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PURPOSE

India Policy Forum 2007–08 comprises papers and highlights of the discussions from the fourth India Policy Forum (IPF) conference, held on July 17–18, 2007, in New Delhi. IPF is a joint venture of the Brookings Institution and the National Council of Applied Economic Research (NCAER) that aims to examine India's reforms and economic transition using policy-relevant empirical research. The sponsoring organizations acknowledge the continuing generous support of Tata Sons, State Bank of India, Citigroup, and HDFC Ltd.

The objective of the IPF is to generate theoretically rigorous, empirically informed research on important current and unfolding issues of Indian economic policy. A rotating panel of established local and overseas researchers interested in India has agreed to support this initiative through advice, personal participation, and contribution of papers. Overall guidance is provided by a distinguished international advisory panel.

Papers appear in this publication after presentation and discussion at a yearly conference in New Delhi. During discussions at the conference, the authors obtain helpful comments and criticism about various aspects of their papers. These comments are reflected in the journal as discussants' comments. The papers, however, are finally the authors' products and do not imply any agreement by either those attending the conference or those providing financial support. Nor do any materials in this journal necessarily represent the views of the staff members or officers of the NCAER and the Brookings Institution.

CORRESPONDENCE

Correspondence regarding papers in this issue should be addressed to the authors. Manuscripts are not accepted for review because this journal is devoted exclusively to invited contributions. Feedback on the journal may be sent to NCAER, Parisila Bhawan, 11, I.P. Estate, New Delhi 110 002 or at ipf@ncaer.org.

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Editors' Summary

The India Policy Forum held its fourth conference on July 17 and 18 of 2007 in New Delhi. This issue of the journal contains the papers and the discussions presented at the conference. The first paper examines the fiscal relationship between the Central Government and the states of India. The next two papers focus on the Indian educational system, specifically the social implications of government policies governing access to primary and secondary schools, and the challenges facing the country's system of higher education. The fourth paper evaluates the performance of an important component of India's microfinance system. Finally, the fifth paper provides an assessment of recent efforts to reform the distribution seg-ment of the electric power industry. In addition to the working sessions of the conference, T. N. Srinivasan of Yale University, a member of the advisory panel, delivered a public lecture on the topic of: "Economic Reforms, External Opening and Growth: China and India."

Despite massive unfulfilled need and repeated rhetorical commitment to increase public spending, public expenditure in India on education and health has never exceeded more than 3.3 and 1.3 percent of GDP, respectively. Implementing such spending, and to a large degree paying for it, is the responsibility of India's states. In her paper, Indira Rajaraman argues that an important explanation for this persistently low level of spending lies in the nature of fiscal transfer arrangements in India's federal structure, particularly the unpredictable and discretionary nature of significant components of these transfers.

The assignment of expenditure responsibilities and revenue rights in India gives rise to a vertical fiscal gap at the sub-national (state) level. The closure of this gap is provided for by the appointment, every five years, of a constitutional body called the Finance Commission. The report of each Commission, once accepted by the government, prospectively defines the formula for statutory flows from the national government (the "Center") for the succeeding quinquennium. Such statutory flows from the Center to the states are predictable in relation to the underlying tax base, are pre-defined both in aggregate and in their distribution between states, and are unconditional. In Rajaraman's view, these are all desirable properties to permit states to make multi-year expenditure commitments of the kind needed for provision of primary education and health.

However, such statutory flows represent only part of the story. In the years before 2005, statutory flows never exceeded 60 percent of the total flow. The remaining Center–state transfers took place under a range of non-statutory mechanisms, largely under the control of an extra-constitutional body called the Planning Commission, and were unpredictable in aggregate from year to year.

While initially entirely discretionary, in 1969–70 the inter-state allocation of a portion of these "Plan" transfers was in turn subjected to a periodically revised formula (commonly referred to as the "Gadgil Formula"). However, this formulaic distribution was accompanied by a shift from a full grant basis to one comprising 70 percent loans and 30 percent grant. This shift to borrowed funds rather than grants implicitly altered incentives away from health and education state-level spending, which were unable to bear the ensuing interest burden. This disincentive, associated with the loan component, led to a gradual reduction in the share of this formulaic component in overall non-statutory flows.

Against this policy and institutional background, the paper performs three empirical exercises to determine the year-to-year changes in the share in grants from the Center received by states in aggregate that was not subject to formula and therefore open to bargaining by the states. The first empirical exercise quantifies the non-formulaic bargaining margin within aggregate flows for each year of the period 1951–2007, and estimates it to have varied inversely with an index of political fractionalization in the federation. As fractionalization increased, the formulaic share rose. The system thus fluctuated in response to changes in the political situation. This instability is inappropriate for funding requirements of basic developmental services.

The second exercise tests whether the control over aggregate state borrowing from the financial markets (constitutionally vested at the national level, and an important force for macroeconomic stability) represents opportunistic behavior influenced by the national electoral cycle. The difference between the consolidated fiscal imbalance, or deficit (aggregated across national and state levels), and the imbalance for the Central Government alone, provides a proxy measure for measuring the extent of sub-national borrowing from financial markets.

The consolidated fiscal imbalance is shown to have risen in years preceding Parliamentary elections. This is in contrast to the fiscal imbalance at the Center, which was not dictated by the electoral cycle. Taken together, the two sets of specifications strongly suggest that aggregate Central limits on state borrowing from financial markets were raised in pre-election years.

This inter-temporal variability, together with the spatial distortions implicit in the opaque system for allocating borrowing entitlements across the states in all years, further adds to the fiscal uncertainty faced by states, and inhibits orderly and sustained planning.

The third empirical exercise deals with a major initiative that commenced in 2005 to reduce the accumulated debt burden of the states. The proposal to reduce this debt originated from the Finance Commission, and addressed debt owed by the states to the Center arising from the loan component of Plan transfers mentioned earlier. The debt relief was to be granted in exchange for promises of fiscal adjustment.

The Finance Commission took the view, later endorsed by Parliament, that the differences in initial conditions across states should be taken into account in setting such conditionality. However the conditionality actually imposed by executive action at the Center envisaged a common terminal year deficit level for all states, implying a difference in the magnitude of adjustment that varies by as much as 10 percent of state GDP, with presumed adverse consequences, once again, for the stable provision of essential state level developmental services.

Starting in 2005–06, there has been a regime change with the replacement of direct Central lending to states for Plan expenditure, with a more inflexible system of caps on state borrowing as part of the conditionality for the above-mentioned debt concessions. Thus, the kinds of uncertainties and patterns in aggregate borrowing limits on states will not be visible for a while longer.

Rajaraman further notes that there has been a fall over the last ten years in the share of state expenditure in overall public spending on health and education because of the huge new Central expenditures on primary education and mid-day meals in schools, which are not routed through states. Thus, the policy response has been to alter the pattern of functional responsibility, rather than restoration to the states of their constitutionally assigned functions, with correction of the adverse incentives that became embedded in the *de facto* structure of sub-national funding.

Finally, Rajaraman also uses the empirical exercises to draw implications for the nature of dialogue between the Center and the states regarding fiscal matters. She notes the absence of a dispute-resolution forum where the *de facto* functioning of fiscal arrangements can be subjected to continual examination and monitoring by all partners to the federation. Within such a forum, major issues spanning Central transfers, revenue rights, expenditure externalities, and unfunded mandates, could be resolved in a participatory framework. Its need is likely to become even more urgent as India moves

to an integrated nation-wide goods and services tax (GST), where the direct role of the states in revenue collection would be even more restricted, and the need for a broad review of fiscal federal arrangements even more urgent.

Over the past several decades, a primary tool used by the Government of India to improve school enrollments, particularly those of the Scheduled Castes (SCs), has been the expansion of access to schools. To this end, the government has long embraced the objective of providing a school within easy walking distance from each rural household. In her paper, Anjini Kochar argues that in implementing this policy, scant attention was paid to the fact that targeting access to schools as a primary objective may constrain the government in addressing other critical aspects of schools, particularly those related to school quality. This is because decisions regarding the location of schools determine more than just access to schools; they combine with the residential structure of a society to define the school community, and hence school characteristics known to affect schooling attainment.

According to Kochar, it is the nature of residential communities in rural India that makes this trade-off between access and quality likely. Rural India resides in habitations—distinct residential settlements within a village—which vary in size but are, on average, fairly small. Because habitations are generally organized along caste lines, the rural economy is thus characterized by a considerable degree of caste-based segregation. The stated policy objective of providing a school within easy walking distance of each household, in conjunction with the geographic distance across habitations, requires the government to adopt a policy that provides schools to relatively small habitations and frequently results in multiple schools within a village.

Therefore, the paper argues that the current school location policy does not permit an optimal allocation of schools based upon enrollment or size. Because school enrollment determines the availability of inputs such as the number of teachers, there is a corresponding variation in the number of teachers per school. To the extent that this attribute of schools affects schooling attainment, Kochar argues that the policy generates schooling inequality across regions, with schools in smaller habitations being of generally lower quality than those in larger habitations.

School location policies also affect the caste composition of the student population. When schools are provided in SC habitations as well as in the other habitations of a village, the residential segregation that characterizes the village gets translated into a corresponding system of *de facto* schooling segregation. The corresponding difference in the caste composition of students across village schools is also likely to affect schooling attainment.

The paper explores these hypotheses empirically, examining the relationship between school enrollments and availability of schools within habitations, as well as the effect of the number of teachers and the prevalence of schooling segregation. To identify the effect of these school attributes, Kochar uses the policy rules that determine whether a school can be placed in a habitation and the number of teachers assigned to a school. These rules are specified at the district level, and are implemented by the government based on district level data on habitations collected in the All India Education Surveys (AIES). The paper uses this same data that guides policy decisions, and relates it to household data from the Government of India's National Sample Surveys. The use of policy rules specific to the attributes in question, and the availability of the data that guides current policy decisions, provides a compelling source of identification. To assess the effects of school segregation, Kochar uses the insight that schooling segregation exists only when schools are provided in the SCs/STs (Scheduled Castes/Scheduled Tribes) habitations. Because the AIES data also provide information on the size distribution of SC/ST habitations, it is possible to identify the probability of schools being located in SC/ST habitations (a proxy for schooling segregation) separately from the overall effect of school availability.

The paper has two principal findings. First, based on the size distribution of habitations within a district, the author finds that the current policy rules do affect access, but they also affect teacher numbers and schooling segregation. The regression analysis shows that schools with two or fewer teachers experience reduced enrollments. The results on teacher availability suggest that the decision to provide schools even to relatively small habitations generates a source of schooling inequality: children who reside in small habitations with schools attend schools of poorer quality than those who reside in larger habitations.

Second, the author finds that school location policies also perpetuate caste-based inequalities. Since the SC habitations are generally smaller than others, this means that SC schools are of lower quality, as measured in terms of the availability of teachers. The empirical results show an asymmetric effect of schooling segregation by caste: children of upper castes benefit significantly while segregation has little effect on the SCs. The benefits of living in districts with widespread access to schools therefore vary by caste.

The results of the paper suggest that improvements in school quality cannot be affected without re-considering the government's school location policies. Kochar admits, however, that improving school quality along the dimensions considered in the paper is no easy task. She suggests an alternative policy that consolidates habitation schools to provide one school in each

village, which would enable an optimal number of teachers in each school and thereby improve schooling attainment. While the greater distance to school implied by such a consolidation, particularly for children from the SC/ST habitations, may reduce access, the paper argues that the savings generated by the consolidation could be used to implement a system of cash transfers to children from the SC and the ST conditional on their school attendance records. The positive effects from increased teachers and economies of scale are enough to provide cause for a reconsideration of school location policy in India.

The higher education system in India also faces troubling distortions and suboptimal outcomes. In their paper, Kapur and Mehta argue that the vast majority of institutions of higher learning are incapable of producing students with skills and knowledge. Attendance does not serve as a screening system for the vast bulk of students, nor does it prepare students to be productive and responsible citizens. The current system is highly centralized, politicized, and militates against the production of general intellectual virtues. It may come as no surprise then, that the last few years have witnessed a rapid rise in skill premiums in India despite the country's huge population.

Kapur and Mehta maintain that the poor state of the sector and the recent rise in skill premiums can be largely explained by the regulatory bottlenecks facing Indian higher education. Despite impressive reforms elsewhere, Indian higher education remains one the last bastions of the "license control raj"—with troubling implications for India's future. The paper argues that the result is a state of crisis in Indian higher education notwithstanding the success of a few professional schools. The fact that the system produces a noticeable number of high-quality students is largely the result of Darwinian selection mechanisms and very little because of pedagogic achievements.

According to the authors, the most acute weakness plaguing India's higher education system is a crisis of governance, both of system and of individual institutions. Because the prevailing political ideological climate views elite institutions as anti-democratic, there is a natural response in political circles to influence admissions policies, internal organization, and the structure of courses and funding. The paper provides data to show that there has been a massive increase in both private higher education and the flight of elites to foreign educational institutions. However, the private sector also suffers from regulatory obstacles and governance weaknesses, raising doubts as to its ability to address the huge latent demand for quality higher education in the country.

From the perspective of the three key suppliers of Indian higher education—markets, the state, and civil society (philanthropy)—the authors

elaborate on six significant distortions. First, the process of regulatory approvals diminishes the capacity of private investment to respond to market needs. Second, the regulatory process produces an adverse selection in the kind of entrepreneurs that invest since the success of a project depends less upon the pedagogic design of the project and more on the ability to manipulate the regulatory system. Third, there are significant market failures in acquiring physical assets that are necessary for educational institutions, especially land. Fourth, regulatory approvals are extremely rigid with regard to infrastructure requirements (irrespective of costs or location) and academic conformity to centrally mandated course outlines, degree structures, and admissions policies. Fifth, a key element of a well-functioning market—competition—is distorted by restricting foreign universities from setting up campuses in India, which limits benchmarking to global standards. Sixth, another central element of a well-functioning market, informational transparency, is woefully inadequate.

The university system in India is the collateral damage of Indian politics. As the paper demonstrates, the dismal educational outcomes are not the result of limited resources. For politicians, the benefits of the license-control raj extend beyond old-fashioned rent seeking by manipulating contracts, appointments, admissions, and grades in government-run colleges and universities to the use of higher education for vote-banks, partisan politics, and as a source of new entrepreneurial activities.

The authors identify three key variables that help to clarify the political economy of India's higher education: the structure of inequality in India, the principal cleavages in Indian politics, and the nature of the Indian state. India is an outlier in the extreme degree of educational inequality, which has led to a populist redistributive backlash. However, the specific redistributive mechanisms are conditioned by the principal cleavages in Indian politics and the nature of the Indian state. The growth of identity politics has sharply enhanced political mobilization around two key cleavages in Indian society: caste and religion. Consequently, redistributive measures follow these two cleavages rather than other possibilities such as income, region (urban–rural), or gender. Thus, the focus on redistribution helps explain why Indian politicians have obsessed over reservations (that is, quota-based affirmative action) in elite institutions of higher education rather than improvements in the quality of primary and secondary schooling, and the thousands of colleges of abysmal quality.

The consequences of the preceding political economy are onerous. One, a diminished signaling effect of higher education; two, an ideological

entrapment between what the authors call half-baked socialism and half-baked capitalism, with the benefits of neither; and three, a pathology of statism wherein higher education policy is being driven foremost by the state's own interest (or perhaps its own ideological whims). Much of what goes in the name of education policy is a product of the one overriding commitment of the education bureaucracy—namely state control in as many ways as possible.

The paper also highlights the role of the Indian judiciary in higher education reforms, arguing that it has done as much to confuse as to clarify the existing regulatory framework. Although there has been a distinct shift in the Supreme Court's stance in the past decade, its primary response does not always center on what will enable the education system to adequately respond to demands. Rather, it has uneasily and often confusingly attempted to reconcile disparate principles, be it the dichotomy between education being a charitable or commercial enterprise, or the inherent tension between institutional autonomy and equitable access in higher education.

Kapur and Mehta conclude with a few options for change moving forward. Market failure in higher education means that substantial public investment will continue to be critical in this sector. However, since there are few clear analytical criteria to address the central question of what is "good" higher education, the paper argues that a regulatory system that emphasizes diversity, flexibility, and experimentation is in the long run most likely to succeed. Such a system will also need a different conception of accountability than the one currently prevailing in the Indian system, where resource allocation decisions are centralized to an extreme degree in the Planning Commission, the Ministry of Human Resource Development, and the University Grants Commission. Its quality depends entirely upon the informational resources of a very small group of decision makers and presumes an omniscience that few decision makers can have. Instead India needs to move to a regulatory system with increased horizontal accountability that empowers students to make better informed decisions. Finally, Indian policy makers need to recognize that the competition for talent is now global and that only a combination of a flexible and supple state system that enlists the energies of the market as well as a committed non-profit sector will be able to meet the challenges and the vast scale of demand for higher education in India.

The expansion of rural credit through the "formal" financial system has been a major goal of Indian policy since independence. While a number of initiatives (including nationalization of the country's major commercial banks) have been taken over the years, success of these initiatives has been only partial.

In 1992, the Reserve Bank of India (RBI), India's central bank and banking regulator, issued guidelines to the public sector commercial banks (which still dominate Indian banking) encouraging them to lend to small pre-formed groups called "self-help groups" (SHGs). These groups are almost always composed of rural women, and are often assisted by non-governmental organizations (NGOs) in their formation and their subsequent growth and development.

While the scheme, sometimes called the "commercial bank–SHG linkage scheme", was in part inspired by the success of Bangladesh's Grameen Bank in sustainably widening access to financial services in that country, the Indian SHG scheme differs in several respects from the Bangladesh model, and therefore needs to be assessed in its own right. One such difference is the provision of subsidized refinancing to the commercial bank by the National Bank for Agriculture and Rural Development (NABARD) (a publicly-owned affiliate of the RBI). The RBI reports that over 2.5 million of such groups have borrowed from commercial banks since 1992, and loan disbursements by commercial banks to SHGs were 29 percent of all direct bank credit to small farmers in 2004–05.

However, in spite of the growing importance of SHGs as a source of credit to the poor, there is little systematic evidence on their internal functioning. The paper by Baland and Somanathan attempts to fill this informational gap by using survey data on SHGs created during the period 1998–2006. It does so by describing the survival of groups and members within groups, documenting group activities, and estimating the determinants of group and member duration using an econometric survival model.

The data comes from a survey of 1,102 rural SHGs and the 16,800 women who were members of these groups at some point during the period 1998–2006. It considers all groups formed by PRADAN (an NGO that has actively promoted SHGs since the start of the NABARD program) in the districts of Keonjhar and Mayurbhanj in northern Orissa, and the Raigarh district in the newly formed state of Chhattisgarh in central India. Although the group members are engaged in a variety of collective activities, saving and credit do seem the most important. Almost all groups surveyed had made small loans to their members and 68 percent of them had received at least one loan from a commercial bank.

For those members who do borrow from the group the average size of the loan, provided from internal group funds, is Rs. 2,200 per year. For groups with at least one bank linkage, 83 percent of members in the group received some part of this loan, and the average amount received by these members is Rs. 2,189 per year. Although loan sizes provided by some specialized

microfinance institutions are often larger, these SHG loans are sizable as a fraction of local earnings and, for women who received both group loans and bank loans, it corresponds to roughly two months of labor earnings at the minimum wage in these areas.

The group members in many SHGs appear to be collectively involved in activities not directly related to credit. About 10 percent of the surveyed groups are involved in the preparation of school meals, 3 percent administer state programs that distribute subsidized foodgrains, and about half of them get involved in family or village conflicts or help members during periods of personal distress. These groups therefore seem to play a role in promoting solidarity networks in the community.

The paper then estimates models of both group and member duration. It finds that factors behind group survival are quite different from those affecting member longevity. With respect to group survival, the highest attained level of education in the group is important for its survival, perhaps because some educated members are needed to facilitate transactions and ensure that group accounts are accurate. The presence of other SHGs in the area also has a positive effect on group duration. It may be that a dense cluster of groups allows for the sharing of costs, provides each group with ideas for successful activities, or simply instills in members the desire to survive, compete, and be part of a larger network.

Drawing upon on a large literature pointing to the importance of social heterogeneity in collective action, the paper then explores whether such heterogeneity matters for the average duration of groups and the members within groups. For each member surveyed, the paper records both their individual caste group (or *jati*) and the "official" caste category to which they belong—ST, SC, Other Backward Castes (OBC), and a residual category often termed General Castes that we refer to as Forward Castes (FC).

The particular question explored is whether heterogeneity matters for group functioning when members belong to different *jati*s in the same official caste category. The paper finds that commonly used measures of fractionalization and social heterogeneity based on these classifications do not have systematic effects on group survival, but that they do help explain the departure of individuals from groups. Even within broad caste categories, heterogeneity matters. This suggests that the "official" classifications fail fully to capture the relevant social hierarchy.

The members from traditionally disadvantaged groups, especially from the ST, are more vulnerable to group heterogeneity. In addition to group heterogeneity, lower levels of education, lower landholdings, and fewer relatives within the SHG are also associated with higher rates of member exit.

The paper also finds that the bulk of the difference in the duration of membership in a SHG observed between Chhattisgarh and Orissa can be attributed to characteristics of groups in these areas; the authors find that state-level variations in performance are negligible once these characteristics are incorporated in their model.

The results suggest that it is problematic to evaluate the success of microfinance interventions based on conventionally reported coverage figures because they do not account for attrition. The authors' concern is not with overall attrition rates but with the selectivity they exhibit. It is predominantly the poorer and socially marginalized communities that leave the SHG network and this makes it unlikely that women moving out of SHGs enter individual contracts with lending institutions. It also means that some of those in desperate need of credit cannot obtain it from within this sector. To arrive at concrete policy prescriptions for this sector, more information is needed about the financial opportunities available to members once they leave this sector and the extent to which SHG lending crowds out other types of lending to the poor. Although the duration of membership is only one, admittedly crude, measure of the performance of the microfinance sector, the study suggests that survey data which follows members and groups in this sector is critical to an assessment of Indian microfinance.

Electricity supply constitutes the most important infrastructure constraint on overall economic growth in India. While the telecommunications sector has gone through a revolution of increased service and lower prices, and signs of progress are visible in virtually all areas of transportation, progress in improving the performance of the electricity sector has been painfully slow. The paper by Saugata Bhattacharya and Urjit R. Patel examines the sources of the inefficiencies and undertakes an evaluation of the efforts to reform the industry's distribution segment, which is dominated by state governments.

The electricity sector can be divided into three segments: the generation of electricity using a variety of fuels; the transmission of electricity from generating plants over high voltage towers and lines to the major distribution points; and the distribution of electricity from distribution points to consumers whether industrial or residential. While both the Central Government and the states have the constitutional right to legislate in areas of generation and transmission, distribution is entirely under the jurisdiction of the states. Reform in the electricity sector is made far more difficult than in the telecommunications sector because it requires active participation from the states, which often lack the necessary technical, legal, and administrative talent as well as motivation.

By the early 1960s, the electricity sector had become a vertically integrated monopoly in each state with generation, transmission, and distribution coming under a single umbrella known as the State Electricity Boards (SEBs). Recent reforms have resulted in the unbundling of these segments in many but not all states, and distribution has been delegated to autonomous distribution companies (discoms). With rare exceptions, the latter remain in the public sector.

A key problem facing the electricity sector is the large magnitude of aggregate technical and commercial (ATC) losses. In effect, ATC losses reflect that fraction of power generation for which there is no remuneration. Nationally, they amounted to 37.2 percent of electricity generated in 2001–02. Electricity shortages could be considerably alleviated if these losses could be brought down to normal international levels. Bhattacharya and Patel analyze the success achieved in this area through a variety of reform efforts beginning in the early 2000s. They emphasize the state-by-state variation in performance as a means of identifying the most successful reform measures.

The authors identify three specific reforms. First, SEBs, which buy electricity from central public sector generation companies, have traditionally accumulated large arrears with the latter. The Central Government offered them a one-time settlement (OTS) scheme provided they undertook a set of efficiency-enhancing steps. Second, the Central Government followed up the OTS with the Accelerated Power Development and Reform Program (APDRP) under which incentives were offered to undertake a variety of reforms. Finally, the government introduced the landmark Electricity Act of 2003 to bring about nation-wide systemic reforms in the sector.

The authors study revenues and cash flows of discoms and SEBs to explain the connection between the reform initiatives and financial performance across states. They also devise a composite index of commercial orientation, which they call the Index of Revenue Orientation (IRO), and rank utilities according to it. The authors explore data over several years from a consistent group of SEBs/discoms on outcomes, and the concomitant key economic and financial parameters that indicate the effect of reform steps associated with SEBs/discoms.

The analysis yields a number of provisional findings. First, at an aggregate level, the deterioration in the power sector has been arrested. The financial situation of the sector has eased and state government subsidies as a ratio to GDP have declined. The sector, nevertheless, is still far from financial viability. The key performance indicators, after having improved significantly in the immediate aftermath of the reform measures, seem to have stagnated after 2003–04. The ATC losses, while having dipped slightly

from the 2000–01 crisis levels, remain very high. The basic problem is that although the sector is expected to have made a small cash profit at an all-India level in 2005–06, there are simply not enough resources in the state government-owned system to add capacity (and/or buy excess capacity from other systems) on any appreciable scale, let alone that which is required to power India's economic growth.

Second, there are significant differences across states and utilities in performance and related indicators (including average revenue realization, collection efficiency, composition of demand, power units input, cost of supply, and physical losses). Also, the variability in performance among states and among utilities has *increased* between 2001–02 and 2004–05. The outcomes and many of the underlying explanatory variables have exhibited even greater unevenness after the reform measures than in 2001–02. Some states have improved significantly and some have deteriorated sharply. Five utilities account for 80 percent of the total cash losses and another five utilities contribute 78 percent of the cash profits.

Finally, using their IRO, authors note that the spread of performance between utilities increased in 2004–05, compared to the situation in 2001–02. While the average index value increased from 1.14 in 2001–02 to 1.3 in 2004–05, the associated standard deviation rose from 0.9 to 1.2. In other words, utilities had a more homogenous ordering of revenue orientation in 2001–02 than in 2004–05. The authors also show that the strongest influence on the extreme ends of the rankings in the IRO was the relative amount of power supplied to the subsidizing (industry) segment versus the subsidized (agriculture and residential) segment.

What implications do these findings have for policy? Various utilities have placed emphasis on different strategies for enhancing revenues. The fragmented information indicates that there is significant progress in many of the basic inputs of utilities. These, however, do not seem to be rapidly translating into higher revenues and cash flows. The unevenness in performance among discoms suggests that there would be large gains to tariff setting at the level of discoms rather than states, or, even at the level of distribution circle and city. This would attract reliable suppliers to discoms or circles who are paying their bills and lead to lower tariffs in an area with low ATC losses. The variation of improvements in different states is also a warning sign of the increasing disparities in the ability of states to attract investments and foster growth.

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The Political Economy of the Indian Fiscal Federation

Introduction

Federal fiscal structures offer economies of scale for national-level public goods and accommodate diversity of preferences at the sub-national level. They thus carry a compelling economic logic for developing countries.[1] But what matters for developmental outcomes is the statutory fiscal framework, and the incentive structure implicit in both the *de jure* and the *de facto* structures. What also matters is whether there is a standing platform open to all partners where actual fiscal functioning is open to continual examination for conformity to the formal framework and potential correction of either if not.

In the hierarchy of terms differentiating unitary nations with a single paramount government from federal systems, India is labeled a quasi-federation, not classically federal,[2] and is not called a federation in the Constitution. The country, however, has all the characteristics of a fiscal federation, in the sense of constitutionally demarcated spheres of fiscal powers for independently elected governments at the national (Central) and sub-national (state) levels.[3] The Seventh Schedule of the Constitution of India defines the

1. The major developing countries with a federal structure are India, Pakistan, Malaysia, Nigeria, Mexico, Brazil, and Argentina. The major country without a federal structure, but with many federal features in its fiscal arrangements, is China.

2. The classical cases being the United States, Switzerland, Canada, and Australia, formed between 1787 and 1900, with degrees of federality among the less classical (Davis, 1978). The label for India by Wheare, 1953, is supported by provisions under the Constitution of India which give emergency powers to the national government over subnational governments in financial emergencies (Article 360, never invoked), and instability (Article 356, invoked more than a hundred times in the last 60 years).

3. The national government is called the Union government in the Constitution, but is popularly known as the Center. There are twenty-eight states with separate fiscal accounts and seven Union territories whose accounts are merged with those of the Center except for two which have separate legislatures of their own.

subjects over which the power to enact laws are assigned exclusively to the Center (List 1), states (List 2), and concurrently to both (List 3). In 1993, a third layer of independently elected local governments was added on by Constitutional amendment. The fiscal powers of local governments are demarcated legislatively at the level of the states.[4]

The focus in this paper is on the top two layers of the Indian federation, Center and states, and on the fiscal aspects of their interaction. The assignment of economic functions across Center and states conforms to the classical prescription of stabilization and redistribution at the national layer, with allocation of responsibility for public goods divided broadly in accordance with degree of spillover.[5] Taxation rights likewise conform in essence to the prescription of more mobile tax bases at national level.[6] However, both func-tional and taxation assignments have acquired an overgrowth of tedious departures over time.[7] Because the principles underlying revenue rights and expenditure responsibilities in any federation originate from independent considerations, there will be a gap (at usually lower than national level), where its magnitude is not necessarily indicative of incomplete or unfair allocation of taxation rights. In India, there is a vertical gap at state level. It is argued in this paper that what matters is not the magnitude of the gap, but how it is filled.[8]

The Constitutional provision for closure of the vertical gap in India could in a very broad sense be said to have been informed by the normative principles governing intergovernmental transfers.[9] It provided for both unconditional transfers, required by the diversity of preferences that funda-mentally underpins fiscally federal structures, and any other flows deemed

4. The local body structure itself is three-layered in the rural areas; there are now roughly a quarter of a million elected local bodies in place. Their tax powers are very limited, especially in rural areas (Rajaraman, 2003).

5. See Oates 1991; 1999. Recent reviews of the principles governing vertical and horizontal competition (both mobility-based and yardstick) are to be had in Breton, 2006 and Salmon, 2006.

6. Musgrave, 1983 is the standard reference, for what carries a longer intellectual history.

7. The most egregious of these, now scheduled for phased elimination over 2005–10, was a Central Tax on inter-state sales of goods introduced by Constitutional amendment, levied by the Center but collected and retained by states, which functioned in effect as an export tax. See also Rao and Rao, 2006.

8. There is an opposing view that sees a more decentralized tax base, in effect reduced vertical gaps, as essential for no-bailout hard budget constraints, which are necessary for effective competitive (Breton, 1996) or market-preserving (Weingast, 1995) federalism. At the limiting case of a zero subnational tax base, this is certainly persuasive, but not necessarily at the 30–60 percent ranges within which federations normally function.

9. There is general consensus on this issue (Rao, 1995; Singh and Srinivasan, 2006).

necessary, including (implicitly) shared cost programs for inter-jurisdictional spillovers. The formulae governing the correction of vertical inequity were reset every five years by independent Finance Commissions, thus providing for revision of both the procedure for estimation of the vertical imbalance itself, and the allocation formulae used so as to accord with international best practice and precept, in principle at any rate. Finance Commissions were also completely free, again in principle, to prescribe transfers carrying no adverse incentives for cost escalation, but a (small) portion of their provisions have indeed carried such incentives (see section on fiscal flows to states).

The point of departure in this paper is the statutory framework for fiscal transfers, juxtaposed against the actual functioning of the inter-governmental transfer system. This is an important developmental issue since it is state governments which carry the major expenditure responsibility for health and school education. There are related issues having to do with political encroachments on states' rights, which are not addressed here.[10] The focus is on the fiscal variables in the first instance.

The paper quantifies statutory fiscal flows from Center to states for each year of the period 1951–2007 relative to a wholly independent stream of funding under the Planning machinery, altogether outside the provenance of Finance Commissions. The component of this non-statutory Plan flow, not subordinated to formulae for spatial allocation, left open a bargaining margin amenable to discretionary allocation and hence political bargaining. The changes in this bargaining margin from year to year are investigated for whether they are systematically underpinned by year-to-year changes in a political fractionalization index (PFI) that measures the degree of political diversity among states in the Indian federation. The difference between statutory flows and non-statutory flows even when formulaic, are examined in terms of their incentives for expenditure allocations.

Thus, the focus of the paper is on what states receive in aggregate from the Center, and the share of this aggregate that was open to discretionary allocation. The paper is quite emphatically not about the pattern across states of receipts, and factors explanatory of these, issues that have received attention elsewhere in recent literature. Prominent among these contributions are Arulampalam et al. (2007) and Biswas et al. (2007) both of which find interesting and plausible explanators of the share garnered by individual states. The focus here is on distinguishing between formulaic and non-formulaic flows, not so much the properties of the formulae themselves in

10. Verney, 1995, and Rudolph and Rudolph, 1987, provide examples of these political tussles.

terms of whether they promote competitive equality or not,[11] and therefore quite different from the investigation in Rao and Singh, 2005, of the cross-sectional progressivity of statutory and non-statutory flows in particular years.[12]

The issue of reform in federal settings has attracted some attention in recent years (Watts, 2001; Wallack and Srinivasan, 2006; Kohli, 2006), and in India in particular, where the reform process begun in 1991[13] was the single biggest directional change in Indian economic policy in the last sixty years. If reform is defined as improving access to both product and factor markets, a clear demarcation of powers of national and subnational governments is necessary for the overall speed and direction of movement not to be obstructed by disputes over the legitimate spheres of operation of each. Thus reform merely underlines the necessity for clear spheres of rights and obligations, which is structurally necessary in any case. The focus of this paper is therefore on the larger structural framework which existed in India much prior to reform. The argument for clarity of assignment is not to be construed as an argument for one form of federal structure over another, although the dual federalism model under which India is classified (Shah, 2007)[14] happens also to be more common in developing countries (with the major exception of Brazil) than cooperative federalism, where the division of responsibility is continually negotiable on an issue-specific basis.

The configuration of domestic forces influencing reform has recently been modeled to distinguish between competition enhancement, which helps those with endowments and might therefore be opposed by those without endowments, and endowment enhancement, which will be opposed by those with endowments who seek to preserve their rents (Rajan, 2006). This competitive rent preservation model is persuasive, but leaves open the issue

11. Competitive equality extends the classical notion of competing jurisdictions (Tiebout, 1956) to the requirements for inter-governmental transfers (Breton, 1987; Wildavsky, 1990).

12. That study found that statutory flows were equalizing in 1998–99, with an elasticity with respect to Net State Domestic Product (NSDP) of –0.26, and that overall flows were equalizing too, with an elasticity of –0.19, notwithstanding the non-equalizing pattern of the non-statutory component.

13. Singh and Srinivasan, 2006, deal with the Indian case; also Saez, 2002.

14. Within the dual category, India is classified along with USA and Canada in the co-ordinate authority model, where local governments have little or no direct relationship with the federal government, as opposed to the layer cake model where Central Government has the hierarchical right to deal with local governments directly (Shah, 2007). However, in actual fiscal functioning, where Central fiscal flows directly targeting local governments amount to one-third of total Central developmental assistance to rural areas (Rajaraman et al., 2007), clearly India is more layer cake than coordinate authority.

of why the dynamic of pre-reform states led to unequal endowments in the first place. If the necessity for public funding of primary education and primary healthcare is taken as a given, then low endowments in a federal setting could be the outcome of adverse incentives in the structure of funding of subnational governments, which usually carry the major expenditure responsibility for these functions.

The paper does not address the issue of the tradeoffs between centralized and decentralized systems, which has been the subject of renewed attention in the theoretical literature,[15] with the interpolation of a legislature between the ultimate voter and government introducing the scope for legislative bargaining within each federation. These further developments have not fundamentally changed the parameters governing the trade-offs between unitary and federal systems, with federal systems clearly better in the presence of diversity of preferences with respect to public goods, and centralized systems clearly better when there are cross-jurisdictional spillovers. The formal fiscal structures in a federation define the scope and room for political bargaining. This paper quantifies the bargaining margin in Central fiscal flows to states, and attempts to explain the behavior of the bargaining margin over time by relating it to an index of political fractionalization within the Indian federation.

The paper also does not examine whether other Indian institutions like the bureaucracy serve Central over state or local interests. Such leanings if any will have room to operate only to the extent of the bargaining margin as it has developed over time. Finally, the paper also does not cover the considerable literature on inter-state inequalities, which in and of themselves are not prima facie evidence of failure of the vertical transfer mechanism. The evidence so far on convergence, or the lack thereof, is in any case inconclusive.[16]

The next section motivates the paper with some descriptives on expenditure on health and education, and on the share of states in total expenditure aggregating across both layers of government. In terms of Constitutional assignment, health is the exclusive responsibility of states, and education (after 1976) is a concurrent function shared between Center and states. The poor international rating of India in both these components of the Human Development Index is well-known. There is also an aggregate measure of developmental expenditure in India, whose boundaries are defined to

15. Baron and Ferejohn, 1989, and Inman and Rubinfeld, 1997.
16. Singh and Srinivasan (2006: 349–59).

include everything except expenditure on administrative departments and interest payments. So defined to include for example expenditures on setting up public sector industries, and subsequent subsidies to loss-making public sector enterprises, the implication of the share of states would be difficult to interpret.

The bargaining margin in Center–state flows is quantified in the section that follows, for each year of the period 1951–2007, and related to an index of political fractionalization that measures the degree of political diversity among states in the Indian federation in each year. Descriptive statistics on variables in this and all other econometric exercises in the paper are in appendix 2.

Control over aggregate borrowing by states is vested with the Central Government, appropriately for Central macroeconomic control over fiscal imbalances in the federation taken as a whole (the third layer is not permitted to run fiscal imbalances).[17] The process by which these limits are set has however never been made transparent, in terms of either the aggregate limits on state borrowing, or the distribution of the aggregate between states. The next section of the paper performs an econometric exercise on the consolidated fiscal imbalance aggregating across Center and states over the period 1951–2005 to test for whether it responded to the national political cycle (which lost its synchronicity with sub-national election cycles after the first fifteen years). The same specification is then estimated on the fiscal imbalance at the Center taken by itself, and the contrast between the two yields insights into whether the discretionary control (rightly) vested at national level over aggregate subnational borrowing from financial markets was subject to opportunistic temporal distortions in pre-election years.

The following section examines the impact of the debt build-up as a result of the practice, suspended in 2005 upon the recommendation of the Twelfth Finance Commission (TFC), of requiring states to take a large portion of their non-statutory Plan flows from the Center as long-term loans, along with another channel of essentially compulsory state borrowing from the Center. Over a period of steeply rising interest rates after the lifting of financial repression in the 1980s,[18] this led to an accumulation of high-interest bearing debt owed by states to the Center. With interest dues claiming

17. Under Article 293(3) of the Constitution.

18. Rajaraman, 2006, charts the interest rates on public debt in India over the period 1951–2001. Nominal interest on public debt rose from an average of 5 percent in 1980 to more than 11 percent at its peak in 2000. Since inflation rates were falling over this period for the most part, albeit not monotonically, the rise in the real rate was even steeper.

ever increasing shares of current expenditure, the TFC recommended a programmed write-off of this debt overhang over the horizon 2005–10, conditional upon a structured fiscal correction timetable. The complexity of these conditionalities (detailed in appendix 1) made for a further disparity between the statutory provision and the manner of its implementation, which imposed uniform targets on states widely disparate in terms of their fiscal sustainability status. The section quantifies the disparity in the required fiscal adjustment arising from the imposition of uniform targets on states with widely varying initial conditions.

The final section draws together the conclusions from the preceding sections.

Expenditure on Health and Education

Figure 1 plots the overall share of the states in total public expenditure, current and capital, and their share in aggregate health and education expenditure.[19]

Three stylized facts emerge. First, the share of the states in expenditures on health and education, at or above 90 percent for most of the period, was much higher than their share in total expenditure, which was in the 50–60 percent range.[20] Second, the health and expenditure graphs are similarly placed, despite the exclusive assignment of health to states, as against the concurrent assignment of education.[21] Third, state shares in both health and education show a falling trend over the last ten years to around 85 percent presently, especially sharp after 2000, despite a slight rise in their share in overall expenditure.

Public expenditure on health has never crossed 1.3 percent of GDP, a peak achieved in 1987–88, and education has never crossed 3.3 percent of GDP, achieved in 1999–2000 (figure 2). Not surprisingly, at these expenditure levels, India performs poorly on health and education indicators in the Human Development Index as compared to other developing countries. The Human Development Report for 2006[22] places India at rank 126 out of

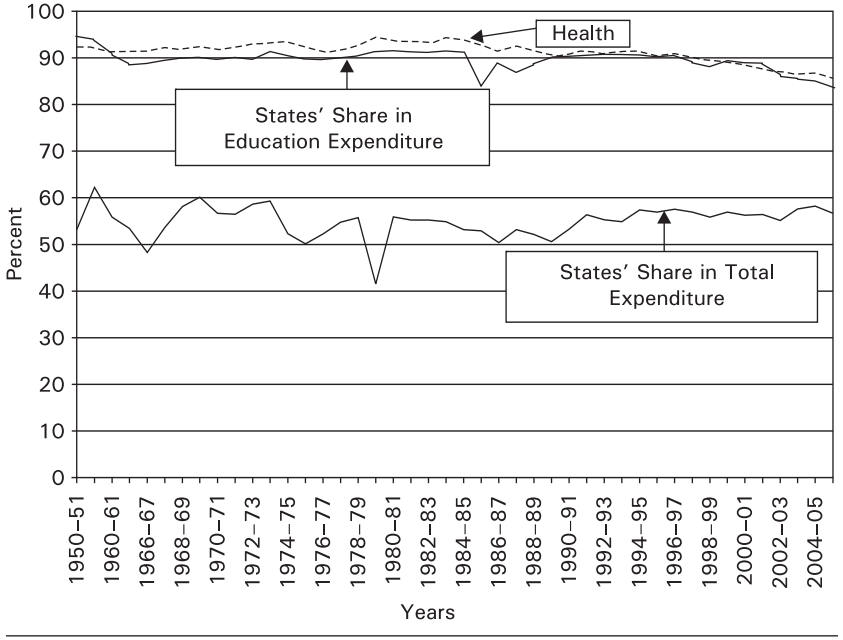
19. Entry 6 in the State List is "Public health and sanitation; hospitals and dispensaries"; education was entry 11 in the State List, but was moved to entry 25 of the Concurrent List by the 42nd Amendment Act in 1976.

20. There is a sharp dip in 1979–80, a year of negative growth in the Indian economy, owing to an unusually synchronous weather shock over much of the country.

21. Education was in the State List until 1976, when it was transferred to the Concurrent list; there had all along been some named educational institutions in the Central List.

22. United Nations Development Programme, 2006. The Human Development Index and its constituent indicators in the 2006 report pertain to the year 2004.

FIGURE 1. State Shares in Expenditure between 1950 and 2006: Health, Education, Total



Source: All expenditure figures from Government of India, *Indian Public Finance Statistics*, assorted issues going up to 2005–06; GDP from Government of India, 2007, *Economic Survey 2006–07* for the new series, and RBI's *Handbook of Statistics 2005–06* for the old series. Until 1966–67, figures were available only at quinquennial intervals.

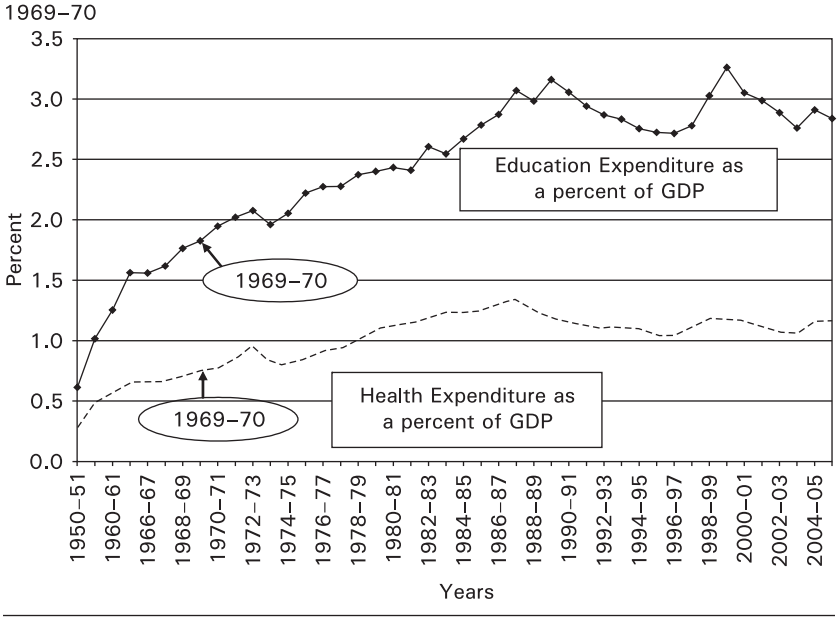
Notes: 1. Education includes art and culture; health includes medical and public health, water and sanitation. For 2004–05 and 2005–06, figures are revised and budget estimates, respectively. Total expenditure includes lending net of repayments.

2. The GDP new series with 1999–2000 as base yielded a splicing factor of 1.0045 for years of overlap with the old series, which was then used to generate a single compatible series for the period 1950–51 to 2005–06.

177 countries with an index value of 0.611 as against 0.679 for all developing countries. Life expectancy at birth is 63.6 as against 65.2 for all developing countries and the adult literacy rate is 61 percent as against 78.9. Quite aside from these rankings, the skills constraint is among the capacity limitations underpinning the present over-heating of the Indian economy.[23]

23. There are no systematic data sources on wages, but it is estimated that nominal wage increases have averaged 12–14 percent in the last few years (Subramanian, 2007).

FIGURE 2. Aggregate Health and Education Expenditure as a Percent of GDP: 1950–2006



Source and Notes: See source and notes to figure 1.

As against the share of states in total expenditure of a little over half, their share in tax revenue has been of the order of one-third, leaving a vertical gap of about 20 percent. It is argued here that the magnitude of the vertical gap itself does not matter. Indeed, if one of the presently visualized forms of the proposed goods and services tax (GST) were to be implemented, states would have negligible revenue collection powers of their own, and the vertical gap would essentially equal their share in total expenditure. What matters is the statutory framework for closure of the vertical gap and the actual departures from it. Both these have to be investigated for their incentive properties and for what they reveal about the political economy of the fiscal federation.

Primary education and health for a growing population call for steady multi-year expenditure commitments, without downside spikes, toward annual salary and other concomitant non-salary costs of delivering the service. The next section examines the pattern of fund flow from Center to states for whether the embedded incentives enabled states to credibly commit themselves to provision of these services. The fall observed over the last ten years in states' share has been because of the huge new programs

for primary education and mid-day meals in schools funded by the Center, and not routed through states.[24] Thus, the policy response has been to alter the pattern of funding, when the need of the hour is for an analysis on why funding failure occurred in the first place.

Fiscal Flows from Center to States

The statutory provision in the Constitution for closure of the vertical fiscal gap quite clearly acknowledges the need for states to have unconditional annual shares of Central revenues, predictable in quantum (subject to a known margin of error), allocated in accordance with transparent formulae as determined by an external body of experts, and subject to formal review every five years by a freshly constituted body of experts. The configuration of the statutory flow thus favors committed expenditures of the kind called for by primary education and health to a growing population.

Although the Constitution does not explicitly forbid Central assistance to states other than those mandated by Finance Commissions, the statutory flow was supplemented right from the start by an assortment of non-statutory flows for developmental assistance, for quinquennial periods along the lines of Soviet Five Year Plans,[25] called Plan flows. The statutory flow is accordingly termed a non-Plan flow, although just to keep things complicated, there are some non-statutory non-Plan (loan) flows as well.[26] The sequence of Plan periods has continued with some disruptions into the post-reform period; the Eleventh Plan currently covers the period 2007–12.

The major feature of the non-statutory flow which de-incentivized multi-year expenditure commitments of the kind needed for primary education and public health was that the aggregate yearly quantum of Plan assistance was not laid down in the way statutory flows were.[27] The quinquennial allocations were purely indicative, with annual disbursements free to vary in

24. The Sarva Shiksha Abhiyan (Universal Education Mission) and the National Rural Health Mission are both intended to provide non-salary support for primary education and health respectively, through an independent channel of funding.

25. Although non-statutory, these were permissible under Article 282 of the Constitution. There were two components of Plan flows, Central assistance for state Plans and Central Plan expenditure routed through state exchequers.

26. These consist principally of flows against small savings collections under a scheme detailed in the section on state borrowing.

27. Tax shares in statutory flows were subject to variation in the underlying Central tax revenue base itself, but this statistical margin of error was very different from the discretionary determination each year of aggregate Plan assistance.

both total quantum and distribution between states at the discretion of the Center, albeit subject to negotiation and bargaining by states. Further, Plan support was explicitly directed at the creation of "new facilities." Multi-year commitments, principally on salaries, extending far beyond the Plan period in which new facilities were created, were left unfunded. The paradox was that Plan flows explicitly meant for development assistance actually disfavored key elements of developmental expenditure.

Figure 3 shows the two components of Central fiscal flows to states, statutory and Plan, as shares of the total across the two.[28] In practice, the statutory flow was exceeded by the non-statutory flow for the first twenty years, and was essentially half of the total for the next thirty years of this 56-year period, never amounting to more than 60 percent (except after 2005).

The statutory flow is pre-determined and largely formulaic in distribution between states, accepted as mandated by Finance Commissions and implemented with no modifications.[29] It has two components, shares of Central tax revenues, and grants, both as prescribed by Finance Commissions. Shared taxes are the most formulaic, although their configuration was changed starting 1996–97 from shares of individual taxes to a share of overall collections.[30] This neutralized the pattern of incentives for tax effort at the Center. Grants prescribed in absolutes by Finance Commissions are as statutorily legitimate as shared taxes, but have carried adverse incentives for fiscal discipline.[31] There is also a clear discretionary element in their distribution between states, but because they are prescribed by a group of

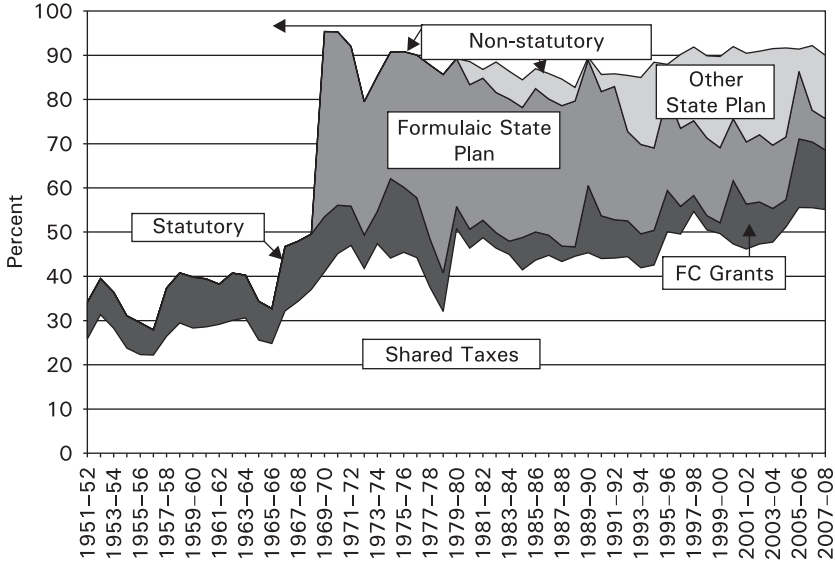
28. This excludes non-statutory non-Plan assistance, driven by an altogether different dynamic of on-lent small savings. There was also short-term "ways and means" assistance, which should in principle have remained constant in end-year outstandings over time. And clearly it excludes expenditure on that portion of the Center's own Plan which did not go into state exchequers at all (see footnote 24).

29. There are recent instances of failure of the Central Government to conform to its statutory obligations as formally accepted in Parliament, for example, with respect to the closure of the Fiscal Reforms Facility of the Eleventh Finance Commission. For departures from prescription and implementation of the recommendations of the TFC, see Rajaraman and Majumdar, 2005.

30. Pursuant to the recommendations of the Tenth Finance Commission.

31. "Deficit grants" to tide over fiscal shortfalls of states as estimated after factoring in tax shares are the major component of Finance Commission and grants, and have been widely pilloried for their obvious adverse incentives (Rao and Singh, 2005: 203). They need not have been, if deficits had been assessed from norm-based expenditures rather than from past actuals, which has been partially attempted ever since the Ninth Commission. Deficit grants are entirely unconditional. However, the Eleventh Finance Commission withheld 15 percent for conditional release upon fiscal correction; see notes to Figure 3.

FIGURE 3. Statutory and Non-statutory Flows from Center to States 1951–2008



Source: Figures starting 2005–06 are pre-actuals or budget estimates. Shared taxes are from Government of India, *Indian Public Finance Statistics*, assorted issues, up to 2002–03; Central Finance Accounts, for 2003–04 and 2004–05; Reserve Bank of India (RBI) *State Finances* for 2005–06 and 2006–07; and as projected in the Report of the TFC for 2007–08. Statutory Finance Commission grants are from Reports of Finance Commissions, First to Twelfth. Non-statutory Plan flows are from the Report of the Seventh Finance Commission for years up to 1973–74, and from RBI State Finances, assorted issues, supplemented by the RBI's *Handbook on State Finances 2004* for all subsequent years up to 2004–05. For the latest three years 2005–08, the Government of India Budgets for 2006 and 2007 were more plausible. For details on the data discrepancies between these and other sources, see Rajaraman, 2004, Appendix I.

Notes: 1. Non-statutory flows: Summed across current and gross capital flows classified as Plan expenditure going to state Government exchequers. They have two components: Central Assistance for state Plans which became formulaic (the Gadgil formula) after 1969–70; and Central Plan and Centrally Sponsored Schemes (CSS), with another category of Special Plan schemes added on after 1992–93. Formulaic state Plan assistance, subordinated to the Gadgil formula was termed "Normal Central Assistance" (NCA), but was not assigned a separate account head and so cannot be extracted from finance accounts. It is however separately identifiable starting 1980–81 (although it is only starting 1986–87 that the term NCA is explicitly used), from pre-actuals for the preceding year given in Central Budget Documents for Plan assistance going from the Ministry of Finance; non-formulaic scheme assistance goes from other Ministries. Starting 1997–98, actuals for NCA were obtainable from the detailed demands for grants of the Ministry of Finance. The capital flow is gross; the net capital flow is not obtainable even from the Central Finance Accounts, because loan repayments by states to the Center do not distinguish between Plan and other loans.

2. Statutory flows: Finance Commission grants are unconditional for the most part and include grants intended for onward transmission to local bodies from the Eleventh Finance Commisssion on. The minor exceptions are upgradation and special problems grants (from the Seventh Finance Commission on), which are conditional on expenditure incurred; and margin money for calamity relief (from the Eighth Finance Commission on), accessible only after crossing prescribed state expenditure caps. The Eleventh Finance Commission grant total here includes the 15 percent withheld as an incentive for fiscal correction, and does not include a matching 15 percent added on for all states, including those not among the beneficiary set for the grants from which the withholding was done.

technical experts, they could in principle be seen as determined outside a bargaining context.[32] Once prescribed and accepted in Parliament, grants are as unalterable as tax shares, and because prescribed in absolutes, actually even more predictable than tax shares. Shared taxes have accounted for most of the statutory flow, which rose substantially in 1970 to half the total flow and remained there until 2005.

Another major development in 1970 was that Central assistance for state Plans, the major content of non-statutory flows, was subordinated to a formula, which prescribed the share of each state in the total,[33] along with a uniform 70 percent loan content across states.[34] The remainder was that portion of Central Plan expenditure routed through state exchequers, and was thus explicitly at the discretion of the Center.[35]

In effect, there developed after 1970 two parallel formulaic components to Central flows to states, one statutory, one not, yielding a sharp rise in the aggregate formulaic share to 95 percent and a corresponding reduction in the bargaining margin to 5 percent. In itself, this was very major improvement. However, there were two serious problems with the persistence of two-track assistance to states, even after introduction of the formula.

32. However, there is evidence of caprice in the distribution of these grants between states; see Rajaraman and Majumdar, 2005.

33. Known as the Gadgil formula, it applied to the distribution of total Plan assistance among states other than a subset of eleven states, called special category (mostly northeastern) states, characterized broadly by hilly terrain, which carry a special status for fiscal purposes. The special category intersects with the set carrying special constitutional provisions under Article 371 of the Constitution, making for an asymmetric federal structure (Arora, 1995), but curiously does not itself carry a Constitutional underpinning. The total for special category states is distributed among them in a non-discretionary systematic manner, but not in accordance with a designated formula. The Gadgil formula has undergone some modifications over the years, reported in detail in Vithal and Sastry, 2002: 152. The weights used after 1991 are 60 percent for population, 25 percent inversely related to per capita State Domestic Product (SDP), 7.5 percent for special problems, and 7.5 percent for performance in "tax effort, fiscal management, population control, female literacy, on-time completion of externally aided projects and land reforms." The last two introduce a discretionary margin into the formula. The population weight is by the 1971 population so as not to de-incentivize population control; and the SDP related weight is further split into 20 percent, which goes only to states below the average SDP and is calculated by the deviation from the mean, and 5 percent which goes to all states and is calculated by distance from the highest per capita level (with a provision for the state at the top).

34. This was for states not in the special category, for whom the loan share was 10 percent. After the TFC recommendations came into force on April 1, 2005, there is no compulsory loan component to Central Plan assistance for states.

35. A portion of this went under the name of Centrally Sponsored Schemes, which required a co-financing stream from states.

First, the total non-statutory flow continued to remain variable from year to year.[36] An example is the sharp dip in 1972–73 in Central assistance for state Plans, soon after it became formulaic, when the lagged response of the Center[37] to the drought of the previous year meant a sharp rise in Central expenditure on drought relief and a corresponding reduction in support for state Plans. It is also generally apparent in the spikes in statutory shares, which were in absolute terms reasonably steady across years (albeit with some discontinuities across Finance Commission transitions).

Second, the 70 percent loan content carried an incentive for projects that could yield a return from which the debt could be serviced. This was the impulse behind the creation by states of parastatals (public sector undertakings), with the promise of commercial return. The year-to-year variability was consistent with episodic loan or equity contributions from state exchequers to these parastatals.

The loans added to a steady increase in state indebtedness to the Center (another source also added to it, detailed in the next section). Interest rates on these loans were set by the Center, and in this manner, states lost control of a substantial portion of their current expenditure.[38] The interest burdens of state governments were among the expenditures that further reduced the willingness of states to expand salary commitments, for health and education. The source of these interest burdens was eventually addressed by the TFC, which recommended no compulsory loan component in state Plan assistance from the Center, starting from 2005.

Perhaps in response to the debt build-up, Central assistance to state Plans began to include components not subordinated to the basic formula. As other schemes outside the formula began to be increasingly added on, the formulaic portion was termed "Normal Central Assistance."[39] The advantage of largely grant receipts was traded off against the loss of formulaic distribution between states. Thus, although the total of Finance Commission and state Plan assistance apparently stayed within the 85–90 percent

36. These went into non-Plan expenditures, to be covered by statutory flows and own revenues of states. But there was no guarantee whatever that statutory flows would cover these expenditure commitments.

37. This has been a standard feature of the relief response for adverse weather shocks; see next section. But there have been other years in which State Plan assistance fell for no apparent reason, such as 1995–96.

38. Default on these loans was ruled out by deduction at source of interest dues from Central transfers to states. This has been successfully enforced and is a major dimension of fiscal discipline in the Indian federation.

39. Starting with the budget documents of 1986–87.

range after 1970, the formulaic share began to decline. The non-formulaic share began widening again to reach 30 percent by 2006–07. The drivers of the year-to-year variations in the non-formulaic share are investigated further in this section.

Although the non-formulaic component in Central assistance for state Plans as a phenomenon is well-known, there was a complete absence of any formal accounting provision for segregating it from the formulaic component.[40] No attempt has therefore been made so far to quantify it in a systematic manner. The numbers underlying figure 3 have been teased out of budget documents, as detailed in the notes to figure 3. The non-formulaic component was open to bargaining in terms of the types and distribution of schemes introduced, and this added to the unpredictability of the total quantum of Central assistance to state Plans further uncertainty about the share that could be garnered by any individual state.[41]

The fluctuations over the period in the non-formulaic bargaining margin in total Central flows to states, clearly call for an explanation. Figure 4 plots the bargaining margin, obtained as the residual from the formulaic share of total flows shown in figure 3, against an index of political fractionalization for each year, constructed for the major fifteen states in the federation. States are assigned each year to two groups, one if the ruling party in the state during the year was either the same as, or a supporter of, the party ruling at the Center; the other if not.[42] Based on the ethnofractionalization formula, the index has the value zero if all states are aligned with the Center, and also if they are all in opposition to the Center.[43] This might seem to be a limitation, but it is actually a useful property as an indicator of the fractionalization among states regardless of the political alignment of each fraction. An index of this kind has not been attempted earlier and it is difficult to do for at least three reasons. First, the major parties have split over the years and

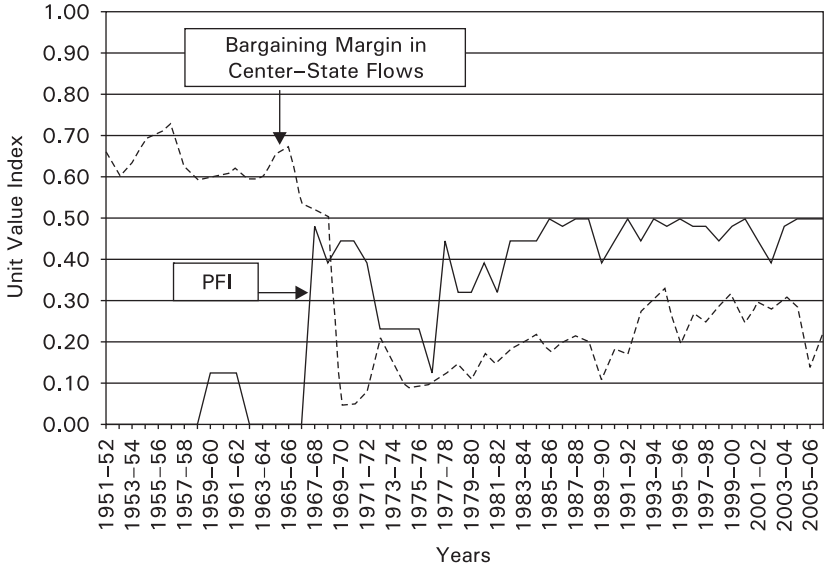
40. No attempt was made to quantify it in an earlier exercise (Rajaraman, 2004) for this reason. Accounting head 3601 for Central assistance to state governments carries only an undifferentiated sub-head 101 for Block Grants in aggregate.

41. Kletzer and Singh, 2000, arrive at their support for pre-committed amounts or formulae for flows to states through a separate line of argument, that the costs of exerting influence (akin to rent-seeking) may outweigh the benefits of discretion in making transfers.

42. No further splitting into party groups was attempted. In years when the state government was dismissed under Article 356 and placed under Central rule, it was assigned to group one. In years with transitions during the year, the closing situation was taken. The formula for the index is shown in the notes to figure 4.

43. The PFI ranges in value from zero to one in the general case, but in this case of two groups, can range only between zero and 0.5.

FIGURE 4. The Bargaining Margin and the Political Fractionalization Index 1951–2006



Source: Author's calculations for the bargaining margin, obtained as the residual after deduction of the formulaic components from total flows, using data from sources to figure 3. For the PFI, author's calculations from election data in Butler et al., 1995 and Penguin Books India, 2005.

Notes: 1. The PFI has the same form as the standard ethnofractionalization index.

PFI = $1 - \Sigma f_i^2$, $i = 1,2$, where f_i = fraction of states ruled by the same party as that at the Center ($i = 1$), or not ($i = 2$). Where there were mid-year changes in government, the party in power at the close of the year was used to assign it to one of the two groups. Where the year closed with an interlude where the state government was dismissed and President's Rule imposed from the Center, the state was assigned to group $i = 1$. The PFI has been constructed for the major fifteen states over the period 1951–52 to 2007–08. It varies in value from zero to 0.5 because there are two groups and in first differences from –0.5 to +0.5.

2. The bargaining margin is aggregated over Central allocations to all states, which grew in number over time with breakaway pieces of the major fifteen, along with the graduation of Union Territories directly governed by the Center into states in their own right.

re-grouped in bewilderingly intricate ways. Second, a party not formally in the government at the Center might nevertheless be a supporter, and therefore aligned with it. An example is the Communist Party Marxist, which supports the present Congress-led United Progressive Alliance (UPA) coalition at the Center. Such non-formal agreements are subject to change even within the term of a particular government at the Center. Finally, elections at state level have lost all synchronicity with elections to government at national level. There are mid-year changes of government in the states, sometimes more than one such in a single fiscal year, with frequent interludes when the Center has dismissed the state government and administered the state

directly. The manner in which all of these were handled are detailed in the notes to figure 4.

The PFI shot up from zero to 0.5 with the elections of 1967, two years before the major drop in the bargaining margin in Center–state flows in 1969–70. Thereafter, the PFI varied considerably before settling in the 0.4 to 0.5 range. A single equation OLS regression of the bargaining margin in first differences on the two-period lagged first difference in the PFI was estimated (table 1), treating changes in the PFI as exogenous to the system.[44] The two-period lag is in accordance with the institutional processes of the Indian fiscal system, where the flows in year t are planned in year $(t-1)$. The model basically tests for whether the change in the bargaining margin from $(t-1)$ to year t, as determined by budgetary processes at work in year $(t-1)$, is related to the observed political change in the most recent completed year $(t-2)$, relative to the year before $(t-3)$. The PFI reflects the political situation at the close of year $(t-2)$, and thus basically reflects the situation at the start of year $(t-1)$, when decisions with respect to year t are taken.

The coefficients show a significant inverse relationship with the bargaining margin declining by 0.05 (corresponding to a rise in the share of the formulaic fraction of Central flows to states) for every rise in the PFI by 0.1 with a two-period lag. The completed political configuration in year $(t-1)$ is not yet defined during year $(t-1)$, and indeed the coefficient was not statistically significant for a one-period lag in the first difference of the PFI.

The results covering the entire period from 1954–55 to 2007–08 clearly span two regimes, one prior to 1967–68, when the PFI was at zero barring a few years, and the subsequent period when it never fell back to zero again. A second regression covering the second regime is also presented in table 1. The coefficient and its significance remain. It is undeniably true that even in the second regime, there is a single dominant observation that drives the results. With the PFI fluttering at or just a little under its maximum value of 0.5 for the past 20 years, clearly the year-to-year changes will have lost their prior amplitude. What is clear is that the PFI breaks the 55-year period into two regimes, one where it was at or close to zero, when the bargaining share of Center–state flows never fell below 0.6; and a second regime where the PFI rose sharply to values well above zero, which brought down the bargaining share to a level never above 0.3 percent.

44. Politics and parties in India are sufficiently personality driven to justify this assumption. For example, the sudden leap in the PFI from zero to 0.5 in 1967 was surely a consequence of the passing away of Nehru in 1964.

TABLE 1. The Political Underpinnings of the Bargaining Margin in Center–State Fiscal Flows 1951–52 to 2007–08

Dependent Variable: Bargaining Margin (t–(t – 1))
Explanatory Variables: PFI and POI ((t – 2)–(t – 3)): (lagged twice)

	PFI		*POI*
	t: 1954–2007	*t: 1969–2007*	*t: 1954–2007*
Intercept	–0.003	–0.000	–0.010
	(–0.301)	(–0.027)	(–0.959)
PFI coefficient	–0.476	–0.498	–
	(–4.811)***	(–4.464)***	
POI coefficient	–	–	–0.205
			(–2.702)***
R bar squared	0.295	0.332	0.106
F-value	23.147***	19.925***	7.298***
No. of observations	54	39	54

Source: See sources to figure 4.

Notes: 1. Variable definitions: See notes to figure 4 for definition of the bargaining margin and the PFI. The Political Opposition Index (POI) is the simple fraction of states, f_2 in the PFI formula, ruled by parties in opposition to the ruling formation at the Center.

2. Lags: The two-period lag is in accordance with the institutional processes of the Indian fiscal system, where the flows in year t are planned in year (t – 1). The model basically tests for whether the change in the bargaining margin from (t – 1) to year t, as determined by budgetary processes at work in year (t – 1), is related to the observed political change in the most recent completed year (t – 2), relative to the year before, (t – 3). The POI is recalculated for the lag in the model to represent opposition to the government at time (t – 1) when the budgetary decision yielding the first difference for year t is taken.

3. Significance: Figures in parentheses are t-values. Asterisks mark levels of statistical significance, three for $P < 0.01$. All D-W values fell in the range 1.81–2.01.

4. The bargaining margin varies in value from 0 to 1 and in first differences from –1 to +1. Since there was no clustering of values at these extremes, a tobit model was not estimated.

A second index measuring political opposition was also tried, for the simple fraction of states ruled by parties in opposition to the ruling formation at the Center. Given the decision-making lags in the system this required a reassignment of parties in opposition to the ruling formation at the Center with a two-year forward lag. The inverse relationship shows up again, with the same two-period lag.

To conclude, the share of statutory flows, the unconditional and predictable statutory component of total Central assistance to states, did not account for appreciably more than one-half of total flows, until the award period of the TFC began in 2005–06. The year-to-year unpredictability of the non-statutory component, which accounted for half the total until very recently, discouraged expansions in health and education facilities which call for steady funding commitments from year to year. The further uncertainty as to each state's share of the uncertain total dropped dramatically with the subordination of the major share of Plan flows to formulaic allocation

across states starting in 1969–70, but the high loan component discouraged expenditures with no prospect of commercial return for loan servicing. Over time the non-formulaic bargaining margin in Plan support grew again on the promise of grant rather than loan support, at the expense of formulaic allocation across states. None of these developments over time was subject to formal assessment or monitoring by any standing platform open to all partners in the federation.[45] The terms of reference of Finance Commissions typically confined their field of vision to non-Plan flows, until recently.[46]

The sharp drop in the bargaining margin in 1969–70 was a lagged response to a sharp increase in 1967–68 in the PFI in the federation. The bargaining margin in first differences is inversely related to the two-year lagged first difference in the index. From these results, it seems possible to conclude that the increasing political fractionalization[47] in India over time has had a favorable upward impact on the formulaic share of total Central flows to states, and has therefore been favorable towards greater willingness by states to make steady expenditure commitments to provision of primary education and health.[48] Figure 2 which charts aggregate expenditure on health and education as a percent of GDP, with 1969–70 marked, adds supportive evidence from the expenditure commitment outcome.

Five miscellaneous points should be noted before concluding this section. First, the segment of assistance to state Plans that is non-formulaic is not necessarily wholly capricious in its distribution between states. The bargaining element has to do with the schemes that are selected and the manner of distribution between eligible states. Some of these are conditional on reform and therefore not apportioned *a priori*. The essential point though is that these flows are subject to yearly variation in both total quantum and apportionment between states, and is therefore entirely unpredictable at the level of any individual state.

45. However, there were fitful efforts by subsets of states to come together on specific issues over the years; see Kapur, 2005. The most successful of these was the introduction of VAT at state-level starting April 2005, in a concerted but voluntary move, with most states having opted for it in over a two-year period.

46. The Seventh (1979–84) and Eighth (1984–89) Finance Commissions were the first whose terms of reference were expanded to include Plan funding requirements of states, but this was dropped and re-surfaced only in the terms of the Eleventh (2000–05) Commission (Twelfth Finance Commission, 2003).

47. This is political fractionalization within a stable electoral system as distinct from political instability that is negatively associated with growth (Mankiw, 1995).

48. Sinha, 2005 makes a similar argument from a parallel stream of thought, that political linkage mechanisms guaranteed by regionalized party competition in India make consistent local and central preference and incentives over policy changes.

Second, a frequent feature of these scheme-specific Plan flows to states is that the funds remain unutilized for long periods for any of a number of reasons, including lack of projects on the shelf. Clearly, this is not a characteristic of statutory or formulaic fund flows which flow into the general pool and points to the general inefficiency of the non-formulaic add-on.

Third, there are Central Plan expenditures which do not flow to state exchequers and therefore have not been considered here, but are fully open to bargaining in terms of type of scheme and location. In that sense, there is a wider bargaining margin than what has been considered here.

Fourth, the recent lowering of state shares in total expenditure on health and education charted in figure 1 is because of a number of Central Plan schemes that have been devised to correct state failure in education. The best known is the Sarva Shiksha Abhiyan (Universal Education Mission) for primary education. The paradox is that correctives of this kind aggravate the conditions that led to underprovision of primary education by states in the first place.

Finally, there is the issue posed by Khemani, 2007, as to whether transfers delegated to an independent agency might serve to constrain the partisan element in apportionment. The issue of partisanship arises only in respect of non-formulaic flows, so that the larger issue posed is whether there should be such flows at all.

State Borrowing

In addition to the compulsory borrowing component of Plan assistance, states were permitted to borrow through sale of securities to financial markets (called market borrowings), which along with all other channels was subject to Central Government approval as in all federations, for reasons of macroeconomic discipline.[49] The total quantum in general has been conservatively set, with outstanding market borrowings of states at end-2007 at 6.7 percent of GDP.[50]

49. Under Article 293 to the Constitution, control over market borrowings is only applicable to state governments with outstanding debt to the Center. See Ter-Minassian, 1997 and Watts, 1999 for comparative information on other federations. In consequence of mandatory Central approval, states did not have to worry about their creditworthiness or market acceptance of their securities, which were floated through the RBI, and had a captive market in mandated minimum investments in government securities by the banking system.

50. The comparable figure for the Center was 35.2 percent. The size of direct market borrowing by states went up after withdrawal of Central lending to states in 2005, pursuant to the recommendations of the Twelfth Finance Commission.

The problem with market borrowings was not Central control over the total but the wholly non-transparent determination of both the aggregate and its allocation between states, and therefore its unpredictability from year to year. The state-wise borrowing shares in the aggregate were worked out as a part of annual Plan discussions, and alterable through bilateral negotiation between each state and the Center. Thus the bargaining space extended beyond that quantified in the last section within Plan flows.

The other major channel of borrowing permissible to states added to state borrowing from the Center, until 1998–99. This was through sale of small savings instruments to the general public, which were routed through the Central Budget and on-lent to states against jurisdictional collections, until a very major accounting change in 1999–2000. Routing through the Central Budget was terminated and state borrowings against these collections were owed to a Fund in the Public Account rather than to the Center as previously. This accounting reform was a major fiscal achievement and was critical to the growth subsequently enabled in the Indian economy.[51] However, the fiscal deficit at the Center became as a result non-comparable across the divide. The Central Government continued to administer the deposit rates on these schemes, so controlling the levers on total collections.

State loans from the Center against small savings added to Plan loans. It gave the Center the biggest share in state liabilities and the administered rates on all these gave it a dominant role in determining the interest payable by states on their debt. Until 1991 when the reform program began, loans to

51. Because state borrowing through this channel was limited only by jurisdictional collections, there was general pressure by consensus to raise deposit rates on small savings relative to other instruments. Since these were risk-free, they functioned as a floor to the interest rate structure. The accounting change enabled for the first time a clear picture of the financial viability of the scheme, which was rendered utterly opaque by the accounting separations previously in place. Subsequent to the accounting reform, it became possible to align deposit and lending rates and bring both down in several stages. Rates on small savings after 1999–2000 were benchmarked to an assortment of instrument-specific rates, but in the absence of any public commitment to the margin in terms of either magnitude or sign, the final rates remained administered rather than market-driven. A more formal commitment was made starting 2002–03 to both the instrument-specific benchmark/s, and a cap on margins of +50 basis points, as recommended by an official committee. Within that cap, the margin is still under Central control and the Center continues to offer tax incentives for these instruments. Thus, the Center still carries downside flexibility with respect to rates on small savings to a considerable degree. Because these are zero-risk instruments, many still carrying tax incentives, these rates continue to function as a floor to the interest rate structure in the economy. With its control over the margin, and the tax incentives given, the Central Government remains in control of the aggregate flows into the scheme.

the Center were between 70 and 80 percent range of total state liabilities.[52] The next section goes into details of the scheme that came into operation in 2005 to reduce this debt overhang.

Thus the Center had macroeconomic control over state-level borrowing through all channels, and therefore over the consolidated fiscal imbalance. This explains the finding in Khemani, 2004, for election years at state government level in India, of no rise in fiscal imbalances of individual states, but only a re-allocation of taxes and expenditures in favor of special interest groups.

The consolidated fiscal imbalance aggregating across Center and states was found in an earlier exercise over 1951–2001 (Rajaraman, 2006) to exhibit upward spikes in years immediately preceding elections to the Parliament ("general" elections, which lost synchronicity with state elections after the first three electoral cycles, to the point where there is now a state election practically every year).

That exercise is carried forward here by estimating an augmented specification for the fiscal imbalance consolidated across Center and states, and over the same period for the Center taken by itself. The consolidated fiscal balance nets out all state borrowing from the Center. Therefore the differential impacts of the variables in the specifications identify factors driving year-to-year changes in the limits placed by the Center on state borrowing from financial markets.[53] Because of the accounting change in 1999–2000 in the routing of small savings, the series for the comparative exercise had to be terminated at 1998–99, since the Central fiscal imbalance is not comparable across that divide.

The results for pre-election fiscal behavior in Organisation for Economic Co-operation and Development (OECD) countries, summarized in Alesina et al., 1997, point to partisan rather than opportunistic behavior over the electoral cycle at national level. However, there are contrary results for subnational elections in the US (Besley and Case, 1995) showing that the probability of

52. Ways and Means advances from the Center to tide over temporary cash needs, also added to the stock of liabilities. Repayments of these are lumped together with other loan repayments, so that it is impossible to judge whether the net stock increased from year to year. Notwithstanding this, and a simultaneous W&M window with the RBI (on which separate figures are available, showing negligible outstandings usually well below 1 percent of total state debt), the budget constraint faced by states could be termed as hard rather than soft.

53. A regression could also have directly been done for the difference between the consolidated and Central deficits, but since the specifications to be tested were in year-to-year first differences, one more difference would have further removed the figures from the directions of movement commonly known.

incumbent victory is inversely related to tax increases relative to neighboring jurisdictions.

The only econometric studies for fiscal imbalances in India are confined to the Central Government. Cashin et al., 2001, establish the presence of tax-smoothing through a Vector Auto-Regression (VAR) approach for the period 1951–97. Tax smoothing, as the term suggests, will leave the tax burden unadjusted to temporary shocks in expenditure, though not to permanent increases. This result is plausible and very useful as far as it goes, but the underlying model treats government expenditure (net of interest) as exogenously given.[54] Clearly, there is a need to build on this further so as to understand what drives temporary expenditure shocks. Further, by investigating fiscal behavior in terms of imbalances rather than expenditure, the tax response gets factored in and informs policy reform more comprehensively. There is also the study by Sen and Vaidya (1996) that examines Central Government revenue (current account) imbalances and finds a statistically significant increase in pre-election years over the period 1951–89. Interestingly, they find no electoral response in either expenditure or revenue taken independently, thus suggesting the use of both in conjunction and contradicting therefore the tax smoothing result of Cashin et al., 2001.

The dependent variable of all the regressions reported in table 2 is the primary fiscal deficit, as a percent of GDP, taken in first differences. The explanatory variables are the election year dummy, GDP growth rates taken both concurrently and lagged one year[55] and the PFI (first differences lagged twice, as in the case of the exercise in table 1, and for the same reason in view of the institutional lags in the fiscal decision-making process). The election year dummy is invariant with respect to the party in power and is assigned a value of one for the fiscal year immediately preceding an election, anticipated either because the government had reached the last year of its five-year term (recent examples are the elections in 1989 and 1996), or because the government expected to be voted out of power in the course of the year (as for example the elections in 1980, 1991, and 1998).[56]

54. Tax-smoothing (Barro, 1979) is not so much the analogue as the mirror-image for public consumption of the consumption-smoothing model for private consumption; what is smoothed here is revenue (income) rather than expenditure (consumption).

55. In Rajaraman, 2006, there is an alternative set of specifications with the agricultural growth rate instead, because of the exogenous rainfall factor, which in failed years calls forth a fiscal relief response in the form of rural employment and other welfare schemes.

56. General elections to the national Parliament, if held before the fifth year of the full term, have always been precipitated by the opposition rather than by the government in power voluntarily choosing to shorten its term. Thus, general elections held after the lapse of less

TABLE 2. Electoral Underpinnings of Fiscal Imbalances 1951–52 to 1998–99: Consolidated (Center + States) and Center

Dependent Variable: % PFD/GDP(t – (t – 1))

	Center+states 1951–99	*Center 1951–99*	*Center+states 1969–99*	*Center 1969–99*
Common intercept	0.330	0.451	0.248	0.204
	(1.044)	(1.231)	(0.586)	(0.502)
Pre-election year intercept	0.729	0.380	1.291	0.602
	(2.324)**	(1.046)	(2.968)***	(1.441)
GDP growth rate (%)	–0.036	–0.079	0.008	–0.025
(t)	(–0.861)	(–1.615)	(0.147)	(–0.465)
(t – 1)	–0.067	–0.038	(–0.132)	–0.059
	(–1.546)	(–0.776)	(–2.101)**	(–0.978)
PFI ((t – 2) – (t – 3))	–1.264	–1.054	–0.969	–0.694
	(–0.985)	(–0.709)	(–0.707)	(–0.527)
R bar squared	0.065	–0.003	0.155	–0.054
F-value	1.768	0.970	2.325*	0.630
No. of observations	45	45	30	30

Source: Author's calculations from Government of India, *Indian Public Finance Statistics*, assorted issues for fiscal data, supplemented by Rangamannar, 2002 for the 1950s. Sources to figure 4 for all election data. PFI from author's calculations.

Notes: 1. Variable definitions: The dependent variable is the primary deficit in percent of GDP taken in first differences (t – (t – 1)), obtained after subtracting interest payments from the fiscal deficit, which is officially reported only after 1988–89. For all prior years, fiscal deficits had to be calculated from the difference between expenditure and non-debt current receipts. There were no disinvestment non-debt capital receipts during that period. All reported capital expenditure figures going into these calculations are net of loan recoveries, and net out loan repayments. GDP growth rates are from the factor cost aggregate.

2. Data series: All series begin in 1951–52, yielding first differences starting 1952–53. The two-year lag with the PFI yielded a first value starting with 1954–55, and thus there are forty-five observations going up to 1998–99. The second estimation period starts with 1969–70, yielding thirty observations going up to 1998–99.

3. Significance: See notes to table 1.

The specifications are estimated with data series spanning two periods, one starting in 1951–52 and the other starting in 1969–70 (the year when higher formulaic shares of Plan flows to states began).

Over the 1951–99 period the only coefficient that carries statistical significance is the pre-election year positive intercept for the consolidated fiscal imbalance. It is not significant in the regression for the Center alone

than five years remain exogenously imposed, and are not jointly determined with the fiscal imbalance or other variables in the specification. This does not hold at state government level (Khemani, 2004). The two special cases were the elections in October 1984 and September 1999. The corresponding dummy value of one was assigned to 1984–85 (even though the precipitating event was unforeseen, it was the last year of a five-year term), and to 1998–99 (since the government was voted out at the conclusion of that fiscal year, with caretaker status until the mid-year election in 1999–2000).

(indeed, the regression itself is statistically insignificant). When estimated over the 1969–99 period, the pre-election spike is higher for the consolidated imbalance, but again insignificant for the Central imbalance alone.

Thus opportunistic pre-election behavior by the Central Government resulted in temporary upward spikes in the aggregate borrowing limits placed on states rather than in any direct spikes in the fiscal imbalance at the Central level alone. This finding substantiates the fact of Central control over the consolidated fiscal imbalance and the opportunity so obtained for temporal distortions in response to the electoral cycle. The distortions seem to have gone up after 1969 although the coefficient of the PFI (first differences lagged twice) itself is insignificant.

The coefficients for the growth rates in concurrent or lagged form carry negative signs, as expected, but are not statistically significant except after 1969, when there is a significant coefficient on the one-period lagged growth rate, for the consolidated imbalance alone, showing a lagged countercyclical response by the Center in aggregate borrowing limits on states.[57]

The election year distortions in limits on borrowing from financial markets added to the uncertainties faced by states in aggregate non-statutory assistance from the Center, and acted as further adverse incentives for enhancement of steady expenditure commitments by states of the kind required for provision of primary education and health. Because of the non-transparent manner of allocation of the aggregate, the uncertainty at the level of any individual state on borrowing limits extended to non-election years as well.

Finally, table 3 extends the exercise up to 2005 for the consolidated fiscal imbalance alone, with two data series. One splices the reported deficit for years after 1988–89 (the fiscal deficit was officially reported only starting 1988–89, see notes to table 2) to the generated figure for prior years; the second uses the generated figure for all years. The generated figure does not

57. The coefficients for the concurrent growth rate capture the composite effect of the structural properties of the fiscal system, which in India carry a peculiar feature that could impart an upward bias to the concurrent growth coefficient. Small savings collections, which are supply-driven, would carry buoyancy with respect to the growth rate but are of course only one component of government borrowing. Unless government borrowing through other instruments is adjusted in response to the small savings inflows in the course of the year, there could be a positive concurrent growth impact on net government borrowing. This could counter the policy response, if any, and yield a statistically insignificant coefficient. The coefficients for growth lagged one year do however carry the policy response, and these are indeed negative and statistically significant coefficients. The one-year lag in the stabilization policy response is also in conformity with the institutional lags in decision-making, where fiscal decisions with respect to year t are made in year $(t - 1)$.

TABLE 3. Electoral Underpinnings of the Fiscal Imbalance 1951–52 to 2000–05: Consolidated (Center + States)

	Center+states 1951–2005	
	Dependent variable: Reported % PFD/GDP(t – (t – 1))	*Dependent variable: Generated % PFD/GDP(t – (t – 1))*
Common intercept	0.323	0.407
	(1.058)	(1.420)
Pre-election year intercept	0.536	0.641
	(1.870)*	(2.378)**
GDP growth rate (%) (t)	–0.042	–0.046
	(–1.058)	(–1.231)
(*t* – 1)	–0.051	–0.070
	(–1.264)	(–1.840)
PFI ((*t* – 2) – (*t* – 3))	–1.079	–1.272
	(–0.867)	(–1.086)
R bar squared	0.025	0.088
F-value	1.325	2.208
No. of observations	51	51

Source: See source to table 2.

Notes: 1. Variable definitions: The first column splices the reported primary fiscal deficit after 1988–89 onto the generated figures for earlier years (see note 1 to table 2). The second column uses the generated figures for all years. In years after 1988–89, where there were disinvestment receipts, the reported figure should be the more correct, since it should (in principle) exclude disinvestment receipts (which are not reported and therefore cannot be subtracted from the generated figure). In practice however, the discrepancy varies widely, and is especially high in 1998–99 (14 thousand crore) and 2003–04 (22,000 crore), higher than known disinvestment receipts in those years.

2. Significance: See notes to table 1.

conform to the reported figure for years in which both are available, with the discrepancy between the two ranging between 1.8 and 19.5 percent of the reported number, not accounted for by disinvestment receipts on the capital account.[58] The two results are shown in the table to highlight problems that still remain with official reporting of fiscal magnitudes. Both results show that the pre-election intercept damped down relative to the estimate over 1951 to 1999, more sharply with the reported series. There was only one national election year after 1999, in 2004. The pre-election year 2003–04 shows evidence of the fiscal restraint introduced by the Fiscal Responsibility and Budget Management Act of 2003. It was also the only year in which there were substantial disinvestment receipts at the Center, but a considerable discrepancy remains even after factoring this in. At the very least, the

58. Disinvestment, which started in 1991–92, was reported in budget documents of the Central Government starting from the year 2000. These receipts did not close the gap between the reported and the generated figures for the fiscal deficit, although there is the (unlikely) possibility that the remaining disparity could be accounted for disinvestment by states, on which there is no consolidated data anywhere.

disparity between the generated and reported fiscal deficits calls for making transparent disinvestment receipts at the level of both Center and states.[59]

Starting 2005–06 there was a regime change with cessation of direct Central lending to states for Plan expenditure. There was also a change to a more inflexible system of caps on state borrowing as part of the conditionalities for debt concessions detailed in the previous section, so that electoral patterns in the consolidated fiscal imbalance will probably not be visible after 2005.

The Debt Write-off Scheme 2005–10

At least two recent schemes have been devised to reverse the build-up of debt owed to the Center by states. Both these are applicable to all states, unlike earlier one-off selective debt pardons for individual states on account of special conditions, such as insurgency. The most ambitious is that currently in place devised by the TFC for the horizon 2005–10, subject to fiscal conditionalities.[60]

The recommendation by the TFC was for a fiscal adjustment aggregated across all states toward a target fiscal deficit at 3 percent of GDP by 2008–09, which with nominal growth of 13.6 percent, would deliver a target debt level at 25 percent of GDP, but only over an infinite horizon.[61] In the face of the tedious and intricate procedure prescribed by the Report for allocation of the required adjustment across states (summarized in appendix 1 to the paper), the administrative rules by which the recommendations were implemented equated the average adjustment target to a uniform fiscal deficit applicable to each state of 3 percent of state GDP by the target year of 2008–09.[62] This was a violation *prima facie* of the recommendations as accepted in Parliament, but in the absence of any standing platform where these issues could be raised, it carried the day.

59. As a first step towards making transparent the process of disinvestment itself, which has been riddled with allegations of corruption.

60. Prior to the 2005–10 scheme a debt swap permitted swapping of debt to the Center carrying interest rates exceeding 13 percent against replacement borrowing from financial markets including small savings. This did not reduce the debt stock but lowered the interest bill of state governments.

61. The formula for the time taken to reach the target ratio of debt to GDP from time 0 to time t is given by $t = \log [d_0 - 0.25]/\log [d_t - 0.25]^* \log (1 + n)$, and can yield a finite number therefore only for debt levels slightly above the infinite target value.

62. Annex 7 of GOI, 2005. Even the required target in terms of national GDP should have translated into 4 percent of the individual GDP of states because state GDP is reported at factor cost and the GDP of the country at market prices in any year is above the sum of state GDP by one-third (see Rajaraman and Majumdar, 2005).

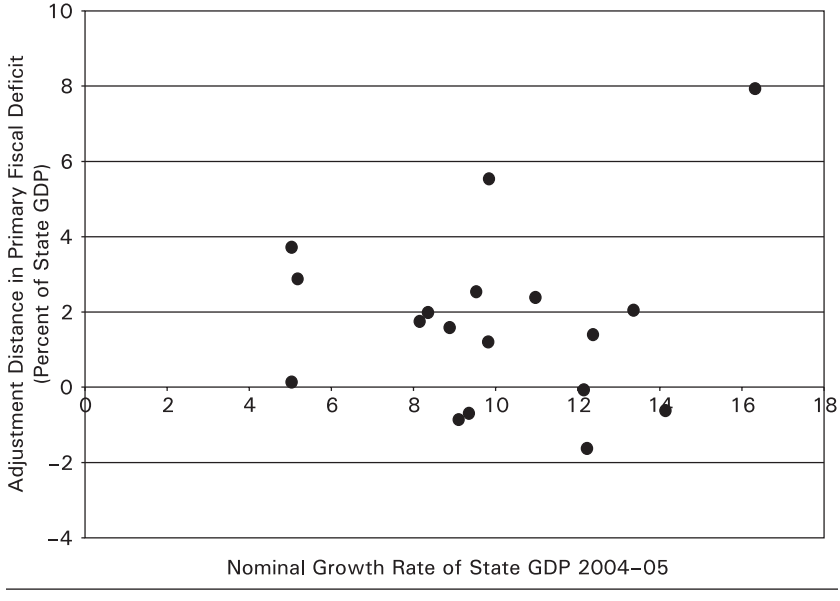
The required primary fiscal deficit in order to meet the uniform fiscal deficit of 3 percent of state GDP is a function of the average interest rate payable on state debt, and the nominal rate of growth, in accordance with the formula given below, and will clearly vary across states:

$p_t = f_t - id_{(t-1)}/(1 + n)$, where p is the required primary fiscal deficit, n is the nominal rate of growth, and i is the average nominal interest rate payable on state debt d.

The required primary fiscal deficit toward the uniform fiscal deficit target was calculated here at debt levels and values of the interest rate and nominal growth parameters that prevailed in 2004–05, the immediate pre-adjustment year. The requirement ranged from a primary surplus of 3 percent of state GDP to a permissible deficit of 1.2 percent of state GDP.

The adjustment distance between the actual and the required primary deficit in 2004–05 was then calculated and is shown in a scatter against growth rates of state GDP in figure 5. Two points emerge quite clearly. First, the

FIGURE 5. Scatter of the Adjustment Distance Required for the Debt Write-Off against Nominal Growth Rates of State GDP



Source: Author's calculations using data from RBI *Handbook of State Finances,* 2006–07. State domestic product figures from www.indiastat.com.

Notes: Variable Definitions: All state domestic product figures are at factor cost. The adjustment distance is obtained as the difference between the actual primary fiscal deficit in 2004–05 and the required primary deficit to achieve a uniform overall fiscal deficit target of 3 percent of state GDP (see text for equation used to calculate the required primary deficit).

adjustment distance range is nearly 10 percent of state GDP, from states which had actual primary deficits above the required level by 8 percent of state GDP, to states which had actual deficits (or surpluses) below the required level by 2 percent of state GDP. The issue is the range itself in the first instance, which by imposing uneven correction robs states of any sense of control over their fiscal parameters. There is also the fact of its having been imposed in the absence of any questioning of the wrongful interpretation of recommendations which prescribed state-specific adjustment formulae.

The second point is that there is no evidence of any systematic relationship between the adjustment distance and the nominal rate of growth.[63] States with a required adjustment of 3.5 percent of GDP, which grew at a nominal growth rate of 5 percent in 2004–05 and therefore at negligible real rates, would be heavily pressed to achieve their targets. The growth rates in the figure are single-year rates of 2004–05 and therefore clearly not immutable. The essential point however is that capricious adjustments of this kind add immeasurably to the uncertainties surrounding state allocations of expenditure, and therefore impact negatively on state willingness to commit themselves to avenues that are not compressible in the short run.

The debt example above is merely one of a larger class of phenomena, whereby a complex mandate is simplified in the executive order through which it is effected and distorted in the process of simplification. Another example was the fiscal reform facility of the Eleventh Finance Commission, which withheld a portion of its recommended statutory grants to be given only if the recipients crossed a fiscal correction threshold. The undistributed amount was to be distributed among performing states at the conclusion of the scheme, but this was not in fact done, and was the subject of extended dispute. There was no forum where the issue could be raised. The Inter State Council was established only as late as 1990 under a Constitutional provision for such a platform under Article 263, for resolution of all other than river water disputes (for which there was a separate provision under Article 262), but, in the years since, it has not been able to play the role envisioned for it. The move by states to a VAT regime on April 1, 2005, perhaps the single most important fiscal reform at the level of states since independence, was discussed and driven by a process altogether outside the purview of the Council.

There are many other issues potentially within the purview of such a body. There are the expenditure externalities imposed upon states every time the Center revises the salary scales of civil servants upwards. The modalities of service taxation lie in a constitutional limbo even though services

63. See appendix 1 to this paper.

account for a little over half of GDP, and drive growth. There is presently an indirect tax levied on services by the Center under a default provision in the Constitution.[64] There are other revenue issues having to do with royalty rates on minerals, a very important source of non-tax revenue for some of the poorer states, which are presently set by the Center. There are unfunded mandates, such as the National Rural Employment Guarantee started in February 2006, to provide an employment guarantee of 100 days to every rural household in every financial year, in such rural areas in each state as notified by the Center, at an absolute stipulated minimum daily wage. State governments bear one-tenth of the variable cost, such administrative costs as will be decided by the Central Government, and unemployment compensation in case of failure to provide work within fifteen days of demand for work at the location where it is demanded.

In a country with as much economic and other diversity as India, there is need for a much more systematic and standing dispute resolution forum, in which major issues of the kind just outlined can be resolved in a participatory framework, such that the economic parameters within which state governments function are predictable, within an acceptable margin of error.

Conclusions

Public expenditure on education and health in India has never commanded more than 3.3 and 1.3 percent of GDP, respectively. This paper investigates the nature of fiscal flows in the Indian federation to identify possible causes. If the necessity for public funding of primary education and primary healthcare is taken as a given,[65] poor human capital endowments in a federal setting could be the outcome of adverse incentives in the structure of funding of subnational governments, which usually carry the major expenditure responsibility for these functions.

The assignment of expenditure responsibilities and revenue rights in India gives rise to a vertical fiscal gap at subnational state level, for the closure of which there is a statutory provision enshrined in the Constitution, revisited

64. A Constitutional Amendment enacted in early 2004 assigns to the Center rights of collection and appropriation (including sharing percentages), outside the purview of Finance Commissions, in respect of taxes on notified services. No list has so far been so notified.

65. In the tradition of the new political economy, accepting reform rather than rejection of the public role (Inman, 1985), although a sizeable body of opinion now favors market provision with private choice.

every five years. Statutory flows from national government (the "Center" in Indian terminology) to states are predictable in quantum (subject to the known error margin of Central tax revenues), defined in both aggregate and distribution between states, and unconditional, properties necessary for multi-year expenditures of the kind needed for provision of primary education and health.

However, statutory flows never amounted in practice (except after 2005) to more than 60 percent of the total flow. Even after non-statutory flows became largely formulaic in distribution between states in 1969–70, they remained unpredictable in quantum from year to year. That, along with the 70 percent loan content implicitly altered the allocation incentives away from avenues such as health and education facilities, which call for multi-year current expenditure commitments, and carry no promise of commercial returns like public enterprises (potentially, at any rate). After 1969–70, there was a gradual reduction again in the share of the formulaic component.

The focus in this paper is on the non-formulaic bargaining margin in total flows, aggregating across all states and across statutory and non-statutory. The paper does not address variations between individual states in access to non-formulaic grants (which has been addressed in recent papers in the literature). The bargaining margin in aggregate flows is quantified here for each year of the period 1951–2007, and found to vary inversely with the PFI of states in the federation, with a two-period lag. As fractionalization increases, the formulaic share rises. Thus in the absence of a formal platform, the system has ricocheted in response to the political kaleidoscope, with the potential for constant change itself unsuited to the unchanging funding requirements of basic developmental services. If one of the presently visualized forms of the proposed goods and services tax (GST) were to be implemented, states would have negligible revenue collection powers of their own, and the vertical gap would essentially equal their share in total expenditure. In that case, the properties of fiscal flows to states will matter even more than they do today.

The difference between the fiscal imbalance consolidated across Center and states, and for the Center taken by itself, yields the net borrowing by states in aggregate. The specifications estimated for the consolidated and Central imbalances together establish that Central control over the consolidated fiscal imbalance, in itself a laudable macroeconomic feature of the Indian federation, was subordinated to opportunistic behavior over the national electoral cycle. These temporal distortions, and the spatial distortions implicit in the non-transparent allocation of borrowing entitlements across states, added further to the expenditure uncertainty faced by states.

The formal results suggest that increasing political fractionalization has had a favorable upward impact on the formulaic share of total Central flows to states, and has thus been favorable toward creating enabling conditions for states to make steady expenditure commitments of the kind needed for primary education and health. However, the pre-election distortion in borrowing entitlements for states was greater in the period after 1969, when political fractionalization was in general higher than before 1969.

Starting 2005–06, there has been a regime change with cessation of direct Central lending to states for Plan expenditure, and a more inflexible system of caps on state borrowing as part of the conditionalities for debt concessions detailed in the previous section. Thus, the kinds of uncertainties and patterns in aggregate borrowing limits on states will not be visible after 2005, at least until 2010. This is one of the good outcomes of the TFC recommendations, but is potentially reversible beyond 2010.

The build-up of state debt and interest liabilities to the Center consequent upon the high loan content of the non-statutory flow was sought to be dismantled starting 2005 with fiscal correction conditionalities prescribed by the TFC with state-specific targets (appendix 1). This complex mandate was simplified in the executive order through which it was effected and distorted in the process of simplification into uniform targets on states with widely varying initial conditions. Thus, the adjustment distances imposed varied widely among states, with a range of nearly 10 percent of state GDP. The issue is the range itself in the first instance, which robbed states of any sense of control over their fiscal parameters. There is also the fact of the wrongful interpretation of recommendations which prescribed state-specific adjustment formulae.

These developments ran on unchecked in the absence of a standing platform whereby the *de facto* functioning of fiscal arrangements might have been open for continual examination and monitoring by all partners to the federation. There is no effective standing dispute resolution forum in which major issues spanning Central transfers, revenue rights, expenditure externalities, and unfunded mandates can be resolved in a participatory framework, such that the economic parameters within which state governments function are known to them within an acceptable margin of error.

There has been a fall over the last ten years in the share of states in expenditure on health and education because of the huge new Central expenditures on primary education and mid-day meals in schools, not routed through states. Thus, the policy response has been to alter the pattern of functional

responsibility, when the need of the hour is for restoration to states of their Constitutionally assigned functions, with correction of the adverse incentives that became embedded in the *de facto* structure of subnational funding.

APPENDIX

Appendix 1: The Conditional Debt Concessions for States of the Twelfth Finance Commission

The summary of the debt concessions in this appendix draws on the detailed account in Rajaraman and Majumdar, 2005. In accordance with the convention whereby Finance Commission recommendations are accepted in full by the Center, with a few minor exceptions along the way, the Twelfth Finance Commission (TFC) scheme for debt concessions was accepted, and by extension, the conditionalities attached to those concessions as prescribed in the report.[1]

The scheme was in two parts, each with separate sets of conditionalities.

The first part was a concessional rate of interest of 7.5 percent on state debt owed to the Center, a 300 basis point reduction from the then average across all states of 10.5 percent. All state debt owed to the Center was to be consolidated and rescheduled for a fresh term of twenty years, with twenty equal installments due. The second part of the scheme was a write-off of debt repayments due until 2009–10, essentially the first five of the twenty newly drawn annual repayments. The write-off was however pro-rated to achieved fiscal correction, so that a state might not achieve a full write-off even of the first five installments.

The first part of the scheme required enactment of fiscal responsibility legislation (FRBM Acts) by states with five features, one of which was that the fiscal deficit be reduced to 3 percent of Gross State Domestic Product (GSDP), in an unspecified target year. The report also suggested that the Center set borrowing limits for states so as to achieve an aggregate fiscal deficit target across all states of 3 percent of Gross Domestic Product (GDP) at market prices, by 2008–09, and held there in 2009–10.

1. The formal document in which this is done is the Explanatory Memorandum on the Action Taken on the TFC Recommendations, dated February 26, 2005. For a detailed chronicle of departures from full acceptance, see Twelfth Finance Commission, 2003.

There was thus a basic contradiction between the idea of centrally-set borrowing limits in this manner and the ostensible freedom given to states to design their own fiscal deficit paths in their FRBM legislation.

The external cap on state borrowing was to be set by a formula allowing for variations in three parameters, for the individual state (subscript *j*), relative to all states taken in aggregate (subscript *a*). The three parameters were the ratio of revenue receipts (inclusive of taxes and grants from the Center) to GSDP (*r*); the interest rate on debt (*i*); and the nominal growth rate (*g*).[2]

$$f_j = f_a \left[\frac{i_a r_j g_j}{i_j r_a g_a} \right]$$

The formula enabled a higher target deficit for states with a higher nominal growth rate, for constant values of the other two parameters. The report suggested time-invariant values for all parameters, but the state nominal growth rates projected in the report were sufficiently at odds with achieved growth rates of states as to lead to serious misallocations of the required correction if used. A correction path in conformity with the formula could only be set iteratively over time with adaptive adjustments to parameter values. Even for constant values of GSDP nominal growth rates, and constant revenue buoyancies, the ratio of revenue receipts to GSDP is time-varying as long as these buoyancies are not equal to one.

The second part of the scheme was the debt write-off, which was prorated to achieved correction,[3] and carried in addition an absolute cap on the fiscal deficit at the level in the year 2004–05. A state fully in conformity with the externally prescribed correction formula, which was configured in terms of percentages to State Domestic Product (SDP), could easily exceed this cap, because of a higher nominal growth rate, for example. There were other issues, detailed in Rajaraman and Majumdar, 2005.

The executive order for implementation of these recommendations, with all their internal inconsistencies, essentially threw out the formula, capped the fiscal deficit at the absolute level in 2004–05, and set the absolute amounts for successive years as well so as to reach a uniform 3 percent of SDP for all states in 2008–09 (failing even to set the correct equivalent for 3 percent of GDP at 3.99 percent of aggregate GSDP at factor cost).[4]

2. The formula as given in the Report was incorrect. This is the corrected formula.

3. To the achieved reduction in the deficit on current account (the revenue deficit), rather than the fiscal deficit.

4. Details are in Government of India, 2005; Rajaraman and Majumdar, 2005, table 1.

Appendix 2

TABLE A-1. Descriptive Statistics

Variable	*Period*	*Mean*	*Std. Dev.*	*Minimum*	*Maximum*
Bargaining Margin	1951–52				
	2007–08	0.33	0.21	0.05	0.72
Bargaining Margin (t – (t – 1))	1952–53				
	2007–08	–0.01	0.08	–0.46	0.12
PFI	1951–52				
	2006–07	0.31	0.20	0.00	0.50
PFI ((t – (t – 1))	1952–53				
	2006–07	0.01	0.10	–0.16	0.48
POI	1951–52				
	2006–07	0.29	0.23	0.00	0.80
POI (t – (t – 1))	1954–55				
	2006–07	–0.01	0.14	–0.53	0.40
Center PFD/GDP (%)	1950–51				
	1998–99	2.60	1.57	–0.42	5.86
Center PFD/GDP % (t – (t – 1))	1951–52				
	1998–99	0.01	0.99	–2.58	2.36
Consolidated PFD/GDP (%)	1950–51				
	1998–99	3.43	1.51	0.48	6.80
Consolidated PFD/GDP % (t – (t – 1))	1951–52				
	1998–99	0.07	0.88	–2.70	1.67
	1951–52				
GDP Growth Rate (%)	2004–05	4.57	3.08	–5.20	10.47

Source: Computed by author from sources to figures 3 and 4.

Notes: 1. The periods for which the descriptives of the first differences of the Bargaining Margin, the PFI, the POI and the PFD/GDP are reported are not the same as the periods over which the specifications of tables 1–3 are estimated, because of the two-period lag applied to the PFI. The PFI is terminated at 2006–07 because the closing value of 2007–08 could be known only after the end of that fiscal year. The first difference of the POI is calculated with a forward lag of two years, and therefore begins in 1954–55; see text. The time period for the Center PFD/GDP is terminated at 1998–99 because of the accounting change starting 1999–2000, which made the fiscal imbalance non-comparable. This change does not affect the consolidated (Center plus states) fiscal imbalance, but descriptives for this series are similarly terminated so as to provide comparable statistics.

2. The pre-election year intercept applied to thirteen years over the period 1951–52 to 2004–05. The election year dummy is for general elections, when voting takes place to the Parliament. Concurrence with state elections broke down after about 1971. The election dummies were assigned a value of one for the fiscal year immediately preceding an election, anticipated either because the government had reached the last year of the five-year term (recent examples are FY90 and FY96), or because the government expected to be voted out of power in the course of the year.

Comments and Discussion

Jessica Wallack: "The Political Economy of the Indian Fiscal Federation" is a very broad and deceptively simple title. The paper's provocative stylized facts, analysis, and discussion are more like a research agenda than a single paper.

Indira Rajaraman has three main arguments. First, India's low level of expenditure on health and education is a symptom of the inadequacies of India's fiscal arrangements, specifically the lack of political certainty about the amount of the Center–state transfer and the overall limit on borrowing imposed by the Central Government. Second, India's politicians erred and directly disobeyed the orders of the Finance Commission by imposing the same deficit target on all states, regardless of the initial deficit position or the state's growth potential. Third, India needs a better forum for hashing out Center–state relations and the fiscal framework—right now there is no effective way for states to voice their concerns. The paper contains a number of other points, but these are the ones emphasized the most.

The paper shines a spotlight on several important aspects of the functionality of fiscal federalism. Rajaraman moves the attention from the existence of a vertical fiscal gap—a nearly universal (and somewhat unsurprising) feature of federalism—to its characteristics. She states that it is not the magnitude of the gap, but how it is filled that is important. This is a pragmatic and fruitful line of research; there are many dimensions of "how" that could affect states, Center, and the intergovernmental relationship functions. Indira's paper focuses on the potentially detrimental effects of political uncertainty, and on the magnitude of transfers and the credit limits for state borrowings on public expenditure decisions.

Second, Rajaraman raises the importance of acknowledging inter-state differences in Central Government "reform prodding" efforts such as the deficit restrictions. In practice, this can be a delicate balance between acknowledging different starting points and maintaining the credibility and perceived fairness in applying "carrots and sticks" to motivate reform. Her section on the debt write-off scheme criticizes the Central Government for imposing the same deficit target on states, regardless of their initial conditions, but it is not clear whether the Finance Commission's detailed recommendations would have necessarily been administered apolitically.

Politicization of the state-specific benchmarks would create even greater uncertainty about the adjustment cost. At least the simple straightforward uniform target gave some certainty about what was expected.

Third, Rajaraman highlights the absence of a formal mechanism giving states a voice in fiscal and other dimensions of intergovernmental relations. This issue has been raised in other articles—notably by T. N. Srinivasan in a *Economic & Political Weekly* (EPW) article (2007) and in this session—but Rajaraman's paper highlights the additional possibility that a participatory forum would enable states more effectively to protest the divergence between the *de jure*/recommended regime and the actual fiscal regime.

Finally, the paper is state-sympathetic in a literature that often portrays states as the recalcitrant anti-reformers, or the free-riders on the national common fiscal pool.[1]

That said, each of Rajaraman's arguments deserves a much closer theoretical and empirical examination than is given in the paper. The paper shows results to support three stylized facts. Each of the points is based on impressive datasets. But these are neither all of the facts that would be required to support her arguments, nor are they uncontroversial as facts. This is why the paper is an agenda rather than a single statement: no one paper could do justice to all of the arguments.

The first result is that the change in the portion of the transfers that are non-formulaic and assumed to be open for political horse trading—the "bargaining margin"—is negatively correlated with the change in the level of political fractionalization and the percent of states ruled by parties in the opposition among states two years before. The relationship between the "bargaining margin" and the political fractionalization index (PFI) clearly varies between two regimes (low and high fractionalization) in figure 4 and the negative relationship in the latter is less obvious than in the first. Rajaraman acknowledges this difference in the empirical analysis, and her choice of dividing point between the two regimes makes sense. The negative relationship is still present in the second regime starting with 1969–70 for the non-formulaic transfers and 1967–68 for PFI, although there is clearly a strong influence from the first observation.

Given the short time period and necessarily limited evidence that the author has to work with, it would also be helpful to understand the motivation for regressing the bargaining margin on the PFI. This might also clarify the rationale for using first differences rather than levels. The first differences imply that governments adjust the bargaining margin in response

1. *The Regional Roots of Developmental Politics in India: A Divided Leviathan* (Bloomington, Indiana: Indiana University Press) by Sinha, A. (2005a)—is an exception.

to changes in the political scenario; levels would imply that governments set the bargaining margin based on the situation observed. The logic of the governments' reaction and its choice are both interesting questions.

The PFI results suggest that the Center reduces its room to maneuver when states become more fractionalized, while the index measuring political opposition (POI) results suggest that the Center reduces its room to maneuver as opposition parties rule more states. The results are somewhat contradictory about what happens when states move from being evenly split between aligned and opposition parties to being majority in opposition: PFI would show this as less fractionalization/more bargaining margin, while the POI would show that this is more opposition/reduced bargaining margin. The results are also surprising. One would think that the Center would want to increase its bargaining margin as states move toward maximum fractionalization: the room to negotiate could help it gain needed marginal support from the half of the states in opposition.

Second, the first difference of the consolidated fiscal deficit (Center plus states) does show a statistically significant increase in pre-election years while the first difference of the Central Government deficit alone does not. The difference between the two dependent variables is the aggregate state borrowing, which would equal the overall cap if states borrowed up to the limit. The paper interprets the difference in significance between these two regressions as an indication that the Center's cap on state borrowing increases in election years.

While it may make sense to assume that states are borrowing up to the cap, the leap from a difference in coefficients' significance to conclude something about the difference between the two dependent variables does not. The statistical significance shows that elections explain part of the variance in the consolidated fiscal deficit, but that variance is made up of the variance of the Central Government deficit, the variance of the state borrowing, and the covariance between these two. The statistical significance does not necessarily mean that elections explain part of the variance in state borrowing. A more direct test would have been simply to use the difference between Center + state and Center alone as dependent variable. It is not clear why the dependent variable needs to be first differenced as it is in the regressions. The argument is that the cap is higher in election years, not that expansion is greater in election years.

Third, the uniform deficit target imposed as part of the debt dismantling initiative imposed widely varying adjustment distances and presumably adjustment costs on states. The variation in this cost did not seem to be related in any way with states' capacity to reduce their deficit, as measured

by the state growth rates. Figure 5 shows a striking scatter plot showing the very different magnitudes of the adjustment challenge.

The remainder of my comments discuss ways to delve deeper into how the analysis could be deepened. The research agenda needs to present more detailed positive analysis in order to support its normative statements.

Establishing the transfer regime as at least part of the cause of low state expenditures on education and health is a two-part argument. First, the author needs to establish that states are in fact uncertain about the revenues that they will receive. The existence of political bargaining does not mean that the results are uncertain, nor does the presence of a formula mean that the revenues are certain. The winners and losers of the bargain may be very obvious to all concerned—if political effects can be picked up in a regression as in Khemani (2003), they can likely be anticipated by savvy politicians. The electoral swings in the credit cap could also probably be predicted if the regression can pick them up. Is this really unpredictable from a state perspective just because it is opaque to an outsider?

Similarly, the formulaic transfers in India are sometimes expressed as a percentage of tax revenues that have yet to be collected. The paper dismisses this uncertainty as a "statistical margin of error" that is "very different" than the bargaining over the aggregate Plan assistance, but it would be helpful to know how different (see fn 27). Even if one ignores the economic uncertainty, the formula allows for continued political uncertainty if the Central Government's taxation decisions can affect the yield from the ones assigned to subnational governments. The state complaints cited in various Finance Commission reports suggest that the Central Government did exactly that until 2000, when the Tenth Finance Commission recommendation to base transfers on the overall central pool was accepted. In any case, the formula in the formulaic transfers is up for revision every five years.

States' uncertainty about revenues also presumably involves some uncertainty about own revenues as well. To what extent are subnational tax bases predictable? And are subnational revenues and transfers likely to be positively or negatively correlated? This matters for the overall variance that states have to cope with.

Uncertainty also has to be separated from volatility, or anticipated fluctuations over time. States' response to ups and downs that they can predict is likely to depend on their ability to and interest in smoothing revenues more than anything else.

Lastly, the author needs to show the uncertainty that any individual state faces. The paper explicitly says that it is not trying to analyze inter-state differences, but in the end, its claims are about the behavior of individual

states' decision makers. The predictability of the aggregate numbers says very little about the predictability of the states' budgets.

Second, the author needs to develop and test hypotheses about state policy makers' response to uncertainty. What is a reasonable way to characterize states' risk aversion? How do politicians, or better yet, groups of politicians, react to the uncertainty? Are there inter-temporal games between alternating parties, for example, that encourage the current regime to seize good times while they can and leave the next group to deal with the aftermath? Or are there games between the Center and state governments, in which state governments squeeze the Center to make up for unexpected downturns by airing the debate in front of the same voters that participate in national elections? How can a national government be completely immune to the charge that its transfer decisions forced a state government to cut a popular education or health program?

In particular, the author needs to establish that states' uncertainty about revenues affects its willingness to make multi-year expenditure commitments in education and health.[2] Uncertainty could also have more effects than just fear of multi-year commitments. It could plausibly affect many other dimensions of state public expenditures: its timeliness in paying contractors, or its attention to maintenance and less politically visible expenditures, among other patterns.

The paper's argument is hard to reconcile with the facts that states often do not spend all of the resources available to them, and they do seem to make multi-year expenditure commitments elsewhere—in civil servants' wages, for example. States' inability to spend money allocated for central sector schemes could be related to uncertainty if they are not using the resources because they cannot guarantee co-payments throughout the project or if they cannot find contractors because the government copes with revenue fluctuations by paying the contractors late. But this is a different mechanism than the one proposed here.

Hypotheses about states' response to uncertainty could be tested using cross-state variation. Smaller-population states, for example, might face greater political uncertainty if their weight in national politics depends on one of their small number of representatives being: *a*) part of a party in coalition and *b*) a leader in that party so that he or she actually has some influence. States whose economic cycles were negatively correlated with

2. It is also an untested assumption that multi-year expenditure commitments would be sufficient to deliver better health and education outcomes. But the object here seems to be to explain India's relatively low levels of education and health expenditure, which are obviously correlated with the poor outcomes.

national economic cycles might be less concerned about fluctuations in the formulaic shares of taxes. Similarly, states' expenditure varies.

Rajaraman's argument that the common fiscal deficit target is harmful to states also needs some empirical support. The paper seems to take issue with the procedure as much as the outcome, but she does not explain why the outcome is so harmful. What kinds of expenditures are being cut by states struggling to meet their targets? And is there any way to mitigate the harm from interrupting longer term investments while still ensuring that fiscal profligacy is not rewarded. Should states that have high deficits have less stringent targets? Wouldn't this send the wrong signals about bailouts? It would be helpful to know what kind of provisions the Finance Commission's plan offered.

More than anything else, it would be interesting to understand why the Finance Commission's recommendations were ignored when so many other proposals are accepted. What is the political economy of listening to the Finance Commission? What are the limits to its influence and the implicit or explicit boundaries that constrain its statements? This is important to understand as a part of Rajaraman's overarching argument about the need to revisit institutions for state–Center coordination.

Finally, the third paper on the agenda would almost have to be a theory or comparative politics paper to make a proactive case for a superior institution. What would be the dynamics of a participatory forum? When would they increase or decrease certainty about shares in the national pie or changes in national policy, from the perspective of individual states? Which kinds of states would see an increase or decrease in certainty? What should voting rights look like, and what should be the balance between rights of citizens to equal representation and rights of states to equal representation? Other federations around the world have struggled with these questions.

That is three significant papers so far. I have no doubt that more could be written on the basis of the agenda Rajaraman proposes—the paper raises important questions about how the Indian federation functions.

Mihir A. Desai: The structure of fiscal federalism within developing countries can help dictate patterns of social spending and can interact with a variety of political economy considerations. In India, a vertical gap—the difference between revenues and expenditures at the state and federal level—of more than 20 percent of taxes has led to a labyrinthine set of arrangements by which revenues are distributed to states for expenditure at the state level. These solutions to the vertical gap have the potential to alter the nature of

critical spending areas by states—such as health and education—and to be swayed by the nature of political currents.

Indira Rajaraman provides a detailed overview of fiscal federalism issues in India. Given the relative paucity of work in this area and the importance of the underlying questions, this is a welcome contribution. Her discussion of the federalism structure in India emphasizes the formulaic and non-formulaic nature of the correctives for the vertical gap. In particular, formulaic correctives to the vertical gap are implicitly considered favorable as they are assumed to lead to more steady allocations of expenditures at the state level. In addition to her overview of the arrangements, she makes a number of related claims. Most importantly, she claims that "increased political fractionalization in India over time has had a favorable upward impact on the formulaic share of total Central flows to states, and has therefore been favorable towards greater willingness by states to make steady expenditure commitments to provision of primary education and health." These are significant and surprising claims.

The first claim—that political fractionalization has increased formulaic allocations—is surprising as a simple political economy logic would suggest that fractionalization might lead to more discretion in the system. As fractionalization increases, politicians might search for more instruments by which to build coalitions, particularly those they can alter at their will. As such, increased discretion would accompany political fractionalization. It is hard to assess her claim that the opposite is the case without knowing the political economy mechanism by which this would operate. Similarly, the evidence to support this claim is complicated, as the author acknowledges, by the presence of a highly influential observation. It would be particularly helpful to know more about the period during which the simultaneous reduction in the bargaining margin and increase in political fractionalization occurred. Were there other factors that might have led to these simultaneous developments? At a minimum, it is difficult to conclude that a strong causal link exists given these considerations.

The second claim—that more formulaic allocations spurred by increased political fractionalization has been beneficial for health and education spending—is, unfortunately, untested. Health and education spending is presumed to be aided by steady allocations from the Center to the states. This claim is complicated by the considerable variation in what might be termed formulaic or non-formulaic allocations. It would be useful to know if formulaic allocations were truly more stable as they are assumed to be in this analysis. As Rajaraman's discussion demonstrates, words like "statutory

and "plan" in the Indian fiscal federation often do not in fact imply the stability that they usually do. Similarly, it is not clear that increased formulaic allocations necessarily lead to more health and education spending. Indeed, the figures demonstrate considerable variation in the bargaining margin with limited variation in the level of expenditure on health and education. As such, it is hard to know how to assess this claim.

These underpinning assumptions are problematic as reality might actually be quite different. Could it be that non-formulaic allocations foster competition between states to demonstrate more effective spending on health and education? In this case, more discretion at the Center can lead to more effective spending and perhaps even more spending on health and education. In other words, would it really be ideal for states to face no uncertainty over their allocations? It would be useful to test this underlying assumption that stable allocations lead to more or better health and education spending. Similarly, increasing political fractionalization could indeed lead to more health and education spending but by the completely distinct mechanism of politicians seeking to sway votes in a more fractured political setting.

The structure of fiscal federalism is a critically important aspect of the Indian political economy picture and of the delivery of social services. Rajaraman's paper provides a comprehensive overview of the complex arrangements at work and takes some provocative, initial steps in what promises to be an important line of inquiry.

General Discussion

Anjini Kochar queried whether Plan expenditures under Centrally-sponsored schemes should really be considered unpredictable. The eligibility guidelines were clearly laid out, and such variability as existed in access *ex post* arose from the provision of counterpart funds by the individual states and their ability to implement the relevant scheme as per the prescribed guidelines, factors that were clearly within their control.

T.N. Srinivasan noted that it was difficult from theory to predict the expenditure response by states to increased uncertainty in the availability of federal transfers. Uncertainty pertained both as to the expected level of the transfer and as to the variance around that expected level. It could not be automatically assumed that the response by an individual state (or states as a whole) would necessarily be a reduction in current expenditure on health and education, as the paper suggested.

He agreed though with the paper that there was an urgent need to review the institutional (and Constitutional) framework for fiscal federalism. The India of 2007 was not the India of 1950. At that time the Planning Commission was an extra-Constitutional body created by a resolution of the Central Cabinet, to devise national plans for development and to recommend transfers to states in support of their plans. Over time, these discretionary transfers and those for Centrally-sponsored schemes together came to dominate the transfers recommended by the Constitutionally mandated Finance Commission. The rationale for planning no longer exists. In his own writings, he had proposed the creation of a two institutions: a Fund for Public Investments to replace the Planning Commission and a Fiscal Review Council, a body in which the states would be represented along with the Center. The Fund would focus exclusively on the financing, monitoring, and evaluation of public investment. The Council would provide a forum where the communication between the states and the Center could be two-way, rather than unidirectional, from the Center to the states, as was currently the case. Crucially, it would provide a collective forum for the sates to monitor the policies and actions of the Center, a forum that was currently absent. In any case what was needed was fundamental reform of the country's fiscal Constitution, not tinkering at the margin. In this regard, Rakesh Mohan, the session's chair, noted that the capital expenditure component of Plan spending was now as low as 10–15 percent. If the Planning Commission were to be restructured to focus on public investment (along the lines proposed by Professor Srinivasan) its financial scope would be considerably smaller than at present.

Nirvikar Singh noted that the regression results were heavily influenced by the treatment of certain influential observations. He made two other points. First that Plan transfers were actually more variable than statutory transfers from the Finance Ministry. To him, this suggested that Plan transfers were more subject to political influences. But second, he felt that the right way to address the impact of various fiscal regimes on state-level social expenditure was to exploit cross-state variation, on which there was a substantial existing literature.

Jessica Wallack noted that Professor Rajaraman's presentation had normalized transfers to the states as percentages of gross revenue receipts of the Center. The formulaic transfers were, however, more appropriately related to the underlying tax base for shared revenues. While it was not easy to measure this base, the base itself was subject to various shocks which generated fluctuations, even with a known and stable sharing ratio. Predictability of the formula was no guarantee of stability of revenues, and formulaic

transfers were not necessarily more predictable in terms of quantum than the apparently more discretionary Plan transfers.

Still on the issue of the predictability and stability of transfers, Govinda Rao noted that the paper had correctly noted that Plan transfers themselves were of two kinds: formula-based Central assistance for state Plans (allocated as per the "Gadgil formula") and truly discretionary transfers, including transfers under so-called Centrally-sponsored schemes.

The "predictability" of formulaic transfers via the Finance Commission award was necessarily dependent on the underlying tax base, as Jessica Wallack had noted. In 2000–01, for example Central tax collections had undershot projections by 20 percent causing severe difficulties for the states. The difference in predictability between formulaic transfers and specific purpose transfers under Centrally-sponsored schemes was therefore more one of degree than of kind. Rao also noted that in recent years, funds for certain important central schemes (education, rural health) had begun to go directly to local governments. This could have affected the recent state level expenditure data, and may have impacted on state budgetary planning overall by reducing one predictable element of Central transfers. Finally, Govinda Rao thought Indira Rajaraman was unfair in her criticism of the Union Finance Ministry in its imposition of a uniform 3 percent fiscal deficit target, as the Finance Commission itself had not been clear on the matter.

Returning to the institutional issues, Devesh Kapur remarked that the National Development Council (NDC), which approved the Central Five-Year Plans, did exist as a Constitutional mechanism for Center–state dialogue on fiscal federalism. In addition, the recently demonstrated ability of the nation to negotiate a value-added tax across the states (through the mechanism of an Empowered Committee of State Finance Ministers, with the Union Finance Ministry providing the secretariat), suggested that the asymmetry of power, or the lack of dialogue, between the states and the Center was not as acute as the paper suggested.

In addition, the states have voice in the Parliament, particularly in the Rajya Sabha (the Upper House: literally the Assembly of the States), which could be used to influence the country's fiscal Constitution. Finally, he cautioned on the applicability of Western models of political behavior to the Indian environment. If there was one constant in the Indian political landscape, it was the high anti-incumbency disadvantage. There was little evidence that populist public expenditure actually helped the incumbents. So even if the empirical analysis revealed such behavior, at best it represented the triumph of hope over experience.

Dilip Mookherjee remarked that there had been a major structural break in the bargaining margin in the 1967–69 period linked to the introduction of the Gadgil formula. He asked whether indeed health and education expenditure had risen subsequently. Suman Bery noted that, in contrast to federations in South America, notably Brazil and Argentina, India had been remarkably free of debt crises emanating from the states. This suggested to him that the Indian controls over sub-national borrowing, even if discretionary and opaque, had by and large worked. But he also asked if this greater Central control was in any way derived from underlying Constitutional differences, since in the South American countries the sub-national entities had preceded the Center, while in India to some degree the process had been reversed.

Responding to these observations, Indira Rajaraman first noted that spending on health and education had indeed jumped after 1969–70, consistent with the reduced "bargaining margin" in the subsequent period. She emphatically disagreed that her hypotheses were best tested by looking at cross-state variation. Her purpose was to look at the behavior of the fiscal federation as a whole. She also defended leaving in the so-called influential observation in the PFI.

On the uniform fiscal deficit target of 3 percent of GDP for all states, the issue for her was not the ambiguities in the report of the Finance Commission, but rather that the Union Ministry had misinterpreted the aggregate fiscal correction across all states, as recommended in the report and as accepted in Parliament. She did not know why this was not pursued politically by the states through the Parliament, but she was clear that the NDC was not a serious forum for debate. On Central control over state borrowing, given the fragile nature of Indian financial markets, she felt that aggregate limits on state borrowing were sensible.

Finally, given the paper's underlying concern for orderly social spending, she stressed that in her view there was indeed a crucial difference between the volatility of formulaic transfers and the unpredictability of discretionary Plan transfers. The rules of the game of the former were known in advance and facilitated forward planning, in the way that the latter did not. The "predictability distance" between statutory and non-statutory transfers was something that she wished to stress.

In his concluding remarks, Rakesh Mohan made three points. First, that there was much to be learned from other federations on cost-sharing in federal programs, and this needed to be examined further. Second, that the shift of the states to market borrowing had not yet begun to bite because they had continued to have access, at relatively high cost, to resources from

the small savings program. If there was reasonable alignment between the relative cost of market borrowings and small savings, the better-managed states would in time gravitate toward the former in order to obtain greater control over their financing. Finally he noted that the RBI had taken the initiative a decade ago to convene semi-annual meetings of the State Finance Secretaries (the senior-most finance civil servants). These meetings had clearly filled a void to address myriad of issues at a level below the basic policy level. So he agreed that there was a need for a higher-level forum to address the kinds of issues raised by Indira Rajaraman in her paper.

References

Alesina, Alberto, Nouriel Roubini, and Gerald D. Cohen. 1997. *Political Cycles and the Macroeconomy.* Cambridge: The MIT Press.

Arora, Balveer. 1995. "Adapting Federalism to India: Multilevel and Asymmetrical Innovations." In *Multiple Identities in a Single State: Indian Federalism in Comparative Perspective*, edited by Balveer Arora and Douglas V. Verney, pp. 71–104. Delhi: Konark.

Arulampalam, Wiji, Sugato Dasgupta, Amrita Dhillon, and Bhaskar Dutta. 2007. "Electoral Goals and Center–State Transfers: A Theoretical Model and Empirical Evidence from India," *mimeo*, Department of Economics, University of Warwick.

Baron, David, and John A. Ferejohn. 1989. "Bargaining in Legislatures." *American Political Science Review* 83 (4): 1181–1206.

Barro, Robert J. 1979. "On the Determination of the Public Debt." *Journal of Political Economy* 87 (5): 940–71.

Besley, Timothy, and Anne Case. 1995. "Incumbent Behaviour: Vote Seeking, Tax-setting and Yardstick Competition." *American Economic Review* 85 (1): 25–45.

Biswas, Rongili, Sugata Marjit, and Velayoudom Marimoutou. 2007. "Fiscal Federalism, State Lobbying and Discretionary Finance in India," *mimeo,* Centre de Sciences Humaines, New Delhi.

Breton, Albert. 1987. "Towards a Theory of Competitive Federalism." *European Journal of Political Economy* special issue, 3 (1 & 2).

———. 1996. *Competitive Governments: An Economic Theory of Politics and Public Finance.* New York: Cambridge University Press.

———. 2006. "Modeling Vertical Competition." In *Handbook of Fiscal Federalism,* edited by Ehtisham Ahmad and Giorgio Brosio, pp. 86–105. Cheltenham (UK): Elgar.

Butler, David, Ashok Lahiri, and Prannoy Roy. 1995. *India Decides: Elections 1952–1995.* Third edition. New Delhi: Books and Things.

Cashin, Paul, Nilss Olekalns, and Ratna Sahay. 2001. "Tax Smoothing, Financial Repression and Fiscal Deficits in India." In *India at the Crossroads: Sustaining Growth and Reducing Poverty*, edited by Tim Callen, Patricia Reynolds and Christopher Towe, pp. 53–74. Washington, D.C.: International Monetary Fund.

Davis, S. Rufus. 1978. *The Federal Principle*. Berkeley: University of California Press.

Government of India. *Reports of Finance Commissions: First to Twelfth.* New Delhi.

———. 1975–2006. *Indian Public Finance Statistics*. Assorted issues. New Delhi: Ministry of Finance.

———. Various Issues. *Central Government Finance Accounts 2003–04 and 2004–05*. New Delhi: Ministry of Finance.

———. 2005. *The States' Debt Consolidation and Relief Facility 2005–06 to 2009–10.* New Delhi: Ministry of Finance.

Government of India. 2007. *Economic Survey 2007*. New Delhi. Ministry of Finance.

———. *Budget Papers*. Assorted years. New Delhi. Ministry of Finance.

———. *Budget Documents*. Assorted years. New Delhi. Ministry of Finance.

Inman, Robert P. 1985. "Markets, Governments, and the 'New' Political Economy". In *Handbook of Public Economics*, edited by Alan J. Auerback and Martin Feldstein, pp. 647–777. Amsterdam: North Holland.

Inman, Robert P., and Daniel L. Rubinfeld. 1997. "The Political Economy of Federalism." In *Perspectives on Public Choice: A Handbook*, edited by Dennis C. Mueller, pp. 86–105. Cambridge: Cambridge University Press.

Kapur, Devesh. 2005. "Explaining Democratic Durability and Economic Performance: The Role of India's Institutions." In *Public Institutions in India: Performance and Design*, edited by Devesh Kapur and Pratap Bhanu Mehta, pp. 28–76. New Delhi: Oxford University Press.

Khemani, S. 2003. "Partisan Politics and Intergovernmental Transfers in India". Working Paper No. 3016, Development Research Group, The World Bank.

Khemani, Stuti. 2004. "Political Cycles in a Developing Economy: Effect of Elections in the Indian States." *Journal of Development Economics* 73 (1): 125–54.

———. 2007. "Does Delegation of Fiscal Policy to an Independent Agency Make a Difference? Evidence from Intergovernmental Transfers in India." *Journal of Development Economics* 82 (2): 464–84.

Kletzer, Kenneth, and Nirvikar Singh. 2000. "Indian Fiscal Federalism: Political Economy and Issues for Reform." In *Institutions, Incentives and Economic Reforms in India*, edited by Anthony Lanyi, pp. 38–76. New Delhi: Sage.

Kohli, Atul. 2006. "Politics of Economic Growth." *Economic and Political Weekly* 41 (13 & 14): 1251–59 and 1361–70.

Mankiw, G. 1995. "The Growth of Nations." *Brookings Papers on Economic Activity* 1: 275–310.

Musgrave, Richard A. 1983. "Who Should Tax, Where and What?" In *Tax Assignment in Federal Countries*, edited by Charles E. McLure Jr., pp. 2–19. Canberra: Australian National University.

Oates, Wallace. 1991. *Studies in Fiscal Federalism*. Brookfield: Elgar Publishing.

———. 1999. "An Essay on Fiscal Federalism." *Journal of Economic Literature* 37 (3): 1120–49.

Penguin Books India. 2005. *The Penguin Guide to the States and Union Territories of India*. New Delhi: Penguin Books India.

Rajan, Raghuram. 2006. "The Persistence of Underdevelopment: Constituencies and Competitive Rent Preservation," *mimeo,* Chicago Graduate School of Business.

Rajaraman, Indira. 2003. *A Fiscal Domain for Panchayats.* New Delhi: Oxford University Press.

———. 2004. "Fiscal Restructuring in the Context of Trade Reform." Working Paper No. 7. New Delhi: National Institute of Public Finance and Policy. Summary version in *Economic and Political Weekly* 39 (26): 2787–94.

Rajaraman, Indira. 2006. "Fiscal Developments and Outlook in India." In *A Sustainable Fiscal Policy for India: An International Perspective*, edited by Peter Heller and M.G. Rao, pp. 8–43. New Delhi: Oxford University Press.

Rajaraman, Indira, and Debdatta Majumdar. 2005. "Equity and Consistency Properties of the Twelfth Finance Commission Recommendations." *Economic and Political Weekly* 40 (31): 3413–20.

Rajaraman, Indira, C. Bhujanga Rao, O. P. Bohra, Manish Gupta and P. R. Jena. 2007. *Rural Decentralization and Participatory Planning for Poverty Reduction*. Overall Report and Four State Reports. New Delhi: National Institute of Public Finance and Policy.

Rangamannar, T. S. 2002. "Long Term Fiscal Trends in India 1950–57 to 2000–01: A Conspectus," *mimeo,* New Delhi: National Institute of Public Finance and Policy.

Rao, M. Govinda. 1995. "Indian Fiscal Federalism from a Comparative Perspective." In *Multiple Identities in a Single State: Indian Federalism in Comparative Perspective*, edited by Balveer Arora and Douglas V. Verney, pp. 272–316. Delhi: Konark.

Rao, M. Govinda, and Nirvikar Singh. 2005. *The Political Economy of Federalism in India*. Delhi: Oxford University Press.

Rao, M. Govinda, and Kavita Rao. 2006. "Trends and Issues in Tax Policy and Reform in India." In *India Policy Forum: 2005–06*, edited by Suman Bery, Barry Bosworth, and Arvind Panagariya, pp. 55–122. New Delhi: Sage.

Reserve Bank of India. 2004. *Handbook of State Finances*. Mumbai: Reserve Bank of India.

———. 2006. *Handbook of Statistics 2005–06.* Mumbai: Reserve Bank of India.

———. 2007. *Handbook of State Finances*. Mumbai: Reserve Bank of India.

Rudolph, Lloyd I., and Susanne Hoeber Rudolph. 1987. *In Pursuit of Lakshmi: The Political Economy of the Indian State*. Chicago: University of Chicago Press.

Saez, Lawrence. 2002. *Federalism with a Centre: the Impact of Political and Economic Reform on India's Federal System*. Delhi: Sage.

Salmon, Pierre. 2006. "Horizontal Competition Among Governments." In *Handbook of Fiscal Federalism*, edited by Ehtisham Ahmad and Giorgio Brosio, pp. 61–85. Cheltenham (UK): Elgar.

Sen, Kunal, and Rajendra R.Vaidya. 1996. "Political Budget Cycles in India." *Economic and Political Weekly* 31 (30): 2023–27.

Shah, Anwar. 2007. "Emerging Issues in Fiscal Federalism: An Overview of Principles and Practice." Paper prepared for Fourth International Conference on Federalism. November.

Singh, Nirvikar, and T. N. Srinivasan. 2006. "Indian Federalism, Economic Reform and Globalisation." In *Federalism and Economic Reform: International Perspective,* edited by Jessica Wallack and T. N. Srinivasan, pp. 301–63. Cambridge,

U.K.: Cambridge University Press.
Sinha, Aseema. 2005. "Political Foundations of Market-Enhancing Federalism: Theoretical Lessons from India and China." *Comparative Politics* 37 (3): 337–56.
Sinha, Aseema. 2005a. *The Regional Roots of Developmental Politics in India: A Divided Leviathan*. Bloomington, Indiana: Indiana University Press.
Subramanian, Arvind. 2007. "Rupee Appreciation: Lessons from China." *Business Standard*, 22 May.
Srinivasan, T. N. 2007. "Poverty Lines in India: Reflections after the Patna Conference." *Economic & Political Weekly*, October 13.
Ter-Minassian, Teresa ed. 1997. *Fiscal Federalism in Theory and Practice*. Washington, D.C.: International Monetary Fund.
Tiebout, Charles M. 1956. "A Pure Theory of Local Government Expenditures." *Journal of Political Economy* 64 (5): 416–24.
Twelfth Finance Commission. 2003. *Fifty Years of Fiscal Federalism: Finance Com-missions of India*. Twelfth Finance Commission.
United Nations Development Programme. 2006. *Human Development Report 2006*. New York: UNDP.
Verney, Douglas. 1995. "Are All Federations Federal? The United States, Canada and India." In *Multiple Identities in a Single State: Indian Federalism in Comparative Perspective*, edited by Balveer Arora and Douglas V. Verney, pp. 19–51. Delhi: Konark.
Vithal, B. P. R., and M. L. Sastry. 2002. *The Gadgil Formula for Allocation of Central Assistance for State Plans*. New Delhi: Manohar.
Wallack, Jessica, and T. N. Srinivasan. 2006. *Federalism and Economic Reform: International Perspectives*. Cambridge, U.K.: Cambridge University Press.
Watts, Ronald L. 1999. *Comparing Federal System*. London: McGill Queen's University Press. Second Edition.
———. 2001. "Introduction: Federalism in an Era of Globalisation." *International Social Science Journal* 53 (167): 9–12.
Weingast, Barry. 1995. "The Economic Role of Political Institutions: Market Preserving Federalism and Economic Development." *Journal of Law, Economics and Organisation* 11 (1): 1–18.
Wheare, Kenneth C. 1953. *Federal Government.* Oxford: Oxford University Press.
Wildavsky, Aaron. 1990. "A Double Security: Federalism as Competition." *Cato Journal* 10 (1): 39–58.

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Can Schooling Policies Affect Schooling Inequality? An Empirical Evaluation of School Location Policies in India

Introduction

The Government of India's schooling policies have long been guided by two primary objectives: to increase schooling attainment and to reduce schooling gaps, particularly those based on caste and gender. As in most developing economies which started with poor social infrastructure in rural areas, it was felt that the primary deterrents to schooling were the inadequate number of schools and the consequent distance between the average residence and a school. The government therefore made the provision of a school within walking distance from each rural household a priority.

In implementing this policy, scant attention was paid to the fact that targeting access to schools as a primary objective may constrain the government in addressing other critical aspects of schools, particularly those related to school quality. This is because decisions regarding the location of schools determine more than just access to schools, they combine with the residential structure of an economy to define the school community; hence, characteristics of schools are known to affect schooling attainment. For example, if residential centers are geographically dispersed and are of relatively small size, then the priority placed on access may imply a corresponding inability to efficiently choose school size: it will be determined by the size of the community. And, if the economy is characterized by a relatively high level of residential segregation, decisions regarding the location of schools across closely spaced communities will determine whether residential segregation implies a correspondingly high degree of schooling segregation. Under such conditions, policies to improve school quality cannot be discussed independently of school location policies.

The nature of residential communities in rural India makes this tradeoff between access and quality likely. Rural India resides in habitations—distinct residential sub-divisions of a village—which vary in size but are,

on an average, fairly small. Habitations are generally organized along caste lines, so that the rural economy is characterized by a considerable degree of caste-based segregation with the Scheduled Castes (SCs) and Scheduled Tribes (STs) households frequently residing in separate, smaller, sub-habitations of the village. The stated policy objective of providing a school within easy walking distance of each household in conjunction with the geographic distance across habitations requires the government to use the habitation as the basis for school mapping exercises and to adopt a policy that provides schools even to relatively small habitations.

In turn, the small size of the average habitation removes the possibility of optimally choosing school enrollment or size; it is dictated by the population size of the habitation. Reflecting this inefficiency, school size varies tremendously within a district, even within a village, and forges a similar inefficient variation in critical schooling inputs such as the number of teachers. If these inputs affect schooling attainment, then the benefits of access to schools will vary across habitations, depending on their size. And, a relatively large number of sub-optimal sized schools will imply a corresponding reduction in the average quality of schools in the country.

It is not just the size of the habitation within which a school is located that affects schooling attainment, the size of neighboring habitations also matters. The geographical distance across habitations implies that large villages commonly have more than one school, with each school serving a different habitation. In these villages, the government's school location policies translate the extensive residential segregation by caste in rural India into a corresponding system of *de facto* schooling segregation. This, in turn, is likely to affect schooling attainment and reinforce the caste-based divisions, which characterize rural India.

The socio-economic and demographic differences across the SC/ST habitations and those populated by the upper castes suggest that the government's policy of providing a school for each habitation implies a trade-off not just in terms of the average quality of schools but also in terms of schooling inequality. The size of the SC/ST habitations, even those large enough to justify a school, is significantly smaller than the average size of upper caste habitations. Schools located in the SC/ST habitations have correspondingly fewer teachers and hence are generally of lower quality than those located in the upper caste habitations. The schooling segregation which results when schools are located in the SC/ST habitations reinforces these quality differences. Schooling segregation implies that children of the upper castes will attend schools primarily populated by children from relatively well-off families, but the opposite is true for children who attend schools

located in the SC/ST habitations. If the average "quality" of the student population matters for individual schooling attainment, as many believe it does, schooling segregation will increase the schooling of the upper caste children, while reducing that of the SC/ST. These school-policy induced differences in school quality are likely to explain a significant component of caste-based differences in schooling attainment.

The empirical analysis of this paper starts by exploring the relationships between the habitation size and the attributes of rural schools. The positive correlation between habitation size and school access suggested by India's school location policy is borne out in the data. Additionally, and consistent with the hypothesis that school location policies forge a relationship between residential characteristics and other attributes of schools, the data reveal that large habitations also have an advantage in the availability of teachers; districts with larger habitations have a smaller proportion of schools with two or less teachers. Moreover, districts with larger habitations are also more likely to have relatively large SC/ST habitations and hence a greater probability of schools being located in SC/ST habitations. This suggests greater schooling segregation in these districts.

The paper then proceeds to explore the effect of these school attributes on primary enrollments. I show that the probability of a school being located within a child's habitation of residence *does* increase enrollment. Extending this analysis, I find that small schools, with two or fewer teachers, are less likely to attract students. Further, the extent of caste segregation in schools, as measured by the probability of a school being located in a SC/ST habitation, also affects enrollment. As expected, these effects vary by caste. Schooling segregation *reduces* enrollments of SC/ST students, though the effect is not statistically significant at conventional levels of significance. However, it significantly increases enrollments by children of other caste households.

Taken together, the results of this paper confirm a relationship between habitation size and schooling outcomes, not just through the effect of size on school access but also because it influences attributes such as number of teachers. The size of neighboring habitations also matters. Specifically, the size of SC/ST habitations in a village dictates the extent of schooling segregation, which in turn further affects schooling attainment. This analysis thus confirms that school location policies affect critical determinants of school quality and contribute to the significant observed variation in school quality across regions. They also contribute to caste-based schooling inequalities. Because regions characterized by larger habitations have an advantage in access, but are also more likely to be characterized by caste

segregation across schools, the benefits of improved access are magnified for the upper castes, but reduced for the SC/ST households. Extending the results of this paper, I quantify the extent of this increase.

This paper is related to several literatures. It is most closely related to the theoretical and empirical literature on the effect of community characteristics on schooling outcomes (Borjas, 1995; Case and Katz, 1991; Coleman, 1988; Fernandez and Rogerson, 1996; Miguel and Gugerty, 2005). As in this literature, I argue that community characteristics play an important role in shaping schooling attainment. However, the focus on school location policies suggests that habitation size may be as or more important than attributes such as community income and its ethnic composition which have been the focus of the literature to date. Because school size affects so many critical school inputs, this focus suggests that the influence of school location policies may be far-reaching: they can affect a very wide range of critical school inputs.

The primary contribution of my research to this literature is on the empirical side. The available empirical work on the topic documents the effect of community characteristics on schooling attainment, but generally does not show that these are mediated through the effect of the community on schooling inputs. Such a structural analysis has proven difficult, both because of the lack of school level data on school inputs and credible instruments to identify their effects. Using community characteristics to identify the effect of school inputs is questionable, since characteristics such as the ethnic composition of the community will likely affect schooling attainment directly, not just through school characteristics. Moreover, when a school serves several different residential communities, data is required not just on the community in which the school is located but also on all those that fall within the school's catchment area.

I use the rules that determine whether schools should be placed within a habitation in conjunction with habitation characteristics as the basis for identification of the effect of school characteristics. Doing so directly relates schooling outcomes to the combined influence of school location policies and habitation characteristics, and thus provides evidence on the role of school location policies in shaping schooling outcomes. I limit myself to an analysis of the effect of those characteristics which I can identify through this approach: access to schools, the number of teachers in the school, and the extent of caste-based school segregation.

The government's school mapping exercises are conducted at the level of the district, based on data collected through the All India Education Surveys (AIES) on habitations and schools. I use the same data, combined with

household data on school enrollment from National Sample Surveys (NSSs) for the empirical analysis of this paper. The focus of this paper, which is on the consequences of school location policies, thus limits the analysis to the identification of district-level variation in school inputs. However, this approach also implies several benefits. It removes the necessity for school-level data, provided the appropriate district-level counterparts can be constructed. The very rich district-level data on the demographic characteristics of habitations and the habitation-wise availability of schooling inputs contained in the AIES facilitate such an analysis.

This is true also for estimates of the effect of school segregation. Recognizing that residential segregation will translate into school segregation only if schools are provided in the SC/ST habitations in addition to the other caste habitations, I use data on the availability of schools in the SC/ST habitations within the district to proxy the extent of school segregation in the district. Doing so yields several benefits. First, it emphasizes the role of school location policies, since the variable I consider is the availability of schools in the SC/ST communities, an outcome which is determined by these policies. Second, the aggregate approach of this paper automatically deals with the difference between the schooling and residential community which arises when a school's catchment area spans several communities. A disadvantage of this approach is that conclusions regarding the effects of school segregation rely on the existence of a correlation between the availability of schools in the SC/ST habitations and schooling segregation. While caste-based residential segregation is strongly suggestive of this correlation, I cannot confirm it without data on the student composition of individual schools.

The focus on school inputs as the pathway through which habitation characteristics affect schooling attainment yields a key insight which has not been sufficiently developed in the existing literature. Existing theories note that community effects on schooling will generate regional inequality in schooling attainment: children who reside in "good" communities will do consistently better than other children, of similar individual and household characteristics, who reside in "bad" communities, generating persistent schooling inequalities across communities. The focus on schooling inputs, in conjunction with the recognition that their effect on attainment can vary across households suggests an alternative form of inequality. Specifically, within any given residential community, the benefits of access to schools may be significantly higher for some households relative to others.

This research is also related to a relatively small literature which examines the determinants of schooling segregation. For example, Benabou (1996)

argues that the positive effects of characteristics such as the average wealth of the community will cause schooling segregation, with richer households separating into exclusive schooling communities so as to increase the mean value of local income. In contrast, observed patterns of residential segregation in many developing economies, such as India, have not arisen as a consequence of community influences on schooling production, but have been a historical response to the desire for segregation in the use of public goods (Kochar et al., 2007). In this context, I show that existing patterns of residential segregation generate segregation in schools, but only because of the school location policy which provides each habitation, with a population above a defined threshold level, with a school.

Also related is an extensive empirical literature that examines the effect of access, or distance to school, on schooling outcomes, primarily enrollments. This literature generally finds that enrollment decisions show little response to the distance of the household to schools (Filmer, 2004). However, these results have been questioned on the grounds that they do not allow for the possibility that governments' decisions regarding school location are responsive to unobserved regional variables which may also directly affect schooling choices, including the returns to schooling.[1] Studies which have attempted to deal with this endogeneity, such as Foster and Rosenzweig (1996), have restricted their analysis to the effect of the availability of a school within a village, not allowing for residential segregation and the possibility that the location of the school within the village may be far more important to households. In addition to the difficulties associated with the endogeneity of school location, a major shortcoming of this literature, which it shares with the policy debate on the topic, is that it ignores the possibility that decisions regarding school location may combine with residential patterns to affect other attributes of schools known to influence schooling outcomes.

The rest of this paper is organized as follows. The second section describes India's school location policies, as well as policies relating to the hiring of teachers and decentralized planning which are relevant to this paper. The following section turns to the study region, the state of Uttar Pradesh, and uses the AIES data to discuss residential and schooling patterns in the state. The data used in this paper is described in the fourth section; the fifth section discusses the habitation size and school attributes while the next section discusses the empirical methodology used for writing this paper. The main results are presented in the seventh section. The last section concludes the paper.

1. Examples of such research include Birdsall (1985), Lillard and Willis (1994), Deolalikar (1997) and Alderman et al. (2001).

India's School Location and Other Schooling Policies

School Location Policy and School Quality

At independence, the Government of India inherited a very weak schooling system, with educational facilities available only for 40 percent of the children in the 6–11 years age group (Planning Commission, 1952). Many felt that this reflected an inadequate access to schools. Although the total number of primary schools in 1950–51 was 2,09,671, so that there was one school for approximately 212 children of that age group, this number did not adequately represent the distance of households to schools and hence the costs of schooling. At the time of the second AIES (1965), only 38 percent of rural habitations had a primary schools in them.

To ensure access, the government determined that every rural habitation would be "served" by a school, in that a primary school would be available either in the habitation or within easy walking distance.[2] This led to a rapid growth in the number of schools. By the Third Survey (1973), the number of habitations with primary-level schools in them increased to 44.3 percent while 75.6 percent were served by schools with a primary-level section either within the habitation or within a walking distance of 1 km. By 2002, 54 percent of rural habitations had a school, up from 50 percent in 1993. However, there remains considerable variation in access to schools across states. In Uttar Pradesh, for example, the percentage of habitations with a school located in the habitation was only 41 percent in 2002 and was as low as 29 percent in 1993.

The implementation of this policy required data on the number of habitations in rural India and the percentage of these habitations that were already served by schools. To provide this, the government initiated the AIESs with the specific objective of collecting the data necessary for school construction policies. These surveys constitute the only datasets that use the habitation as the survey unit, and which provide information on the availability of schools and schooling inputs at the level of the habitation. The data collected in any particular survey provides the basis for the government's school construction program in the period between that survey and the next survey. Thus, for example, information contained in the fifth AIES conducted in 1986 provided the basis for the government's school construction program between 1986 and 1993, as well as the data that guided the allocation of teachers in this period.

2. For the first two surveys, this meant that a school should be available within 1 mile. As of the third survey, this was changed to 1 km.

The first AIES report, submitted in 1957, specified the guidelines for construction of a school, guidelines which maintain even today. Every habitation with a population of 500 or more should have a primary school located in the habitation. For habitations with a population ranging from 300 to 499, this population criterion was combined with a distance criterion: schools should be located in habitations of this size range only if there were no primary schools (existing or proposed) within a walking distance of half a mile.

In determining the policy for the location of schools, little thought was given to the fact that decisions regarding school location would also affect other characteristics of schools, notably the school size and the socio-ethnic-economic composition of the student population. Instead, the government made clear that it considered these decisions to be separable. The second AIES survey states that its objective was to develop an approach for the location of schools, not to deal with issues such as the number of divisions or classes available or necessary in any given standard, or the optimum size of the school or class. It argued that these decisions came under the jurisdiction of the state level educational administration, in contrast to decisions regarding school availability which were under the authority of the Central Government.

By 1986, the number of primary schools had increased from 2,09,671 to 5,29,392. However, despite the significant expenditure on school construction, enrollments remained low, particularly for children from the SC/ST households. In rural Uttar Pradesh, for example, the 1999 NSS survey data reveal that of the SC/ST children between the ages of six and eleven, only 48 percent were currently enrolled in primary school. In contrast, this percentage was 56 percent for children from other castes.

Continued low schooling attainment, particularly by the SCs and STs, could reflect the very poor physical conditions of government schools in rural India. As documented later in this paper, the government's decision to separate school access decisions from concerns over optimal school size resulted in the schooling system being characterized by a large number of very small schools. In 2002, total enrollment in the average rural government school was only 114.[3] Such a small school population makes it difficult to justify the fixed costs required for investments in physical infrastructure and perhaps explains the lack of basic facilities in many of India's rural schools. For example, in 2002, 45 percent of rural government schools lacked usable

3. These data are from the Government of India's Seventh All India Education Survey.

playground facilities and only 24 percent had toilets. Further, 34 percent of sections in primary schools had no furniture for children.

Teachers

Attention to the availability of teachers and to the teacher-pupil ratio (TPR) started around the 1980s. The Steering Group on Education, Culture and Sports for the Seventh Five Year Plan (1985–90) targeted a TPR of 1:40. The availability of teachers became a central focus with the 1986 National Policy on Education. This policy introduced a scheme entitled Operation Blackboard to ensure the minimum essential facilities to all primary schools.

The introduction of Operation Blackboard in 1987–88 modified the rules for the allocation of teachers. Rather than be guided strictly on the basis of a targeted TPR, the scheme specified a minimum number of teachers who should be provided in each primary school. The original scheme called for a minimum of two teachers. An extension of the scheme in the Eighth Plan called for a minimum of three teachers in all schools with an enrollment of eighty or more. This target was subsequently relaxed so as to ensure three teachers for all schools whose enrollment exceeded 100 students.

Decentralized Planning

The Government of India has always stressed the need for decentralized planning in the context of schooling. In the early years of planning, however, this policy was implemented at the level of the state. The Sixth and Seventh Plans, for example, introduced state-specific targeting of central grants for schooling (under Centrally-sponsored schemes), making funds available on a priority basis to "educationally backward" states.[4]

The Eighth Plan, however, and the approach papers to the Plan, argued that inter-district variation in schooling was more pronounced than inter-state variation. The Working Group on Childhood and Elementary Education for the Eighth Plan therefore undertook a ranking of districts in terms of educational achievements. Arguing that there was no guarantee that funds targeted for educationally backward states would reach the backward districts within the state, it required all funds provided from central schemes to be targeted to districts (regardless of the state in which they were located) on

4. Andhra Pradesh, Assam, Bihar, Jammu and Kashmir, Madhya Pradesh, Orissa, Rajasthan, Uttar Pradesh, West Bengal, and Arunachal Pradesh belong to this category.

the basis of this ranking, and in proportion to the degree of backwardness. The rank was based on a composite index, which gave equal weight to the following four parameters (based on data available in 1991): the literacy rate, the female literacy rate, the gross enrollment ratio for primary level, and this same ratio for females. This same index guided the allocation of funds through the Eighth and Ninth Plans.

Residential Patterns in Uttar Pradesh

In 2002, there were 96,014 villages in Uttar Pradesh and more than double that number of habitations (2,01,606). Thus, on an average, each village had at least two habitations. Of the total number of habitations, 47,946 were classified as SC or ST habitations, so that SC/ST habitations accounted for 23.8 percent of total habitations. This percentage mirrored the percentage of the SCs and the STs in the state's population (23.5 percent). The total population residing in the SC/ST habitations was 3,00,06,468. This population total amounts to 89 percent of the estimated population of the SCs and the STs in the state[5] and suggests a very high degree of residential segregation by caste.

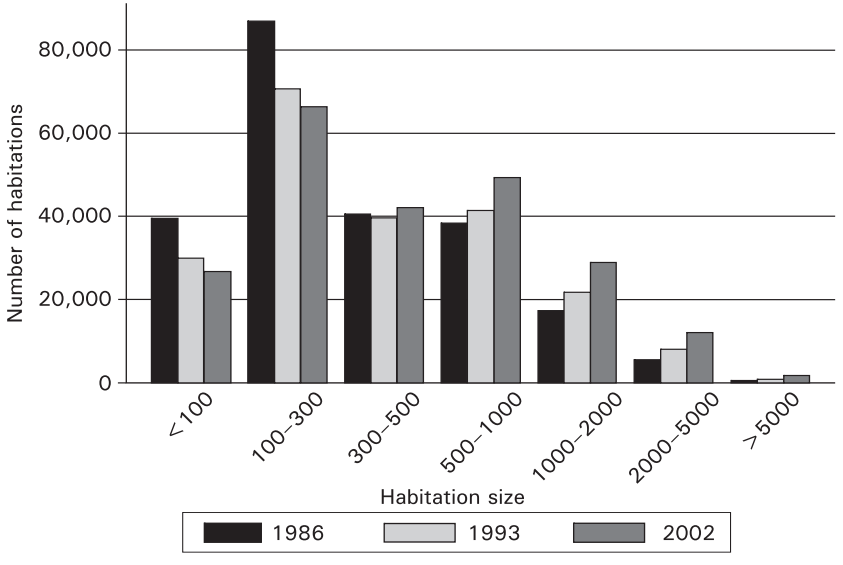
Habitations are, in general, small. Figure 1 plots the distribution of habitations by size group for the years from 1986 to 2002. The data reveal that, in 1993, 47 percent of habitations had a total population size of less than 300 while as many as 66 percent were less than 500 in size. The SC/ST habitations are smaller: the percentage of SC/ST habitations with a population size of less than 300 is as high as 56.3 percent (figure 2). Thus, the average SC or ST child is likely to reside in a habitation of smaller size than a child from a general caste.

The policy of defining a school's catchment area by the habitation of its location, in conjunction with the small average size of habitations, implies that school size is also typically very small (figure 3). In 1993, the average school size in rural Uttar Pradesh was 138 students, with 37 percent of schools having student strength of less than 100.[6] Because teacher allocations are determined by the total enrollment in the school, the small size of schools implies a correspondingly small number of teachers in each school (figure 4). The vast majority of schools in rural Uttar Pradesh have two or fewer

5. Of course, the SC/ST habitations will also include members of Other Backward Castes (OBC). Data on the exact caste composition of each habitation is not available.

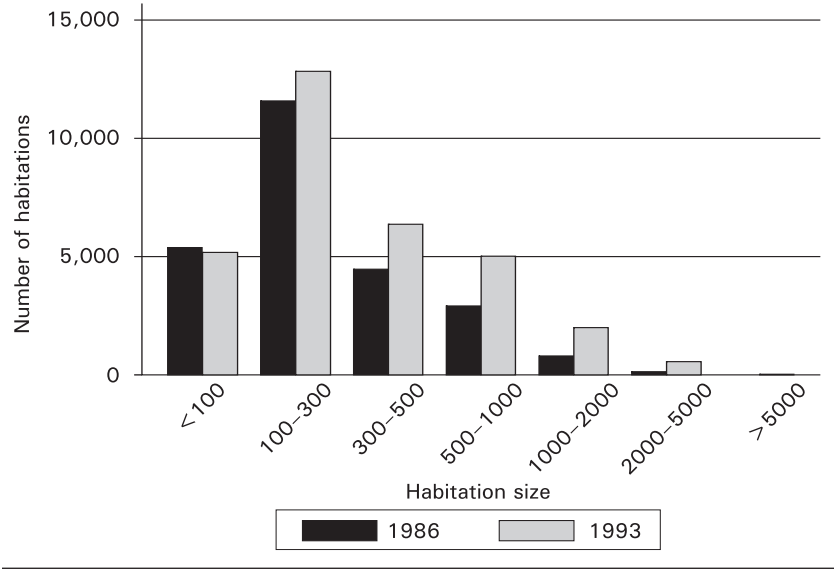
6. A school size of 100 or less is generally considered to be unviable.

FIGURE 1. Distribution of Habitations by Habitation Size, Uttar Pradesh, 1986–2002



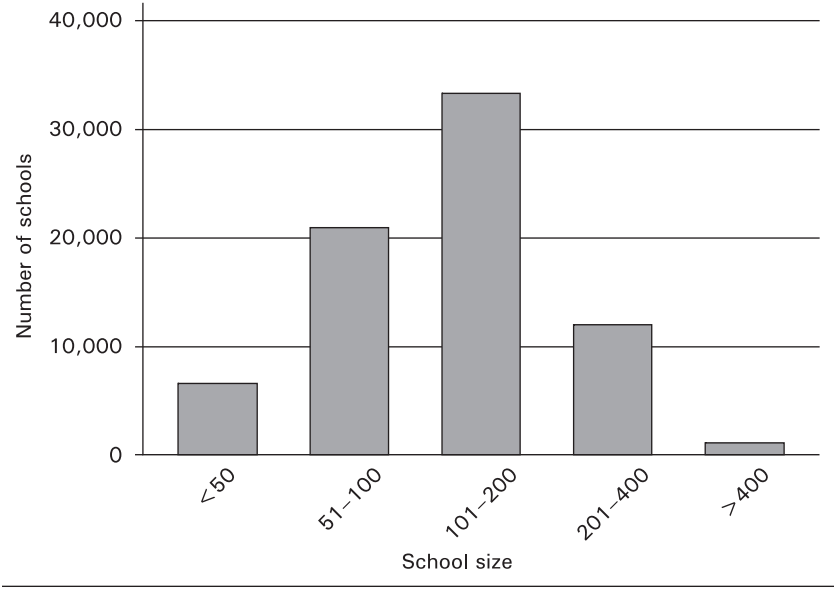
Source: AIES various rounds.

FIGURE 2. Distribution of SC and ST Habitations by Size, Uttar Pradesh, 1986 and 1993



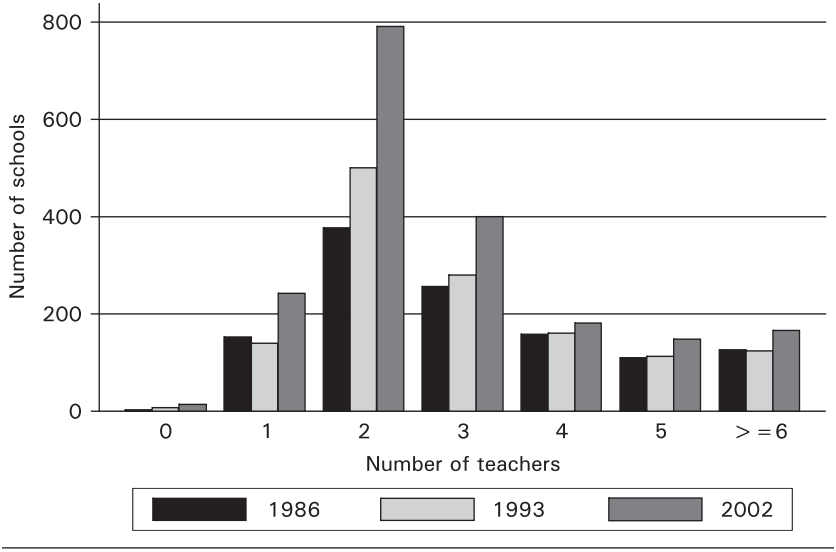
Source: AIES various rounds.

FIGURE 3. Distribution of Schools by School Size, Rural Uttar Pradesh, 1993



Source: AIES various rounds.

FIGURE 4. Distribution of Schools by Number of Teachers, Rural Uttar Pradesh, 1986–2002

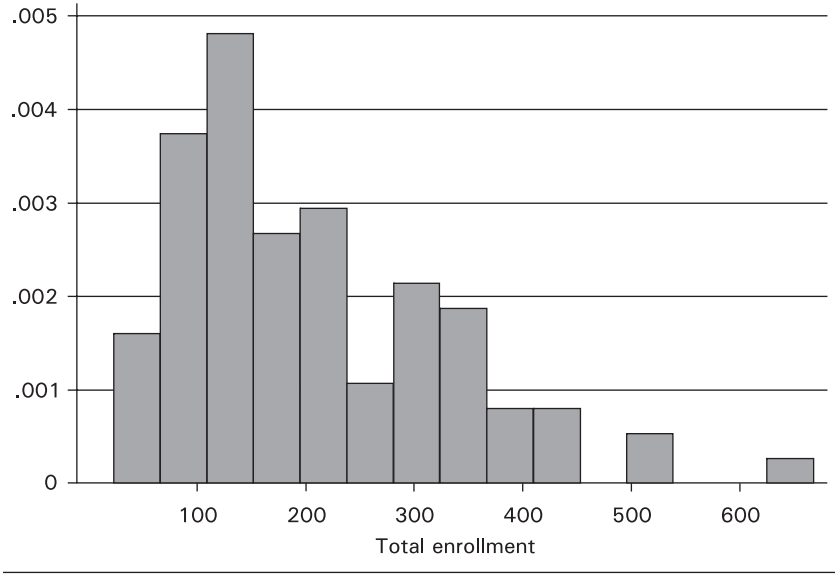


Source: AIES various rounds.

teachers, implying that multi-grade teaching, which combines students of several different grades, is the norm.[7]

The school-level data on enrollment and teachers in the seventh AIES reveal the considerable variation in school size (total enrollment) even within a block (figure 5). This variation confirms that the policy of using habitations as the basis for school mapping exercise in conjunction with the small size of habitations yields school populations which are not efficiently determined—if they were, there would be little variation in school size within this rather small geographical unit. In fact, large villages with several habitations in them are also characterized by significant variation in the size of schools located within a village. This is strikingly revealed in figure 6, where, for

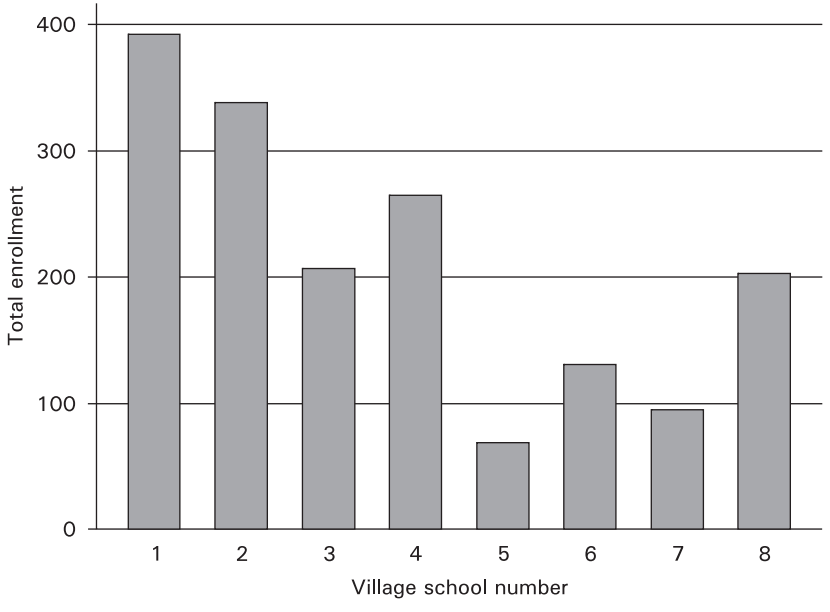
FIGURE 5. Frequency Distribution of Schools by Total Enrollment, Ballia District, Block Bairiya, Uttar Pradesh, 2002 (Mean Enrollment = 206)



Source: Seventh AIES round.

7. The effects of multi-grade teaching have not credibly been established, and many believe that its effects may be positive. However, there is agreement that the benefits are only obtained if it is restricted to two contiguous grades (for example, grades 1 and 2). In rural India, however, the assignment of teachers is based on class size, which is determined by the number of children of a particular age group in the habitation. It is thus common to see a large number of students in one class and a small number in other classes. Accordingly, the assignment of teachers to classes reflects class size, not an optimal allocation.

FIGURE 6. Distribution of 8 Schools by Size, Village ..., District Ballia, Uttar Pradesh



Source: Seventh AIES various rounds.

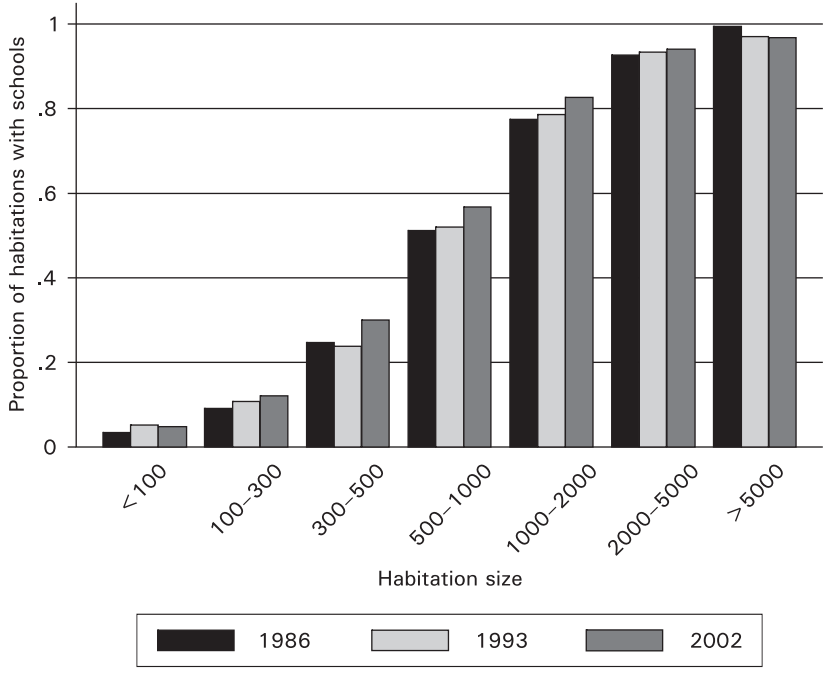
one village, I have plotted the distribution of school size across the eight schools located in the village. School size in this village ranges from less than 100 to nearly 400.

The data on the proportion of habitations with schools in them (figure 7) reveal that over 80 percent of habitations with a population of more than 1,000 have a primary school located in the habitation. Approximately half of the habitations with a population size of 500–1,000 have a school located in them. This number falls off sharply after that: in 1993, 24 percent of habitations with a population size of 300–500 had a primary school located in the habitation while the corresponding percentage for habitations of size less than 300 was only 6.9 percent.

The AIES does not provide school-level data on the caste composition of the student population.[8] Hence, it is not possible to show the extent of caste segregation in schools in Uttar Pradesh. However, the extensive residential segregation by caste, in separate habitations, suggests a correspondingly

8. For the seventh survey, data on enrollment is available at the level of individual schools, but no details on the caste composition of students are available.

FIGURE 7. Proportion of Habitations with Schools in Them, by Habitation Size, Uttar Pradesh, 1986–2002



Source: AIES various rounds.

high segregation of students by caste. This situation is not unique to Uttar Pradesh; since the school location policy is the one adopted by the Central Government, the same pattern of caste segregation across schools exists in other parts of India. The data from a survey of sixty schools in rural Andhra Pradesh (forty-five "main village" schools and fifteen schools located in the SC/ST hamlets) reveals the considerable caste segregation in this state.[9] In 2004, the proportion of SC/ST students to total students was as high as 66 percent in hamlet schools. Indeed, the SCs/STs and the OBC comprise almost all the student population (92 percent). In striking contrast, the SCs/STs comprise only 16 percent of the student population in "main village" schools. This survey also reveals the difference in size and correspondingly in teacher strength across hamlet and main village schools.

9. The first round of this survey was conducted in 2002, by the author, in collaboration with the Byrraju Foundation, Hyderabad.

The average (total) enrollment in hamlet schools in 2004 was ninety students while the average number of teachers was three. Conversely, main village schools had, on an average, an enrollment of 177 students, with an average of six teachers.

Data

For the analysis of this paper, I combine household data from the NSS on the schooling status of individuals, with district-level information on school availability and habitation characteristics from the AIES. Specifically, I examine the enrollment status of two cohorts of 6–11 year olds, from the 1993 and 1999 NSS employment surveys (rounds 50 and 55) and match this with data from the sixth (1993) and seventh (2002) AIES surveys on the proportion of habitations within a district with schools.

Each survey round of the AIES provides the basis for the construction of schools and the mapping programs in the inter-survey years. Thus, the construction of schools between 1986 and 1993, and hence the availability of schools in 1993, is based on the data contained in the fifth AIES survey (1986), while the availability of schools in 2002 is based on the sixth (1993) survey. As explained in detail in the next section, data from the preceding AIES survey thus provides the source of identification of the current availability of schools.

Matching of the NSS surveys and the AIES data is done at the level of the district. This exercise is complicated because, over the years, many districts have been divided into smaller units or new disricts have been created. Because we use data spanning the period 1986–2002, matching is done on the basis of the 1986 classification of districts. Information regarding the division of districts, which enables the tracking of districts over time, is provided in the Census of India.

Habitation Size and School Attributes

This section examines simple correlations between the characteristics of habitations and schools, focusing on the size of the habitation. The objective is to show a relationship between the attributes of habitation and quality of school q, as measured by the number of teachers and other features of schools. The next section provides evidence on the effect of these school features on

enrollments, and allows an assessment of the extent to which the correlations between habitation size and schooling outcomes reflect habitation effects on school attributes.

In addition to school access, measured by the proportion of habitations in a district with a school located within the habitation, I examine the determinants of two other characteristics of the school system: the proportion of schools with two or less teachers and the probability of a school being located in a SC or ST habitation (given by the ratio of the number of SC/ST habitations with schools to total habitations). This latter variable indicates the degree of caste segregation in schools, since it is only when a school is available in a SC/ST habitation within the village that children from the SCs and the STs are likely to attend separate schools from children of other castes. The two characteristics of habitations which I initially focus on are the proportion of habitations with a population size of 500 or more and the average size of habitations in a district. The former variable is of particular interest, since it forms the basis of school location policies. The data are at the level of the district. The school attributes are from the sixth and the seventh AIES (1993 and 2002, respectively), and are related to habitation characteristics from the prior rounds of the AIES (fifth and sixth rounds for 1986 and 1993, respectively).

Table 1 presents simple correlation coefficients for these variables. The data reveal that districts characterized by relatively large habitations are more likely to have a school located in them. They are, however, also more likely

TABLE 1. Simple Correlation Coefficients between Habitation Size and School Attributes

	Sch_hab	*Prop schools with < =2 teachers*	*Sch_SChab*	*Hab_5*	*Avge pop.*
Sch_hab	1.0				
Prop schools w/ < =2 teachers	0.25	1.0			
Sch_SChab	0.57	0.17	1.0		
Hab_5	0.73	–0.17	0.31	1.0	
Avge pop.	0.70	–0.24	0.23	0.91	1.0

Note: Calculations are based on district-level data from the All India Education Surveys. Data on school attributes are from the sixth (1993) and seventh (2002) surveys, and are related to habitation size from the fifth (1986) and sixth (1993) surveys, respectively. Total number of observations is 110. Hab_5 is the proportion of habitations of population 500 or more. Sch_hab is the proportion of habitations with a school within the habitation, while Sch_SChab is the ratio of the number of SC/ST habitations with a school to total habitations. Avge pop. is the average population size of a habitation.

to have schools located in the SC/ST habitations, suggesting a greater degree of caste segregation in schools. Finally, larger habitations are associated with fewer schools with two or less teachers.

The table 2 elaborates on this evidence through OLS regressions which control for the effect of various other demographic and economic characteristics of habitations, including the average population and squared population of habitations in the district, average population (and its square) of SC/ST habitations, number of habitations and squared habitations separately for total habitations and SC/ST habitations, district female literacy rate, average per capita expenditure, and education rank. In addition to the proportion of

TABLE 2. Simple Regressions of School Attributes on Habitation Characteristics

	Pr sch_hab	*Pr. Tchrs < =2*	*Pr Sch_SChab*
Pr hab_5	0.65*	0.86	0.008
	(0.25)	(0.59)	(0.09)
Pr SChab_5	0.43	–1.39	0.69*
	(0.63)	(1.37)	(0.29)
Pr hab_3	–0.79	0.54	–0.29+
	(0.28)	(1.01)	(0.16)
Pr SChab_3	–0.46	–1.69	2.14*
	(0.88)	(3.03)	(0.77)
Avge pop.	–0.0007*	–0.001*	4.2 e–6
	(0.0003)	(0.0007)	(2.8 e–8)
Avge pop. square	1.69 e–7*	2.96 e–7	–1.49 e–8
	(7.47 e–8)	(1.86 e–7)	(2.77 e–8)
# of habitations	–0.0001*	–0.0002*	–0.00002*
	(0.00002)	(0.00007)	(7.2 e–6)
# of SC habitations	–0.00002	0.0003	–0.00002
	(0.00007)	(0.0003)	(0.00002)
District p.c. exp	–0.0001	–0.0002	–0.00003
	(0.001)	(0.0003)	(0.00005)
District ed rank	–0.0001	–0.0005+	0.00006
	(0.0001)	(0.0003)	(0.00005)
Lagged # of schools	0.0001*	0.001*	–1.32 e–6
	(0.0004)	(0.0001)	(0.00001)
Lagged enrollments	2.73 e–7	–4.6 e–6*	–5.79 e–9
	(2.74 e–7)	(9.1 e–7)	(1.08 e–7)
Dummy year 2	0.16*	–0.17+	0.04*
	(0.03)	(0.09)	(0.02)
Regression R^2	0.91	0.74	0.83
Sample size	110	110	110

Source: Computed by the author.
Notes: Standard errors are clustered at the district level.
*Significant at 5% level.
+Significant at 10% level.

total and SC/ST habitations of size greater than 500, regressions include the proportion of total habitation and SC/ST habitations with a population of 300–499, since school location policies also call for schools to be located in habitations of this size, if no school is available within a 1 km distance. As before, all regressions are run on district-level data. Because outcomes for any given district are likely to be correlated, all standard errors are clustered at the level of the district.

Supporting the evidence from simple correlation coefficients, the proportion of habitations of size 500, and more is positively and significantly associated with the proportion of habitations with schools, even after controlling for the average size of habitations (and its square). This suggests that policy rules *do* affect school location, since the rule dictates that particular population cut-off levels must determine school location. Interestingly, this same variable does not affect the availability of schools in SC/ST habitations—access to schools in these habitations reflects the size distribution of SC/ST habitations, as measured by the proportion of SC/ST habitations of population between 300 and 499, and greater than 500. The population cut-off values that determine school location also do not appear to affect teacher allocations: proportion of habitations of size between 300 and 499, and greater than 500 is not a significant determinant of the proportion of schools with two or less teachers. This provides supportive evidence that these population cut-off values *do* reflect policy rules; if they merely reflected a non-linear effect of habitation population size, they would also likely affect other schooling inputs. Teacher strength *is* significantly affected by the average population size of habitations: as expected, the proportion of schools with two or less teachers falls as population size increases.

Empirical Methodology for Assessing the Effect of School Characteristics on Enrollments

Basic Equation for Examining the Effect of Access to School

The basic estimating equation for assessing the effect of access to schools on the enrollment status of child *i* in district *j* is the following:

$$\Pr(enroll)_{ij} = \alpha_0 + \alpha_1(Sch\_hab)_j + X'_{ij}\alpha_2 + Z'_j\alpha_3 + u_{ij} \quad (1)$$

The dependent variable in this regression, $\Pr(enroll)_{ij}$, is an indicator variable which takes the value 1 if the child is currently enrolled in primary

school, 0 otherwise. The regressor of interest, Sch_hab_j is the proportion of habitations in the district with a school located within the habitation. X_{ij} is a vector of child and household specific characteristics that determine school enrollment. This includes the age and squared age of the child, his or her gender, a dummy variable which records whether he or she is a SC/ST, household per capita expenditure, the demographic composition of the household as reflected in the division of household members across ten sex-age groups, the maximum years of education of adult household males in two different age groups (20–40 and 40–60), and an indicator variable for whether the household head has completed primary education. Z is a vector of district variables, including the district average per capita expenditure, female literacy rates, the number of habitations, and the proportion of the SC and the ST to total population in the district.

A primary concern of this paper is to examine the differential effects of school location policies on the SC and the ST. Therefore, all regressions are run on a pooled sample of children in the 6–11 age group and then separately for children who belong to SCs and STs, and those who belong to general castes.

Identification of School Access

The critical issue in the estimation of equation (1) relates to the identification of the effect of school availability on enrollment. Decisions relating to the location of schools are based on the size of the habitation. But habitation size will also determine total enrollments in the school and hence the number of teachers and a number of other attributes of a school. Large habitations may also have better infrastructure such as roads which are also likely to increase the returns to schooling. If so, α_1 in equation (1) will be biased upwards.

I base identification on the program rules which specify a specific population cut-off level for decisions regarding school location. Specifically, only habitations with a population exceeding 300 are eligible for schools. However, the criterion for determining the eligibility of habitations of sizes 300–499 differs from those of larger habitations, in that it includes a distance criterion (no other school within a 1 km distance) as well as a population criterion. Thus, population cut-off levels of 300 and 500 will differentially affect access to school.

These population cut-off levels are unique to decisions regarding location of school—they do not influence decisions regarding the availability of any other local public good, including health centers, roads, or investments in sanitation. This suggests the feasibility of basing identification on this

particular size classification of habitations in a district, specifically on the proportion of habitations of size greater than 300 and greater than 500. Because the AIES is conducted specifically for the purpose of school mapping, it provides information on the number of habitations in a district which fall into these population groupings.

As previously described, data from a specific survey year formed the basis for the school mapping exercises conducted in the inter-survey period between that and the next survey. Thus, identification of the availability of schools in 1993, for example, reflects data on the distribution of habitations in 1986. It is these lagged population figures, the exact data which guided school mapping exercises, which are used in this analysis.

Habitation size, however, also determines school size. Moreover, data on the availability of schools in habitations, previously summarized in figure 7, suggest that targets for construction of schools were not achieved—not all habitations of population size greater than 500 have a school located in them. This reflects the financial constraints faced both by the Central Government and the state government—the necessary funds required to provide the desired number of schools have not been available. Instead, governments have had to prioritize amongst habitations in determining school location, making decisions on the basis of the district's educational ranking, as discussed in the second section of this paper.

The availability of a school in a habitation thus reflects the combined effect of the population criterion and the district's educational rank. This suggests the use of the interaction of the proportion of habitations of size 300–499 (*hab_3*) and greater than 500 (*hab_5*) with the district's education rank (*ed_rank*) as instruments. This educational index provides a particularly good source of identification, since it ranks all districts in the country based on 1991 data, not just districts within a given state, and because the particular rank of any given district was meaningful—the division of central funds for schooling was to be in proportion to the specific cardinal rank of the district. Moreover, the district's education rank amongst all districts in the country was not used to guide any state or local government decisions regarding schooling investments.[10]

To ensure that identification comes only from the interaction of the population criterion with the district's education rank, *hab_3* and *hab_*5 as well as

10. This ranking is available in Annexure V of the Report of the Working Group on Early Childhood Education and Elementary Education set up for Formulation of the Eigth Five Year Plan.

ed_rank are included amongst the set of regressors and hence excluded from the instrument set. I also include the average population size of habitations in the district amongst the regressors, as further assurance that identification does not come from habitation size.

Assessing the Implications of School Size

As previously noted, the decision to locate a school in a habitation suggests that the socio-economic features of the habitation, including habitation size, will affect schooling outcomes through their effects on school attributes such as school size and the composition of the student population. This section discusses the methodology used to evaluate how habitation size affects enrollments in schools.

Rather than consider the effect of school size, I assess the impact of the number of teachers in the school, an attribute which closely reflects school size. School size will primarily be determined by the population size of the habitation. However, habitation population may also affect other school inputs, including the number of teachers, as also the availability of other local public goods, such as health centers, which may have spillover effects on schooling. Lack of good instruments for school size therefore dictates my decision to consider, instead, the number of teachers.

The number of teachers assigned to a school reflects several criteria discussed in the second section of this paper. One criterion is total school enrollment. However, this rule does not generate a good source of identification. It implies that availability of teachers is determined by the size of the habitation which, as previously argued, is likely to be directly correlated with schooling outcomes for a variety of reasons. Instead, I base identification on the auxiliary set of rules specified under Operation Blackboard and the extension of this program in 1992, which determine the minimum number of teachers in a school. Under the expanded Operation Blackboard, each school with an enrollment of over 100 was to have three teachers (with funding provided by the Central Government). This implies a distinct population cut-off that determines whether the school would have two or fewer teachers: Two (or fewer) teacher schools would be those with a total enrollment of less than 100.

Identifying the number of teachers on the basis of this strategy requires information on the proportion of schools in a district with an enrollment of less than 100. Unfortunately, that information is not available in the AIES. However, the information necessary to predict this number is. Specifically,

we assume that the distribution of school size follows a normal distribution, so that the proportion of schools of size less than 100 is:

$$\Pr(Size <= 100) = \int_{0}^{100} \frac{1}{\sqrt{2\pi}\sigma} e^{-(100-\mu)^2/2\sigma^2} \quad (2)$$

In all probability the variation in school size will vary with the distribution of habitation size. I therefore assume that $\sigma = f(hab\_3)$. A linear approximation of this, inserted into equation (2), implies that the probability of school size being less than 100 is a function of $Size\_100 = -[(100 - \mu)/(hab\_3)]$, where μ is the (lagged) average enrollment in the school.

I use $(Size\_100)^2$ and $(Size\_100)^3$ as instruments for the proportion of schools with two or less teachers. Identification thus comes from a non-linear function of the cut-off enrollment size which determines this distribution of teachers (100), lagged average enrollment in the district, and the proportion of habitations of size 300–500 in the district, with the particular functional form suggested by the probability distribution of school size. Lagged average enrollments and habitation size are from data in the survey round of the AIES previous to the NSS survey round from which the current enrollment status of the student is drawn. That is, for children in the 6–11 age group in 1993, lagged average enrollments and habitation size are from the fifth (1986) round of the AIES.

As before, stronger identification comes from interacting $(Size\_100)^2$ and $(Size\_100)^3$ with the district's educational index rank. Because teachers provided under Operation Blackboard and the expanded version of this scheme were funded by the Central Government, districts which had the highest rank were most likely to receive these funds on a priority basis. The interacted variable, $(size\_100)^2 * ed\_rank$ and $(size\_100)^3 * ed\ rank$ ensures that identification does not just come from a non-linear function of (lagged) average enrollments and habitation size.

Assessing the Implications of Residential Segregation

A final concern is that the government's school location policies translate the residential segregation which characterizes rural India into a *de facto* system of caste-based schooling segregation, and that this provides an additional avenue by which school policies affect schooling attainment. My analysis of this issue draws on the insight that schooling segregation follows when schools are provided in SC/ST sub-habitations of a village. When this is not

the case, then the SC/ST students must attend the same schools as students from the other castes. This suggests that the extent of schooling segregation in a district will reflect the availability of schools in the SC/ST habitations.

I therefore examine the effect of the probability of a school being located in a SC/ST habitation on enrollment decisions. This probability is given by the joint probability of a school being located in a habitation and the habitation being a SC/ST habitation, whose sample counterpart is the ratio of the number of SC/ST habitations with a school to the total number of habitations in the district. I refer to this variable as (*Sch_SChab*).

The analysis of the effect of the availability of schools in the SC/ST habitations, as distinct from that of overall access to schools, is possible because the AIES provides data on the total number of SC/ST habitations, their population distribution, and the number of them that have a school located in them. As in the treatment of the endogeneity of the (general) availability of schools (*Sch_hab*), my instruments for (*Sch_SChab*) are formed by interacting the district's educational rank with the number of SC/ST habitations of size 300–499 and the proportion of SC habitations with a population of 500 or more. These two population characteristics of SC/ST habitations, *SChab_3 and SChab_5*, are included amongst the regressor set. I also expand the regressor set to include the proportion of the SC/ST habitations in the district and the average size of SC/ST habitations.

The expanded regression that I run is:

$$\Pr(enroll)_{ij} = \alpha_0 + \alpha_1 (Sch\_hab)_j + X'_{ij}\alpha_2 + Z'_j\alpha_3 + \alpha_4 (Tch\_2)_j + \alpha_5 (Sch\_SChab)_j + u_{ij} \quad (3)$$

where $(Tch\_2)_j$ is the district proportion of schools with two or less teachers.

The first-stage reduced form regressions for (*Tch_2*) and (*Sch_SChab*) include the vector of variables, which capture the population distribution of habitations in the district (*hab_3, hab_5, SChab_3, SChab_5*) as well as the interaction of these variables with the district's educational rank. Thus, the first stage regressions provide evidence of the effect of the size of the habitation on schooling outcomes. Combining this with the second-stage estimates of the effect of school attributes on enrollment outcomes [the coefficients in equation (3)], it is possible to examine the extent to which habitation characteristics affect schooling outcomes through their effect on school characteristics, independent of any direct effect through other means.

Results

Preliminary Regressions on School Access

Table 3 reports results from an initial set of regressions, which considers the effect of the availability of a school on enrollment decisions in a habitation (equation 1). The first column reports the reduced form first-stage

TABLE 3. Effect of the Availability of a School, in Habitation, on Enrollment in Primary School, Rural Uttar Pradesh, Children Ages 6–12

	Proportion of habitations with schools	*Currently enrolled in primary school*		
		Probit	*IV probit*	*Marginal effect*
Prop. Habitations with schools	–	0.83* (0.13)	2.28* (0.35)	0.48
Habitations 300–500 × rank	–8.87 e–7* (2.14 e–7)	–	–	–
Prop. Habitations greater than 500 × rank	–0.002* (0.0005)	–	–	–
Habitations 300–500	0.0001 (0.0001)	0.0001* (0.00006)	0.0003* (0.0001)	0.00006
Prop. Habitations greater than 500	0.89* (0.17)	–0.70* (0.18)	1.495* (0.256)	0.32
SC/ST	0.005 (0.003)	–0.03 (0.02)	–0.031 (0.025)	–0.007
Sex	–0.001 (0.001)	–0.34* (0.03)	–0.34* (0.03)	–0.072
Age	–0.004 (0.004)	1.43* (0.08)	1.43* (0.08)	0.302
Household p.c. exp	–2.57 e–6 (4.45 e–6)	0.0002* (0.00006)	0.0002* (0.0006)	0.00004
District avge p.c. exp	–0.0001 (0.0002)	–0.00007 (0.0002)	–0.0001 (0.0002)	–0.00002
Educational rank	0.001* (0.0004)	–0.0004* (0.0002)	–0.0005* (0.0002)	–0.0001
# of habitations	–0.00005* (0.00002)	0.00002 (0.00002)	0.00004+ (0.00002)	0.00001
Avge pop. of habitations	0.00002 (0.00004)	–0.00006 (0.00006)	–0.0001+ (0.00006)	–0.00002
District Prop. SC	0.026 (0.12)	–0.04 (0.19)	–0.16 (0.20)	–0.034
Sample size	16,759	16,759	16,759	
Test Statistic	$F(29,61) = 104.14$	$\chi^2 = 2004.48$	$\chi^2 = 1843.64$	
Wald test of exogeneity $\chi^2(1)$			20.35 ($p = 0.00$)	

Notes: Regressions run on data from the 55th (1999) and 50th (1993) rounds of the National Sample Surveys. All standard errors are clustered at the district level.

*Significant at 5% level.

+Significant at 10% level.

regression of the proportion of habitations with schools in them on the set of instruments. All regression errors are clustered at the district level, to account for the correlation between observations within a given district. The second column reports results from a probit regression of school enrollment on (*Sch_hab*), ignoring the endogeneity of this variable. The third column uses an instrumental-variable probit (IV probit) regression, with suitably adjusted standard errors, to account for endogeneity, using the instruments previously described. The last column lists the marginal effects of the variable on the probability of current enrollment in primary school, based on the IV probit results of the previous column.

The first stage regression attests to the explanatory power of the instruments. Larger habitations (with population in excess of 500) are more likely to have a school in them. However, the effect of population size on school access is tempered by the district's educational rank in the expected direction. The government policy specified that districts with a *lower* educational rank should first be allotted schools. Reflecting this, the interaction of habitation size with educational rank negatively affects the proportion of habitations in the district with a school. That is, a district with sufficiently large habitations was less likely to get a school if its educational rank was high.

The coefficient on school access obtained from probit regressions which ignore the endogeneity of school location policies is significantly lower than that obtained from IV probit regressions, which utlize the interaction of the variables used to guide policy with the education rank of the district as instruments. Correspondingly, Wald tests for the exogeneity of school access reject the hypothesis of no endogeneity. These results suggest that prior estimates of a small effect of distance to school on enrollment decisions may be biased downwards because of the failure to properly account for the endogeneity of school access. The IV probit results suggest a relatively large effect of the availability of schools in a habitation. The coefficient of 2.28 from the IV regression results reported in table 3 imply that a 1 percent increase in the proportion of habitations with a school will increase the proportion of school-age children attending schools by 0.4 percent. This justifies the decision to situate a school within easy access to students, if this policy is to be evaluated purely from the viewpoint of its effect on school access.

Table 4 provides estimates of school access by caste and by gender. While school access is important for children from all castes, and for boys and girls, it matters more for SCs and for girls. The effect on enrollment of the probability of a school being located in a habitation is 3.39 for the SC/ST but only 1.94 for the upper castes. This translates into an elasticity of enrollment

TABLE 4. Effect of School Access by Caste and Gender
(Dependent variable: currently enrolled in primary school, ages 6–12)

	SC/ST	*Other castes*	*Boys*	*Girls*
Prop. Habitations with schools	3.39*	1.94*	1.81*	2.86*
	(0.81)	(0.38)	(0.46)	(0.53)
Habitations 300–500	0.0002+	0.0003*	0.0002+	0.0005*
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Prop. Habitations > 500	–2.41*	–1.31*	–1.20*	–1.92*
	(0.57)	(0.29)	(0.35)	(0.38)
SC/ST	–	–	–0.05+	–0.01
			(0.03)	(0.04)
Sex	–0.43*	–0.32*	–	–
	(0.05)	(0.03)		
Age	1.08*	1.54*	1.49*	1.39*
	(0.16)	(0.09)	(0.11)	(0.12)
Hhold p.c. exp.	0.0004*	0.0002*	0.0001	0.0004*
	(0.0002)	(0.0001)	(0.0001)	(0.0001)
District p.c. exp.	–0.0003	–0.0001	0.0002	–0.0004
	(0.0004)	(0.0002)	(0.0003)	(0.0003)
Education rank	–0.0002	–0.0005*	–0.0005*	–0.0004*
	(0.0004)	(0.0002)	(0.0003)	(0.0002)
# of habitations	0.0001	0.00005+	0.0001*	0.00002
	(0.0001)	(0.00003)	(0.00003)	(0.00004)
Avge habitation population	–0.0001	–0.0001+	–0.0002+	–0.00007
	(0.0001)	(0.00007)	(0.00009)	(0.0001)
Prop. SC	–0.05	–0.22	–0.18	–0.10
	(0.37)	(0.23)	(0.27)	(0.29)
Sample size	3,863	12,896	9.143	7,616
Wald χ^2 (27)	425.82	1456.43	804.64	997.89
Wald test of exogeneity, $\chi^2(1)$	8.28	12.06	8.25	12.87
	(p = 0.004)	(p = 0.001)	(p = 0.004)	(p = 0.0003)

Notes: Regressions run on data from the 55th (1999) and 50th (1993) rounds of the National Sample Surveys. All standard errors are clustered at the district level.

*Significant at 5% level.

+Significant at 10% level.

with respect to school access of 0.7 for the SC/ST children, but only 0.3 for the other castes. Similarly, the corresponding coefficient of 1.81 for boys and 2.86 for girls implies an elasticity of 0.3 for boys but 0.5 for girls.

Incorporating Teacher Availability and School Segregation

I now extend the analysis to see how enrollment decisions are affected by additional school characteristics, and to examine whether these effects vary by caste. Table 5 documents results from the first stage regressions

TABLE 5. First Stage Regressions

	Proportion habitations with school	*Proportion of schools with < =2 teachers*	*SC habitations with schools to total habitations*
Habitations 300–499 × rank	–1.51 e–6*	–4.73 e–6*	–2.94 e–7*
	(4.43 e–7)	(1.10 e–6)	(1.26 e–7)
Prop. Habitations > 500 × rank	–0.002*	–0.001	0.0003+
	(0.0008)	(0.002)	(0.0002)
Predicted prop. of schools with < =2 teachers	–1.37 e–7	4.39 e–6*	–1.35 e–7
	(4.27 e–7)	(1.17 e–6)	(8.18 e–8)
Predicted < =2 teachers × rank	3.81 e–9	–1.56 e–8*	1.07 e–9
	(3.05 e–9)	(7.88 e–9)	(7.37 e–10)
Predicted prop. < =2 teachers, square	–2.15 e–11	2.84 e–9*	–2.68 e–11
	(5.21 e–10)	(1.34 e–9)	(8.83 e–11)
Predicted prop. < =2 teachers square × rank	2.09 e–12	–1.20 e–11	1.43 e–13
	(3.54 e–12)	(9.00 e–12)	(6.75 e–13)
SC habitations 300–500 × rank	7.36 e–6	0.00001+	1.43 e–6
	(2.85 e–6)	(8.29 e–6)	(8.75 e–7)
SC habitations > 500 × rank	–0.006	–0.04*	–0.003*
	(0.006)	(0.02)	(0.001)
Habitations 300–499	0.0001+	0.001*	0.00002
	(0.00006)	(0.0002)	(0.00002)
Prop. habitations > 500	0.292	–1.04+	–0.04
	(0.252)	(0.62)	(0.05)
SC habitations 300–499	–0.001*	–0.001	–0.0001*
	(0.0002)	(0.001)	(0.00007)
SC habitations > 500	3.71*	5.16	1.50*
	(1.06)	(4.27)	(0.37)
# of habitations	–0.0001*	–0.0001	–2.52 e–6
	(0.00002)	(0.0001)	(4.68 e–7)
Avge hab. population	0.0002	0.001*	3.71 e–6
	(0.0001)	(0.0002)	(0.00003)
District prop. SC	–1.10*	2.90	0.06
	(0.53)	(2.47)	(0.19)
Sample size	16,759	16,759	16,759
Regression R^2	0.92	0.74	0.90

Note: Regressions run on data from the 55th (1999) and 50th (1993) rounds of the National Sample Surveys. All standard errors are clustered at the district level.

*Significant at 5% level.

+Significant at 10% level.

of the endogenous variables on the full set of instruments and additional regressors.

The regression results confirm the explanatory power of the instruments, and hence the role of habitation size in determining important school attributes. For example, the interaction of a district's education rank with the proportion of habitations of size greater than 500, significantly affects the

proportion of habitations with a school. And, the interaction of $(size\_100)^2$ and $(size\_100)^3$ with education rank also significantly reduces the proportion of schools with less than two teachers: As prescribed by policy, a greater proportion of schools with enrollment over 100 suggested additional teachers, and hence a reduction in the proportion of schools with two or fewer teachers at the time of the next survey. However, this effect is stronger in districts with lower educational rank.

Confirming the results from simple correlation coefficients, the first stage regressions also suggest that the instruments for the proportion of schools with two or less teachers do not also affect access to schools. This supports the credibility of the results, since it suggests that the instruments for teacher strength are uncorrelated with the availability of schools and other schooling inputs.

These first stage regression results provide the basis for the IV probit regressions in table 6. The first column repeats regression results for the probability of current enrollment in primary schools as a function of school access, ignoring other school attributes, to provide a point of comparison.[11] The regression reported in column (2) includes the proportion of schools with two or less teachers and the probability of a school in a SC/ST habitation amongst the regressors. The results confirm that school access increases enrollment. However, as expected, fewer teachers imply a reduction in enrollment. And, higher levels of school segregation, suggested by the availability of schools in SC/ST habitations, appear to increase enrollments.

These results in conjunction with the first stage regression results of table 5 suggest that habitation size does affect schooling outcomes because of school location policies which determine whether a school can be constructed in a particular habitation, including the availability of schools in the SC/ST habitations. Habitation size also affects school outcomes through its effect on other schooling inputs such as the number of teachers. This is because the assignment of teachers to schools is based on enrollment, which, in turn, reflects the population of the habitation in which the school is located. That the effects of habitation size on schooling outcomes are mediated through school inputs is further suggested by comparing the results in column 1, which conditions only on school access, with those in column 2 which additionally control for teacher strength and the provision of schools in the SC/ST communities. The inclusion of these latter variables significantly affects the coefficient on measures of habitation size which are included as regressors in both regressions.

11. This regression differs from that reported in table 3, since it includes additional regressors.

TABLE 6. Effect of School Access Controlling for Number of Teachers and School Segregation

	Probability of current enrollment in primary school		
	(1)	*(2)*	*(3)*
Prop. Habitations with schools	2.34*	3.59*	3.42*
	(0.39)	(0.42)	(0.44)
Prop. of schools with < =2 teachers	–	–0.35*	–0.23+
		(0.07)	(0.13)
Prob. of school in SC habitation	–	4.59*	4.93*
		(1.58)	(1.61)
Habitations 300–500	–0.001*	0.0001	0.0001
	(0.0003)	(0.0001)	(0.0001)
Prop. Habitations greater than 500	–3.05*	–1.31*	–0.97*
	(1.61)	(0.26)	(0.39)
SC habitations 300–500	0.001*	0.001*	0.001*
	(0.0003)	(0.0003)	(0.0003)
Prop. SC habitations > 500	–3.05+	–11.02*	–10.43*
	(1.61)	(2.23)	2.38
SC/ST	–0.03	–0.06*	–0.06*
	(0.02)	(0.03)	(0.03)
Sex	–0.34*	–0.34*	–0.34*
	(0.03)	(0.03)	(0.03)
Age	1.4	1.45*	1.45*
	4*	(0.08)	(0.08)
	(0.08)		
Household p.c. exp	0.0002*	0.0002*	0.0002*
	(0.00006)	(0.0001)	(0.0001)
District avge p.c. exp	0.0002	0.0004*	0.0005*
	(0.0002)	(0.0002)	(0.0002)
Educational rank	–0.0003	–0.0009*	–0.0008*
	(0.0002)	(0.0002)	(0.0002)
# of habitations	0.0001*	0.0002*	0.0001*
	(0.00003)	(0.0003)	(0.00003)
# of SC habitations	–0.0002*	–0.001*	–0.0005*
	(0.0001)	(0.0001)	(0.0001)
Avge pop. of habitations	–0.0002+	–0.0003*	–0.0005*
	(0.0001)	(0.0001)	(0.0002)
Avge pop. SC habitations	–0.0002	–0.0003+	–0.0003+
	(0.0001)	(0.0002)	(0.0002)
District prop. SC	–1.08	0.35	0.03
	(0.95)	(1.02)	(1.06)
Predicted prop. teachers < =2	–	–	–3.31 e–7
			(4.07 e–7)
Predicted prop. teachers < =2 squared	–	–	–9.34 e–11
			(2.62 e–10)
Sample size	16,759	16,759	16,759
Wald χ^2	1871.72	1883.91	1884.43
Wald test of exogeneity χ^2	17.57	91.02	87.36

Notes: Regressions run on data from the 55th (1999) and 50th (1993) rounds of the National Sample Surveys. All standard errors are clustered at the district level.

*Significant at 5% level.

+Significant at 10% level.

Robustness Checks

Before assessing the separate implications of schooling inputs by caste, I conduct several robustness checks. First, I include $(size\_100)^2$ and $(size\_100)^3$ amongst the regressors, allowing identification of teacher strength to come only from the interaction between these variables and the district's education rank. This is a simple over-identification test for the validity of including these variables in the instrument set. The results, detailed in the last column of table 6, support their validity: their independent effect on school enrollment is statistically insignificant and does not change the regression results.

A second check explores the sensitivity of results to non-linearity in habitation size. As always, when identification rests on a particular functional form assumption, there is the possibility that the results simply reflect a non-linear relationship between habitation size and school enrollment. To test for this, a second set of regressions includes the square of average habitation population as well as the square of the average population of SC/ST habitations in the regressor set. The results, reported in table 7, suggest that the results are robust to this inclusion. The estimates of the effect of school inputs, including school access, are not affected by this inclusion. And, standard F tests for the expanded regression reject this version in favor of the more parsimonious specification.

Regression Results by Caste

In order to examine whether the effects of school attributes varies by caste, I run the same regression on schooling enrollments separately for children from the SC and the ST and for those from the other castes. The results are reported in table 8. For all children, regardless of caste, access to schools enhances the probability of enrollment while the proportion of schools with two or fewer teacher reduces this probability. However, there are significant differences in the effect of schooling segregation. An increase in the probability of a school being located in a SC/ST habitation significantly enhances the schooling of the upper caste households. Conversely, the effect on children from the SC and ST is negative. However, this latter effect, though relatively large in magnitude, is imprecisely estimated and is not significant at conventional levels of significance.

The results suggest that a greater degree of homogeneity in the student population enhances the schooling attainment of upper caste households. It is beyond the scope of this paper to explore the reasons that underlie this effect. One explanation offered in the literature is that ethnic homogeneity fosters community support for, and involvement in, schools, thereby improving schooling attainment (Miguel and Gugerty, 2005). However, if this were

TABLE 7. Robustness Check: Including Square of Average Population of Habitation

	First stage regressions			
	Prob. school in habitation	*Prop. teachers < =2*	*Prob SC hab with school*	*Current enrollment*
Prob. School in habitation	–	–	–	3.87*
				(0.44)
Prop. Teachers < =2	–	–	–	–0.32*
				(0.06)
Prob. School in SC habitation	–	–	–	2.77*
				(1.44)
Habitations 300–499 × rank	–1.39 e–6*	–3.74 e–6*	–3.31 e–7*	–
	(4.18 e–7))	(9.60 e–7)	(1.24 e–7)	
Prop. Habitations > 500 × rank	–0.002**	–0.0001	0.0003+	–
	(0.0007)	(0.002)	(0.00018)	
Predicted prop of schools with < =2 teachers	–2.64 e–7	3.3 e–6*	–8.37 e–8	–
	(4.65 e–7)	(9.56 e–7)	(8.99 e–8)	
Predicted < =2 teachers × rank	4.54 e–9	–9.33 e–9	7.89 e–10	–
	(3.28 e–9)	(6.57 e–9)	(7.41 e–10)	
Predicted prop < =2 teachers, square	–3.3 e–10	1.82 e–10	9.27 e–11	–
	(6.64 e–10)	(1.08 e–9)	(1.12 e–10)	
Predicted prop < =2 teachers square × rank	3.60 e–12	1.02 e–12	–4.24 e–13	–
	(4.23 e–12)	(7.14 e–12)	(7.54 e–13)	
SC/ST habitations 300–500 × rank	7.19 e–6*	0.00001*	1.46 e–6+	–
	(2.92 e–6)	(6.02 e–6)	(8.18 e–7)	
SC/ST habitations > 500 × rank	–0.005	–0.03	–0.003*	–
	(0.005)	(0.02)	(0.001)	
Habitations 300–499	0.0001	0.0004	0.00002	0.0002
	(0.0001)	(0.0002)	(0.00002)	(0.0001)
Prop. habitations > 500	0.48*	0.54	–0.11*	–1.17*
	(0.23)	(0.42)	(0.05)	(0.41)
SC/ST habitations 300–499	–0.001*	–0.0007	–0.0001+	0.001*
	(0.0003)	(0.0006)	(0.00007)	(0.0003)
SC/ST habitations > 500	3.70*	5.00	1.49*	–8.00*
	(1.06)	(3.96)	(0.34)	(2.12)
# of habitations	–0.00005*	–0.0001	–3.27 e–6	0.0002*
	(0.00002)	(0.0001)	(4.6 e–6)	(0.00003)
# of SC/ST habitations	0.0002*	0.0002	–7.08 e–6	–0.0005*
	(0.00005)	(0.0001)	(0.00001)	(0.0001)
Avge hab. population	–0.0002	–0.003*	0.0002*	–0.001*
	(0.0004)	(0.0007)	(0.0001)	(0.0005)
Avge hab. population square	1.40 e–7	1.21 e–6*	–6.15 e–8*	3.75 e–7*
	(1.24 e–7)	(2.42 e–7)	(2.95 e–8)	(1.42 e–7)
Avge pop. SC/ST habitation	–0.00001	–0.0001	–0.0001	0.001*
	(0.0003)	(0.001)	(0.0001)	(0.0005)
Avge SC/ST pop. square	–6.62 e–10	–2.64 e–8	2.39 e–8	7.84 e–7*
	(1.68 e–7)	(4.11 e–7)	(3.07 e–8)	(2.35 e–7)
Sample size	16,759	16,759	16,759	16,759
Regression R^2	0.92	0.80	0.90	Wald χ^2 = 1893.05

Notes: Regressions run on data from the 55th (1999) and 50th (1993) rounds of the National Sample Surveys. All standard errors are clustered at the district level.

*Significant at 5% level.

**Significant at 1% level.

+Significant at 10% level.

TABLE 8. Enrollment Regressions by Caste

	SC/ST		*Other castes*	
Prop. Habitations with schools	4.30*	(0.87)	3.24*	(0.48)
Prop. of schools with < =2 teachers	–0.21+	(0.13)	–0.35*	(0.08)
Prob. of school in SC habitation	–2.34	(3.00)	6.45*	(1.90)
Habitations 300–500	–0.0002	(0.0002)	0.0002	(0.0001)
Prop. Habitations greater than 500	–1.59*	(0.51)	–1.25*	(0.31)
SC habitations 300–500	0.0005	(0.0006)	0.001*	(0.0003)
Prop. SC habitations > 500	–4.48	(4.77)	–12.67*	(2.70)
Sex	–0.43*	(0.05)	–0.32*	(0.03)
Age	1.09*	(0.07)	1.55*	(0.09)
Household p.c. exp	0.0005*	(0.0002)	0.0002*	(0.0001)
District avge p.c. exp	0.0005	(0.0004)	0.0003+	(0.0002)
Educational rank	–0.0002	(0.0005)	–0.0009*	(0.0003)
# of habitations	0.0002*	(0.0001)	0.0001*	(0.00004)
# of SC habitations	–0.0004+	(0.0002)	–0.0005*	(0.0001)
Avge pop. of habitations	–0.00004	(0.0002)	–0.0004*	(0.0001)
Avge pop. SC habitations	–0.001*	(0.0003)	–0.0001	(0.0002)
District Prop. SC	2.91	(2.07)	–1.23*	(0.31)
Sample size	3863		12896	
Wald χ^2	448.71		1480.90	
Wald test of exogeneity χ^2	18.21	(0.0004)	70.87	(0.0000)

Note: Regressions run on data from the 55th (1999) and 50th (1993) rounds of the National Sample Surveys. All standard errors are clustered at the district level.

*Significant at 5% level.

+Significant at 10% level.

so, the greater ethnic homogeneity fostered by schooling segregation should increase schooling enrollments for the SCs/STs as well as for other castes. A more convincing explanation is that schooling attainment does depend on the "mean" quality of the community, either through its influence on the attributes of the student population or through the quality of community contributions to the schools. If so, and if the SC/ST communities are characterized by lower mean quality then, consistent with the results of this paper, schooling segregation will enhance the schooling of the upper castes while reducing it for the SCs and the STs.

Quantifying the Effects of Habitation Size on Enrollment through School Characteristics

Combining results from first stage regressions, which reveal the influence of school location policies on schooling inputs, with the results from the second stage instrumental variable regressions, which confirm that these same schooling inputs influence enrollment, establish that school location policies affect schooling outcomes not just because they affect a household's access to school but also because they affect schooling inputs. Since access to schools

is greater in larger habitations, one would expect children who reside in larger habitations to have an advantage over their counterparts living in smaller habitations. However, habitation size determines not just access to schools but also the number of teachers in a school, and this, in turn, significantly affects enrollments. As a consequence, the decision to situate schools in relatively small habitations implies that the benefits of access are less for the residents of these habitations; they are provided with lower quality schools. School location policies, then, contribute to regional schooling inequalities, with children in larger habitations attending better quality schools, as measured by the number of teachers in the school. Further, because the SC/ST habitations are generally smaller than others, the correlation between the number of teachers in a school and habitation size implies that schools in the SC/ST habitations will generally be of lower quality than those located in other habitations.

The simple relationship between habitation size and schooling attainment which derives through a consideration of school access alone is further modified when we recognize that schooling attainment also varies with the size distribution of habitations in a village because of its effect on schooling segregation. Districts with larger habitations are more likely to support segregated schools. The results of the previous section suggest that this improves schooling for the upper castes but not for children from the SCs. These results therefore suggest that the benefits of living in districts with improved access to schools differ across the SC/ST and the upper caste children.

What is the magnitude of these benefits, and how does the auxiliary effect of habitation size on school quality, as measured by teacher strength and schooling segregation, mediate the relationship between habitation size and schooling attainment? The answer to this question can be obtained by combining the first stage regression results on the determinants of school attributes with the IV probit estimates of the effect of school inputs on enrollment. However, because the first stage regressions utilize a number of different measures of habitation size, the overall effect of habitation size on school attributes are difficult to infer from the regression results reported in table 5.

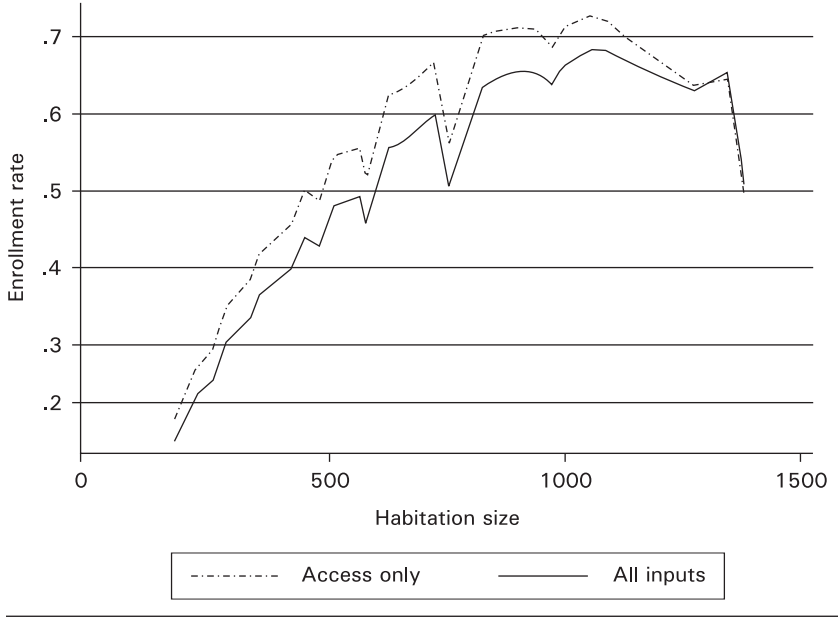
I therefore proceed by first running a reduced form predicting equation for each of the school attributes in question (proportion of habitations with a school located in them, the proportion of schools with two or less teachers, and the probability of a school in a SC/ST habitation) on average habitation size in the district and its square. I use these regressions to predict the effect of average habitation size on the school attribute in question, and then combine this with the IV probit estimates of the effect of school attributes on

enrollment to infer how district average habitation size affects enrollments through its effect on school inputs. The IV probit results I use are those reported in table 8, which allow the determinants of schooling enrollment to vary by caste. This correspondingly allows the calculation of the effect of habitation size on schooling attainment to also vary by caste.

I graph the results separately for the SC/ST children and the other children, in figures 8 and 9, respectively. Each figure depicts two graphs. The first explores the effect of habitation size on enrollments, allowing habitation size to affect enrollment only through its effect on school access. The second graph adds on the additional influence of habitation size on school enrollment through its effect on teacher availability and school segregation.

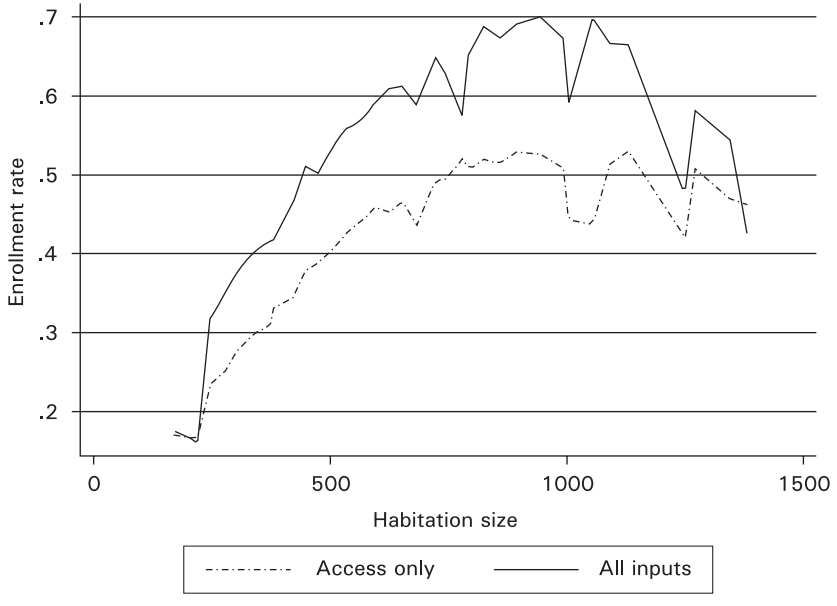
Both graphs confirm the positive effect of the average size of habitations, in a district, on enrollment through its effect on school access: because the probability of a habitation having a school located in it increases with its size, children who live in districts with larger habitations are significantly more likely to be enrolled in school. Calculated at the mean level of the variables, the elasticity of enrollment with respect to habitation size, allowing this effect to operate only through access, is 0.36 for children of the upper castes and as

FIGURE 8. Effect of Average Habitation Size on Enrollment of SC/ST through School Inputs



Source: NSS and AIES various rounds.

FIGURE 9. Effect of Average Habitation Size on Enrollment of Other Castes through School Inputs



Source: NSS and AIES various rounds.

high as 0.48 for those of the SCs/STs. If school location policies determined access to school, without affecting measures of school quality, this suggests that these policies could serve as a powerful means for reducing schooling inequalities—they suggest that providing access to schools has a far larger effect on children from the SCs/STs than on the upper caste children.

This conclusion is modified if we allow habitation size to also affect school quality, as represented by the number of teachers in a school and the extent of schooling segregation. For the upper caste children, the benefits of residing in districts with larger habitations are magnified because schools in these districts have more teachers and are more likely to be characterized by student populations which are segregated by caste. Allowing habitation size to affect enrollment through these additional inputs increases the benefit of a 1 percent increase in habitation size on enrollment from 0.36 to as much as 0.45. However, the benefits of residence in districts with larger habitations do not similarly apply to the SC/ST children. This is primarily because extensive schooling segregation in these districts negatively affects the enrollment decisions of the SC/ST. The elasticity of enrollment with respect to habitation size falls to 0.44, once these auxiliary effects are accounted for.

Thus, despite the fact that the effect of access on the enrollment of the SC/ST substantially exceeds its effect on the upper castes, the overall benefits of residing in districts with widespread access to schools do not significantly differ by caste, suggesting that school location policies cannot be an effective instrument for reducing schooling inequalities. This result is the consequence of the fact that school location policies affect school quality, not just access to schools.

Conclusion

In designing a policy for the construction and location of primary schools in rural India, the government has paid scant attention to the fact that the location of schools determines not just access but also important dimensions of school quality. Because of the geographic distance between habitations in rural India and their small size, the decision to situate a school in a habitation determines total enrollment and hence the total number of teachers in the school. The policy of constructing schools in all habitations above a minimum size in conjunction with caste-based residential segregation also implies that many villages have multiple schools, with the SC/ST children attending different schools from the children of other castes.

Consistent with these hypotheses, this paper documents the significant role of habitation size in determining not just access to schools but also critical school inputs such as the number of teachers. The inability to ensure that each school is of the optimal size, reflected in the effect of habitation size on teacher availability and the consequent variation in teacher strength across schools, implies that school location policies are partly responsible for the significant observed variation in school quality across rural India. Of habitations of size large enough to receive a school, households who reside in larger habitations will be characterized by higher levels of schooling than those who reside in smaller habitations. Because the SC/ST habitations are generally smaller, the government's school location policies imply that schools located in the SC/ST habitations will be of lower quality, thereby contributing to caste-based schooling inequalities.

They also contribute to caste-based schooling inequalities through their effect on school segregation. The results of this paper show that the availability of schools in the SC/ST habitations, which in turn enables schooling segregation, affects schooling attainment. However, the effect of schooling segregation varies by caste; the availability of schools in SC/ST habitations

increases the schooling of the other caste children but reduces that of the SC/ST children. Higher levels of schooling segregation in districts with widespread access to schools wipe out the differential benefits of access for the SC/ST.

The results of this paper suggest that improvements in school quality cannot be affected without re-considering school location policies. Improving school quality along the dimensions considered in this paper is, however, not an easy task. The importance of teacher strength suggests that a policy which consolidates habitation schools to provide one school in each village is likely to improve schooling attainment, since it would enable an optimal number of teachers in each school. While the greater distance to school implied by such a consolidation, particularly for children from the SC/ST habitations, may reduce access, the savings generated by the consolidation could be used to implement a system of cash transfers to children from the SCs and the STs, conditional on their school attendance records. Evidence from Mexico (Schultz, 2004) suggests that these transfers can significantly enhance access.

On the other hand, it is unclear what a consolidated school system would imply for schooling segregation. While it could potentially reduce it, the evidence of this paper that schooling attainment is affected by the average quality of the student population suggests a segregating force; in the presence of such externalities, households may be willing to pay to achieve a level of segregation through, for example, their support for private schools (Benabou, 1996). Indeed, one could view the rapid rise of private schooling in rural India as a consequence of the increases in schooling by the SC/ST, and the consequent reduction in the average "quality" of students in government schools. School consolidation, under these conditions, may not significantly alter schooling segregation. Even so, the positive effects on the number of teachers and the improved ability to bear the fixed costs of investments in infrastructure, playgrounds, laboratories, computers, and libraries may still imply that a re-consideration of school location policies may be necessary to ensure improvements in schooling.

Comments and Discussion

Rukmini Banerji: This paper focuses on an interesting and relatively unexplored dimension of schooling provision in India—the effect of school location on both schooling attainment and caste-based segregation in primary schools. Kochar argues that India's school location policies have had a significant impact on school quality. In her paper, school quality is coterminous with school inputs, especially the number of teachers. Using district-level data she shows that school segregation by caste is higher in districts with widespread access to schools, thus the benefits of access are wiped out by the negatives of school segregation as far as school enrollment and school attainment are concerned.

While much of her contribution to the allied literature is empirical, I will raise some conceptual issues to think about.

In the last five years, especially in the north Indian educationally backward states like Uttar Pradesh and Bihar, there has been large-scale recruitment of teachers and para-teachers. For example, in Uttar Pradesh, para-teachers (*shiksha mitras*) are local and recruited by the local village body. Early grades in primary school are generally assigned to the para-teachers. In several states like Uttar Pradesh and Bihar, a significant percentage of para-teachers are female and local. Along with this decentralized recruitment, governments have been building new schools with a special target on unserved habitations. Considerable work has been also been done in upgrading small schools and in constructing additional classrooms. Along with this expansion of school inputs, both at Central and state government levels, there has been a big push to bring the teacher-pupil ratio (TPR) to 1:40.[1]

The data for this paper is based on a variety of sources of data from 1993, 1999, and 2002. More recent data may have allowed Kochar to disentangle some of the new trends in school provision and estimate its implications. For example, without disaggregated data at school level it is difficult to measure the impact of para-teacher (local and perhaps same caste as students

1. ASER stands for Annual Status of Education Report. ASER 2007 sample of 16,000 schools indicates that at the all-India level, the TPR is now below 40. Except for Uttar Pradesh, Bihar, Jharkhand, and West Bengal, many of the major states have TPR below 40 or around 40. See the set of entire reports from 2005–07 on www.pratham.org.

in small habitations) versus regular teacher (higher caste and not local) on schooling attainment. It is widely perceived that para-teachers are less absent and are more effective than regular teachers as they are hired on a contractual basis.

What is the "optimal" school size and for what outcome? Kochar is concerned about schooling attainment. If you consider learning as another outcome, then the available evidence points to surprising and unexplained trends. Bihar—which is a state that has had very poor school provision and woefully inadequate number of teachers until very recently—does well in terms of children's learning in national learning surveys (school-based grade level government administered NCERT pen and paper tests) as well as household-based oral individual assessments of ASER. Tamil Nadu—which is a well-functioning state with adequate school inputs and incentives—does poorly, at least in ASER. Himachal Pradesh has very small schools, (children's enrollment and teacher availability) and a high degree of multi-grade teaching. The conception of, and evidence on, "optimal" school size is worthy of further study.

The rapid increase of private schools is very visible in many states in north India but is poorly measured. Government school statistics do not have a complete enumeration of these schools, especially the un-recognized private schools. Usually, the incidence of private schools is higher in bigger habitations and is lower in the catchment area of a well-run government school. It would be interesting to look at school attainment and school segregation in habitations where there are not only several government schools but also private schools.

While most of India now has primary schools within 1 km of the habitation, understanding implications of school location and provision policies are critical as middle school/upper primary school expansion begins to take place. To date, the government norm for middle schools is that it should be located within 3 km of the habitation. Given this landscape, Kochar's topic is a relevant one and her rigorous empirical research is timely.

Rajnish Mehra

Introduction

I enjoyed reading this thought-provoking paper. It raises an interesting issue regarding the adverse consequences of a well-intentioned government policy. The paper analyzes the effectiveness and consequences of a

post-independence priority: the emphasis on facilitating educational achievement for India's rural population, both as a desirable goal in and of itself, and as a crucial input to alleviating entrenched caste and gender educational discrimination. Implementation of this policy focused broadly on *access*—providing a school within walking distance (typically 1 km) of each rural household.

The author undertakes a challenging task—to catalogue and critically assess the consequences of this policy, half a century later—and is to be complimented on her research. Central to understanding the results of this paper is the concept of "habitation": a distinct cluster of houses existing in a compact and contiguous manner[2] with a local name. Further, its population should not be less than twenty-five houses in plain areas and not less than ten in sparsely-populated areas. In case there exist more than one such cluster of houses in a village, they are treated as separate habitations only if the convenient walking distance between them is more than 200 meters. A village may thus have within it one or more habitations.

Basic Findings

Most habitations in India are small and dispersed. Large habitations are characterized by efficient school size, more schools, more teachers per school, and higher rates of enrollment. By contrast, small habitations typically manifest lower enrollment numbers, one or no school with two or less teachers, and generally an inefficient school size. A large village is likely to have habitations segregated by caste and, often consequently, this results in schooling segregation—typified by one small school with two or less teachers and lower enrollment rates.

The paper argues that habitation size may be as, or more important than other attributes such as community income in determining schooling outcomes. There are two implicit assumptions motivating the discussion: 1) Over a certain range, there are increasing returns to scale in school design. This is a reasonable assumption given the large fixed costs of establishing a school and the negligible marginal costs of an additional student. One school with an adequate number of teachers and an integrated student body is better than two inadequately staffed segregated schools. Requiring a school to be located within a specified distance from a household leads to a

2. NCERT's Seventh All India Survey.

sub-optimal size with concomitant effects on quality. 2) There is an optimal location choice that maximizes access while minimizing inefficiencies and externalities.

From a policy point of view, how would this be implemented? To address this we need an objective function and resource constraints. This is a problem in Economic Geography. The paper does not discuss this issue. There are a number of models that can be adapted to address the issues discussed in the paper for example, Marianov and Serra (2004), and Banerji and Fisher (1974). The two key arguments with the maximum weight in such an objective function are attendance by teachers *and* attendance by *students*. Kremer et al. (2004) and others have found that, on average, 25 percent of teachers in rural schools are absent on any given day. This is shown in table 9.

TABLE 9. Teacher Absence in Public Schools by State

State	Absence (%)
Maharashtra	14.6
Kerala	21.2
Haryana	21.7
West Bengal	24.7
Uttar Pradesh	26.3
Punjab	34.4
Bihar	37.8
Jharkhand	41.9
Weighted Average	24.8

Source: Kremer et al. 2004.

They find that absenteeism increases with the distance of the school from the main road. From this point of view, smaller schools local to the habitation might be a critical factor in increasing teacher attendance. The student attendance is also of first-order importance. In light of this, one can understand what motivated the government to opt for the current policy.

The simplest way to increase school participation is to reduce the cost of schooling, or even pay for attendance (Kremer 2003). Mid-day meals have proven to be an effective motivator. This is especially so for the SC/ST students—the elasticity of enrollment with respect to access is probably higher for them. From a welfare point of view, school attendance is desirable even in a segregated system and with few teachers, when the alternative is non-participation (child labor). Discrimination is a ground reality, especially in rural India. Even if schools are located randomly and students are free to choose which school to attend, one suspects that, in equilibrium, segregation may be the outcome (Schelling, 1978).

A recent development is the proliferation of private "unrecognized" schools even in rural areas. These schools are emerging as viable substitutes to government-run schools. Some discussion is warranted on how the presence of these schools can affect educational attainment in districts made worse off by the current government policy.

Sector-specific rates of technological progress are also likely to have important implications for the distributions of schooling and these are likely to be different for landed v. landless households. The results from Foster and Rosenzweig (1996) suggest that technical change in agriculture is likely to increase schooling inequality in rural areas. It increases schooling returns for landed households—who make the decisions about the adoption and management of new seeds but not for landless households—who undertake such tasks as weeding or harvesting crops.

Conclusion

The 'pluralist' view of the causes of poor schooling outcomes in rural India, for example, Drèze and Kingdon (2001), recognizes several key determinants of school participation: household resources, parental motivation, the returns to child labor, and school quality. A valuable insight that emerges from the analysis in this paper is that habitation size may be as or more important than other attributes such as community income in determining schooling outcomes. The next step would be to investigate how one might extract efficiency gains from this insight.

General Discussion

Dilip Mookherjee began the general discussion by echoing the concerns raised by Mehra about the policy alternatives. Because commuting time is a considerable constraint in many situations, there would need to be a way of getting children in small habitations to larger schools in larger habitations. Mookherjee noted how dispersed hamlets in India can be with children often commuting several hours each day. Second, if the schools were desegregated by merger into a larger school, would the lower castes receive decreased attention from teachers and reduced access to resources? Mookherjee argued that large schools would be responsive to concerns about resource costs because they were likely to gain from economies of scale. However, if the

primary concern is equality of opportunity for education, resource costs are less important and the current policy may be justified, given all the other constraints.

Abhijit Banerjee made two points. First, rather than interpreting the paper as a statement about optimal resource allocation, it could be seen as a statement about what could be done to generate caste-based equity. Therefore, if schools in small hamlets are doing poorly, it may be better to devote extra resources to those schools rather than thinking of it as a problem of bussing children. Second, he noted that it may be useful to check the exclusion restrictions for the econometric estimations. He argued that it is not clear whether being a small hamlet in a less developed district is the same thing as being a small hamlet in a more developed district.

Another participant suggested that there may be a tradeoff between gender and caste inequality from the perspective of walking further to school. The literature has shown that girl enrollment is more sensitive to distance than that of boys. Second, the caste of the teacher may be important for educational outcomes, as there appear to be big differences in teacher attendance depending on whether a high caste teacher is going to a Scheduled Caste (SC) hamlet or if a SC teacher is going to a SC hamlet.

Indira Rajaraman echoed the gender equity issue raised by others. She noted that one of the well-known reasons why girl children are not sent to school—especially after puberty—is because of the non-availability of toilets in schools. So, the current policy of school access within 1 kilometer has meant that they can go home in between the school day, which has really improved gender equity as far as attendance in schools is concerned.

Finally, several other participants raised additional points. One questioned why the current policy is producing gains to the non-Scheduled Caste groups, and why those gains were asymmetric to the costs to the SC/ST students. Another suggested that if bussing is impractical, other policy responses, such as a cash transfer conditional upon attendance, may be an effective means of achieving the desired result. It was also argued that more than just the location of a hamlet needs to be included in the analysis of performance. The infrastructure and community involvement may also differ greatly among and within hamlets.

The author responded to the questions and comments by first reiterating the main point of the paper that there is huge variation in school quality across schools by habitation size and SC/ST, and that a lot of these caste-based inequalities are a result of the current school location policy. So, in a sense, the paper was meant as an identification of a problem that is not sufficiently recognized in current policy circles.

Regarding policy alternatives, Kochar had several suggestions. First, one could contemplate a different configuration of schools. Rather than the traditional K to 5, and 6, 7, and 8, it could be possible to have schools which go from kindergarten to grade 2, and then moved to a combined school. She remarked that the state of Punjab has actually moved in the past few years to a unified school system. The alternative of providing a conditional cash transfer to SC/ST households only, provided that they go to school would be responsive to Banerjee's comment about the relative ease of targeting the SC/ST.

Finally, Kochar emphasized that many of the points raised during the discussion should be areas for future research. Whether the SC/ST will be treated equally or not when they go to other schools can only be answered with further research. In addition, the distribution of teachers in panchayat schools and the caste relationship of teachers to hamlets are both researchable questions that should be explored in the future.

References

Alderman, Harold, Jere R. Behrman, Victor Lavy, and Rekha Menon. 2001. "Child Health and Social Enrollment: A Longitudinal Analysis." *The Journal of Human Resources* 36 (1): 185–205.

Banerji S. H., and H. B Fisher. 1974. "Hierarchical Location Analysis for Integrated Area Planning in Rural India." *Papers of the Regional Science Association* 33: 177–94.

Benabou, Roland J. M. 1996. "Equity and Efficiency in Human Capital Investment: The Local Connection." *Review of Economic Studies* 63 (2): 237–64.

Birdsall, Nancy. 1985. "Public Inputs and Child Rearing in Brazil." *Journal of Development Economics* 18 (1): 67–86.

Borjas, George J. 1995. "Ethnicity, Neighborhoods, and Human-Capital Externalities." *American Economic Review* 85 (3): 365–90.

Case, Anne, and Lawrence F. Katz. 1991. "The Company You Keep: The Effects of Family and Neighborhood on Disadvantaged Youth." NBER Working Paper 3705.

Coleman, James. 1988. "Social Capital in the Creation of Human Capital." *American Journal of Sociology* 94 (Suppl.): S95–S120.

Deolalikar, Anil. 1997. "Determinants of School Enrollment and School Expenditures in Kenya." Unpublished Manuscript, University of Washington, Seattle, WA.

Drèze J., and G. G. Kingdon. 2001. "School Participation in Rural India." *Review of Development Economics* 5 (1): 1–24.

Fernandez, Raquel, and Richard Rogerson. 1996. "Income Distribution, Communities, and the Quality of Public Education." *Quarterly Journal of Economics* 111 (1): 135–64.

Filmer, Deon. 2004. "If You Build It, Will They Come? School Availability and School Enrollment in 21 Poor Countries." World Bank Policy Research Working Paper 3340. Washington, D.C.: The World Bank.

Foster, Andrew D., and Mark R. Rosenzweig. 1996. "Technical Change and Human Capital Returns and Investments: Evidence from the Green Revolution." *American Economic Review* 86 (4): 931–53.

Kochar, Anjini, Kesar Singh, and Sukhwinder Singh. 2007. "Targeting Public Goods to the Poor in a Segregated Economy: An Empirical Analysis of Central Mandates in Rural India." Unpublished Manuscript, Stanford University, Stanford, CA.

Kremer, M. 2003. "Randomized Evaluations of Educational Programs in Developing Countries: Some Lessons." *American Economic Review* 93 (2): 102–106.

Kremer, M., Karthik Muralidharan, Nazmul Chaudhury, Jeffrey Hammer, and F. Halsey Rodgers. 2004. "Teacher Absence In India: A Snapshot." Forthcoming, *Journal of the European Economic Association.*

Lillard, Lee A., and Robert J. Willis. 1994. "Intergenerational Educational Mobility: Effects of Family and State in Malaysia." *Journal of Human Resources* 29 (4): 1126–66.

Marianov, Vladimir, and Daniel Serra. 2004. "New Trends In Public Facility Location Modeling." UPF Economics and Business Working Paper No. 755.

Miguel, Edward, and Mary Kay Gugerty. 2005. "Ethnic Diversity, Social Sanctions and Public Goods in Kenya." *Journal of Public Economics* 89 (11–12): 2325–68.

Planning Commission India. 1952. *The First Five year Plan*. New Delhi: Planning Commission.

Schelling, Thomas C. 1978. *Micromotives and Macrobehavior*. New York: W.W. Norton and Co.

Schultz, Paul T. 2004. "School Subsidies for the Poor: Evaluating the Mexican Progresa Poverty Program." *Journal of Development Economics* 74 (1): 199–250.

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Mortgaging the Future? Indian Higher Education

> Our university system is, in many parts, in a state of disrepair… In almost half the districts [340] in the country, higher education enrolments are abysmally low, almost two-third of our universities and 90 per cent of our colleges are rated as below average on quality parameters… I am concerned that in many states university appointments, including that of vice-chancellors, have been politicised and have become subject to caste and communal considerations, there are complaints of favouritism and corruption.
>
> Prime Minister Manmohan Singh's address at the 150th Anniversary Function of University of Mumbai, June 22, 2007.[1]

Introduction and Overview

This paper analyzes two interrelated facets of higher education policy in India: the key distortions in higher education policies and what explains them. It first sets the stage by laying out the principal conceptual issues that need to be considered when thinking about an appropriate policy framework for higher education in India. It then examines three key distortions in Indian higher education with regard to the markets, the state, and the civil society (philanthropy). The next part of the paper examines the political economy of Indian higher (tertiary) education and seeks to explain the ideological and political underpinnings of these distortions and how they work in practice. We conclude with some indicative and policy directions for Indian higher education. The purpose of this exercise is not to make detailed policy recommendations, but rather to flag the kinds of issues that ought to be addressed.

1. http://pmindia.nic.in/lspeech.asp?id=555.

The key argument of this section of the paper is twofold. The first is that higher education in India is being *de facto* privatized on a massive scale.[2] But this privatization is not a result of changing preferences of the key actors—the state, the judiciary, or India's propertied classes. Rather, this privatization has resulted from a breakdown of the state system. As a result, it is a form of privatization in which ideological and institutional underpinnings remain very weak. Instead of being part of a comprehensive program of education reform, much of the private initiative remains hostage to the discretionary actions of the state. Consequently, the education system remains suspended between over-regulation by the state on the one hand and a discretionary privatization that is unable to mobilize private capital in productive ways, on the other. Any policy intervention, if it is to succeed, will have to change this political economy equilibrium. However, vested circles of interest will impede reform, whether of public or private institutions. We focus on the political economy not just because it explains the current regulatory regime. This political economy also explains why even *conceptualization* of issues in higher education is likely to remain distorted for some time. We begin with an overview of Indian higher education.

Structure and Scale of Indian Higher Education[3]

In 1950–51 India had 27 universities, which included 370 colleges for general education and 208 colleges for professional education (engineering, medicine, education). By 2007, India had 361 universities (comprising 219 state universities, 21 central universities, 110 deemed universities, 11 private universities) and 18 institutions of national importance (five established under state legislations and 13 Institutes by Central Legislation). In addition, there are 18,064 colleges. The total number of students enrolled in the universities and colleges was 14 million (Planning Commission, 2007). While we do

2. The authors would like to thank Atul Kohli for his insightful comments, and Jandhalya Tilak, Urjit Patel and Pushpa Sundar for access to their work and some important bibliographical tips. For assistance with the research, we are grateful to Mihir Sheth and in the preparation of this manuscript, Anjali Salooja and Megan Crowley. An earlier version of this paper was presented at a conference organized by the Center for the Advanced Study at the University of Pennsylvania on "Economic Reforms, Human Development and Governance in India: Changes in Institutional Structures and Incentives since 1991."

3. In this paper, we focus on that part of the higher (tertiary) education that encompasses colleges and universities. We do not address issues related to technical education in India's industrial training institutes (ITIs), which are an important component of higher education imparting technical training in a wide range of trades and crafts. Also see Agarwal (2007).

not have data for the distribution of students by discipline, in 2003 of the 2 million-odd graduates, engineering and medicine graduates accounted for 7 percent and 0.7 percent, respectively.

Nearly two-thirds of the colleges in 2005 were classified by the University Grants Commission (UGC—the apex government regulatory body for higher education) as "Arts, Science, and Commerce Colleges" (table 1). Recent growth is much greater in professional colleges (especially engineering, management, and medicine), as well as in private vocational courses catering especially to the IT sector.

TABLE 1. Type-Wise Number of Colleges in the Country: 2004–05

Type	*Number*
Arts, Science, and Commerce Colleges	10,377
Teachers Training	1,082
Engineering/Technology/Architecture	1,302
Medical	817
Others*	2,431
Total	16,009

Source: Government of India, Department of School Education and Literacy, 2007. *Annual Report 2004–2005* URL: http://www.education.nic.in/AR/AR0607-en.pdf.

Note: *Others includes colleges exclusive for Law, Management, MCA/IT, Agriculture, and so on.

There has been a rapid expansion in higher education, with student enrollment growing at about 5 percent annually over the past two decades. This growth is about two-and-half times the population growth rate (table 2), and results from both a population bulge in lower age cohorts as well as increased demand for higher education. However, even today's gross enrollment ratio of Indians in institutions of higher education is approximately 11 percent of the age cohort, which is considerably higher than developing country averages, but lower than the average for Asia as a whole and much lower than Organisation for Economic Co-operation and Development (OECD) countries. Enrollment ratios vary across Indian states, with the southern and western states faring better than their eastern counterparts (table 3). Women now constitute about 40 percent of all student enrollments, varying from a low of 20 percent in Orissa to a high of 58.8 percent in Kerala (table 3). The bulk of students (nearly two-thirds) are enrolled in Arts and Science, with another 18 percent in commerce/management (tables 4a and 4b). This is of some importance because most "private investment" in higher education is concentrated in engineering, medicine, and management and consequently does little for the majority of students. Notwithstanding the great hopes reposed

TABLE 2. All India Growth of Student Enrollment (1983–84 to 2004–05)

Year	*Total enrollment*	*Increase over the preceding year*	*Percentage*
1983–84	3,307,649	174,556	5.6
1984–85	3,404,096	96,447	2.9
1985–86	3,605,029	200,933	5.9
1986–87	3,757,158	152,129	4.2
1987–88	4,020,159	263,001	7.0
1988–89	4,285,489	265,330	6.6
1989–90	4,602,680	317,191	7.4
1990–91	4,924,868	322,188	7.0
1991–92	5,265,886	341,018	6.9
1992–93	5,534,966	269,080	5.1
1993–94	5,817,249	282,283	5.1
1994–95	6,113,929	296,680	5.1
1995–96	6,574,005	460,076	7.5
1996–97	6,842,598	268,593	4.1
1997–98	7,260,418	417,820	6.1
1998–99	7,705,520	445,102	6.1
1999–2000	8,050,607	345,087	4.5
2000–01	8,399,443	348,836	4.3
2001–02*	8,821,095	421,652	5.0
2002–03*	9,227,833	406,738	4.6
2003–04**	10,009,137	781,304	8.5
2004–05**	11,777,296	1,768,159	17.7

Source: University Grants Commission, various years.
Notes: *Provisional
**Government of India, 2007. *Selected Educational Statistics 2004–2005.*

by a spate of committee reports on alternative sources of funding for higher education, the state will continue to have to occupy the commanding heights of at least this sector of the economy.

Although total expenditure on higher education has risen since independence, from 483 crore to 2418.3 crore between 1980 and 1995, spending per pupil in real terms declined for nearly two decades. Higher education occupies a low priority in public expenditure (table 5). Real public expenditure per student in higher education declined by 21 percent between 1993–94 and 2003–04 (Planning Commission, 2007). Its share of gross national product (GNP) was nearly 1 percent during the 1970s, just 0.35 percent in the mid-1990s, before increasing modestly to 0.6 by the end of the decade. After the formulation of the New Policy of Education (NPE) in 1986, the Central Government gradually increased its contribution to the funding of elementary education, and this trend continued in the 1990s. As a result, the share of higher education spending in total expenditure on education

TABLE 3. State-Wise Student Enrollment (2004–05)

S. No.	*State/UT*	*Total enrollment*	*Women enrollment*	*Women %*
1.	Andhra Pradesh	1,056,719	397,103	37.58
2.	Arunachal Pradesh	6,745	2,519	37.35
3.	Assam	214,342	88,732	41.40
4.	Bihar	553,693	135,423	24.46
5.	Chhattisgarh	163,254	60,028	36.77
6.	Goa	21,643	12,569	58.08
7.	Gujarat	645,689	274,198	42.47
8.	Haryana	264,331	113,939	43.10
9.	Himachal Pradesh	103,628	48,813	47.10
10.	Jammu and Kashmir	80,405	36,327	45.18
11.	Jharkhand	209,176	76,559	36.60
12.	Karnataka	706,241	313,202	44.35
13	Kerala	313,155	184,170	58.81
14	Madhya Pradesh	758,418	237,364	31.30
15	Maharashtra	1,534,613	577,892	37.66
16	Manipur	38,679	17,422	45.04
17	Meghalaya	30,716	14,284	46.50
18	Mizoram	12,180	4,325	35.51
19	Nagaland	13,644	6,139	44.99
20	Orissa	367,187	73,332	19.97
21	Punjab	279,707	143,422	51.28
22	Rajasthan	394,478	131,986	33.46
23	Sikkim	6,596	2,711	41.10
24	Tamil Nadu	809,366	379,493	46.89
25	Tripura	22,447	9,491	42.28
26	Uttar Pradesh	1,507,991	581,460	38.56
27	Uttaranchal	131,742	62,447	47.40
28	West Bengal	746,509	276,298	37.01
29	A & N Islands	2,706	1,479	54.66
30	Chandigarh	51,309	25,329	49.37
31.	D&N Haveli	0	0	0
32.	Daman & Diu	619	325	52.50
33.	Delhi	709,169	342,469	48.29
34.	Lakshadweep	0	0	0
35.	Pondicherry	20,199	10,326	51.12
	Total	11,777,296	4,641,576	39.41

Source: Government of India, *Annual Report 2006–07*, www.education.nic.in/AR/AR0607.en.pdf.

declined from 12.2 percent during 1982–92 to 11.4 percent for the states, and more dramatically, from 36.2 percent to 23.3 percent for the Center. Notwithstanding the high growth rate after economic liberalization, the real rate of growth of public expenditure on higher education declined from about 5.5 percent during 1982–92 to 5.3 percent between 1993 and 2004, largely because of deceleration in spending by the states. The average real

TABLE 4A. Student Enrollment by Academic Discipline (2002–03)

No.	*Faculty*	*Total enrollment*	*Percentage of total*
1.	Arts	4,158,606	45.07
2.	Science	1,834,493	19.88
3.	Commerce/Management	1,660,238	17.99
4.	Education	132,572	1.43
5.	Engineering/Technology	692,087	7.50
6.	Medicine	300,669	3.25
7.	Agriculture	55,367	0.60
8.	Veterinary Science	14,765	0.16
9.	Law	298,291	3.23
10.	Others	80,745	0.88
	Total	9,227,833	100.00

Source: University Grants Commission, various years.

TABLE 4B. Student Graduation by Academic Discipline (2002–03)

		Undergraduate		*Graduate*	
No.	*Faculty*	*Total*	*% Female*	*Total*	*% Female*
1.	Arts	972,720 *of which*: B.A. 843,073; B.A. Hons. 114,596	43.7	306,416	45.2
2.	Science	327,775 *of which*: B.Sc. 280,982; B.Sc. Hons. 38,698	40.2	74,295	43.0
3.	Commerce	373,192 *of which*: B.Com. 330,664; B.Com. Hons. 23,690	40.0	94,426	37.4
4.	Education	106,048	45.1	4,713	35.4
5.	Engineering/ Technology	127,610 *of which*: B.Tech: 22,070; Civil: 9,179; EE 21,745; ECE 13,042; Mech 19,844 CS: 13,943	20.7	12,370	17.5
6.	Medicine	38,787 *of which*: Dental: 3,764; B. Pharm. 5,751 Nursing: 3,260; MBBS: 14,182	41.3	8,219 (M.D. 3,441)	29.0
7.	Agriculture	7,801 *of which*: B.Sc. Ag. 6,892	16.4	3,716	19.0
8.	Veterinary Science	1,497	23.1	700	17.6
9.	Law	58,228	19.3	2,193	35.5
10.	Others	38,539 *of which: BCA (Comp.App.)*: 17,248	28.7	33,607 (*BCA*: 20,972)	29.8
	Total	2,052,197	39.8	540,658	41.3
	Grand Total All Graduates:			2,592,855	40.1

Source: University Grants Commission, various years.

TABLE 5. Public Expenditures on Higher Education[1]
(Share of GDP and Total Education Expenditures)

Year	*Expenditure on education as percent of GDP*	*Expenditure on higher education as percent of expenditure on education*	*Expenditure on higher education as percent of GDP*
1981–1990[2]	3.59	15.6	0.34
1991–2000	3.77	19.3	0.72
2001–2002	3.82	17.9	0.69
2002–2003	3.80	18.5	0.70
2003–2004	3.50	17.8	0.62
2004–2005 (RE)	3.68	18.0	0.66

Source: [1] Ministry of Human Resource Development, *Selected Educational* Statistics 2004–05.
[2] Ministry of Human Resource Developments, *Analysis of Budgeted Expenditure on Education*.
Note: Based on the new series of GDP with base 93–94 = 100.
RE: Revised estimates.

expenditure on higher education per enrolled student declined at 2.4 percent annually during this period from Rs. 8,322 in the period 1981–82 to 1991–92 to Rs. 6,790 in the period 1992–93 to 2003–04 (at 1993–94 prices).

Until very recently, most state governments had virtually ceased to expand the list of government-aided institutions, thereby increasing the percentage of "self-financed" or "private-unaided institutions," most noticeably in professional and technical education. In contrast to cash-strapped state governments, in June 2007 the Center announced plans to set up and fund 30 new central universities across the country. India has 20 central universities (18 funded by the UGC), spread over just nine states, Delhi and Puducherry. The remaining 19 states of India would receive first priority in getting central universities. In addition, the Central Government announced that it would work with the states to support the expansion of colleges to the 340 districts that have extremely low college enrollments. To increase the likelihood of enrollment from these districts it also announced plans to set one high-quality school in every block of the country (6000) which would also establish benchmarks for excellence in public schooling.

Conceptual and Policy Issues

The conceptual and policy issues relating to higher education in general (and not just in India) face an analytical conundrum: any discussion of these issues has to begin by acknowledging that from a policy point of view it is not easy conceptualizing what "good" higher education means, and therefore what kind of regulatory framework is appropriate (Kapur and Crowley, 2008). India is not unique in experiencing a crisis in the higher education system,

and the debate on optimal regulatory frameworks across the world is quite indeterminate in its conclusions.

Appropriate policy frameworks for higher education are difficult to design for several reasons. First, there is considerable disagreement over the social rates of return in higher education. This confusion over this issue is reflected in the World Bank reports on this issue (*Higher Education*: *The Lessons of Experience*, 1994 and *Priorities and Strategies for Education: A World Bank Review*, 1995). The confusion and obfuscation in the 1994 report is evident in its contradictory claims. To quote:

> Indeed, it is arguable that higher education should *not* have highest priority claim on incremental public resources available for education in many developing countries, especially those that have not yet achieved adequate access, equity and quality at the primary and secondary levels. This is because of the priority these countries attach to achieving universal literacy; *because the social rates of return in investments in primary and secondary education usually exceed the rates of return on higher education* and because investment in basic education can improve equity because it tends to reduce inequalities (World Bank, 1994, p. 3).

Ironically, the executive summary of the same document reads:

> Higher education is of *paramount* importance for social and economic development. Institutions of higher education have the main responsibility for equipping individuals with advanced knowledge and skills required for positions of responsibility… estimated *social rates of return of ten percent or more in many developing countries also indicates that investments in higher education contributed to increase in labor productivity and to higher long term economic growth essential for poverty alleviation* (World Bank, 1994, p. 1).

There is a substantial technical literature on the social rates of return on investment in higher education, which is not our concern here. But there is a judgment call governments have to take in making the appropriate allocative decisions. All we would like to stress here is that allocative decisions in India have, by and large, not been governed by any serious debate over this question. They are rather determined, as we shall see later, by political economy considerations. While recognizing the difficulty of this question, any sensible public policy ought to be able to publicly justify its allocative priorities on rational grounds. The Eleventh Plan draft, for instance, envisages doubling public investment in higher education. But much of this has been driven by the need to defuse the political backlash caused by India's affirmative action policies, rather than by a rigorous examination of allocative priorities.

The second issue concerns the *distribution* of investments within an education system. In any optimum system of regulation this question will have two aspects. First, how are private investment decisions made? Second, given (as we explain later) significant market failures in higher education, public investments will be required. But on what informational basis are public investments made?

We first address the question of private investment decisions in higher education. In the Indian context, it is important to emphasize that while there is considerable private investment (detailed later), it would an exaggeration to describe this as entirely market driven. Most private investment requires regulatory approval, and its character will be determined by the character of regulatory regime. Regulatory bottlenecks distort the character and degree of private investment in higher education in several important ways.

Distorted Markets

First, the process of regulatory approvals diminishes the capacity of private investment to respond to market needs. In some areas like management and IT diplomas, institutions have managed to skirt the regulatory process by running "unrecognized" institutions, but in most areas severe distortions remain. Two examples illustrate this point. There has been an explosion in the demand for nursing. Yet setting up nursing colleges, or even increasing seats in existing ones requires regulatory approval that can frequently take years. So paradoxically, India remains a country that produces more doctors than nurses. India's civil aviation sector experienced phenomenal growth from 2001 onwards, yet approvals for aviation engineering schools were not forthcoming. As a result, India is a net importer of aviation engineers and pilots. Second, if the regulatory process is perceived to be corrupt and opaque, it produces an adverse selection in the kind of entrepreneurs that invest since the success of a project depends less upon the pedagogic design of the project but rather on the ability to manipulate the regulatory system. The cumulative effect is to deter entrepreneurs who are interested in education rather than expending their energies in manipulating state functionaries. Third, there are significant market failures in acquiring physical assets that are necessary for institutions. Land is one such key asset. But the land market in India is severely distorted, and this has ramifications for the ability of educational entrepreneurs to set up institutions. Fourth, the templates under which approvals are given to institutions are extremely rigid on two dimensions. They stipulate infrastructure requirements irrespective of costs or location. And regulatory agencies insist that new institutions

instead of innovating academically, conform to centrally mandated course outlines, degree structures, and admissions policies. Fifth, a key element of a well-functioning market—competition—is often severely distorted. For instance, foreign universities are not allowed to set up campuses in India, and this arguably prevents benchmarking to global standards. There are other micro rules, about institutions not being allowed to operate outside the state they are registered, high entry barriers for universities, the ability of the state to withhold operating licenses on the grounds that there are already enough institutions in a particular area, all of which impede competition. Sixth, the central element of a well-functioning market, informational transparency, is woefully inadequate. The state's view is that accountability is best imposed through two instruments. The first is direct state inspection. The second is bringing these institutions under an accreditation process. Both mechanisms are deeply flawed. It is literally not possible for the state to physically inspect thousands of colleges, and the inspector *raj* is subject to abuse and corruption. The accreditation process is deeply flawed because one single accreditation agency does not have the capacity to fairly, rigorously, and transparently accredit a large number of institutions. Instead, the state might be better off creating some competition in the accreditation process by licensing a number of agencies. The state would also be better off focusing on enforcing transparency: requiring institutions to share basic information that empowers students to make more informed choices. Although the regulatory agencies have made attempts in this direction, output-related information is critically lacking particularly information on the performance of an institution in terms of where its students end up after graduation. Few institutions are even required to track their own performance, let alone share this information publicly. Another significant lacuna on the issue of transparency is that while the state has a plethora of laws to regulate institutions (and if need be even close them down), there are no laws specifically pertaining to fraud or misrepresentation in the education sector. Under current law, the regulatory institutions may close down fraudulent institutions, but they do not have the legal instruments for prosecuting those who have engaged in outright fraud. For instance, some institutions admit students and grossly misrepresent their legal status. In the middle of the degree course, the institution simply "vanishes" leaving the students with a number of "wasted" years and large financial losses. There are no laws specifically to prosecute such cases of fraud. So the irony is that the one piece of legislation that could strengthen student protection in relation to private institutions, without curtailing their autonomy, is missing. But a whole series of other restrictions

are selectively enforced by regulatory agencies. Finally, the private sector will for some time to come, free ride on years of accumulated scarcity. This scarcity is of two kinds. On the supply side, it is not easy to overnight tap into the kind of human capital that might be required to run good institutions; on the demand side, the scarcity is such that even weak institutions that would not have otherwise survived a competitive environment do so. There is an important analytical point here. Even if a system is formally competitive, in that there is a choice of institutions available and no institution (or a small number) commands a large market share, competition alone may not ensure accountability if aggregate demand remains high. The cautionary tale is that the accountability effects of competition will not kick in until demand is met. In the short run measures like regulating fees seem to create access, but in the long run they diminish the supply of the education system as a whole. At least with regard to private investment, the distortions can be removed by crafting regulatory regimes that address the aforementioned concerns.

State Distortions

We take it to be the case that public investment will play a major role in higher education. There will be significant market failures in education. For instance, it is not clear that even under the best of conditions the market will create an environment conducive to research that has long time horizons or which responds to important social needs. These will have to be met through public funding. If higher education has significant public good aspects it will be under-supplied. If it is a private good there could be significant credit market failures that impede access. The important policy questions are who should be making the allocative decisions on behalf of the state and what principles should guide them?

The question of who should be making allocation decisions is particularly significant in the Indian context. At the moment, it is fair to say that these decisions are centralized to an extreme degree. The Planning Commission and the Ministry of Human Resource Development not only determine aggregate higher education budgets but also the forms in which they will be spent (this includes everything from the kinds of institutions, subject areas, and so forth). The University Grants Commission, the premier funding body for public institutions, has also greatly centralized allocation decisions. The quality of these allocation decisions will depend entirely upon the informational resources a very small group of decision makers have access to. In our view such extraordinary centralization of allocations is bound to produce significant distortions because it presupposes an omniscience that

few decision makers can have. For instance in the Eleventh Plan draft, the Planning Commission envisages 30 new central universities. How was this number arrived at? Who determined the tradeoff between investing in existing institutions and creating new ones? As a first step, it is important to bring these allocations under some metric of public reasons. But it is also important to empower a variety of institutions, including universities themselves to make allocations.

The question of what principles should guide these allocations is a tricky one. There are different kinds of tradeoffs here. First, it is almost impossible for centralized planning to second guess what the structure of the labor market will be. Obviously, an education system, to a certain degree has to respond to the needs of the labor market. But trying to tailor an education system too closely may be like a general fighting the last war. Yet in the debates over how much to allocate for vocational as opposed to general education, it is precisely this knowledge that is assumed. There is a considerable debate in the OECD whether investment in general education (maths, articulation, and reasoning) has greater payoffs for future labor markets than investments in domain specific knowledge (Wolf, 2002). We would urge two considerations. First, decision makers need to address these questions with great care. Second, we also recognize that these questions are also both difficult and indeterminate. But this is precisely what suggests that an optimal institutional architecture for making these allocation decisions must be diverse (so that there is more information) and flexible (so that changes can be made in real time). Decentralization of these decisions at various levels is the only way of achieving diversity and flexibility in the basic architecture of public investment in higher education.

SUBSIDIES IN INDIAN HIGHER EDUCATION. An important issue in Indian policy debates is the extent to which the state should be investing and subsidizing higher education. The allegedly low social rates of return on higher education were frequently deployed during 1990s to reallocate public expenditure away from higher education. It has become commonplace to argue that India was anomalous in the emphasis it placed on higher education at the expense of elementary and secondary education. While the unconscionable neglect of primary education has distorted India's social policy, it is difficult to make a case that this is because of an overemphasis on higher education. India's gross enrollment ratios in higher education are still relatively low (around 10 percent) and, as table 5 shows, since 1999s, expenditure on higher education as a percentage of total expenditure on education remained roughly 18–19 percent, or about 0.6–0.7 percent of GDP. These ratios hardly signal an overemphasis on higher education.

Inspired by the same World Bank documents mentioned earlier, the Department of Economic Affairs, in its 1997 discussion paper, *Government Subsidies in India* (GOI, 1997), argued for a reduction of subsidies to higher education. It claimed that education beyond the elementary level is a "non-merit" service because the benefits of the subsidy accrue primarily to the recipients. It argued that the private rates of return are greater than social rates of return in higher education; hence, subsidies should be phased out.

One of the assumptions of this paper was that "most subsidies to higher education accrue predominantly to the better-off sections of society." This argument has been frequently deployed and has become a staple criticism of government subsidies to higher education. And it has been used to explain the contours of India's higher education policy. But this argument has to be taken with a grain of salt. For one thing, there is little doubt that marginalized groups have been given much greater access to education as a result of government subsidies. The ratio of male to female students in higher education dropped from 8.3:1 in the 1950s to almost 1.5:1 by the late 1980s. All the evidence from studies of primary and secondary education suggests that the place where parents discriminate most against a female child is in the preference for public versus private expenditure. Parents are more likely to incur private expenditure for sons than daughters. If this is the case, it is difficult to imagine these ratios dropping in the absence of public subsidies.

Another piece of evidence against the proposition that education subsidies go largely to the privileged is the increase in enrollment of India's most marginalized social groups, namely the Scheduled Castes (SCs) and the Scheduled Tribes (STs). The ratio of general to SC/ST students has dropped from almost 12:1 in the late 1950s to 8:1 during the late 1980s to just above 6:1 in 2004.[4] There is no reliable study on this, but there is strong suggestive evidence to show that the proportion of first generation graduates in universities has been rising dramatically in both state and, to a somewhat lesser degree, in Central universities. If one uses the fact that at least one parent was a graduate as a proxy for privilege, then the dramatic increase in the proportion of first generation graduates belies the claim that state expenditure only subsidises the privileged.

Global patterns of funding clearly show that higher education remains very much a state-dominated sector. In the OECD countries such as Denmark and Holland, public funding provides 98 percent of the resources

4. As of 2004, total enrollment in higher education in India was 11.77 million of which SC was 1.26 million and ST 0.434 million (MHRD, 2007).

for higher education; the figure is almost 90 percent for Canada. Even in the United States, the figure is as high as 78 percent. There is absolutely no doubt that the public sector has a pre-eminent role to play in higher education (Kapur and Crowley, 2008).

The need for subsidies is not at issue. What is at issue is their form and structure. Historically in India there have been few moves by the government to remove subsidies and recovering user costs. The recovery of user costs (or costs recovered from students) remained at roughly 5 percent during the entire decade, substantially less than the Punayya Committee's recommendation that the government aim at recovering 25 percent of costs from students.[5] The general principle has been more widely accepted both by the Eleventh Plan and the National Knowledge Commission. But there are risks in the way in which this might be implemented for public universities. While this proposal is a good aggregate *target*, the outcome will be suboptimal if this is converted into a simple formula applicable to *each university*. For the ability of institutions to raise fees and resources will vary considerably. The risk of rigidly imposing this formula may be to enfeeble weak institutions even more.

The second issue with subsidies is that the cost of education bears no relationship to the earning potential of degrees. In other words, the issue is whether fees structures are rationalized in relation to markets for *individual* students based on their potential earning capacity, background, and so forth. There is a sense in which a lot of middle-class students are beneficiaries of subsidies in that the fees they pay has no relation to their earning potential. But the emphasis on uniformity translates into uniformly low fees. Indeed, it is an astonishing application of the uniformity principle that even in areas of fees, the requisite degree of variation is not allowed, adding to the impression that subsidies go to the rich. Thus, even as Indian students are going abroad in droves, spending nearly two orders of magnitude per capita than the Indian state spends per student in India, even elite public educational institutions are constrained from raising fees that correlates with the earning potential of graduates. A proper fee structure requires that fees should bear a relationship, not to the cost of education but to the initial earnings of students after graduation. This is equivalent to a risk-sharing contract or a "claw-back"

5. The target of recovering 25 percent through fees was probably arrived at by looking at the East Asian example. South Korea has gross enrollment ratios in higher education of 47 percent and recovers 23 percent of its expenditure as fees; Indonesia has an enrollment ratio of 11 percent and a recovery of 25 percent; Malaysia has an enrollment comparable to India's of around 8 percent and like India recovers only 6 percent in fees.

mechanism based on real future stream of student earnings rather than costs of a monopolist, which is also more fair to both parties.

Public universities in India need radical reform on every single dimension imaginable. Detailing those reforms would take a paper in its own right. These institutions are run on an endless series of perverse incentives that militate against productivity and excellence, much of the investment is not matched to the objectives and educationists have little control over pedagogical and evaluation decisions. To take a few examples: One of the striking features of university expenditure is that most of it goes to salaries; in some instances as much as 95 percent of total expenditure. The result is, to put it mildly, very poor infrastructure and intense competition for scarce resources resulting in intense politicization. The second feature leading to a dramatic politicization of university life was the introduction of the so-called promotion schemes during the late 1970s. Under this scheme university promotions were considered analogous to civil service promotions, in that one ought to be entitled to promotion if one had demonstrated minimal competence. In principle, this scheme had all kinds of review mechanisms built into it, but it essentially resulted in two things. It enabled many mediocre academic professionals to rise to top positions of responsibility and decreased the mobility of individuals who were seeking promotions across universities. In some ways, this scheme did most damage not by removing incentives for performance (it could, in principle, have attracted more talent to universities), but by ensuring that non-academically oriented administrators got the upper hand in university administration. There is some argument over whether this scheme was a response to real pressure from the teaching community or a pre-emptive attempt by the state to buy them off. But the net result is that the clout of the teaching community is considerable. It does not take the form of policy formation (teachers unions do not have that sense of corporate identity), but as a powerful lobby that has resisted attempts at change and reform in the education system. One striking feature is that of the ten universities we surveyed, it was almost always teachers who went on strike rather than students during the past decade. The point is that a nexus of state power and the entrenched educational establishment more or less governs policy in the area of education.

One area we would like to highlight that cuts across the public and private divide is the issue of "quality." At one level, there is a great concern with quality. But the credibility of institutions depends largely on the *selection mechanism* for students. In fact, part of the ideological evolution of the system has been the displacement of debates over pedagogy to debates over

selection mechanisms. But even this focus on selection mechanism is largely at the top institutions (table 6). There is a potentially radical conclusion that could be drawn from the Indian experience. Rather than worry about the quality of higher education institutions per se, India should simply replicate the success of Indian Institute of Technology (IIT) or Indian Institute of Management (IIM) selection mechanisms on a larger scale and across different domains across the country. The success of the National Law Schools in resuscitating legal education is an example.

TABLE 6. Selectivity of Elite Indian Higher Education Institutions

Entrance exam	*Higher education institution*	*Number of examinees*	*Successful candidates*	*Percentage successful*
CAT	Indian Institutes of Management	180,000	1,200	0.66
JEE	Indian Institute of Technology	300,000	5,500	1.8
All-India PMT	Pre-Medical	214,503	1,654	0.77
All-India Engineering Exam	National Institutes of Technology	490,193	11,000	2.24

Source: Authors' estimates.

As a thought experiment, suppose India simply abolished most of its non-performing universities and dispensed with formal requirements of having a degree and instead put in place a series of well-designed exams, which students can take at periodic intervals. How they choose to "study" for these is left entirely up to them. These exams would be such that they would carry the kind of credibility IIT–JEE does at the moment; except that they would send credible signals to employers about the "quality" of recruits. To be sure, there are soft skills that may not be captured by this process, but it is hard to see how it could be worse than the status quo. On this view, what India needs is simply a deepening and widening of some objective "selection mechanisms" and the focus on institutions is of comparatively little consequence. In a *de facto* sense, the Indian system is moving more in this direction. The focus here is picking out good individuals through centralized selection mechanisms rather than building good institutions. But there might be huge externalities associated with picking out quality only through objective, non-discretionary exams. The first is that is makes education more Darwinian. The second is that it gives up on the idea entirely that institutions can help *improve* the average quality of students.

We have stressed how incentives and ownership of institutions militates against *pedagogical* diversity and debate. Currently the "legitimacy" of academic institutions in India are entirely premised on their selection

mechanisms, and very little on pedagogic achievements (which, in any case, are difficult to benchmark). The political, policy, and ideological debates in higher education in India pay virtually no attention on pedagogical debates to what it is that college educators claim to be providing. It is perhaps a sign of how low the system has sunk that, at least in the "public" system, the debate over what it means to be a university in the 21st century has barely begun.

Distorted Philanthropy

In discussions on the privatization of education, a good deal of emphasis is placed on the potential of private philanthropy to make up for the deficiencies of the state or the market.[6] It is for this reason that we decided to examine some of the broad trends in philanthropy in education. To put it briefly, there is very little evidence so far that philanthropy has been able to even make a dent in the deficits bequeathed by the state in this sector. Indeed, we argue that the structure of philanthropy has exacerbated the distorted forms of privatization, we discussed above, in the following ways:

1. There is a good deal of confusion in Indian official assessments and public discourse at large between philanthropy and not-for-profit educational institutions.
2. Philanthropic commitment to public institutions of higher education has been steadily declining since the middle of the century. Philanthropy is being "privatized" in two senses. First, donors to higher education are more likely to retain effective control over the resources they donate. Second, philanthropy is being conflated with creating not-for-profit but financially sustainable institutions. In these institutions, financial sustainability does not refer to receiving income from endowments and investments, but to charging the beneficiaries for the services being provided to them.
3. This form of philanthropy is having many adverse consequences for the credibility of public institutions and philanthropic activity related to higher education in general.
4. Public institutions of higher education are unlikely to attract significant amounts of philanthropic investment in the near future because of their own weaknesses and the lack of a philanthropic sensibility

6. For an analysis of policy issues on charitable contributions see Modi and Mukhopadhyay (2000); for patterns of philanthropy see Sundar (2002); for an early study of voluntary contributions see Tilak (1983); and for diasporic philanthropy see Kapur et al. (2004).

amongst most potential donors of the kind that existed in pre-independence India.

5. Philanthropy can still play a significant role in higher education in India, but it will have to take different organizational forms than the ones we have seen in the recent past.

Philanthropy is one of the ways in which the relationship between public and private is negotiated. All philanthropic activities, or non-profit organizations claiming tax benefits, must pass the following two tests:

1. The Public Purpose Test: The organization that claims tax exemption must operate *primarily* for some purpose other than private gain. The idea is not that such organizations avoid profit (understood as excess of revenues over expenses), but rather on the existence of a substantial public purpose.
2. Non-distribution of Surplus: Such organizations are barred from dis-tributing their net earnings, if any, to individuals who exercise control over it, such as members, officers, directors, or trustees. This is known as the "non-distribution constraint."

A major difficulty in the Indian case is whether most private institutions that claim tax-exempt status qualify as "philanthropic." This has been a major legal conundrum and, as we have noted in another section, judicial decisions have done little to add clarity on the issue. There are major legal and conceptual difficulties in fixing the boundaries of what ought to be regarded as tax-exempt, philanthropic or non-profit activity in the field of higher education. By definition, all Indian universities and private colleges (excluding non-degree giving diploma institutes like computer training conglomerates NIIT and Aptech) are "non-profit" organizations, but this category is too blunt and does not distinguish between say, capitation fees colleges in the south and a regular college run out of trust funds that does not charge students. Technically, both are non-profit institutions and qualify for tax exemptions. But there is a good deal of suspicion whether investment in private unaided colleges can be called "philanthropic" at all, even though they are formally not-for-profit.

Indeed, it was the recognition of this difficulty that led a GOI committee (the Parthasarthi Shome Committee) to propose an amendment to the legal definition of the term "charitable." The Shome Committee recommended that only organizations that receive 90 percent of their annual receipts through

donations or grants be treated as organizations for a charitable purpose. The underlying rationale is that donors are best placed to judge whether the activities of an organization are charitable or not. To the extent that an organization receives the bulk of its income from donations, the activities of the organization could be perceived to be predominantly charitable in nature. However, the criterion presented by Shome Committee's definition of "philanthropic" or "charitable" would disqualify most existing organizations. Donations are an uncertain source of income for most organizations; free-rider incentives often keep the flow of funds to organizations below the socially optimal level; trusts run on donations are only part of the spectrum of philanthropic activity; and many NGOs are engaged in economic activities designed to generate incomes to make the poor self-reliant. The Shome Committee wanted a criterion of charitable that was based on *source of income rather than end purpose*.

But whatever the difficulties with the Shome Committee's recommendations, it did highlight a central issue in the field of higher education and philanthropy: should institutions of higher education that derive almost 100 percent of their revenue from charging students for goods and services be classed as "philanthropic"? Or should a classification of "philanthropic" take into account some criteria of the source of income?[7] The extent of philanthropy in higher education in India depends upon whether or not one classifies a large number of private colleges as surrogate businesses or as genuinely philanthropic. This phenomenon is of some interest because it helps to shed light on an apparent paradox—while the number of "trusts" set up for philanthropy in higher education has been rising steadily, the total share of "endowments and other sources" in higher education (that is, resources excluding government expenditure and fees) has declined sharply and is now 2.74 percent of all education expenditure, down from a high of 11.62 percent in 1951 (Modi and Mukhopadhyay, 2000). In other words, while the number of educational trusts is increasing, most of them are generating revenue by charging for services rather than through donations or endowments. Although more comprehensive data is needed on this, it appears that philanthropy in higher education has increased, if one uses as a measure the total number of trusts and volume of activity. However, the picture is the opposite if the measure is the source of income.

7. Interestingly, the formal legal definitions of "charitable" in India are all based on objectives of the organization concerned. Formally, even the Board of Cricket Control in India (BCCI) is a charitable organization because "cricket" appears on a government list of objectives that it desires to promote.

The pre-independence period, or that between 1892 and 1947, has been termed as the "Golden Age of Indian Philanthropy" (Sundar, 2000). Indian philanthropy not only made the transition from merchant charity to organized, professional philanthropy but did so on an impressive scale. This period saw the establishment of some of India's most enduring trusts and foundations and public institutions of enduring significance. Aligarh Muslim University, Banaras Hindu University, Jamia Millia, Annamalai, Indian In-stitute of Science, among others, were created largely through voluntary donations. Higher education, especially institutes of research were widely considered to be "pioneering." Of the 16 largest, "non-religious" trusts set up during this period, 14 were major patrons of higher education.[8] India's most renowned research institute, the Indian Institute of Science, is a case in point having been set up with the strong support from the then Maharaja of Mysore and Jamsetji Tata (Bhagwan, 2003).

What is even more striking is that a major proportion of their grants went to "public institutions" such as universities that were either directly under state control or some form of public authority. It is not only the object of their spending that is of interest but also the manner in which money was spent. Arguably, philanthropy had much closer links with public institutions in the most literal sense of that term. Grants, although emanating from family trusts were, once made, not under the control of family trusts and were deployed for specific purposes by the terms set by the receiving institutions and not by the trust itself. The net result was that the net share of private philanthropy in shouldering the burden of public institutions was as high as 17 percent in 1950 and is now down to less than 2 percent. That this share would decline does not come as much of a surprise as the government has expanded its role in higher education. Even so, the extent of the decline is striking.

Alumni contributions are beginning to rise but have been most noticeable only in the case of IITs (since about the mid-1990s), which have been able to tap into a large base of professionalized alumni among the Indian diaspora. However, even as this effort was gathering pace, the Indian government's Human Resource Development Ministry formed the Bharat Shiksha Kosh (India Education Fund) in 2003. The Indian Parliament's Standing Committee on Human Resource Development simply noted that "the contribution of the Government to the Bharat Shiksha Kosh should

8. These trusts are Tatas (Sir Ratan Tata, Sir Dorabji Tata, and JRD Tata), Bajaj, Birla (G. D. Birla and B. M. Birla), Lalbhai, Sarabhai, Godrej, ShriRam, Singhania, Modi, Annamalai Chettiar, Murugappa group (AAM Foundation), Naidu, Ramco, Mafatlal, and Mahindra.

definitely have been more than Rs. 1.00 crore considering the mammoth task of funding from the Kosh."[9] But by centralizing all overseas donations for education to the fund, the move effectively denied would-be donors any say in the purposes for which the money was used. Since the fund was set up, individual contributions to IITs dropped dramatically. Kanwal Rekhi, a founder member of TIE (The Indus Entrepreneur) who had funded an IT school at his alma mater IIT-Mumbai, called the Fund "the most asinine thing I ever heard in my life." He went on to say, "Donors are making voluntary gifts because of emotional attachment or commitment to the institutes. They will not hand off money to a nameless bureaucrat or a feckless politician (Lakshman, 2003)."

While the decision was reversed by the successor UPA government, allowing alumni to contribute directly to their alma maters, its populist stance on reservations for Other Backward Castes (OBC) at the IITs and IIMs has hardly helped in this regard, underscoring the uncertainties of the regulatory structure in this sector. The lack of autonomy of educational institutions has been one of the biggest impediments in attracting diasporic philanthropy for higher education. Alumni who are prepared to give substantial resources also want to have a say in its use and an institutionalized mechanism to have their voices heard. However, the governance structures of most higher education institutions are so poor that such mechanisms are non-existent. Nearly half of the alumni of the All India Institute of Medical Sciences (AIIMS) are overseas, but they have balked at contributing since they have little say in the governance of that organization (Kapur et al., 2004). The recent intrusiveness of the Health Ministry in the institution's governance, has all but paid put to any possibility of alumni contributing to the institution.

The Political Economy of Higher Education

The previous section has demonstrated that all three areas of higher education provision in India—state, private, and non-profit—suffer from severe distortions. Why do they persist and why is it so difficult to change them?

9. Parliament of India, Rajya Sabha, 145th report on action taken by government on the Department-related Parliamentary Standing Committee on Human Resource Development recommendations/observations contained in the 139th report on demands for grants 2003–04 (demand no. 57) of the department of secondary and higher education (Ministry of Human Resource Development). (Presented to the Rajya Sabha on December 12, 2003; laid on the table of Lok Sabha on December 12, 2003; Rajya Sabha secretariat, New Delhi, December, 2003.)

De Facto Privatization

The starting point of our discussion of the political economy of higher education is an overview of the trends towards privatization in Indian higher education. For Indians, higher education has been, in Stanley Wolpert's (1999: 147) evocative words, "the swiftest elevators to the pinnacles of modern Indian power and opportunity." This realization, coupled with the severe limitations of publicly-funded higher education institutions and the greater purchasing power of the middle class, means that Indians are prepared to pay rather than be denied. According to the National Sample Survey (NSS) data, the government's share in overall education expenditure has been declining steadily, from 80 percent in 1983 to 67 percent in 1999. For states like Kerala, the decline is steep, from 75 to 48 percent, while for Madhya Pradesh it is from 84 percent to 68 percent. Indeed, while private expenditure on education rose 10.8 times between 1988 and 2004, that for the poor rose even faster, by 12.4 times. Many students who formally enroll in publicly-funded colleges and universities barely attend classes there. Instead, they pay considerable sums to the burgeoning private sector vocational IT training firms such as NIIT and the Aptech or in new professions such as the "Aviation University" being set up by the UB group.[10]

However, the most noticeable trend has been the transformation in the provision of professional education, especially engineering, medicine, and business schools. We analyzed data on all medical and engineering colleges in India to understand how the ownership structure has changed over the last four decades. Data for medical colleges was obtained from the Medical Council of India's website, which gives the year of establishment, an ownership classification as "Government" or "Private" (institutions set up under the Societies Act or as trusts), and the number of seats for each institution.[11] We examined data for 19 major states of India—Assam, Andhra Pradesh, Bihar, Chhattisgarh, Delhi, Gujarat, Haryana, Himachal Pradesh, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Punjab, Tamil Nadu, Uttar Pradesh (UP), Uttaranchal, and West Bengal. Similar data for engineering colleges was obtained from the All India Council for Technical Education (AICTE).[12]

The data are presented in table 7, and figures 1 and 2. In the case of engineering colleges, the private sector, which accounted for just 15 percent

10. According to Finance Ministry data cited in *The Hindu*, since its launch in 2001 the Education Loan Scheme has grown from roughly 50,000 accounts and Rs. 670 crore loans as on March 31, to approximately 153,000 accounts and Rs. 2,600 crore loan amounts on March 31, 2004. **"**Education loan scheme simplified," *The Hindu*, August 11, 2004.

11. See http://www.mciindia.org/apps/search/

12. See http://www.aicte.ernet.in/

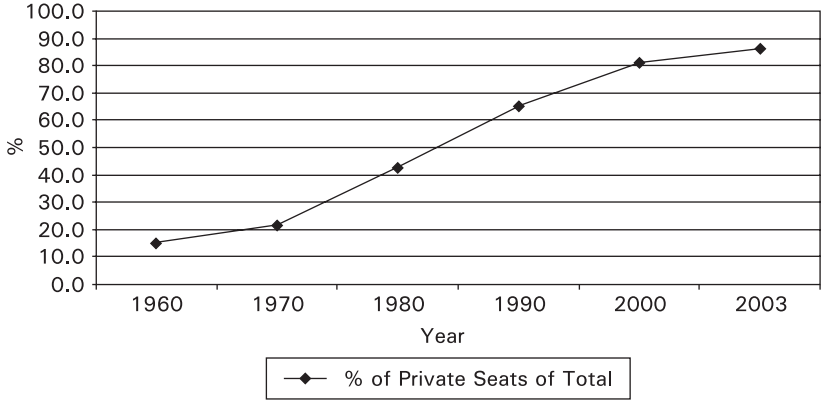
TABLE 7. Management Structure of Engineering and Medical Colleges Across States (2003)

State	Medical colleges		% Private	Engineering colleges		% Private
	Government	Private		Government	Private	
Andhra Pradesh	14	14	50.0	10	213	95.5
Assam	3	0	0.0	3	0	0.0
Bihar	6	2	25.0	4	3	42.9
Chhattisgarh	2	0	0.0	2	9	81.8
Delhi	5	0	0.0	7	7	50.0
Gujarat	8	4	33.3	9	16	64
Haryana	1	2	66.6	7	29	80.5
Himachal Pradesh	2	0	0.0	2	3	60.0
Jharkhand	0	2	100	4	2	33.3
Karnataka	4	22	84.6	13	99	88.4
Kerala	7	8	53.3	31	51	62.2
Madhya Pradesh	5	1	16.7	6	47	88.7
Maharashtra	19	18	48.6	16	133	89.3
Orissa	3	0	0.0	6	38	86.4
Punjab	3	3	50.0	11	27	71
Tamil Nadu	12	7	36.8	16	234	93.6
Uttar Pradesh	10	2	16.7	25	58	69.9
Uttaranchal	0	2	100.0	5	4	44.4
West Bengal	7	0	0.0	15	37	71.2

Source: Data supplied to the authors by the Medical Council of India and AICTE.

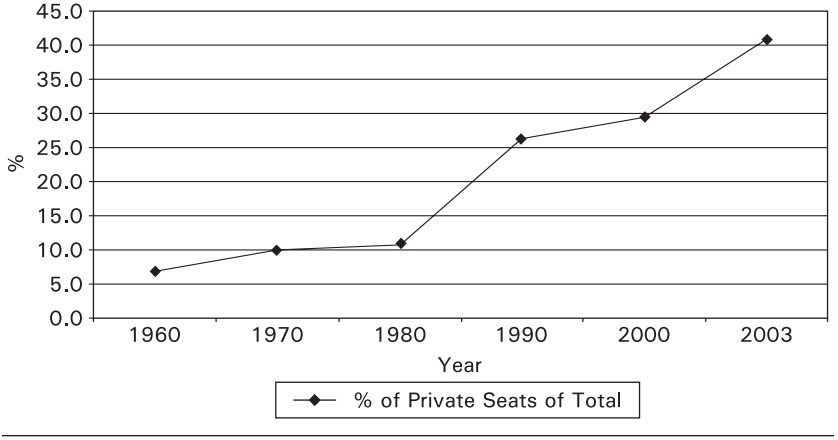
of the seats in 1960, accounted for 86.4 percent of seats and 84 percent of all engineering colleges by 2003. In the case of medical colleges, the private sector dominance is less stark, but the trend is unambiguous: the proportion of private seats has risen from 6.8 percent in 1960 to 40.9 percent in 2003. While we do not have precise data, the situation in more than 1000 business schools suggests that 90 percent are private. Even in general education, there is now a mushrooming of private, self-financing colleges. In Kanpur University (in UP), the number of such colleges outnumber

FIGURE 1. Private Engineering Seats (% of Total)



Source: Authors' estimates based on AICTE and MCI data.

FIGURE 2. Private Medical College Seats (% of Total)



Source: Authors' estimates based on AICTE and MCI data.

state-assisted colleges 3 to 1, while in Tamil Nadu, self-financing colleges com-prise 56 percent of general colleges and 96 percent of engineering colleges (Srivastava, 2007). Educational institutions, including private universities and coaching centers, have emerged as the largest advertising spending category in print media (which has the largest share of the advertising market in India) (Mookerji and Kaul, 2005). Even as political parties rail against *de jure* privatization, *de facto* privatization continues unabated.

For long, it was taken for granted that private universities (as distinct from private colleges) needed approval from the UGC. After the break-up of Madhya Pradesh, the Ajit Jogi-led Congress government in Chhattisgarh saw a regulatory loophole and enacted the Private University Act in 2002. Hundred and eight such universities came up in the state, with 94 in the state capital (Raipur) alone. After a new BJP government came to power, it passed the Private University Amendment Bill in 2004, under which proprietors of all private universities would have to deposit Rs. 2 crore with the government and prove that they have 25 acres of land for their institutions. Belatedly, the UGC came up with the UGC Establishment of and Maintenance of Standards in Private Universities Regulations 2003. Each private university would now require a separate State Act conforming to the relevant provisions of the UGC Act. Interestingly, the private universities set up were using the state's regulatory largesse, and, even to the limited extent, they were delivering educational services, were doing so outside the state, under the nomenclature of these being off-campus centers. The new UGC regulations try to curb this loophole as well. A university set up under a State Act shall operate "ordinarily within the boundary of the State concerned," and can open off-campus centers (outside the home state), off-shore (abroad) centers, and study centers only "after the development of main campus… and after five years of coming into existence." Even then, it would require the prior permission of the UGC and the government of the host state, and such approval would be forthcoming in unspecified "exceptional circumstances." On the other hand, the admission, fee structure, and programs of study of the private university will have to conform to the norms and regulations prescribed by the UGC and other statutory bodies.[13]

13. "A private university shall fulfill the minimum criteria in terms of programs, faculty, infrastructural facilities, financial viability, etc. as laid down from time-to-time by the UGC and other statutory bodies such as the All-India Council for Technical Education, the Bar Council of India, the Distance Education Council, the Dental Council of India, the Indian Nursing Council, the Medical Council of India, the National Council for Teacher Education, the Pharmacy Council of India, and so on (Government of India, 2003)."

The degree to which states have allowed the establishment of private higher education institutions varies considerably (table 7). The number is greatest in the southern states and Maharashtra, and least in states like Bihar and West Bengal. However, most other state governments are now following suit. Caught between escalating demand and ballooning expenditure on higher education, even communist West Bengal has begun to reduce funds to meet the salary requirements of teachers and non-teaching employees for private undergraduate colleges in Calcutta (Mukherjee, 2004a). Gradually, the state plans to eliminate its annual commitment of Rs. 350 crore on the more than 240 general-degree colleges run by private bodies. However, the state government has been adamant that any self-financed undergraduate general degree colleges be affiliated with the state-run University of Calcutta.[14]

There are three key reasons for the expansive stance of political parties from all ends of the ideological spectrum: the state's fiscal limitations; partial diffusion of the reservation conundrum by expanding supply; and, with earlier sources of patronage exhausted, the search for new sources of patronage. The license *raj* may have been dismantled in industry, but it is flourishing in higher education. The non-profit status allows for tax exemption and makes it easier to launder money; it also gives access to free land without inviting a PIL; and, given the demand, virtually any institution has a market. We examine the governance of private sector institutions in greater detail in the next section.

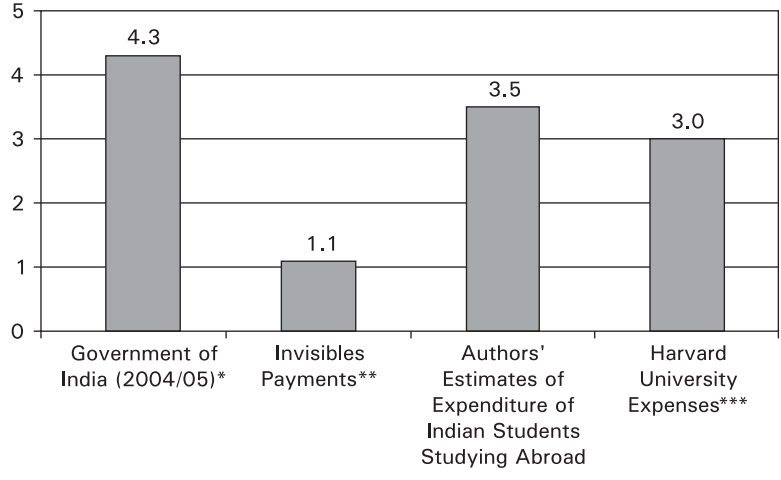
The exit of students to private suppliers of higher education is a phenomenon not limited to India's borders. While the numbers are lower, the overseas purchase of higher education has much greater financial implications. In 2006 we estimated that there were more than 150,000 Indian students studying abroad—nearly 80,000 in the US; about 40,000 in Australia; 19,000 in UK; and another 11,000 in Canada, New Zealand, and Singapore. Pre-liberalization, the figures were barely one-fifth of this number. The main growth has been in undergraduate education and professional degrees (especially MBAs), both of which require students to put up their own money. We have two estimates of the amounts spent by Indians on consuming education abroad: invisibles data from the Reserve Bank of India (RBI) balance of payments and our own calculations based on average costs of education in these countries with allowances for scholarships. The RBI estimate was $1.06 billion in 2005–06, more than ten-fold the amount in 2000–01 ($95 million). This is a lower bound, since in many cases the money is paid

14. The one condition on the self-financed colleges is that they have to offer courses in emerging areas like bio-technology, molecular biology, and business administration. See Mukherjee, 2004.

from overseas. Our estimate for 2005–06 is about $3.5 billion, a staggering amount for a poor country whose own educational institutions are starved of resources (figure 3).

FIGURE 3. Higher Education Expenditures (2005–06)

billion US$



Sources: *MHRD Annual Report 2006/2007, Table 35.
Notes: **Statement 3, RBI Bulletin "Invisibles in India's BOP" November 2006.
*** Harvard University 2007 Online Factbook.

Even more important than the financial costs are the implications for public education when elites leave. Indeed, the dilemma is a more basic one—the consumption of public services by elites has adverse distributional effects. But when elites exit, so does their voice. The big difference between the higher education systems of Pakistan and India is that elites in the former invariably sent their children abroad even for undergraduate education and consequently had little stake in the system. The results have been disastrous for higher education in Pakistan. Could India face a similar problem?

This reality is lost to Indian policy elites, especially in the HRD Ministry which is strongly opposed to the General Agreement on Trade in Services (GATS) (although the Ministry of Commerce has been an advocate). The Indian policy is expressed by the HRD Ministry:

> The revised offer made by India at the GATS was to partially open up the Higher Education Sector under the condition that Higher Education Institutions can only charge fee as fixed by an appropriate authority and that such fees do not amount to charging capitation fee or lead to profiteering. The provision of the Higher

> Education services would also be subject to regulations already in place or to be prescribed by an appropriate regulatory authority (MHRD, 2007: 232).

Hardly the most welcoming policies to attract the world's best universities, especially when so many countries are vying for their attention.

Whose Interests Does this System Serve?

The three key variables that help to understand the political economy of India's higher education are the structure of inequality in India, the principal cleavages in Indian politics, and the nature of the Indian state. While India is not exceptional by conventional measures of income inequality, it is an outlier when measured by educational inequality. Indeed, India is to educational inequality what Brazil is to income inequality (Kapur, 2007). Such extreme inequalities inevitably result in populist redistributive backlash. However, the specific redistributive mechanisms are conditioned by the principal cleavages in Indian politics and the nature of the Indian state. The growth of identity politics has sharply enhanced political mobilization around two key cleavages in Indian society: caste and religion. Consequently, redistributive measures follow these two cleavages rather than other possibilities such as income and class, region (urban-rural), or gender. Moreover, given the fiscal constraints of the Indian state and the shifting locus of rents, since the resources available for redistribution are very limited, redistribution focuses on much more "visible" forms. This explains why India's poverty alleviation programs focus on "visible" club goods such as employment programs rather than less visible public goods such as health and education. And this is also why in recent years Indian politicians have obsessed over reservations in elite institutions in higher education rather than improve the quality of primary and secondary schooling, and the thousands of colleges of abysmal quality.

The battle over admissions to higher education institutions in India is as old as independent India. In 1951, a Brahmin girl was denied admission to a medical college in Madras even though she had scored sufficient marks. The student appealed to the Supreme Court claiming she had been discriminated only based on her birth (caste). The Court agreed and struck down the Madras government order.[15] Major agitations broke out in the state and the resulting pressure forced India's first constitutional amendment even

15. Champakam Dorairajan challenged a government order issued by the government of Madras Province (as it was then called), earmarking admission of students to engineering and medical colleges of the state strictly on the following basis: of every fourteen seats, six were to be allotted to Non-Brahmin (Hindus), two to Backward Hindus, two to Brahmins, two to Harijans, one to Anglo-Indians and Indian Christians, and one to Muslims.

before the Lok Sabha had been formed. The amendment (adding Clause 4 to Section 15 of the Constitution) now read: "Nothing in this Article or in Clause 2 of Article 29 shall prevent the state from making any special provision for the advancement of any socially and educationally backward classes of citizens or for the Scheduled Castes and the Scheduled Tribes." The unambiguity implied in "nothing" combined with sufficient ambiguity of the term "socially and educationally backward classes" would prove fertile terrain for political populism.

The social re-engineering that began in Madras province gradually spread to the rest of the country over the next half century. The confluence of identity and redistributive politics meant that higher education—the erstwhile preserve of India's upper castes—would inevitably become the battle ground of politics, especially as the "silent revolution" empowering lower castes gathered force. Indeed, the mismatch between new social groups holding political power and erstwhile dominant social groups entrenched in universities led the former to deliberately undermine state universities (exemplified in Bihar in the 1990s), since in doing so they were also undercutting the social power of old upper caste elites.

The other cleavage of Indian politics—religion—is also manifest in higher education policies. The Constitution of India (Articles 29 and 30) provides special protection to linguistic and religious minorities in the country, allowing them to preserve their culture and traditions through minority institutions with few government controls. However, when government controls are circumscribed for "minority" institutions but mount for all other private higher education institutions, the incentives for each group to classify itself as a minority are obvious. Meanwhile, those minorities—Muslims—for whom the original protection was put into place get little more than symbols. The HRD Minster Arjun Singh's declaring Aligarh Muslim University (AMU) "a minority institution"—later declared unconstitutional by the courts—even when the Muslim community was not pushing for it, is a case in point. When the Sachar Committee on the status of India's Muslims showed that the socioeconomic status of Muslims was relatively lowest in the states ostensibly most committed to secularism—the Samajwadi Party (SP)-governed UP, and the CPM-governed West Bengal—the states rushed to announce the creation of special universities for Muslims. A day after the final exit polls for UP elections in 2007 showed the SP losing, the government of Mulayam Singh Yadav called a special session of the State Assembly whose sole agenda was to pass a bill granting minority status to the Mohammad Ali Jauhar University in Singoor, Rampur (the constituency of his Urban Development Minister, Azam Khan) and making Khan the university's lifelong chancellor.

With the university having been accorded minority status, any irregularity in its functioning could be probed by the UGC only after being cleared by a three-fourths majority in the Assembly. The analytical point is that when entry barriers arising from regulatory control vary across communities, the consequences are worrying both for politics and for education.

In 2007, India's best known liberal arts college, St. Stephen's College, announced a new reservation formula for Christians and the introduction of a separate quota for Dalit Christians citing the college's "Christian foundation" and unambiguous identity as a "mission college" to justify the new quotas. Forty percent of the seats in the college will now be reserved for Christian students as against the earlier 32 percent, and 25 percent of these will be set aside for Dalit Christians. Quotas for SC, ST, disabled, sports, and children of defense personnel will add another 20-odd percent. Only 40 percent will be purely on examination results—this, in an institution where 95 percent of the funding of the college is from the Government of India (via the UGC). The creation of many new central universities is also driven by similar motives. The Babasaheb Bhimrao Amedkar University and Mahatma Gandhi Antarrashtriya Hindi Vishvavidyalaya have total enrollments of 435 and 200 respectively, a decade after they opened—hardly the sorts of numbers that would enhance the ostensible social goals underlying their creation.

Nonetheless, the choice of instruments used by the Indian state to advance the cause of "backward classes" remain puzzling. Consider the recent extension of reservations to OBC in the IITs and the IIMs on grounds of helping India's "depressed classes." The total number of annual admissions in the IITs are just 5500 and in the IIMs a further 1200. The second-tier national engineering colleges [the National Institutes of Technology (NIT)] have another 11,000. The number of engineering colleges in India nearly tripled in the last decade—from 562 in 1997–98 to 1,522 in 2006—while their annual intake grew from 134,298 to 550,986 (MHRD, 2007). Thus, although the IITs account for just 1 percent of all engineering graduates, they attract most of the attention.

It may appear that equity goals may be better pursued in expanding the size and quality of the base on a *prima facie* basis. The dismal condition of public primary education is a stark testimony to the level of commitment to this ideal. However, it could be argued that even with the best of intentions the sheer magnitude of the task means that it would take a long time. Why not try something that would promise faster, though more limited results? If that were the case, then interventions at the secondary school level would be warranted. The gross enrollment ratio in Class IX–X is 51.65 percent

but drops sharply to 27.8 percent at Classes XI–XII. Even a modest reduction in the dropout ratio could significantly increase the potential college-going pool among the backward classes. But there has been little effort directed to this end. Let us suppose that there is an imperative need to immediately improve access to tertiary education for the backward classes. Clearly, sharply increasing the resources directed for this purposes would be a beginning. At the secondary level, the Annual Plan expenditure for the purposes of improving "Access and Equity" is Rs. 3.9 crore while another Rs. 3.7 crores has been earmarked for "Quality Improvement in Schools." At the tertiary level, UGC's entire expenses to this end are Rs. 84 crore: Rs. 26 crore for special development grants to universities and colleges in backward areas; Rs. 25.6 crore for remedial coaching of SC/ST students and disadvantage minority communities; and Rs. 8.8 crore for coaching SC/ST students and disadvantage minority communities for entry into services. There is no evidence of the effectiveness of these programs.

An insight that might explain the choice of instruments comes from Mani and Mukand (2007), who argue that a "visibility effect" distorts governmental resource allocation and explains why governments neglect provision of essential public goods, despite their considerable benefits. Greater democratization widens the gap in resource allocation between more visible (such as specific poverty projects) versus less visible (such as malnutrition prevention) public goods, up to an intermediate level of democracy (after that this gap decreases). The specific instruments to address distributive issues in India illustrate this trend.

The university system in India is the collateral damage of Indian politics. The vast majority of government colleges in small towns offer dismal educational outcomes, the result of tight control of appointments, fees, curriculum, and capital improvements. With fees in some of these colleges capped as low as Rs. 9 per month, and the state picking up salaries for civil service like faculty jobs, with little work burden, there are considerable rents around to get those jobs. Running government higher education institutions to the ground is not the result of limited resources but a matter of deliberate strategy. For politicians, there are four benefits of the license-control *raj*:

1. Old-fashioned rent seeking on contracts, appointments, admissions, and grades:[16] At the Center, the HRD Ministry appoints more than 100 heads for the key higher education institutions. There are hundreds

16. The examples cited here draw from various issues of *Education World* as well as newspaper articles.

of discretionary grants to government-aided institutions and building contracts. The situation is far worse at the state level as examples from just two states illustrate.

Karnataka: The credentials of the nominees of JDS (Janata Dal Secular)-BJP coalition government to the governing syndicate of Bangalore University were so dubious as to be rejected by the previous vice-chancellor (VC). A new more pliable VC accepted all of them–and their power to steer contracts and appointments despite the Karnataka Universities Act, 2000 which requires all members of the governing syndicate of Bangalore University to be "eminent educationists." The first VC of the all-women Karnataka Women's University, Bijapur, has been indicted by the Justice S.R. Venkatesh Murthy Committee for large scale misappropriation and maladministration. Despite this indictment she remained in office. In Tumkur University, which exists on paper, the VC was investigated for running up huge personal bills on the university account. At the Rajiv Gandhi University of Health Sciences, Bangalore, the Central Bureau of Investigation (CBI) recommended the filing of criminal charges against the VC, former registrar, and 30 other officials for deliberately leaking question papers to favored students writing the university's postgraduate entrance test and tampering with their answer papers.

Uttar Pradesh: In September 2005, the VCs of four universities—Mahatma Jyotiba Phule University, Rohilkhand, Bareilly; Veer Bahadur Singh Purvanchal University, Jaunpur; Sardar Vallabh Bhai Patel University of Agriculture & Technology, Modinagar; and Chandrasekhar Azad University of Agriculture & Technology, Kanpur—were dismissed by the governor, T.V. Rajeshwar Rao, on corruption charges. In August 2006, Class V students were found grading the postgrad answer papers of LLB, BCA, MCA, and nursing students of Chaudhury Charan Singh University, Meerut.

2. Old-fashioned patronage and partisan politics: The use of state resources for higher education directed for partisan purposes has been an accepted practice ever since Mrs Gandhi put large resources into the creation of Jawaharlal Nehru University (JNU) to enlist the support of intellectuals of a specific ideological bent. In the last decade this has become more blatant, ranging from Murli Manohar Joshi's (the HRD Minister in the BJP-led NDA government) attempts to pack various Indian Council for Social Science Research (ICSSR) institutions with academically inept partisans to the Left Front government in

West Bengal refusing to grant autonomous status to the venerable Presidency College, since it would then be unable to pack the faculty with its own supporters.

The demand-supply imbalance for affordable quality institutions means that the battle over the location of a few brand name institutions is even more intense. This includes not just the IITs and the IIMs but also the central universities. Recently members of the Left parties and the Dravida Munnetra Kazhagam (DMK)—fellow travelers in the UPA government—nearly came to blows in the Lok Sabha over the introduction of the Indian Maritime University Bill, 2007 which sought to locate a national-level maritime university in Tamil Nadu (the state from which the minister is from) rather than Kolkata (which has had a long-standing marine engineering college) (Hindu, 2007).

3. New entrepreneurial activities: Parliament in independent India was initially dominated by lawyers. Subsequently, agriculturalists became dominant. Today "educationists" are probably the most prominent. In many cases they have a direct interest.[17] In other cases, their names are used to signal protection, be it the Sharad Pawar University or the Arjun Singh Street in Jamia Milia Islamia University. The promotion of professional (medical, engineering, business management, and so on) colleges has become the private preserve of small-town politicians doubling as "educationists." It makes good financial sense to run government-run higher education institutions to the ground since it forces students and parents to look for more meaningful alternatives in the private sector—which are controlled by them. Politicians have emerged as the single largest provider of new higher educational institutions. The license control *raj* in higher education and the apparent horrified reactions to education becoming a commercial enterprise result in capitation fees being driven underground, thereby ensuring large amounts of untaxed income. And since the institutions are classified as Trusts and Societies, their reporting requirements are much less than if they were under the more transparent Companies Act.
4. Colleges as screening mechanisms for politics: It is usually assumed that an important function of higher education is to act as a signaling device to potential employers and labor markets. The better institutions indeed play that role in India. But the majority of government

17. The Union Health Minister Anbumani Ramadoss's father and Pattali Makkal Katchi founder, S. Ramadoss, established the Vanniyar Educational Trust which has recently set up a deemed university (Menon, 2006).

institutions (where the education is a farce) appear to serve a signaling role to an entirely different audience: political parties and politics. Since the education in these colleges—mostly in small towns and cities—have little effect in job markets, especially in the growing private sector, student politics serves as the signaling mechanism for aspiring politicians. The ability to win student elections and resort to street violence is an asset to all political parties.

The Three Vicious Circles

This section draws together the three fundamental effects of the preceding political economy. The first such vicious circle is the diminishing signaling effect. As evident from table 4, more than four-fifths of Indian students in higher education are not in professional schools like engineering or medicine. Investment in these institutions, on a per capita student basis, has been declining. In addition, most of 300-odd universities (especially state universities) to which the bulk of the student population is affiliated have stopped performing the essential functions of a university. The primary purpose of a university is to provide a minimal signaling effect to the job market. Most observers agree that Indian universities, with a few exceptions, do not perform this signaling effect. A degree from any of these universities could mean anything in terms of quality. Anyone familiar with the Indian education system knows that competitive exams have virtually replaced performance at the university level as a passport to further education or jobs. University degrees serve as formal minimal requirements but little else. A tacit acknowledgement of the breakdown of signaling effects of degrees comes from the principal regulatory authority of higher education, the UGC. For instance, in order to be eligible to teach at a public university, candidates with even a PhD have to take another qualifying test; this test was introduced to remedy the fact that the candidate's PhD in and of itself did not indicate anything about his or her abilities.

Once the signaling effect of a university system breaks down, three consequences follow. First, the curriculum and pedagogy of the university become less compelling. There is little incentive to take education at the college degree level seriously because these degrees are no more than purely formal requirements—they do not signal quality. Hence, there is no compelling demand for quality improvements in the bulk of higher education. Second, greater attention and resources are devoted to those arenas which now *de facto* perform signaling functions, such as entrance exams and competitive tests. This leads to the creation of an almost parallel system of education. Since the formal institutions are disconnected from these signaling mechanisms,

informal institutions such as coaching classes dominate the intellectual space. Third, there is an attempt to secede from the system. The breakdown of the signaling system is such that an Oxford Brookes University or a Deakin University are thought to be more credible signal providers than most Indian institutions. But of equal importance is the fact that almost all of these institutions incur significant private expenditures (systematic data is not available), which are largely borne by the middle class. Indeed, if the middle class was influential, one would expect that there would be great pressure and momentum to restore the credibility and signaling effects of higher education.

A second vicious circle stems from an ideological entrapment between half-baked socialism and half-baked capitalism, with the benefits of neither. In some ways this is best exemplified by the fact that officially there is an enormous reluctance to see education as an industry or business. Officially, as per the Supreme Court's decisions education can still not be a "for profit enterprise," though the Court will allow institutions to deduct "reasonable operating and other capital expenses." Second, the courts have been very strict about merit-based admissions (except in cases of affirmative action). In public institutions the Court has come down severely on discretionary power of institutions in admissions policies. In the case of "private" institutions the situation remains murky, but the Court has tried a compromise formula whereby half the seats are reserved for pure merit and half are based on the ability to pay. The details of regulatory control over education are complex but a few points stand out starkly.

First, there is a severe prohibition on public institutions mobilizing private resources in any form—higher fees, licensing arrangements, or philanthropy. While some of these regulations have been relaxed somewhat (discussed earlier in the section on philanthropy), the net result has been that a vast pool of private resources available has not been mobilized for public institutions. Although it seems only fair that no one ought to be able to "buy" one's place into an institution of education, from another angle this prohibition seems almost perverse. It has the consequence of saying,

> If you have money, you can spend it on education abroad, you can come to a private arrangement, or even waste it on any form of consumption, but the one thing you will not be allowed to do is to spend it at public institutions or on getting an education in India.

In effect, ideological commitment to some principle of equality has precluded the state from mobilizing the vast reservoirs of private money available for higher education. In a context where the sum total of private expenditures considerably exceeds expenditures by the state, this policy

needs to be rethought. One would have thought that it would be in the interest of both the middle classes and the newly rising social groups to find ways to access these resources. But ideological commitments have precluded such a mobilization. And since these funds have not been mobilized, the system of education deteriorates which, in turn, necessitates even higher private spending by the very classes that the egalitarian system was meant to protect.

Second, there has been a proliferation of private institutions, largely in the area of professional education. But again, the pattern of this expansion suggests that the middle class had very little influence on this policy. The rapid expansion of "capitation fees colleges" came about not as a result of great middle class pressure but rather from the entrepreneurial activities of politicians. While there is no systematic data on this trend, there is little doubt that a majority of these institutions have been supported or made possible by the direct involvement of politicians. In fact, we would argue that the growth of private colleges, while it helps to relieve the pressure on public institutions, is not simply a rational response to expanding demand but is an opportunity to collect rents. This explains a couple of features of the rapid expansion of private colleges. First, all of these, in principle at least, come under the same panoply of regulations as state colleges. For instance, unless an institution is declared a deemed university, the formal degree that is granted through these colleges is actually given by one of the existing state universities. The result is that there is virtually no pedagogical innovation or excellence associated with private institutions because they are all determined by roughly the same curricular guidelines and rubrics as public institutions. Rarely—except perhaps in the case of management institutions—are these institutions driven by a sense of creating a market niche. Indeed, contrary to expectations due to the great middle class demand for education, it has not been a pressure group behind the deregulation of the education sector as a whole. The result is that Indian higher education is in a regulatory environment in which the private sector will not be deregulated, foreign direct investment (FDI) will not be permitted (even "closed" China permits more FDI in education), the state sector is strapped for resources because of the government's fiscal constraints, and public education cannot mobilize higher funds because of ideological commitments. It is something of a mystery (other than due to problems of collective action) why the middle class has not been more active in breaking this deadlock in line with its interests.

There is an inherent tension in the ideology of the Indian state toward higher education. On the one hand, education was going to be a means toward creating social mobility and equality of opportunity. But to create the conditions under which the education system can effectively serve these purposes requires a vast mobilization and commitment of resources. Since the

state has been patently unable to do that, it interpreted equality of opportunity in almost a formalistic, even formulaic manner, where any difference or distinction was regarded as inimical to these goals. The state used the education system to *express* these commitments by insisting that there be no differentiation of fees, or even substantial differentiation of curriculum across 250-odd universities. Indeed, the crisis of standards that afflicts Indian universities is in part sustained by an ideological commitment to the myth that education should not be made into an arena of difference. This aspiration is in principle flawed because higher education is, among other things, about creating distinction and excellence. It is true that the mandate of the state ought to be to enhance the median level of skills among citizens, but it is hard to imagine a robust system of higher education that does not perform the function of distinguishing the skills and qualities of its students. The suspicion of excellence in Indian higher education was a result of this commitment, and was in part instrumental for destroying its signaling functions. Normally, the middle class is supposed to have a great commitment to a system where degrees provide signaling functions. The emphasis on leveling rather than distinction is perhaps another indication of the weakness of middle class hold on education.

The third vicious circle follows from the previous two and might be called the *circle of statism*. One of the subtexts of the above argument is that higher education policy is being driven less by a clear ideological vision or class interest than by the state's own interest (or perhaps its own ideological whims). Indeed, the surprising constancy in education policy and expenditures over time reinforces the argument that this arena is not susceptible to an overtly demand-driven calculus. Much of what goes in the name of education policy is a product of the one overriding commitment of the education bureaucracy—namely state control in as many ways as possible. State control can take various forms, including direct regulatory control, where the setting up of an institution requires a whole set of clearances or is required to conform to a set of norms set by state bodies. Arguably, the one sector where *dirigisme* has increased rather than decreased is higher education. We are not just referring to ideological battles over the curriculum in history, but to the many ways in which state bodies have sought to increase administrative control over institutions of higher education through a web of regulations. In a way, the ideological commitments mentioned above neatly dovetail into the ideology of state control (competition equals distinction, which is antithetical to leveling; deregulation would allow monetary considerations some place in the system and that would be intolerable). The incentives for increasing state control come from two directions. Over the course of the 1970s and 1980s, politicians acquired a great vested interest in the affairs of universities, seeing them as possible sites for not just political

recruitment, but expanding patronage. The direct interference of the state has implied that in most states, universities have become appendages of government offices.

To more precisely illustrate what we are referring to, we turn to two examples. In 1999, the GOI issued a circular requiring all appointments at the level of joint secretary and above to be cleared by the ACC (Appointments Committee of the Cabinet). The government then argued that since the rank and pay scale of professors was equivalent to those of the joint secretary, India's most prestigious medical college, AIIMS, did not have the power to appoint professors. Added to the anomaly of bureaucrats and politicians deciding who was good enough to be a professor at AIIMS was the reality that there were huge delays inherent in the procedure—the ACC was just one of the many tasks a cabinet charged with running the government of a billion people has to do, and appointments of AIIMS professors was just one of hundreds of appointments it controlled. The policy was changed only after the AIIMS director managed to personally persuade the Prime Minister. Indeed, it became clear that the 1999 circular was in fact illegal because the institute was created under AIIMS Act 1956, which provided that only the director would have to be appointed with the ACC's clearance while all other appointments would be made by the Institute Body, which is, in effect, the board of governors of AIIMS. Exercising its new-found autonomy, AIIMS appointed over 50 professors on March 11, the very day it received the authorization from the government. But that autonomy was short-lived. After the new UPA government came in, battles between the director of AIIMS and the Health Minister amplified caste-based cleavages with protests, legal actions, and bitter recriminations weakening this once august institution. Finally, in late 2007, the Indian parliament passed a bill whose sole objective was to remove the director of AIIMS. The bill was struck down by the Supreme Court a few months later. The latter's intervention was yet another example of the degree to which Indian courts have become involved in higher education (see Box 1).

West Bengal, the state most associated with an intellectual ethos, has also witnessed a flight of talent that is unprecedented (other than perhaps from Bihar). It is a testament to the degree of political control of higher education by the ruling party in that state, and reflects what is happening elsewhere. Banerjee et al. (2002: 4206), put the onus on the:

> … trend in the last two decades towards excessive egalitarianism and politicisation in education. To begin with, the process of hiring of teachers is hopelessly politicised. After that, unconditional job security, use of criteria unrelated to merit such as political connections and seniority in promotions and transfers imply that

teachers have no accountability. The government owns or funds most institutions of higher education and so it can get away with whatever it wants—just look at the sorry states that Presidency College and Calcutta University find themselves in today, in contrast to their past glory.

In both examples, talented individuals have taken the path that is relatively easy for them, which is to move. Over the long run, an adverse selection effect has meant that the universities themselves have played a large role in the abdication of university autonomy and professionalism. The reasons for this are complex, but they arise in part from incentives that are internal to the functioning of the university itself. The enemy of the academy has not been an evil state, but the opportunism and supine attitude of boards of trustees and university administrators. But this is an outcome of the state-sponsored selection system.

BOX 1. The Legal Conundrum

In the realm of higher education, the judiciary in India has done as much to confuse as to clarify the existing regulatory framework. Although there has been a distinct shift in the Supreme Court's stance in the past decade, from an undisguised suspicion of the private sector to a grudging acceptance of the emerging reality, its primary response does not always center on what will enable the education system to respond to demands. Rather, it has uneasily and often confusingly attempted to reconcile disparate principles, be it the dichotomy between education being a charitable or commercial enterprise, or the inherent tension between institutional autonomy and equitable access in higher education.

The issues tackled by the Supreme Court can be broadly classified into three overlapping categories—access, finance, and the rights of minority-run institutions. The lack of the Court's own clarity on these issues is exemplified by the following sample of judgments from the last two decades.

Access to Higher Education

1993, *Unni Krishnan* v. *Andhra Pradesh*: In a landmark judgement, the Court ruled that all colleges offering professional courses would have to reserve 50 percent of the seats for candidates selected through an entrance examination conducted by the government.

2002, *TMA Pai Foundation* v. *State of Karnataka*: In somewhat of a reversal, the Court decided that the *Unni Krishnan* judgment violated the right of private, unaided institutions to set their own criteria of admission and was therefore unconstitutional.

2003, *Islamic Academy of Education* v. *State of Karnataka*: The *TMA Pai* judgment had several anomalies, necessitating a clarification in this case. In terms of access, the judgment clarified that private-unaided institutions could reserve a certain percentage of seats for admission by management and the rest would have to be filled through "counselling" by state agencies.

2005, *P.A. Inamdar & Ors.* v. *State of Maharashtra & Ors*: The Court ruled that private colleges, or those that do not receive government aid, are not required to meet reservation quotas, and further maintained that these schools have full autonomy in their admission of students. This is arguably the strongest property rights-based judgment given by any Court in India to date.

(Box 1 continued)

(Box 1 continued)

Financing Educational Institutions

1993, *Unni Krishnan* v. *Andhra Pradesh*: Seeking to regulate the activities of capitation fees colleges, which charged students high fees to recover costs, the Court ruled that at least 50 percent of seats in these colleges would be reserved for students who qualified on the basis of merit, and the college would be entitled to charge only the level of fees prescribed for government institutions for these students.

2002, *TMA Pai Foundation* v. *State of Karnataka*: While formally upholding "the principle that there should not be capitation fee or profiteering is correct," the Court argued that "reasonable surplus to meet the cost of expansion and augmentation of facilities, does not however, amount to profiteering." It reasoned that the restrictions on fees and admission imposed in the Unnikrishnan case prevented the accumulation of "reasonable" surplus.

2003, *Islamic Academy of Education* v. *State of Karnataka*: In its clarification of the *TMA Pai* judgement, the Court agreed that "private institutes should be free to fix their own fee structures so as to generate the funds required to run their institutions and benefit the students, as well as to generate a surplus for the betterment and growth of their institutions."

2005, *P.A. Inamdar & Ors.* v. *State of Maharashtra & Ors*: Along with autonomy in the admission of students, private colleges were also given independence in the setting of fees, with the caveat that such tuition could be regulated to prevent "unreasonable profits." Curiously, the Court suggested that the schools set aside 15 percent of seats for non-resident Indians (NRIs), to be charged higher fees to subsidize poorer students.

Rights of Minority Institutions

1992, *St. Stephen's* v. *University of Delhi*: The Court ruled that minority-run institutions, even those receiving government aid, are entitled to reserve up to 50 percent of their annual intake for students from their own communities.

2002, *TMA Pai Foundation* v. *State of Karnataka*: By ruling that private-unaided institutions were free to set their admission criteria and fee structures, the Court extended the freedom accorded to minority rights to all religious denominations under the broad banner of freedom of occupation. However, it contradicted the *St. Stephen's* judgement by not according the same rights to minority-aided institutions.

2003: *Islamic Academy of Education* v. *State of Karnataka*: Although this verdict was mean to be a clarification of the *TMA Pai* verdict, it ruled that minority institutions have a special right bestowed upon them by the Constitution, which non-minority institutions do not possess. In effect, this reversed the equivalence between minority and non-minority unaided institutions posited in the *Pai* judgement.

The Politics of Higher Education

While there has been a steady progression in the Court's judgements on finance and fee structures to cover costs, the Court has not been as forthcoming on the issue of access, primarily because the debates have mostly centered on reservation, a politically charged issue. The *Inamdar* ruling prompted a storm of protest from lower caste groups. A weak UPA government rushed to amend the Constitution, allowing Parliament to enact legislation mandating reservations in private higher educational institutions. This amendment allowed for the subsequent passage of the Central Educational Institutions (Reservation in Admission) Act, 2006 providing for 49.5 percent of seats

(Box 1 continued)

(Box 1 continued)

in higher educational institutions to be reserved for SCs, STs, and OBC, in aggregate. The fact that the Act was passed unanimously by the Lok Sabha—and in record time—was indicative of just how much reservations has become the third rail of Indian politics.

On the issue of minority rights, another contentious topic, the Court has suffered from a genuine inability to reconcile the inherent tension between Article 29(2) of the Constitution, which enjoins that the state shall not discriminate on the basis of religion, and so on, and Article 30(1), which protects the rights of minority institutions. Does a state-aided institution run afoul of the non-discrimination provisions of the Constitution, if it is allowed to give members of certain communities preferences in admission? Ultimately the Court has often opted for something like a *modus vivendi*. Aided minority institutions should be allowed to retain their minority character. But to prevent these institutions from falling afoul of the non-discrimination provisions, they should admit a sprinkling of non-minority students. Although the statement of principle in *Inamdar* toward greater autonomy is more emphatic, its practical implications are, however, still unclear.

Conclusion

Despite impressive reforms elsewhere, Indian higher education sector remains the most tightly controlled and least reformed sector. Deep ideological and vested interests have made reform in India's higher education sector all but impossible. Indeed, for the next generation of reforms in India, this is the central puzzle. The rapid rise in skill premiums in India in the last few years has exposed an important paradox about India's labor markets. Despite its enormous size, the pool of skilled labor is relatively shallow—the result of a deep crisis in higher education despite the success of a few professional schools. The veneer of the few institutions of excellence masks the reality that the median higher education institutions in India have become incapable of producing students with skills and knowledge. The process neither serves a screening or signaling function for the vast bulk of students, nor prepares students to be productive and responsible citizens. Consequently, students are forced to spend more years (and, increasingly, larger resources) to acquire some sort of post-graduate professional qualification, as they desperately seek ways to signal their qualities to potential employers. It would not be an exaggeration to say that India's current system of higher education is centralized, politicized, and militates against the production of general intellectual virtues. The fact that the system nonetheless produces a noticeable number of high-quality students is due to the sheer number of students and the Darwinian struggle at the high school level to gain admission into the few good institutions.

The most acute weakness plaguing India's higher education system is a crisis of governance, both of the system and of the individual institutions.

We have argued that precisely because there are few clear analytical criteria to the central question of what is "good" higher education, a regulatory system that emphasizes diversity, flexibility, and experimentation is in the long run most likely to succeed. Such a system will also need a different conception of accountability than the one currently prevailing in the Indian system, which can be characterized as a vertical command and control system, with state authorities empowered to enforce accountability from the top. Instead India needs to move to a regulatory system, which has more horizontal accountability that empowers students to take better informed decisions.

The crisis of governance in Indian higher education is most visibly manifest in the acute shortage of qualified faculty. The generation that was inspired by a broad commitment to the public good has retired or will do so soon. There is little likelihood of sufficient replenishment, given entrenched mediocrity in institutions with lifetime appointments, few competitive pressures and abysmal governance. The result has been the academic equivalent of Gresham's law—the bad drives out the good. The prevailing political ideological climate in which elite institutions are seen as anti-democratic, finds its natural response in political control to influence admissions policies, internal organization, and the structure of courses and funding. As quality deteriorates, students are increasingly less willing to pay the very resources without which quality cannot be improved. In India's case, the answer has been the growth of private sector higher education institutions and increasingly the consumption of education abroad. However, as our analysis suggests, private sector investment has been confined to professional streams, bypassing the majority of students. Furthermore, private institutions are also plagued by severe governance weaknesses, raising doubts as to their ability to address the huge latent demand for quality higher education in the country.

This crisis of governance is not going to be amenable to merely technical solutions. The purpose of this paper has been to argue that higher education is so deeply implicated in politics, so deeply inflected by large ideological objectives that have little to do with pedagogy that it would be the height of optimism indeed to think that there is a technocratic solution to this crisis. But we hope that when the appropriate opportunity arises there will be serious and more rigorous reflection on all the aspects of education that need to be regulated: entry, access, quality, accreditation, and institution formation. Fundamentally, Indian policy makers have to recognize two things. First, the competition for talent is now genuinely global. If the design of institutions is not commensurate with this reality; if the freedoms,

incentives, and quality benchmarks on offer do not allow you to compete on a global scale, building quality institutions will remain a chimera. There is, in principle, no reason why India could not become a global education hub, if it got its regulatory system in order. Second, a vibrant system requires enlisting the energies of a whole range of actors. It also requires responding to a diversity of challenges and unexpected opportunities. Only a system that draws on the competitive energies of the market on the one hand, a flexible and supple state system on the other, and a genuinely committed non-profit sector as a third leg will it be able to meet India's challenges. The scale of demand in India is such that it needs to draw resources and energies from all sources rather than engage in a politics that benefits incumbents, constrains supply, and rewards mediocrity with regard to quality.

Comments and Discussion

Pawan Agarwal: Considering that there is little ongoing research on Indian higher education despite a significant interest in it both at home and abroad, this paper is a very welcome sign. The paper examines contemporary realities of Indian higher education in a comprehensive manner. Lack of credible data is a serious limitation in a work of this kind. Regardless, careful analysis of the political economy and the identification of specific distortions suggest the authors' deep insight of Indian higher education. Based on a detailed recent review of the Indian higher education, I reached broadly the same conclusions (Agarwal, 2006). Thus, I agree with the authors on their analysis and recommendations, but to suggest that long-term consequences of recent developments amount to mortgaging the country's future seems overly harsh. There have been several redeeming features of the recent demand-driven growth in private educational institutions. My following comments point out the positive fallout from the private sector growth and supplement the authors' recommendations on regulation and financing with some additional observations.

Indian higher education has evolved over the centuries and is rooted in the country's history and culture. From the first universities and colleges for modern higher education in the mid-19th century, the focus has been on Humanities and Arts. This continues even today[1] as far as public higher education is concerned. As a result, half of the country's graduates have degrees in Arts and Humanities and almost four-fifths of graduates have no employable skills. It is therefore not surprising that India like many other countries of the world is in a situation where acute problems of graduate unemployment and skill shortages co-exist.

However, over the past two decades in response to societal pressure and market forces, India has seen an explosive growth of private higher education. Most of this private growth is in professional areas. Even the public institutions started mostly self-financing programs with a professional focus. This has ensured a better matching of skills of graduates with their own preferences and the demands of the labor market. Thus, private growth has

1. This is unlike the United States, for instance, where despite a strong focus on liberal arts education, growth of higher education over the centuries had an underlying occupational status.

helped to correct the country's historical and undesirable bias toward liberal arts education. At the same time, the growth has shifted the cost of higher education from government to students and parents.

There have been obvious concerns about equity, quality, and exploitation with this private growth. Most people conclude that only the professional education is useful. Hence, the tuitions and fees are high for professional education whether delivered in public or private institutions. Therefore, useful forms of higher education are now out of the reach of the poor. Except for preventing the fees to rise in general higher education (for which there few willing takers), very little is being done to put in place an adequately funded scholarship and loan scheme for the poor. Such an intervention is urgently required to promote inclusion in higher education and to address equity issues.

To ensure quality, accreditation agencies have been put in place, and admissions and fees are tightly regulated. Yet, these changes have not had the desired effect due to a hiatus between what is said and what actually gets done. Lacking transparency and fair play (or perception of the same), private institutions do not have an incentive to do the right things. Some private institutions indulge in gross malpractices that contribute to a poor overall image of private higher education.

Standards in public institutions continue to deteriorate. While funding is an issue, the lack of competition, flawed personnel policies, and dysfunctional governance structures create little hope that public institutions will improve. Personnel policies and the governance system both need to be fixed. Public institutions that are starved of resources definitely require more funding. Many countries of the world now use fund allocation mechanisms to create a competitive environment and to leverage change. Experience has shown that clear financial incentives enable public institutions to better deliver on goals set as per national policy objectives. Thus, besides an increase in the level of funding, mechanisms to ensure public funds are used to direct change become important.

Contrary to the common belief that the national government and its premier funding body—the University Grants Commission (UGC)—contribute a major share of public funding for higher education, in reality they have a very limited role. Most of the public funds, particularly for running higher education institutions, come from the state governments and most state governments are faced with severe financial stress. Thus, pragmatism requires understanding the fact that while the government could at best set up and support a few more top quality institutions and support public research, sustained support for higher education, and its growth and improvement

would come through private finance. The issues of equity that this raises can be addressed through properly designed income contingent loans and scholarships for the very poor.

Overall, the role of the private sector in inducting dynamism and fostering competition in higher education needs to be recognized. The right incentives are required for it to ensure that quality is maintained. Regulations need to be rooted in the current realities and applied in a fair and transparent manner. While accepting the fact that the private sector would result in skewed growth, public institutions should continue to play an important role and need to be supported as such. There is a need to increase funding levels and use innovative financing mechanisms to create incentives for public institutions to do the right things and change with time. The government should direct and accelerate the change in the Indian higher education through a process that allows both public and private institutions to grow and flourish.

Dilip Mookherjee: The state of crisis in Indian higher education today is all too palpable. Yet it occupies relatively little space in contemporary social science research. Devesh Kapur and Pratap Mehta are to be congratulated for bringing this issue to the forefront and initiating a provocative discussion on the causes of the current malaise, its likely implications, and the challenges that lie ahead for policy makers. The paper is broad-ranging, well-informed, and combines detailed knowledge of the ground realities with a broad perspective on the political origins of the problem. I found myself agreeing with most of their assertions and viewpoints. At various points of their paper I felt they were putting their finger on key governance problems afflicting not just Indian higher education but also the entire social service sector.

The paper should be viewed as initiating a discussion, a prelude to a more systematic and detailed research agenda on the political economy of Indian higher education. As they mention at the outset, the purpose of their paper is not to make detailed policy recommendations but rather flag the kinds of issues that ought to be addressed. I shall complement their discussion with my own perspective as an economist on the kinds of issues that we ought to have more detailed empirical knowledge of, before policy recommendations can be discussed.

Let me start by recapitulating some of the main points of the paper. I will then turn to a discussion of questions that could form a research agenda on the economics of Indian higher education. I will conclude by discussing some of the related policy questions.

Dimensions of the Current Crisis

The conventional wisdom regarding Indian education policy is that primary and secondary education are the real crisis areas, rather than higher education. Without denying the crucial importance of elementary education, Kapur and Mehta argue that higher education is also in a state of acute crisis. I agree that quality standards in higher education are falling sharply at the same time that enrollments are rising sharply, and that much of this is due to political, institutional, and regulatory problems rather than economic factors.

This is a matter of crucial importance for growth and equity. The higher growth trajectory of the Indian economy in recent years owes considerably to its ability to participate in a global knowledge economy, building on its investments in higher education initiated in the Nehruvian era. The sustainability of this growth process hinges on its ability to impart high quality education in its colleges and universities. Declining standards in higher education today will not have an immediate impact on the growth rate this year or the next. But it will surely affect growth prospects a few years down the road. The Chinese growth strategy so far has relied on its comparative advantage in low-end manufactured goods, based in turn on an almost infinitely elastic supply of relatively unskilled labor. But they are now preparing to move up the quality ladder, embarking on an ambitious strategy of skill upgradation of the Chinese population with large-scale investments in higher education and research. Ireland and Israel are examples of other countries positioning themselves to compete increasingly in knowledge-based industries. It is not difficult to imagine the locus of the global knowledge industries shifting to countries outside India a few years from now, as its higher education system continues on its current downward spiral, while its competitors forge ahead.

Apart from rising aspirations and increasing affordability of higher education to the middle class, the increasing pattern of enrollments observed in India reflect a growing awareness that higher education is the pathway for the next generation to participate in the fast growing segment of the economy. Kapur and Mehta note that in terms of inequality of education attainment, India is a remarkable outlier across developing and middle income countries, comparable to the outlier status of Brazil in income inequality. As the importance of the knowledge-based sectors in the economy grows, perpetuation of current educational inequalities will imply that income inequality in India will also grow to extreme proportions. The increasing trend toward privatization of higher education is likely to aggravate this even further. Quality education is becoming increasingly expensive and competitive, increasing gaps between the rich and poor in terms of access and

educational achievement. It is hard to think of many other sectors which are as important both to long-term growth prospects as well as prospect for upward social mobility among the poor.

I should add to this the observation that Kapur and Mehta make regarding the scope of privatization of higher education being limited to a few professional sectors such as engineering, business, and medicine. The bulk of higher education in Arts and Sciences are virtually untouched. Apart from the importance of this sector to the promotion of scientific research, it also produces qualified teachers for primary and secondary schools. Declining standards in higher education will imply declining quality of teachers in elementary schools. In the long run, investments in the two sectors could well be complementary.

There is not much I have to add to their diagnosis of the underlying political and institutional causes: the state is ideologically strapped and lacks a coherent policy. Institutions of higher learning are subject to increased rent-seeking, capture, and manipulation by politicians. Merit-based considerations in promotion and appointment are vanishing; educational policy is hopelessly over-centralized, with little scope for flexibility, experimentation, or accountability. There is a steadily growing and poorly regulated privatization, by default rather than design. It allows capacity to expand in a limited set of areas. Growth in demand limit the competitive discipline that privatization could bring about. The current regulatory framework does little to preserve standards and control fraud or abuse.

There may also be perverse effects whereby privatization undermines quality and accountability in public institutions. It encourages students from more affluent backgrounds to shift out of the latter as their standards decline. Peer effects and concern with declining reputations can then induce others to leave as well, leaving the public institutions with less vocal, affluent, and motivated students. It can cause a shift out of a historical equilibrium where public institutions delivered quality education, and students from all backgrounds and intellects attended such institutions. In the new equilibrium that is emerging, students of varying qualities and from different family backgrounds are being sorted across public and private institutions, thereby increasing inequality of access, and possibly lowering quality standards in the public institutions.

The Research Questions

The preceding broad brushstroke observations need to be translated into a systematic set of research questions and subjected to rigorous analytical and

empirical scrutiny. The assertion that investments in higher education are going to be critical to growth prospects of the economy in the intermediate to long term translates into a hypothesis concerning the magnitude of the social rate of return to education. That they will affect inequality in educational attainment or social mobility is a statement of the distributive impact of changes in educational quality in the public sector. Is it really true that the rate of return to quality education at the macro or micro level is high and growing? How has this been affected by the economic liberalization of the past decade, the rising importance of the knowledge-based sectors, and patterns of global competitiveness? Has the quality of higher education been declining? How has it been affected by privatization? These are all questions of vital importance, yet there is very little by way of solid empirical evidence.

One can question some of the hypotheses suggested by Kapur and Mehta. Is it really true that the signaling role of higher education is virtually nonexistent? If that were the case, why are enrollments continuing to rise so sharply? Presumably the cost of quality education is rising, as students have to increasingly resort to private tuition or institutions to prepare them for increasingly competitive entrance examinations. The opportunity cost of attending these institutions is also rising, in the form of foregone wages and opportunities to gain work experience. The private value of education to the student must then also be rising.

Perhaps it is the case that one now signals by the kind of educational institution one gains entrance into. This may be consistent with very little learning occurring *within* those institutions. Or maybe increasing enrollment reflects growing entry of students from poorer backgrounds into higher education, causing congestion and declining quality within public institutions, motivating the more affluent to exit into private institutions (including those located abroad). This may (but need not) cause quality to decline in the public institutions: there may be a benefit from declining levels of congestion. This is the hypothesis of transition from one equilibrium to another alluded to above. Nevertheless it is unlikely that quality will have declined to the point that there is no signaling value at all; otherwise, one would not expect demand to continue to grow at the rate that is being currently observed. Perhaps the signaling value has declined compared to what it used to be a few decades earlier, but it must be still sizeable. Yet we remain puzzled by where this value comes from, given the abysmal quality of most universities.

To address these kinds of questions one needs to formulate and estimate econometric models of educational choice, with data on costs and returns

to education. We need good statistical databases that will tell us about the kinds of choices students from varying family backgrounds and intellects are making, the options they have available, the costs they are incurring, their academic success rates, and the kinds of job market experience following graduation. Data on students and their experiences need to be combined with information about the resources and teacher quality of educational institutions. Traditional estimates of rates of return to education have typically ignored the problem of educational quality, focusing instead on crude measures of the quantity of education (such as the number of years of education). We all know that where one gets a degree from, and in what subject, makes an enormous difference to subsequent job market success. The central issue in the Indian context concerns educational quality, including the problem of how to measure it and compare quality across different kinds of educational institutions.

The other classic problem in estimating the social returns to education is separating out the signaling value of education from its productivity-enhancing effects, and in measuring spillover effects on peer learning and agglomeration. Other important and challenging issues concern modeling choices made by students from varying backgrounds between public and private educational institutions, decisions which depend both on the range of institutions available, their relative cost, and perceived quality. There is an emerging literature on the complex effects of school choice and competition between public and private schools in the context of the US, Bolivia, and Chile (for example, Epple and Romano, 1998; Urquiola, 2005; Urquiola and Verhoogen, 2007) that could form a starting point for such a modeling effort. Such models could also be used to formulate and test hypotheses concerning effects of entry of private universities, and alternative policies concerning tuition fees charged.

Finally, the school choices are likely to be strongly affected by opportunities to borrow funds for educational purposes. The large outflow of Indian students to universities abroad is likely to have been fueled partly by easy availability of foreign exchange in the post-liberalization era. It is also possible that the growth of consumer credit over the past decade has not just driven a boom in purchases of housing and consumer appliances but is also one of the factors underlying increased enrollments within Indian universities. Educational policies and financial market reforms are thus closely interwoven.

The kinds of databases required to pursue such a research agenda are not currently available. Longitudinal surveys of educational institutions, students,

and their experiences in education and labor markets will need to be conducted. Until then, our understanding of the problems of higher education and related policy discussions has to be based on speculative judgments.

Policy Issues

The current malaise of higher education in India seems to be hopelessly complex. At the heart of it is the kind of governance problem that Kapur and Mehta describe and explain so well, resulting from a combination of political imperatives and institutional constraints.

Reforming the public system seems the most difficult. Fiscal constraints prevent large increases in rates of spending by the state. Even more forbidding are the political and institutional constraints: politicians will have to cede rents and patronage sources, merit-based criteria, and the pursuit of excellence will have to become the missions of educational institutions; mediocre teachers will have to give way to those less interested in institutional politics and more interested in teaching and research. It is always hard to turn around an institution in a state of steep quality decline, and particularly so when there is no compulsive pressure to do so at any level.

Perhaps a better hope lies in a more fully-baked version of capitalism, based on improving regulation of the private, philanthropic, and non-profit sectors. The authors have described many problems in the current regulatory setup, driven partly by the fact that there has been little effort so far to consciously evolve a coherent strategy for educational regulation in the post-liberalization age. They also emphasize the need to think of educational policy in an era of private education and a global knowledge-based economy. The widespread mushrooming of coaching schools, private tuitions at one end, and growing opportunities to study abroad mean that the education sector is effectively being privatized on a large scale. It is high time policy makers begin to think of ways of adapting to such an environment, by evolving a coherent approach to entry, accreditation and quality certification, and providing the public with information about educational quality of existing institutions. Educational scholarships, loans, and vocational and remedial training programs need to be developed to expand educational access among those from poorer and historically disadvantaged backgrounds. Demands arising in the labor market as well as from primary and secondary schools need to be coordinated with policies for regulating entry of private institutions in different educational areas. Policies for funding of infrastructure in public universities and reforms in pay, recruitment, and promotion of university teachers are urgently required as ways of improving quality and accountability. Research linkages of universities with industry need to

be actively encouraged. There is a large range of policy options available to turn around the state of higher education in India. Whether and how this is done will have a decisive impact on India's ability to sustain its current growth path, and ensure that the benefits from this diffuse through a large section of its population.

General Discussion

Chairperson Isher Ahluwalia began the general discussion with a few comments on the current political economy of Indian higher education. First, she pointed out that the government is currently committed to a substantial expansion of spending on higher education. However, the Ministry of Education is delaying the expansion of existing institutes until the Supreme Court decides on the issue of an expanded quota for the Other Backward Castes (OBC) reservations. Ahluwalia argued that this is a prime example of the central control of the system, leading to a homogenized, standardized framework for higher education rather than a framework wherein the different states retain the ability to cater to the needs they perceive in their particular regions. Second, Ahluwalia drew attention to the major decline in the quality of research and pure sciences within the Indian higher education system. This is particularly troubling, she argued, given the importance of these areas for innovation and other long-term benefits for the country.

Abhijit Banerjee remarked that it is necessary to determine what the natural benchmark should be for the quality of academic institutions in order to have a meaningful discussion on this subject. Given the resource constraints, the academic sector should not necessarily be able to compete with the IT sector in terms of attracting skilled faculty and students. The conceptual problem of what the right benchmark should be is quite difficult, especially with the large number of jobs being created in fields such as private bio-technology, which offer much more money than jobs in pure research and sciences.

Anne Krueger offered a US perspective on two points. First, she pointed out that economists working on higher education in the US have focused on measuring rates of return from education for different classes of people over time. Research on the rates of return in India would be important in sorting out many of the questions that have been raised. Second, Krueger argued that the reason the US does pretty well at the higher education level and much more poorly at primary and secondary education is the greater level of competition among the universities. In contrast to a virtual state

monopoly at the primary and secondary levels, the increased competition in higher education has led to a greater degree of diversification. There is a huge demand in the US for information about higher education. This has taken the form of an increased number of accreditation committees, all of which are private. The role of the public sector is in things like the National Science Foundation, which has allowed competition among both private and public universities for grants and funds for scholarships.

Focusing on the juxtaposition of market barriers and government barriers, Jeff Hammer argued that there are wide variations in the ease with which different policy measures can be implemented. In his view, the biggest problem missing from the authors' discussion was credit market failure. He agreed with Krueger that making loans more affordable across public and private institutions would be a very important step in encouraging competition. On the other hand, Hammer disagreed on the importance of research on rates of return to education. In his view, since they are private rates of return, they have little to do with public policy, which should be guided by a broader public rate of return.

Anjini Kochar also commented that the appropriate distinction was not between public versus private institutions but on whether there was effective competition. In addition, she argued that the politics of support for the financing of higher education were changing. Wealthy families may have opted out of the system in the past and sent their children abroad for an education. However, in the current environment, business leaders had a greater interest in the quality of higher education and the workforce within India. They were more supportive of devoting additional resources.

Rakesh Mohan wanted to get a better understanding of the huge increase in higher education enrollments in the southern states. Was it demand-induced, resulting from the increased job growth for graduates with those skills, or was it a supply-side phenomenon prompted by the expansion of the system of reservations, which began much earlier than in these states? The current response of the government to national pressures for increased OBC reservations, for example, is to increase total enrollment. Second, he pointed out that low rates of return to higher education in India relative to other countries could suggest either an excess supply of graduates or that the system is such a mess that it does not produce graduates with equivalent skills.

Speaking on the subject of funding for higher education, T. N. Srinivasan identified an additional issue in evaluating private and public funding. Funding that comes from sources with specific agendas can distort not only

the priorities of research for an institution but also promotion and recruitment. This can be the case with government funding as well as industry-sponsored research. Therefore, the nature of the funding sources can be an important determinant of the quality of the research being carried out by these institutions.

Rajnish Mehra argued that since tax revenue is now growing enormously, funding is no longer the primary constraint. However, he noted that there is enormous diversity in the public institutions in India with regard to the governance of teachers and the distribution of funding. Increased flexibility in the allocation of funds may matter more than an increased in the total. Institutions often had greater flexibility in spending funds from outside sources.

Arvind Panagariya returned to the issue of competition. Although there has been *de facto* privatization through the entry of private colleges, the same is not true for private universities. The creation of private universities still requires either the Central Government or the state government to pass authorizing legislation. He argued that the system is far too constraining and obviously restricts competition. Additionally, he pointed out that each private college has to affiliate itself to some public university, and if that public university happens to have a terrible reputation, then the terrible reputation spills over to the college. It cannot build its own reputation.

Panagariya maintained that the system in India is much different that that of the US. The greatest difference is in the degree of central control. In the US, there is huge competition for faculty, in terms of both salaries and other benefits. In that sense, the Indian system does not have any competition. Even the salaries in the private colleges are essentially determined by the UGC, which enforces elaborate criteria and guidelines that severely restrict most forms of competition. Finally, Panagariya noted two areas where the system seemed to be working well: engineering colleges and business education. Where competition has been allowed, quality has improved, and that also explains why India still has done well is some specific skill areas.

The other participants emphasized a history of repeated funding increases for education without the complementary institutional reforms required to improve performance. In the political space, each of these episodes has been squandered, resulting in an intensification of an old institutional structure. A contrasting perspective is provided by noting that if higher education was viewed as an industry—with new entrants, increased market share of the new entrants, and active involvement in shaping outcomes—the pessimism that dominated the session seems surprising.

In his response, Mehta agreed about the importance of establishing benchmarks for measuring quality. Regarding competition, he agreed that it is competition in a formal sense but with many other binding constraints. In particular, Mehta identified three conditions that a private entrepreneur would require to establish a private university in India. First, that there be enough available land, which typically is scarce due to urban regulations. Second, that there be no other restriction on students other than what centrally mandated affirmative action legislation requires. Third, that there be minimal or no state government representation in running the institution. According to Mehta, few if any states could meet all three of these conditions.

Devesh Kapur continued with three main points. First, he agreed that there is a dearth of research on the optimal tradeoff between educational quantity and quality. In his view, this is why the public policy debates in this area are so difficult. Second, Kapur expanded on the problems imposed on the higher education system by the regulatory framework in India. This is not just a problem created by the state but also by professional organizations, which place restrictions on the activities and pursuits of its members. Also, he argued that there is no reason why the salaries of Indian Institute of Management (IIM) and Indian Institute of Technology (IIT) professors should be capped and linked to those who teach Hindi. This drives these professors to devote more time to consulting and less to research. As a final point, Kapur asserted that the single biggest constraint in research in India is the lack of graduate students, particularly in the sciences.

References

Agarwal, Pawan. 2006. "Higher Education in India: the Need for Change." ICRIER Working Paper No. 180, New Delhi, June. Availale at www.icrier.org/publication/working_papers_180.html.

———. 2007. "Higher Education in India: Growth, Concerns and the Change Agenda." *Higher Education Quarterly* 61 (2): 197–207.

Banerjee, Abhijit, Pranab Bardhan, Kaushik Basu, Mrinal Datta Chaudhuri, Maitreesh Ghatak, Ashok Sanjay Guha, Mukul Majumdar, Dilip Mookherjee, and Debraj Ray. 2002. "Strategy for Economic Reform in West Bengal." *Economic and Political Weekly* 37 (41): October 12–18.

Bhagwan, Manu. 2003. *Sovereign Spheres: Princes, Education and Empire in Colonial India*. New Delhi: Oxford University Press.

Epple, D., and R. Romano. 1998. "Competition Between Private and Public Schools, Vouchers and Peer Group Effects." *American Economic Review* 88 (1): 33–62.

Government of India. 1997. *Government Subsidies in India*, Report published by Ministry of Finance, Government of India.

———. 2003. UGC (Establishment and Maintenance of Standards in Private Universities) regulations, Gazette Notification on December 27, para 3.4.

———. 2007a. *Annual Report 2004–2005*. New Delhi: Department of School Education and Literacy. Available at http://www.education.nic.in/AR/AR0607-en.pdf.

———. 2007b. *Selected Educational Statistics 2004–2005*. New Delhi: Department of Education, Planning, Monitoring and Statistics Division, Ministry of Human Resource Development.

The Hindu. 2007. "Left, DMK members clash." Available at http://www.hindu.com/2007/03/14/stories/2007031408630100.htm.

Kapur, Devesh. 2007. "Globalization and the Paradox of Indian Democracy," draft.

Kapur, Devesh, and Megan Crowley. 2008. "Beyond the ABCs: Higher Education and Developing Countries." Washington D.C.: Center for Global Development, Working Paper Number 139, February.

Kapur, Devesh, Ajay S. Mehta, and R. Moon Dutt. 2004. "Indian Diasporic Philanthropy." In *Diaspora Philanthropy and Equitable Development: Perspectives on China and India*, edited by Peter Geithner, Lincoln Chen, and Paula D. Johnson, eds, Cambridge, MA: Harvard University Press.

Lakshman, Nandini. 2003. "IITs: Indian Institutes in Trouble," May 24. Available at http://www.rediff.com/money/2003/may/24spec.htm

Mani, Anandi, and Sharun Mukand. 2007. "Democracy and Visibility." *Journal of Development Economics* 83 (2): 506–29.

Menon, Jaya. 2006. "Meanwhile for Papa Doc, Hurdles Cleared for 180-acre University." September 7, *Indian Express*.

Ministry of Human Resource Development, Government of India. 2007. *Annual Report, 2006–07*. New Delhi.

Modi, H., and A. Mukhopadhyay 2000. *An Analysis of Tax Concessions of Charitable Organizations.* Delhi: NIFP.

Mukherjee, Mita. 2004a. "Slash Prelude to Funds Full Stop." *The Telegraph,* March 17.

———. 2004b. "Privatisation Kickoff with Two Colleges, *The Telegraph* April 4.

Mookerji, Nivedita, and Pummy Kaul. 2005. "Education Tops Ad Spend in Print," *Financial Express*, April 18.

Planning Commission. 2007. Draft report of Working Group on Higher Education, 11th Five Year Plan. Available at: http://planningcommission.nic.in/aboutus/committee/wrkgrp11/wg11_hgedu.doc.

Srivastava, Ravi. 2007. "National Knowledge Commission: Meeting Social Goals or Neoliberal Reform." *Economic and Political Weekly* March 10: 812–15.

Sundar, Pushpa. 2000. *Beyond Business: From Merchant Charity to Corporate Citizenship.* New Delhi: Tata MacGraw Hill.

———. 2002. *For God's Sake: Religious Charity and Social Development in India.* New Delhi: Sampradaan: Indian Center for Philanthropy.

Tilak, J. B. G. 1983. *Voluntary Contributions to Education in India.* Working Paper, 4 (2), Punjab School of Economics and Business.

Urquiola, M. 2005. "Does School Choice Lead to Sorting? Evidence from Tiebout Variation." *American Economic Review* 95 (4): 1310–26.

Urquiola M., and E. Verhoogen. 2007. "Class Size and Sorting in Market Equilibrium," Working Paper, Department of Economics, Columbia University.

Wolf, Alison. 2002. *Does Education Matter: Myths About Education and Economic Growth.* London: Penguin.

World Bank. 1994. *Higher Education: The Lessons of Experience*. Washington, DC: The World Bank.

NIEPA Report on Consultative Meeting for Funding Higher Education

UGC Annual Reports, 1990–2001

University News

Government of India Report on Tax Exemptions (Kelkar Committee Report)

Shome Committee Report

UGC Committee Reports (Punayya, Pylee, Anand Krishnan, Rehman)

Kumarmangalm Birla Report on Higher Education, Prime Minister's Task Force

Annual Reports of approximately forty trusts

Directory of Donor Organizations: Indian Center for Philanthropy

JEAN-MARIE BALAND
University of Namur

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Microfinance Lifespans: A Study of Attrition and Exclusion in Self-Help Groups in India*

Introduction

Microfinance is often advocated as a solution to multiple social problems. Productive investments financed by loans can bring households out of poverty, reduce income and wealth disparities, and groups can serve as forums for collective action to improve gender relations and local governance. Over the last few years, savings and credit groups have also helped manage some important social programs of the Indian government, such as the distribution of foodgrains and school meals in state-run primary schools.

There are two principal institutional forms through which group lending takes place in the microfinance sector of most countries. In the first, specialized institutions organize potential lenders into groups. Group composition may be determined by random factors, as in the case of the Foundation for International Community (FINCA) in Peru, or the matching preferences of members as in the case of Grameen Bank.[1] These lending institutions are

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1. See Karlan (2007) for a description of group operations in FINCA and chapter 4 of Armendariz de Aghion and Morduch (2005) for Grameen Bank lending practices.

intimately and permanently involved with their members—they form groups, set interest rates and fines, and their representatives are usually present in group meetings.

An alternative model is one in which several loosely connected institutions are involved with a given group of borrowers. Government and non-government agencies form credit groups, the groups determine their own rules for saving and lending, and some of these groups subsequently borrow from commercial banks. Microcredit is just a fraction of the loan portfolio of these banks who see it as a way of meeting their social responsibilities. This is the dominant institutional form in Indian microfinance, in terms of both outreach and total loan disbursements.

The present structure of the microfinance sector in India emerged in the early 1990s when the Reserve Bank of India (RBI) issued guidelines to nationalized commercial banks encouraging them to lend to informal self-help groups (SHGs). Since then, such groups have been actively promoted by a number of different agencies and the National Bank for Agriculture and Rural Development (NABARD) has provided banks with subsidized credit for lending to SHGs.[2] Official statistics currently report over two and a half million groups and thirty-two million households in them (NABARD, 2006: 38). Most of these groups are composed entirely of women.

In spite of the phenomenal growth in the number of SHGs and total loans advanced to them, there is little systematic evidence on their internal functioning. In part, this is due to the nature of governance within the sector. Statistics on Indian SHGs have emerged because the organizations promoting these groups provide their donors an account of the number of new groups created and because commercial banks are required to report their lending to the Reserve Bank. In neither case are details on the uses of funds or their distribution within a group reported. We therefore know little about group demographics, about whether groups, once formed, continue to function effectively or how many members leave groups that they initially joined. This paper attempts to fill this informational gap by using survey data on SHGs created during the period 1998–2006. We describe the survival of groups and members within groups, document group activities, and estimate the determinants of group and member duration using an econometric survival model.

Our data come from a survey of 1,102 rural SHGs and the 16,800 women who were members of these groups at some point during the period 1998–2006. We consider all groups formed by PRADAN [a non-government

2. See Reserve Bank of India (1991) and National Bank for Agriculture and Rural Development (1992) for the original policy statements.

organization (NGO) that has actively promoted SHGs since the start of the NABARD program] in the districts of Keonjhar and Mayurbhanj in northern Orissa and Raigarh district in the newly formed state of Chhattisgarh in central India. Groups are engaged in a variety of collective activities but saving and credit do seem the most important.[3] Almost all groups we surveyed had made small loans to their members and 68 percent of them had received at least one loan from a commercial bank. Each borrower received about Rs. 2,200 per year from internal group funds. For groups with at least one bank linkage, 83 percent of members in the group received some part of this loan and the average amount received by these members was Rs. 2,189 per year.[4] Although loans provided by some specialized microfinance institutions (MFIs) are often larger, these SHG loans are sizable as a fraction of local earnings and, for women who received both group loans and banks loans, total borrowing from these two sources corresponds to roughly two months of labor earnings at the minimum wage in these areas.[5]

Groups do undertake activities not directly related to credit. About 10 percent were involved in the preparation of school meals, 3 percent administered state programs to distribute subsidized foodgrains, and about half of them had, at some point, been involved in resolving family or village conflicts. They also frequently reported helping members during periods of personal distress. These groups therefore seem to play a role in promoting solidarity networks in the community. The data we have collected so far do not allow us to investigate these activities in much detail. In terms of the fractions of groups and members involved however, they appear secondary.

We estimate models of both group and member duration and find that factors behind group survival are quite different from those affecting member longevity. The maximum level of education in the group is important for its survival, perhaps because some educated members are needed to facilitate transactions and ensure that group accounts are accurate. The presence of other SHGs in the same village also has a positive effect on duration. It may be that a dense cluster of groups allows for the sharing of

3. See table 8.

4. Our survey did not explicitly ask members about the bank credit received each year. This number has therefore been computed using the total amount received by members from bank sources and dividing it by the number of years that the group has been active since first bank linkage.

5. The minimum wages for each sector are determined by the Indian states under the Minimum Wages Act, 1948. The Central Government issues guidelines regarding these and currently recommends a floor of Rs. 66 per day. Agricultural workers who are privately employed typically receive about two-thirds of this amount.

costs and ideas or instills in members the desire to survive, compete, and be part of a larger network.

Based on a large literature that points to the importance of social heterogeneity in collective action, we explore whether such heterogeneity matters for the average duration of groups and of members within groups. For each surveyed member, we recorded both their individual caste or *jati* and the official category to which this caste belongs. Our fractionalization measures are a function of the shares of group members that belong to each caste. There are over a hundred different castes in our surveyed area and all four of the official categories are present—the Scheduled Tribes (STs), Scheduled Castes (SCs), Other Backward Classes (OBC), and the residual category of Forward Castes (FCs). We find that commonly used measures of fractionalization and social heterogeneity based on these classifications do not have systematic effects on group survival but they do explain the departure of individuals from groups. Heterogeneity matters even within broad caste categories, suggesting that the official classification fails to fully capture the relevant social hierarchy. Members from traditionally disadvantaged groups, especially poor communities within the ST, are the most vulnerable to group heterogeneity. In addition to heterogeneity, lower levels of education, smaller landholdings, and the absence of relatives within the group are all associated with greater exit of members. We find that most of the differences in the duration of membership within a group between Chhattisgarh and Orissa can be attributed to characteristics of groups in these areas and regional variations in duration are negligible once these characteristics are incorporated into our model.

Our results suggest that it is problematic to evaluate the success of microfinance interventions based on conventionally reported coverage figures because these figures do not adequately account for attrition. The formation of groups is much better recorded in official data than their closure and groups, rather than their members, are the unit of analysis. As a result, estimates of microfinance outreach are inflated because they are based on the initial and not the actual membership of SHGs.

One might argue that the attrition rates observed in our data are not particularly high compared with many government programs. Even groups that are no longer active functioned for a little over two years and members that left functioning groups stayed for an average of one and a half years. Besides, even if attrition rates were higher, it would be difficult to derive their welfare implications without more information on the types of credit contracts that these members have access to upon leaving their group. It is

possible, and perhaps desirable, that SHGs are an intermediate stage in the process of financial integration of these households and that members leave groups when individual contracts with formal financial institutions become sustainable.

We find, however, that attrition rates are systematically related to measures of social disadvantage. It is predominantly the poorer and socially marginalized communities that leave the SHG network, and this makes it unlikely that women moving out of SHGs enter individual contracts with lending institutions. It also means that some of those in desperate need of credit cannot obtain it from within this sector. An additional concern is that lending by commercial banks to SHGs is considered *priority sector* lending by the banking system and may therefore *crowd out* other lending. Disbursements by commercial banks to SHGs were 29 percent of all direct bank credit to small farmers in 2004–05 and SHG credit has been rapidly rising since.[6]

To arrive at concrete policy prescriptions for this sector, more information is needed about the financial opportunities available to members once they leave this sector and the extent to which SHG lending substitutes for other types of lending to the poor. Although the duration of membership is only one, admittedly crude, measure of the performance of the microfinance sector, our study suggests that survey data on the histories of members and groups in this sector is critical to an assessment of Indian microfinance.

We provide a brief institutional history of the microfinance sector in India in the second section. Our survey data, some summary statistics, and empirical methods are described in the third and fourth sections, respectively. Results are presented in the fifth section and are followed by some reflections on their implications for policy.

Microfinance Institutions in India

Many detailed accounts on the history of rural banking in India are available. The All India Rural Credit Survey in 1954 was the first major study of household access to credit. It found that the rural poor were heavily

6. The loan disbursements to farmers with less than 2.5 acres of land were Rs. 10,833 crore in 2004–05 while SHG linked loans increased by Rs. 2,994 crore over the same period (RBI, 2007, tables 59 and 72).

indebted and had very limited access to banking services.[7] As part of a process aimed at improving services to this population, the State Bank of India (SBI) was set up in 1955, the 14 largest commercial banks were nationalized in 1969, and the NABARD was created in 1982. Each nationalized bank was designated a lead bank for a particular state and these banks were required to maintain specific ratios of urban to rural branches in their state. As a result of these policies, a vast network comprising thousands of credit cooperatives and regional rural banks was created. There is some evidence that this expansion reduced regional poverty (Burgess and Pande, 2005), but it was accompanied by operating costs and default rates that were too high to be sustainable. Moreover, the reliance on informal credit sources persisted among the very poor.

In the early 1990s central bankers tried to revitalize this elaborate and largely inefficient banking system. The start of institutionalized microfinance in India is often attributed to the circular that was issued by the Reserve Bank to all nationalized commercial banks in 1991, announcing the objective of linking informal groups of rural poor with these banks. Some NGOs at the time had organized women into groups that used their pooled savings for mutual insurance and small credit needs. Based on studies of these informal groups, it was believed that they had the "potential to bring together the formal banking structure and the rural poor for mutual benefit" (RBI, 1991). The following year NABARD launched a pilot project that linked 500 groups with commercial banks. The banks were offered finance from NABARD for such lending at the rate of 6.5 percent per annum. It was recommended that banks either lend directly to groups at 11.5 percent per annum or route their loans through voluntary agencies at the lower rate of 8.5 percent in order to cover the transaction costs of these agencies (NABARD, 1992). Banks were also permitted to classify such lending under Advances to Weaker Sections, and this category has historically accounted for a large fraction of their unprofitable loans.

Another major change came in April 1999, with the launching of the Swarnajayanti Gram Swarozgar Yojana, popularly known as the SGSY (RBI, 1999). This program was introduced to increase the membership of SHGs among families living below the poverty line. The introduction of the SGSY reflected a significant change in state policy by directly subsidizing borrowers (as only part of the initial loan had to be repaid) and by restricting the composition of a group to families living below the poverty line.

7. See, for example, Bell (1990) for summary statistics on rural borrowing and indebtedness based on rural credit surveys and Karmarkar (1999) for recent figures on the numbers of different types of rural banking institutions.

Subject to caps, the rates of subsidy were 50 percent for borrowers from the SC and ST categories and 30 percent for other poor households. A proper evaluation of the changes that the SGSY brought about in the composition and performance of SHGs is yet to be undertaken.[8]

The NABARD pilot program of 1992 was widely regarded as successful. As seen in table 1, the number of SHGs linked to the banking system has been rising rapidly over the last 15 years and is currently over 2.5 million. Over the past few years, alternative models of lending have appeared and private banks have also entered the sector. However, in spite of the rapid growth of specialized MFIs in India, they are estimated to cover only about one-half the number of households covered by SHGs.[9] This contrasts sharply with countries such as Bangladesh and Indonesia, where each of the major MFIs is, in proportional terms, larger than the combined non-SHG sector in India (RBI, 2005; Basu and Srivastava, 2005).

TABLE 1. Cumulated Bank Linkages, 1992–2007

Year (end-March)	*No. of SHGs linked*	*Bank loans (Rs. crore)*
1992–93	255	0.29
1993–94	620	0.65
1994–95	2,122	2
1995–96	4,757	6
1996–97	8,598	12
1997–98	14,317	24
1998–99	32,995	57
1999–2000	114,775	193
2000–01	263,825	480
2001–02	461,478	1,026
2002–03	717,360	2,048
2003–04	1,079,091	3,904
2004–05	1,618,456	6,898
2005–06[a]	2,238,565	11,397
2006–07 [b]	2,580,000	14,479

Sources: Figures from 1992–2005 have been taken from RBI (2006) and RBI (2007).
Notes: a. provisional estimates; b. up to end February 2007.

8. Our own surveys indicate that the combination of restrictions of group composition and subsidies may have been a factor causing the closure of some groups. Surveyed groups were asked about whether or not they received a subsidy. Although very few of the subsidized groups failed, other groups sometimes cited their exclusion from state subsidies as a reason for the failure of their group. In some cases, a few members were excluded from the group by the others because they were not on government poverty lists and the group was required to have a certain fraction of their members on these lists in order to be eligible for SGSY subsidies.

9. Ghate (2007, p. 17) estimates that about fourteen million households are served by SHGs and 7.3 million by MFIs.

The dominance of SHGs in Indian microfinance appears to have resulted from the combined presence of a vibrant non-government sector engaged in rural development and an extensive but unprofitable network of rural banks and agricultural cooperatives that were created with the explicit purpose of providing small loans to the rural poor.[10] Policy makers may have been impressed by the phenomenal expansion in the outreach of MFIs like the Grameen Bank in Bangladesh and other countries. The Grameen Bank alone, starting from a humble beginning, had reached almost a quarter of all Bangladeshi villages by 1991.[11] The linking of banks with SHGs was a creative approach that harnessed existing investments in rural banking to rapidly increase outreach among the poor and gave India its own particular brand of microfinance.

Data

Our data comes from a survey of all of the 1,102 SHGs created by PRADAN in two of its field locations, one in northern Orissa and the other in central Chhattisgarh. We collected information on the history of every group formed since the start of the program in these areas and on each of the 16,800 women who, at any stage, had been members of these groups. Our group-level survey records all loans taken by the group from commercial banks; rules on interest rates, fines and repayment; and a summary of the production and social activities undertaken collectively by group members over the year preceding the survey. Through member interviews we obtained their social and economic characteristics, and their borrowings from internal and bank sources. In the few instances in which current or former members of a group could not be traced at the time of the survey, we relied on other informed respondents. We begin this section with a brief outline of PRADAN's microfinance program. This is followed by a description of our survey methodology and some descriptive statistics on groups and members.

The PRADAN SHG Program

The first SHG formed by PRADAN was in Alwar, Rajasthan in 1987. In subsequent years, the program expanded in several states in central India:

10. Harper (2002) provides some additional reasons for why SHGs rather than Grameen type institutions are more successful in the Indian context.

11. This proportion is based on figures for the total number of Bangladeshi villages published by the Bangladesh Bureau of Statistics (www.bbs.gov.bd) and the number covered by the Grameen Bank (available at www.grameen-info.org).

Jharkhand, West Bengal, Madhya Pradesh, Orissa, and Chhattisgarh. Table 2 provides a list of PRADAN locations in each of the six states in which the organization operates, together with the year of the first SHG and the total number of SHGs in existence at the end of March 2006.[12]

TABLE 2. Number of PRADAN SHGs in India (as on March 31, 2006)

State	*Location*	*Year*[a]	*First SHG*	*# SHGs*
Chhattisgarh	Raigarh	1998	1999	532
Jharkhand	Godda	1987	1989	314
Jharkhand	Barhi	1992	1992	411
Jharkhand	Lohardaga	1992	1995	449
Jharkhand	West Singhbhum	1992	1996	363
Jharkhand	Gumla	1994	1994	484
Jharkhand	Dumka	1995	1989	318
Jharkhand	East Singhbhum	1997	1996	392
Jharkhand	Khunti	2000	1997	314
Jharkhand	Koderma	2000	1992	359
Jharkhand	Petarbar	2000	1998	322
Jharkhand	Deogarh	2002	1989	280
Rajasthan	Dausa	1999	1999	171
Rajasthan	Dholpur	1999	2000	180
Rajasthan	Alwar	1986	1987	162
Madhya Pradesh	Kesla	1986	1996	300
Madhya Pradesh	Vidisha	2000	2000	44
Madhya Pradesh	Sidhi	2002	2005	49
Madhya Pradesh	Dindori	2005	2005	110
Orissa	Keonjhar	1990	1998	506
Orissa	Balliguda	2001	2001	201
West Bengal	Purulia	1987	1995	218
West Bengal	Bankura	2005	2000	142
Total				6,621

Source: Personal communication with PRADAN.

Note: a. This refers to the year in which a PRADAN office was opened in the area. The Deogarh and Dumka SHGs were initially under the Godda office and the Koderma and Peterbar SHGs were managed by the Barhi office. This is why the first SHG in these areas predates the opening of the PRADAN branch office.

The groups formed by PRADAN are a small fraction of the total number of SHGs in the microfinance sector, but they have an important presence in the areas in which they operate. The program targets administrative blocks with high levels of rural poverty and proceeds by building a dense network of SHGs in these areas over a few years. In recent years, SHGs have been the first intervention by the organization in each village, and group meetings have then been used to introduce other activities aimed at raising agricultural productivity and rural incomes. The social composition of

12. The current aggregate figures for the SHG program are available at www.pradan.net.

these villages is often different from other parts of the state and district; the proportion of communities classified as ST is higher and literacy rates are lower than the state average.

The groups themselves consist entirely of women and are formed according to the guidelines issued by NABARD and the Reserve Bank (NABARD, 1992; RBI, 1999). Each group has between ten and twenty-five members and large villages often have multiple groups, one in each hamlet. The PRADAN professionals begin the process of group formation by meeting village women in a public space in the village. They discuss the benefits of membership and some general principles followed by successful groups (for example, compulsory attendance, weekly savings, sustainable interest rates, bookkeeping, and so on). Interested women are enlisted and a regular meeting time is set. A professional is usually present at meetings until membership becomes fairly stable and all members are familiar with group practices. Each group is provided with a register for keeping accounts and a cash box, and the group either designates one of the members to keep accounts or hires an accountant. The register, cash box, and keys are usually rotated among the members.

As groups mature, they get federated and select representatives who regularly attend cluster meetings organized by the federation. The groups that function smoothly typically open a savings account with a nearby commercial bank within a year of their inception. At this stage, PRADAN professionals discuss the feasibility of alternative self-employment projects with the group, and, once a few members decide on particular projects, the group applies for a loan to a commercial bank. This loan constitutes their first bank linkage. Bank funds come into the group and are then lent to individual members. These members make payments to the group, which then repays the bank on the stipulated date.

Over time, the professionals who initiated the group withdraw, and their interactions with members are limited to cluster meetings and occasional visits to the village. Regular communication with PRADAN takes place mainly through copies of weekly accounting transactions that are sent in to the local office. Groups are free to determine the rules under which they operate and the stringency with which they are implemented. After the inception of the SGSY in 1999, some subsidies to groups are routed through PRADAN, provided the groups satisfy the selection criteria required by the scheme. Therefore, both subsidized and unsubsidized SHGs co-exist in the same area.

In the absence of regular visits to older SHGs, the organizations promoting these groups are not always informed about their functioning. Successful groups may stop sending in accounts as they reduce their reliance on

PRADAN, others may temporarily suspend meetings because some members migrate seasonally, and yet others may stop their activities altogether. Survey data is therefore required to accurately track the performance of groups over time.

The Survey Design

As mentioned above, we surveyed all PRADAN groups created in the districts of Keonjhar and Mayurbhanj in northern Orissa and the district of Raigarh in eastern Chhattisgarh. Both the districts in Orissa are serviced by the professionals in Keonjhar and we henceforth refer to these groups as the Keonjhar SHGs. The three survey districts are shown in figure 1 and surveyed areas within each district are indicated in figures 2–4. Although only a small fraction of each district is actually covered by the program, groups are geographically clustered in dense pockets. This makes it easier for professionals to visit these areas and it also allows groups to benefit from frequent contact with each other.[13]

In our analysis, we refer to a group as inactive if the group has not held any meetings over the three months prior to the survey and if its members declare that they have no plans to meet in the future. A group is considered as active if it is meeting regularly at the time of the survey. All women who left groups while the group was still functioning are called past members and the others are referred to as present members. This category therefore includes women in inactive groups if they remained with the group until its last meeting.[14]

At the group level we collected data on rules, activities, and the timing of some significant events. These events include the inception of the SHG, the creation of savings accounts, bank loans, the group's membership in an SHG federation, and, for inactive SHGs, their last meeting. Group rules include fines (for attendance and late repayment), minimum savings requirements, interest rates, and the assignment of group responsibilities. We asked group members about their collective activities such as their involvement in resolving village and family conflicts, their visits to government officials, and their administration of state-funded school meal programs in primary schools. We also recorded the total number of other SHGs formed by PRADAN in the same village.

13. Some of these benefits are studied by Nair (2005).

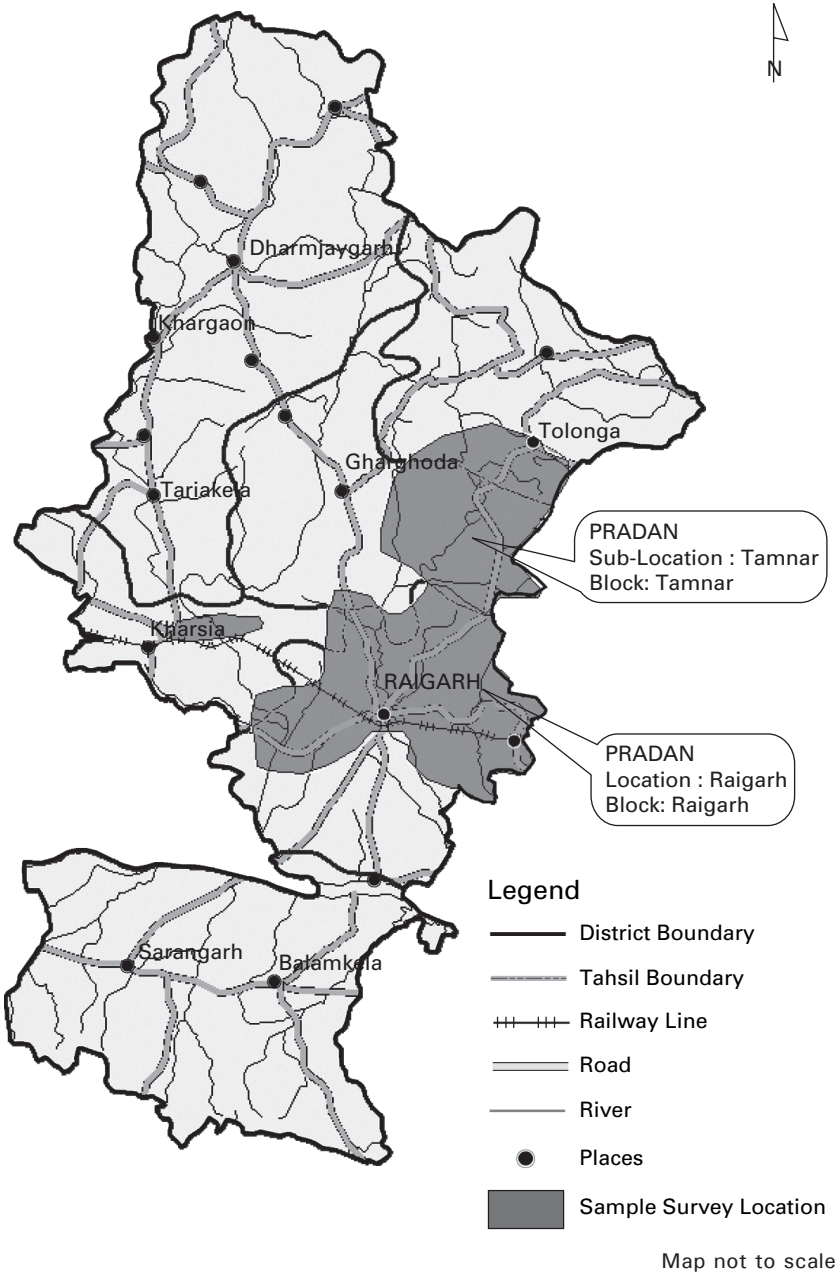
14. Our main reason for using this classification is that we would like to distinguish between members who left existing groups and those whose membership ended because the group became inactive. It is likely that the factors underlying these two types of events are different. We intend to explore these differences more carefully in future research.

FIGURE 1. Study Area

Source: Census of India.

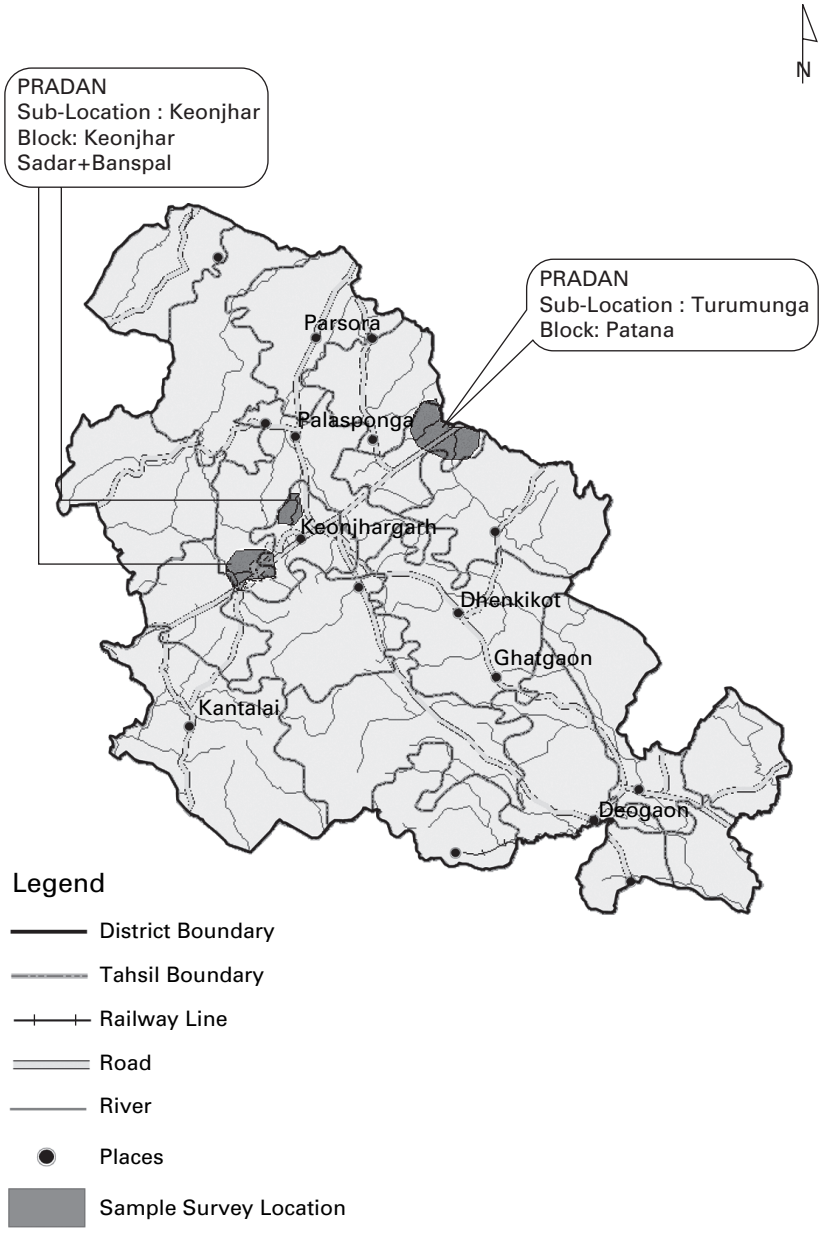
For all present and past members, we collected information on a standard set of characteristics relating to their social and economic background: caste, education, age, marital status, fertility, household landholdings, and some parental information. Our data on caste includes both the *jati* of each member and the official caste category to which the *jati* belongs. We classify a group as homogenous if all its members belong to the same *jati.* For each

FIGURE 2. Raigarh (Chhattisgarh)



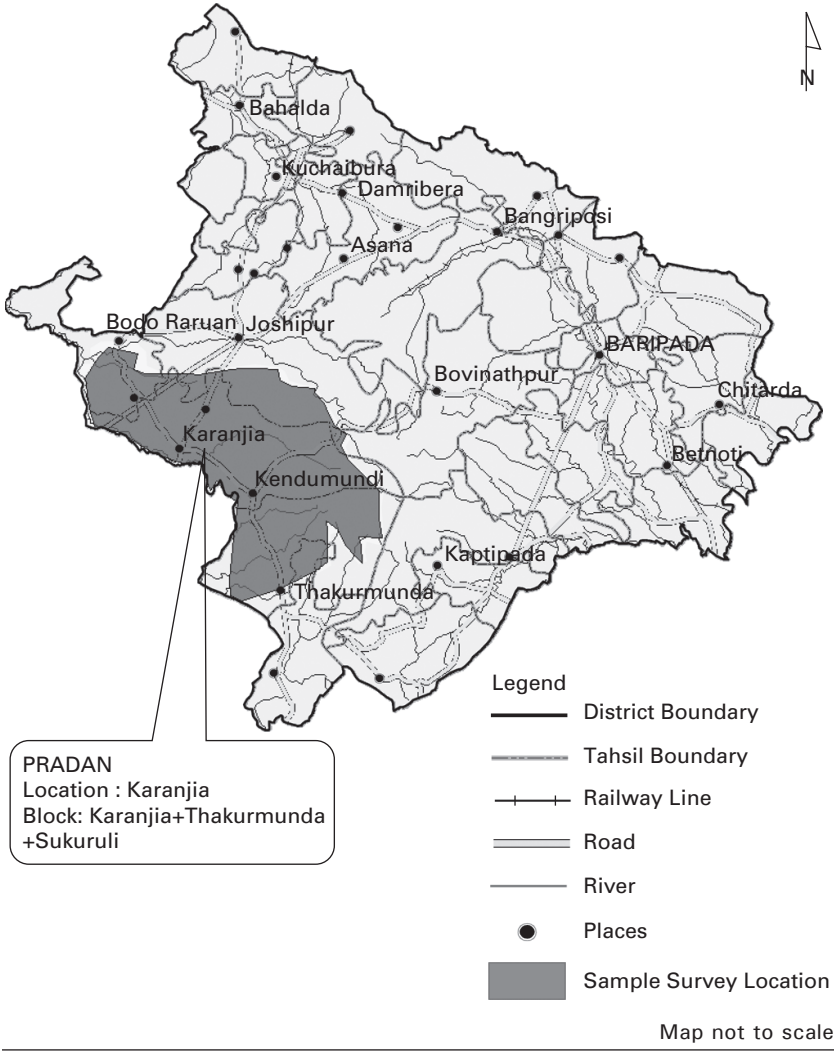
Source: Census of India.

FIGURE 3. Keonjhar (Orissa)



Source: Census of India.

FIGURE 4. Mayurbhanj (Orissa)



Source: Census of India.

member and for each accountant, we recorded their dates of entering and, if applicable, leaving the group, and the total value of loans taken by them. We also created a relationship matrix, which recorded family ties between members. For inactive groups, we asked members the main reason for group failure and recorded the most popular response. Similarly, we asked past members the main reason for their departure from a group.

Descriptive Statistics

Table 3 provides a chronology of the formation of SHGs in our study area. The survey in Keonjhar was conducted during the summer of 2006 and the Raigarh survey was in January 2007. In each case, we surveyed all groups created in the area from the start of the program until the date of our survey. This gives us a total of 1,102 groups created in the period 1998–2006. Of these 10 percent were inactive by the time of the survey (12 percent in Raigarh and 9 percent in Keonjhar).

TABLE 3. Year-wise Formation and Dissolution of SHGs: Survey Data, 1998–2006

	Started		*Inactive*		*Bank loan*	
Year	*Keonjhar*	*Raigarh*	*Keonjhar*	*Raigarh*	*Keonjhar*	*Raigarh*
1998	4	0	0	0	0	0
1999	10	18	0	0	0	0
2000	51	61	0	0	0	3
2001	27	36	3	5	2	7
2002	155	30	4	5	14	23
2003	89	46	11	7	100	31
2004	95	172	9	8	95	100
2005	85	160	17	24	89	140
2006	16	47	2	20	62	91
Total[a]	532	570	46	69	362	395

Source: Survey Data, 1998–2006.

Note: a. There are two main reasons why the totals in this table do not match with those in table 2. First, we included all groups that were formed before the survey date, and some of these were created after March 2006. Second, table 2 is based on administrative data that do not always account for group failures since these are not consistently reported.

Table 4 contains descriptive statistics on groups by their survival status. A comparison of the two types of groups throws up some interesting patterns. First, active and currently inactive groups are both reasonably long-lived with inactive groups operating for an average of two years after they are formed. Second, there are many more homogenous groups in Keonjhar in both categories and these groups as a whole have lower survival rates. This pattern is driven by groups composed of ST, who form a majority of our surveyed population, and it does not hold systematically for the other caste categories. Since we have defined a homogenous group as one in which all women are of the same tribe or caste, the lower survival rates reflect in part lower levels of education among some tribal communities, which make it hard to sustain a group. We discuss this issue in detail in the fifth section. Third, groups that survive are more involved in the village activities and in the lives

TABLE 4. Group Characteristics by Survival Status

	Keonjhar		*Raigarh*	
	Active	*Inactive*	*Active*	*Inactive*
Number of groups	486	46	501	69
Percentage	(91)	(9)	(88)	(12)
Average duration (days)	1105	884	1129	620
COMPOSITION				
Total number of castes in dataset	88	22	96	45
Average number of castes	2.4	1.8	4.0	3.4
Average number of caste categories (ST, SC, OBC, FC)	1.8	1.3	2.3	2.2
Fractionalization index	0.26	0.17	0.51	0.46
HOMOGENEOUS GROUPS (%)	34.8	52.2	10.2	13.0
ST (% of homogenous)	68.6	91.6	60.8	66.7
SC (% of homogenous)	8.9	4.2	19.6	33.3
OBC (% of homogenous)	22.5	4.2	17.7	0
FC (% of homogenous)	0	0	1.9	0
GROUP ACTIVITIES LAST YEAR				
Mid-day meals (%)	9	0	12	1
Public Distribution System (PDS) (%)	3	0	4	0
Panchayat meetings (%)	34	22	56	35
Exposure trips (%)	70	41	13	6
Federation meetings (%)	12	2	2	0
Meet government officials (%)	20	7	32	16
Involvement in family or village conflict or member in distress (%)	44	26	52	26
RULES				
Minimum weekly saving (%)	100	100	94	96
Saving compulsory (%)	30	20	38	39
Groups with absence fines (%)	97	67	38	26
Absence fine (Rs.)	3.1	2.6	3.8	3.2
Higher interest rates default (%)	15	13	92	91
OTHER CHARACTERISTICS				
Received a subsidy (%)	14	0	5	1
Developed a group project (%)	34	9	26	6
Accountant is a member (% of accts)	68	41	59	62
MEMBERS				
Average number of members	16	15	15	15
Past member (%)	13	14	15	14
Literate (%)	33	12	29	25
No school (%)	59	87	64	70
Maximum education (years)	9	5	8	7
Mean education (years)	2.8	1.0	2.0	1.6
Mean land (acres)	1.7	1.4	2.0	1.9

Source: Survey Data, 1998–2006.

of their members. They are more likely to administer government schemes, meet government officials, attend cluster meetings, go on exposure trips organized by PRADAN to observe projects in other villages, and get involved in resolving family and village conflicts. In terms of their demographic characteristics, members of active groups are, on average, more educated, they own more land, and more of them act as accountants for their group.[15] Differences in group size are negligible.

Table 5 compares present and past members. Homogenous caste groups retain a slightly higher proportion of their members. Demographic characteristics of past and present members are similar. Members who eventually

TABLE 5. Characteristics of Present and Past Members

	Keonjhar			*Raigarh*		
	Present	*Past*	*All*	*Present*	*Past*	*All*
Number of women	7473	1116	8589	6995	1216	8211
(%)	(87)	(13)	(100)	(85)	(15)	(100)
Average duration (days)	1002	491	936	1071	542	993
CASTE CATEGORY COMPOSITION						
ST (%)	60.8	62.0	61.0	46.7	52.2	47.5
SC (%)	10.6	10.9	10.6	19.3	23.0	19.8
OBC (%)	27.1	25.8	26.9	32.1	23.0	30.8
FC (%)	1.5	1.3	1.5	1.9	1.8	1.9
BACKGROUND						
Education (number of years)	2.7	2.5	2.7	1.9	1.6	1.9
No school (%)	61	65	61	65	68	65
Read and write (%)	31	29	31	30	24	29
Father's education (number of years)	2.2	1.5	2.1	2.1	1.3	2.0
Land (acres)	1.7	1.7	1.7	2.0	1.8	2.0
RELATION TO GROUP						
Relatives within group (%)[a]	12.0	7.6	11.4	8.2	5.8	7.8
In homogenous groups (%)	35.3	32.3	34.9	9.8	7.3	9.4
Previous SHG membership (%)	4.4	9.0	5.0	5.7	6.5	5.8
Joined other SHG after leaving (%)		20.4			18.3	
CHAIRMAN[b]						
membership < 2 years (%)	5.6	0.49	4.7	8.5	3.2	7.1
2 years < membership < 4 year (%)	7.7	3.3	7.3	9.1	3.7	8.7
4 year < membership (%)	8.3	0	8.1	8.7	5.8	8.5

Source: Survey Data, 1998–2006.

Notes: a. Percentage of members who have at least one relative in their group.
b. Percentage of members who have been chairman, given the duration of their membership.

15. The average member characteristics for both types of groups are calculated using all members that were ever part of the group.

leave have fewer years of education and a smaller fraction of them are literate, but these differences are not large. A striking contrast between those who remain in SHGs and those who leave is seen in the networks these women have within their groups and in the extent to which they are responsible for group decisions. In Keonjhar, 12 percent of women currently in groups had another relative in the group while this was true of only 7.6 percent of past members, and those who stayed in their groups were at least twice as likely to have held the position of group chairman, conditional on the number of days spent in the group. Table 6 shows the distribution of present and past SHG members across the major caste groups in the area. We use these groups in our empirical analysis in the next section and investigate whether the durability of SHGs varies by community.

A variety of reasons were cited by respondents for group inactivity and exit of members from the groups. The principal responses are shown in table 7. We asked former members of inactive groups for their assessment

TABLE 6. Distribution of SHG Members by Caste

	Keonjhar	*Raigarh*
ST	5,231	3,878
(%)	(61)	(47)
SC	916	1,616
(%)	(10)	(20)
OBC	2,397	2,512
(%)	(27)	(31)
FC	124	157
(%)	(2)	(2)
SCHEDULED TRIBES[a]		
Bhuiyans	1,127	203
Kharia	15	466
Ho	444	5
Munda	533	12
Santhals	501	0
Bathundi	811	0
Gond	432	620
Ganda	375	127
SCHEDULED CASTES		
Harijans	421	11
Chauhan	0	886
OTHER BACKWARD CASTES		
Yadav	5	697
Mahanta	823	99
Kurmi	493	14
Teli	95	497

Source: Survey Data, 1998–2006.
Note: a. Only the largest groups are reported here.

TABLE 7. Stated Reasons for Group Failure and Member Exit

	Keonjhar	*Raigarh*
GROUP		
PRADAN withdrew support	18.2	11.8
Personal conflicts/leadership problems/accountant problems	45.5	38.2
Unpaid loans/irregular savings	27.3	25.0
Others	9.0	25.0
Total	100	100
Number of observations	46	69
MEMBER		
PERSONAL REASONS		
Illness/death	8.3	8.1
Left village/married/seasonal migration/going to school	17.8	12.0
RELATED TO GROUP		
The family was not supportive	6.2	9.1
Could not reimburse a loan taken/difficulty in saving	29.2	17.1
Could not attend the meetings	9.8	12.8
Personal conflict with the group	15.5	20.3
Excluded by the group	4.9	1.0
OTHERS		
Wanted to join another group	0.5	6.5
Others[a]	7.8	13.1
TOTAL	100	100
Number of observations	1,116	1,216

Source: Survey Data, 1998–2006.

Note: a. Others includes not understanding the working of the SHG, PRADAN official stopped visiting the group, the group is too big, and no clear reason.

of why the group stopped functioning. In both regions, problems of leadership and conflict turned out to be the most important (40 percent) followed by low savings and repayment rates. The stated reasons for member departures vary by region. Difficulties in saving and reimbursement are most important in Keonjhar while personal conflicts matter more in Raigarh. These responses are not surprising given the higher levels of education of departing members in Raigarh and the greater social heterogeneity of their groups. Between one-quarter and a fifth of all members who have left cite personal reasons, which often involve leaving their village.

The borrowing and lending activities of groups are summarized in table 8. Almost all active groups provided their members with loans from internal funds in the year prior to the survey and a fairly high fraction of members received such loans (88 percent in Keonjhar and 63 percent in Raigarh). Borrowing members of active groups received an average of between two and three loans during the year prior to the survey and they

TABLE 8. Borrowing and Lending Activities of Groups

	Keonjhar			*Raigarh*			*Both areas*
	Active	*Inactive*	*All*	*Active*	*Inactive*	*All*	
GROUP LOANS							
Lending from internal funds (%)	100	91	99	96	30	88	93
Members receiving loans (%)	88	14	78	63	10	55	68
Loans per member last year *(#)*	3.1	2.4	3.1	2.1	2.1	2.1	2.7
Borrowing per member last year (Rs.)[a]	2,792	1,831	2,769	1,320	1,024	1,312	2,220
BANK LINKAGES							
At least one bank linkage							
Total groups (%)	74	15	69	74	23	68	68
Number of linkages *(#)*	1.7	1.0	1.7	1.8	1.3	1.8	1.7
Total bank borrowing (Rs.)	46,555	13,500	45,924	52,206	23,571	50,958	48,518
Members receiving bank funds (%)	77	89	78	89	84	90	83
Loans per borrowing member (Rs.)	4,222	984	4,150	4,154	1,488	4,070	4,108
Duration of group since first linkage (days)	613	318	607	768	526	759	685
Exactly one bank linkage							
Total groups (%)	52	100	53	38	75	40	46
Average loan size per member (Rs.)	2,386	1,979	2,375	1,303	512	1,285	2,039
Members who received part of loan (%)	88	61	87	59	18	56	74

Source: Survey Data, 1998–2006.

Note: a. For loans and borrowings, last year refers to the year before the survey for members of active groups. For inactive groups it is the last year for which they were active. In the case of women who left groups we refer to their last year of membership.

borrowed an average of Rs. 2,298 from the group. For inactive groups, we recorded lending activities during the last year of their regular functioning. Most of these groups in Keonjhar did lend out internal funds while less than one-third of the inactive Raigarh groups were engaged in such lending during the last year in which these groups were active. In both cases, access to these loans was very uneven and less than 15 percent of members received such loans. Those who did borrow received sizable amounts of, on an average, Rs. 1,831 in Keonjhar and Rs. 1,024 in Raigarh. It is plausible that this uneven distribution of group funds may have led to the high levels of group conflict reported by members of inactive groups.

Nearly three-quarters of active groups in both areas have been linked with commercial banks. Linked SHGs have received an average of 1.7 bank loans and average total borrowings of Rs. 48,518. Over 80 percent of members in linked groups received these loans, resulting in average borrowings of a little over Rs. 4,000 per member.[16] To better understand the extent of credit provided by banks per year, we compute the number of days between the first group linkage and the survey date for active groups and the days from the first linkage to the last meeting for inactive groups. Using the average duration of 685 days (across all regions and both active and currently inactive groups), members receiving bank credit get about Rs. 2,000 per year through these linkages.

Empirical Methods

General Issues

In the previous section, we have described various aspects of the composition and functioning of SHGs and discussed some of the interesting correlations in our data. We have observed, for example, that groups that survive are more involved with village activities, they have more stringent attendance and savings requirements, and they share loans more equitably. Members who remain in groups are more educated than average and have a network of family connections within the group. We now proceed to estimate the effects of some of these group and member characteristics on the duration of the group and on the length of time women remain in these groups.

16. This is roughly $100 dollars at the current exchange rate and $273 using the purchasing power parity rate of 14.67 released by the International Comparison Program in December 2007.

The group and member life-spans that we are interested in have to be estimated using data that is *right-censored.* In other words, we would like to estimate the length of time that groups and members survive using data in which most groups are still active and most women who joined these groups are still in them. This makes many standard regression techniques inappropriate for our purpose. To see why, suppose that we use a binary variable, which takes the value of one for groups (or members) that are no longer active and zero otherwise, and would like to estimate the effect of a set of covariates on the likelihood of survival. Even if all groups had the same chances of survival, and our covariates did not matter at all, we would observe older groups surviving at lower rates simply because they are older, and the characteristics of these groups would therefore appear to be negatively associated with the likelihood of survival. We would therefore obtain inconsistent estimates of the effects of group and member characteristics on survival rates. To take another example, suppose PRADAN started its SHG program in areas with low literacy. Even if literacy did not matter for group duration, it would appear to matter because older groups are less likely to have survived until our survey date and these groups have lower literacy rates.

If we try to avoid these types of biases by restricting our sample to inactive groups and to members who have completed their stay in a group, we lose a lot of the variability in our sample and reduce it to a fraction of its current size. What we do instead is to use methods of survival analysis, popular in the biomedical and quality control fields, which allow us to use censored observations by making use of information on the censored group or member until the time of censoring, rather than simply ignoring these observations or not accounting for the fact that they are censored. These methods are used to estimate the time until events occur in our case, the events being either the cessation of regular group activity for the group-level analy-sis, or the departure of a member for our study of member attrition.

We estimate the distribution of a random variable T which denotes the duration (in days) of a group, or of a member within a group. This distribution can be represented in several ways.[17] The *survival function* $S_T(t)$ represents the probability of surviving beyond a time t or, in other words, the probability that the random variable $T \geq t$ or that the event has not occurred until time t. The *hazard rate* $h_T(t)$ is, in the language of survival analysis, the instantaneous chance of failure at time t. For our purposes, it

17. This discussion is based on Klein and Moeschberger (2003), chapters 2 and 3.

is the probability that a member will leave a group at time t, conditional on her being there until that point in time. Finally, the *cumulative hazard rate* $H_T(t)$ is sum or integral of these hazard rates over $(0, t)$, depending on whether T is discrete or continuous.

These three representations of the distribution of T can be estimated using either parametric or non-parametric methods. Non-parametric estimators are a natural choice when dealing with a homogenous population because of the flexibility they offer. Our population is far from homogenous but we begin with these non-parametric estimates as descriptive tools to summarize the survival behavior of groups and members. We then estimate a parametric model that allows us to incorporate covariates and therefore estimate the causal effects of group and member characteristics on survival rates. A variety of different non-parametric estimators and parametric models are available. For non-parametric estimates we focus on the Nelson–Aalen estimator of the cumulative hazard function, which is shown to have desirable small sample properties and on a smoothed hazard rate derived from this estimator. For parametric estimates we use the Weibull model for reasons discussed below.

The Nelson–Aalen Estimator

With right-censored data, the exact lifetime is only observed if failure or exit occurs before the time of censoring, namely the date at which the group was surveyed. In the following discussion, we will usually refer to events as the exit of SHG members although the same principle applies for group failure.

Suppose that in our data, members exit groups at D distinct times $t_i < t_2 < \ldots < t_D$ and that at time t_i there are d_i departures. Time, in our case, is the number of days since the member joined the group. Let Y_i represent the number of individuals who are at risk at time t_i. In our case, this is the number of members who are still part of the group at t_i or who leave it at t_i. Members who do not leave but are observed for less than t_i days in the group are subtracted from Y_i. The ratio d_i/Y_i estimates the conditional probability that a group or a member who survives to time t_i, experiences the event at time t_i. The Nelson–Aalen estimator is then given by:

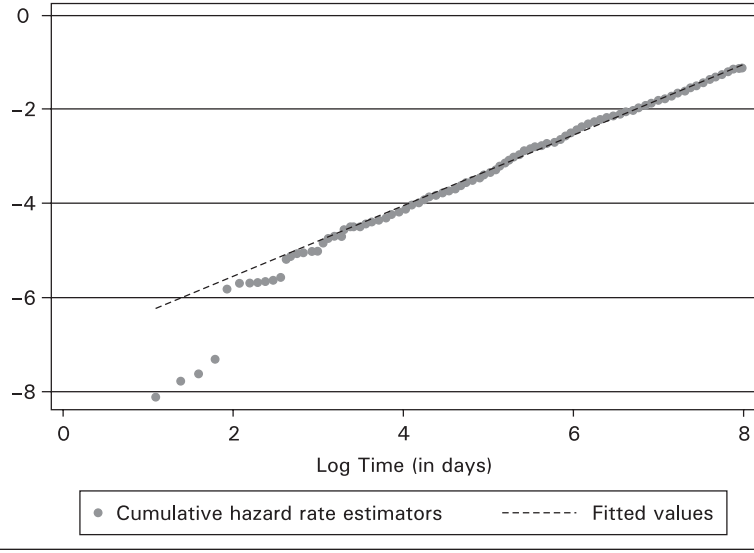
$$\hat{H}(t) = \begin{cases} 0 & \text{if } t \le t_1 \\ \sum_{t_i \le t} \dfrac{d_i}{Y_i} & \text{if } t_1 \le t \end{cases} \tag{1}$$

By smoothing the jump sizes of this estimator with a parametric kernel, we can obtain a hazard function *h(t)*.

The Weibull Model

We now impose some additional structure on the survival function to examine the importance of various group and member characteristics on survival times. We assume that both group and member duration follow a Weibull distribution. The natural log of the cumulative hazard function in the Weibull model is linear as a function of the log of member duration. Figure 5 plots these two variables for our dataset of members [using Nelson–Aalen estimates of *H(t)*]. The model seems to fit the data fairly well except for members with very short durations within groups. The group-level plot looks similar.

FIGURE 5. Appropriateness of the Weibull Model



Source: Computed by the authors.

Given a vector of covariates Z and corresponding coefficients β, the Weibull hazard rate is given by

$$h(x|Z) = (\alpha\lambda x^{\alpha-1}) \exp(\beta' Z)$$

The first expression $(\alpha\backslash x^{\alpha-1})$ is referred to as the baseline hazard, h_o and α is termed the shape parameter. All our results are presented in the form

of hazard ratios corresponding to our explanatory variables. For binary variables these tell us the factor by which the hazard function moves up or down relative to the baseline hazard. In general, it gives us the ratio of the hazard function to the baseline hazard for a unit change in the explanatory variable. If an explanatory variable has no effect on the risk of failure our estimated hazard ratio should be close to 1.

Results

We first present non-parametric estimates of hazard functions separately for each of our areas and then discuss the effects of group and member char-acteristics based on the Weibull model.

Non-parametric Estimates

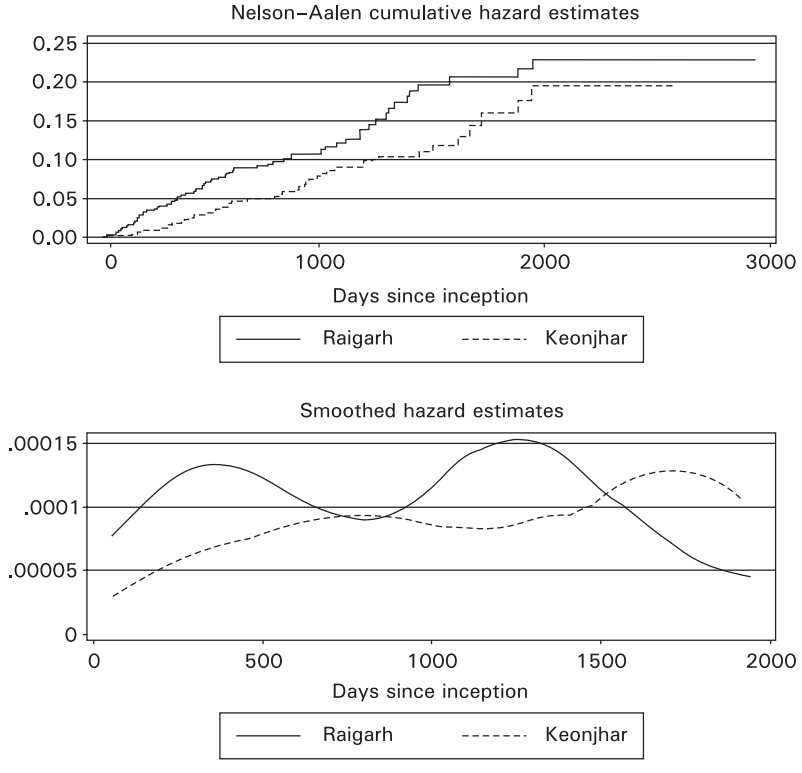
The Nelson–Aalen estimates of cumulative hazard functions are shown in the upper panel of figure 6. The lower panel shows hazard rates that are obtained by a kernel smoothing of the hazard contributions provided by the Nelson–Aalen estimators. Like all estimates obtained by kernel procedures, these hazard rates are not reliable at the end points of the time-interval because our sample is thin in this region.

The lower survival rates for SHGs in Raigarh shown in table 3 are also reflected here.

The double-humped hazard rate for Raigarh suggests that there are two different phases in a group's life when it is especially vulnerable: about a year after inception and then again after three or four years. The hazard rates in Keonjhar vary much less over a group's lifetime. We noted that the Raigarh groups are much more socially heterogenous than those in Keonjhar and that group conflict is often cited by members as a reason for leaving the group. One reason for the differences in estimated hazard rates across our two regions may be the higher levels of conflict in Raigarh. The first rise in hazard rates is at about the time that a group takes its first bank loan and the sharing of this loan may be a possible source of conflict in heterogeneous groups. In the absence of any direct evidence on this type of conflict, this is of course purely speculative.

Figure 7 displays hazard rates for members in the two regions. The risk of exit in the early stages of membership is very similar, but once again, we see a second hump in the Raigarh hazard function that is missing for Keonjhar. Differences in these member-level hazard rates across the two areas appear less marked than the group-level estimates of figure 6.

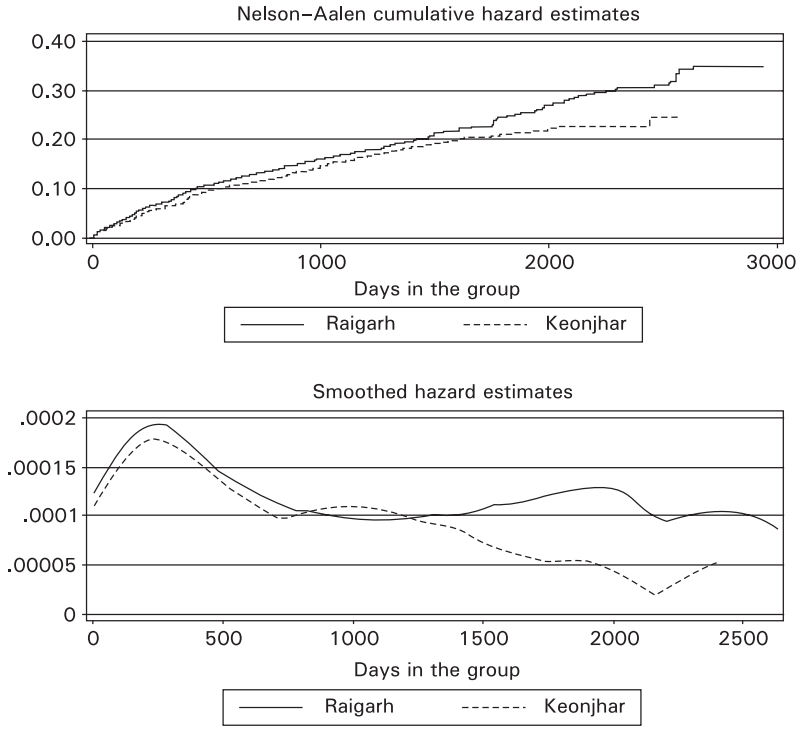
FIGURE 6. Nelson–Aalen Estimates of Regional Hazard Rates: SHG Level



Source: Computed by the authors.

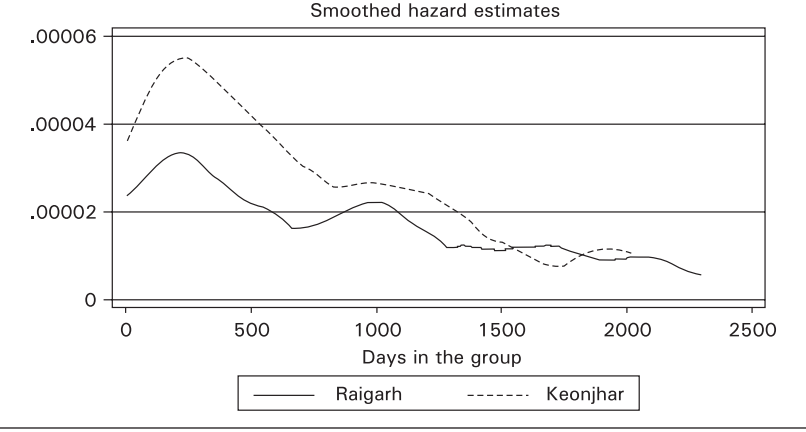
As discussed earlier (under the sub-section on Descriptive Statistics), members who had left groups were asked for the principal reason for their departure. The two most frequently cited reasons were (*a*) difficulty in saving and repayment and (*b*) conflict with other group members. Figures 8 and 9 estimate hazard rates based on restricted samples of members to illustrate the importance of these two factors as a function of the length of time a member stays in the group. Figure 8 is based on a sample that includes only those members that left due to difficulty in savings or repayment. Similarly, figure 9 includes only those that stated conflict as their reason for leaving the group. The reversal of hazard rates across regions in these two figures is striking. Exit due to difficulty in saving and repayment is much more important in Keonjhar and reverses the relative position of the aggregate hazard functions seen in figure 7. As our summary statistics suggest in table 7, conflict is more important in Raigarh.

FIGURE 7. Member Level Regional Hazard Rates



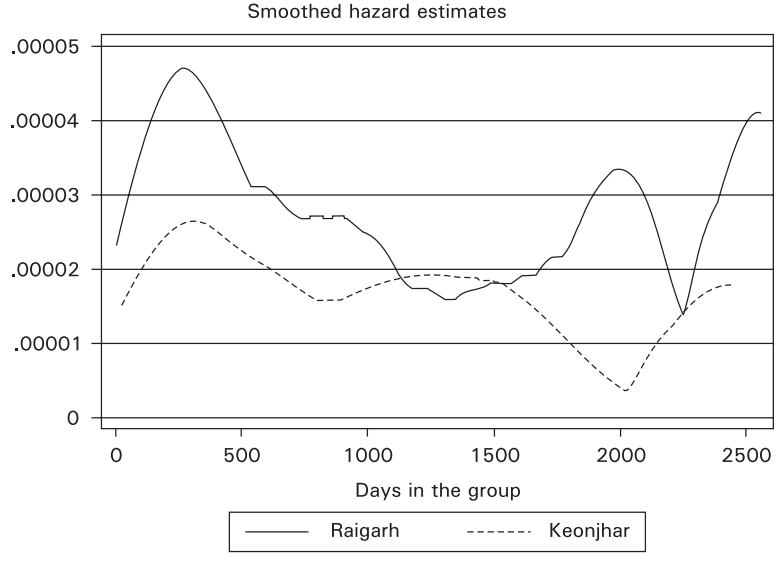
Source: Computed by the authors.

FIGURE 8. Hazard Due to Difficulty in Saving: Member Level Data



Source: Computed by the authors.

FIGURE 9. Hazard Due to Member Conflict: Member Level Data



Source: Computed by the authors.

Parametric Estimates

Weibull estimates using group-level data are presented in table 9. Of the various characteristics that we consider, the only ones that systematically affect group hazard rates are the number of other PRADAN-initiated SHGs in the village and the maximum level of education within the group. Both these lower the risk of group failure. In our most comprehensive specification, an additional year of education for the most educated member of the group lowers the hazard rate by 8 percent and an additional group in the same village lowers it by 18 percent. It is conceivable that the presence of an educated member facilitates interactions with banks and other officials, and ensures better book-keeping. Other groups in the village may help either through the sharing of information or by making it more likely that a PRADAN professional frequently visits the area. We have not looked at these mechanisms directly and at this stage these are simply conjectures that are consistent with our data and have some anecdotal support.

Before proceeding to study the exit of members from functioning groups, it is worth noting that many of the factors that are commonly believed to affect collective action processes do not seem to matter for the group survival in

TABLE 9. Hazard Rates for SHGs, Weibull Model

	(1)		*(2)*		*(3)*	
Shape parameter	1.12		1.13		1.16	
Homogeneous SHG, caste	1.11	(0.37)				
Homogeneous SHG, ST			1.20	(0.41)	1.18	(0.41)
Homogeneous SHG, SC			1.76	(1.02)	1.73	(1.02)
Homogeneous SHG, OBC			0.25	(0.26)	0.26	(0.27)
Fractionalization	0.78	(0.44)	0.79	(0.44)	0.74	(0.42)
Average relations in group	0.84	(0.55)	0.79	(0.51)	0.80	(0.52)
Number of initial members	0.95	(0.03)	0.95*	(0.03)	0.95	(0.03)
Maximum education in group	0.92**	(0.02)	0.92**	(0.02)	0.92**	(0.03)
Average land (Acres)					0.97	(0.06)
Average age					0.95**	(0.02)
Average total children					1.12	(0.21)
Average separated					3.9	(3.52)
Concurrent PRADAN SHGs	0.82**	(0.03)	0.82**	(0.03)	0.82**	(0.03)
Raigarh	1.63**	(0.38)	1.57*	(0.36)	1.72**	(0.44)
Number of observations	1064		1064		1062	
Number of departures	107		107		106	

Notes: *significant at a 10 percent significance level. **significant at a 5 percent significance level. Figures in brackets are standard errors.

our model. Group size, average landholdings, social networks or our various measures of social heterogeneity—none of these has statistically significant effects on group survival. In particular, the lower survival rates observed for tribal communities seem to result from their demographic characteristics rather than their tribal status per se. Survival is admittedly a crude signal of group success and it may be that these group characteristics do matter for the financial success of groups. We are currently in the process of collecting financial data on the SHGs in our sample and plan to explore these questions in future work.

Table 10 is based on our member-level dataset and identifies the determinants of member attrition from groups while these groups are still functioning. Member exit appears to be sensitive to both member characteristics and group composition. Women from the intermediate social category of OBC have lower hazard rates than those from other castes. Education, children, and relatives within the group are also associated with longer life-spans. Separated women are less likely to leave their group, perhaps because they have greater need for the social network provided by it. The average age of members in a group and higher average landholdings are also positively associated with the survival of its members.

TABLE 10. Hazard Rates for SHG Members, Weibull Model

	(1)	*(2)*	*(3) ST*	*(4) SC*	*(5) OBC*	*(6) FC*	*(7)*
Shape parameter	0.75	0.75	0.75	0.76	0.76	0.58	0.75
Caste category, SC	1.18** (0.07)	1.13* (0.07)					1.04 (0.07)
Caste category, OBC	0.91* (0.05)	0.87** (0.05)					0.84** (0.05)
Caste category, FC	1.12 (0.19)	1.00 (0.17)					1.01 (0.18)
Education (in years)	0.98** (0.01)	0.97** (0.01)	0.96** (0.01)	1.02 (0.02)	0.97** (0.01)	0.84** (0.05)	0.97** (0.01)
Land (Acres)	0.99 (0.01)	0.99 (0.01)	0.99 (0.01)	0.97 (0.03)	1.01 (0.01)	1.00 (0.04)	1.01 (0.01)
Age	1* (0.002)	0.99** (0.002)	1.00 (0.003)	1 (0.01)	0.99** (0.01)	0.96** (0.02)	1.00 (0.01)
Separated	0.83** (0.06)	0.81** (0.06)	0.83* (0.08)	0.68** (0.13)	0.96 (0.16)	0.45 (0.34)	0.82** (0.07)
Total children	0.89** (0.01)	0.89** (0.01)	0.90** (0.02)	0.89** (0.03)	0.88** (0.03)	0.78* (0.10)	0.89** (0.01)
Relation	0.34** (0.06)	0.08** (0.02)	0.09** (0.04)	0.06** (0.03)	0.09** (0.05)	0.001** (0.001)	0.08** (0.02)
Homogenous SHG, castes		0.91 (0.07)	0.90 (0.09)	1.26 (0.27)	0.84 (0.15)	0.26 (0.26)	0.86* (0.07)
Homogenous SHG, SC							1.18 (0.19)
Homogenous SHG, OBC							0.99 (0.15)
Fractionalization		1.36** (0.16)	1.49** (0.23)	1.74* (0.49)	1.04 (0.26)	0.53 (0.63)	1.31** (0.15)
Average relations in group		7.97** (2.35)	5.52** (2.37)	16.56** (10.74)	6.22** (3.59)	251.21** (614.50)	7.59** (2.26)
Number of initial members		1.03** (0.01)	1.04** (0.01)	1.01 (0.01)	1.04** (0.01)	1.07 (0.06)	1.04** (0.01)
Maximum education in group		1.01 (0.01)	1.01 (0.01)	1.00 (0.02)	0.98 (0.02)	1.07 (0.08)	1.01 (0.01)
Average land (Acres)							0.94** (0.01)
Average age							0.99** (0.01)
Average total children							0.99 (0.05)
Average separated							0.87 (0.22)
Concurrent PRADAN SHGs		1.02** (0.01)	1.03** (0.01)	1.00 (0.01)	1.03** (0.01)	1.06 (0.05)	1.02** (0.01)
Raigarh	1.10** (0.05)	0.99 (0.05)	1.01 (0.07)	1.18 (0.16)	0.81* (0.1)	1.92 (0.92)	1.05 (0.06)
Defunct	1.35** (0.10)	1.48** (0.11)	37.40** (0.13)	2.36** (0.41)	1.13 (0.25)	0.92 (0.69)	1.46** (0.11)
Number of observations	15,895	15,895	8,619	2,421	4,586	269	15,895
Number of departures	2,087	2,087	1,175	368	509	35	2,087

Notes: Figures in brackets are standard errors.

*Significant at a 10 percent significance level. **Significant at a 5 percent significance level.

The role played by family connections within the group seems to be particularly important. Using the combined sample of all members and controlling for a large set of member and group characteristics (the last column in table 10), we find that the hazard rate for a woman with one relative in the group is 92 percent below the hazard rate for a woman with no relatives. On the other hand, we find that the average density of family networks in the group puts members at greater risk. This suggests that the most vulnerable members are those with no relatives in groups where the other members are closely related. Finally, the existence of competing PRADAN SHGs within the same village also encourages attrition, most likely by members who choose to participate in another group. This effect of competition is statistically significant but not large.

There is a sizable literature on the role of social heterogeneity and conflict in group settings.[18] Almost a fifth of the members in our survey who have left groups report personal conflicts as their main reason for leaving. We explore the role of heterogeneity in a variety of different ways. Our first approach is to construct a number of measures of social heterogeneity and use these as explanatory variables. We use our data on the *jati*s of individual members to construct a social fractionalization index that is commonly used in the literature. The value of the index is based on the shares of each caste or *jati* in the group and is obtained by subtracting the sum of squares of these shares from one. This variable therefore takes on strictly positive values whenever members of a group are of different castes even if they are all in the same official caste category. We also include a set of dummy variables for groups where all members have the same caste and for those where they are of different castes but of the same caste category. We find that group fractionalization raises hazard rates. When we estimate the model separately for each of our four official caste categories, we find this effect of fractionalization especially marked for the ST and the SC (columns 3 and 4, respectively, in table 10). To illustrate, if we estimate our duration model using only the SC women in our sample, we find that a change in the fractionalization index from zero to one (the minimum and maximum values this index can take) causes the hazard function to jump up by 74 percent. This is double the value of the corresponding coefficient in our full sample of women.

Our second approach is to estimate the model only for those SHGs that have women from at most two official caste categories. This means, for example,

18. See Banerjee et al. (2008) for a survey.

TABLE 11. Hazard Rates for Members by Caste Categories: Weibull Model (Restricted Sample)

	ST	*SC*	*OBC*	*FC*
Shape parameter	0.78	0.78	0.77	1.09
Heterogeneous within the same caste category	1.44** (0.16)	0.66 (0.24)	1.2 (0.33)	
Heterogeneous across caste categories and member of the majority caste category	1.31** (0.11)	1.04 (0.20)	1.03 (0.17)	0.84 (2.66)
Heterogeneous across caste categories and member of the minority caste category	1.23 (0.21)	1.19 (0.27)	1.68** (0.31)	1.35 (5.24)
Concurrent PRADAN SHGs	1.03** (0.01)	1.01 (0.02)	1.06** (0.02)	0.77 (0.32)
Number of observations	6,706	1,321	2,962	87
Number of departures	848	182	301	7

Notes: Figures in brackets are standard errors.
*Significant at a 10 percent significance level. **Significant at a 5 percent significance level.

that we exclude groups with a combination of SC, ST, OBC, and FC women, but include groups that are constituted from any two of these categories. Our intention here is to examine whether the chances of exit vary based on whether a member forms part of a majority or a minority (in terms of these official categories) within the SHG. These results are shown in table 11. Group heterogeneity affects ST women the most. SC women leave heterogenous and homogenous groups at similar rates and those from the OBC are more likely to leave heterogenous groups only when they are in a minority. Somewhat surprisingly, the extent to which greater heterogeneity is associated with exit does not depend on whether the SHG is comprised entirely of tribal women or of a mixture of castes and tribes. These results point to a lack of solidarity among the ST and are consistent with other research that demonstrates that, unlike the SC, tribal communities have not succeeded in establishing a common identity.[19]

Caste, Education, and Family Networks

Our parametric estimates show that the attrition of women from SHG groups is selective along three major dimensions: caste, education, and the number of relatives in the group. We now examine the role of these characteristics more carefully.

19. Banerjee and Somanathan (2007) find that the ST received far fewer government-financed public goods than the SC over the period 1971–91.

Table 12 contains survival rates for women in each of the four caste categories, separately for each region and for homogenous and heterogenous groups. Average attrition is greatest among the ST. Over the first two years of membership, survival rates for homogenous groups are higher than those for heterogenous groups and higher for Keonjhar than for Raigarh, but at the end of three years about a quarter of the ST women have left their group and this rate does not vary much across region or across homogenous and heterogenous groups. Scheduled Castes remain longer in their groups in Keonjhar, but not in Raigarh and castes that comprise the OBCs survive longer in both areas.

TABLE 12. Member Survival by Caste

	Keonjhar		*Raigarh*	
	Homogenous	*Heterogenous*	*Homogenous*	*Heterogenous*
ST				
Number of members	1,945	2,535	453	3,064
1 year	92.4	91.2	90.8	87.8
2 year	82.5	82.6	84.5	80.2
3 year	75.3	76.3	75.0	74.4
SC				
Number of members	210	530	163	1,248
1 year	97.0	90.3	85.3	87.7
2 year	93.8	85.4	70.1	79.1
3 year	89.4	81.3	67.2	76.8
OBC				
Number of members	495	1,429	99	2,210
1 year	93.3	92.8	100.0	89.1
2 year	90.5	88.2	98.7	82.7
3 year	84.0	83.9	98.7	79.4

Source: Survey Data, 1998–2006.

Table 13 presents results from a similar exercise, stratifying this time member survival by education levels. In Keonjhar there is a marked difference in survival rates for uneducated women relative to those with some education. Over a quarter of those with no education left their groups within three years of joining them while only 10 percent of those with some primary schooling did so. An interesting pattern seen in the table is the non-monotonicity of survival rates by education levels. In Keonjhar, women with one and five years of schooling stay longer in groups than those with some secondary schooling. Patterns in Raigarh are similar, though

TABLE 13. Member Survival by Education

	Keonjhar	*Raigarh*
No education		
Number of members	4,512	4,877
1 year	91.6	88.4
2 year	82.2	80.5
3 year	74.9	75.7
class 1–5		
Number of members	1,049	1,694
1 year	95.1	88.8
2 year	92.2	82.3
3 year	90.2	78.2
class 6–8		
Number of members	457	593
1 year	91.1	88.0
2 year	87.3	81.2
3 year	84.3	77.3
class 9–12		
Number of members	1,230	243
1 year	91.3	87.7
2 year	87.3	82.8
3 year	82.6	77.5

Source: Survey Data, 1998–2006.

less marked. One plausible hypothesis is that uneducated members leave because they are discriminated against or because they find it difficult to meet the savings requirements of the group while the more educated ones leave because they have better prospects. This is worrying given our finding that group survival depends on the highest education level in the group.

Table 14 is based on a member's education relative to others in the group. For each group we compute quantiles corresponding to the education levels of the bottom quarter, half and three-quarters of the population. In Keonjhar, we observe the highest attrition among those below the first quantile and the lowest attrition is found in the group between the first and second quantiles. These differences in survival rates are not however large relative to those seen in table 13. No systematic pattern is seen in Raigarh.

Table 15 compares survival rates across members based on their family networks within the group. Members are classified into two groups: those with no family relationships within the group and those with at least one relative in the group. The last column in table 15 shows that the differences across these types are large: in Keonjhar, members with no relatives have a

TABLE 14. Member Survival by Relative Education

	Quantile 1	*Quantile 2*	*Quantile 3*	*Quantile 4*
Keonjhar				
Number of members	3,902	491	1,033	884
1 year	93.4	93.5	93.3	93.2
2 year	88.6	90.3	91.0	89.5
3 year	85.0	89.2	88.5	86.9
Raigarh				
Number of members	4,513	371	933	1,084
1 year	92.2	93.8	93.2	93.6
2 year	87.7	88.4	90.0	89.2
3 year	84.6	86.3	87.4	86.6

Source: Survey Data, 1998–2006.

TABLE 15. Member Survival by Family Networks

	Present members		*Inactive groups*		*All members*	
	No relatives	*Relatives*	*No relatives*	*Relatives*	*No relatives*	*Relatives*
Keonjhar						
Number of members					3,661	3,545
1 year	91.8	95.5	98.3	98.5	90.2	94.0
2 year	86.4	92.5	94.1	95.8	81.2	88.5
3 year	82.2	89.9	90.9	92.4	74.8	83.1
Raigarh						
Number of members					3,697	3,723
1 year	90.7	94.0	95.3	96.2	86.5	90.3
2 year	85.5	90.5	90.2	93.8	77.0	84.9
3 year	81.8	88.3	87.0	92.6	71.2	81.7

Source: Survey Data, 1998–2006.

survival rate of 74.8 percent while those with at least one relative have a survival rate of 83.1 percent. A similar difference can be observed for Raigarh (71.2 percent versus 81.7 percent). This differential attrition starts early and over the entire three-year period, the survival function for members with relatives lies above the one for members with no relatives in the group.

To get a better idea of how these family networks might operate, we further distinguish between the attrition caused by groups becoming inactive and the attrition that results from members leaving functioning groups. These figures are shown in the first two columns of table 15. Recall, that *present* members are defined as all those in active groups and those who remained in groups that are currently inactive and until the last group meeting. In Keonjhar, the differential attrition of connected and un-connected members

arises mainly from women with no relatives leaving functioning groups at higher rates. In Keonjhar, 8.2 percent of women with no relatives in the group had left it by the end of the first year while the corresponding figure for women with relatives is only 4.5 percent. At the end of three years, these rates are 17.8 percent and 11.1 percent, respectively. In contrast, the rates of survival in active groups are not very different for those with and without relatives. Three years after joining a group, 90.9 percent of those without relatives and 92.4 percent of those with relatives are still inactive groups. In Raigarh, departures from functioning groups and group closures seem equally important causes of attrition from the SHG network. These descriptive tables are consistent with the Weibull hazard ratios presented earlier. Social status, family networks and, to a lesser extent, education, are important predictors of the duration of membership of women in a microfinance network of the type we consider.

Policy Implications

In spite of the phenomenal expansion of the Indian microfinance sector since the early 1990s, and the dominant role played by SHGs in the sector, little is known about the composition and the internal activities of these groups or length of time for which they function effectively. This paper has attempted to fill this gap. We use survey data from SHGs formed over the period 1998–2006 in selected regions of northern Orissa and Chhattisgarh, and estimate the life-spans of groups and members. We find that about one-fifth of those joining an SHG network at some point during our reference period have left it by the end of the period. This attrition is caused both by groups becoming inactive and by members leaving functioning groups.

We estimate duration models for groups and members separately and find that the maximum level of education in a group and the presence of a network of other groups in the village are both associated with longer lived groups. The life-span of a member within a group depends on her education, caste, family structure and, critically, on whether she has other family members in the group. Women with more education, intermediate (rather than low) caste status, and relatives within a group stay longer.

The aggregate attrition rates we observe are not, in themselves, large enough to undermine the effectiveness of the SHG program. In fact, some attrition is probably desirable if members use the group as an introduction to the formal banking system and proceed to enter into individual lending

contracts with banks after they leave a group. Groups, with their regular meetings, rules, and collective action problems are a costly way of linking rural women to the banking system, and their most useful function may be as intermediary institutions which help borrowers make a transition from local moneylenders to banks. On the other hand, it is also possible that those who leave groups are excluded from them for various reasons and that their sources of credit outside these groups are very limited. Our results on the determinants of group and member duration support this latter hypothesis: groups with educated members and those in villages with other SHGs are less likely to fail and it is therefore the remote, disadvantaged communities that are most likely to be deprived of credit through these institutions. It appears unlikely that women leaving groups are moving on to better opportunities and this should make attrition a matter of concern to policy makers.

Before concluding, we would like to draw the reader's attention to several sample selection issues that make it difficult to interpret the survival rates we observe in our data as representative of the SHG system in India. First, the villages selected by PRADAN for their program are not typical of most Indian villages and PRADAN as an organization is regarded as being especially effective. The villages we surveyed have large ST populations and high rates of poverty and illiteracy. The attrition rates we observe may therefore be much higher than those for other parts of the country if, as our estimates suggest, these variables lead to shorter group and member lifespans. On the other hand, other parts of the country, most notably south India, have multiple organizations promoting SHGs in the same village or town and this denser network may lead to more competition and more attrition as members move to groups that best match their needs. Organizational effectiveness is also likely to be an important determinant of SHG success but this has been little explored because of the absence of comparable data from different SHG promoting institutions.

Another important issue relates to the non-random selection of SHG members within villages.

The survey data on which this paper is based is restricted to members of SHGs and it may be that members who choose to participate in these groups differ from other families in same village who decide not to participate. We cannot rule out biases from this type of selection but we do not believe these are large, both because the process by which PRADAN forms groups is quite inclusive (all adult women in the hamlet are initially invited to join the group) and because existing work that compares SHG members and non-members in PRADAN villages elsewhere finds that they differ

very little at the time that they enter the program.[20] We are in the process of collecting village-level demographic data and information on the credit and background characteristics of a random sample of non-members. We are also compiling weekly financial data for the groups in our sample. These datasets will facilitate a more careful comparison of members and non-members, and will also allow us to look beyond survival to other measures of the financial success of groups and members.

20. Dewan and Somanathan (2007) study poverty targeting in the SHG program and find that while the program neglects the bottom tail of the income distribution, for the most part, participants to newly formed SHGs in Jharkhand differ very little from non-participants.

Comments and Discussion

Kenneth M. Kletzer: Baland, Somanathan, and Vandewalle present their first results from a survey of participants in self-help groups (SHGs) set up in two adjoining districts in Orissa and one in Chhattisgarh by the NGO PRADAN from 1998 to 2006. This is a large survey involving approximately 1,100 SHGs and 16,000 participating women that initiates a very interesting research agenda. The focus of this paper is on the dissolution of groups and member exit. The duration analysis identifies a few significant covariates for group longevity and member attachment, and reveals some interesting patterns in the hazard rates. The surveyed SHGs were established in districts where a large share of the population belongs to the Scheduled Tribe (ST) or the Scheduled Caste (SC), and the authors emphasize the effects of caste composition of the SHGs on group attrition and member departures.

Group Dissolution

The first analysis is the non-parametric estimation of the hazard rates for group dissolution and participant exit. Differences between SHGs in the two study areas, Keonjhar and Raigarh, are evident in the variation of the hazard rates for group dissolution over the life of a group. The hazard rate for Raigarh is uniformly higher that for Keonjhar and is double-peaked with the first peak occurring about one year from group formation. The hazard rate for Keonjhar rises over the lifetime of the group so that its peak is associated with groups formed at the beginning of the program.

One question raised by this observation applies to the parametric analysis as well. The sample period is the entire period of the program in these districts. There may be unobserved differences between SHGs started at the outset of the program and those that are formed later. The organization of later groups could be informed by experience from the earliest SHGs in these districts. Even though the time period is relatively short, the parameters in the hazard model estimation may be time-varying because the program is expanding throughout the period.

The two local maxima for the hazard rates for survival of groups started in Raigarh suggest the possibility that some groups lack the characteristics

for success from the outset. As shown in table 8, groups that fail in Raigarh are much less likely to have made non-linked loans to members than groups that fail in Keonjhar (32 percent against 91 percent). In the data summarized, we cannot find out whether groups that fail quickly do so because the local population of interested participants lacks the ties, heterogeneity, and resources to realize mutual gains from collective saving and borrowing or the organization of these groups could be improved. For example, the groups dissolving early simply may not meet the threshold to obtain a linked loan or too many founding members are unable to meet savings requirements. Alternatively, these may be groups that require more guidance or are more susceptible to member conflict or discrimination against members. Why this is more pronounced in Raigarh might be a matter for policy even though it is probably not possible to explore it in a parametric estimation.

Group formation is a multilateral matching problem. PRADAN is setting up clubs, and survival and participation depend on what the individuals bring to the group and can get out of the group. I think that it important to note that few groups fail quickly. The potential gains for members could be substantial even though the amounts borrowed seem so small. Even though the stated reasons for group failure indicate the importance of personal conflicts and leadership problems, it takes time for these to lead to group dissolution. Among the significant correlates of group survival in the parametric estimation of the hazard rate is the maximum education level of the group indicating the importance of basic skills. Another finding is that group fractionalization by caste is not associated with group failure although it raises the likelihood that a member leaves. The policy implication is that is important that some member can keep accounts.

It is hard to gain a clear picture of why groups fail without understanding the gains for the group. Most of the groups that failed did not obtain a linked loan (those that did, received a single loan), but three-quarters of the groups existing at the survey date received a linked loan and about two-thirds of those received a second linked loan (table 8). Similarly, unpaid loans and irregular savings are associated with group dissolution. Clearly, whether a group received a linked loan or dissolved are related outcomes of how well a group functions. However, the data for Keonjhar seems to show that groups that do not make it to a linked loan are able to make non-linked loans. What determines the receipt of a linked loan may be what determines the survival of the group. It could be that groups are failing to meet a threshold, so that it would be useful to understand why in the context of studying group survival. A clearer picture of group success or failure might be gained by studying the criteria for and determinants of receiving linked loans.

Individual Attrition

Turning to individual member attrition, the non-parametric estimates display an intuitive pattern. The hazard rate is largest in the first year of participation and generally declines thereafter. For example, figure 8 is consistent with the simple idea that some members cannot make the required savings from the outset and are unable to participate in a group savings program. The hazard rate for departure due to personal conflict displays a similar peak in the first year as the value of the match with the rest of the group is learned.

The estimation of the Weibull model considers how the net gains from belonging to the groups depend on individual characteristics. As emphasized by the authors, women who are separated, have children, and have relatives in the group are significantly less likely to leave the group. They are likely to have greater gains from attachment to the group and fewer conflicts in the family over financial participation in a SHG. Individual educational attainment and caste are also significant correlates with attachment to the group. The authors also note that concurrent local SHG are correlated with exit and about 20 percent of women who leave a SHG join another group.

A substantially lower percentage of members who departed groups received group loans or part of a linked loan than members who remained attached to a group (table 8). Only 14 percent of women who left groups in Keonjhar received group loans while 10 percent of those who left groups in Raigarh did. It could well be that a primary reason women leave groups is their inability to borrow from the group. The decision of the group not to lend to a particular member and her decision to leave the group are very likely related. The factors that determine whether a member receives a loan could be the same as the determinants of member exit. The proximate cause for leaving a group could be that the individual fails to receive loans she expected when she joined the group and observes other members receiving it. I expect that personal conflict, inadequate savings, or poor opportunities for using funds to be among the primary reasons for not receiving a loan. These are probably negatively correlated with education and family ties in the group. The same reasoning applies to the most frequent reason given for leaving a group, inability to reimburse a loan or difficulty in saving. The capacity to repay or save should also be correlated with education, marital status, and number of children.

My point is that member attachment is related to the outcomes for the individual woman when she is in the group. Characteristics of the individual or the match with the group (observed and unobserved) that make it less likely she will receive a loan or be able to save will also increase the likelihood that she leaves the group. In my opinion, the determinants of loan

receipt and saving by the individual in a SHG should be discussed together with the determinants of individual attachment to the group. I appreciate the authors' need to focus separate papers on different aspects of a survey collected at great effort and the reasonableness of addressing one question at a time. Even though causal links may be elusive, these outcomes are closely related so that reporting the analysis of member attrition only gives less information about member attachment and attrition than the survey appears to have to offer.

This suggestion applies to the analysis of group survival as well. It would be useful to know how important the inability to obtain a linked loan is for group dissolution and how group characteristics influence the capacity of the group to reach the threshold for receiving a linked loan. Thus, an alternative would be to study group dissolution with other group outcomes and member attachment along with the outcomes that indicate gains for individual women from being in the group.

In summary, this is a very interesting paper that investigates self-enforcing economic relationships in a highly disadvantaged population. The survey is impressive, and the econometric analysis allows a clear picture of the role of relationships, education, and caste for realizing gains from cooperation in saving and borrowing within the group and from the formal sector. I look forward to seeing the analysis of other outcomes from the survey data.

Esther Duflo: The world of microfinance in India is deeply divided. On one side, the microfinance institutions (MFIs), adhering to a "Grameen style" model; on the other, SHGs, adhering to an "Indian style of microfinance." The division has deepened with the passions, growing more rancorous, far from a reasonable policy debate on the relative merits of two models of providing much needed financial services to poor women in rural areas.

Barred from collecting savings deposits by the Reserve Bank of India (RBI) regulations, the MFIs focus entirely on lending. Clients start with a loan of a few thousand rupees, to be repaid in weekly installments. Often they are supported by commercial banks, and they aim to achieve some commercial sustainability. They seek it through a combination of aggressive marketing, insistence on repayment discipline, and strong incentives for loan officers, both to find new clients and to ensure that the existing clients repay. Loan officers meet with each client group every week to collect repayments. This makes the servicing of MFI loans labor intensive and costly. Combined, these factors make for fairly high interest rates on MFI loans, presently between 12 percent and 25 percent.

The SHG rely on NGOs that organize groups of women, who start by saving together and are eventually linked to a bank. The bank then provides them with a savings account or a loan or both. After the initial handholding period, lasting up to a year or longer, the groups are left essentially alone. The group-formation costs are subsidized, by the World Bank, large NGOs such as Care and Oxfam, and by the government itself, to name a few. When a SHG is linked, one of the women is made responsible for collecting and forwarding the group's repayments to the bank. So, unlike the MFI, the linking banks do not bear the high labor costs of managing small loans. Combined with the implicit subsidy linking banks receive for lending—a benefit the MFI also receive—this makes for lower costs and lower interest rates on SHG loans.

This much is known. But with neither the MFI nor the SHG particularly transparent about their operating practices, little else is. It was perhaps because there was not much independent information to adjudicate the claims of either side that the debate began to deteriorate, both sides trading accusations. Proponents of the SHG model, among them the RBI, have argued that MFI rules are not transparent, their lending strategies are too aggressive, they do not conduct enough background checks (indeed the MFI got into major trouble last year when the RBI started enforcing the "know your customer" rules), and many of MFI borrowers end up being over-indebted. For their part, proponents of the MFI model have pointed out that the SHGs in fact lend very little, and so they cannot really be considered a substitute for providing improved access to financial services to poor women in rural areas. In early 2006, this back and forth issued in what is now called the "Andhra Pradesh crisis." At the behest of local politicians adhering to SHG model, the local media accused MFI of hounding over-indebted clients to suicide. MFI accused the government of outright corruption. The police raided the offices of two MFIs. The fray went national, then international. Many broadsides were written. But, apart from an excellent report by Prabhu Ghate (cited in the reference list of this paper), there was very little dispassionate analysis of the claims on either side.

Given the importance of microfinance, the passions are not surprising. What is surprising is that both sides have gone on with so very little information. Efforts to document what is really going on either side would be invaluable. The Center for Microfinance at Institute for Financial Management and Research (IFMR), Chennai, is spearheading an effort to study the MFI. And already valuable evidence on interest rates, competition practices, and the level of information of their customers has emerged from their work. But until now there was almost no complimentary work on the SHG. As one of the first studies on SHG, this paper is particularly welcome.

The paper exploits a unique dataset: the authors have conducted a survey of over 1,000 SHGs started by the NGO PRADAN in two districts in Orissa. About 10 percent of these groups are now defunct, and some of the members of the existing groups have left. The authors are primarily interested in what explains which groups survive and which members stay, but their data reveal many other interesting things about these SHGs.

Of particular interest is the data on bank linkages. This data sheds some light on whether SHG are in fact primarily lending groups. On this, my interpretation of the data presented in table 8 differs slightly from that of the authors. Viewed from the perspective of a woman considering whether or not to join an SHG, we should calculate the average loan received from a bank as the product of three quantities—the probability that the group is ever linked, the proportion of client from these groups who get a share of these loans, and the amount received in total for the groups linked group. Using the data in table 8, this calculation comes to Rs. 2,318 ($0.68 \times 0.83 \times 4108$). This is over the entire lifetime of a group, which, according to the data in table 4, is 1,076 days, or almost exactly three years.[1] That is, Rs. 786 a year on average. Alternatively, since the average group has existed for 685 days after the linkage, we could also say that a client joining an SHG knows that she will get no loan for a year, and after that a loan of Rs. 1,000 a year on average is expected.

This may not be negligible, but is indeed much lower than what the MFI lend. MFI loans in rural areas are usually around Rs. 6,000 in the beginning, and the amount increases after the first loan. Strikingly, it is also much lower than the figure of Rs. 4,000 per member per year reported by Sa-dhan for lending by the SHG (Sa-dhan is the association of microfinance organizations). One possibility is that Orissa is special. The other is that Sa-dhan reports a number akin to the number reported by the authors in the fifth row of table 8, which is the amount lent per member per linkage, for borrowing members and for the duration of the linkage. A major virtue of the paper is that it shows very clearly that this is not the only relevant piece of information. In this data, almost half (44 percent) of the SHG members never borrow. This is important for calculating the implicit subsidies that go to the SHG sector. When we compute the cost of creating and maintaining a group, it needs to be compared with the amount of money that is actually

1. Note that both the numerators and the denominators of this expression are censored: some groups are still alive, and those groups may get more loans in the future. The ratio would still be right under the assumption that the groups that are still alive have reached some sort of steady state, in which they borrow at regular intervals. The fact that they do not borrow for an entire year when they first start suggest that the second calculation (the amount borrowed per year in expectation after the initial screening year) is more robust.

lent, including the fact that lending takes time to start, and that many people will end up never borrowing.

Given these numbers, if we take seriously the point made by the authors that microfinance is the primary reason why these SHGs exist, another striking fact of the paper is how many of the groups survive and for how long. The hazard rate estimated in the paper suggests that only 25 percent of the clients will have left after eight years. This seems to be incredibly low. The attrition rates of microfinance organizations are not well known, but in one of the datasets I had access to, the retention rate was considered particularly high, with 95 percent of clients renewing their first loan. Even if the attrition rate stayed that low in subsequent loans, it would imply that there would be 63 percent of the original clients remaining, if all the centers of this MFI stayed alive. The SGHs seem to manage at much higher rates of persistence despite, at first glance, doing much less.

The puzzle we are left with is, then, what explains these high retention rates among SHG. There are several possibilities. First, may be even an average of Rs. 1,000 a year from a bank is sufficient to justify continued membership. The authors mention that "membership" is defined as regular attendance to the group meeting but does not specify regularity. One cost of continuing participation in MFI is that clients must attend weekly meetings and must also borrow shortly after their first loan is entirely reimbursed. It is possible that SHGs meet less often and give more flexibility when a member wants to borrow, making it worthwhile for the member to stick around until the need arises. One possible sign that the possibility of borrowing does matter is that the defunct groups are much less likely to have ever been linked than those that still exist (15 percent versus 74 percent in one district, and 23 percent versus 74 percent in the other). This is not only a mechanical effect of time (they did not have the time to be linked), since the average duration of the defunct groups is still well over a year. It may of course be that dysfunctional groups are not linked and do not survive. But there is at least some indication here that members may not stick around in groups that are not linked to banks.

Second, SHG members also lend to each other. The authors calculate that they had lent on average Rs. 2,220 to each member in the last year. Given that 83 percent of the members had borrowed, and these loans come from the own funds of the groups, these must be short-duration loans, or the groups must be saving large amounts. SHGs thus appear to work like rotating savings and credit associations (ROSCAs) or like an insurance pool. This role appears to be quantitatively more important than the bank linkage. It would be fascinating to know a bit more how this is working.

Third, and related, SHG may be valued by their clients because they offer a safe savings opportunity, even for small amounts. In his other works Baland has shown that ROSCAs may be used by women to protect their savings against their husbands. It may be the case here, too, or more generally, that the SHG may provide a way to save safely in environments where such opportunities are very rare. Moreover, the rules imposed by the groups may help women commit themselves or their family to a regular savings plan. Ashraf et al. (2006) have shown that such commitment plans do help people save more, and that many people are willing to make such commitment as a way to help themselves reach their goals. MFIs provide a similar commitment structure for someone who wants to save to make a large purchase, except that they get to make the purchase when they first join and are then committed to save. But it comes at the cost of a high interest rate. For many people who are not in any particular hurry to obtain the item they save for, the SHGs may be a much cheaper way to save.

The current paper focuses on characterizing which groups survive and which members exit the group. This is useful. It shows that generally the member who exits is not someone who finds better opportunity elsewhere, but rather is someone who does not find an appropriate place in a group or someone whose group proves unsustainable. An exciting area of future research would be to reframe the question a little, and provide more evidence on why groups persist despite the low levels of borrowing from banks. A richer description of what these groups do for their clients would be fascinating. It would also be interesting to know whether SHG clients continue to borrow from MFI or moneylenders, or whether the SHG does address their needs for fund. This paper is a great first step in learning more about SHGs. One hopes that it will pave the way for many more in the same vein.

General Discussion

T. N. Srinivasan was concerned that the survival functions seemed to assume that survival was not affected by the sheer passage of time; to him it seemed likely that duration itself would be a determinant of survival. Anjini Kochar concurred, believing that the benefits expected by group members would be related to elapsed time, and that in this sense, group membership and attrition, were endogenous to the group.

Pranab Bardhan, like Esther Duflo, was struck by the relatively low attrition rates. He speculated that this could reflect self-selection in the formation of the group. Group characteristics need not be a random reflection

of the larger population. Bardhan also referred to work that he was currently doing on predictors of success of groups involved in collective management of environmental resources such as forests and fisheries. His own attempt to capture the role of social heterogeneity had not been successful. He felt that the officially-defined sub-caste categories used in collecting the data were simply too broad, and he believed that some finer classification (perhaps based on lineage) was needed.

Drawing further on his own work, Bardhan believed that it was important to examine the size of the group as a predictor of successful collective action. Theory was ambiguous on this point, while one might assume that smaller groups would be more cohesive, larger groups could be more effective in lobbying upper social layers. Other factors that he had found important were exit opportunities (proxied, for example by urban connections) and economic inequality. Finally his work also suggested that it was very important to know who defines the rules of functioning of the group. If the rules are defined by officials outside the group then group members do not feel bound by them and may indeed take perverse pleasure in violating them. In the present case, it would be useful to know which group rules, if any, were specified by, say NABARD.

Responding to Esther Duflo's comment on relatively small loan sizes, Dilip Mookherjee reported on the work that he and Bardhan had done on loans in West Bengal under the government's Integrated Rural Development Programme (IRDP). While average loan sizes were only of the order of Rs. 900, they still appeared to have a significant impact on farm productivity in later years. Turning to the paper, Mookherjee concurred with those who felt that the interesting object of the inquiry was less why people left groups and more what induced them to come together in the first place. He cited his work with Banerjee, Munshi, and Ray with respect to the composition of sugar cooperatives in Maharashtra, where the relationship between heterogeneity, fractionalization, and survival was highly non-linear, depending on the balance of power between the larger and smaller landowners in the cooperative.

Mr Narendranath provided the perspective of PRADAN, the NGO that had organized the SHGs that were the subject of the survey. He noted that the formation of these groups was very far from being spontaneous, and depended on significant and sustained outside intervention. He noted that in the Keonjhar district, for example, some of the tribals remained very forest-dependent and practiced a form of farming which was close to slash and burn. Their entry into the monetary economy was still recent and tenuous; many of their transactions still took place through barter. This needed to be

taken into account in assessing the volume of credit activity. PRADAN saw its role as much wider than mere provision of credit; the issue was one of providing overall orientation and capacity building so that credit could be responsibly used. It was in this context that PRADAN organized exposure visits so that the groups could see how other successful groups functioned. He also attributed the relatively low attrition rates to the amount of handholding that PRADAN was willing to provide. His hunch was that in areas of India with more settled agriculture and an established tradition of SHGs, such as the south, attrition rates would indeed be higher.

Ritu Anand noted that subsidy from NABARD was only a part of the story, and not necessarily the largest part. Her then employer, the State Bank of India (SBI), was the largest provider of funds to SHGs in the country, and the bulk of the subsidy came from cross-subsidy from other activities, rather than through refinance by NABARD. She also noted that loan size was related both to level of individual saving, and to repayment record by the individual. As such, loan and savings size could be expected to grow over time.

Abhijit Banerjee thought the small size of loans was a sign that the resources were not being used for asset creation: it was difficult to buy half a cow. In his view, it was also important to know who in the SHG made the lending decisions; it could be that the tribals left the SHGs because their loan requirements were not being met. He was also struck by the importance of at least one educated member in each group to conduct the minimal accounting functions.

Willem Buiter, the session chair, warned against assuming that dissolution of the group was necessarily a sign of failure. In this regard he wanted to know both what happened to members from dissolved groups, and whether it was possible for a newcomer to join an already established group. An official of the SBI confirmed that in his experience many of the smaller loans were taken to finance consumption. In his view, the major difference between the SHG model and its many government-supported predecessors was the focus on group responsibility for repayment. This had resulted in far better repayment records and therefore greater sustainability than earlier schemes.

Anushree Sinha reported on work underway at NCAER that examined the reverse issue, namely factors explaining the sustainability of SHGs. Initial findings also did not suggest that caste was a major factor in explaining longevity; such early findings suggested that it was important to get information from several members of the group, not just one or two. In her experience it was very difficult to get accurate information on groups that

had dissolved. Finally, she did believe that when individuals left groups, some at least migrated to other government credit programs.

In her response, Somanathan noted that this was the first paper from a large dataset that was still being explored, and that some of the relevant information was still being entered. As Kletzer had correctly noted, the goal of this paper was to look carefully at one phenomenon, namely survival, which could only be explored by a dataset of this kind. Accordingly, the focus of the present paper was less on the benefits derived from participation in SHGs, but rather on the interplay between the group and the individual in duration and survival.

Within this limited scope, she agreed with many of the points made by the two discussants, and by the other participants. With respect to individual attrition she accepted that, in principle, the decision to stay with or leave a group was an individual decision, and in that sense might be seen as "optimal" from the individual's perspective. But she also believed that there were circumstances under which the composition and behavior of the group impacted on the individual decision to leave, and she was concerned that it was the weaker members of the groups that tended to exit. With respect to groups as well, she cautioned against reading too much into the average numbers. Where groups were largely composed of primitive tribes, the failure rate was much higher than the norm. Such outliers were not well caught by regression equations but were important from a social policy point of view. Equally, for less advantaged groups such as these, she did not believe that SHGs were a transition to more independent forms of financial linkage; it was more probable that people dropped out of formal finance completely.

Somanathan also clarified how the data had been collected. Information had typically been gathered from each member in the group; where members had left (for example, to get married in another village) the remaining members had been queried. In order to ensure full capture of group attrition, the areas surveyed had deliberately been selected as ones where PRADAN had begun its activities relatively recently and registers were complete. Equally in judging whether a group was "alive" a range of activities were tracked. Village level data had been gathered; when available, it could be used to judge how different groups were from the village population as a whole. The rules of the group were specified by the group itself, with some support from PRADAN. She also clarified that 20 percent of members who left a given group joined another group. So the figures for member exit covered those who had completely exited from the system.

References

Armendariz de Aghion, Beatriz, and Jonathan Morduch. 2005. *The Economics of Microfinance.* Cambridge, MA: MIT Press.

Ashraf, Nava, Dean Karlan, and Wesley Yin. 2006. "Tying Odysseus to the Mast: Evidence from a Commitment Savings Product in the Philippines." *Quarterly Journal of Economics*, 121 (2): 635–72.

Baland, Jean-Marie, and Siwan Anderson. 2002. "The Economics of Roscas and Intra-household Resource Allocation." *Quarterly Journal of Economics*, 117 (3): 963–95.

Banerjee, Abhijit, Lakshmi Iyer, and Rohini Somanathan. 2008. "Public Action for Public Goods." In *Handbook of Development Economics,* volume IV, edited by T. Paul Schultz and John Strauss, pp. 3118–54. UK: Elsevier.

Banerjee, Abhijit, and Rohini Somanathan. 2007. "The Political Economy of Public Goods: Some Evidence from India." *Journal of Development Economics* 82 (2): 287–314.

Basu, Priya, and Pradeep Srivastava. 2005. "Scaling up Microfinance for India's Rural Poor." World Bank Policy Research Working Paper 3646.

Bell, Clive. 1990. "Interactions between Institutional and Informal Credit Agencies in Rural India." *World Bank Economic Review*, 4 (3): 297–327.

Burgess, Robin, and Rohini Pande. 2005. "Can Rural Banks Reduce Poverty? Evidence from the Indian Social Banking Experiment." *American Economic Review* 95 (3): 780–95, June.

Dewan, Isha, and Rohini Somanathan. 2007. "Poverty Targeting in Public Programs: A Comparison of some Non-parametric tests and their Application to Indian Microfinance." Working Paper, Delhi School of Economics.

Ghate, Prabhu. 2007. *Indian Microfinance: The Challenges of Rapid Growth.* New Delhi: Sage.

Harper, Malcolm. 2002. "Self-help Groups and Grameen Bank Groups: What are the Differences?" In *Beyond Micro-Credit: Putting Development Back into Micro-Finance,* edited by Thomas Fisher and M. S. Sriram, pp. 169–98. New Delhi: Vistar Publications.

Karmarkar, K. G. 1999. *Rural Credit and Self-Help Groups: Microfinance Needs and Concepts in India.* New Delhi: Sage.

Karlan, Dean. 2007. "Social Connections and Group Banking." *Economic Journal* 117 (517): F52–F84.

Klein, John P., and Melvin L. Moeschberger. 2003. *Survival Analysis.* New York: Springer.

Nair, Ajay. 2005. "Sustainability of Microfinance Self-Help Groups in India: Would Federating Help?" World Bank Policy Research Working Paper 3516.

National Bank for Agriculture and Rural Development. 1992. *Guidelines for the Pilot Project for Linking Banks with Self Help Groups*. Circular Issued to all Commercial Banks. Mumbai. Available at www.nabard.org.

National Bank for Agriculture and Rural Development. *NABARD Annual Report, 2005–2006.* Mumbai, www.nabard.org.

Reserve Bank of India. 1991. *Improving Access of Rural Poor to Banking-Role of Intervening Agencies–Self Help Groups.* Circular issued to all Scheduled Commercial Banks. Mumbai. Available at www.rbi.org.in.

———. 1999. *Swarnajayanti Gram Swarozgar Yojana.* Circular issued to all Scheduled Commercial Banks. Mumbai. Available at www.rbi.org.in.

———. 2005. *Internal Group to Examine Issues Relating to Rural Credit and Microfinance.* Mumbai. Available at www.rbi.org.in.

———. 2006. *Handbook of Statistics on Indian Economy.* Mumbai. Available at www.rbi.org.in.

———. 2007. *Annual Policy Statement for the Year 2007–2008.* Mumbai. Available at www.rbi.org.in.

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The Power Sector in India: An Inquiry into the Efficacy of the Reform Process*

Introduction

The infrastructure deficit in India is immense and in some sectors growing. Over the years, the provision of essential but uneconomical services seems to have been driven by non-commercial principles resulting not just in the ineffectiveness of the objectives of universal service coverage of the original programs, but also assuming a heavy fiscal burden on the government. This is especially true of the power sector.

India is power stressed. The increasing vibrancy and flexibility of the rest of the Indian economy is not matched by the power sector. Experience and casual empiricism is vindicated by analysis that suggests that electricity supply by government monopolies is the most important (infrastructure) constraint on overall economic growth, and is significant in growth regressions and investigations of foreign direct investment (FDI) determinants (Virmani, 2005). Based on a firm-level survey, it is estimated that for manufacturing firms the cost of private electricity is 24 percent higher than that of utility supply; 69 percent of firms have their own generators; and output lost due to power outages is 9 percent (World Bank, 2002). A recent phenomenon has been a sharp deterioration of energy adequacy, both at base and peaking periods. Given the record of meager additions to the generation capacity over the 10th Plan period (2002–03 to 2006–07), projections of energy requirements in the future, *prima facie*, would seem to make the task of closing the gap between demand and supply appear almost insurmountable.

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The sector is dominated by government-owned behemoths at both the national and state levels; 88 percent of utility-based power is produced by government generators (state government generating plants account for close to 60 percent of total installed utility capacity in the country), and transmission is almost entirely within the public sector. The cash-generating distribution segment—where responsibility for supply, billing, and collection lies—is almost completely under the ambit and ownership of respective state governments [through State Electricity Boards (SEBs) or state government distribution companies (discoms)].[1] Private distribution is limited to the states of Delhi, and some parts of Orissa, West Bengal, Maharashtra, Gujarat, and Uttar Pradesh (UP). In the seventh year of the millennium, astoundingly, some power utilities still follow single-entry book-keeping practices. Despite the sorry state of affairs, the inadequacy (until recently) of the commercial aspects of the sector that has "seized the attention" of decision makers is particularly bewildering. The clear and present problems in the distribution segment notwithstanding, the tone of official discussions remains skewed towards generation capacity. Every year, for instance, the Economic Survey devotes the majority of column space on the power segment to generation, transmission, and arcane technical minutiae like "super critical technologies," while relegating distribution and supply to a secondary position.

Having said this, it is not that there has been lack of application of mind on the issues, or, paucity of strategies for addressing problems. Task forces, working groups, and committees constituted by both the Central and state governments have, for the most part, proffered well-argued policy alternatives over the last decade.[2] Specifically, the Central Government's policies in early 2000s attempted to systemically galvanize state governments to tackle mounting losses in the sector. The one-time settlement (OTS) scheme of SEB dues to Central Government-owned public sector units recommended by the Expert Group on Settlement of SEB Dues (Government of India, 2001), linked the capital restructuring of SEBs to a set of incentives and penalties. To ensure that the OTS remained precisely that, measures to accelerate state level reforms by rapidly restoring and then sustaining the financial viability of the power sector were considered important by the Empowered Group of (State) Ministers. Arising out of the OTS Scheme, the Accelerated Power

1. These are *de facto* an extension of the respective state government.

2. The Report of the High Level Committee on Escrow Cover to IPPs prepared in February 2000 at the behest of the Government of Karnataka was probably the first official undiluted statement of the centrality of the distribution segment in restoring the sector's health.

Sector Development and Reform Programme (APDRP) [recommended by the Expert Committee on State-Specific Reforms (Government of India, 2002a)], has also become a landmark intervention. The Central Government, in addition, made an admirable effort to prod the states toward meaningful reform to infuse the sector with competition and efficiency by legislating the Electricity Act 2003 (EA), first introduced in Parliament in 2000. In the aftermath of the Central Government initiatives after 2000–01, various states have gone about their individual trajectories in terms of the operational steps to increase revenues and reduce losses. Some have been more assertive and changed the market structure of the sector.

Have the measures had the desired effect? It has now been several years since various (systemic) institutional initiatives were introduced to reform the state-dominated sector, hence (arguably) this is an apposite juncture to weigh their effectiveness. The perception of improvement in the sector five years into the reform process has received a jolt in recent months, with widespread shortages of power being reported from many industrialized states. The bulk of the (already inadequate) additions to generation capacity have been in the public sector. Independent power producers (IPPs) have been attempting to achieve financial closure for their generation capacity plans, but continuing doubts about financial viability ensure that due diligence and related activity drags on. The evidence of the decrepitude and shortages are most startlingly demonstrated by the power cuts that have begun to creep into the island city of Mumbai like a malignant growth, to use a simile of cancer. Long having been "islanded" from the Maharashtra State Electricity Board's distribution system, with standby charges levied on private suppliers of power to the city, there are now increasing doubts about this exclusivity.[3]

The paper shows, *inter alia*, that the reform actions have not, by and large, resulted in the improvements in cash flows and revenues that would have given potential investors comfort about the ability of utilities (which are the buyers of the IPPs' generation) to meet their debt service obligations. But this is only one part of the story; more fundamentally, has there been a change in the intrinsic functioning of SEBs over the period of reforms that is likely to induce profitability and keep the sector consistently remunerative? At a deeper level, the main objective of the multiple policy interventions had been to impart a "commercial orientation" to discoms (and SEBs). The

3. The dominant private electricity supplier to Mumbai city (Tata Power Company) annually makes a payment to the state-owned supplier to back-stop any shortfall that may occur due to unforeseen incidents (it is akin to buying "insurance").

importance of this concept had been officially identified by the Report of Distribution Policy Committee (Government of India, 2002b):

> Traditionally, the supply of electricity has been viewed as a public service and the overall operations of the SEBs has been characterised by a lack of commercial orientation. One reason for this is that since inception, SEBs have been focusing towards the objectives of government providing electricity to larger sections of society and to agriculture at low rates. The second but more important reason for the lack of commercial orientation has been the absence of incentives for improving efficiency (Section 3.2.1).

The policy reforms sought to ensure that the discoms utilized the transfers from the Center to the states in a financially productive manner and, moreover, capitalized on the leeway in terms of improved market structures and regulatory efficiencies to make the financial improvement sustainable and lasting.

To our knowledge, no exploration of the panel data of SEBs/discoms on the outcomes, and key economic and financial parameters that indicate the effect of reform steps has hitherto been available in the public domain; toward this, inter-utility comparative analysis of high-level financial/commercial indicators is attempted. An important pivot of this objective is to quantify the unstructured concept of "commercial orientation," and to develop a summary statistic on which utilities/states may be compared. In the process of this construction, the paper, *inter alia*, endeavors to decipher broad patterns in the components of commercial operations of the power sector, while tracking changes after the near breakdown in 2000–01. Throughout, the paper attempts to sensitize the reader to the immense fiscal and financial challenges, and the institutional complexities involved in the reform process.

It is important to also delineate what this paper does not attempt. It does not deconstruct the microstructure of the reform process. The economic and financial logic for establishing appropriate market structures, restructuring of liabilities, tariff principles, process flows, and regulatory oversight have been charted, largely through detailed case studies, by multi-laterals, international development agencies, Indian academic institutions, consulting agencies and others; they have analyzed these actions for certain key states at the inception of reform and designed road maps, identifying the exact steps needed to transition toward financial viability.[4]

4. See *inter alia*, IDFC (2001), Patel (2004a; 2004b), World Bank (2007) and references therein.

A literature has built up that explains the arcane technical minutiae of operational and financial elements of the power sector (NTPC, 2006; Government of India, 2006). These relate *inter alia* to administrative measures (for example, human resource management, including details like the designation of circle-in-charge as CEO, re-labeling of Junior Engineer as feeder manager, establishment of special courts for energy theft, and so on), technical parameters (whether a 33 kV line results in lower transmission losses than an 11 kV line, the rate of transformer burnout, the advantages of electronic supply meters, IT enabling with data logging, and so on), and commercial issues (energy audits, metering, and so on).

Another strand has explored the details of financial engineering that must accompany the restructuring of the power supply system; these include the restructuring and treatment of existing liabilities, including unfunded one such as pensions, unbundling and power purchase systems, including decisions on whether the purchase should be via the transmission company in a single buyer model (see Tadimalla, 2000; 2001 for an extensive analysis of these processes). A third stream has looked at regulatory issues, including the impact on tariffs and accounting principles accompanying the restructuring (see TERI, 2007 for a recent treatment).

All of this is beyond the scope of the paper, both from the viewpoints of feasibility and desirability. The former is almost self-explanatory; the power sector is one of the most operationally complex with characteristics that vary even in contiguous areas and the reform experience has been richly varied. The desirability of looking beyond these details relates to the evaluation of the effectiveness of the various steps to enhance revenues and reduce losses, among other indicators. This emphasis is important since it is the outcome of the multiple actions taken by utilities and regulators that ultimately determines the status of the financial viability of the sector, not the actions *per se*.

As for the methodology used in investigating the effect of the drivers on performance outcomes, the paper does not dwell on statistical relationships between various outcome indicators and causal reform processes. There are two reasons. Foremost, there is just not sufficient data to effectively estimate and infer causal relationships in an environment where institutional eccentricities are predominant and structural instability is high. Second, gaps remain in power flow audits in most states, arising from uneven and inadequate metering, which does not provide a complete picture of consumption patterns and loss levels. A caveat is in order: there are diverse official sources for data on the Indian power sector, and we do not attempt reconciliation

in this paper.[5] Suffice it to observe that all sources manage to convey the magnitude of the challenges; for example, the payments crisis at the onset of this decade was plain regardless of the specific measure, or, source.

The plan for the rest of the paper is as follows. In the next section, against the backdrop of the institutional framework of the power sector, initiatives designed to nudge the sector toward efficiency and financial discipline (especially on the distribution side) are discussed, focusing on the OTS scheme, the APDRP, and the EA. The third section reviews trends in the macro-economic evolution of the sector and explores changes in key (aggregate) financial performance variables of the sector. In the fourth section, after examining the dissimilarity in financial performance across states, we explore these variations across utilities in terms of commercial orientation; a summary measure—Index of Revenue Orientation (IRO)—is constructed that captures a critical (commercial) aspect of the sector. The fifth section has our conclusions.

Institutional Background and Reform Initiatives

India has the fifth largest installed capacity for electricity—about 140 GW—in the world, but shortages plague the country as the power system has not kept pace with economic performance.[6] One pattern that emerges is deterioration of energy adequacy (both at base and peaking periods) that is sharpening seemingly on a month-to-month basis. During the period April 2006–February 2007 the country recorded a base shortage of 14.2 percent[7] in comparison to 2005–06, which itself showed signs of deterioration from the previous year, though not as markedly (in 1999–2000, the national energy and peaking shortages were 6.2 percent and 12.4 percent, respectively).

The difficulties of state government-owned utilities lie at the heart of the problems of the power sector. The financial position of SEBs deteriorated rapidly over the decade of the 1990s and culminated in the payment crisis of 2000–01 when, according to the Economic Survey (2001–02), commercial

5. Agencies that publish data include Ministry of Power, Ministry of Finance, Planning Commission, Central Electricity Authority, Regional Load Dispatch Centers, Power Finance Corporation, and Reserve Bank of India.

6. Nationally, power generation increased by 8.4 percent per annum in the 1980s (when average annual GDP growth was 5.8 percent), 6.7 percent in the 1990s (annual GDP growth was same as the previous decade), and there was further deceleration to a mere 4.7 percent per year in the first half of this decade (average annual economic growth of 6 percent).

7. See Indian Electricity Scenario, Ministry of Power (available at powermin.nic.in).

losses reached Rs. 254 bn. Large and persistent losses—on account of both technical reasons related to transmission and distribution, and theft, non-billing, incorrect billing, and inefficiency in collection—have adversely affected operations and the ability of utilities to reliably supply electricity to consumers.

Institutional Structure of the Electricity Sector in India

In order to appreciate the complexity of implementing reform and restructuring in the electricity sector, the reader needs an overview of its institutional structure, which is dispersed across multiple organizations both at national and state levels [a summary is in Box 1; also see Panagariya (2008) for a comprehensive introduction to the issues]. The Central Government has important responsibility for electricity policy, long-term planning, technical analysis, and project approvals through the Ministry of Power, Planning Commission, and Central Electricity Authority. Under the Constitution of India, the electricity sector is a "concurrent" subject; jurisdictionally, therefore, on matters of both policy and regulation, the sector is divided—but clearly demarcated—between the Union and the state governments. [It is because of the "concurrent" nature of responsibility in the electricity sector that one level of

BOX 1. Institutional Framework of the Electricity Sector in India

<table>
<tr><th>Function</th><th>Central level</th><th colspan="3">State level</th></tr>
<tr><td>POLICY</td><td>Ministry of Power
Central Electricity Authority</td><td colspan="3">Department of Energy</td></tr>
<tr><td>REGULATION</td><td>Central Electricity Regulatory Commission (National Grid Code; inter-state transmission and sale of power, incl. tariff)</td><td colspan="3">State Electricity Regulatory Commission (intra-state transmission and sale of power, incl. distribution tariff for final consumer)</td></tr>
<tr><td>GENERATION</td><td>Central Sector Undertakings (Thermal, Hydro and Nuclear)</td><td rowspan="3">State Electricity Boards (SEBs)</td><td>Govt.- owned Generating Companies</td><td>Private Generators (IPPs)</td></tr>
<tr><td>TRANSMISSION</td><td>Central Transmission Utility (Power Grid Corporation of India Ltd.)</td><td colspan="2">State Transmission Utilities (Govt.- owned Transmission Companies)</td></tr>
<tr><td>DISTRIBUTION</td><td></td><td>Govt.- owned Distribution Companies</td><td>Private Distribution Companies</td></tr>
<tr><td colspan="5">Source: Computed by authors.</td></tr>
</table>

government cannot (in practice) really force the other to take specific action.][8] The sector is dominated by large state monopolies at both Central and state levels, with the cash-generating (and customer interface) distribution segment completely under the ambit of state governments.

The Indian Electricity Act, 1910 provided the original framework for the electric supply industry. It empowered the state governments to issue licenses authorizing the licensee to supply electricity in specified areas and spelt out the legal framework for laying down wires and other work. It also specified the rules governing the relationship between licensee and consumers. This Act allowed private agents in both generation and distribution. In 1948, the Electricity Supply Act brought all new generation, transmission, and distribution facilities within the state's purview. It directed the creation of a Central Electricity Authority to develop a sound and uniform national power policy. It also authorized the creation by each state of its own vertically integrated SEB. This model continued until virtually the end of the 1990s, when individual states initiated measures to unbundle their respective electricity boards into separate entities for generation, transmission, and distribution.

Thereafter, a series of legislations has guided the reform, restructuring, and regulation of electricity industry in India. At the national level, the first was the Electricity Regulatory Commissions Act, 1998, which was later repealed and replaced with the EA, incorporating most of the provisions of the former. However, it is noteworthy that Orissa and Andhra Pradesh had initiated far-reaching reforms comprising unbundling, corporatization (including privatization by the former), and constituting regulatory commissions prior to both the 1998 and 2003 Central Government acts. The EA laid the foundations of a structure that substantially sought to make competition and commercial principles the driving impetus for decision-making. It provides *inter alia* that Regulatory Commissions shall adopt tariffs if they are determined through transparent process of bidding, in accordance with the guidelines issued by the Central Government through the Electricity Tariff Policy, notified in January 2006, with the aim of moving away from cost- and norm-based approach for tariff determination to competitive tariff fixation, including by public sector generating companies after a transition period of five years. The Central Government still guides the overall development of the sector through the National Electricity Policy notified in 2005 which, *inter alia*, stipulates that "all efforts would need to be made to bring

8. In other words, if a state government does not implement what is specified under an Act, there is not much that the Central Government can do "operationally"; for example, thus far, a major state like Tamil Nadu has not unbundled the state-owned electricity board.

the power industry at a stage in which competition will determine the price rather than any cost plus exercise."

Initiatives after the Payments Crisis of 2000–01

The year 2000–01 may well be considered a watershed year for the power sector in India. The Central Government by this time had been sufficiently exercised in the malaise afflicting the sector; outstanding dues owed by state government power utilities to Central Government-owned public sector units such as National Thermal Power Corporation, National Hydro Power Corporation, Coal India Limited, Indian Railways, and Power Grid Corporation of India Limited had reached Rs. 415 bn (as percent of 2000–01 GDP, 1.8 percent).[9] Given the inherent limitations on account of the division of responsibilities between the states and the Center, and also that the sector is almost wholly government-owned, the Central Government could deploy only indirect instruments to influence changes in the (revenue generating) distribution segment, which is under the ambit of states. That there was also method to this can, perhaps, be appreciated by the following mapping of objectives to the specific initiative:

1. The OTS scheme—restructure liabilities that had accumulated on account of SEBs' persistent failure to make regular payments, and to settle surcharges and interest imposed as penalty; in other words, a financial workout to moderate burden on SEBs but at the cost of a harder budget constraint on state governments (as owners of SEBs).
2. The APDRP—to nudge states to address long-standing problems related to the cash-generating segment of the sector.
3. The EA—to help coalesce thinking on the structure of the electricity sector by providing a framework for legislative changes at the state level for undertaking reforms.[10] Although all aspects—distribution,

9. Of the total outstanding amount on February 28, 2001, Rs. 257 bn was principal and Rs. 157 bn was on account of surcharge and accumulated interest on delayed payments (Government of India, 2001). By the time of the cut-off date of September 30, 2001, this figure had increased to Rs. 419 bn (Ministry of Power, 2002–03).

10. State governments did not require formal legislative action at the Center to initiate reforms. As mentioned earlier, Orissa established a regulatory commission and privatized the power sector as early as 1996 (under the purview of the Orissa Electricity Reform Act approved in November 1995), without any Central Government legislation. In fact, Orissa's approach to regulation spread to other states and was adopted by the Central Government in the form of an Electricity Regulatory Commissions Act 1998. The Andhra Pradesh Reform Act 1998 was similar to the Orissa Act regarding regulatory structure and functioning.

tariff setting, and market structure—of the problem end of the electricity business are under the ambit of state governments, the EA (passed with broad support) nevertheless was important for introducing political suasion at Center–state forums[11] and Planning Commission dialogue with states in the context of plan allocations.[12]

SEB DUES RESTRUCTURING SCHEME. The Conference of State Chief Ministers and Power Ministers held in March 2001 noted that the large accumulated dues owed by SEBs, in turn, adversely affected the finances and investment plans of central public sector units (CPSUs). An expert group established to recommend a resolution of outstanding dues to the CPSUs submitted its report in May 2001 (Government of India, 2001). The key features of the scheme (which came to be known as the OTS) included securitization of the accumulated dues through 15-year tax-free bonds—with a five-year moratorium on repayments—issued by respective state governments through the Reserve Bank of India (RBI) at a tax-free interest rate of 8.5 percent per annum. A 60 percent waiver of the surcharge on outstanding dues was granted as an incentive for states to accede to the securitization scheme. In addition, to harden the budget constraint, a quasi-binding restriction on SEBs designed to recover defaults (exceeding ninety days) to Central Government-owned utilities and suppliers through adjustments from Central Plan Assistance to state governments, was introduced.

Under the scheme, state governments have issued bonds worth Rs. 350 bn (Ministry of Power, 2006).[13] The OTS can be deemed to have worked, against a simple measure (that of timely payments): the mechanism to recover dues through the RBI has, to the best of our knowledge, not been availed.[14] (Has the prospect of being *named and shamed* concentrated the minds of state governments?) In other words, state utilities have regularly paid Central Government-owned suppliers of electricity and coal, and to transmission operators and Indian Railways. However, a comprehensive verdict on the

11. Of which the National Development Council (NDC) is probably the most prominent.

12. Another possibility is that reform minded leadership in state governments could deploy the EA as a lightening rod to goad their (recalcitrant) colleagues to support initiatives.

13. This number increased with each subsequent issue of the Annual Report since 2003–04, when it was Rs. 323 bn.

14. The tripartite agreement has hardened the budget constraint. But its durability is, *per se*, not guaranteed since the potential for individual state governments to indulge in arm twisting exists, especially given the reality of a Central Government that is a coalition reliant on powerful regional parties.

scheme can only be made when amortization of outstanding bonds will have to be honored to the tune of about Rs. 35 bn annually. Given the cash position of state-owned utilities (elaborated in the fourth section), many state governments may end up making repayments from general revenues.

ACCELERATED POWER SECTOR DEVELOPMENT AND REFORM PROGRAMME (APDRP). To ensure that the OTS remained precisely that, measures to accelerate state-level reforms by rapidly restoring and then sustaining the financial viability of the power sector were considered important by the Empowered Group of Ministers. Against this background, the Union Ministry of Power constituted an expert committee to examine (and recommend changes in) the method by which Central Government assistance for the power sector was given to states. Based on the recommendations of the committee (Government of India, 2002a), the Central Government decided to revamp an existing scheme, the Accelerated Power Development Programme (APDP) which had been introduced in February 2000 for providing financial assistance toward renovation and modernization of power plants and also for strengthening and improvement of sub-transmission and distribution network.[15]

The motivation and operational contours for broadening the scope of the APDP and changing it to the APDRP were informed by two interrelated objectives, viz., a reduction of losses and increasing revenue collection.[16] The change from the APDP to the APDRP reflected a change in emphasis from a project/input (engineering) orientation to performance and outcomes; the emphasis was shifted to the commercial aspects of the engineering actions. The tenor of the Central Government assistance changed to a reform program predicated on the realization that an ad hoc and piecemeal approach to loss reduction needed to be replaced with sustaining reforms.[17]

Access by state utilities to assistance under APDRP was made contingent on a state signing off on the OTS Scheme. There were two streams of support under the APDRP—one for investment and the other as an incentive based on reducing operational cash losses. The Union Budget, 2002–03 formally rechristened APDP as APDRP and enhanced the allocation to Rs. 35 bn from Rs. 15 bn in the previous year with the stipulation that "access of the States to

15. The APDP financed 50 percent of the project cost with a grant to loan ratio of 50:50 to the state governments as advance Central Plan Assistance. The balance 50 percent of funds had to be contributed by respective states.

16. In recent years, India has attempted to estimate an omnibus (physical) measure, aggregate technical and commercial (ATC) losses, to gauge what fraction (percentage) of the units of electricity is not paid for (in the third section the concept is formally defined, and the data presented).

17. Details are available at powermin.nic.in under Acts and notifications.

the fund will be on the basis of agreed reform programmes, the centre piece of which would be the narrowing and ultimate elimination of the gap between unit cost of supply and revenue realisation within a specified time frame." The incentive stream provided for a "substantial reward," up to 50 percent of the actual cash loss reduction (without elevating tariffs) as a grant for states that were willing to go beyond "demonstration projects" for the investment component and undertake enterprise-wide reform for performance improvements. 2000–01 was the stipulated base year for calculating the reduction of loss during subsequent years.[18]

As part of the scheme, and some even before, states initiated steps aimed at restructuring the sector through measures relating to private sector entry into power generation, re-organization of SEBs into separate corporations for generation, transmission and distribution, metering feeders, measures for reducing losses, rationalizing tariffs and initiating statutory steps for establishing regulatory commissions. Over the four years 2002–03 to 2005–06, aggregate disbursement (investment and incentive) under the APDRP was Rs. 77 bn. Nineteen states submitted incentive claims to the Ministry amounting to Rs. 108 bn; on scrutiny by independent evaluators, eight states were found eligible, and the aggregate of incentives that has been released is Rs. 15.8 bn.[19]

RESTRUCTURING APDRP. The Ministry of Power in Delhi felt that despite being a major improvement over the APDP, there were residual flaws in the structure of the APDRP. The performance of the APDRP, at least in terms of financial assistance to states, fell short of what had been envisaged (Rs. 200 bn was targeted in the 10th Plan). The thinking was that the program had to be restructured to an outcome-driven program based on monitorable targets against established baselines.

According to the committee established to restructure the APDRP (Government of India, 2006), some aspects transpired time and again as hindrances to the level of performance improvement that had been envisaged in the APDRP. All the agencies interacting with the Committee pointed out certain bottlenecks encountered during implementation of the schemes,

18. Losses are calculated on net of subsidy and tariff compensation given by the state government, both in the base as well as subsequent years. Revenue is considered on net realization basis only (increase in receivables is factored out). Incentive in subsequent years was given on the basis of incremental loss reduction by the utility with calculation of loss at the enterprise level. For the states where SEBs have been restructured, calculation for transmission and distribution utilities are used for assessing reduction in cash loss.

19. In the most recent Union Budget documents released in February 2007, no figures were given for APDRP disbursements in 2006–07.

including unrealistic investment project reports, delay in supply of equipment due to increased demand, heavy quantum of work, increase in price of materials and equipment, poor response to turnkey offers, and employees' resistance to outsourcing (especially on work related to information systems). Other flaws emerged consistently from responses of the utilities, most notably that state governments were tardy in transferring funds that had been released to them by the Center.

It is difficult to ascertain how much of the improvement in the cash position of the sector has been due to Central Government initiatives and how much has been on account of states' desire to restore the sector's health. The payments made on account of APDRP have been modest. Some states have focused on top-level (revenue enhancing) instruments which has taken the form of (i) reduction of losses; (ii) tariff rationalization; and (iii) management of load composition, in particular handling agricultural supply and greater emphasis on supply to industrial and commercial consumers (these are investigated at length in the fourth section). There are also instances (unheard of in the past) of some state power utilities swapping their high cost debt for debt with lower coupon, renegotiating power purchase agreements, and shopping around for cheaper coal.[20] Some state governments have also pitched in by financial restructuring through carving out liabilities of state utilities and assuming responsibility for them.

THE ELECTRICITY ACT 2003.[21] The Act essentially provided a "process map" for a market-based transparent regime through progressive introduction of competition and choice by incorporating impressive panoply of features comprising liberalization of captive generation, introduction of open access in transmission and subsequently in distribution, and the provision for issuing multiple distribution licenses in a given area. A critically important change that the Act sought to encourage was replacing the present single-buyer model to a multi-buyer model. This would lead to a paradigm change in the environment whereby monopoly of the SEBs for buying/selling power would cease, thus leading to a market determined tariff structure. Toward harmonization of regulation, the Act specificates that the principles laid out by the Central Electricity Regulatory Commission (CERC) in generation and transmission should guide State Electricity Regulatory Commissions (SERCs).

20. Over 2002–03 to 2005–06, Gujarat's state-owned power system negotiated savings of Rs. 7.7 bn on costs pertaining to fuel and power procurement (Government of Gujarat, 2006).

21. The Act, *inter alia*, consolidated the Indian Electricity Act 1910, Electricity (Supply) Act 1948, and Electricity Regulatory Commissions Act 1998.

The Act wrote the code for the sector from a national perspective with regard to grid discipline and rationalized dispatch of power.[22] In May of 2007, Parliament also passed legislation that makes stealing of electricity a cognizable offence and authorizes establishment of special courts for prosecution of those indulging in theft of power.

Structural Outcomes

All states, except Arunachal Pradesh and Nagaland, have constituted SERCs. However, SERCs of three states (viz., Goa, Jammu and Kashmir, and Meghalaya) are non-functional, and except for the electricity regulatory commission in Bihar, all SERCs that are functioning have issued tariff orders (appendix table A2 provides a composite summary on implementation of some of the reform measures discussed above). Thirteen states have unbundled their SEBs whereas nine states have sought extension; the mandatory date for unbundling SEBs into generation, transmission, and distribution entities was June 2004.

THE REGULATORY ENVIRONMENT. The role of state electricity regulators has been extensively analyzed [see, for example, Prayas (2003)]. Although the function is critical in the reform process, it is by and large exogenous to the reform efforts of state governments/discoms. Being largely outside the scope of the paper since the metric for evaluating the regulatory function is very different from this paper's analysis, we will limit our observations to an assessment of some of their broad functions [see Bhattacharya and Patel (2003; 2005) for the relevant criteria and associated evaluation of national regulatory agencies].

The effectiveness of regulators has, decidedly, been mixed. They have been able to pry open the books of state power utilities, at least partially, which has led to state governments to explicitly provide subsidies (up to a point) to the utility from the exchequer, if it wants to pursue social objectives.[23] While state regulators in recent years have contributed toward tariff rationalization—altering tariffs for different consumer segments, reflective

22. Transparent application of Availability Based Tariff (ABT) and Unscheduled Interchange (UI) are formal tools in this context. As part of implementation of EA, the government notified a National Electricity Policy in February 2005 and, subsequently, a National Tariff Policy, which *inter alia* facilitated Merit Order Despatch in supply (giving priority to least costly generators).

23. State governments never pay the entire uncovered net cross subsidy balance, in part because they know that utilities include shortfall due to pilferage from the system as subsidy requirement.

of cost of supply and occasionally stipulating (performance oriented) multi-year tariff methodology to enhance predictability—the pace of the initiative is uneven, and much remains to be done.[24] The SEBs have often been unwilling to follow the basic rules of the National Tariff Policy. One of these requires that utilities should file annual revenue requirement to the concerned SERC (filing the revenue requirement initiates the process of tariff revision keeping in mind the viability of distribution utilities). In 2006, only some states filed average revenue requirement petitions on time, and ten states had sent these in after the deadline. Important states such as Maharashtra, Gujarat, and Tamil Nadu did not bother.[25] State governments of diverse hues promise gifting away power to favored consumers—in 2006, Scheduled Castes in Punjab and farmers in Andhra Pradesh—in contravention of the rules for subsidies in the notified tariff policy. Therefore, not surprisingly, it is felt (and not without merit) that some SERCs have been ritually handing out tariff orders often (implicitly) endorsing populist initiatives at the behest of state governments. An interesting political economy aspect of regulation is provided by the comment of an eminent panel on a study on the SERCs: "… many State Governments have been brazen in defying the orders and directives of the [S]ERCs, year after year. Even the basic requirement of submission of full data in support of the tariff increase proposals is not being met by the utilities. This does not augur well for the [S]ERCs…" (Prayas, 2003).[26] The observation underscores the inherent difficulty of regulating government-owned utilities (Tadimalla and Patel, 2005).

The practice of quarterly up-to-date audited accounts is unheard of although this would increase transparency and allow for critical examination of accounting practices followed by SEBs. It will be difficult for state utilities and governments to publicly oppose introduction of 21st century accounting practices. The EA provides flexibility for regulators to force the issue, but practically none have to the extent that the Companies Act enjoins corporations to prepare financial statements.

24. Statutory requirements for hearings, access to information, and recourse in tariff determination have been positive (and useful) attributes of the regulatory framework that states have embraced (Dubash and Rao, 2006). Also see Rao (2007a).

25. Maharashtra eventually did so in April 2007.

26. Recently, a staff member of the Uttar Pradesh ERC has bemoaned the same point: "The power ministry should take note of the fact that most of the government-owned utilities across states have chosen to ignore the mandated legislative structural arrangements despite time-bound provisions in the [Electricity] Act. Non-compliances of regulatory orders galore; delays, disobedience, frequent reviews and appeals are common responses to the orders of the regulatory commissions" (Singh, 2007).

One of the most disappointing aspects of the reform process has been the slow (actually negligible) tangible progress on competition and open access to wires in the sector. This is an area in which significant responsibility may be placed on state electricity regulators, who should have been more proactive in "encouraging" introduction of open access and third party sales to break the monopoly of state-owned utilities. There has been a marked lack of effort to advocate change of current practices and initiate debate.[27] It is noteworthy that consultation and discussion papers by other sector regulators, for example, Telecom Regulatory Authority of India (TRAI), now have a proven track record as change initiators.

OPERATIONAL EFFICIENCY AND SUSTAINABILITY. Even if there is improvement in top-line indicators such as revenue performance and cash profits, will it be sustainable? An important aspect in evaluating the sustainability of commercial improvements is analogous to progress in the operational efficiency of the system. Capacity to withstand competition, reductions in system interruptions, quality of metering, grid discipline, and electricity supply parameters (like voltage fluctuations) are "well-being" indicators of a power system, and improvements (or lack of them) are an important gauge for the underlying health.

MARKET STRUCTURE AND COMPETITION. Market contestability may be considered to be a key factor for inducing efficiencies in electricity operations and reliability. Despite the advancement of many changes in the market structures of the erstwhile monolithic SEBs, there has been virtually no change in the level and nature of competition for customers. While most developed markets, and many emerging ones, have progressed quite rapidly from competition in the wholesale segments to retail competition, there has been virtually no progress in most discoms in India despite an enabling environment in the EA. The quantum of electricity traded is only about 3 percent of the total power sold.

The transition from a single-buyer model to a multi-buyer multi-seller model should result in a competitive power market so as to provide incentives for new investment while providing affordable and quality power to consumers. In January 2006, the Forward Markets Commission (FMC) notified electricity to be included in the list of commodities permitted for futures trading. Unfortunately, the process seems to lack a roadmap toward development of a competitive bulk power market, which should comprise

27. Of course, SEBs are extremely unwilling to allow choice to their "subsidising" customers as they are the major source of income for meeting expenses; loss of cash streams to private electricity suppliers, even with surcharges and open-access charges, would result in a severe cash shortfall.

adoption of a direction sensitive and efficient transmission pricing regime, introduction of intra-state ABT regimes, liberalization of fuel markets, rationalization of retail tariffs, and competitive procurement of renewable energy. The Indian wholesale power market is characterized by long-term bilateral contracts, which will continue to play a dominant role.

An exposition on the design of power markets and dispatch mechanisms is a complicated and technical subject, and beyond the scope of this paper (Deo, 2007). All we can comment on is that the development of this market requires the application of economic principles that incentivize the flow of power from the most efficient generators to the most creditworthy customers. The magnitude of wheeling charges and cross-subsidy surcharges has *de facto* made open access unviable. Maharashtra is probably the only state where the surcharge formula allows for the possibility of open-access sales to be remunerative.

GRID DISCIPLINE. A well-functioning electricity system with balanced flows and seamless responsiveness to demand–supply imbalances is critical for the smooth operation of the grid as a whole.[28] An acceptable international standard of deviations in electricity system frequency from 50 Hz is considered to be .005 percent, anything below 49.5 Hz is bad and below 49.0 Hz is a crisis. In 2006–07, on average, the chronically power-short northern region had a grid frequency below 49 Hz 21 percent of the time. The southern region was the most disciplined.

The kind of grid discipline that is being followed is inimical to the emergence of an actively traded market for power. The CERC has developed mechanisms for making inter-state transfers of power more efficient and commercially oriented. In this regard, the UI mechanism under the ABT regime could continue (albeit with modification) as a proxy for balancing the market to help smooth transition from the existing practice. For instance, given the current prices at which short-term power is being purchased by state and private discoms, the increase in the UI ceiling rate in April 2007 by CERC from Rs. 5.70/unit to Rs. 7.45/unit may not be binding.[29] A rate of Rs. 9.30 was suggested to the CERC, in keeping with the requisite practice of setting the UI rate at slightly higher than the cost of diesel generation (in some instances this is as high as Rs. 10–13/unit).

28. Grid discipline is a very important gauge of the physical integrity of the power system, that is, whether rules are followed. In the Indian context, grid indiscipline is usually on account of overdrawing of power (on account of incipient shortage) from the system which leads to a decline in the frequency of the grid, and occasionally its collapse.

29. The UI rate is a penal rate for drawing unsanctioned power from the grid.

Moreover, the current regime's limitations are likely to be exacerbated with the emergence of a nationally synchronized power grid encompassing all the power regions of the country.

METERING AND ENERGY AUDITS. One of the recommendations common across all committees on the power sector has been an insistence on energy audits, and as a precursor, metering of consumers, in order to be able to identify power flows and losses at the distribution levels. One of the basic problems of estimating the magnitude of losses in the system was the ability of utilities to disguise the extent of these losses by attributing them to (underpaid/unpaid) consumption in agriculture. Appendix table A3 provides a summary of the current status of metering. The striking aspect of these numbers is the completely inadequate metering at the level of distribution transformers; nationally, only 11 percent of these transformers are metered. Even worse is the metering status at the consumer level at end-2006, after years of reform funds for metering and audits; large states in terms of sales of electricity units have metering levels of anywhere between 2 percent and 34 percent. While metering at the 11 Kv level is high, it only provides a rough idea of the approximate location where the supply is being dispersed. The numbers on meters themselves may not be entirely reliable given the lack of information on how many meters are in a working condition, properly calibrated or actually read. [30]

Macroeconomic Assessment

There are several (interrelated) indicators that convey the extant financial health of the power sector at the aggregate level. The principal markers deployed in this paper comprise fiscal indicators, commercial aspects, and cash position.

Fiscal Aspects

Poor financial performance of state government-owned power utilities as well as the fact that SEBs account for the bulk of the states' investments in PSUs, have been major fiscal challenges for state governments. The proximate

30. The evidence on this aspect can, almost inevitably, only be anecdotal. The purchase of low voltage meters (about two years back) by the Maharashtra distribution utility is apocryphal. The "meters" were procured on the basis of lowest-price bidding at about Rs. 200 each, which is ridiculously low by any standards; what, in fact, was purchased were metallic boxes that looked like meters! Regarding transformers the story is that (occasionally) existing units are removed (at night) and sold back to the utility.

reasons have been the state-mandated subsidy to some consumers and the attendant scope (indeed, incentive) for camouflaging outright theft for supply to these categories that a skewed tariff policy has engendered. In macroeconomic terms, the sector, by some measures, is currently perched more or less where it was in 1997–98 (and the position then was not considered to be healthy). Recent strong economic growth and the concomitant buoyant tax revenues have given state governments some elbow room for financially supporting the power sector.

How far the sector had fallen can be appreciated when one notes that despite increase in subsidy payments—2–3 times the 1994–95 level—the burden on SEBs that remained uncovered had almost doubled (as a percent of GDP) by 1999–2000 (table 1), and which almost brought their operations to a virtual halt in 2001. This is because in tandem, the net subsidy to consumers (after taking into account over-charging to industry and the commercial sector), increased sharply over the same period, from 0.8 percent of GDP to 1.5 percent of GDP. After 2001–02 there has been a sharp correction in net subsidy, and, commensurately the uncovered gap, and currently both measures are at about the same level that they were a decade ago (1997–98).

As a percent of GDP, subsidy by the state governments to partly compensate SEBs for below cost sale of electricity to agriculture and domestic sectors have declined in recent years. However, despite a supportive macroeconomic environment, budgetary support, both in absolute terms and as share of state gross fiscal deficit (GFD), has increased in 2006–07. Although this, of itself, is not bad, since the states seem to be taking more responsibility for social objectives, risk of aggravating the fiscal situation as subsidies gradually creep up remains high. For some states, the scope for vulnerability on this score is significant. Consider, for example, subsidy in 2004–05 (last year for which state-wise data is available) as percent of respective GFD for the following states: Haryana (91.3 percent), Punjab (56.6 percent), Karnataka (38.8 percent), Gujarat (23.3 percent), Tamil Nadu (16.6 percent), and Andhra Pradesh (15.9 percent). Other states have some buffer; for instance, the ratio is relatively modest for Orissa (1 percent), Assam (3.4 percent), Uttar Pradesh (5.3 percent), Rajasthan (11.2 percent), and Madhya Pradesh (12.6 percent).[31]

In 2006–07, while (estimated) subsidy from state governments to SEBs was Rs. 138.7 bn, an (estimated) uncovered subsidy of Rs. 212 bn remained, which, as the 2006–07 Economic Survey observes, "offers the large reform

31. A word of caution: a low ratio for some states may be due to under-payment of subsidy, rather than the requisite subsidy bill being low.

TABLE 1. Overall Fiscal Indicators of the Power Sector (in Rs. bn)

	Gross cross-subsidy (as % of GDP in brackets)	*Surplus from subsidizing sectors*	*Net cross-subsidy (as % of GDP in brackets)*	*Subsidy to power sector from state govts. (as % of GDP in brackets)*	*State govt. subsidies as % of State GFD*	*Uncovered cross-subsidy loss*	*Uncovered subsidy as % of GDP*
			(3)			(6)	
	(1)	(2)	(1– 2)	(4)	(5)	(3–4)	(7)
1991–92	74.5 (1.1)	21.7	52.8 (0.8)	20.5 (0.3)	10.8%	32.3	0.5%
1992–93	93.5 (1.2)	33.1	60.4 (0.8)	19.1 (0.3)	9.1%	41.3	0.5%
1993–94	114.5 (1.3)	35.0	79.4 (0.9)	20.7 (0.2)	10.0%	58.8	0.7%
1994–95	133.1 (1.3)	53.1	80.0 (0.8)	18.3 (0.2)	6.6%	61.7	0.6%
1995–96	172.8 (1.4)	66.6	106.2 (0.9)	72.3 (0.6)	23.0%	33.9	0.3%
1996–97	201.5 (1.5)	78.5	123.0 (0.9)	62.8 (0.5)	16.9%	60.1	0.4%
1997–98	245.2 (1.6)	90.6	154.6 (1.0)	72.1 (0.5)	16.3%	82.4	0.5%
1998–99	303.5 (1.7)	68.8	234.7 (1.3)	78.5 (0.4)	10.6%	156.2	0.9%
1999–00	338.1 (1.7)	42.4	295.7 (1.5)	109.4 (0.6)	12.0%	186.3	1.0%
2000–01 (P)	344.3 (1.6)	34.4	309.9 (1.5)	88.2 (0.4)	9.9%	221.7	1.1%
2001–02 (P)	345.9 (1.5)	37.0	308.9 (1.4)	86.8 (0.4)	9.0%	222.1	1.0%
2002–03 (P)	305.7 (1.2)	48.0	257.7 (1.0)	130.0 (0.5)	12.7%	127.8	0.5%
2003–04 (P)	331.5 (1.2)	61.3	270.2 (1.0)	110.8 (0.4)	9.0%	159.4	0.6%
2004–05 (P)	361.9 (1.2)	63.9	298.0 (1.0)	104.8 (0.3)	9.6%	193.2	0.6%
2005–06 (P)	364.0 (1.0)	60.6	303.4 (0.9)	116.1 (0.3)	10.2%	187.3	0.5%
2006–07 (RE)	401.3 (1.0)	50.6	350.7 (0.9)	138.7 (0.3)	12.7%	212.0	0.5%
2007–08 Plan	395.4 (0.9)	88.2	307.3 (0.7)	124.6 (0.3)	10.1%	182.7	0.4%

Source: *Economic Survey* (2006–07), and previous years; *Handbook of Statistics on Indian Economy* (2006).

Notes: GFD is consolidated gross fiscal deficit of state governments; (P) means provisional. RE means revised estimates.

potential for improving not only the electricity sector itself but also the fiscal position of the States." The recovery of cost by the government from the power sector (not a non-excludable commodity) has been low at 13.1 percent, compared to 17.7 percent for irrigation, 11.6 percent for roads, 5 percent for public health, and 1.2 percent for education (RBI, 2006). In addition to subsidies and loans to utilities, governments have also provided substantial guarantees to financial institutions for enabling state utilities to raise requisite resources. With persistently negative rates of return of SEBs (on capital employed), resources forgone continue to be very large.

AGRICULTURAL POWER AND SUBSIDIES. Politicians have used state distribution utilities to deliver populist measures like (almost) free power to agriculture; over the last two decades this has been the primary contributor to the financial weakness of the sector (table 2). The promise of free power has reached epidemic levels with most political parties doing so in practically every election [see Narendranath et al. (2005) on the underlying political explanations].

For the most part, accounting practices of SEBs have continuously disguised non-technical losses (essentially pilferage) as consumption of power by agriculture. Since a large part of the supply to agriculture is unmetered, utilities can under-report the systems' actual distribution losses by ascribing a significant portion of non-technical losses and theft as supply to agriculture. Subsidies expected to benefit poor farmers in fact benefit the large farmers and the pilferers of power, many of whom are not farmers [see Katiyar (2005) on power theft in rural areas]. While this reality is well known, existing estimates are largely based on anecdotal evidence or non-representative samples.

Losses

In consonance with improvement in their finances (at least in cash terms), the overall financial losses of state-owned power utilities have declined from Rs. 293 bn (1.3 percent of GDP) during 2001–02 to Rs. 221 in during 2004–05 (0.7 percent of GDP) (Power Finance Corporation, 2005; 2006). But ATC losses, which include theft, non-billing, incorrect billing, inefficiency in collection, and (technical) transmission and distribution (T&D) losses,[32] are about 36.8 percent nation-wide in 2004–05, the last year for which data is officially available (PFC, 2006).[33, 34]

32. The T&D losses are determined by the physical quality of the T&D infrastructure of a power system (a very good system would have losses on this count in the low single digit).

33. Available data does not give a breakdown of ATC losses between TD and other losses.

34. There are informal indications that ATC loss levels might have fallen in 2005–06, based on a selective survey of tariff filings.

TABLE 2. Power Sector Cross–subsidy Indicators (in Rs. bn)

	Subsidy to agricultural consumers (as % of total gross subsidy in brackets)	*Subsidy to domestic consumers*	*Subsidy on inter-state sales*	*Gross cross-subsidy*	*Gross cross-subsidy as % of state GFD*
	1	*2*	*3*	*4 (1+2+3)*	*5*
1991–92	59.4 (79.7)	13.1	2.0	74.5	39.4%
1992–93	72.1 (77.1)	19.2	2.3	93.5	44.7%
1993–94	88.8 (77.6)	24.2	1.4	114.5	55.6%
1994–95	101.1 (76.0)	29.6	2.3	133.1	48.0%
1995–96	137.9 (79.8)	31.6	3.3	172.8	55.0%
1996–97	156.3 (77.6)	42.3	2.9	201.5	54.1%
1997–98	190.9 (77.9)	51.7	2.6	245.2	55.5%
1998–99	225.4 (74.3)	72.7	5.4	303.5	40.9%
1999–00	241.8 (71.5)	91.7	4.6	338.1	37.0%
2000–01 (P)	240.7 (69.9)	99.7	3.9	344.2	38.5%
2001–02 (P)	240.1 (69.4)	103.5	2.3	345.9	36.0%
2002–03 (P)	218.5 (71.2)	85.3	1.9	306.7	29.9%
2003–04 (P)	233.5 (70.4)	88.9	9.2	331.5	26.6%
2004–05 (P)	252.4 (60.7)	104.3	5.2	361.9	33.1%
2005–06 (P)	244.7 (67.2)	108.4	10.9	364.0	31.9%
2006–07 (RE)	273.3 (68.1)	130.1	–2.12	401.3	36.2%
2007–08 Plan	270.9 (68.5)	118.4	6.1	395.4	32.0%

Source: *Economic Survey* (2006–07), and previous years; *State Finances*, a study of budgets of 2006–07, RBI (2006).

Definition of ATC Losses[35] ATC losses (in percent) are calculated as follows:[36]

$$(1 - \text{ATC Loss}) = (1 - \text{TD Loss}) \times (\text{Collection Efficiency})$$
$$= [(\text{Units billed})/(\text{Units input})] \times [(\text{Rupees realized})/(\text{Rupees billed})]$$

There is another interpretation of this formula. Rearrange the two terms in parentheses on the right hand side as follows:

$$= [(\text{Rupees realized})/(\text{Units input})] \times [(\text{Units billed})/(\text{Rupees billed})]$$

The first term in square brackets is the "Average Realization Rate." The inverse of the second term is the "Average Billing Rate." Therefore,

$$(1 - \text{ATC Loss}) = (\text{Average Realization Rate})/(\text{Average Billing Rate}).$$

The reduction of losses is the proximate determinant of the financial viability of the power sector; in a sense, it is the overarching outcome of various reform measures that have been instituted by states/discoms. And it is here that the progress (or lack of it) has been the most disappointing. The ATC losses have declined from 37.2 percent in 2001–02 to 36.8 percent in 2004–05 (PFC, 2005; 2006) (although it is likely that the data will show an improvement in 2005–06).[37] It is instructive that the Report on State-Specific Reforms (Government of India, 2002a), which initiated the APDRP, had envisaged a reduction of losses from the then (estimated) 60 percent levels to around 15 percent over five years, thereby implying an annual reduction of about 9 percentage points.

35. The definition presented here, which is now widely used, was formulated by Prayas, Pune and Delhi Electricity Regulatory Commission. An ATC loss estimate (which is a physical measure) helps to gauge what fraction (percentage) of the units of electricity is not paid for.

36. The TD in the formula is also, of course, in percent.

37. The *Report on Restructuring of APDRP* (Government of India, 2006), which are the latest available estimates of ATC losses, has 38.9 percent and 33.8 percent for 2001–02 and 2004–05, respectively. Provisional accounts for 2005–06 show that the states of Andhra Pradesh, Goa, and Tamil Nadu have reported ATC losses below 20 percent during the year, and that Punjab and two discoms of Gujarat (Madhya and Uttar) have reported ATC loss of 20–25 percent. Further, utilities in the states of Andhra Pradesh, Goa, Himachal Pradesh, Punjab, Gujarat, Meghalaya, Chhattisgarh, and West Bengal have reported profits. States of Jharkhand, Madhya Pradesh, Haryana, Rajasthan, Uttaranchal, Karnataka, Kerala, and Assam have also reported reduction in their losses during 2005–06.

Aggregate financial data do not convey the whole picture, given that business and the underlying physical supplies are also changing. A look at some of the above trends in per unit of electricity supplied provides an alternative and important perspective (table 3).

All the available data indicate that after a fairly sharp improvement over 2001–02, improvements are stagnating in the last couple of years. In fact, the reported worsening of the rate of return in 2006–07, at a time when the economy is strong and state government finances are solid, bode ill for the underlying performance of the sector. One adverse trend that shows up in table 3 is a marked deterioration in the revenue gap of the agriculture sector although this needs to be looked at with more care, given the problems with metering and weak energy audits of agriculture feeders.

Overall Financial Assessment of State Government Utilities

Most SEBs (and successor entities after unbundling) are unable to earn a rate of return (RoR) of even 3 percent on their net fixed assets after providing for depreciation and interest. [This is one of those quaint features of the Indian electricity sector; the Electricity (Supply) Act 1948 mandates a minimum return on assets.] In fact, despite significant improvements in many financial and commercial parameters over recent years at the aggregate level (these are evidenced in table 4 up to 2004–05), there seems to have been a significant deterioration in the projected RoR in 2006–07; the cause is unexplained.

During 2004–05, although state utilities had incurred (book) losses of Rs. 221 bn (before subsidy), cash losses of the sector (on a revenue- and subsidy-realized basis) have improved dramatically from Rs. 189 bn in 2001–02 to Rs. 34 bn in 2004–05 [and are likely to have lessened even more in 2005–06 (table 4)].[38] Subsidy provided by governments is important; transfers have increased, as state fiscal situations have improved since 2002–03, and this has contributed to incomes of utilities. Subsidy booked but not paid to utilities has declined from Rs. 52 bn in 2001–02 to overpayments of Rs. 7 bn in 2004–05.

The financial liquidity to cover losses of this magnitude is likely to be manageable through working capital loans, deferred payments to their state government owners, some increase in dues to suppliers and, presumably,

38. One of the problems in interpreting financial data of the power sector is the multiplicity of accounting conventions used in different contexts; revenues booked and realized are often used interchangeably. This makes it difficult to compare revenue streams from different sources for different years, especially given the large revisions that are made in the data. Very different pictures of the health of the sector emerge depending on the particular definition of revenue adopted.

TABLE 3. Electricity Tariffs and Costs (in paise/unit)

	ACS (1)	*ARR w/o subsidy (2)*	*ARR–ACS (2–1) (w/o subsidy) (3)*	*ARR–ACS gap (w/o subsidy) (4)*	*ARR for agriculture (5)*	*ARR for industry (6)*	*ARR–ACS gap for agriculture (7)*	*ARR–ACS gap for industry (8)*
1991–92	–	–	–	–24.91	–	–	–	–
1995–96	–	–	–	–28.10	–	–	–	–
1999–00	–	–	–	–70.53	–	–	–	–
2000–01	–	–	–	–65.38	–	–	–	–
2001–02	246	181	–65	–81.34	58.7	410.0	–	–
2002–03	239	196	–43	–48.05	77.5	412.7	–161.5	173.7
2003–04	239	202	–37	–37.00	70.1	387.5	–168.9	148.5
2004–05	250	208	–42	–42.00	73.3	384.2	–176.7	134.2

Sources: Cols. (1), (2), (3), (5), (6), (7), and (8) are from *Report on the Performance of the State Power Utilities*, Power Finance Corporation (PFC) (2005; 2006), which do not carry long time series for each of the data fields. The gap shown in col. 4 is from *State Finances*, a study of budgets of 2006–07, RBI (2006).

Note: ARR stands for average realization rate.

ACS stands for average cost of supply.

TABLE 4. Consolidated Cash Profits/Losses (in Rs. bn)

			2001–02	*2002–03*	*2003–04*	*2004–05*	*CAGR (2004–05 over 2001–02)*
A		Income (without subsidy)–Utilities selling directly to the consumers	809.0	882.4	981.5	1,068.8	9.7%
B		Expenditure (without depreciation and tax) Utilities selling directly to consumers	1,035.4	1,009.5	1,090.5	1,203.9	5.2%
C1	A–B	Profit/Loss without depreciation, subsidy, and tax for DISCOMs	–226.4	–127.1	–109.0	–135.1	–15.8%
C2		Add Gencos and Transcos (Profit without depreciation, subsidy, tax)	24.5	18.2	24.1	30.7	7.8%
	C1+C2	Total Profit/Loss without depreciation, subsidy, and tax	–201.9	–108.9	–84.9	–104.5	–19.7%
D		Tax	0.8	1.6	1.6	2.4	45.0%
E		Depreciation	90.6	100.7	110.2	112.2	7.4%
F	C–E	Profit/Loss (without subsidy and tax)	–292.5	–209.6	–195.0	–216.7	–9.5%
G		Subsidy booked	146.0	136.7	104.3	110.2	–9.0%
H	(F–D + G)	Book Profit/Loss	–147.4	–75.2	–92.3	–111.1	–10.2%
	(H–G)	Profit/loss without subsidy	–293.3	–211.9	–197.2	–221.3	9.0%

I		Subsidy Unpaid (subsidy booked less received)	51.5	13.3	–2.1	–7.4	–42.6%
J		Unrealized revenue	80.9	61.4	42.7	45.0	–17.8%
K	(C–D+G–I–J)	Profit/Loss (without depreciation but on revenue and subsidy realized basis)	–189.2	–48.5	–22.7	–34.4	–43.3%

Source: PFC (2005; 2006). The data covers state power utilities, power departments, and distribution companies that were an outcome of the reform process, in all 29 states as well as the Union Territory of Pondicherry.

Note: CAGR stands for compound annual growth rate.

Memo items:

	2001–02	*2002–03*	*2003–04*	*2004–05*	*2005–06*	*2006–07*
Collection efficiency (%, in income terms)	90	93	96	96	–	–
Units sold (Mn Units)	287,138	309,725	329,647	358,905	–	–
Income (w/o subsidy)/unit sold (in Rs./unit)	2.82	2.85	2.98	2.98	–	–
Rate of Return (%)*	–32.8	–31.6	–28.3	–28.0	–24.8	–27.4

Notes: We have not reported units sold for 2000–01, to preserve continuity; earlier estimates in the *Annual Report of SEBs and EDs* from the Planning Commission vary widely from the PFC (2005; 2006]) estimates thereafter.

*RoR data (provisional/estimated) is from *Economic Survey*, various years.

assistance under the APDRP. The sector manages to (barely) keep its head above water, just about able to meet operational expenses, but being in no position to invest adequately in strengthening the distribution infrastructure or investing in generation capacity.[39] While the financial position has improved, it is noteworthy that the debt service coverage ratio of utilities is hardly likely to inspire confidence among lenders (table 5).

The system—at least on a cash basis—appears to have settled down (albeit at a low level equilibrium), which has contributed to a perception in recent times that the sector is at the cusp of turning the corner, and that this would soon snowball into a full-fledged commercial revitalization and crowd in new investment. The data in tables 4 and 5 is part of the extensive information memorandum of the show-piece initiative [Ultra Mega Power (UMP) Projects] of the Central Government. It is a program of coal-based power stations of 4,000 MW each, which the government hopes can be developed with private sector participation. Open tenders (with lowest tariff as the bidding variable) for executing the UMP projects have been invited for locations across the country and one has been awarded in Gujarat. The private sponsors of UMP utilities would need robust and credible mechanisms to ensure that governments honor their payment commitments under the power purchase agreement (PPA) with multiple states. Public sector financial institutions, it can be argued, may be better placed to assume the counter-party risks of these large projects in which linkages to government-dominated sectors (coal supply, fuel transport, and transmission) are critical for success. The financial shock could be overwhelming; for instance, a back-of-the-envelope calculation

TABLE 5. Distribution of Debt Service Coverage Ratio (DSCR)
(no. of utilities)

DSCR	*2002–03*	*2003–04*	*2004–05*
0–0.50	4	10	7
0.5–1.0	11	9	11
> 1.0	15	20	18
–ve	10	8	17

Source: PFC (2005; 2006).

Note: Among the discoms that have DSCR > 1, there are two each from Andhra Pradesh and Karnataka; ratios of the SEBs of Gujarat, Punjab, and Madhya Pradesh are also larger than one.

39. Of course, the stress in the system is felt in the dilapidated physical assets of the utilities because of inadequate capital expenditure; net fixed assets grew in nominal terms by only 4 percent in 2004–05 from the previous year. Recently, the Prime Minister said that by 2012 (end of the 11th Plan), investment of Rs. 6 tn is required in the power sector (Address to Chief Ministers at Centre–States Meeting on the Power Sector, New Delhi, May 28, 2007).

indicates that discoms would have to essentially, albeit not legally under the PPA, "earmark" distribution circles with revenue collections of Rs. 58 bn to provide "comfort" to *one* UMP (at, say, 75 percent PLF, @ Rs. 2.20/unit)) for meeting procurement costs. To put this in perspective, aggregate income of discoms was about a trillion rupees in 2004–05.

The following is a summary of the positives and negatives that we can discern at the aggregate level:

Positive	*Negative/unchanged*
• Cash flows have improved. • Collection efficiency has improved. • Subsidies from state governments have become more stable, even as fiscal burden (as percent of GDP) on account of the power sector has moderated.	• ATC losses remain stubbornly • Performance indicators seem to have plateaued in 2004–05.

State- and Utility-specific Outcomes

Disaggregating the Financial Turnaround by States/Utilities

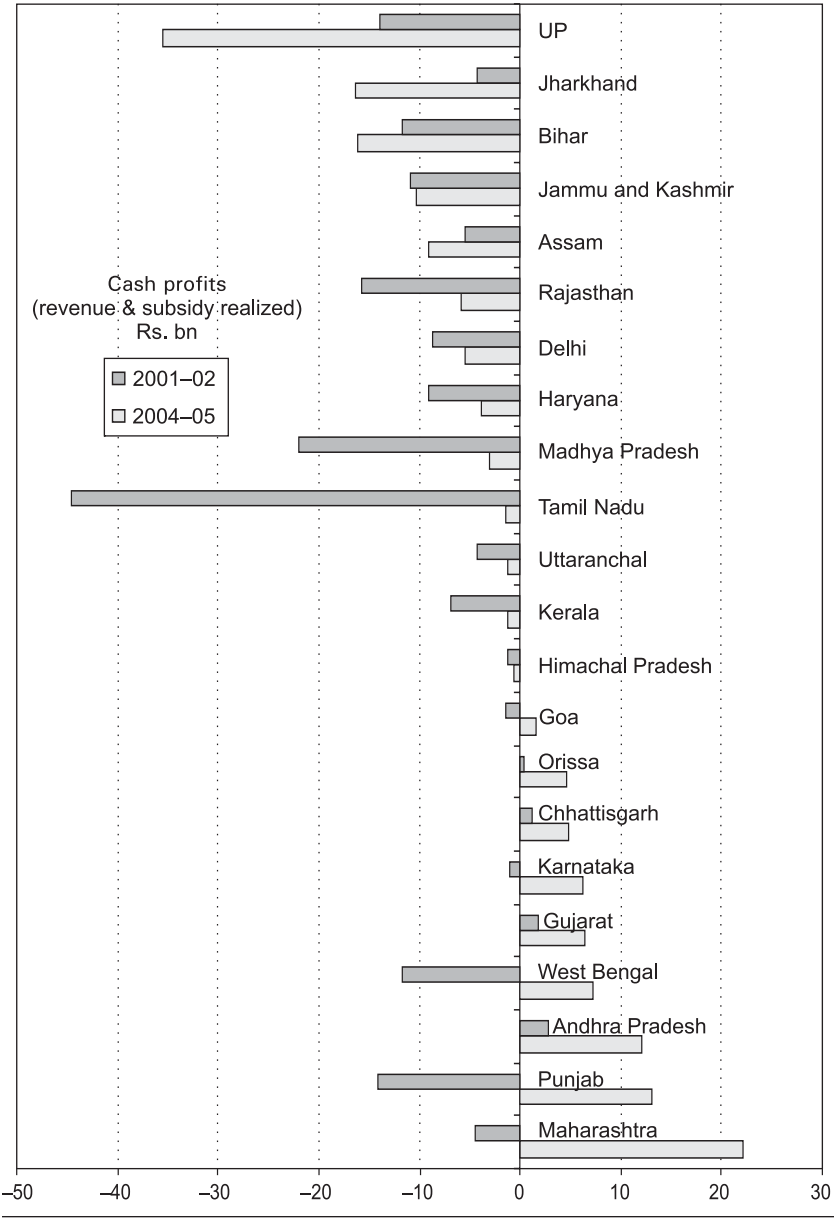
Is the overall pattern at the all-India level that we have reviewed above, repre-sentative of most states? This section examines disaggregated numbers and finds that there is considerable variability between states and distribution utilities (discoms).[40]

The concentration of losses and profits is immediately apparent from the state-wise distribution of cash profits/losses (on a subsidy realized basis) (figure 1).[41] Of the gross cash losses of around Rs. 110 bn in 2004–05 from

40. See data appendix 1 for a discussion on the choice of states and performance metrics in the paper; it also includes nomenclature for discoms in the sample. We will consistently use "utilities" to denote power utilities of individual states. Note that this will include integrated utilities (that is, where SEBs have not been unbundled) *as well as* unbundled distribution utilities (that is, discoms where SEBs have been broken up).

41. We look at cash profits and losses on revenue and subsidy realized basis in section 4; in the interest of fairness to discoms, to the extent that their losses are due to supply to subsidized segments, including agriculture, the onus is on state governments to recompense for what is considered to be essentially a "social (political)" obligation. Later in the same section, however, we consider revenues, profits, and so on, before subsidies, since we are concerned with the commercial aspects of the utilities' performance.

FIGURE 1. Distribution of Cash Profits/Losses by States (in Rs. bn)



Source: PFC (2005; 2006).

Note: The cash profits and losses for states that had unbundled their gencos and transcos in our reference period (2001–02 to 2004–05) include the losses and profits made by these entities, in addition to those by their discoms. This is to enable comparability with those states that had not unbundled.

thirteen states, 80 percent originated in five states (UP, Jharkhand, Jammu and Kashmir, Bihar, and Assam). Gross cash profits of Rs. 78 bn were slightly more dispersed across the nine states generating it, with five states accounting for 78 percent (Maharashtra, Punjab, Andhra Pradesh, West Bengal, and Gujarat).

One of the main inferences from figure 1 is the higher variability in the cash position in recent years. In 2001–02, the cash positions were clustered more closely around a higher average loss (Rs. 8.4 bn), and by 2004–05, the average loss had reduced significantly (Rs. 1.4 bn), but the spread around this lower loss level had widened. The coefficient of variation for states' levels of loss had increased from –1.23 in 2001–02 to –8.23 in 2004–05, due to the standard deviation increasing from 10.4 to 12.0 over this horizon.

Of the improvement that we have seen in the last three years, a few states have contributed a disproportionate share. The most remarkable turnarounds (in terms of loss reduction) were in the states of Tamil Nadu, Maharashtra, Punjab, West Bengal Madhya Pradesh, and Karnataka. Andhra Pradesh, Orissa, Gujarat, and Chhattisgarh significantly improved their profits.[42] Uttar Pradesh, Jharkhand, and Bihar had contributed the most to the higher loss levels in 2004–05.

Even within states, there is large variability among the unbundled discoms. For the individual discoms of unbundled state utilities, the coefficient of variation had increased from –1.11 to –2.33 over this period. Figure 2 shows that very few discoms had made the transition from a cash loss situation to cash profits (prominent among those making the transition were the Bangalore circle of Karnataka, Delhi North, AP North, AP East, Orissa West, and Delhi Rajdhani).[43]

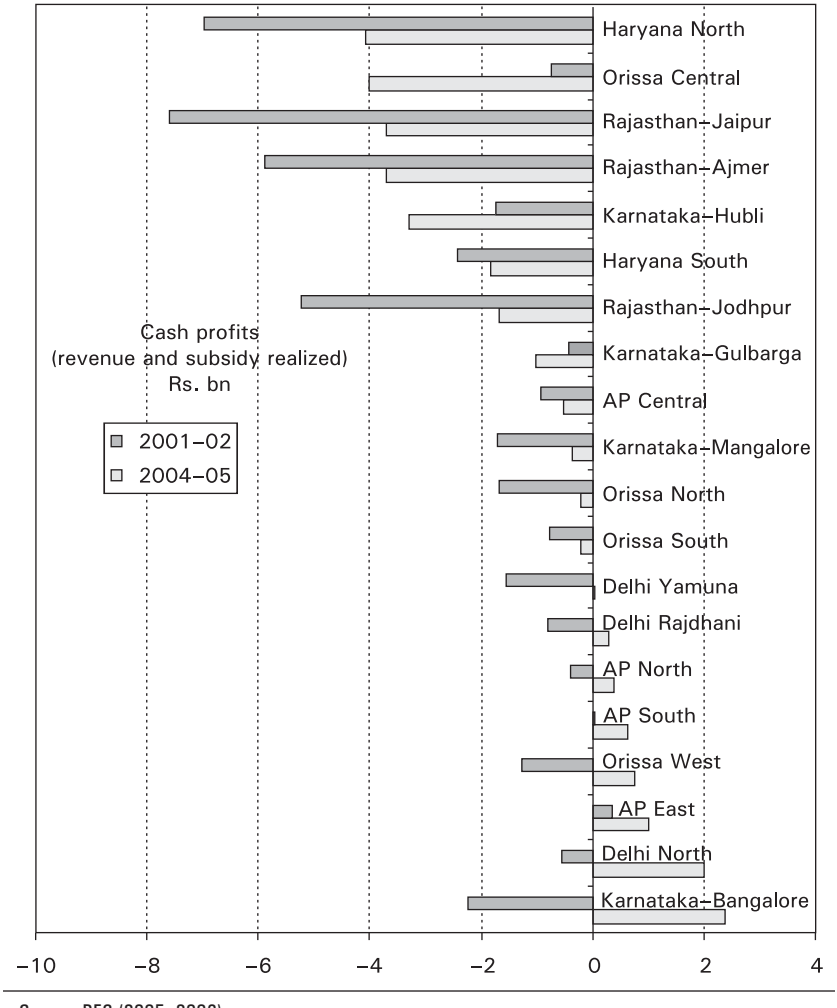
The performance of the six privately-owned discoms (in Delhi and Orissa)[44] was all the more remarkable, as they did not receive (direct) subsidies from their respective governments in 2004–05; despite this, four

42. In fact, Gujarat has earned profit before tax (PBT) after depreciation of Rs. 1.8 bn in 2005–06. The per unit (ACS–ARR) gap has been reduced from a deficit of 66 paise in 2003–04 to a surplus of 5 paise in 2005–06 (Government of Gujarat, 2006).

43. It is notable that *after* depreciation (that is, on a book basis), only three (unbundled) discoms made profits in 2004–05, notably Delhi North, AP East and Karnataka-Bangalore (PFC, 2006). Among the vertically integrated utilities (SEBs, which are not part of figure 2), Punjab, Chhattisgarh, Maharashtra, West Bengal, and Goa made significant profits after depreciation.

44. Central Electricity Supply Company of Orissa (CESCO) (Orissa Central) reverted from private majority to the Government of Orissa [through Grid Corporation of Orissa Limited (GRIDCO) assuming control] in 2002, following the exit of AES Corporation from the joint venture operating the discom.

FIGURE 2. Distribution of Cash Profits/Losses by Discoms (in Rs. bn)



Source: PFC (2005; 2006).

Note: The chart does not include the losses/profits of states with integrated SEBs, since the scale of these numbers would blunt the variations in the other discoms.

of them made profits in 2004–05, which amounted to 41 percent of the profits of the unbundled discoms and 4 percent of total profits.

To lend credence to having qualified under the incentive component of the APDRP, the qualifying discoms generally have been some of the most improved among their peers but, at the same time, have also been dispersed by the metric of cash profits. However, it is not to say that states that did not

qualify under the incentive scheme have not done well, the most striking being Tamil Nadu.

Determinants of Revenue Orientation

Why have some states done well and some so poorly? We would argue that the main motivator of performance is the degree to which individual utilities are commercially oriented.[45] In particular, it comprises measures to enhance revenues (and hence cash flows). The following sections investigate aspects of the focus on revenues in greater detail and attempt to answer why some states have succeeded more than others in devising a turnaround.

There are three broad aspects that determine revenue orientation. The first is reduction of ATC losses, which, in turn, comprises several sub-areas, including metering and collection efficiency. The second is management of overall load composition, with greater emphasis on supply of power to industrial and commercial entities. The third is tariff rationalization. Are overall tariffs moving towards the cost of supply? Are industry, domestic, and agriculture tariffs converging toward cost?

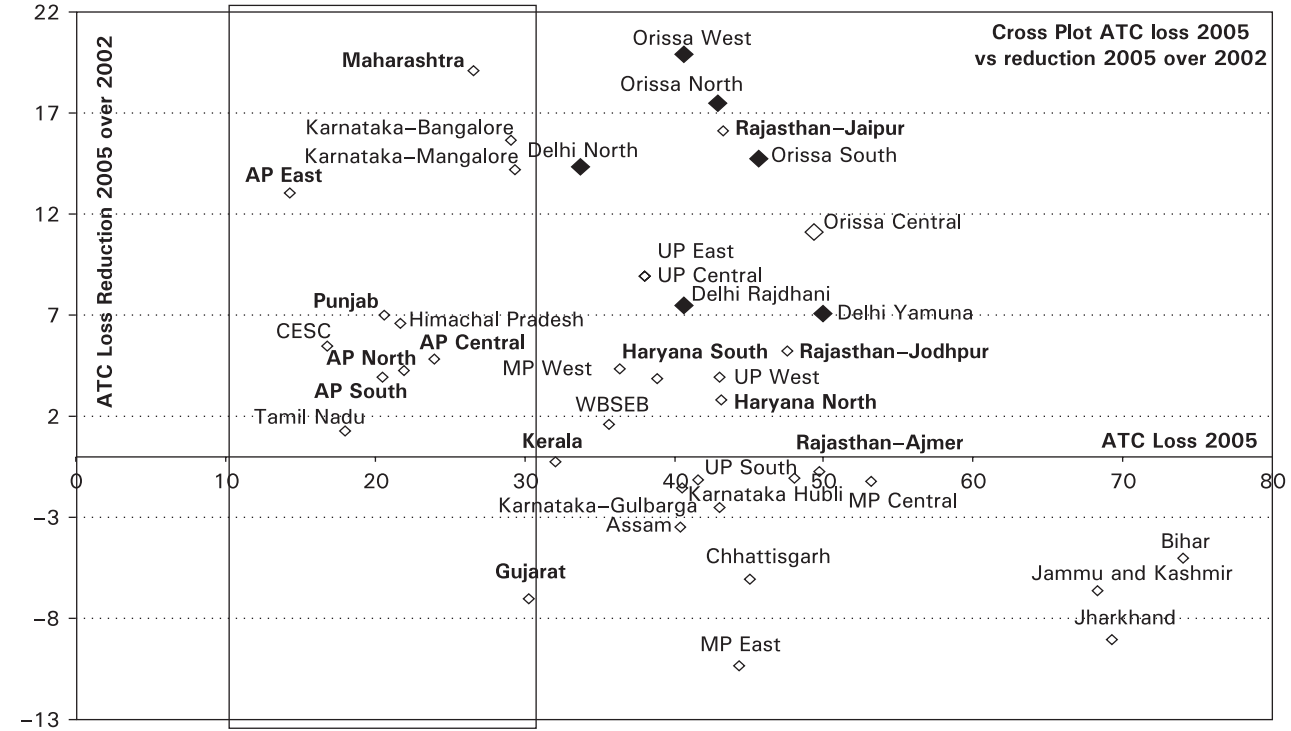
ATC Losses

As with most outcome indicators in the power sector, there is a wide dispersion in the ATC loss levels and reduction (figure 3). The figure is a cross plot of utilities with ATC losses in 2004–05 and loss reduction (from 2001–02 to 2004–05). Although the distribution of utilities at various loss levels seems more or less random, the high loss ones (that is, those with losses above 50 percent) seem to have predominantly deteriorated. Among the others, though, a dominant majority have reduced their losses.

TARIFF RATIONALIZATION. One of the important contributors to India's relatively low rankings in most competitiveness indices is the high cost of power to industrial and commercial enterprises, which is an outcome of the fiscal necessity to offset the subsidy on account of sales to agriculture and domestic customers. Since these latter accounts for over half of total units sold, the cross-subsidy loading on to the subsidizing segments is significant. Tariff rationalization entails moving tariffs toward cost, mostly by reducing

45. The market microstructure and political economy aspects of commercial orientation have been the subject of much discussion elsewhere. The following quote in a recent article by a former chairman of the CERC is instructive: "Government owns all transmission and distribution, and the bulk of the country's generation. They are run by government servants with no *commercial* experience, adding to inefficiencies, poor maintenance, tolerance of indiscipline and theft by employees" (Rao, 2007b, authors' emphasis).

FIGURE 3. Cross Plot of Level of ATC Loss and Loss Reduction during 2001–02 to 2004–05



Note: Diamond legends in black are discoms which have been privatized. The legend names in bold are those states/utilities that have qualified for the APDRP incentive scheme.

the gap between subsidized and subsidizing segments. At the same time, managing demand growth in subsidized segments and increasing supply to paying customers also moves the average revenue toward average cost.

Utilities with a large gap were far more likely to have deteriorated over the four reference years (figure 4); this relationship seems to be among the strongest that we have found. On the other hand, those with the lowest gap in 2004–05 have managed a loss reduction on average. The threshold ACS–ARR gap below which the change seems to become random across utilities is about 60 paise/unit. Among the measures that we deploy, this is about the only one with a cost component. Power procurement costs, that is, the cost of purchasing power from external entities account from anywhere between 30 and 70 percent of total expenditures of utilities. Management of these costs, of course, is important and a few utilities have taken initiatives to negotiate better deals on PPAs.

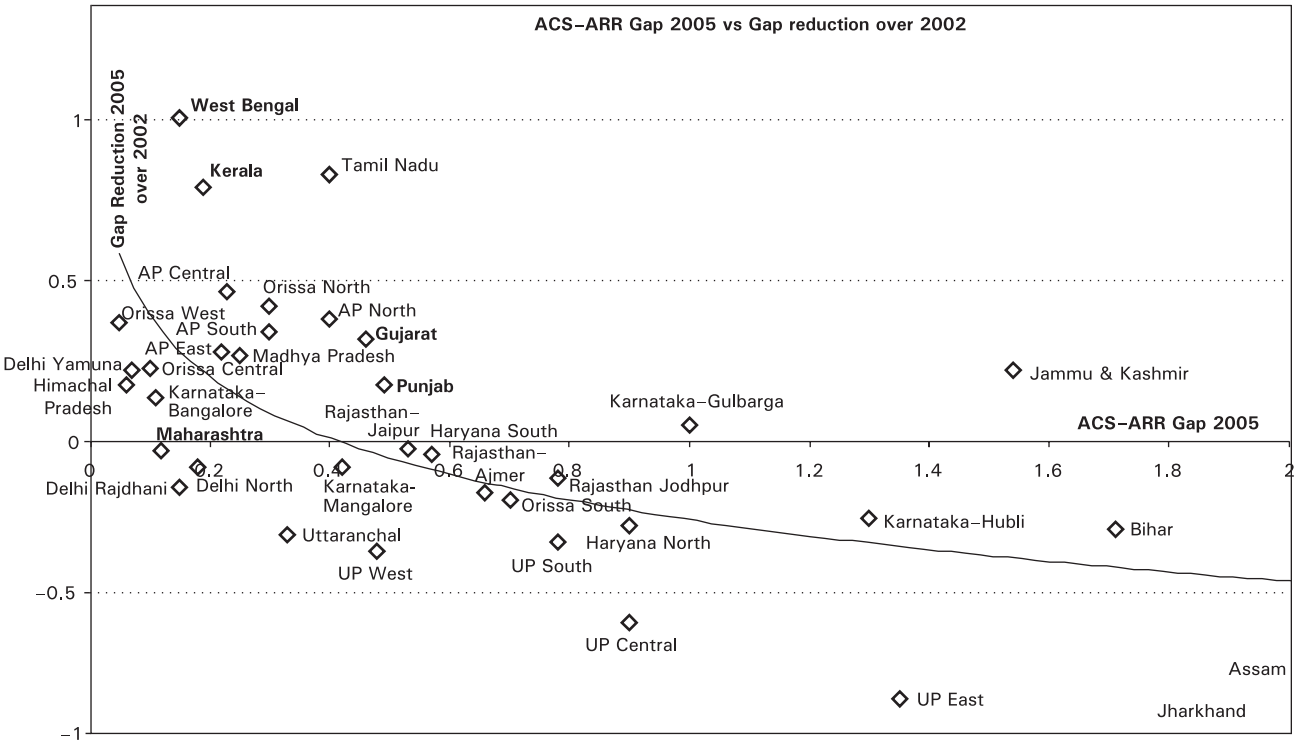
DEMAND COMPOSITION MANAGEMENT. Those states that have managed to shift their incremental load composition toward industries and commercial enterprises will have tended *ceteris paribus* to have better cash flows and would therefore be more financially viable. It is important to note that the potential of some states to increase their industrial and commercial demand has been higher in part due to their ability to attract investments by offering a better investment climate and fiscal incentives. At the same time, one of the key determinants of investment decisions is the cost competitiveness conferred upon commercial units through reliable supply of power at reasonable cost.

Figure 5 shows the outcomes of utilities over the four reference years in shifting the composition of load demand. It shows the ratio of units supplied to subsidizing segments (that is, commercial, high- and low-tension industries) compared to subsidized segments (that is, agriculture and domestic consumption). It is striking from the graph that the modal change from 2001–02 to 2004–05 has been fairly small. A substantial majority of utilities sell more units to the subsidized segments than to subsidizing ones (which is an important reason why ARR is below cost). A telling observation on the commercial orientation of utilities is that only a bare majority of them have managed to increase the share of the subsidizing segments in the overall supply. Two of the most mineral-rich states—Jharkhand and Chhattisgarh—have had a major drop in this ratio.

A Composite Index of Revenue Orientation

An important perspective of the results of reform might emerge by ranking utilities on the basis of their operational decisions that result in both

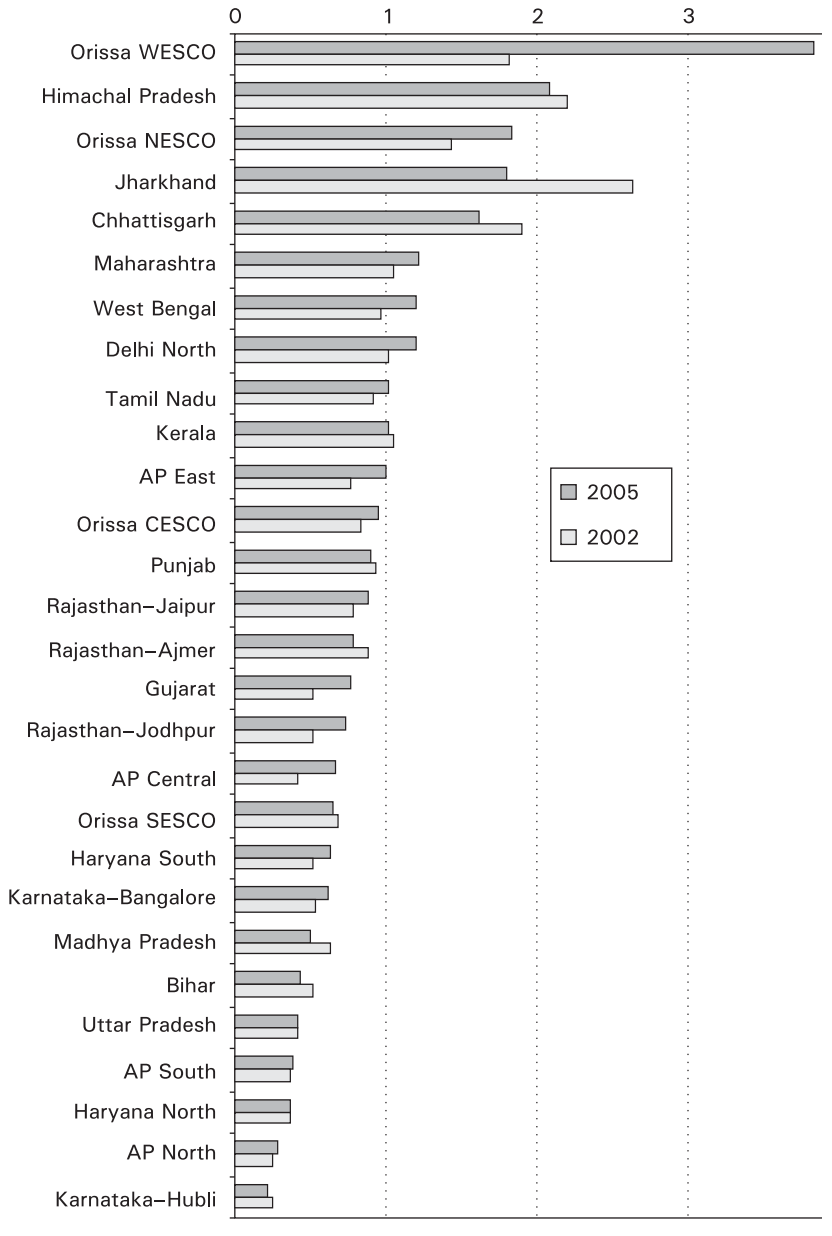
FIGURE 4. Cross Plot of Revenue Gap vs Gap Reduction



Source: Computed by the authors.

Note: Diamond legends in black are discoms which have been privatized. The legend names in bold are those states/utilities that have qualified for the APDRP incentive scheme.

FIGURE 5. Change in Demand Composition



Source: Computed by the authors.

intermediate and final outcomes. In other words, the implicit assumption underlying such a decision-based ranking is to control for exogenous factors that were beyond the control of the utility in evaluating revenue and profit outcomes. A summary indicator that captures the various aspects of what we have described as "commercial orientation"[46] of a utility might be a useful "sufficient statistic" for the revenue and cash performance of a utility. Toward this end we construct a utility-specific IRO for 2001–02 and 2004–05.

The authors are aware of only one previous attempt in constructing such a composite measure and that too in a somewhat different context. Internet Content Rating Association (ICRA) and Credit Rating Information Services of India Limited (CRISIL), two of India's credit rating agencies had been mandated by the Power Finance Corporation at the instance of the Union Ministry of Power to carry out a performance rating exercise for state electricity boards/discoms. The first report was for data available up to 2003 and the fourth edition was released in June 2006 (ICRA and CRISIL, 2006). There are several problems with the methodology of this exercise. First, the scope of the variables included was too extensive and unwieldy for drawing inferences on financial performance, which is the bottomline outcome measure. Input and output indicators could have been combined in a more logical manner. Second, the methodology for translating the indicated metric into the final score is not publicly available although the list of variables that have been deployed is. Third, the weights assigned to the aggregated grouping of individual metrics are not only subjective but have also undergone significant change during the four years over which the ratings score were calculated. If that was not enough, the scores were changed "based on the feedback obtained from the Ministry of Power and the utilities, as also the most recent developments in the sector."

Although a better understanding of the rating process is certainly useful, some of the parameters are too blunt and unquantifiable. Others are open to a mechanical interpretation, ignoring ground realities. For instance, the measure of progress in attaining 100 percent rural electrification and electrification of households is likely to provide a much distorted picture since the extant definition of an electrified village is the provision of an electricity pole and that some wires have reached the outskirts of the village.

46. We construe "Commercial Orientation" as a wider construct than "Revenue Orientation," encompassing actions that are likely to result in sustainability of increasing revenue realizations, which is the objective of the latter concept. Although key aspects of commercial orientation were earlier elaborated in section 2 ("operational efficiency and sustainability"), it is difficult to adequately quantify and grade since there has been little action on many of these aspects, and patchy data where there has been progress.

Given the shortcomings associated with such an omnibus measure, we decided to focus on a few parameters that are relatively well-defined; those that are based on more or less observed outcomes and might be thought to be the upshot of several processes instituted over the years. The aggregation is meant to capture one very important aspect of commercial orientation, specifically, what we term "Revenue Orientation."

Electricity provision is a commercial business, like any other service provision such as banking or healthcare. Admittedly, there is a *merit* good aspect in this service, involving the provision of access to economically disadvantaged sections of consumers or in remote areas. These functions, however, are best enabled through financial support from the government and should not be embedded in the tariffs and provisions of supply to designated segments. At the end of the day, the electricity supply business has to generate returns on capital employed regardless of ownership (government or private sector).

The index is composed of the following elements:

1. ATC loss levels.
2. Collection efficiency.
3. The gap between the ARR and the ACS.
4. The gap between the ARR from the industry segment and the ACS (as a percentage of ACS).
5. The ratio (in terms of units supplied) of the subsidizing segments [that is, commercial, industry (high tension), and industry (low tension) to the subsidized segment (that is, agriculture and domestic)].

The formula for the index is as follows:

$$\begin{aligned} \text{IRO} = {} & (1 - \text{ATC losses}) + \text{Collection Efficiency} \\ & + (\text{ARR} - \text{ACS}) - (\text{Industry ARR} - \text{ACS}) \\ & + \text{Ratio of subsidizing to subsidized segments} \end{aligned} \tag{1}$$

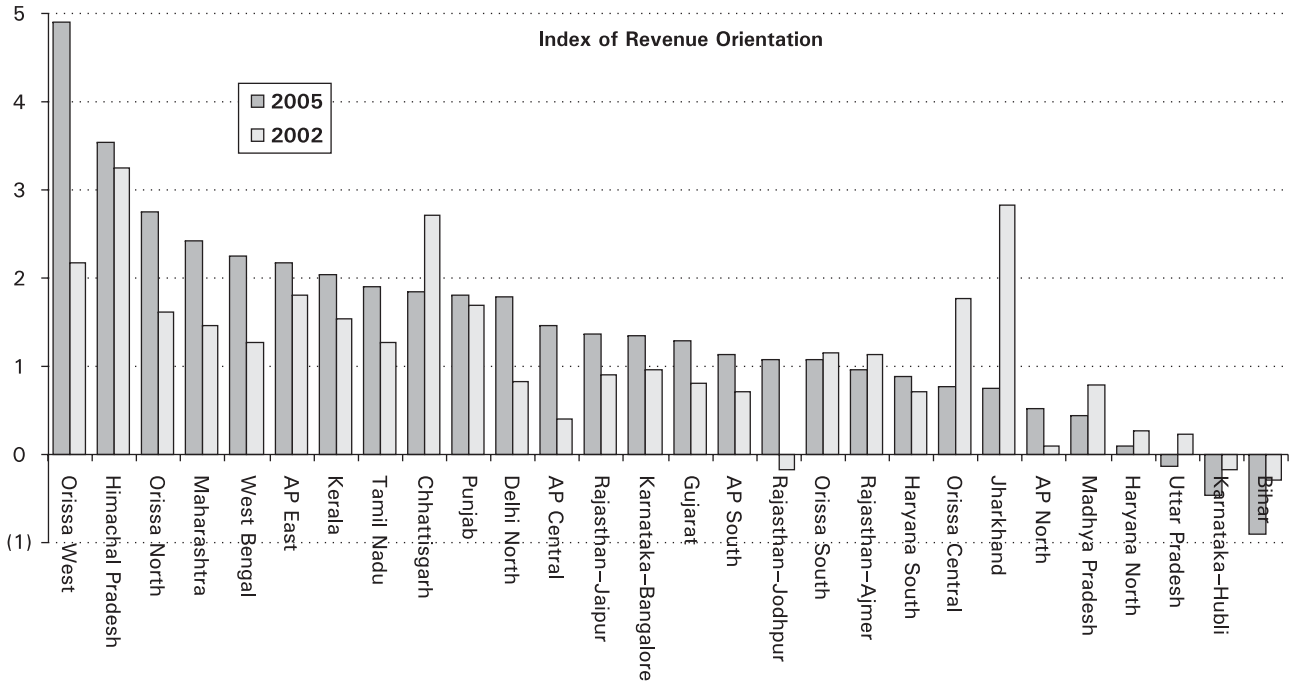
The weights are uniform and are simply +1 or −1 depending on the appropriate definition of the respective measures. Consequently, the simplest aggregation of the indicators comprising each of the indices is an arithmetic mean. Punctilious analysts might argue that the effect of particular elements might be more significant than those of others, in terms of their impact on the extent of revenue orientation. However, in the absence of statistically significant measures of the relative magnitudes of such impacts, the best (in the sense of least biased) weights may be uniform ones. The rationale for the components of the index is as follows:

1. The two sets of numbers for a state electricity system that are relatively reliable and robust are the number of electricity units input in the system and the actual cash collected. The best portmanteau measure, by definition, to capture this is ATC loss, which is measured as a percentage of energy units input.
2. The next measure is collection efficiency, which although a component of the ATC loss, provides a measure of the effectiveness of energy audits, metering, and billing processes. Collection efficiency is being included separately to reinforce the importance of ATC loss reduction, and to emphasize the importance of this step within it since it is probably less likely to be susceptible to political and administrative imperatives that characterize a large part of ATC losses. The measure has to be interpreted a little carefully, since annual changes in the ratio can be exaggerated by collecting arrears from previous years; however, the movement over a period of four years is likely to mitigate this distortion.
3. The ARR is in some sense the summary outcome measure of revenue *orientation*, with the others contributing to improvement (or deterioration) in the ARR. Reduction of the gap between the ACS and the ARR is the basic objective of reforms in the power sector.
4. While overall ARR needs to move toward ACS, so that the system's losses are brought down, this should generally not be the result of tariffs for industry and commercial segments becoming prohibitively high, consequently leading to business uncompetitiveness and exit from the grid.
5. The last measure is demand load management. From a business perspective, increased focus on enhancing the share of paying customers in comparison to those on which the utility incurs a loss is desirable.

There are some obvious limitations in the construction of such an index. The choice of metrics constituting the index involves a degree of ambiguity in the separation, an inevitable degree of double counting inherent not just in the separation of the metrics but also in the nature of the variables used as constituents of the index. For instance, there is a degree of overlap between ATC losses and collection efficiency, and consequently a problem akin to collinearity.

Keeping in mind the caveats, figure 6 allows us to draw the following inferences. In line with our observations regarding the change in the state (and discom)-wise cash losses/profits positions, the spread between utilities

FIGURE 6. Index of Revenue Orientation



Source: Computed by the authors.

Note: The utilities are arranged in descending order of revenue orientation in 2004–05.

has opened out in 2004–05, compared to the situation in 2001–02. While the average index value increased from 1.14 in 2001–02 to 1.3 in 2004–05, the associated standard deviation also increased from 0.9 to 1.2. In other words, utilities had a much more homogenous ordering of revenue orientation in 2001–02 than in 2004–05. The strongest influences on extreme ends of the rankings in the IRO are those of the ratio of subsidizing to subsidized segments. The next important variable was the ATC loss level. There does not seem to be a systematic pattern in the middle range of the IRO rankings.

Most utilities have improved their performance (and orientation), some significantly. The most notable of these were Rajasthan Jodhpur, AP Central, Delhi North, Orissa West, and Orissa North. Among the utilities that had contributed the most to cash losses, UP and Bihar show a substantial deterioration of their revenue orientation, which had been poor to begin with. Some others, also with high losses, for example, Jharkhand and Orissa Central, have shown a significant deterioration in orientation. The index, therefore, reflects the popular perception of the utilities that have improved and those that are perceived to have deteriorated significantly.

Some other generalizations are also possible. First, there is a significant variation between the rankings of individual utilities within a state. Stating, for instance, that Andhra Pradesh has done well as opposed to, say, Haryana, masks the differential performance of the utilities within this. Haryana South has a higher ranking than AP North and Karnataka Hubli has done much worse than the Bangalore circle. Second, most of the utilities that had been privatized have done fairly well and have improved. Of course, some utilities that had been privatized are still not performing well; Orissa South, for instance, is not just relatively low on the scale, but has also deteriorated since 2001–02. At the same time, other utilities have improved as much or more than those privatized.

The states that have qualified for the incentive component of APDRP are spread along the entire spectrum of the index, but are grouped along the upper deciles of utilities in terms of the improvements in their rankings over the four-year window. The picture among those that were privatized is less uniform, and shows a higher dispersion in terms of their ranking in the index as well as improvement.

Finally, we find that the IRO is relatively robust to alternative transformations of the input data, designed to induce scale-invariance. While there are some transitions in rankings of the utilities in the middle depending on the method adopted, the rankings of the outlying utilities remain unchanged. In other words, while noise levels and effects of "omitted variables" might

influence the middle orderings (which result from small variations around the averages of the outcome values), signals of "Revenue Orientation" of utilities at either end of the rankings are strong enough to dominate the noise.

Conclusion

Following a series of policy interventions instituted after a default crisis in the power sector around 2000–01, the rot in the power sector has been stemmed. The financial situation of the sector has eased and state government subsidy as a ratio to GDP has declined. The sector, nevertheless, is still far from financial viability. Aggregate technical and commercial losses, while having dipped slightly from the 2000–01 crisis levels, have remained stubbornly high. A source of fiscal vulnerability emanates from demand for increased supply of power at below cost to rural areas that could come about on account of the politically important flagship rural electrification scheme of the Central Government to expand the distribution network. The rate of return on capital is reported to have deteriorated in 2006–07. Shortages in many states have worsened over the past couple of years, and supply reliability and quality of power delivered have declined. Industries and commercial enterprises have had to invest heavily in high-cost captive generating capacity, which undermines business competitiveness. Investments in upgrading, improving, and renovation and modernization in wires, transformers, and feeders have been reported to be inadequate, let alone large investments in new generating capacity. Moreover, many of the indicators, after having improved significantly in the immediate aftermath of the reform measures, seem to have plateaued after 2003–04.

The basic problem is that although the sector at an all-India level is expected to have made a small cash profit in 2005–06, there are simply not enough resources in the state government-owned system to add capacity on any appreciable scale, let alone that which is required to power India's economic growth. (The cash profit, of course, does not capture the burden of principal repayments.) By and large, it is likely that there will be incremental improvement in many metrics of performance in utilities over the next couple of years. These, unfortunately, will not be close to those levels required for meeting the soaring demand for energy. There is limited likelihood of fresh lending to the sector on account of poor debt service coverage ratios. Utilities will need to generate vastly higher cash flows to attract significant investments in generation and transmission, which are unlikely

to be forthcoming if there are no major improvements in the variables discussed in the paper.

Five years into the reform effort, we believe that it is time to take stock of the effectiveness of reform measures. If significant change is needed in the reform process to speed up restructuring, an understanding of deep cause-and-effect relationships between inputs and outcomes is critical. Important motivations for the paper were to examine improvements in revenues and cash flows of utilities, delve into the underlying causal factors and then map these factors into a composite metric of commercial orientation; this allows a ranking of utilities on the basis of this quantified metric. We believe that this orientation is the key to inferring the long-term outcomes of the reform steps.

Beyond a point, it is not very meaningful to talk of the power sector as a monolith in terms of commercial and financial viability. Variability in outcomes (and in many of the underlying explanatory variables) has increased after the reform measures; the dispersion was much lower in 2001–02. Some states have improved significantly, some have deteriorated sharply. Five utilities contribute 80 percent of the total cash losses and another five 78 percent of cash profits.

What does this entail for policy? Different utilities have placed emphasis on different strategies for enhancing revenues. Fragmented information indicates that there is progress in many of the basic inputs of utilities. These, however, do not seem to be rapidly translating into higher revenues and cash flows, which would presumably have happened more swiftly had there been a more widespread focus on the top line. The unevenness in performance between discoms warrants granularity in tariff setting, that is, at the level of a discom (rather than at the state), or, even distribution circle and city, which would only be fair to honest consumers (they would attract reliable suppliers because they are paying their bills, and lower tariffs if ATC losses are lower in a particular area). One of the showpiece reform initiatives, the APDRP, has patently had limited success in attaining the objectives for which it was initially established. The variation in improvement in different states is also a warning sign of the increasing disparities in the ability of states to attract investments and foster growth.

The objectives of revenue and cash flow enhancement are likely to improve faster and more consistently if market structures and incentive signals are designed to make utility actions more consistent with these objectives. Deeper reforms are needed to advance these two objectives. These structures and signals are, in turn, synonymous with *inter alia* competition and private (as opposed to state) ownership.

While the data in the paper shows evidence of only a weak relationship between ownership and profitability, it is important to bear in mind that the more successful subset amongst the discoms which have been privatized (that is, Delhi) is a relatively nascent experiment, which has still managed to outperform many of its more mature peer utilities, while having started from a more disadvantaged initial condition. Private utilities have also come out relatively better in terms of one of the key indicators of revenue orientation, that is, ACS–ARR gap reduction.

The other measure of a competitive market structure, the ability of the most efficient generators of electricity being allowed to sell power to the most creditworthy customers has been a non-starter in the context of the prevalent single-buyer model. This is a hypothesis that cannot, as of now, be validated by data, since states have not implemented the policy in an effective manner.

APPENDIX

Appendix 1: Data Appendix: Rationale for Inclusion and Exclusion of Utilities for Computation of the Different Metrics

The paper, using data in PFC (2005; 2006), has included the following states (and the associated utilities) in its analysis: Andhra Pradesh, Bihar, Chhattisgarh, Delhi, Gujarat, Haryana, Himachal Pradesh, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh, and West Bengal. On occasion, there might be other states like Assam, Goa, Jammu and Kashmir, and Uttaranchal included, but this is usually limited to those analyses where only one metric is involved. These states together accounted for 86 percent of the total units of power sold in 2004–05. Some states were excluded due to missing data for the relevant periods.

Also note that while most indicators using multiple metrics use data from 2001–02 to 2004–05, some utilities do not provide the complete data series. In such instances, we have used the starting year of 2002–03. Occasionally, some utilities have not released data for 2004–05. If the relevant data point was available for 2001–02, we have used the last available data point for 2003–04 in these cases. If none of these end-point data were available, the utility was omitted [for example, Delhi Rajdhani and Delhi Yamuna in the Index of Revenue Orientation (IRO)].

Another aspect to keep in mind is that the electricity boards of some states were unbundled during the period of investigation (Delhi, Karnataka, and Uttar Pradesh). Data for relevant parameters are for the entire electricity system for the initial years, but for only the unbundled discoms for the later years. Although the contribution of these segments to the overall indicators is often relatively small, the resulting discrepancy should be kept in mind. A final point to note is that comparisons between the figures (and the associated datasets) across sections of the paper may not be entirely valid. Various definitions of revenues and profits have been used in the respective sections, depending upon the context of the analysis in that particular section.

TABLE A-1. Mapping of Formal Discom Name to Our Nomenclature

State	*Official name*	*Name used in text*
Andhra Pradesh	APCPDCL	AP Central
Andhra Pradesh	APEPDCL	AP East
Andhra Pradesh	APNPDCL	AP North
Andhra Pradesh	APSPDCL	AP South
Delhi	BSES Rajdhani	Delhi Rajdhani
Delhi	BSES Yamuna	Delhi Yamuna
Delhi	NDPL	Delhi North
Haryana	DHBVNL	Haryana South
Haryana	UHBVNL	Haryana North
Karnataka	BESCOM	Karnataka Bangalore
Karnataka	GESCOM	Karnataka Gulbarga
Karnataka	HESCOM	Karnataka Hubli
Karnataka	MESCOM	Karnataka Mangalore
Madhya Pradesh	Poorva KVVCL	MP East
Madhya Pradesh	Pashchim KVVCL	MP West
Madhya Pradesh	Madhya KVVCL	MP Central
Orissa	CESCO	Orissa Central
Orissa	NESCO	Orissa North
Orissa	SESCO	Orissa South
Orissa	WESCO	Orissa West
Rajasthan	AVVNL	Rajasthan Ajmer
Rajasthan	JDVVNL	Rajasthan Jodhpur
Rajasthan	JVVNL	Rajasthan Jaipur
Uttar Pradesh	Dakhinachal VVN	UP South
Uttar Pradesh	Madhyanchal VVN	UP Central
Uttar Pradesh	Pashchim VVN	UP West
Uttar Pradesh	Poorvanchal VVN	UP East

Source: Authors.

Appendix 2

TABLE A-2. Status of Reforms in 24 States as on End-March 2006

	MoU/MoA signed with ministry of power, GoI	*State electricity board unbundled*	*Constitution of state electricity regulatory commission (SERC)*	*Tariff/ARR order passed*	*Others*
Andhra Pradesh	Yes	Yes	Yes	Yes	Anti-theft law passed, strategy for privatizing distribution is being finalized
Assam	Yes	Yes	Yes	Yes	–
Bihar	Yes	No, extension sought	Yes	–	Anti-theft law passed
Chhattisgarh	Yes	No, extension sought	Yes	Yes	–
Goa	Yes	No, only Electricity Department	Yes (non-functional)	–	–
Gujarat	Yes	Yes	Yes	Yes	Anti-theft law passed
Haryana	Yes	Yes	Yes	Yes	–
Himachal Pradesh	Yes	No, extension sought	Yes	Yes	–
Jammu and Kashmir	Yes	No, only Electricity Department	Yes (non-functional)	–	–
Jharkhand	Yes	No, extension sought	Yes	Yes	–
Karnataka	Yes	Yes	Yes	Yes	Anti-theft law passed
Kerala	Yes	No, extension sought	Yes	Yes	Anti-theft law passed
Madhya Pradesh	Yes	Yes	Yes	Yes	Anti-theft law passed
Maharashtra	Yes	Yes	Yes	Yes	Anti-theft law passed

(Table A-2 continued)

(Table A-2 continued)

	MoU/MoA signed with ministry of power, GoI	*State electricity board unbundled*	*Constitution of State electricity regulatory commission (SERC)*	*Tariff/ARR order passed*	*Others*
Meghalaya	Yes	No, extension sought	Yes (non-functional)	–	–
Orissa	Yes	Yes	Yes	Yes	Distribution privatized
Punjab	Yes	No, extension sought	Yes	Yes	–
Rajasthan	Yes	Yes	Yes	Yes	–
Tamil Nadu	Yes	No, extension sought	Yes	Yes	–
Tripura	Yes	Yes	Yes	Yes	–
Uttaranchal	Yes	Yes	Yes	Yes	–
Uttar Pradesh	Yes	Yes	Yes	Yes	Anti-theft law passed
West Bengal	Yes	No, extension sought	Yes	Yes	Anti-theft law passed
NCT Delhi	Yes	Yes	Yes	Yes	Distribution privatized

Source: *State Finances, a study of budgets of 2006–07*, RBI.

Appendix 3

TABLE A-3. Metering Status, 2005–06

	11 Kv feeders			*Distribution transformers*			*Consumer connections*		
	No.	*Metered*	*%*	*No.*	*Metered*	*%*	*No.*	*Metered*	*%*
Andhra Pradesh	9,239	8,674	94%	351,751	38,729	11%	15,746	15,047	96%
Assam	709	709	100%	21,980	1,528	7%	1,274	1,209	95%
Bihar	1,125	465	41%	15,000	–	0%	1,250	623	50%
Chhattisgarh	2,030	2,030	100%	42,664	7,012	16%	2,459	1,696	69%
Delhi	1,850	1,850	100%	8,000	3,500	44%	2,665	2,665	100%
Goa	179	179	100%	3,562	1,781	50%	396	386	97%
Gujarat (GEB)	5,307	5,307	100%	236,632	1,500	1%	7,477	6,957	93%
Guj.(Torrent AEC)	752	266	35%	4,228	4,228	100%	1,264	1,264	100%
Guj. (Torrent SEC)	303	303	100%	2,300	2,300	100%	520	520	100%
Haryana	3,888	3,888	100%	133,364	–	0%	3,917	3,612	92%
Himachal Pradesh	762	727	95%	18,133	16,730	92%	1,747	1,747	100%
Jammu and Kashmir	1,558	1,480	95%	30,015	–	0%	1,000	400	40%
Jharkhand	461	396	86%	16,500	15,000	91%	653	490	75%
Karnataka	4,570	4,570	100%	144,000	34,500	24%	12,889	10,568	82%
Kerala	1,334	1,334	100%	35,442	5,506	16%	7,799	7,799	100%
Medhya Pradesh	5,660	5,660	100%	160,000	3,000	2%	6,492	4,650	72%

(Table A-3 continued)

(Table A-3 continued)

	11 Kv feeders			*Distribution transformers*			*Consumer connections*		
	No.	*Metered*	*%*	*No.*	*Metered*	*%*	*No.*	*Metered*	*%*
Mah. (BEST)	594	0	0%	2,570	0	0%	66,700	66,600	100%
Mah. (MSEB)	6,148	6,148	100%	215,241	52,923	25%	13,532	11,812	87%
Mah. (REL)	600	300	50%	4,067	3,917	96%	2,495	2,495	100%
Manipur	193	40	21%	–	–	–	170	140	82%
Orissa	1,792	1,699	95%	22,000	20,500	93%	2,149	1,745	81%
Punjab	5,928	5,928	100%	217,000	11,660	5%	5,894	5,039	85%
Rajasthan	8,411	8,411	100%	188,170	–	0%	5,845	5,478	94%
Sikkim	115	115	100%	1,370	531	39%	66	61	92%
Tamil Nadu	3,777	3,777	100%	161,092	4,703	3%	17,033	14,813	87%
Uttar Pradesh	8,507	8,507	100%	330,000	6,652	2%	8,806	8,038	91%
Uttaranchal	1,106	1,106	100%	27,681	9,360	34%	1,060	1,004	95%
West Bengal	2,347	2,347	100%	53,420	13,500	25%	5,731	5,670	99%
Chandigarh	174	174	100%	–	–	–	197	197	100%
Total	80,425	77,136	96%	2,449,613	259,730	11%	198,322	183,549	93%

Source: *Powerline*, December 2006, sourced from the Ministry of Power.

Comments and Discussion

Navroz K. Dubash: Although the language of "crisis" is applied to many sectors in contemporary India, the power sector stands out for holding a seemingly permanent position on this list of infamy. The paper by Bhattacharya and Patel provides a useful stock-taking exercise, and an analytical narrative within which to locate the problems besetting the power sector. Perhaps most important, in my view, it focuses attention on the correct part of the sector—the distribution end and in particular mismanagement of distribution. To see why this focus is important, it is worthwhile to briefly locate this paper within the recent past of India's power sector.

The initiation of power sector reform is normally dated to 1991 when the power generation was opened up for private investment. The larger national macroeconomic crisis of the time, international prevailing winds in the direction of increased private investment and decreased state control, and a re-thinking within the electricity fraternity on the inevitability of public monopolies in electricity, all contributed to this shift. A rash MOU signing followed, stimulated in part by attractive incentives and government financial guarantees of various sorts to insulate new players from loss-making SEBs. The MOUs did not, unfortunately, lead to tangible results on the ground; the decade of the 1990s was a decade of low, rather than high, capacity addition. With the benefit of hindsight, given high levels of theft and losses in distribution (although these were to accelerate considerably in the mid–late 1990s), abetted by poor management practices and efficiencies, power sector reform started at the wrong end of the sector. Attracting money into generation in the early 1990s was like pouring water into a bucket that was missing a third or more of its base.

A second wave of reform in the mid-1990s started at the correct end—distribution—with an emphasis on turning over management of distribution to the private sector. Privatization in distribution was first undertaken with World Bank support in Orissa, in what one participant in the process has described as fundamentally a "bankruptcy workout (Dubash, 2001)." The package followed the then prevalent international prescription of unbundling, privatization, and establishment of a regulator. The primary aim was to demonstrate that privatization was feasible even for mis managed and problematic public utilities. The Orissa story has since been mixed at best. After several

years of uneven gains and performance, political questioning, and the withdrawal of one private player, the situation now appears to be improving. At the time, however, the act of privatization appeared to have been viewed as a "silver bullet" solution, with little thought given to whether ownership change was sufficient, or whether ownership change had to be embedded within a larger set of changes in incentives.

The third wave of changes, from the later 1990s onwards, brings us into the period covered by Bhattacharya and Patel. There was a major national push for an omnibus and landmark legislation, the Electricity Act 2003 (EA) aimed at encouraging a move toward competitive markets in electricity, accompanied by several Central Government-led efforts to induce more prosaic changes in management and approach, such as the Accelerated Power Sector Development and Reform Programme (APDRP). As the paper describes, despite the Act there has been only limited movement toward competition, and, despite the APDRP, indifferent gains on management reforms.

Fast-forwarding to the present, there is currently a renewed frenzy on generation capacity, with the introduction of "ultra-mega" power plants (the term risks creating a real shortage of adjectival superlatives for future electricity policies). By contrast with the first round of efforts to bring in private investment in generation, these projects are being competitively bid, and promise considerable cost savings, which is an important advance. However, it is important that history should not repeat itself and that attention to the generation side, although necessary, not be read as a substitute for urgent and continued attention to the distribution side, without which the financial health of the sector simply cannot be assured.

This context-setting is needed to fully appreciate both the contribution of Bhattacharya and Patel, and the challenge the authors faced in untangling the trends in the sector. The paper provides a detailed stock-taking of the third wave of reform discussed above, which has not been systematically presented elsewhere. This is a complex history with very many continuously shifting policies and programs, and the authors summarize it neatly. They have also sought to compile relevant data with which to track the performance of the sector, a task that is far harder than it should be. Indeed, to track basic performance parameters requires extracting information from at least three institutions, the Planning Commission, the Power Finance Corporation, and the Central Electricity Authority, and grappling with different conventions and seemingly random changes in them.

Beyond stock-taking, the paper provides an analytical narrative organized around a central theme: there has been considerable divergence in state performance in response to various central schemes, and this divergence has to do with utility rather than state-specific performance. An important

implication of the paper is to re-focus much of the current state-centric research on the utility as the unit of research. The authors back up the narrative with an effort to decompose utility effects into three measures of performance: aggregate technical and commercial losses (ATC), tariff rationalization, and demand composition management.

This decomposition leads into the most ambitious part of the paper: to construct a single index of "revenue orientation" (IRO) of utilities as part of a larger effort to capture "commercial orientation." The need for such an index is illuminating. It suggests that well over a decade into attempts to re-make India's electricity, policy makers still do not have a clear and usable metric with which to evaluate progress. And it suggests that simply looking at the bottomline of utilities has proved to be an insufficient diagnostic, an acknowledgment that should take the debate further in the direction of power sector reform as management change, an argument perhaps most forcefully articulated elsewhere by Joel Ruet (2003).

Accepting the value of an index of this sort, how successful are the authors at constructing a useful and robust index to serve as a sector reform benchmark? I examine this question from three perspectives: construction of the index, its deployment, and the results their efforts yield.

First, on construction, it would have been helpful to see a little more discussion on the pros and cons of different forms the index could have taken, and exploration of alternative specifications. As the authors themselves state, the components of the index do overlap and risk overcounting some dimensions of change. For example, ATC losses overlap with collection efficiency. Moreover, the ATC measure—invented as the core of the bidding process during Delhi's privatization effort—is subject to manipulation that may obfuscate measurement of the change sought to be accomplished.[1] Other components of the index such as demand load management—how well does the utility divert power to subsidizing rather than subsidized consumer categories—risks making a virtue out of a pernicious situation that should be transitional at best. Having provided subsidies in the name of the poor, and having then failed to target them appropriately, the solution mooted is to starve the subsidy receiving class, harming potentially deserving consumers along with the not-so-deserving. Although this measure may be needed in

1. Specifically, as the Prayas Energy Group points out in a study of Delhi reforms, since ATC losses are related to (1-Average Billing Rate), manipulation of the billing rate for different consumer classes can affect ATC. Their study shows that two of Delhi's distribution utilities reported an unlikely average consumption level for the lowest tariff slab (<100 units/month) of almost exactly 100 units over the course of a full year. Such a consumption pattern has the useful (to the utility) effect of reducing ATC, allowing them to meet or exceed their loss reduction target for the year. See Prayas Energy Group, 2006.

the short term, surely this measure does not deserve to be enshrined as a best-practice management objective.

Second, the authors suggest the index is "relatively robust" to alternative transformation of the input data, particularly with respect to the extremes of the index. However, the reader would be better persuaded of the robustness of the index if more details of a few alternative specifications were also provided and discussed.

Third, the authors draw out two major observations from their analysis using the index. The first is that the ability to manage load explains a large part of the difference in performance between extremes in the ranking. This is an interesting observation that signals the sorts of insights that such an exercise can throw up. Exploring the implications a little further than do the authors, the observation suggests that the effectiveness of a utility at squeezing subsid-izing categories matters greatly to revenue performance. Viewed positively, it suggests there is an obvious road available to non-performers. Viewed less positively, the result suggests that a measure that, in my view, should only be transitional accounts for much of the gains, while long-term improvements in underlying performance—bringing down losses, increasing collection efficiencies—have been less productive strategies.

A second observation—that privatized utilities have done well—is less robust, and insufficiently developed. Looking only at the data provided by the authors in figure 6 ranking utilities by their index, it is hard to see the basis for this claim. Of the 28 utilities examined, privatized utilities are spread across the full spectrum, occupying ranks 1, 3, 11, 18, and 21. Of course, what we need to know to further examine the authors' claim is whether the privatized utilities rankings change significantly after privatization, but the authors do not address that specific question.

The final conclusions offered by the authors range from perfectly reasonable suggestions following from the analysis—performance variation across utilities warrants greater granularity in tariff setting—to far-reaching suggestions that do not. In the latter category, the paper concludes on the note that deeper reforms aimed at privatization and competition are required. This is indeed the conventional wisdom. However, the conclusion does not emerge from the analysis, and by simply repeating the conventional wisdom, the authors miss an interesting opportunity to reflect on whether and how their analysis suggests modifications or conditioning of the conventional wisdom. In the remainder of these comments, I take a brief stab at this task, with the intent of contributing to a pragmatic debate on how to move forward with power sector reforms.

Looking first at whether privatization leads to improved performance, the evidence presented in the paper suggests the answer is at most a "maybe." We have evidence of privatized utilities that were stalled for many years in Orissa, those that resulted in consumer dissatisfaction and suspicion of manipulation before increasing performance in Delhi, and those that provided substantial gains almost immediately, also in Delhi. We also have evidence, in Andhra Pradesh, of public utilities that have effected a management turnaround equal or superior to the performance of the best-functioning private utility.

This admittedly thin and anecdotal evidence prompts two observations. First, "commercial orientation," the key attitudinal change the authors wish to measure, may under some circumstances also be achieved under public ownership; privatization is sufficient, but may not be necessary for commercial orientation. Second, once privatized, utilities are indeed keener to make money, but whether they do so in a way that leads to public objectives of loss reduction and consumer service depends on the institutional framework of incentives within which they are embedded. With an ambiguous incentive structure and weak oversight, they may chose instead to manipulate data to project loss reductions where few occurred, as may have occurred in Delhi. These observations are hardly novel and rest on institutionalist literature of various pedigrees that stress incentives over ownership. From this perspective, privatization is not sufficient, and may not be necessary for improved performance.

This is not about, or should not be about, ideological beliefs for or against privatization. The prevailing political economy suggests that privatization has proved to be a tough sell politically, and our institutions have proved to be weak at setting incentives and monitoring. Consequently, although privatization may well be the best way to spur a commercial orientation, creating incentives through robust institutions matters more than ownership at this stage in India's power sector.

Competition, particularly in the form of markets for electricity (as opposed to competitive bidding), forms the second prong of the conventional wisdom. Here the belief in favor of competition among many policy makers, as also the authors, is increasingly out of touch with the global empirical record and intellectual debate.[2] Contrary to the authors' assertion, most countries have not progressed rapidly from wholesale to retail competition. Following the California crisis in the US, for example, states that had competition-oriented

2. These views are based on a collection of papers summarizing experience with electricity reform around the world, published in a special issue of *Economic and Political Weekly* (December 10, 2005), jointly edited by myself and Daljit Singh.

reform on the anvil have pulled back from reform. The staunchly libertarian Cato Institute in the US has called for a return to regulated electricity markets, based on a conclusion that fully unfettered electricity markets are not achievable, in part for political reasons. In the developing world, South Korea, South Africa, and Indonesia are among those countries rapidly backpedalling from creating electricity markets.

The questioning of electricity markets is driven by a growing realization that crafting markets for electricity may be much harder than previously imagined, due to structural factors that have to do with the nature of the commodity. For example, incentives for investment in generation capacity are hard to create in the context of the greater price volatility that electricity markets bring. Side markets or incentives are required for transmission infrastructure and short-term adjustment needs of the system. Meshing these various markets together while maintaining both the short-term technical integrity of the system (ensuring that demand and supply are in equilibrium at all times throughout the grid) and the long-term viability (sufficient investment given the long lag times) is an enormous challenge.

None of this is to state that electricity markets are either impossible or undesirable. But it is to say that they are much harder to construct than was earlier imagined, and their suitability and desirability for developing countries is worth dwelling on in some depth. In India, the electricity competition story is stuck on a political reef—to what extent and how much should buyers of electricity compensate previously monopoly sellers for loss of their cross subsidy component. Assuming this barrier can be crossed, there is a lot of hard work that remains to envision how electricity markets can be constructed and with what likely effects. At minimum, they are unlikely to be the panacea that many hope they will be for India's electricity sector.

If not the conventional wisdom of privatization and competition, then what is the way out? The authors provide some hints when they call, in their conclusion, for an "understanding of deep cause and effect relations between inputs and outcomes." Specifically, devising a sensible way forward requires exploring the pathways and mechanisms through which particular policy reforms may change incentive structures for utilities. I see three types of reform agenda for which pathways need to be spelt out.

First, state governments, aided by the Center, could continue on the path of the past few years, encouraging unbundling, independent regulation, and other elements of the standard package with a presumption that moving toward competition is best. However, as I have discussed above, neither the theory nor the empirics is very clear on how this pathway will unfold.

Second, state governments, and particularly their political leadership, could effectively control the sector, as seems to have happened in Andhra Pradesh in recent years, and actively manage the sector with the use of management incentives, bargains with unions, monitoring systems, and strategic changes such as attracting industrial buyer. Here the pathway is clear—political leadership can enforce the relatively straightforward management changes needed to reduce losses. The tricky part, of course, is supplying the political leadership.

Third, regulators could emerge as an increasingly effective form of discipline to shape incentive structures. Although the authors discount regulators somewhat as "by and large exogenous to the reform efforts of state governments/discoms," regulators offer several viable pathways to reform: as disciplinarians, monitors, and (micro) policy formulators. For example, by scrutinizing power purchase agreements (PPAs) and investments, regulators can keep prices down, buying time and political space for challenging reforms. They can also set management targets and attempt to hold utilities to them, although the track record of regulatory enforcement has been poor. Perhaps most important, regulators are the best way of introducing transparency and external scrutiny to a previously opaque sector. In my view, the regulatory route has received insufficient exploration or backing so far.

The analytical conclusion that follows from this brief discussion is that it is necessary to get into the guts of utility reform through more case studies, and understanding of drivers and pathways. How likely is each of these policy reforms to lead to the desired outcomes? Are there unforeseen detours? This research agenda is an essential complement to the sort of data-driven, aggregate picture-building exercise of index construction.

The policy conclusion is that India is faced with a choice between imperfect competition, imperfect state control, and imperfect forms of independent regulation. Policy formulations will need to be tailored to states based on a balanced assessment of competing imperfections, and without hopes for a silver bullet that will deliver policy makers from the curse of hard choices.

Nirvikar Singh: Saugata Bhattacharya and Urjit Patel (henceforth, BP) have written a very useful paper on the power sector in India. The contributions of the paper include a summary of the reform process in the sector, an assessment of the impacts of reform on individual utilities, and a comparison across different utilities, rather than a state-level comparison. The focus at the firm level allows for a detailed consideration of quantitative performance and outcome measures, including technical efficiency, allocative efficiency, and

commercial viability. Given the complexities of the data and the institutional idiosyncrasies of the different components of the power sector, the BP analysis marks an important step forward in furthering our understanding of what has been accomplished, as well as isolating where further analysis may be required, in order to guide future policy decisions. This comment first reviews the contributions of the paper, then examines the robustness of a major analytical tool that is developed there—the IRO—and finally discusses issues of political economy, reform paths, and what else we need to know about power sector reform in India.

It is generally agreed that electric power represents a major constraint on Indian growth. As documented in the BP paper, additions to generating capacity have not met targets and have fallen far short of the requirements of a rapidly growing economy. In practice, industrial and household consumers of electric power resort to self-generation, which is highly inefficient in terms of resources used, being unable to take advantage of economies of scale. Transmission and distribution (T&D) are also subject to severe inefficiencies. Reported T&D losses include illegal diversion of power as well as genuine wastage, but even the former involves inefficiency, allocative rather than technical. The importance of electric power is confirmed by a melding of growth theory and input–output analysis, due to Majumdar and Ossella (1999). They identify the sectors for which exogenous efficiency improvements (reductions in the relevant input coefficients) would have the greatest potential growth impacts, and "electricity, gas and water supply" is the sector that tops the list for 1989 data. Singh (2007) repeats this exercise with the 1998–99 input–output matrix for India and reaches the same conclusion (table 6). In fact, the growth impact of efficiency gains for the leading sector is more than double that of the next one, making the result even more striking.

TABLE 6. Growth Impact of Increasing Efficiency of Sectors by 5 Percent

Sector	*Relative growth factor*	*Growth rate (base 7 percent)*
Electricity, gas & water supply	1.0108	8.16
Iron, steel and ferro-alloys	1.0049	7.52
Non-ferrous basic metals	1.0037	7.40
Other services	1.0031	7.33
Other transport services	1.0028	7.30
Railway transport services	1.0020	7.21
Coal and lignite	1.0018	7.19
Trade	1.0016	7.17
Miscellaneous manufacturing	1.0016	7.17
Inorganic heavy chemicals	1.0013	7.14

The numerical exercise confirms the urgency of steps that will improve efficiency in the electric power sector, particularly where those efficiency improvements will support commercial viability and hence capacity expansion. The BP paper provides an abundance of detailed analysis of the performance of most of the individual utilities that make up the sector. It is useful to summarize their conclusions to make them stand out. Here is my interpretation of what the analysis tells us, in the form of a list of conclusions:

1. Policy reforms implemented so far have neither spurred new investment nor led to reductions in capacity shortfalls or a major turnaround of the sector.
2. Restructuring of debts has temporarily improved payments.
3. Fiscal incentive schemes (the APDRP and its predecessor) designed to curb losses by state-owned power companies have had limited positive impacts.
4. However, large state government subsidies continue unchecked although they have become somewhat more stable.
5. Operating efficiency and monitoring of operations remain poor.
6. The cash losses of state-owned utilities improved dramatically from 2001–02 to 2002–03, but have registered little improvement thereafter.
7. Collection efficiency has improved over the reform period.
8. The ATC losses remain high for the sector as a whole.
9. There is high variability in the bottomlines of the utility companies and this variability increased in the reform period.
10. The worst performers among the utilities are concentrated in a few states.
11. There are a few examples of significant positive turnarounds among the utilities whose data has been analyzed.

The above list represents the trees of the analysis, but what of the forest? Clearly, reform in the power sector has been a mixed bag. As the authors make clear in their discussion, the often poor outcome of reforms does not discredit the idea of reform but rather its particular manner of implementation. The argument is made that reforms have been fragmentary and incomplete and this has contributed to the lack of broad measurable progress in the performance of the power sector. At the same time, the authors admit that, "[T]here is just not sufficient data to effectively infer causal relationships in an environment where institutional eccentricities are predominant, and structural instability is high." This statement is made in the context of

explaining the failure of attempts at formal econometric analysis of the data. Nevertheless, one can argue that some qualitative or conjectural discussion of causality might have been attempted in the paper: that issue is taken up later in this comment.

Some of the background for teasing out missing causal links might lie in what the paper does not cover. The authors explain very clearly that their scope does not extend to the details (or institutional "microstructure") of the reform process, the operational minutiae of the sector (including engineering and organizational/managerial considerations), specifics of financial restructuring requirements, and the regulatory principles that have, or should have informed the process of reform. Of these dimensions, perhaps the first three are not central to understanding the causal chain connecting policies and performance. The fourth, however, is implicitly implicated in considering the role of market structure in performance. Again, the BP paper hints at some views, and we offer an assessment further on in this piece.

First, consider what is the centerpiece of the BP paper. After marshalling a wealth of data on different dimensions of the performance of individual utilities, the authors create and construct an IRO as a way of capturing overall performance. By comparing IROs across two years, 2002 and 2005, they are able to systematically and transparently assess individual firm performance, as well as overall patterns. While the eleven conclusions listed above do not rely on the IRO, the index, as it should, provides a summary measure incorporating key aspects of performance. The IRO is defined by BP as follows:

$$\begin{aligned}\text{IRO} = {} & (1 - \text{ATC losses}) + \text{Collection Efficiency} \\ & + (\text{ARR} - \text{ACS}) + (\text{Industry ACS} - \text{ARR}) \\ & + \text{Ratio of subsidizing to subsidized segments}\end{aligned}$$

Here ARR stands for annual revenue requirement, and ACS for average cost of supply. As explained in the paper, the National Tariff Policy requires that utilities should file an ARR to the relevant State Electricity Regulatory Commission to initiate any process of tariff revision. BP provide an extensive discussion of the rationale for the components, as well as the weighting scheme, so that will not be repeated here. They do note issues of overlap or collinearity between components such as ATC losses and collection efficiency. In the absence of any strong theoretical rationale, the best way to check the reliability of the IRO is to perform a sensitivity analysis. To guide this analysis, one can examine the correlations between the IRO and its components (table 7). The calculations reported in the table show that the subsidizing ratio actually dominates the IRO, having a correlation with the index of 0.89 in 2002 and 0.84 in 2005. Most of the correlations between individual

TABLE 7. Correlation Matrix: IRO and Components

2002	*1-ATC loss levels*	*Collection efficiency*	*ARR-ACS gap*	*Industry ACS minus ARR*	*Subsidizing ratio*	*IRO*
1-ATC loss levels		0.73	–0.07	0.18	–0.16	0.17
Collection efficiency			0.13	0.10	0.07	0.37
ARR-ACS gap				-0.46	0.35	0.47
Industry ACS minus ARR					0.28	0.41
Subsidizing ratio						0.89
2005						
1-ATC loss levels		0.62	0.71	–0.17	–0.05	0.43
Collection efficiency			0.54	0.04	0.20	0.57
ARR-ACS gap				–0.31	0.25	0.65
Industry ACS minus ARR					0.41	0.34
Subsidizing ratio						0.84

components are stable across the two years, and not too high. Exceptions to the stability are the correlations of the ARR–ACS gap with ATC losses and with collection efficiency. These correlations are much higher in 2005, consistent with the authors' observation that utilities with large ARR–ACS gaps were far more likely to have deteriorated over the 2002–05 period, with this relationship being among the strongest that they identified.

The numbers in table 7 suggest that one should investigate the sensitivity of the IRO to lowering the weight on the subsidizing ratio. A weight of one-half seems to be a reasonable alternative to explore. A broader issue arises from the fact that the components of the IRO have somewhat different scales, and their spreads in the sample are quite different as well. This is not necessarily a problem, since variability in a component ought to be reflected in the overall index, but one can also explore robustness of the BP index by normalizing the components in each sample. In a sense, this overdoes the correction, but again, it provides a good robustness check.

The two alternative indices are defined as follows, where m is the mean and s the standard deviation for the respective component:

$$\begin{aligned}\text{IRO1} = {} & [(1 - \text{AT\&C losses}) - m]/s + [\text{Collection Efficiency} - m]/s \\ & + [(\text{ARR} - \text{ACS}) - m]/ + [(\text{Industry ACS} - \text{ARR}) - m]/s \\ & + [\text{Ratio of subsidizing to subsidized segments} - m]/s\end{aligned}$$

$$\begin{aligned}\text{IRO2} = {} & (1 - \text{AT\&C losses}) + \text{Collection Efficiency} \\ & + (\text{ARR} - \text{ACS}) + (\text{Industry ACS} - \text{ARR}) \\ & + 0.5*\text{Ratio of subsidizing to subsidized segments}\end{aligned}$$

Since neither alternative changes the correlations among individual components, table 8 reports only the correlations of the components with the alternative indices, IRO1 and IRO2. As noted, neither alternative is itself inherently superior, but the correlations of the components with the index appear to be more balanced in each case. The main implication and robustness check comes from examining the IRO ranking (levels are not comparable across the alternatives). Table 9 summarizes the rankings for all the cases.

TABLE 8. Correlations of Alternative IROs and Components

	IRO1 2002	*IRO1 2005*	*IRO2 2002*	*IRO2 2005*
1-ATC loss levels	0.62	0.68	0.31	0.58
Collection efficiency	0.75	0.78	0.48	0.68
ARR-ACS gap	0.35	0.71	0.49	0.76
Industry ACS minus ARR	0.41	0.31	0.44	0.29
Subsidizing ratio	0.57	0.59	0.77	0.70

Source: Computed by the author.

In table 9, utilities that move four places or more in the rankings as a result of changing the index are highlighted—bold for those moving down, italics for those moving up. The numbers of these are reassuringly small. For the first alternative, out of thirty-one utilities, there are six sharp movers in 2002, and only two in 2005. For the second alternative index, the sensitive cases are even fewer, two and zero in 2002 and 2005, respectively. The conclusion is that the BP IRO index is quite robust, at least in these samples, to variation in its construction. It is also noteworthy that almost all the sensitive cases are away from the extremes of the rankings.

With the reassurance of the sensitivity analysis, one can use the IRO to examine some of the patterns in utility performance over time. The authors note the improvement in the average index, together with greater dispersion among the utilities, from 2002 to 2005. An important observation is the variation in performance among utilities serving the same state, emphasizing the need to go below state-level indicators of performance. The authors also argue that privatized utilities have done fairly well on average, though at the same time there are privatized utilities that have done poorly, and state-owned firms that have done well. The qualification for APDRP incentives seems to be associated with relatively good performance on an average for utilities in the qualified states, but the incentive payments have been small, as the authors note, so the driving forces for performance may lie elsewhere, in regulatory, managerial or political factors.

The rationale for focusing on the IRO comes from the context of the power sector in India—with lack of capacity, inefficiency, and financial

TABLE 9. Alternative IRO Rankings

2002 (BP)	*2002 IRO1*	*2002 IRO2*	*2005 (BP)*	*2005 IRO1*	*2005 IRO2*
Himachal Pradesh	Himachal Pradesh	Himachal Pradesh	Orissa WESCO	Orissa WESCO	Orissa WESCO
Jharkhand	AP East	Chhattisgarh	Himachal Pradesh	Himachal Pradesh	Himachal Pradesh
Chhattisgarh	Chhattisgarh	Jharkhand	Orissa NESCO	Maharashtra	Maharashtra
Orissa WESCO	Punjab	AP East	Maharashtra	AP East	AP East
AP East	Orissa WESCO	Orissa CESCO	West Bengal	West Bengal	**Orissa NESCO**
Orissa CESCO	Kerala	Orissa WESCO	AP East	Tamil Nadu	West Bengal
Punjab	Orissa CESCO	Punjab	Kerala	Punjab	Kerala
Orissa NESCO	*Tamil Nadu*	Kerala	Tamil Nadu	Orissa NESCO	Tamil Nadu
Kerala	West Bengal	Maharashtra	Chhattisgarh	Kerala	Punjab
Maharashtra	**Jharkhand**	Orissa NESCO	Punjab	*AP Central*	Delhi North
West Bengal	Gujarat	Tamil Nadu	Delhi North	Delhi North	AP Central
Tamil Nadu	**Orissa NESCO**	Orissa SESCO	AP Central	*AP South*	Chhattisgarh
Orissa SESCO	Orissa SESCO	West Bengal	Rajasthan Jaipur	Karnataka Bangalore	Karnataka Bangalore
Rajasthan Ajmer	*AP South*	Rajasthan Ajmer	Karnataka Bangalore	Gujarat	AP South
Karnataka Bangalore	Maharashtra	Karnataka Bangalore	Gujarat	Rajasthan Jaipur	Rajasthan Jaipur
Rajasthan Jaipur	Karnataka Bangalore	Gujarat	AP South	Chhattisgarh	Gujarat
Delhi North	*AP Central*	AP South	Rajasthan Jodhpur	Orissa SESCO	Orissa SESCO
Gujarat	Haryana South	Rajasthan Jaipur	Orissa SESCO	Rajasthan Jodhpur	Rajasthan Jodhpur
Madhya Pradesh	Rajasthan Ajmer	Madhya Pradesh	Rajasthan Ajmer	Haryana South	Rajasthan Ajmer
AP South	Madhya Pradesh	Haryana South	Haryana South	AP North	Haryana South
Haryana South	AP North	**Delhi North**	Orissa CESCO	Rajasthan Ajmer	AP North
AP Central	**Delhi North**	AP Central	Jharkhand	Haryana North	Orissa CESCO
Haryana North	Haryana North	Haryana North	AP North	Madhya Pradesh	Madhya Pradesh
Uttar Pradesh	Uttar Pradesh	Uttar Pradesh	Madhya Pradesh	Jharkhand	Haryana North
AP North	Rajasthan Jaipur	AP North	Haryana North	Karnataka Hubli	Jharkhand
Rajasthan Jodhpur	Karnataka Hubli	Karnataka Hubli	Uttar Pradesh	Uttar Pradesh	Uttar Pradesh
Karnataka Hubli	Rajasthan Jodhpur	Rajasthan Jodhpur	Karnataka Hubli	**Orissa CESCO**	Karnataka Hubli
Bihar	Bihar	Bihar	Bihar	Bihar	Bihar

weakness, all contributing to the sector's acting as a constraint on growth. As the BP paper emphasizes, large-scale new investments in capacity will require a significant improvement in the financial performance of India's utility companies. The authors argue that the incentive structure facing the utilities still does not drive their actions sufficiently toward revenue and cash flow enhancement. The reforms they call for in the paper are greater private ownership and more competitive market structures.

Ultimately, however, the case for reforms of this nature requires attention to the factors that the paper skates over, for reasons of scope and space. One feature of power sector reform that implicitly emerges from the paper is the fragmentation of regulation in the sector, its conceptual lack of clarity, and the shadow of political interference. The broader political economy issues, which include distortion of decision making in state-owned enterprises, as well as regulatory distortion, are alluded to at several points in the paper. However, they are not tied in to the variation in the IRO across utilities. While this connection may not be amenable to a quantitative analysis, it seems that the poor performance of utilities in states such as Bihar and Uttar Pradesh, as measured by the IRO, is attributable to the political economy of these states, just as is their overall poor economic performance.

It is plausible that private ownership would reduce politically induced distortions, but the latter may occur even after privatization, which may not break the nexus of managers, regulators, and politicians.[3] In this context, it would have been useful to have more insight into the reasons why "different utilities have placed emphasis on different strategies for enhancing revenues." Has this variation been due to structural differences (for example, the mix of user segments) or differences in regulation or political influence? In particular, one might conjecture that "institutional eccentricities" at the level of operations of utilities, or in state-level regulatory bodies, can be traced to political economy factors. If so, a case may emerge for a package of reforms that include regulatory reform (Wolak, 2006) as well as ownership changes.

The approach to regulatory reform would, therefore, have to be one that delinks utility regulation from broader political economy factors. Certainly, the authors document that utilities that started out in the worst situations had the worst subsequent performance: "Although the distribution of utilities at

3. Nevertheless, the authors do provide evidence that ownership changes can help. For example, they note that "The performance [in achieving cash profits in 2004–05] of the six privately-owned discoms (in Delhi and Orissa) was all the more remarkable since they did not receive (direct) subsidies from their respective governments in 2004–05; despite this, four of them made profits in 2004–05, which amounted to 41 percent of the profits of the unbundled discoms and 4 percent of total profits."

various loss levels seems more or less random, high loss ones (i.e., those with losses above 50 percent) seem to have predominantly deteriorated. Among the others, though, a dominant majority have reduced their losses." Furthermore, they note that "Utilities with a large [ACS–ARR] gap were far more likely to have deteriorated over the four reference years …; this relationship seems to be among the strongest that we have found. On the other hand, those with the lowest gap in 2004–05 have managed a loss reduction on average."[4]

The claim I make here is that political economy factors may be the explanation for the poor initial conditions as well as the failure to register improvement, in a subset of utilities. The location of these utilities in states that have been laggards in overall economic reform and economic performance is consistent with this claim. Even within a state differences may be traced to aspects of political economy. For example, the cross-subsidization that occurs between industrial/urban users and agricultural/rural users is driven by political compulsions, and limits to manipulating the demand composition can differentially affect different regions within a state: Karnataka-Hubli's poor performance relative to other Karnataka utilities may be partially traced to this factor.[5] A more systematic analysis of the linkages going from economic structure and political constraints to utility performance would clearly be beneficial.

An important answer to problems of collusion and political influence is to rely on competitive markets as disciplining devices. The BP paper calls for this solution. Certainly, competition in power markets is feasible, as the experience in several other countries has demonstrated. However, the international experience also illustrates that power markets can be manipulated,[6] and that regulation has to be well designed and effectively implemented to enforce competition in power markets. The authors rightly point out the obstacles to competitive markets imposed by current tariff structures,[7] and they note the political economy constraints inherent in cross-subsidy regimes of state-owned monopolies. If this is the case, then regulators have to

4. See the authors' figures 4 and 5 for respective illustrations of the two quoted statements.

5. See the authors' figures 5 and 6.

6. It is also worth noting that industrialized countries' reform efforts began from situations where electric utilities were financially viable and tariffs were thought to be too high—competition was seen as a way of bringing down prices. In the Indian case, substantial fractions of users are heavily subsidized, even paying nothing for power.

7. For example, the authors point out that "The magnitude of wheeling charges and cross-subsidy surcharges has *de facto* made open access unviable. Maharashtra is probably the only state where the surcharge formula allows for the possibility of open access sales to be remunerative."

be change agents; as suggested in the paper the authors note that this sequence from agenda setting and discussion to implementation was relatively successfully accomplished by the telecommunications regulatory body in India. The precondition for greater competition in power markets, therefore, may have to be more effective regulation (Wolak, 2006).[8] In fact, some might argue that attracting investment in the sector will require restraining com-petition to some extent, to allow attractive rates of return. However, this would still leave the door open to rent-seeking and inefficiency of operations.

In fact, one should be careful to disentangle different aspects of reform. Certainly, little can be achieved in the power sector without effective regulation. A key issue that remains unanswered in analyses such as that of Wolak (2006) is how to construct a politically feasible path to well-functioning regulatory institutions. The complications created by the federal dimensions of responsibility with respect to the power sector (making regulation much more challenging than in telecommunications, for example) have been noted by several analysts.[9] However, even if the Central Government cannot impose its will on state regulators, it can play a more assertive role in establishing and disseminating best practices in regulation—as the authors discuss briefly, there are a host of complex technical issues in the power sector, throughout the supply chain, which interact with economic considerations.

The need for a clear, conceptually sound regulatory framework has perhaps not been fully appreciated by the government.[10] Two facets of regulation, which have been areas of more general weakness in regulatory reform in India, are worth stressing. The first is the need for as much independence as possible for the regulators: this has been difficult to achieve in practice because of the reluctance of ministries (whether bureaucrats or politicians) to give up influence: this is yet another aspect of the political economy factors at work. The second is the need for wider and more detailed academic inputs into the regulatory process. The paper under discussion makes an important contribution in this respect.

8. Wolak (2006) is very categorical on this point, stating that "My analysis of the current situation in the Indian electricity supply industry demonstrates that the potential benefits to the Indian economy from establishing an effective regulatory process swamp the short-term and medium-term benefits of introducing a competitive wholesale electricity market." One implicit argument is that the kinds of tariff anomalies that are inimical to competitive efficiency (see previous footnote) can and need to be addressed in the regulatory sphere, whether or not there are markets with bidding for power.

9. See Singh and Srinivasan (2005) and references therein.

10. For example, a long, detailed account of power sector reform by the then seniormost bureaucrat in the power ministry (Shahi, 2006) gives short shrift to regulatory issues such as the details of tariff-setting.

Given the importance and priority of regulatory reform and institution building, one should not underestimate the benefits of privatization. Even though the empirical evidence on this point presented by BP is somewhat limited, one can argue from first principles that moving toward private ownership is necessary, simply to reduce politically-induced distortions, even before any gains from greater competition are realized. Certainly, competition must remain an ultimate goal, but the lessons of experience elsewhere suggest that designing and running competitive power markets can be tricky, and needs setting the stage carefully.

All the latter issues we have discussed are somewhat outside the avowed scope of the BP paper, which successfully seeks to answer the question, "How well has electric power reform worked in India?" The authors have marshaled a vast amount of data, and filtered and analyzed it in a manner that gives a clear picture of the recent performance of utility companies in the country, though only hints as to the underlying causal factors. Clearly, some kinds of reforms already implemented have had limited impacts on commercial orientation and financial performance. However, other reforms that have not been tried in India cannot be assessed using Indian data—only international experience, not assessed in this paper, can provide any kind of guide. The paper, therefore, leaves a gap between the assessment of the current position of utilities and the broad direction of policy reform that is called for by the authors. Mapping out a feasible path of reform for the power sector remains to be done.[11] Nevertheless, this paper is an important analytical and empirical contribution. It uncovers for the first time details of changes in structure and performance over time, and variation in performance across individual utilities. It also provides a significant new quantitative index to measure financial orientation and performance of the utilities.

General Discussion

T. N. Srinivasan began by asking if the paper considered why electricity subsidy was being rationalized as an instrument of poverty reduction. Without appropriate pricing of electricity, no reform in the sector was going to be sustained over the long run. He also questioned periodic debt reduction schemes that effectively amounted to loan write-offs.

Another participant stated from the floor that the mafia is often behind electricity theft. It steals from the distribution lines and sells to the poor who

11. Wolak (2006) makes an important start, but without fully getting to grips with political economy constraints that must be dealt with.

do not have access to electricity otherwise. The participant asked whether the NSS (National Sample Survey) data were good enough to glean the information on how much the poor were spending on electricity informally or formally. There have been a number of studies of privatization of electricity distribution in Latin America. These do not support the hypothesis that privatization has adverse distributive effects.

Saugata Bhattacharya responded that there had been a number of surveys of willingness to pay and patterns of electricity consumption in rural areas by the World Bank. But there had been no studies of the impact of privatization on income distribution. Agreeing with Srinivasan, Bhattacharya stated that electricity pricing could not be an instrument of targeting income distribution and other social objectives. He added that the analysis in the paper did deal with prices, even if indirectly. The difference between ARR and ACS on which they focus depends on pricing of electricity and demand—load management. He agreed, however, that a more direct measure of tariffs was needed but said it is difficult to get tariff measures across the states.

Turning to inconsistencies between revenue decomposition and the IRO measures noted by Nirvikar Singh, Bhattacharya acknowledged that the measures they use are first pass and further refinements are required. He then pointed out that the revenue decomposition and IRO were meant to measure different aspects of the reform outcomes and were not strictly comparable. He then returned to the issue of privatization discussed by Navroz Dubash. He said that Delhi's privatization was a benchmark case for the process of privatization in India. All the economic, financial, and commercial steps required by a proper privatization process were followed in Delhi. But even then the outcome has been less than satisfactory. Dubash explains the reasons for this in a recent paper. The bottom line is that replacing a public monopoly for private monopoly is not a complete solution for the problem.

Referring to the successes in Andhra Pradesh and Gujarat within public ownership structure, Bhattacharya noted that these seem to have resulted from initiatives by specific individuals at the top. But he expressed a need for deeper, more careful look at the experience in several states. Some four or five reports had appeared in the preceding six months that may shed more light on how successes are being engineered.

Urjit Patel joined the discussion stating that outside of Orissa, which had been poorly designed, privatization of distribution has been a success. In the Delhi privatization, all three of the distribution companies had met all the benchmarks that the regulator had set. The ATC losses had come down from 55 percent to 30 percent. Given the risk of law and order in collecting

dues, this kind of turnaround was commendable. This performance well surpasses that of the public sector companies.

Patel went on to note that the big question regarding the Andhra experience was whether it could be sustained. We had a Chief Minister who was *de facto* CEO of the Electricity Department. Is this going to be sustainable? It may not happen and may not last much longer. And do we really want to turn the Chief Minister into *de facto* CEO of the electricity system? What we need is profit making and high rate of return on capital to drive electricity industry. There is conclusive evidence that private sector distribution companies in India are doing very well and we need to recognize that to take that model forward.

Montek Singh Ahluwalia, as Chair, asked whether the authors were taking the view, espoused by Srinivasan, that privatization is essential for commercial orientation or the alternative view that commercial orientation was possible even without privatization. Patel stood his ground, however, arguing that the real issue was privatization and that the government had decided not to go for it.

Arvind Panagariya raised three issues. First, regarding privatization, he noted that replacing private monopoly for public monopoly may be an improvement but it is not sufficient. The message from telecom sector was that you needed competition through the entry of multiple suppliers of the service. In telecom, the performance of even the public sector supplier, BSNL (Bharat Sanchar Nigam Limited), dramatically improved under competitive pressure from private suppliers. Therefore, from incentives perspective, even if you think that commercial orientation is possible under public ownership, you need private suppliers operating side-by-side.

The second point Panagariya raised related to cross-subsidy whereby industrial customers were charged a higher price to subsidize residential customers. The EA had set a deadline for eliminating this cross-subsidy but the current government had amended the Act to allow the cross-subsidy indefinitely. The authors need to discuss the issue of cross-subsidy. The final point Panagariya raised related to captive plants, which no one had mentioned. Where did these fit in the overall reform process? These plants were not only very costly sources of electricity but also imposed heavy environmental costs. Where did the authors see these plants going in ten to twenty years time? Will these still be there or replaced by cleaner and less costly large-scale suppliers as they should be?

Dubash reminded the group that the paper and discussion seemed to underemphasize regulatory institutions. The option to privatize all distribution circles in the next five years is simply not available. But the option

to strengthen regulation is. This institutional solution needs to be studied and emphasized more than has been the case.

The session concluded with Montek Singh Ahluwalia, the session chair, giving his perspective on the sector. He pointed out that there was improvement on several fronts: grid management had improved; some states were moving toward supplying subsidized electricity to agriculture at night when the marginal cost of supply was lower; most tariff orders had reduced the price difference between industrial and residential customers; and challenges to undue interference by state governments in regulatory matters were receiving backing from the courts. Ahluwalia made the case that even though privatization was not happening, many improvements in the sector were underway and were reflected in gradual reduction in distribution losses, though a great deal remained to be done.

References

Bhattacharya, Saugata, and Urjit Patel. 2003. "Markets, Regulatory Institutions, Competitiveness and Reforms." Working Paper No. 184, Stanford Center for International Development, Stanford University.

———. 2005. "New regulatory institutions in India: White Knights or Trojan Horses?" In *Public Institutions in India: Performance and Design*, edited by D. Kapur and P. B. Mehta, pp. 406–56. New Delhi: Oxford University Press.

Deo, Jayant. 2007. "Power Exchange," *mimeo,* January.

Dubash, Navroz K. 2001. "Power Politics: Process of Power Sector Reform in India." *Economic and Political Weekly*, September 1, XXXVI (35): 3367–90.

Dubash, Navroz, and Narasimha Rao. 2006. "Emergent Regulatory Governance in India: Comparative Case Studies of Electricity Regulation." Paper presented at a conference on "Frontiers of Regulation: Assessing Scholarly Debates and Policy Changes," University of Bath. September.

Government of Gujarat. 2006. "Gujarat Power Sector Turnaround." State Energy Department Presentation.

Government of India. 2001. *Report of the Expert Group on 'Settlement of SEB Dues*. Planning Commission. May.

———. 2002a. *Report of Expert Committee on State-Specific Reforms: 'Structuring of APDRP, Reform Framework and Principles of Financial Restructuring of SEBs*'. Ministry of Power. September.

———. 2002b. *Report of Distribution Policy Committee*. Ministry of Power. March.

———. 2003. *Report of Expert Committee on State-Specific Reforms: 'Power Sector Reform—Transition Financing Windows'*. Ministry of Power. March.

———. 2006. *Report on Restructuring of APDRP*. Ministry of Power. October.

Government of Karnataka. 2000. Report of the High Level Committee on Escrow Cover to IPPs. February.

ICRA, and CRISIL. 2006. *State Power Sector Performance Ratings.* Final Report to the Ministry of Power, Government of India.

Infrastructure Development Finance Company Limited (IDFC). 2001. "Six Steps to Accelerated Privatisation of Electricity Distribution," *mimeo*. January.

Katiyar, Sudhir. 2005. "Political Economy of Electricity Theft in Rural Areas: A Case Study from Rajasthan." *Economic and Political Weekly*, February, 12: 644–48.

Majumdar, Mukul, and Ilaria Ossella. 1999. 'Identifying Leading Sectors that Accelerate the Optimal Growth Rate: A Computational Approach.' In *Trade, Growth and Development: Essays in Honor of Professor T. N. Srinivasan*, pp. 273–90. Amsterdam: Elsevier Science.

Ministry of Power. 2005. *Annual Report, 2005–06.*

Narendranath, G., Uma Shankari, and K. R. Reddy. 2005. "To Free or Not to Free Power: Understanding the Context of Free Power to Agriculture." *Economic and Political Weekly*, December, 31: 5561–70.

National Thermal Power Corporation (NTPC). 2006. "Retrospection of Reforms in Distribution-A Way Forward." Presentation by Lead AcCs. May.

Panagariya, Arvind. 2008. *India: The Emerging Giant*. New York: Oxford University Press.

Patel, Urjit. 2004a. "Plug Power Financials—Now!" *Business Standard*, March 10.

———. 2004b. "Time to Go Back to Basics." *Business Standard,* March 19.

Power Finance Corporation Limited (PFC). 2005. *Report on the Performance of the State Power Utilities for the Years 2001/02–2003/04*. New Delhi.

———. 2006. *Report on the Performance of the State Power Utilities for the Years 2002/03–2004/05.* New Delhi.

Prayas. 2003. *A Good Beginning but Challenges Galore: A Survey Based Study of Resources, Transparency, and Public Participation in Electricity Regulatory Commissions in India.* Pune.

Prayas Energy Group. 2006. "A Critical Review of the Performance of Delhi's Privatized Distribution Companies and the Regulatory Process." Available at www.prayaspune.org.

Rao, M. G. 2007a. "Issues in Electricity Governance." *Business Standard*, May 1.

Rao, S. L. 2007b. "Darkness at Noon." *Times of India*, May 22.

Reserve Bank of India. 2006. *State Finances: A Study of Budgets of 2006–07*. Mumbai: RBI.

———. 2006. *Handbook of Statistics on Indian Economy.* Mumbai: RBI.

Ruet, Joel ed. 2003. *Against the Current: Organizational Restructuring of State Electricity Boards.* New Delhi: Manohar.

Seetha. 2003. "People Power: Market for Electricity from Below." Policy Paper No. 7, Julian L. Simon Centre for Policy Research, Liberty Institute. New Delhi.

Shahi, R.V. (2006). 'Infrastructure Reforms in India: A Case Study of Power Sector.' In *Documenting Reforms: Case Studies from India*, edited by S. Narayan, pp. 211–48. New Delhi: Macmillan.

Singh, Nirvikar, and T. N. Srinivasan. 2005. 'Indian Federalism, Economic Reform and Globalization.' In *Federalism and Economic Reform: International Perspectives*, edited by Jessica Wallack and T. N. Srinivasan, pp. 301–63. Cambridge, UK: Cambridge University Press.

Singh, Sanjay. 2007. "Power Reforms: Reality or Chimera?" *Economic Times*, June 9.

Singh, Nirvikar. 2007. 'Services-led Industrialization in India: Assessment and Lessons.' In *Industrial Development For The 21st Century*, edited by David O'Connor and Mónica Kjöllerström, pp. 235–91. New York: UN-DESA.

Tadimalla, Srikumar. 2000. "Privatisation of Kanpur Electricity Supply Company (KESCO): A Case Study," *mimeo*, December.

———. 2001. "Extricating the Orissa Power Sector from the Current Crisis," *mimeo.* December.

Tadimalla, Srikumar, and Urjit Patel. 2005. "Regulation: Only One Piece of the Infrastructure Jigsaw," *mimeo*, January.

The Energy Research Institute (TERI). 2007. "Analysis of Tariff Orders (distribution) of Nine States: A Study Undertaken for the Ministry of Power." Available at http://powermin.nic.in.

Virmani, Arvind. 2005. "Policy Regimes, Growth and Poverty in India: Lessons of Government Failure and Entrepreneurial Success!" *mimeo*, Indian Council for Research on International Economic Relations, New Delhi.

Wolak, Frank A. 2006. "Reforming the Indian Electricity Supply Industry." Working Paper No. 301, Stanford Center for International Development.

World Bank. 2002. *Improving the Investment Climate in India: An Investment Climate Assessment.* Washington, D.C.: World Bank.

———. 2007. *Closing the Electricity Supply-Demand Cap*. Washington, D.C.: World Bank.