

Editors' Summary

This is the third volume of the *India Policy Forum*. The journal is jointly promoted by the National Council for Applied Economic Research (NCAER) in New Delhi and the Brookings Institution in Washington, D.C., with the objective of presenting high-quality empirical research on the major economic policy issues that confront contemporary India. The forum is supported by a distinguished advisory panel and a group of active researchers who participate in the review and discussion process and offer suggestions to the editors and the authors. Our objective is to make the policy discussion accessible to a broad nonspecialist audience inside and outside India. We also hope that it will assist in the development of a global network of scholars interested in India's economic transformation.

The five individual papers included in this volume were selected by the editors and presented at a conference in Delhi on July 31 and August 1, 2006. In addition to the working sessions, Pranab Bardhan, a member of the advisory panel, gave a public address on the topic of "Governance Matters in Economic Reform." The papers cover a diverse set of macro and micro-economic topics of relevance to policymakers. The first two papers focus on India's economic growth performance over the past quarter century and the impact of trade liberalization on the distribution of income and poverty. The third paper highlights the distressingly poor performance of India's elementary schools. The fourth paper examines the role of economic factors on the decline of the Indian birth rate. The last paper explores the link between economic growth and environmental change by assessing the interaction between local living standards and forest degradation in the Indian mid-Himalayas.

During the first three decades of its development, the Indian economy grew at the so-called Hindu rate of growth of 3 to 4 percent. But India has now turned a corner, growing at a much higher rate of 6 to 7 percent during the last two decades. How has this transition been achieved and what implications does it have for the future transformation from a primarily rural and agricultural economy to a more modern one? These are the key questions Bosworth, Collins, and Virmani address in their paper.

Bosworth et al. observe that answering these questions requires analyses of both the evolution of productivity in the three key sectors—agriculture, industry and services—and the implications for aggregate productivity

growth of the reallocation of resources out of agriculture to more productive activities in industry and services. Consequently, they use a growth accounting framework to examine empirically the acceleration in economic growth that India has achieved over the past two decades. The analysis focuses on two dimensions in which India's experience differs from that of China and other parts of Asia. First, instead of strong growth in the manufacturing sector and in exports, India's success reflects rapid expansion of service-producing industries. Second, it has been associated with relatively modest levels of human and physical capital accumulation.

The authors construct accounts at the sectoral level, and identify the residual gains from resource reallocation across sectors. They then undertake further analysis of the role of capital accumulation—providing estimates of the returns to schooling for human capital, and reporting on trends in sectoral saving and investment in physical capital. The paper concludes with a discussion of some of the important issues for India's growth experience and prospects for the future.

Throughout the analysis, the authors focus on the quality of the available data. The updated growth accounts incorporate recent data revisions, some of which are quite large. Extensive examination of the relevant underlying data series helps to clarify a number of issues related to how the data are constructed. In particular, the discussion highlights challenges faced by the Indian statistical agencies in preparing measures of output and employment, primarily because much of the non-agricultural workforce operates outside of standard reporting programs. Thus, India's national accounts depend on quinquennial surveys (conducted in 1973, 1983, 1987, 1993, 1999, and 2004) for information on households and small enterprises. Researchers should have a reasonable degree of confidence in the GDP estimates for benchmark years that incorporate results from the surveys. However, for non-benchmark years, annual output data are based on interpolation and extrapolation of the labor input data required to construct output measures for India's large unorganized sector. The lack of reliable annual series makes it impossible to pin down the precise timing of India's growth acceleration.

A key finding of the paper is that services have shown very substantial productivity growth since the early 1980s—a result in sharp contrast to that obtained for other countries at a similar stage of development. Productivity gains in agriculture and industry have been modest, which is consistent with both the findings of prior studies of India and those for other comparable countries such as Korea and Taiwan in the 1960s and 1970s. What distinguishes the Indian case is the relatively small *output*

growth in industry: the sector has not played a major role in reallocating workers out of agriculture where they are underutilized.

Considerable attention has been focused on the role of services—especially high-tech services—as the source of India’s growth. The growth accounts attribute 1.3 percentage points of the 3.8 percent per annum growth in GDP per worker during 1980–2004 to growth in total services productivity (versus 0.7 percentage points each to agriculture and industry and 1 percent to reallocation).

However, the authors argue that the frequent emphasis on business services as the driving force behind India’s economic expansion may be overblown. Despite its extraordinary growth, the industry comprises only a small share of India’s GDP and employment. Business services provide jobs primarily for the relatively small proportion of the workforce that is highly educated, and recent increases in the returns to higher education suggest that high-skill services industries are encountering labor shortages. Furthermore, the strong gains in service sector TFP are puzzling. One might expect this in sub-sectors such as finance and business services, but these sectors remain small—just 17 percent of total services output in 2004. In fact, the growth acceleration is quite widely dispersed across service sub-sectors and rapid productivity growth seems unlikely in the biggest, which are trade, transportation and community services. Though difficult to verify, the authors express concern that an underestimate of services price inflation, particularly in the more traditional sectors, may imply an overestimate of output growth. The available measures of employment suggest a less dramatic acceleration of overall growth and a somewhat smaller focus on services.

In any case, India’s growth expansion is not creating adequate job growth for the bulk of the population that is not particularly well-educated. Thus, it is important that India broaden the base of the current expansion by promoting programs that would increase India’s attractiveness as a source of manufactured goods for the world market. Growth of the manufacturing sector would also provide a strong match for the skills of India’s workforce.

The paper also offers additional discussion of education and physical investment, both of which have an important bearing on growth and productivity. The accounting decomposition finds that the growth contribution from increases in education has been quite modest. The paper also examines the evolution of India’s saving behavior. The authors conclude that saving is not constraining India’s growth. However, there is room for increased public and foreign savings.

Pulling together the findings of their analysis, the authors draw a number of implications for India's growth in the coming decade. A key message is that India needs to broaden the base of its economic growth through the expansion of the industrial sector—especially manufacturing. In this context, China provides a useful model, in its emphasis on exports of manufactured goods as a primary driver of growth.

To accomplish this, India needs to create a more attractive economic environment for doing business—a location able to compete effectively with China. This will require strengthening its infrastructure—including a weak and unreliable power system, and poor land transportation in many states. However, India already enjoys relatively good institutions and is strong in the areas of finance and business services.

The liberalization of the international trade regime is believed to reduce poverty through its impact on both efficiency and distribution. Expansion of trade lowers the cost of goods and services consumed by the poor and freer trade should lead to an increased demand for and higher returns to unskilled labor in poor countries. However, those gains may not emerge if workers are not able to move to the sectors and areas of expanding demand. Thus, the ultimate effect of trade expansion on poverty is ambiguous and must be determined empirically.

In their paper, Hasan, Mitra, and Ural examine the impact of India's trade liberalization on poverty reduction using state and regional level data from the National Sample Survey (NSS) of households. Their measure of trade policy includes changes in both tariffs and non-tariff barriers (NTBs). They weight tariffs (and alternatively NTBs) by sectoral employment to arrive at a state-level measure of the trade exposure of the labor force, and they construct a second version that is based on a principal-components aggregation of the two policy instruments. They then allow the impact of trade policy on poverty to differ across states according to the flexibility of labor-market institutions. The classification of states with flexible and inflexible labor markets is based largely on a prior study by Besley and Burgess. To obtain a clearer picture of the effects on poverty, they also investigate the impact of another important, complementary component of economic reforms, namely product market deregulation, and look also at its interaction with labor-market institutions.

The measures of poverty are drawn from the NSS surveys of 1987–88, 1993–94, and 1999–2000, and are largely based on a methodology developed by Deaton and Drèze and their approach for adjusting the poverty estimates for a change in the design of the household survey in 1999–2000.

However, Hasan et al. also check the robustness of their results with two alternative measures: one based on the official Government of India (GOI) estimates of poverty, and a longer time series of state-level poverty rates created by Ozler, Datt, and Ravallion. Another innovation in the paper is that they allow the transmission of changes in protection rates to domestic prices to vary across states since distance and the quality of the transportation system should influence the extent of change in local prices.

Their principal finding is that states whose workers are more exposed to foreign competition tend to have lower rural, urban and overall poverty rates (and poverty gaps), and this beneficial effect of greater trade openness is more pronounced in states that have more flexible labor market institutions. Trade liberalization has led to poverty reduction to a greater degree in states that are more exposed to foreign competition by virtue of their industrial composition. The results hold, at varying strengths and significance, for overall, urban and rural poverty.

For example, controlling for state as well as time fixed effects, they conclude that the reduction in tariff rates over the 1990s was associated with a reduction in poverty rates ranging from 16 percent to 40 percent. Reductions in tariff rates also were associated with a decline of about 15 percent in urban poverty in states with flexible labor market institutions relative to other states. They find some evidence that industrial delicensing has had a more beneficial impact on poverty reduction in states with flexible labor institutions.

Hasan et al. contrast their evidence on the linkages between trade and poverty with a prior study by Petia Topalova, whose investigation utilized district-level data. Topalova concluded that trade liberalization slowed the pace of poverty reduction in rural districts, with the strength of this effect being inversely related to the flexibility of labor-market institutions. She found that the linkage between trade liberalization and poverty reduction was also negative in urban areas, but that result was not statistically significant. The authors provide some reasons for the differences. First, Topalova restricted her analysis to one measure of employment-weighted tariffs. The current paper includes NTBs and a principal-components aggregate of tariffs and NTBs. Second, there are significant differences between the two studies in the methods used to construct the overall employment-weighted indexes of average tariffs. Topalova included non-tradable goods industries, which are explicitly excluded from the measures used in the current study. Third, the Topalova paper did not allow for the effects of changes in trade protection on domestic prices to vary across districts. Finally, the authors explored the robustness of their own results

by incorporating a greater variety of poverty measures and by extending the analysis to the regional level.

India's public elementary education system faces enormous problems. Although enrollments have increased, a recent survey of rural areas found shockingly low levels of learning achievement, confirming the cumulating evidence of a dysfunctional system. There are many other indicators of distress—high levels of dissatisfaction of parents and students with teachers, the massive and on-going shift into private schooling, and the unhappiness of the public sector teachers themselves.

In their paper, Pritchett and Murgai argue that the current system of teacher compensation in the public sector is at the heart of many of these problems. They argue that the system of compensation within any high performance organization should be designed to attract, retain and motivate workers who, on a day-to-day basis, pursue the goals of the organization. All four elements of a system of compensation (*durability of the employment relationship, structure of pay across states of the world, assignment of workers to tasks, and cash versus benefits*) should work together towards this goal.

Their paper highlights the extraordinary extent to which India's system of teacher compensation departs from this norm. While there are many variations across states, the current system can aptly be described as a combination of *high pay and zero accountability*. The paper documents four facts about the system of teacher compensation: (1) there is little or no ability to terminate the employment of teachers—for any cause; (2) the average pay of public sector teachers is very high relative to alternatives (both private teaching and other private sector jobs); (3) the degree of overpayment is *higher* for public sector teachers at the early stages of a career; and (4) the pay of public sector teachers has very little variance even potentially related to performance—much less than either private sector teachers or other private sector salaried workers.

Each of these elements of the system of compensation reinforces the lack of accountability. There is nothing in the present system to attract people well matched to teaching, to retain the best and most committed teachers, or to motivate performance of good teachers (for that matter, prevent good teachers from becoming disillusioned, cynical, and embittered and yet stay until they are 60 years old). Moreover, the institutional context of basic schooling—all the other relationships of accountability—is also weak.

Pritchett and Murgai argue that this system of compensation plays a large role in producing the current “perfect storm” in public schooling:

(a) the learning achievement of students is low, (b) absenteeism of teachers is very high, (c) the treatment by teachers of students is often abysmal, (d) parents and students are dissatisfied with government schools, and (e) families are voting with their feet and pocketbooks to move their children into private schools. Perhaps worst of all, the potentially good teachers within the public system are disenchanted, overburdened, and feel disrespected by parents and managements. The authors argue that any reform of teacher compensation needs to be *pro-teacher* in contrast with the current system which is dramatically *anti-teacher*.

In one study of schools in New Delhi, teachers in government schools were compensated at a rate seven times of that of teachers in unregistered schools, they were present less than half the time, and their students consistently scored far below those of students in the unregistered schools in all subject areas. Parents and students expressed higher levels of displeasure with teacher performance in the public schools. Even so, government teachers were dissatisfied with nearly every element of their jobs.

While accepting the common view that there is no possibility of significant reform of the compensation system under the present circumstances, Pritchett and Murgai argue that the devolution of education to Panchayati Raj Institutions (PRIs) provides a unique opportunity to restructure the system to be consistent with an accountable and performance-oriented public sector. Decentralization to PRIs, if done well, has the potential to break the political impetus behind business as usual by combining a reallocation of functions across tiers of government (states and PRIs) with allowing PRIs to develop systems of compensation that are aligned with the realities of public employment and the particularities of the practice of teaching.

Pritchett and Murgai suggest that the development of a future cadre of teachers should take place within a new system under district control. They propose a system with three phases for teachers' careers, ranging from an initial apprentice phase up to a masters level, with each stage corresponding to increased pay and prestige. Promotion from one phase to another would be based on performance reviews with input from the local school, peers, and technical reviews. The objective is to develop a professional teacher cadre at the district level, but to leave control of school administration and the actual hiring of teachers from the eligible pool with the local authorities.

Fast growth of the population has been a central concern of policy makers in the developing countries with large populations such as India and China. Reductions in fertility have been seen as an important means to achieve

rapid and sustained economic growth. And, many countries have adopted policies ranging from offering incentives for fertility reduction to outright restrictions on the size of the families. The advocates of such direct measures to reduce fertility are skeptical that economic growth alone can deliver the necessary reduction in fertility without at least a major expansion of education among women.

At one level, the controversy over the positive role of economic growth in driving down fertility would seem surprising. After all, richer, more developed economies have uniformly lower fertility rates than do poorer, less developed ones. Over time many formerly poor countries have become richer and simultaneously achieved sustained fertility declines.

But there also exist examples and patterns supporting the view that fertility responds to declining mortality and a transition in cultural perspective that need not be related to growth. For example, we have countries such as Cuba, Costa Rica, and Sri Lanka with traditionally high levels of education and health and correspondingly low levels of fertility. Likewise, China has lowered fertility through direct intervention at a relatively low level of income. There also exists evidence that the timing of a first sustained decline in fertility is not connected to a particular threshold level of economic development.

In their paper, Andrew Foster and Mark Rosenzweig employ a newly available panel data set to assess the impact of economic factors on fertility. The data set offers a representative sample of rural India over the period 1971-99, and it allows an examination of the main factors responsible for the rural fertility decline that occurred in India in the 1980s and 1990s. The authors first construct a simple dynamic model of fertility choice that incorporates the opportunity cost of time, the trade-off between investments in the human capital of children and family size (the so-called quality-quantity trade-off), and increased access to health and family planning services as determinants of fertility. The model yields testable hypotheses relating the fertility decision to its various determinants.

The authors then go on to use the data set to test the hypotheses so derived. A key feature of the data is that it links the households across different rounds of the survey. This permits the elimination of the influence of time-persistent cultural and preference differences across Indian states and households that may be correlated with economic change. When these cultural and preference differences are ignored, the empirical results lead to the conclusion that neither agricultural productivity growth nor changes in the value of time matter for fertility change. Cross-sectional variations in

fertility decisions depend only on the spatial differences in maternal education. This analysis supports the advocates of direct intervention to influence fertility decisions.

But once the authors take the cultural and preference differences into account, the results change dramatically. The corrected results show that increases in the opportunity cost of women's time, as reflected in female wages and increased investments in child schooling, explain the lion's share of the fertility decline. The results leave very little role for parental schooling, male or female.

The results show that the areas of high agricultural productivity growth not only experience declines in fertility but also increases in the schooling of children and in the time devoted by married women to non-household work. The quantitative estimates suggest that aggregate wage changes, dominated by increases in the value of female wages, explain 15 percent of the decline in fertility over the 1982–99 period. In combination, changes in agricultural productivity and agricultural wage rates explain fully 61 percent of the fertility decline. Health centers are found to have had a significant effect on fertility as well, but the aggregate increases in the diffusion of health centers in villages only explains 3.4 percent of the fall because during the period there was little change in the distribution of such centers. The results thus suggest that the process of economic growth has had a major impact on fertility in India over the last two decades. The authors conclude that given sustained economic growth that continues to raise wages and increase returns to human capital, the fall in fertility in India will continue for the foreseeable future.

Given their enormous populations, the rapid, sustained growth of India and China has heightened concerns on the environmental consequences of such growth. Yet there is no accepted professional consensus on the nature and intensity of these links. For some economists, growth is seen as continuing to raise the demand for the earth's energy resources. For others poverty is seen as the root cause, implying that growth is itself at least part of the solution. The so-called 'environmental Kuznets curve' hypothesis represents an intermediate view: economic development may initially aggravate environmental problems, but beyond a threshold of economic development environmental conditions improve. Yet another viewpoint stresses the importance of local institutions such as monitoring systems and community property rights. Particularly where deforestation is concerned it is argued that assigning local communities effective control of forest resources would substantially reduce environmental pressures, leaving little need for external policy interventions.

Despite these different perspectives, there is remarkably little systematic micro-empirical evidence on their relative validity. Efforts to test these hypotheses have been cast mainly on the basis of macro cross-country regressions, with only a few recent efforts to use micro evidence concerning behavior of households and local institutions governing use of environmental resources. The paper by Baland and others attempts to fill this gap through a careful analysis of the determinants of firewood and fodder collection, the chief causes of forest degradation in the mid-Himalayan region of India. The study seeks to predict the deforestation implications of future growth in the region, assess the likely impact on future livelihoods of local residents, and evaluate some specific policies to arrest forest degradation.

The analysis is based on a stratified random sample of 3,291 households in 165 mid-Himalayan villages in the Indian states of Uttaranchal (recently renamed Uttarakhand) and Himachal Pradesh, complemented by detailed measurement of forest conditions in surrounding areas used for collection of firewood and for livestock grazing. Prior accounts of the state of these forests suggest significant externality problems at both local and transnational levels. The local externality problem arises from the dependence of the livelihood of local inhabitants on neighbouring forests. The forests are important for the collection of firewood (the principal source of household energy), fodder for livestock rearing, leaf-litter for generation of organic manure, timber for house construction, and collection of herbs and vegetables. Sustainability of the Himalayan forest stock also has significant implications for the overall ecological balance of the South Asian region. The Himalayan range is amongst the most unstable of the world's mountains and therefore inherently susceptible to natural calamities. There is evidence that deforestation aggravates the ravaging effects of regular earthquakes, and induces more landslides and floods. This affects the Ganges and Brahmaputra river basins, contributing to siltation and floods as far away as Bangladesh.

On the basis of contemporary recall the paper finds considerable evidence of forest degradation (though not deforestation) over the last quarter century in forest areas accessed by villagers. Such degradation is evident in the presence of over-lopped trees and low rates of forest regeneration, and a 60 percent increase in the average time needed to collect a bundle of firewood—approximately six additional hours per week per household. Against this background, the first part of the paper assesses the likely impact of growth in **household incomes and assets** on firewood collection. Such growth both gives rise to wealth effects (which raise collections by increasing household energy demand) and substitution effects (which lower

collections by raising the value of time of households; almost all firewood is directly collected by consuming households with negligible amounts purchased in markets). The econometric analysis shows that the substitution and wealth effects offset each other, so that firewood and fodder collection is inelastic with respect to improvements in living standards. The paper finds no evidence for any effects of poverty or growth on forest pressure, nor any Kuznets-curve patterns.

In contrast, the effects of growth in **population** are likely to be adverse: rising population will cause a proportional rise in collections at the level of the village, while leaving per capita collections almost unchanged. To the extent that household fragmentation induces a shift to smaller household sizes, the resulting loss of economies of scale within households will raise per capita collections even further. Hence anthropogenic pressures on forests are likely to be aggravated by demographic changes, rather than economic growth. Unless there is substantial migration out of the Himalayan villages, the pressure on forests is likely to continue to grow in the future.

The paper next estimates the effect of such further projected forest degradation on the future livelihoods of affected villagers, mainly via a further increase in collection times for firewood. This is done by estimating the effects of increased collection times by one hour, which is a plausible estimate for the next decade or two. The welfare impact of this externality turns out to be surprisingly low: the effect is less than 1 percent loss in household income across the entire spectrum of households. Moreover, there are no significant effects on child labor, nor on the total labor hours worked by adults. This indicates that the magnitude of the local externality involved in use of the forests is negligible, providing a possible explanation for lack of effort among local communities to conserve neighboring forests. The argument for external policy interventions then rests on the larger ecological effects of forest degradation, which are beyond the scope of the paper.

Should the ecological effects demand corrective action, the paper surveys the available policy options. The authors find that the principal fuel alternative to firewood, somewhat surprisingly, is LPG (liquefied petroleum gas); kerosene and electricity are still secondary (despite the region's enormous abundance of hydropower reserves). Household firewood use exhibited considerable substitution with respect to the price and accessibility of LPG cylinders, suggesting the scope for LPG subsidies as a policy which could be used to induce households to reduce their dependence on forests for firewood. The authors estimate the effectiveness and cost of a Rs 100 and a Rs 200 subsidy for each gas cylinder. The latter is expected to induce a rise in households using LPG from 7 percent to 78 percent, reduce

firewood use by 44 percent, and cost Rs 120,000 per village annually (about 4 percent of annual consumption expenditure). A Rs 100 subsidy per cylinder would be half as effective in reducing wood consumption, but would have a substantially lower fiscal cost (Rs 17,000 per village annually, approximately 0.5 percent of annual consumption).

The econometric estimates also show that firewood use was moderated when local forests were managed by the local community (*van panchayats*) in Uttaranchal. However, this effect is limited to those community-managed forests that were judged by local villagers to be moderately or fairly effectively administered, which constituted only half of all (*van panchayat*) forests. It is not clear how the government can induce local communities to take the initiative to organize themselves to manage the neighboring forests effectively, when they have not done so in the past. Moreover, the authors conclude that, even if all state-protected forests could be converted to van panchayat forests, firewood use would fall by only 20 percent, which is comparable to the effect of a Rs 100 subsidy per LPG cylinder.