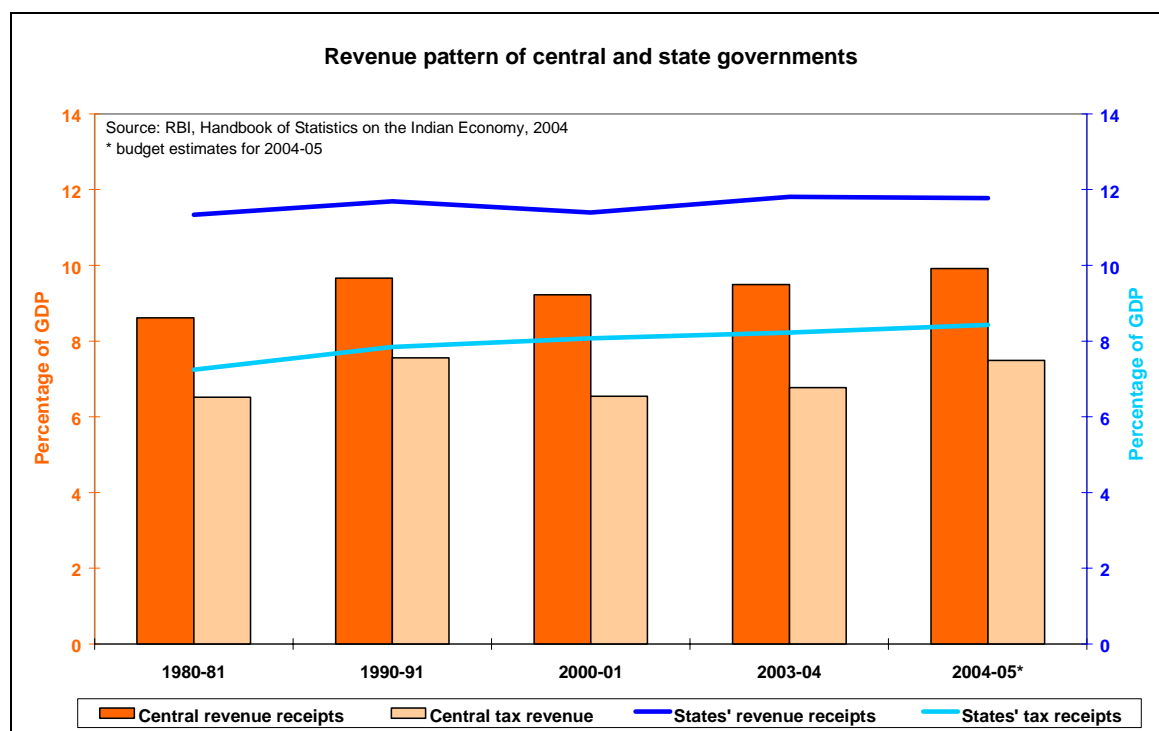
Source: RBI

### 3.2 Fiscal revenues and expenditures: concerns ahead

The fiscal vulnerabilities of both central and state governments are further emphasised when considering the structure of fiscal revenues and expenditures.

On the revenue side, the following chart clearly highlights that while the gross fiscal deficit has experienced large variations (especially at the central level), the revenue and tax receipts at the central and state levels have remained broadly stable since 1980. Thus at the central level, the revenue receipts were on average 9.8% of GDP between 1980 and 1989, 9.3% between 1990 and 1999 and 9.4% between 2000 and 2004. These revenues receipts are even more stable for the state governments, at 11.5% of GDP on average for the same time frames. The same stability is observed as regards tax revenues: between 6.6% and 7.4% of GDP on average at the central level and between 7.7% and 8.1% at the states' level. This low volatility of the revenue to GDP ratio is a positive thing on the one hand since it makes the debt to revenue ratio more stable and hence more sustainable as well. However, on the other hand, this stability also underlines the difficulty of both central and state governments in raising revenue receipts. This appears as a critical issue as the government is currently considering several options to increase the very low tax revenue (compared to other emerging economies): for instance introducing a sub-national VAT system or removing the numerous tax exemptions.

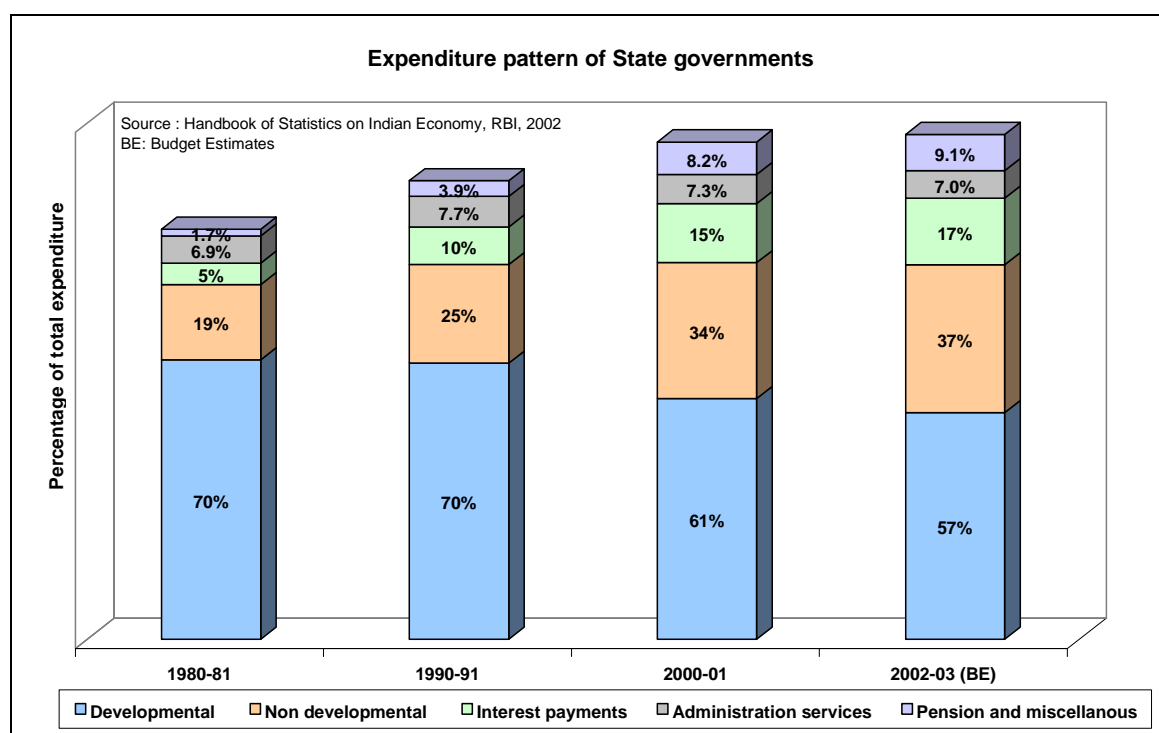
Chart 7 Revenue pattern of Central and State governments



Source: RBI

When considering the expenditure pattern, the striking fact is the growing share of both interest payments and pensions as a percentage of revenue expenditure at the state level (see graph below). Such an increase is also true at the central level: interest payments, which represented 18.1% of revenue expenditure in 1980-81, grew to 29.2% in 1990-91 and reached 34.3% in 2003-04. This is despite the fact that capital controls have kept interest rates below market-determined levels.

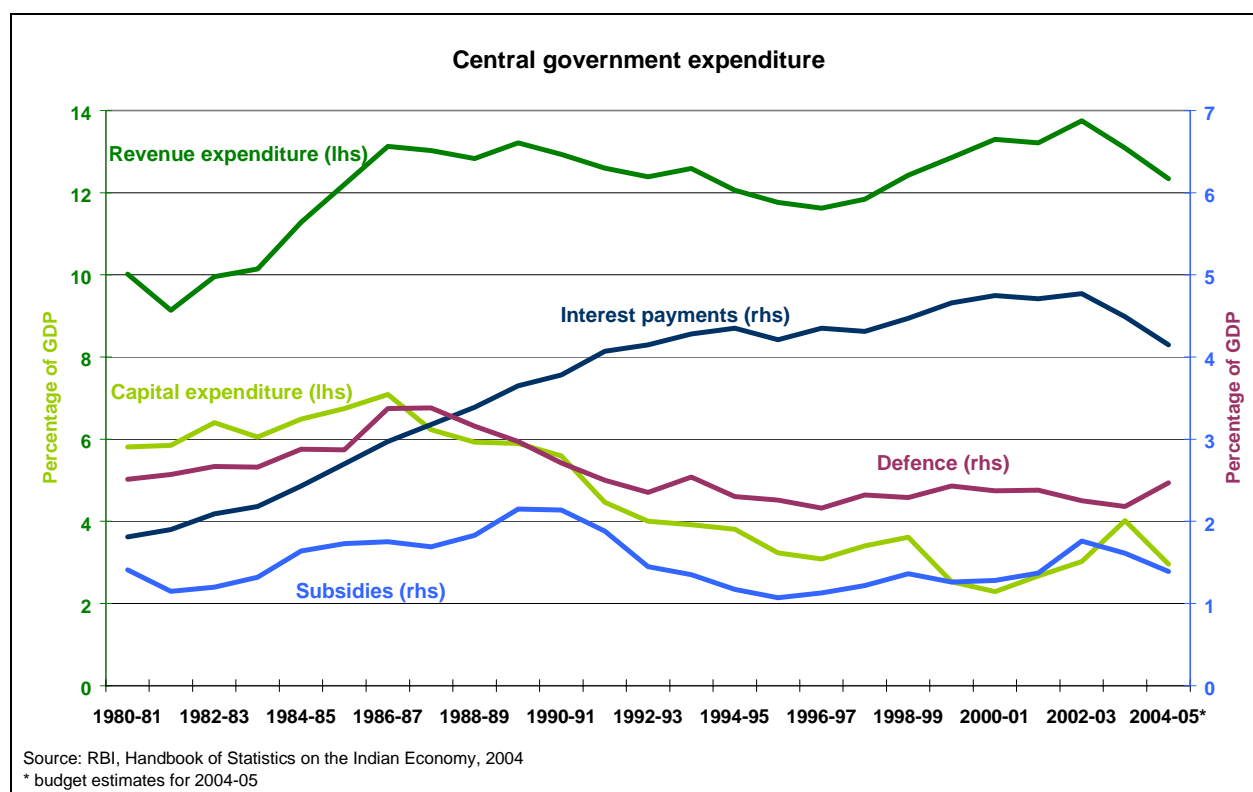
Chart 8 Expenditure pattern of State governments



Source: RBI

As the following chart shows, at the central level, interest payments have also taken a growing share as a percentage of GDP and revenue expenditure have been on the rise as well (with a decrease at the end of the period due to conservative budget estimates). On the opposite, defence and subsidies expenditures have remained broadly stable throughout the period, with even a slight decrease compared to the end of the 1980's and beginning of the 1990's. Similarly, capital expenditures as a share of GDP have been on a decreasing trend since the end of the 1980's, in itself expressing the first symptoms of a crowding-out effect because of excessive deficit on current expenditures and revenues.

Chart 9 Central government expenditure pattern



### 3.3 Growth-interest rate differential

The contradiction is now quite apparent: fiscal indicators point unambiguously to some imbalances, while the overall macroeconomic situation suggests a positive and improving background.

The solution to this paradox lies naturally with the dynamics of public debt and the relation between this variable and the growth rate of the economy, the interest rates and the primary budget balance (balance before interest payment on the public debt). The formula can be written in a very simple form around the following equations:

- (1)  $D_t = D_{t-1} + FD_t$
- (2)  $FD_t = PFD_t + iD_{t-1}$
- (3)  $Y_t = (1 + g)(1 + \pi)Y_{t-1}$
- (4)  $r = \frac{(1 + i)}{(1 + \pi)} - 1$

Where  $D_t$  is the total public debt at period t

$FD_t$  is the total fiscal deficit at period  $t$   
 $PFD_t$  is the primary fiscal deficit at period  $t$   
 $Y_t$  is the nominal GDP at period  $t$   
 $i$  is the apparent nominal interest rate  
 $r$  is the apparent real interest rate  
 $g$  is the GDP growth rate at constant price  
 $\pi$  is the inflation rate (GDP deflator)

By dividing all the variables by the GDP and combining the different accounting equations (1) to (3) we obtain an equation that relates the dynamic the public debt to the apparent real interest rate, the real GDP growth rate and the primary fiscal deficit:

$$(5) \quad \frac{D_t}{Y_t} = \frac{(1+i)}{(1+g)(1+\pi)} \frac{D_{t-1}}{Y_{t-1}} + \frac{PFD_t}{Y_t}$$

The sustainability of the fiscal situation may be expressed as an improving or stable ratio of public debt to GDP:

$$(6) \quad \Delta \left( \frac{D_t}{Y_t} \right) = \frac{(r-g)}{(1+g)} \frac{D_{t-1}}{Y_{t-1}} + \frac{PFD_t}{Y_t} \leq 0 \quad \text{or} \quad \frac{PFD_t}{Y_t} \leq \frac{(g-r)}{(1+g)} \frac{D_{t-1}}{Y_{t-1}}$$

The equations (5) and (6) illustrate the condition for fiscal sustainability: the real GDP growth rate must be higher than the real interest rate if the primary fiscal balance is nil or negative (primary deficit), and the difference between the GDP growth rate and real interest rates has to increase if the primary balance is deteriorating, and is dependent on the initial level of public debt. In other words, a country with a high initial stock of public debt and a primary deficit is on an unsustainable path if real GDP growth is not substantially higher than the real interest rates.

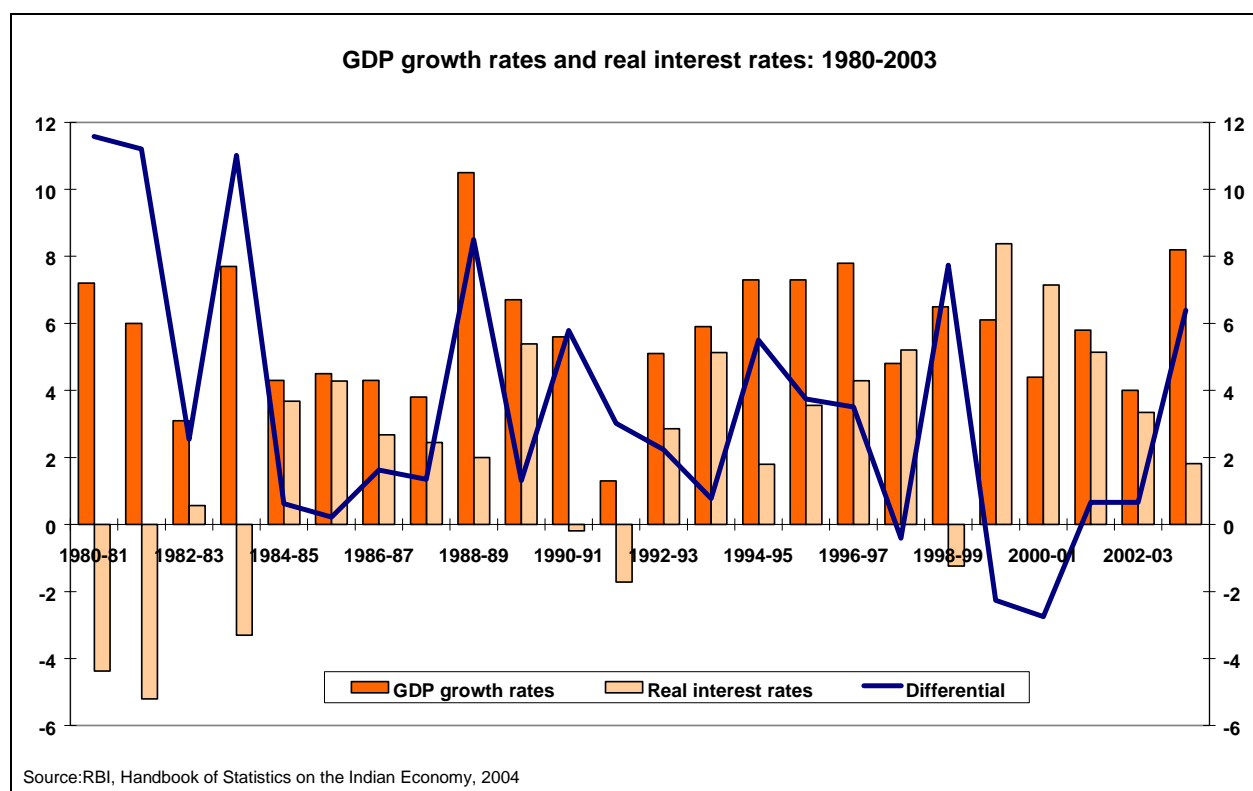
Simplified figures can be examined for India: the total stock of public debt is about 75% of GDP, the primary balance is a deficit of about 1.7% of GDP. Putting these figures into the previous equations shows that Indian real GDP growth has to be at least 2.3 points above real interest rates, and that the differential has to rise if interest rates increase.

The chart 10 illustrates the movements of real GDP growth and real interest rates during the past period. A couple of simple but key remarks can be drawn:

- There is no apparent long- or medium-term trend for the differential between GDP growth and interest rates, but this differential exhibits huge movements over the past 20 years;
- The last period has seen a rapidly improving differential, when growth accelerated as real interest rates declined markedly: in one sense, this is both the central explanation for the current complacency about the urgency for fiscal reforms, and the key bet or assumption by the Indian authorities for future debt sustainability;
- It is difficult to judge the current trend in interest rates; it was only in 1998-99 that real interest rates reached their cyclical peak, and inflation does not yet seem a threat. However, it is also difficult to assume that the very low historical level is here to stay, especially when adding the need for further investment and the likely consequences of the growing financial integration of India in the world capital markets. If any clue can be taken by the recent evolutions, inflation has come down to the levels of 2003 after a burst in 2004 (to around 5% year-on-year in 2005Q1, 4% in July 2005, for the wholesale price index), while interest rates have nudged up (5.5% on 3-month T-Bills in July 2005 against 4.3% in 2004Q1, clearly pushing up real interest rates and

therefore requiring a significant acceleration in economic growth to provide the same outcome in terms of public debt.

Chart 10 GDP growth rates and real interest rates evolution



- This favourable development has coincided with a decline in the central government primary deficit, from above 4% of GDP until 1991, to about 1% since 2000. This is partly compensated by the deterioration at State level, with interest payment now absorbing more than 20% of total State revenues.
- More importantly, the idea that the Indian reforms would induce a higher economic growth rate with structurally lower interest rates is not supported by the observation of average values over the past 20 years. On the contrary, the past financial repression allowed artificially low interest rates (negative in real terms at the beginning of the 80s), while the financial liberalisation has led to higher interest rates and almost identical growth performances, with a differential lower than what would be needed when taking into account the current level of public debt and the primary deficit.

Table 1 Average values for GDP growth and interest rates, 1980-2004

	GDP at factor costs (constant prices)	Real interest rates on central government securities	Growth- real interest rate differential (central)
average 1980-2004	5.8	2.2	3.5
average 1990-2004	5.7	3.3	2.5
average 1995-2004	6.1	4.2	1.9
average 2000-2004	5.6	4.4	1.2

Source: RBI, TAC

## **4- TACEMI, a macro econometric model on India**

It is in such an ambiguous context that the use of a macro econometric instrument is useful. Indeed, the interest of such a quantitative construction is to relate fiscal decisions, output and prices, and interest rates. Basically, the use of such model is to test various assumptions and look at the different outcome, notably in terms of fiscal deficit and public debt. The model was constructed by TAC in 2004 to design plausible scenarios for India over the period 2005-2015.

### **4.1 Description of the model**

TAC has designed and estimated a full macro-econometric model on the Indian economy<sup>4</sup>, benefiting from both TAC's long experience in macro modelling, and a quasi-exhaustive review of existing econometric tools on India<sup>5</sup>. The definition of the key economic concepts and rules used in the model has undoubtedly a large share of arbitrary selection by the economist. It has been checked however that the broad principles would receive a very large consensus from most macroeconomist working on India.

The most fundamental relation assumed by the model is the relationship between the investment effort and the economic growth. An exogenous assumption is made on the so-called ICOR (Incremental Capital Output Ratio), the ratio of investment effort (measured as total investment in the economy as a percentage of total GDP) to GDP growth. The assumption is based on the convergence between Indian level of ICOR and that of other developing countries.

The model has then to estimate the various components of investment to reach a result in terms of GDP growth. Separate estimations or exogenous assumptions are made on the other components of domestic demand (household consumption and government spending). Having on the one side the projected GDP estimated through the investment effort, and all components of domestic demand on the other side, the difference between the two is giving the external balance (exports of goods and services, less equivalent imports), a key "variable" to check the sustainability of the scenario and associated policies.

Such policies are translated in public expenditures (investment and the different components of current non-interest expenditures) and ratio of fiscal pressure (rate of tax to GDP for different kinds of public revenues, including privatisation in the form of capital income). Once the endogenous GDP growth is estimated, fiscal revenues can be computed, leading to the estimation of the budget balance.

Finally, the variables are endogenously related to financial indicators, including prices, interest rates and exchange rates: prices are determined by the exchange rate and productivity gains, themselves estimated from investment efforts, demographic changes and social tensions; prices influence the interest rates, alongside with the budget balance and the exchange rate; exchange rates are determined by inflation and the external balance.

The chart on the next page summarises TACEMI's major links:

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<sup>4</sup> Called TACEMI, TAC Econometric Model on India.

<sup>5</sup> In particular, detailed exchanges of views were made with the Reserve Bank of India's Research Department, the NCAER, the Planning Commission, ICRA and the IEG.

Chart 11 TACEMI : TAC Macro Econometric Model on India

**TACEMI : TAC MACRO-ECONOMETRIC MODEL ON INDIA**

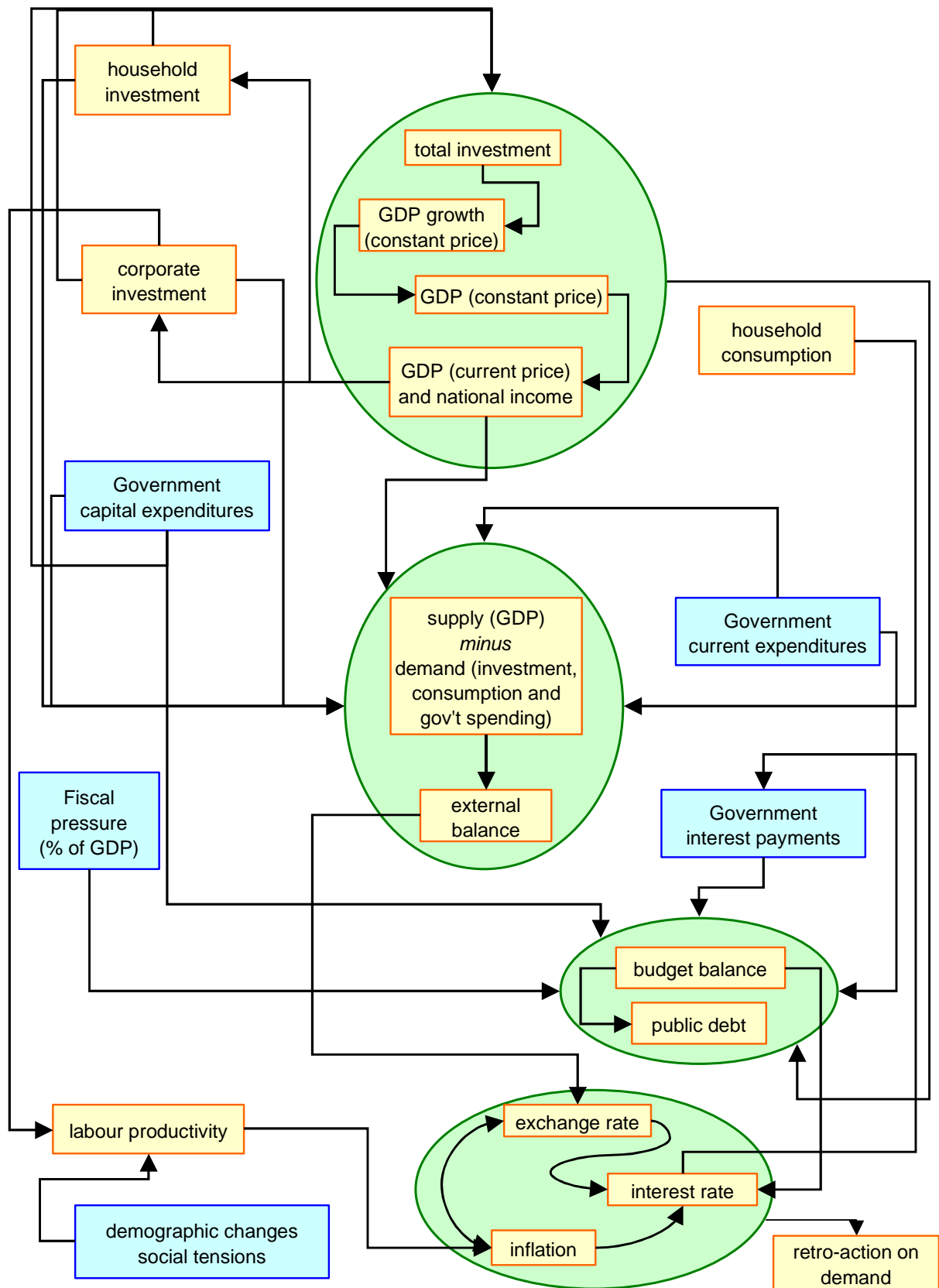
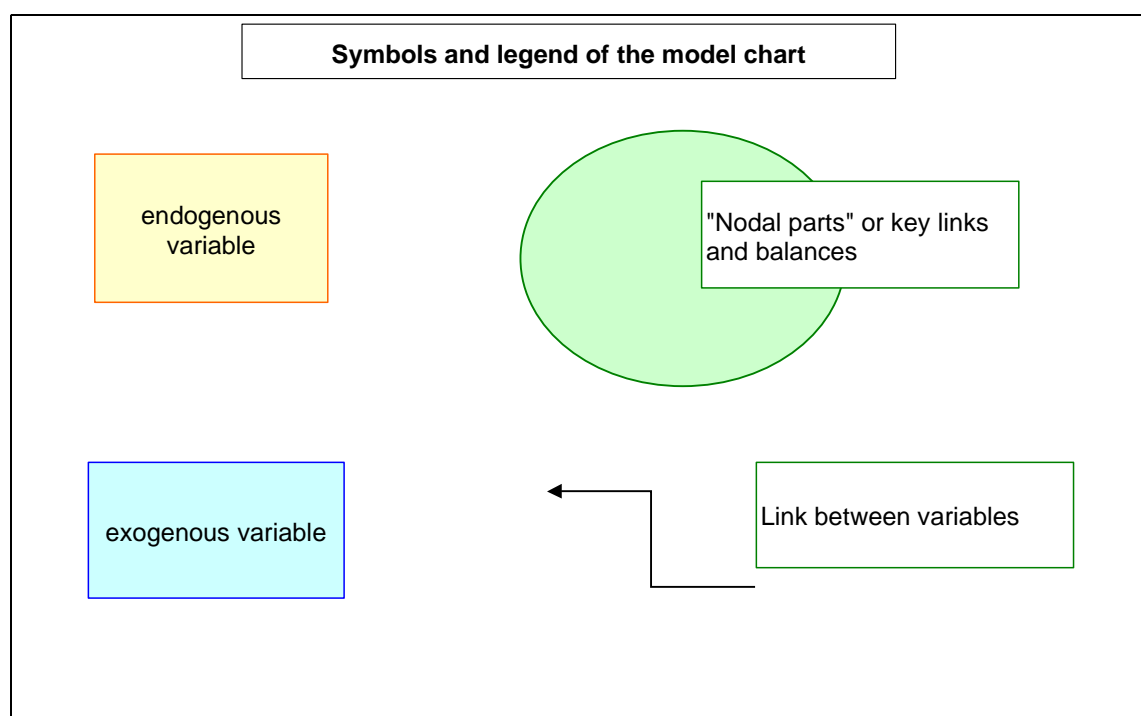


Chart 12 Symbols and Legend of the model chart



The following table summarizes the presence of explanatory variables in the endogenous estimations:

Table 2. Major Economic Equations of TACEMI

Major econometric equations of TACEMI				
Explained variable	Explanatory variables (exogenous in <i>italic</i> )			
Household investment (constant price)	National income after taxes and subsidies	Interest rates (nominal)		
Corporate investment (constant price)	National income after taxes	Interest rates (real)	Foreign investment	
Household consumption	National income after taxes and subsidies	<i>Agriculture production</i>	Interest rates (nominal)	
Prices	Exchange rate	Labour productivity		
Labour productivity	Corporate investment	Foreign investment	<i>Population aged 15-64</i>	<i>Social tensions</i>
Interest rates (real)	Prices	Exchange rate	Budget balance	
Exchange rate	Prices	External balance		

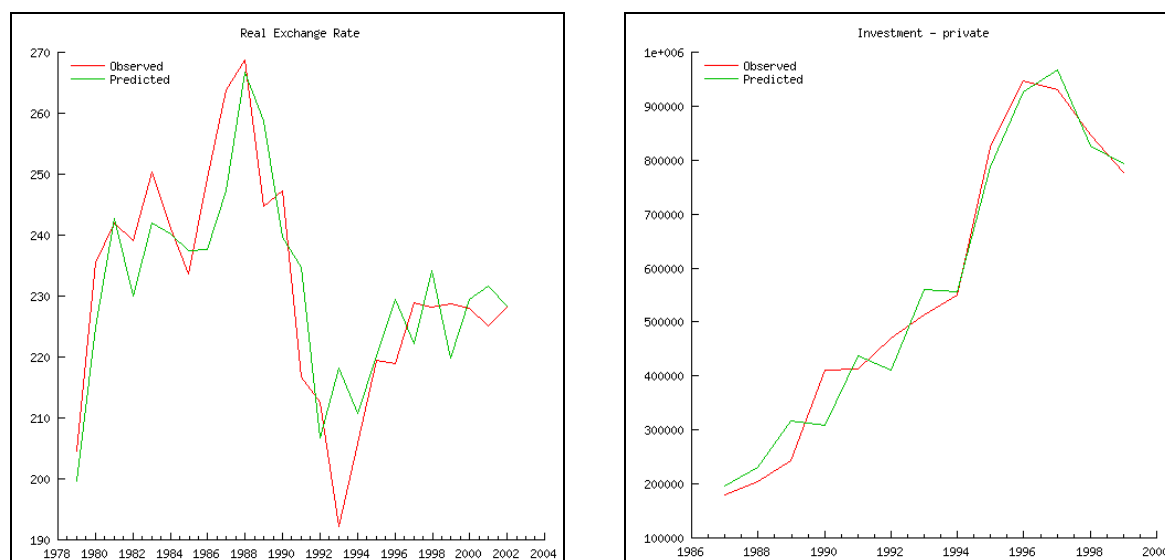
## 4.2 Statistical qualities and main points highlighted by the model

The TAC Econometric Model on India was estimated using annual data from 1970 to 1999 and the powerful Fair-Parke program, created by Ray C. Fair<sup>6</sup>. The model contains 12 estimated equations (without the identities and accounting equations) and a total of more than 40 variables. The econometric equations that were estimated for the model include the following: household investment, household consumption, corporate investment, profits, productivity, consumer prices, total investment deflator, GDP deflator, price earning, exchange rate, total interest payments on public debt, real interest rate. The objective of the model is to be able to run medium-term dynamic simulations on India on the basis of different economic assumptions. Hence, the exogenous variables are classified into six groups: growth and investment, income repartition, demography, government, financial sector, and income, demand and GDP.

As the model was estimated with annual data and a relative short period of time, the number of observation is small and we decided to apply a large set of statistical measures to test the quality of the model. During the 2SLS estimation process a particular attention was devoted to the robustness of the key equations of the model. First, the significance level of the right hand side variables was always tested and all 'non significant' variables systematically suppressed from the equations. Secondly, on all key variables, the selection criterion was always to maximize the  $R^2$  and to minimize the autocorrelation (using the Durbin-Watson). Consequently, the lowest  $R^2$  of the model is for the equation of household investment, on which the  $R^2$  is 0.71 (and the Durbin Watson 2.05); apart from this equation and the one on profits (for which the  $R^2$  is 0.77), all the other estimated equations have  $R^2$  equal to 0.87 or above. Finally, the model was tested through the assessment of endogenous historical simulations, leading to adjustments on the originally tested equations.

Hereunder, two examples of the estimated equations and associated predicted values are given, on real exchange rate and corporate investment.

Chart 13 Simulation performances of the model



Source: TAC

The fiscal side of the model tries to capture in a simplified way the effective process of interactions between policy decisions and overall macroeconomic results. The following steps can describe this specific aspect of the TACEMI model:

<sup>6</sup> For more information about this program, please go to the author's web page <http://fairmodel.econ.yale.edu>

- Exogenous assumptions are made for rates of fiscal pressure (fiscal revenue as a percentage of GDP) for the different categories of taxes included in the model, with a distinction between central and State budgets:

ACTAX	Central government – Tax pressure on tax revenue
ASTAX	States – Tax pressure on tax revenue
ANTAX	Tax pressure on non tax revenue (Central government + States)
AGRANTS	Tax pressure on public revenue, grants (Central government + States)
ACAP	Tax pressure on public revenue, capital income (Central government + States)

These policy-decided rates are applied to the GDP (i.e. no time-lag is introduced between the GDP and the tax income) and determine the total fiscal revenues, at the consolidated level of Centre and States.

- Exogenous assumptions are then made budget expenditures, on the basis of policy-decided nominal rates of increase over the preceding year. Expenditures are distinguished as follows:

IPC	Central government capital expenditure
IPS	State capital expenditure
GC1	Central government exp. on other goods & services (1.3)
GC2	Central government exp. transfers to other level of nat. gov. (3.2)
GS1	States exp. on other goods & services (1.3)
GS2	States exp. transfers to other level of nat. gov. (3.2)
LEND	Lending minus repayments (Central government + States)
W	Wages and salaries (Central government + States)
SUB	Subsidies (subsidies and other transfer – transf to oth lev nat govt)
CSUB	Central government subsidies and other current transfer (3)
SSUB	States subsidies and other current transfer (3)

- Interest payments are endogenously computed with an econometric (but semi-accounting) equation including the level of public debt the previous year, interest rates, and a moving average of the ratio of budget deficit to GDP, this latter variable being used as a proxy for the slope of the yield curve.
- Endogenously determined GDP and interest rates allow then computing the consolidated budget balance, which in turn determines the level of public debt (with the assumption that the whole deficit is financed through interest-bearing liabilities). It is important to underline that the figure used in the model for total public debt is not the one indicated above from RBI and Government figures, but one which is derived from national accounts and does not include some portion of the consolidated figures. As a result, the current level of public debt used in the model is 51% and not the 76% indicated previously. As the model is used in a dynamic way, we include the difference when dealing with “critical thresholds” in the unfolding of the scenarios.
- Budget outcomes have then retroactions on other variables: through the impact on real interest rates, the public deficit has a significant influence on investment, and therefore on GDP growth.

## **5- Results of medium-term simulations**

### **5.1 Logic of the scenario and assumptions**

This macro-econometric model has then been used to consider how main Indian macroeconomic balances would evolve in the medium-term if no significant fiscal adjustment were to take place. Such a scenario relies on the underlying assumption that an unstable government coalition has to constantly

face conflicting interests, in part fostered by the growing importance of regional parties in this coalition. As a result, fiscal reforms and structural changes are much more difficult, especially because the fiscal repartition between the central authorities and the States is still hotly discussed, many years after the decentralisation laws has been adopted. From a field perspective, the devolution of financial responsibilities to the lower levels of the Indian administration is faced with huge issues of administrative capacity building, implying that the actual repartition of powers, expenditures and revenues is an uneven process ripe with a highly political sensitivity.

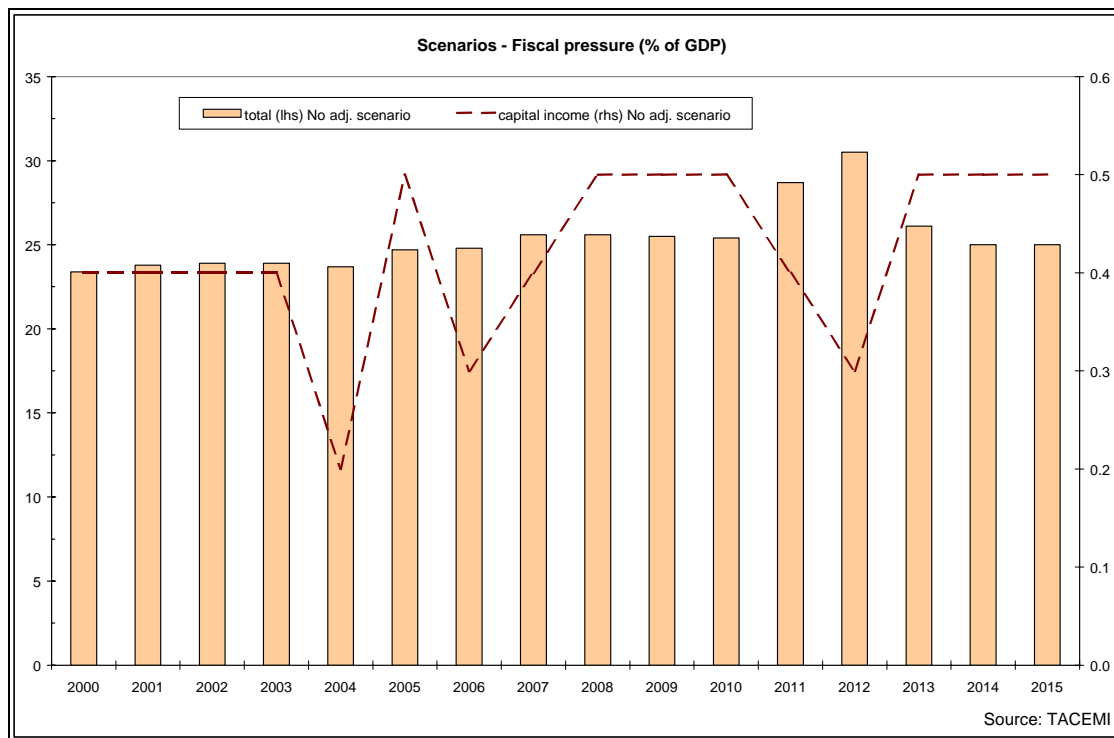
The construction of the scenario obviously required more assumptions than only on the fiscal side. The main element that is important for the overall “equation” between GDP growth, interest rates and public debt sustainability is related to foreign direct investment: indeed, this exogenous variable has a strong influence on the overall growth outcome since it creates a higher total investment without weighing on domestic financial resources; in our scenario, we also related this variable to possible privatisation of state owned assets, since the observation of most developing countries suggest that such a process is central to kick-start much larger flows of FDI. The political assumptions made before clearly point towards a reluctance, or at least a moderate willingness for selling state enterprises, especially those that are profitable and would therefore attract the largest amounts. This underlying assumption has therefore led to moderate amounts of FDI as an exogenous variable, about USD 5.5 bn per year on average, higher than during the past period, but clearly small compared to India’s potential.

Finally, the model was used on a year-by-year basis to reflect the possible policy adjustment over the period 2004-2015, and more importantly the *need* to proceed to required adjustments when critical threshold are crossed. In particular, when looking at the fiscal outcomes (deficits and debt), it was assumed that deficit financing would be difficult and / or confidence in Government bonds would unravel and/or international ratings would be lowered, if or when the budget deficit and the public debt would simultaneously move over, respectively, 10% and 60% (for our indicator: this would be equivalent to 100% on the basis of wholly consolidated figures on public debt).

The logics of the scenario is therefore as follows:

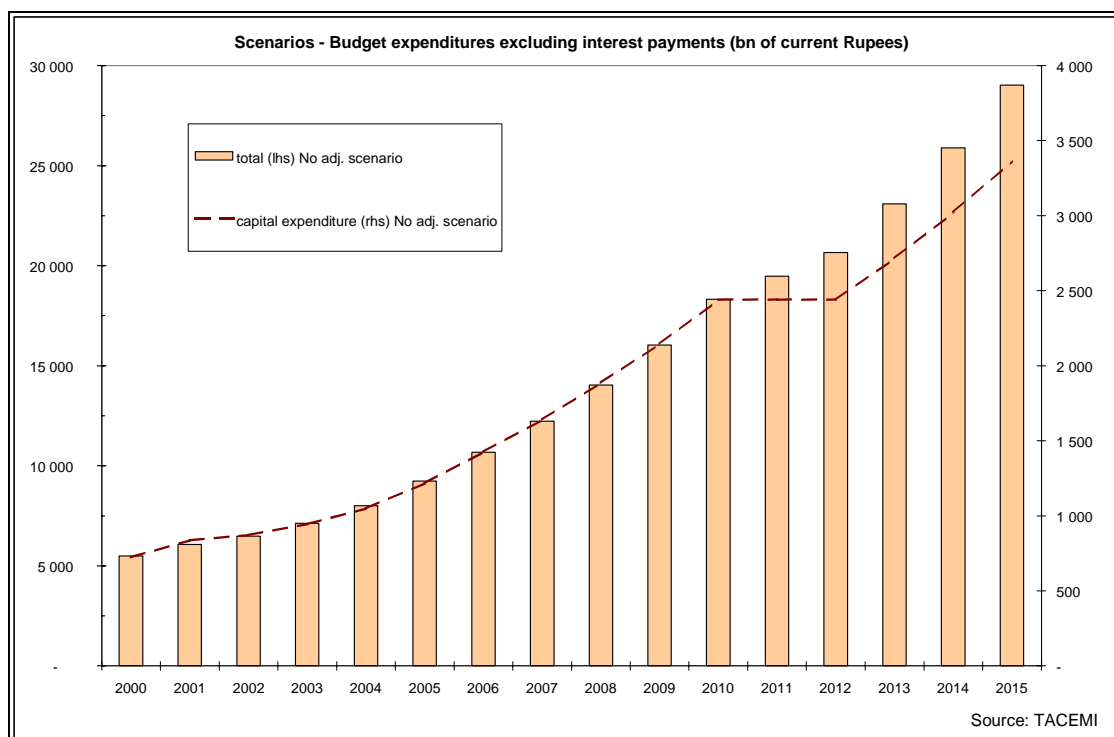
- There is no significant fiscal adjustment, but a progressive and piece-meal programme in order to be able to meet all contradictory demands from the coalition constituents. In the scenario, this is translated by very limited changes to the historical values observed for the tax pressure (see chart 14 on the next page).

Chart 14 Assumptions on fiscal pressure and capital income



- Limited privatisation, more devolution of spending powers to the States, and a focus on better-targeted subsidies are however helping maintaining significant demand with a higher productivity of capital (but lower for labour). In parallel, the permanent role of Government and public spending in the overall economic framework enables to reduce the social tensions, except during the moment of deep fiscal adjustment. The scenario is also associated with significant transfers to the States and therefore visible efforts to limit the widening gaps between areas.

Chart 15 Assumptions on fiscal expenditures

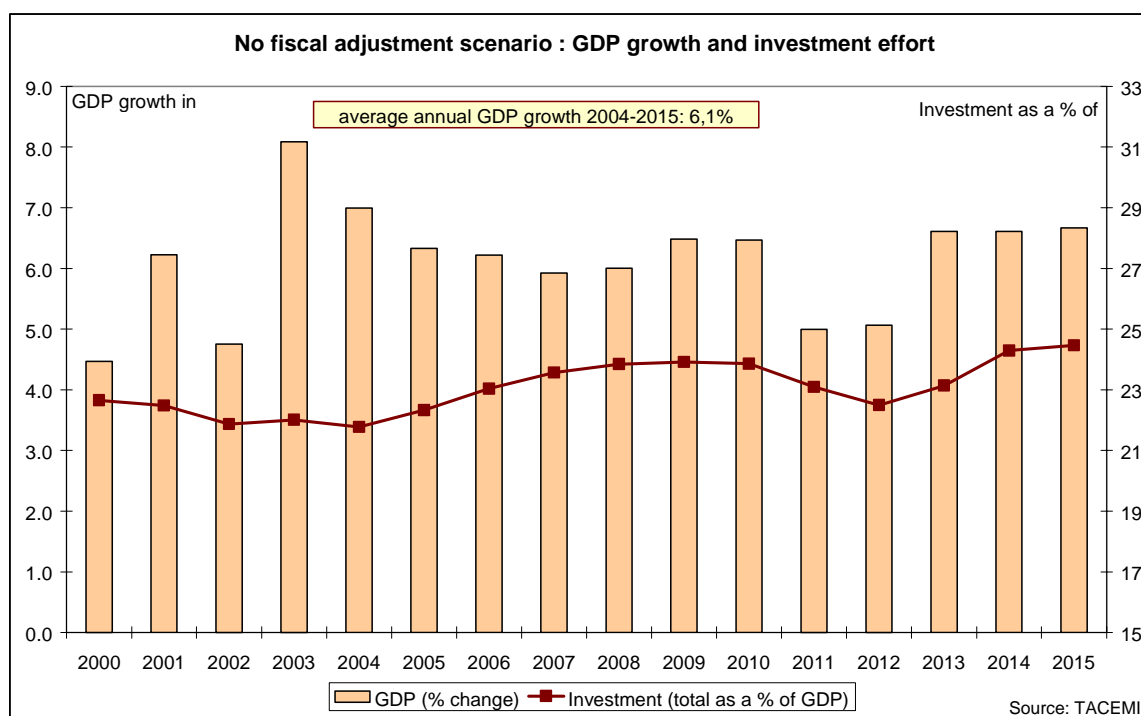


## 5.2 Results of the scenario and the risk of fiscal crisis

The lower level of investment (lower FDIs and negative impact of interest rates on overall investment) induces a productive capital constraint on growth, despite a slightly better investment utilization. However, the positive demographic changes, the initial level of capital stock, and the low inflation still allow GDP growth to be higher than during the past period, at 6.1% per year on average over the period 2004-2015.

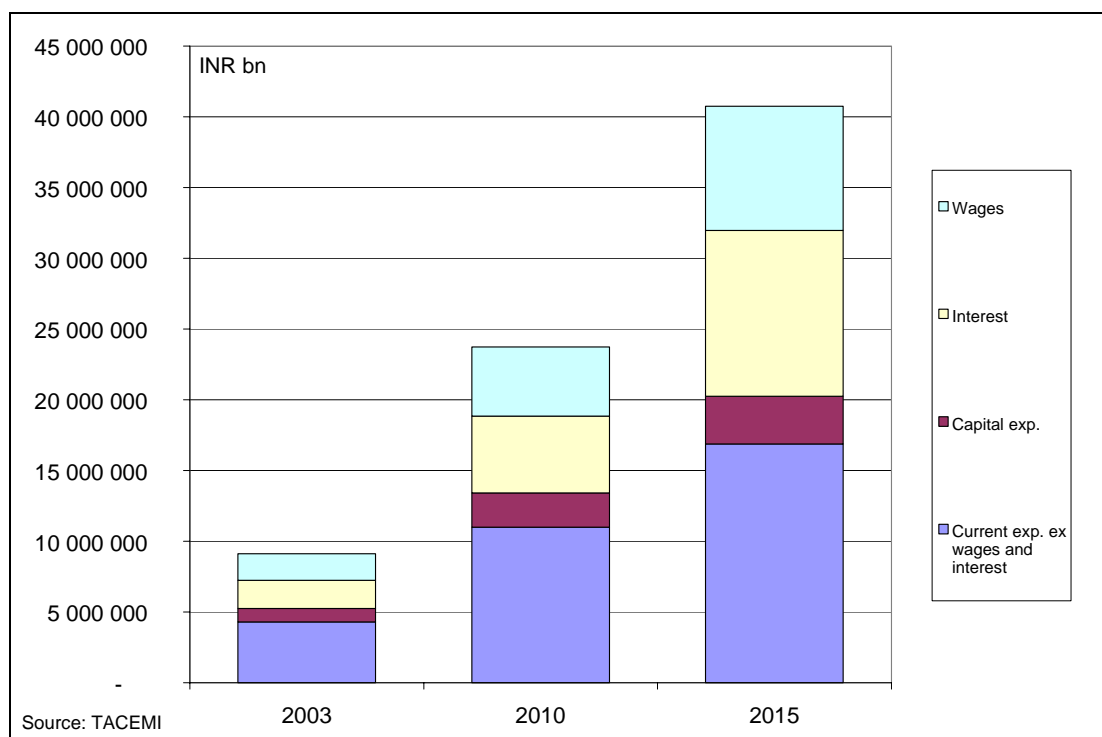
The constraints on demand and incomes allow the external balance to remain contained for most of the period (except at the very end, when the model is basically indicating the likely tensions on export competitiveness and domestic market shares), allowing a somewhat stable real exchange rate and supporting a low inflation.

Chart 16 No fiscal adjustment scenario: GDP growth and investment effort



From the fiscal perspective however, real interest rates increase because of sustained public deficits, and this creates a pervasive spiral debt-interest rate-deficit-debt cycle, where interest payment either crowd-out the other expenditures (weighing on growth) or, as in our quantification, increase further the deficit.

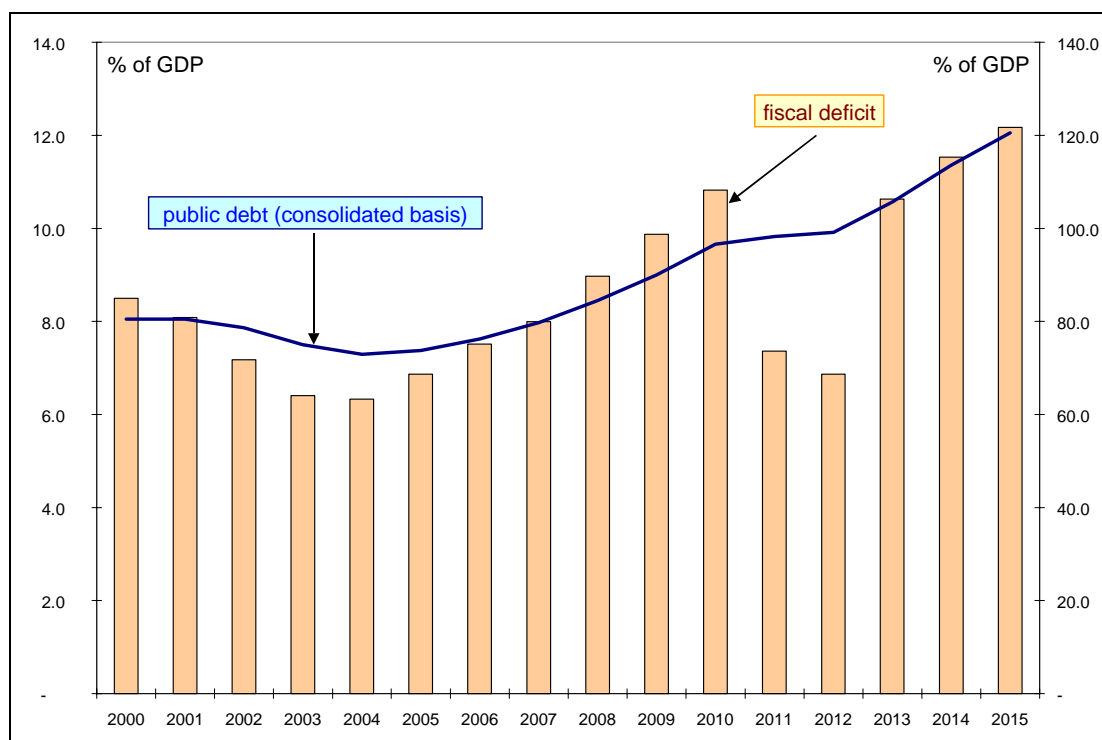
Chart 17 No fiscal adjustment scenario: components of public spending



The lower investment, higher interest rates and larger public deficits all combine to create the conditions of a fiscal shock around the end of the decade. In our quantification, the “critical” thresholds of a deficit above 10% of GDP and a public debt above 60% (100% on a consolidated basis) are reached in 2010-11, after an initial improvement (2004-2006), followed by a rapid deterioration (2007-2009). The thresholds are obviously arbitrary, but the deficit and debt dynamics appear unsustainable after 6-7 years if no adjustment is made. Even more interestingly, a piecemeal fiscal adjustment in 2010-2011 (sharp cut in expenditures, almost exclusively on the capital spending and other “discretionary” spending items) cannot solve the Indian fiscal issues for a long time, since the critical thresholds are attained again as soon as 2015.

Simultaneously, the low inflation / higher interest rate context is pushing upward the exchange rate valuation, progressively hampering exports, which are also negatively affected by the lower level of investment. Therefore, at the end of the simulation period, the likelihood of combined fiscal and external tensions is very high.

Chart 18 No fiscal adjustment scenario: fiscal balance and public debt



Source: TACEMI

At the end of the period (2015), India has clearly sacrificed some economic growth and has put some future burden on the next generations for the still-to-be-done fiscal adjustment, but it has probably managed to engineer its own income repartition model. Public debt is much higher than now (75% of GDP against 50% today, i.e. about 115% of GDP on a wholly consolidated basis), and the ability to adjust is more difficult, even with a sustained economic growth. This would be particularly true if the external tensions were to materialize, since the defence of the Rupee would imply much higher interest rates and a control on domestic demand, mechanically creating a very large unfavourable gap between GDP growth and interest rates.

Overall, it is interesting to see that in this “no fiscal adjustment” scenario, the public debt trap does not occur in the short term and that fiscal adjustment is necessary only close to the end of the period. Moreover the high level of public debt at the end of the forecast period (2015) leaves very limited room to manoeuvre to governments in terms of economic policy and more critical reforms would have to be implemented at that time if a crisis were to be avoided.

When compared to a scenario where fiscal adjustment is conducted (see summary of macroeconomic results in the table below), the following comments can be added:

The total investment ratio is lower in the non-adjustment scenario, although in both scenarios this ratio is higher than in the previous 1994-2003 decade. On the opposite, household investment in the non-adjustment scenario is lower than both the 1994-2003 figures and the adjustment scenario previsions. This can be explained by the fact that the stimulating subsidies granted by the government are compensated at the household level by a higher real interest rate than in the adjustment case. A key difference here is on the level of FDI, much higher in an “adjustment” scenario where the fiscal changes are associated with large privatisation receipts, both leading to increases in total capital accumulation, reduction in the initial level of public debt, and lower interest rates. In parallel, the fiscal adjustment would include the disappearance of the primary deficit, reinforcing the favourable spiral between the decline in interest payment (lower interest rates and lower public debt), the reduction in the overall fiscal deficit, and the positive macroeconomic consequences on investment

and growth. The accentuation of this positive spiral leads to a sharp reduction in the stock of public debt to GDO, to 20% on our measures (i.e. from 75% on a consolidated basis in 2003 to about 30% in 2015).

As regards the impact on GDP growth, it is interesting to see that in both scenarios, average growth on the 2004-2015 period remains at least as good as in the previous decade. While it is of course higher in the adjustment scenario than in the non-adjustment one, the gap between the two is not as wide as many pundits would forecast, considering the large and growing Indian fiscal deficit. Moreover, even when fiscal adjustment takes place and investment effort is higher, GDP growth does not reach the 8% objective set up by the Indian government as a medium-term target. Thus according to the two fiscal scenarios considered here, while non-adjustment costs around one percentage point per year in economic growth, it does not appear as the only reason preventing India from reaching a higher (8% or above) growth path.

Table 3 TACEMI's macroeconomic results for two fiscal scenarios

<b>Macroeconomic performances</b>			
	<b>1994-2003</b>	<b>2004-2015 adjustment</b>	<b>2004-2015 non-adjustment</b>
<b>GDP growth</b> (average)	6.0	7.2	6.1
<b>Total investment ratio</b> (average % of GDP)	22.2	27.6	23.3

<b>Macroeconomic imbalances</b>			
	<b>1994-2003</b>	<b>2004-2015 adjustment</b>	<b>2004-2015 non-adjustment</b>
<b>Inflation</b> (CPI, average)	6.9	5.3	5.2
<b>Budget balance</b> (global, average % of GDP)	-8.8	-2.5	-8.9
<b>Public debt</b> (end-of-period, % of GDP)	61.5	20.0	75.8
<b>External Balance</b> (average % of GDP)	-2.4	-2.8	-3.4
<b>Real interest rates</b> (average)	6.2	2.9	4.5

Source: TACEMI

## 6- Conclusion

India is becoming an economic success story: growth has accelerated and appears to be less sensitive on climatic events, inflation is low, the external balances are favourable, Indian companies are branching out to the world and make headlines for aggressive acquisition and restructuring. Why then worry about the fiscal deficit, in a country where poverty reduction has to remain a top priority for policy makers? This would probably be the mainstream reasoning, especially within the leftwing support of the current Indian government.

However, a quantified simulation instrument using detailed fiscal accounts confirms that the current level of public debt and primary budget balance would require a sustained and large differential between GDP growth and interest rates to allow the “upside exit” from fiscal issues that the Indian authorities are hoping for. This large differential is unlikely to materialize for a sustained period if no fiscal adjustment is made, and this imply that the risk of a serious fiscal shock is very high for the end of the decade or the early 2010s.

Moreover, the “no-adjustment” option is progressively making public spending less efficient in terms of social and development efforts, as interest payment ate progressively crowding-out the required expenditures.

This would then strongly suggest that the nature of the required fiscal adjustment be examined in further details. In particular, the trade-off between privatisation (notably for companies operating in a globally competitive environment) and public debt is a very attractive one, since it both creates an initial favourable shock on public debt and therefore on the whole fiscal spiral after, and it is likely to encourage larger foreign investment, themselves creating conditions for faster growth and a better fiscal situation. The political sensitivities about privatisations should therefore be weighed against the positive implication for social and development spending as well as the risk of a much more painful shock in 5-10 years time. In an ideal world, such an initial adjustment would also be associated with key reforms on public governance so that public spending becomes more efficient. Such a policy change would not dent the social objectives of the current Indian government, but would put India on a higher and sounder development path for the next ten years.

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