India's Growth Turnaround

From 1950 to 1980, Indian real gross domestic product (GDP) grew at an annual average rate of 3.6 per cent (1.5 per cent in per capita terms). From 1990 to 2007 the growth rate averaged 6.4 per cent (4.1 per cent in per capita terms).[1] The shift to a higher growth path during the course of the 1980s is referred to as the Indian growth turnaround. Fast growth in India since the early 1980s has placed it amongst the top nine rapidly growing economies in the world (Ahmed and Varshney 2009).[2]

India's growth turnaround is illustrated in Figure 1. This plots aggregate real GDP growth from 1950 to 2008 against the estimated probability of being in a high growth regime using Hamilton's (1994) Markov Switching Model.[3] The model estimates two distinct regimes: a first sub-period from 1950 to 1981 over which the estimated average real GDP growth rate is 3.7 per cent; and a second regime during which the estimated average growth rate is 6 per cent. The model suggests that there was a relatively short transition period in the early 1980s, with an estimated 100 per cent probability of being in the high growth regime by the mid-1980s. More recently, between 2003–4 and 2007–8, real GDP growth increased further, averaging 8.8 per cent.[4]

The identification of a turnaround in the early 1980s by the Hamilton model is consistent with a range of studies using aggregate data (see Rodrik and Subramanian 2005; Balakrishnan and Parameswaran 2007). More recent work using disaggregated data (Ghate and Wright 2009) points to a rather later data in the mid-1980s, suggesting a conflict between both approaches. We discuss the contrast between these two attempts to time the turnaround in more detail later; but the key issue on which all studies agree is that, at some point during the 1980s, there was an increase in growth, which, from the 1990s, was not only of statistical but also of massive economic

[1]These numbers reflect simple averages and are measured in 1999–2000 prices. The per capita averages for the 1990–2007 period are until 2004, the latest year for which population numbers are available on the Penn World Tables.

[2]Brad De Long at UC Berkeley first pointed out that India's growth acceleration started in the early 1980s. Subsequently, there was a race to explain this acceleration.

[3]Regimes are generated using a Markov switching model (see Hamilton 1994). The model was estimated using EM algorithm-based GAUSS codes by Hamilton. We use the Markov switching model as an illustrative technique.

[4]The year 1980–1 is also identified as breakpoint when we undertake the same exercise with real GDP measured in 1993–4 prices. This suggests that India's growth transition in the early 1980s does not depend on the price series one uses. Interestingly, 1991–2 is not identified as a breakpoint using 1993–4 prices, although it is using 1999–2000 prices.

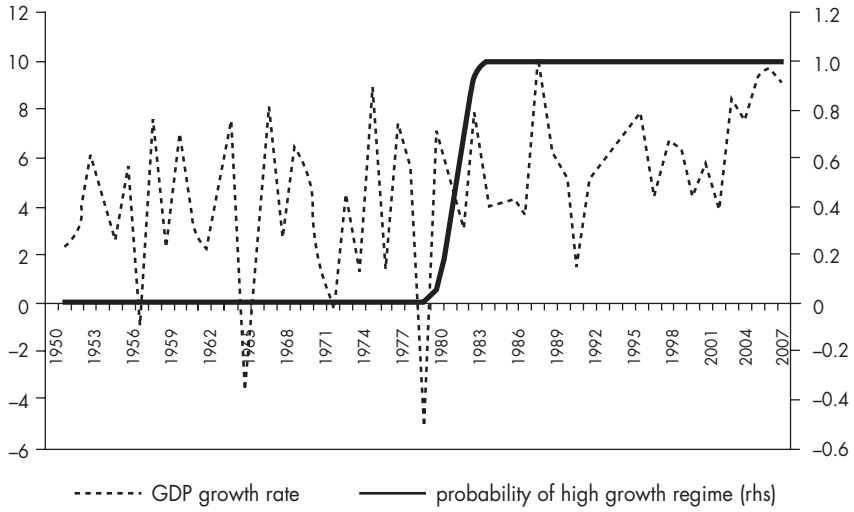

Figure 1 Indian GDP Growth Rate against the Probability of a High GDP Growth Regime

significance. What has puzzled many contributors to the literature is that analysis of aggregate data suggests a pickup in growth during the early 1980s, *before* most of the major policy changes.[5]

The low growth in the first phase is pejoratively referred to as the Hindu rate of growth, a period in which import duties were among the highest in the world, foreign direct investment (FDI) was prohibited in many sectors of the economy, and there was extensive regulation of interest rates. During this period Indian GDP per capita growth was, at best, in line with the long-run average growth rates in most rich countries: there was minimal, if any, tendency to converge. While this performance was better than many African countries, it was clearly in marked contrast to the extremely rapid rates of convergence of the East Asian Tigers during this period.

[5]While a few significant pro-market reforms took place in the mid-1980s, the bulk of economic reforms—which shifted India to an outward-looking, incentive-based private-sector economy—were enacted after the balance of payments (BOP) crisis of 1991.

The upward shift in India's growth path during the 1980s is significant for two reasons: the turnaround happened well before the BOP crisis of 1991 and the large-scale macroeconomic reforms that ensued.

The second puzzling aspect about India's growth turnaround is that it was not driven by manufactured exports and, therefore, has little in common with the East Asian economic miracle. In particular, there was no industrial policy targeted towards developing specific industries. It was the service sector that led the increase in the overall growth rate in the early 1980s. Since many components of services are income related (such as financial services, business services, and hotels and restaurants) and begin to increase only after a certain stage in development, the fact that India's service sector created the impulse for the growth turnaround is puzzling.

While there is a reasonable degree of consensus amongst economists on the timing of India's growth turnaround, there is less agreement about its causes. What is

indisputable is that something happened during the 1980s that opened the door to a rise in growth. The challenge facing growth economists is to weave a logically consistent story on the timing and causes of India's growth turnaround.

TOTAL FACTOR PRODUCTIVITY (TFP) OR POLICIES?

In an influential paper, Rodrik and Subramanian (2005) argue that Indira Gandhi, substantially chastened by her 1977 electoral defeat, became significantly more 'pro-business' after coming back to power in 1980. This 'attitudinal shift' led to more investment which increased manufacturing output dramatically. This led to a growth pickup in 1980. In their view, aggregate productivity measured by TFP growth is driven by an attitudinal shift towards pro-business policies. This contrasts with the role that directly observable policies, such as trade liberalization, would have on a growth shift.[6] The Rodrik–Subramanian story is essentially a manufacturing sector driven explanation of India's growth turnaround.

The above story, however, is generally known to be problematical. This is because of the unlikely finding that a small manufacturing sector (roughly 9 per cent of GDP in the early 1980s) would raise the aggregate growth rate by 2 percentage points. The implied multiplier effects would have to be fantastically large for this to occur. This seems highly implausible, especially since the share of registered manufacturing to GDP in the early 1980s was very small (roughly 8 per cent of GDP).

Balakrishnan and Paramewswaran (2007) use the multiple structural break test approach of Bai and Perron (1998) to look at breaks in sectoral growth rates since 1950. They find that agriculture growth increases (permanently) during the mid-1960s. This is followed by a take-off in the service sector in the mid-1970s. Finally, manufacturing output growth breaks in 1982–3, after the break in overall growth which they place as early as 1979. Based on the timing of these recursive sectoral breaks, they suggest that the manufacturing sector is not responsible for a shift to a higher growth path, rather it is has been led by growth shifts in other sectors.[7] This discussion suggests that framing the debate on India's growth turnaround as driven either by TFP shifts or a change in policies is problematical. The shift in manufacturing growth occurring after the shift in overall growth is also verified by Figure 2: using the regime switching approach, the break in manufacturing occurs in 1986–7, well after the estimated upward shift in aggregate growth (see Figure 1) with the growth rate of manufacturing output amounting to 4.8 per cent in the period 1964–86 and

[6]Rodrik and Subramanian distinguish between pro-business policies and pro-market policies. Examples of pro-business polices are easing restrictions on capacity expansion for incumbents, removing price controls, and reducing corporate taxes; trade liberalization is an example of a market-oriented policy. They conclude that a shift towards a pro-business orientation can be an essential trigger that sets off growth accelerations.

[7]Balakrishnan and Parameswaran argue that because of the drought of the mid-1960s, there was a huge decline in food grain production. There was also extremely poor management of the macro-economy leaving little foreign exchange to import food. The crisis ultimately induced a green revolution and saw large public investments in the agriculture sector. The resource flow into the sector led to a growth shift in agriculture. This explains the impulse in agriculture in the mid-1960s. The problem with this narrative is that it does not address the endogeneity problem surrounding public investment. An interesting open research question is whether inter-sectoral linkages from the manufacturing sector are greater than those from the service sector.

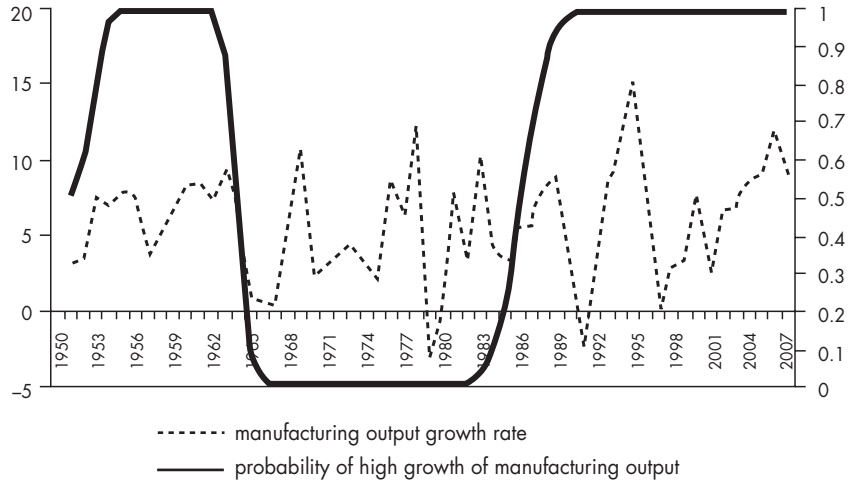

Figure 2 Growth Rate of Manufacturing Output against the Probability of High Growth of Manufacturing Output

6.5 per cent between 1987 and 2007 (and before 1964).[8]

Balakrishnan and Parameswaran's approach for determining turning points is (itself) not without criticism. Basu (2008) argues that a common problem that applies to the existing empirical literature on the Indian growth turnaround is the special nature of the period 1979–80, which saw a sharp contraction in Indian real GDP growth (–5.2 per cent). The approach followed by Balakrishnan and Parameswaran (2007)—by essentially fitting linear segments to a fluctuating growth pattern—would find a propensity for the break to appear before 1979–80.[9]

A possible reconciliation of the TFP versus policy debate is that while a few key trade reforms were legislatively enacted in the mid-1980s, they started to get debated in the early 1980s. Because investment is forward looking, the anticipated effects of policy changes led to India's growth turnaround prior to the enactment of the reforms. For instance, the removal of capacity constraints would allow firms to produce at higher or full capacity with the same inputs, leading to an increase in the rate of growth of productivity. The need for future research is to understand more clearly the disaggregated mechanisms that induced the Indian growth turnaround.[10]

[8]Both Rodrik and Subramanian (2005) and Balakrishnan and Parameswaran (2007) use the multiple structural break tests of Bai and Perron (1998). This possibly explains why they obtain a similar breakpoint (early 1980s) in aggregate real GDP growth.

[9]Basu (2008) finds that if 1979–80 is discounted, the break in trend occurs in 1975–6. This suggests that the 1979–80 breakpoint is a statistical construct without much policy significance.

[10]In an interesting discussion, Kotwal et al. (2009) suggest that technology transfers in the early and mid-1980s allowed cheaper and easier access to imported machinery made possible by trade liberalization, unleashing a process of creative destruction in which the efficient firms—who upgraded their technology—drove out the inefficient firms. This raised the overall productivity of factors in the economy as factors got reallocated more productively. Rising industrial and service-sector productivity also had secondary effects: it attracted labour from agriculture. This raised wages for the workers left behind in agriculture.

THE V FACTOR

Recent work by Ghate and Wright (2009) suggests that the turning point in Indian growth was not in the early 1980s, as most other studies have assumed, but in the mid-1980s. In this respect the Ghate and Wright approach appears to resolve the puzzle discussed by Rodrik and Subramanian (2005), who, using aggregate data, concluded that the turnaround in growth came in the early 1980s, well before any observable shift in policy. Instead of using an aggregate GDP series, Ghate and Wright use factor analysis on state-level sectoral time series data for fourteen sectors in fifteen states—at 1993–4 prices—to identify common patterns in the growth shifts of Indian states. A significant advantage of the common factor representation is that one does not need to impose a particular date for the turnaround in growth. Nor does one need to impose that it be a deterministic shift, as in standard econometric representations of structural breaks; nor even that all series participate in the shift at identical dates.

Apart from random fluctuations, Ghate and Wright find that two factors drive these time series: one is a nearly deterministic straight-line growth factor, and the other exhibits a V shape, which the authors refer to as the V factor. The apex of the V is in 1987 when reforms to open up the economy started to take place.[11] In fact, the time profile of the V is strongly correlated with the pattern of trade liberalization, as summarized by the effective tariff rate (see Ghate and Wright 2009: figure 7).[12]

While the common nature of the growth turnaround, as identified by the V factor, appears to correspond to a common shift in trade policy, the disparate impact of the V factor across major Indian states presents something of a puzzle. Table 1 examines this issue by showing correlations between identifiable state characteristics shortly before the turnaround, and their estimated V factor loadings. The table provides both negative and some (weaker) positive results. On the negative side, it allows us to dispose

Table 1 State Characteristics and State V factor Loadings

State characteristics	Correlation with average state V factor loading
A Rich State Club?	
Log real ouput per capita 1985	–0.07
Solow Variables	
Fixed investment, % of NSDP 1981	–0.42
Log population 1981	0.09
Population growth 1971–81	–0.22
Public Spending	
Development expenditures as a percentage of NSDP 1981	0.17
Supply-side Characteristics	
Share of registered manufacturing 1985	0.18
Electricity generation, kwh per capita, 1981	–0.19
Share of agriculture, % 1985	–0.68
Literacy rate 1981	0.49
Urban population, %	0.32

Note: NSDP is net state domestic product.

[11]Figure 1 shows that up until at least the mid-1980s growth of GDP remained within the range of variation observed in the first regime. Aggregate data do not, therefore, appear to conflict markedly with the null hypothesis that the switch actually occurred as late as, say, 1987, the date identified by Ghate and Wright (2009), using disaggregated data.

[12]Other major internal liberalization measures that were implemented in 1985 and 1986 involved (a) eliminating the licensing of twenty-five categories of industries, (b) extending de-licensing to large companies in twenty-two industries that were previously restricted by the Monopolies and Restrictive Trade Practices Act and Foreign Exchange Regulation Act, and (c) allowing companies that had reached 80 per cent capacity utilization to expand their capacity up to 133 per cent of that reached in any of the previous years (see Rodrik and Subramanian 2005).

of some candidate explanations: (a) the turnaround in growth was not restricted to a club of richer states: initial income levels were unrelated to the magnitude of the response to the V factor; (b) explanations based on differences in key magnitudes in a standard Solow-style growth model (saving, investment population growth rate and level) also do not show any systematic differences (the sign of the investment correlation is perverse—the correlation with population growth is of the correct sign but very low); (c) the direct contribution of the public sector to the turnaround appears to have been at best weak, and possibly perverse: there was essentially a zero correlation between the initial values of development spending and the subsequent impact of the V factor; and (d) total public spending actually had a V factor loading which was somewhat negatively correlated with the overall state loading (that is, 'V states'—those with a positive loading on the V factor—tended if anything to have slowdowns in growth of public spending after the turnaround in overall growth).

The bottom block of the table provides evidence of some proxies for supply-side characteristics of individual states. The table shows that 'V states' tended to be somewhat more literate and somewhat more urbanized, and (the strongest correlation shown) had lower shares of agriculture.

Table 1 also shows that there was essentially no link between V factor loadings and the share of registered manufacturing, which played an important role in Rodrik and Subramanian's (2005) explanation of the turnaround. This suggests that while registered manufacturing may, in line with Rodrik and Subramanian's analysis, have been a catalyst for growth in the early 1980s, it was far from being an engine of growth over the longer term.

THE GROWTH TURNAROUND AND IMPLICATIONS FOR DIVERGENCE

The V factor provides evidence of a highly pervasive, but by no means universal shift in behaviour in India during the course of the 1980s. Can we reconcile this evidence with any underlying economic model? One way to think about this is to consider a general model of convergence of the form

$$\Delta(y^{i}_{t+1} - y^{US}_{t+1}) = \alpha_i (y^{US}_{t} + s_{it} + s^{India}_{t} - y_{it}) + \Delta TFP^{i}_{t+1} - \Delta TFP^{US}_{t+1} + \varepsilon_{it+1}$$

where y_{it} is log output per capita for state *i*, the s_{it} and s^{India}_{t} variables captures factors that determine steady-state output relative to the frontier represented by y^{US}_{t}; log output per capita in the United States, for individual states and for India as a whole; TFP_{it} and TFP^{US}_{t} is growth rate of TFP in state *i* and in the United States and ε_{it} captures short-run cyclical factors.

The simple framework of the equation offers a range of possible ways of accounting for the all-India pattern. It seems reasonable to argue that the sum of the last three terms on the right-hand side of the above equation is unlikely to provide an adequate explanation of longer-term trends. In standard Cobb-Douglas type technology models TFP growth shocks are common across all economies and hence cancel out precisely. But even if they are country specific, such relative shocks might reasonably be assumed to have a stationary distribution. The same applies to the short-term error term, (ε_{it}). Thus we need to look for an explanation somewhere in the first term.

One possible interpretation of the earlier period was that the bracketed 'convergence' term (the term multiplied by α_i) was on average close to zero—that is, most, or possibly all, Indian states were conditional upon the s_{it} and s^{India}_{t} processes, fairly close

to their steady-state values. The downward drift in most states' relative output levels would, according to this interpretation, be understood either as a succession of bad relative TFP growth shocks, or possibly as a downward drift in s_t^{India}.

It is harder to continue the logic of this explanation after the growth turnaround. The evidence of the V factor, and its correlation with the measure of trade liberalization in Ghate and Wright (2009), suggests very strongly that the impetus for the turnaround was common across all states, hence it is reasonable to attribute it to changes in the common Indian steady state factor, s_t^{India}. Given the subsequent dramatic changes in rates of convergence, then, conditional upon a reasonable degree of stability in the other elements on the right-hand side of the equation, the implied changes in s_t^{India} must have been quite dramatic. Rodrik and Subramanian (2005) argue that this is plausible because India was well away from its production possibility frontier.

But since these changes were common across states, the puzzle presented by the differential impact of the V factor is why any such shift in s_t^{India} did not have largely symmetric effects across the states. There is one possible explanation which reconciles both the all-India and state-wise evidence. The analysis of these shifts has implicitly assumed that the state-specific rates of convergence, α_i, were both strictly positive and reasonably similar across states. But an alternative explanation would attribute the pattern of the evidence largely to the α_i themselves. According to this interpretation, and consistent with the arguments of Rodrik and Subramanian, the bracketed expression in the first term was *not* necessarily close to zero in the first period; but failure to converge to the global frontier was largely due to the α_i being so close to zero that differences between actual and steady state income levels had essentially no impact. The turnaround in growth and its differential pattern would then be attributed to some combination of a common shift in s_t^{India} and state-wise differences in the α_i. A differential impact of the all-India shock might be attributed to different values of α_i; with non-V states, by implication, having α_i values extremely close to zero, thus closing off any convergence response.

AGENDA FOR FUTURE RESEARCH

Research on India's growth turnaround needs to move beyond its empiricist nature and towards a theoretical model of India's growth pattern. Given India's economic planning history and the empirical evidence it would be natural to think of the main counterfactual as openness to trade, that is, what would India's growth path have looked like if the many opportunities for trade had been acted upon? However, an alternative counterfactual relates to India's abysmal record in primary education to which the Mahalanobis plan gave little attention (Balakrishnan 2008). The rate of growth induced by higher human capital accumulation might have vastly changed the growth pattern of India.

Looking forward, probably the most crucial factor is whether the Indian turnaround is sufficiently robust that it will be sustained, and whether India will follow the East Asian precedent of rapid convergence (albeit from a very low base) towards per capita income levels of rich countries at the technological frontier. To the extent that, for example, while the 'V factor' of Ghate and Wright (2009) appears strongly correlated with tariff reductions, there are arguably only modest further gains that can arise from this source, since tariffs are now steadily approaching the levels in

most OECD countries. The key issue looking forward, therefore, is that having shifted to a higher growth path (whatever the initial impetus or catalyst may have been), will this growth path prove self-sustaining?

CHETAN GHATE, STEPHEN WRIGHT, AND TATIANA FIC*

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