

## A New Approach to Public Sector Hiring in India for Improved Service Delivery

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**Abstract:** This paper argues that the current structure of public sector labor markets in India severely limits the ability of the Indian state to effectively deliver services across a wide variety of core functions including policing, education, healthcare, and public health. Sources of inefficiency include: too few front-line employees, caused in part by entry-level salaries that are too high; life-time jobs offered without assessing candidate fit for the position; ineffective training and skilling; inadequate rewards for performance; and spatial mismatch between population needs and employees' preferred work locations. I propose a new approach to hiring front-line service providers to address these issues. The key idea is to introduce a three to five-year long apprenticeship for entry-level service providers, giving priority to local candidates, and interspersing modular training and certification of skills that are consistent with the new National Skills Framework. Hiring into regular full-time positions will be unchanged for the most part, but (performance-linked) credit will be provided for each successful year as an apprentice. One-time exit payments will be made to apprentices who do not get selected for regular positions. I illustrate this approach with several examples, and argue that such an approach can improve the quantity and quality of front-line service providers, in a fiscally feasible way. Additional benefits include reducing youth unemployment, improving their skills, and increasing female labor force participation and empowerment. Since most front-line service delivery responsibilities are under the jurisdiction of state governments, I conclude by noting that the increased fiscal devolution to states under the Fourteenth Finance Commission constitutes an especially promising opportunity for a few states to try out this approach.

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## 1. Introduction

Several studies over the past decade have documented that the Indian state does a poor job at effectively delivering basic services to its citizens. These weaknesses are apparent in almost every function of the state, including policing, water and sanitation, public health, and education (World Bank 2003, Pritchett 2009). One strand of explanatory factors for poor service delivery has focused on the weak governance and accountability of front-line service providers – exemplified by high absence rates of teachers and healthcare workers (Kremer et al, 2005; Muralidharan et al. 2011; Muralidharan et al. 2014). A second strand has focused on the poor training and preparation of front-line service providers (Rao et al. 2011).

While both of these factors are important, a more direct explanation for poor service delivery may simply be the inadequate numbers of front-line staff. The Indian state is remarkably understaffed in several front-line service delivery functions including police, teaching, and community health. At the same time, fiscal pressures have made it difficult to fill even existing vacancies, let alone create new positions. The standard approach of advocates for any given sector (such as education or health) to address these staffing shortages is to argue for a larger budget – typically, for hiring more staff and launching more programs. For instance, education advocates repeatedly call for 6% of Gross Domestic Product (GDP) to be spent on education, and health advocates similarly call for 3% of GDP to be spent on health.<sup>1</sup>

However, these calls for increased spending rarely consider the broader fiscal situation (such as the low tax-to-GDP ratio in India of around 17%), or the opportunity-costs of diverting funds to their preferred sector (within a fixed overall budget). It is then left to the Finance Ministry to juggle the competing demands across a fixed fiscal envelope and in practice most ministries and departments get less than what they seek. The "shortage" of funds then becomes an alibi for poor state capacity and service delivery. However, given the strained nature of public finances as a whole, it should be clear that "more of the same" will simply not work, and that policy-makers need to find a way to deliver services more effectively within the same fiscal envelope, with increased focus on the *quality* of public spending on service delivery and its cost-effectiveness.

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<sup>1</sup> Understanding the sources of these benchmarks (typically, emanating from international organizations like UNESCO, UNICEF, and the WHO) and the assumptions behind them is an interesting exercise in its own right. Typically, they are based on taking the current structure of costs per user or facility and multiplying them by the extent of additional coverage that is needed to reach universal access. While universal coverage is certainly a laudable goal, what is typically missing from these benchmark calculations is any consideration of the possibility of achieving the same goals in a more cost-effective manner.

I argue in this paper that a fundamental reason for the weak capacity of the Indian state for service delivery is the current structure of public-sector labor markets, which induce several inefficiencies in the productivity and effectiveness of publicly-provided services, and also induce distortions in the broader economy. I present evidence to show that the status quo system does not hire enough front-line service delivery staff, does not adequately assess their fit for the roles they are hired for, does not train them the right way, does not allocate them optimally spatially, does not pay them the right way, and does not promote them the right way either. Recognizing these distortions is essential to correctly diagnosing the problem. The first goal of this paper is to document the broad range of distortions induced by the current structure of public sector labor markets, and the ways in which the status quo is sub-optimal.

I then proceed to discuss a possible new approach to hiring front-line service providers that has the potential to mitigate these distortions and improve service delivery without significantly increasing spending. This approach draws on different strands of evidence from India and around the world and it features the following main components: (a) create untenured apprenticeship positions lasting from three to five years in major front-line service delivery departments including police, teaching, community health, and early childhood care at lower entry-level pay scales than the status quo; (b) give preference to local candidates for these positions; (c) create modular training courses that are taken alongside the apprenticeship and allow the interspersing of theory and practice, and provide certificates of levels of skilling that are compatible with the new National Skills Qualification Framework; (d) retain the current pay scales and process for hiring regular full-time staff (including age limits for entry), but provide extra (performance-based)<sup>2</sup> credit for each year of successful service as an apprentice; (e) provide one-time payments to apprentices (based on years of meritorious service) who do not get hired into regular full-time positions at the end of their eligibility age.

There are several ways in which the proposed approach improves upon the status quo. First, it allows for a fiscally-feasible expansion of front-line service providers in areas where they are needed by increasing the hiring of local candidates at a lower pay scale. Second, it improves the effectiveness of training by interspersing credentialing with practice. Further, providing credit for performance on the training modules at the time of regular hiring will improve the extent to

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<sup>2</sup> While providing performance-based credit would be ideal, in practice, even an approach that simply provides credit for each year of successful service would enable a considerable improvement over the status quo. See section 3.1.5 for a more detailed discussion of this issue.

which apprentices absorb and apply the training to their jobs. Third, it is likely to improve the match quality of front-line service jobs by allowing candidates to experience the actual job for a few years before getting hired into permanent positions, and by placing more weight on performance on the job before offering permanent positions. Under the status quo, most candidates enter a permanent government job before having any experience of what the job entails in practice. Many of these candidates may be qualified on paper, but they may be a poor fit for the actual job on personal characteristics that are not reflected on a résumé, entrance exam, or interview.<sup>3</sup>

The three main margins on which quality and effectiveness of public employees can be improved are: selection, training, and motivation/rewards for performance. The proposed approach aims to improve the quality of the public sector workforce on all of these margins. A good way of summarizing this approach is to say that it reduces the barriers to entry into service-delivery positions (since many more apprentices can be hired than regular staff), but it raises the barriers to entry into permanent government positions, and it ensures that those selected for permanent positions are more likely to have demonstrated aptitude and competence on the job. The one-time payment to apprentices who do not get selected for regular positions is designed to facilitate their transition to other roles, and the credentials accumulated during the apprenticeship will in turn improve their skills and employability in the private sector.

Beyond these direct benefits to service delivery, there are also likely to be several indirect benefits to the economy. First, educated youth in India waste several years attempting entrance exams to various government jobs without gaining either meaningful skills or work experience. The new approach will be designed to make it more attractive to enter apprentice positions and obtain modular credentials, since it will increase the probability of getting a regular government job. This in turn will reduce youth unemployment and the misallocation of talent by channeling time into more socially-productive tasks. Second, a major barrier to increased female labor force participation is the unwillingness (or inability) of young educated rural women who have completed secondary or higher-secondary school to travel outside their village to work (this could reflect strong social norms – especially in rural North India). An emphasis on local hiring for new positions as teaching assistants, early-childhood caregivers, public health workers, and

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<sup>3</sup> Teaching is a particularly good example, where qualified candidates who get selected for permanent positions have often not spent much time actually teaching. Many ultimately find that they are simply not ready to deal with the challenges of managing a classroom. The same point also applies to *anganwadi* (early-childhood care) workers.

police personnel, can therefore significantly improve female labor force participation and empowerment. Third, increased employment opportunities for young women who have completed secondary or higher-secondary education will increase both real and perceived returns to education for girls, which will positively affect schooling for younger girls, and delay the age of marriage and fertility (Jensen 2012). These in turn are correlated with better child human development outcomes, and are a key step in achieving a demographic transition.<sup>4</sup>

There are several elements of this proposal that are not new and have been tried before with mixed success (such as the use of locally-hired contract teachers in lieu of regular civil-service teachers in several states, and the recent program of hiring Youth Brigade police staff in Tamilnadu to supplement the existing police force). However, I will argue that these initiatives have not delivered to full potential (and in some cases have even failed) because they have been introduced in a piece-meal fashion and have not been implemented as part of a new unified approach to personnel policy in the public sector. These issues will be illustrated with a more detailed discussion of how this new approach can be implemented in the case of education using a model of teaching assistants as the first step in a career ladder (and how it mitigates important professional, legal, and political weaknesses of the contract teacher model). I will also discuss the applicability of this model to other critical sectors such as police and early childhood care.

Finally, I argue that the current moment is a particularly opportune time to try out this new approach. Most of the front-line service delivery functions discussed in this paper are under the purview of state governments. The sharp increases in devolution of funds to state governments under the Fourteenth Finance Commission, and the corresponding reduction in allocations to centrally-sponsored (and arguably "strait-jacketed") schemes – especially in the social sector – provide an excellent opportunity for states to use these additional resources to innovate and experiment with more effective ways of delivering services. The main goal of this paper is to provide an analytical framework and a concrete policy suggestion with which states can potentially experiment to sharply improve service delivery in a fiscally-feasible way.

There has been a recent increase in both theoretical and empirical research on the importance of building state capacity for development (Besley and Persson 2009 and 2010; Mathew and

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<sup>4</sup> The demographic transition refers to the transition of societies from a "high fertility and high mortality" equilibrium to one of "low fertility and low mortality". The demographic transition is also characterized by families prioritizing the *quality* of their children (in terms of human capital investments) over *quantity*, and it is strongly correlated with societies achieving improved human development outcomes, as well as with achieving higher levels of per-capita income.

Moore 2011; Krishnan and Somanathan 2013; Kapur and Subramanian 2013; Muralidharan, Niehaus, and Sukhtankar 2016). This paper contributes to this literature with a focus on front-line service providers and it is a complement to Krishnan and Somanathan (2005, 2013), who discuss the capacity of the apex civil service in India. It also draws on a growing body of research on personnel economics in the public sector in developing countries, which is summarized well in a recent review by Finan, Olken, and Pande (2015).

The rest of this paper is organized as follows. Section 2 presents the key background facts that motivate this paper and outlines the various distortions and inefficiencies that arise from the current structure of public sector labor markets. Section 3 outlines the proposed new approach to public sector hiring, and illustrates it with a detailed case study of teaching assistants, followed by a briefer discussion of applicability to police and early childhood care givers. Section 4 discusses a possible implementation roadmap and concludes.

## **2. Some Key Facts**

A large number of facts associated with the weak performance of the Indian state at delivering services to its citizens can be explained by the structure of public sector labor markets. This section outlines key facts on weak service delivery and then discusses distortions in the broader labor market, which are created by the structure of public sector labor markets.

### **2.1. Shortage of front-line staff for key service delivery functions**

Aggregate data reveal the striking extent to which the capacity of the Indian state to deliver services to its burgeoning population is constrained by the lack of adequate numbers of front-line staff. India's population has nearly doubled in the last 35 years from 700 million in 1980 to 1.3 billion in 2015. However, during this period, the total number of central and state government employees put together has barely increased (moving from 15.5 million in 1980-81 to 17.6 million in 2011-12).<sup>5</sup> Thus, the number of government employees per capita has fallen sharply in this period, and these aggregate statistics are also reflected in the paucity of front-line service delivery staff across a range of sectors in India, with several studies and reports documenting a shortage of staff.

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<sup>5</sup> These data were provided by Devesh Kapur in his discussant slides and were obtained from [india-stat.com](http://india-stat.com)

Consider policemen, for instance. Among countries with data, India ranks last in the G20 in terms of police officers per capita. India currently has an average of one policeman per 761 people (DNA 2014), which lags behind even the national benchmark established by the Bureau of Police Research and Development of one policeman per 568 people. The lag relative to international standards is even more pronounced: the United Nations recommends one policeman per 450 people, and these figures depart considerably from the police-to-population ratios in developed nations, such as Italy (one policeman per 181), Canada (one per 191), the United States (one per 224), and Spain (one per 313), (Nandan 2014). Further, as I discuss below, the spatial allocation of policemen is far from uniform, which creates even greater shortages in effective staff in several locations.

India also faces a sharp teacher shortage. Estimates indicate that India's schools fall short of 5.86 lakh primary school teachers and 3.5 lakh upper primary teachers (Pathak 2014). The teacher shortage stems partly from the government's reluctance to fill up permanent posts. At the national level, there are 5.23 lakh vacant posts (Kohli 2015). Instead, states such as Uttar Pradesh, Bihar, and Madhya Pradesh – which have faced acute teacher shortages and fiscal deficits in the past decade – have hired para-teachers (who are typically not well qualified). The use of locally-hired non-civil service teachers by itself may not be a problem (as I illustrate below), but the problem is that the use of para-teachers has typically taken place in a "stop gap" manner, without a strategy to integrate para-teachers into a unified human resource framework. This, in turn, has created several problems, which I discuss further in section 3.

The teacher shortage will be exacerbated by the Right to Education (RtE) Act, which stipulates a reduction in pupil-teacher ratio (PTR) in primary schools from 40:1 to 30:1 and proscribes the use of contract teachers or para-teachers. It is estimated that, in addition to filling existing vacancies, the government will need an additional 5.1 lakh teachers to meet the 30:1 PTR norm in classes 1 to 5 (Chatterji 2011). Overall, meeting the PTR norms of the RTE is expected to cost over Rs. 25,000 crores/year. This illustrates the tension between the desire to improve staffing and reducing PTR on one hand and the limited fiscal space on the other.

Similarly, the ratio of health workers to inhabitants in India is also very low by global standards. The number of allopathic doctors, nurses, and midwives (11.9 per 10,000 people) is about half the WHO benchmark of 25.4 workers per 10,000 people (Rao et al 2011). When

adjusted for qualification, the number falls to about a quarter of the WHO benchmark. Further, there is little indication that the availability of health workers per population is improving over time. In fact, the ratios of health professionals (e.g., doctors, dentists, and nurses and midwives) to population have barely budged from 2000 to 2009 (Hazarika 2013).

The problem of lack of staff also extends to the effectiveness of early childhood health and education programs delivered through the Integrated Child Development Services (ICDS). A recent review of the functioning of the ICDS conducted by NCAER for the Planning Commission concluded that *anganwadi* workers are over-burdened and that *anganwadi* centers are under-staffed relative to the range of functions that they are expected to perform (PEO 2011). These findings were reinforced in recent field visits I made to ICDS centers in Tamilnadu (in June 2015). Even in a high-performing state like Tamilnadu, staff shortages were the single most frequently reported concern by workers and supervisors.

The gaps in supervisory staff across sectors are also glaring. For instance, a recent review found that 32% of the positions of block- and cluster-level education officers across India were vacant (Govt. of India 2011). Systematic data is not easily available in other sectors, but interviews on a recent field visit to ICDS centers in Tamilnadu revealed supervisor-level vacancies of over 40%. Overall, the evidence above makes it seem clear that there is a severe shortage of front-line staff and supervisory staff across sectors in India, and that this shortage negatively affects the quality of services delivered to citizens.

## **2.2. Public sector salaries are (too) high and not correlated with productivity**

An important reason for the inability of governments to hire staff to fill the shortages documented above is the limited fiscal and budgetary space to do so. Salary costs account for the majority of public expenditure on services, and the salary costs of additional staff are high. While the total number of government employees barely increased during the period from 1980 to 2010, inflation-adjusted government spending (most of which was spent on employee salaries) in the same period increased more than four times.<sup>6</sup> On the face of it, the large excess demand for every open public sector job – often exceeding 200 applicants per job opening<sup>7</sup> – may suggest

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<sup>6</sup> These data were provided by Devesh Kapur in his discussant slides and were obtained from [india-stat.com](http://india-stat.com)

<sup>7</sup> Averaging across various categories of central government employees, the “applicant to post ratio” (APR) exceeds 200 (UPSC Annual Report 2010). Data provided by Devesh Kapur in his discussant slides.

that the pay and benefits of a government job are too high (especially, after accounting for the lifetime job security they provide), and that it may be possible to hire more staff at a lower pay.

But by itself, the fact of high excess demand for government jobs at the existing pay and benefit scale does not show that salaries are too high. If the large applicant pool enables the government to select the very best candidates for permanent employment, then what matters is not the extent of excess demand for public sector jobs, but rather whether the terms offered are adequate to attract the high-quality candidates who *do* get selected (and may have otherwise opted out of public service).

In other words establishing whether salaries are too high or low requires a comparison of the marginal cost and marginal productivity of government workers at different levels of pay. This is a non-trivial problem because measuring public sector productivity is difficult to begin with – let alone mapping productivity to specific workers and levels of pay. However, there is one important government-provided service in which we can measure productivity and attribute it to specific workers. This is the case of teaching, where detailed longitudinal data on the annual learning progress of students, combined with the information on the assignment of students to teachers each year, can be used to estimate the "value added" of each teacher. Since the job description for all teachers is similar (teaching children), teachers mostly work on their own in their classroom, and their output is quantifiable in a meaningful way,<sup>8</sup> education provides a useful setting to compare the productivity of different types of public workers. Specifically, this setting can be used to study the relative effectiveness of regular civil-service teachers and contract teachers (or para-teachers) who are hired through different processes and under very different employment terms.

Muralidharan and Sundararaman (2013) present such evidence based on five years of data collected on primary education in Andhra Pradesh (AP) and report two main findings. First, untrained contract teachers (or para-teachers) are able to significantly improve learning outcomes in primary school. Second, contract teachers are at least as effective as regular civil-service teachers who are more educated, have formal teacher training credentials, and are paid over five

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<sup>8</sup> See Chetty et al (2014a and 2014b) for evidence that having a "high-value added" teacher in school (measured by their effectiveness in raising students' test scores) is correlated with positive long-term labor market outcomes.

times higher salaries.<sup>9</sup> They also find that regular teachers were 50% more likely to be absent (with an absence rate of 27 percentage points compared to 18 percentage points for contract teachers). Overall, the results suggest that the contract teachers were able to more than make up for their lower levels education, training, and experience with higher levels of effort.

Other plausible mechanisms for the positive effects of contract teachers include the lower social distance relative to the communities they served, the greater accountability to the community (due to the renewable nature of their contracts), and the fact that they live in the village closer to the school (reducing the daily cost of attendance). Indeed, Kingdon (2011) argues that the high salaries of regular teachers may *increase* their social distance from the communities they serve and make it more difficult for communities to hold teachers accountable.

Further, analysis of longitudinal data on education from AP finds no correlation between teachers' value-added and their salary level. The current pay structure rewards qualifications and experience, but these do *not* appear to be correlated with productivity. Similarly, Bau and Das (2011) also find no correlation between teacher salaries and value-added in public schools in Pakistan. Thus, high *levels* of pay seem to be neither necessary nor sufficient to ensure improved public worker performance.

In contrast, Muralidharan and Sundararaman (2011) and Muralidharan (2012) find that even modest amounts of performance-linked pay for public school teachers in AP (equal to an average of 3% of annual pay – but within a range of 0-15%) led to sharp increases in student learning outcomes that were sustained over five years. Muralidharan (2012) finds that students who completed five years of primary school under a system in which their teachers were paid these small performance-linked bonuses scored 0.54 and 0.34 standard deviations higher on math and language tests, respectively (these are very large effects when compared to those of other education interventions).

The idea that the productivity of public sector workers is much more sensitive to the *structure* of pay than to its levels is further supported by recent experimental evidence from Indonesia. De Ree, Muralidharan, Pradhan, and Rogers (2015) evaluate the impact of a

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<sup>9</sup> This does not even account for the additional employer contribution towards pensions (equivalent to 10% of salary) that the government pays for regular teachers, but does not for contract teachers.

landmark teacher law passed in Indonesia that *doubled* teacher pay across the board. They find that the pay increase led to a significant increase in teacher satisfaction with their income, a reduction in the number of teachers holding second jobs (and in the hours spent on these jobs), and a reduction in their self-reported financial stress. Despite these improvements, the doubling of pay had absolutely *zero* impact on improved learning outcomes. While it is possible that the increases in pay may have attracted higher-quality candidates over the long-run, the results suggest that unconditional salary increases for current workers (that are not linked to performance) are an extremely inefficient use of scarce public funds for improving social sector outcomes. This lesson is especially relevant for the Seventh Pay Commission in India (and for states considering adopting these norms for their employees).

While the best evidence on comparative productivity across public workers on different pay and employment contracts comes from education, there is also similar evidence from the health sector. Das, Holla, Mohpal, and Muralidharan (2016) measure the quality of healthcare across public and private providers in rural Madhya Pradesh using an audit study, where highly-trained standardized fake patients presented a common set of symptoms during unannounced visits to healthcare providers. The symptoms presented were for cases of unstable angina, asthma, and dysentery in a 2-year-old child at home, and the cases were chosen so that the presenting symptoms were consistent with multiple possible diagnoses. The quality of healthcare provided was evaluated based on the effort expended by the provider to reach a correct diagnosis (measured by the fraction of items completed on an essential checklist of history-taking questions and exams), and the correctness of the treatment provided.<sup>10</sup>

In addition to measuring provider quality, Das et al. (2016) observe the prices charged for the transaction in the private sector, and collect data on salaries for the public sector staff. They find that while prices charged in the private sector are positively correlated with effort (time spent, and checklist completion) and with the provision of a correct treatment, there is *no correlation* between wages and effort or quality in the public sector.

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<sup>10</sup> The use of standardized patients allows the authors of this study to credibly measure quality of care provided because they know the underlying ailment that was presented, the corresponding checklist items, and the correct treatment. This would not be possible if they just observed doctors in their clinics with typical patients because the actual ailment presented and the corresponding correct treatment protocol would not be known to the observer. The details of the measurement protocol are important because the fundamental challenge in assessing whether pay is correlated with productivity is to identify the productivity/quality of individual public-sector workers.

Thus, while the current structure of entry-level pay and benefits in public sector jobs may attract more qualified candidates on paper, it is not clear that these qualifications are either necessary (as seen by the evidence on contract teachers) or sufficient to ensure quality service delivery. Overall, the idea that high salaries, benefits, and job security help to attract the most effective public sector workers does not seem to be supported by the evidence. Further, modifying the structure of pay to include performance-based components is likely to deliver considerably improved outcomes for a given level of spending.

### **2.3. The status quo on training and credentialing is not working**

Another rationale for the current system of public sector recruitment is to hire qualified service providers. For instance, teacher selection norms prescribe that candidates must have either a diploma or degree in education. While this seems reasonable, it does not seem to produce the expected results. For instance, there is not a single credible study on education in India that finds a significant positive correlation between teachers possessing formal training credentials and their effectiveness in improving student learning – at least in the public sector (see Muralidharan 2013 for a review of the evidence). Why might this be the case? There are three plausible reasons.

First, many of the institutions that provide teacher education certificates are of very poor quality and it is not uncommon for these certificates to even be purchased, in which case it is not surprising that their possession is not correlated with effectiveness. Second, even in cases where the institutions are of reasonable quality and the credentials genuine, a content analysis of the curriculum of teacher training institutions reveals an almost exclusive focus on theoretical issues including history, theory, philosophy, and sociology of education with very little attention paid to effective pedagogy. While the current content may help teachers become more reflective and potentially more effective, it does not adequately prepare them for the practice of managing a classroom full of children and teaching effectively in such a setting. Third, even if the content of the training is useful in making teachers more effective, it may not translate into improvements in classroom effectiveness because there are no career rewards for effective teaching.

The establishment of a Teacher Eligibility Test (TET) as a pre-requisite for entry into the profession is likely to help with the first problem (of low-quality or fake degrees). Yet, it does

not address the second or third concerns. In contrast, the global evidence on effective teacher training programs suggests that programs that intersperse classroom instruction with extended periods of teaching practice under the observation of experienced teachers hold some promise (see next section for the review). This is already common practice in the medical profession, in which residents conduct hospital rounds supervised by senior physicians to diagnose patients and propose a prognosis. I will return to this theme in the next section.

#### **2.4. Mismatch between Selection Criteria and Determinants of Effectiveness on the Job**

The results presented above suggest that the current selection criteria (performance on exams and interviews) as well as pay criteria (qualifications and experience) do not predict the performance of employees on the job. At the same time, we also find significant and persistent variation in employee effectiveness when measured directly with performance data (such as teachers' value-added). Given that this variation is persistent, it suggests that there *are* characteristics of employees that are correlated with their performance, but that these characteristics are not easily observed at the time of recruitment.

Identifying and quantifying these traits is an active and fascinating area of ongoing research. Some of these include traits such as persistence, grit, discipline, and pro-social behavior that may be correlated with effectiveness on any job, and some are traits that may be relevant for success on specific jobs (such as enjoying working with children for teachers or early childhood workers).<sup>11</sup> This literature is still nascent, but two broad themes emerge from it.

First, there is mounting evidence that employee characteristics that are difficult to observe at the time of recruitment are important for their actual effectiveness. For instance, there is evidence skills such as leadership, perseverance, and critical thinking are positively correlated with teacher effectiveness (Bastian, 2013; Dobbie, 2011; Duckworth, Quinn, & Seligman, 2009; Rockoff, Jacob, Kane, & Staiger, 2011). There is also suggestive evidence that public employees with higher "socio-emotional" or "character" skills perform better on the job. For example,

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<sup>11</sup> This is an important distinction, because sector advocates often argue for policies that will attract higher quality candidates into that specific profession (the most common example is arguing for salary increases across the board – see for instance the UNESCO Education for All Global Monitoring Reports). However, from a social perspective, it is not obvious that this is efficient because attracting high-quality talent into a sector displaces it from other sectors where the social value of the talent could have been higher. On the other hand, identifying the traits that are likely to make candidates more successful in some professions than in others, and using these traits to match candidates to occupations, will likely improve job fit and increase efficiency across the board.

doctors in Punjab (Pakistan) who scored higher on measures of agreeableness, emotional stability, extroversion, conscientiousness, and openness (collectively known as the "Big Five" traits), or on a measure of intrinsic motivation for public service, were more likely to attend work and less likely to falsify inspection reports (Callen et al 2015). Health inspectors who scored higher on these personality measures were also more responsive to increased monitoring. And senior health officials with higher Big Five scores were more likely to respond to a report of an underperforming facility by compelling better staff attendance.

There is also evidence from teacher interviews conducted in Andhra Pradesh that pro-social attitudes and empathy with student conditions is an important predictor of teacher effectiveness (these interviews were conducted as part of the Andhra Pradesh Randomized Evaluation Studies in education). Specifically, interviewing teachers facing similar student populations but who had different levels of effectiveness, we found that low-performing teachers often had a derogatory attitude towards first-generation learners. They claimed that these children would drop out of school anyway, and only attended school for the free mid-day meals. On the other hand, high-performing teachers reacted to the same situation with the attitude that *they* were the only hope for a child who was a first-generation learner. The importance of such differences in empathy is almost obvious ex-post, but these are not traits on which teachers are currently selected.

The same theme was repeated during my recent field visits to ICDS centers in Tamilnadu, where senior field staff mentioned that many candidates simply applied for the job because of the attraction of a government job, and often got recruited based on their paper qualifications and interview, but that they were not a good fit for the job because of inadequate empathy with children and inability to keep them engaged in a classroom.

The second important theme from this literature is that while these traits (I shall refer to them as "non-CV" traits) are difficult to measure at the time of recruiting, they *are* observable on the job. In the United States, a number of studies have shown that teachers' performance on classroom observations (Grossman, Loeb, Cohen, & Wyckoff, 2013; Kane & Staiger, 2012; Kane, Taylor, Tyler, & Wooten, 2011; Pianta, Belsky, Vandergrift, Houts, & Morrison, 2008), student surveys (Kane & Staiger, 2011), and principal surveys (Jacob & Lefgren, 2008; Rockoff, Staiger, Kane, & Taylor, 2012) do a much better job predicting that teachers' capacity to improve student achievement than traditional measures such as graduate degrees or teaching certificates.

Again, while the best evidence on these topics comes from education, several qualitative studies from around the world point to the importance of temperament and other, "non-CV" traits in the effectiveness of policemen and in their ability to be unbiased in interacting with populations with different demographic characteristics from themselves, which are however easily observable to senior officers and colleagues (Correll et al 2002; Sim et al 2013).

## **2.5. Spatial mismatch**

The average figures on police officers, teachers, and health workers per capita in section 2.1 may severely understate the extent of staff shortages by masking considerable spatial variation. This is true both across states (with poorer states having worse ratios – partly explained by their lower budgets) and within states (with rural areas having much poorer effective availability per capita of public service providers). Note the use of the term "effective availability" as opposed to "availability". The latter is typically reported in official data on the basis of sanctioned staff, whereas the former accounts for unfilled vacancies and provider absences (which are both higher in poorer states and rural areas).

For instance, the all-India average pupil-teacher ratio (PTR) in primary schools in 2010 was 39.8:1, which was in accordance with the norms at the time (a PTR of 40:1 prior to the passing of the RtE Act). However, this average can be misleading because states like Kerala, Tamilnadu, Karnataka, Andhra Pradesh, and Himachal Pradesh had PTRs of 25:1 or lower; states like UP and MP had PTRs of around 47:1; and states like Bihar had PTRs close to 70:1. Adjusting for teacher absences, the figure is even more striking, with effective PTR in UP being close to 70:1, in Jharkhand to 80:1, and in Bihar to 100:1 (Muralidharan et al. 2015).

Similar patterns emerge in police to population ratios. The situation is particularly grim in states like UP, where each policeman serves over 1,100 people, which is almost double the national average (DNA 2014). Further, in practice, the spatial allocation of police personnel is controlled by elites and leads to a more than proportionate use of police personnel to address elite concerns as opposed to that of the average population. A striking example is provided by the extent to which police forces are diverted to VIP security relative to general policing. For

instance, out of the 83,762 policemen in New Delhi, the largest police force, only 30% work in general policing. The remainder were reserved for personal security details (Bergen 2013).<sup>12</sup>

Finally, the shortage of health workers differs widely across states. For example, states like Kerala, Tamil Nadu, and Karnataka have 3.46, 3.39, and 3.09 nurses and midwives per 1,000 people, respectively (Hazarika 2013). Others like Uttaranchal, Bihar, and Jharkhand have 0.08, 0.16, and 0.17 nurses and midwives per 1,000 people, respectively. The pattern is similar for doctors and dentists. The number of health workers per 10,000 people ranges from 23.2 in Chandigarh to 2.5 in Meghalaya (Rao et al 2011). Overall, the combination of fiscal pressures in hiring and weaker governance (which leads to higher absence rates) makes service delivery in large states such as UP, MP, Bihar, and Jharkhand especially challenging.

A further distortion comes from the fact that service providers are typically most needed in rural areas, but qualified providers typically prefer to live in more urban areas closer to better facilities and schools for their children. Indeed, one reason for the high absence rates of regular teachers and health-workers compared to contract teachers and community health workers is that the former typically live in the block or even district headquarters and commute to their jobs each day, whereas the latter live in the villages they are serving. Data from AP shows that the typical contract teacher lives one kilometer away from the school, whereas the typical regular teacher lives over 12 kilometers away (Muralidharan and Sundararaman 2013).

Overall, the status quo prioritizes hiring the most qualified candidates at the district or state level, but ignores the spatial mismatch that ensues. Since the most qualified candidates disproportionately come from urban areas or have aspirations to continuously move to larger cities, it is more common to find staff vacancies in rural as opposed to urban areas. This in turn leads to lower staff-to-population ratios in rural areas. Even if administrative allocations of staff are equalized spatially, it is impossible to prevent staff from choosing to live far away from their work sites in urban areas and commute to work – which both increases absence rates and reduces their connection to the communities they serve. Further, corruption in transfers and postings is

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<sup>12</sup> These figures may be particularly extreme because New Delhi is the national capital and has a disproportionate number of VIP's (including diplomatic staff attached to embassies), who may need additional security. Nevertheless, the main point is that data on average number of police per capita may over-estimate the effective strength of staff for maintaining general purpose law and order, and this is still likely to be true in most parts of India, though systematic data on the spatial allocation of police personnel was not easy to find.

widespread in many states, and again reflects the spatial mismatch between where posts exist and where providers want to live (see Bêteille 2009).

Given the earlier results that show no correlation between paper qualifications and effectiveness on the job for front-line service providers, and the evidence from multiple studies of lower absenteeism among locally-hired staff with modest amounts of training, there is a strong empirical case for making local hiring a core principle of staff recruitment for service delivery positions. For instance, Bang et al (1999) and Haines et al. (2007) show that community health workers who receive limited training and are paid much more modest stipends than regular government health workers were able to improve health outcomes in underserved rural areas in India. Further, given that contract teachers and community health workers are effective at a fraction of the cost of regular government employees, using such workers may be a promising avenue to further explore for improving service delivery in a cost-effective way.

## **2.6. Time wasted by educated youth in trying to get a public sector job**

Beyond the direct inefficiencies in service provision, the structure of public sector labor markets also induces important distortions in the overall economy. One unappreciated distortion is the extent to which educated youth spend years attempting to get a government job by taking exams for any government job opening. The most common job aspiration for youth across India is a government job, and millions attempt to get one each year. Many of them spend several years unemployed or under-employed and they are supported by their families and part-time jobs (that do not build skills or certification) while making multiple attempts at passing exams to get a government job. Jeffrey (2010) provides an illuminating ethnography of educated unemployed youth in Meerut, Uttar Pradesh for whom the phenomenon of "waiting" for a government job is so widespread that the title of his book is *Timepass*.

Analysis of unemployment by age using NSS data finds considerably higher unemployment rates for males below age 30 (which is the age limit for entry into many government jobs).<sup>13</sup> This is also consistent with evidence reported in Krishnan and Somanathan (2013) that the average age of selection into the civil-service has been steadily increasing and that the average applicant makes between three and four attempts to get selected. Thus, the average *successful* applicant

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<sup>13</sup> I thank Abhijit Banerjee for sharing these results from his ongoing work on youth employment in India.

spends around four years preparing for and attempting these exams. Since the ratio of applicants to positions exceeds 200:1, this implies that hundreds of thousands (if not millions) of youth in their twenties attempt these exams, and it is not surprising to see the age-unemployment patterns in Figure 1.

The time spent attempting these exams also takes educated youth away from *other* productive parts of the economy. A puzzling fact about youth and skilling in India is the low take-up for training programs, and very high attrition from training programs. There is anecdotal evidence that at least 80% of trained candidates leave their jobs within three months of their placement (UPSDM Brief, 2009).<sup>14</sup> Anecdotes suggest that a plausible reason for this is that many youth prefer to attempt entrance exams for government jobs rather than getting skilled and entering a competitive and uncertain labour market.

Note that this is perfectly rational on the part of individuals because the returns to winning the "government job lottery" are so large (with above-market wages, pension and benefits, lifetime job security, and the potential to extract rents in several public sector jobs) that it makes sense to keep trying instead of getting skilled and working in the competitive private economy.<sup>15</sup> However, while it may be individually rational, it is socially inefficient because the probability of winning this lottery is very low, and those who do not make it waste several prime years of youth, which could potentially be used to obtain real skills and be productively employed.<sup>16</sup>

## 2.7. Corruption in recruiting

A final manifestation of the distortions induced by the structure of public-sector labor markets is the widely acknowledged prevalence of corruption in recruiting for public sector

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<sup>14</sup> Interviews with placement managers (conducted by Abhijit Banerjee and his colleagues on an ongoing project) confirm this phenomenon with quotes along the lines of: "Attrition post-placement is one of our larger concerns. While most candidates complete two-to-three-month long trainings, very few of them eventually stick on in the labour market."

<sup>15</sup> A particularly striking recent example of this point was the widely reported case of over 2.3 million applicants for 368 posts as a peon in Uttar Pradesh, including over 250 applicants with a Ph.D. qualification (Verma 2015), implying an applicant to post ratio of over 6000. While the story was widely reported in the media as reflecting poor employment opportunities, the data are also consistent with the large "excess returns" over the market wage to a job in the government or public sector.

<sup>16</sup> In practice, many of these applicants do combine their exam preparation with various formal and informal jobs and so not all their time is wasted. Nevertheless, obtaining a public sector job and studying for the selection exams is typically the main focus of these youth, as opposed to obtaining skills that are rewarded in the broader economy.

jobs.<sup>17</sup> Since the present discounted value of winning the "government job lottery" is so large, it is not surprising that candidates are willing to pay to improve their chances, or that officials with discretion will be tempted to offer such options. Thus, the potential benefit of paying significantly above-market wages in the hope of attracting the best candidates may be rendered moot if it induces corruption in hiring. Note also that candidates appointed this way are likely to be negatively selected on intrinsic motivation (Shleifer and Vishny 1993) and work less hard since they would have paid for their jobs (Akerlof 1982) and would be more likely to want to recover their upfront cost of their investment through corruption or shirking.

It is of course possible that the status quo benefits political leaders who can either monetize the "excess returns" in government jobs through upfront bribes, or offer the promise of a government job as patronage in return for political support. The latter channel may be a particularly important incentive for unemployed youth to work as political party workers, with the government job being offered in return for loyal service. In such a case, there may be limited political incentives for reforming the structure of public sector hiring. Nevertheless, it is also true that state level political leaders are under increasing political pressure to deliver better public services. The approach to public sector hiring laid out in the next section assumes the existence of political will to improve service delivery and offers an approach that would allow this in a fiscally feasible way.

### **3. A New Approach to Public Sector Hiring**

The facts outlined in the previous section point to several distortions in public sector labor markets, many of which are inter-related. In this section, I outline a proposal for a new approach to public sector hiring that mitigates several of these weaknesses and can form the basis for a comprehensive human resource strategy for public service delivery. Since the core elements of the idea have been outlined in the introduction, this section provides a fully fleshed out example from teaching and then present brief extensions to police and early childhood care workers.

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<sup>17</sup> Recruitment scams that have come into public attention recently include the Vyapam scam in MP, the teacher recruitment scam in Haryana (for which a former Chief Minister was convicted), and the recent resignation of a Railway Minister in response to allegations that he was selling positions on the apex Railway Board. However, corruption in public sector recruitment has long been widespread in India. See Wade (1985) for the classic reference, and see Sukhtankar and Vaishnav (2015) for a fuller set of references.

### **3.1. Case Study 1: Teaching Assistants<sup>18</sup>**

#### **3.1.1. The quality challenge in primary education in India**

With more than 50% of children aged 6-14 not being able to read at a second class level, the quality challenge is the biggest crisis in the Indian education system. Long-term annual data on student learning in primary schools in India shows a sharp flattening of learning trajectories after class 2 (Muralidharan and Zieleniak 2014). The most likely reason for this is that the textbooks and syllabus in class 3 and beyond require children to be able to "read to learn" and children who have not attained reading competencies by class 3 sharply fall behind over time.

The main message from high-quality academic research on the impact of education policies on improving education is that the most expensive components of education spending that have been prioritized in recent years (infrastructure, teacher salaries and training, mid-day meals, and other inputs) have shown very limited impacts on improving learning outcomes. It is extremely unlikely that a "business as usual" expansion of education spending along current patterns will significantly improve learning outcomes (Muralidharan 2013). On the other hand, relatively inexpensive interventions such as using modestly trained and paid community volunteers to provide supplemental instruction to children at their level of learning (as opposed to the level dictated by the curriculum or assumed by the textbook) have proven to be highly effective at improving learning outcomes in multiple settings across India.

The Twelfth Five-Year Plan recognizes the centrality of the quality challenge and has explicitly committed to a target of: "Improving learning outcomes that are measured, monitored, and reported independently at all levels of school education with a special focus on ensuring that all children master basic reading and numeracy skills by class 2 and skills of critical thinking, expression and problem solving by class 5." While investing in education quality is clearly one of the most important priorities for the Government of India, the fiscally-constrained budgetary environment creates an imperative to implement both cost-effective and scalable policies to address this massive challenge.

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<sup>18</sup> This section is adapted from Muralidharan (2013) but has been expanded with more details and references.

### **3.1.2. Teaching assistant proposal outline**

I posit here that changing the structure of public sector hiring of teachers to include an entry-level apprenticeship position (called a "teaching assistant" or TA) provides one of the most promising and fiscally sustainable ways of achieving the learning objectives of the Twelfth Plan. The fiscal neutrality of the proposal relies on making more efficient use of the Rs. 25,000 crores per year earmarked for the most expensive stipulation of the Right to Education (RTE) Act, which is to reduce pupil-teacher ratios (PTR) from 40:1 to 30:1. This may be especially relevant for states with large effective PTRs like UP, Bihar, and MP.

The proposal suggests maintaining the regular teacher norm at 40:1 (subject to a minimum of two regular teachers per school as per original Sarva Shiksha Abhiyan (SSA) norms) as opposed to 30:1. The same funds that would have been used to achieve the reduction from 40:1 to 30:1 can be used to provide each regular teacher with two TAs from the same village. These TAs shall have an explicit mandate to focus on first-generation and weaker learners and to provide small-group instruction that is tailored to their current level. Such an allocation of TAs to teachers will enable the PTR (defined as the ratio of adults to children in the school) to be reduced to 13.5 (or lower), which will allow for much more individualized attention to children and provide schools with the teaching resources needed to bridge early learning gaps. The main goal of the proposal is to provide the regular teacher with the instructional support needed to ensure that *all children* master basic reading and numeracy skills by class 2 or 3 (to be able to "read to learn") as targeted in the Twelfth Plan, and to hold regular teachers responsible for delivering on this goal.

The proposal allows for a sharp reduction in PTR in a fiscally-sustainable way, while also creating employment and skill-building opportunities for educated rural youth (especially, young women). The TA position would also be the first step in a career ladder that allows many more candidates to try out teaching and select the best candidates (as revealed partly by their performance on the job) for regular teacher positions.

### **3.1.3. Qualifications and appointment criteria**

The appointment criteria for the teaching assistants would be very similar to those used for the appointment of non-regular government employees in several service delivery functions. Examples include the appointment of contract or guest teachers, and anganwadi or ASHA

workers. While there may be variation across states and sectors in the appointment rules, the following broad principles would apply to prioritize among applicants for the teaching assistant position. Different weights can be assigned to each of the criteria below to come up with a composite score for ranking applicants.

First, in line with the evidence presented earlier, preference will be given to candidates from be from the same village (or Panchayat if needed). The minimum qualification for this role will be passing twelfth standard, though the most qualified applicants in a village will be prioritized for appointments. Current data suggests that around half of the appointees will be college graduates, while half will have passed twelfth standard (though in some exceptional cases it is possible that the most educated candidate in a village will only have passed tenth standard). TAs will be appointed for one year at a time with the target duration of total employment being four years. The appointments will be renewed annually, subject to meeting performance and training norms. No formal teacher training credentials will be required to join as a TA, but continuous and ongoing training will be required over four years (see below). Since research suggests that women may be more effective at teaching younger children (especially, young girls), each school could target filling 50-75% of these positions with women (Muralidharan and Sheth 2016). Reservation policies can be implemented in accordance with current norms.

Note that there is likely to be a surplus of applicants even for these apprentice level jobs and it will be necessary to implement standardized procedures for their hiring at the block or district levels. However, implementing such procedures is within the existing capabilities of the government since the suggested recruiting protocol is similar to ones that are already in place for contract teachers and anganwadi workers.

### **3.1.4. Training and Credentialing**

As discussed earlier, a consistent finding in the research on education quality globally over the past four decades, and in India over the past decade, is that there is no association between having a formal teacher training credential and teacher effectiveness in improving student learning outcomes (Hanushek, 1971, 1986, 1992; Kane & Staiger, 2012; Rivkin, Hanushek, & Kain, 2005). This does not imply that training cannot have an impact on improving teacher effectiveness, but it does suggest that training credentials (as currently generated within the

system) are unlikely to be effective markers of teacher quality, and that it is essential to rethink the approach to teacher training. [SEP]

Some of the most promising innovations in teacher training around the world involve experimenting with different ways of integrating traditional lecture-style teacher training with teaching "practicums" (i.e., opportunities for trainees to practice teaching under the supervision of an experienced mentor). There is suggestive evidence that these "practice-based" teacher preparation programs may have multiple benefits, including: (a) broadening the pool of high-talent entrants to the profession; (b) improving the screening of aspiring teachers; (c) accelerating the learning of new teachers; and (d) inducing teachers to work hard at improving their effectiveness in the early stages of their career, when professional habits are formed.

First, these programs may attract high-ability individuals who did not originally study to become teachers. For example, in the United States, there are more than 30 "teacher residency programs" (TRPs), in which college graduates interested in entering teaching simultaneously complete coursework and have a supervised fieldwork experience for at least one year. A study of these programs indicated that TRPs broadened the pool of candidates that entered teaching, attracting candidates who had not initially studied education, and that novice teachers in these programs were as likely to stay in teaching as regular novice teachers (Silva, McKie, Knechtel, Gleason, & Makowsky, 2014).

Second, practice-based teacher preparation programs may offer an opportunity to assess whether teaching trainees will become effective teachers. For example, a program that recruits college graduates to teach in hard-to-staff schools in New York City requires its applicants to, among other things, deliver a demonstration lesson. A study found that the performance of applicants in this selection process predicted their subsequent effectiveness in the classroom, as measured by student achievement gains (Rockoff & Speroni, 2011). Similarly, a "mentoring" program, also in New York City, requires experienced teachers to periodically observe the lessons of new recruits. The same study found that the performance of new teachers on these observations predicted the performance of their students in standardized tests.

Third, practice-based teacher preparation programs may help teachers improve faster. For example, a study of a TRP in Boston, Massachusetts found that program participants were

initially less effective than regular novice teachers at teaching math and equally effective at teaching English (Papay, West, Fullerton, & Kane, 2012). However, "residents" (as program participants are called) improved faster than regular novice teachers (at least in math), and by their fourth and five years they outperformed veteran teachers. Similarly, a small randomized trial of an in-service "coaching" program for teachers in their first four years of service in New Orleans, Louisiana found that the program improved teachers' performance on classroom observations, principal evaluations, and student surveys (Kraft & Blazar, 2014). These effects emerged across subjects and grades, and they persisted beyond the first year.

Finally, practice-based teacher preparation programs may also provide incentives for trainees to try their hardest, if there are consequences for poor and good performance. For example, a randomized evaluation of a high-stakes teacher evaluation system in Cincinnati, Ohio showed that the system improved the performance of teachers during and after the evaluation process (Taylor & Tyler, 2012). Similarly, a randomized evaluation of another high-stakes teacher evaluation system in Washington, DC found that low-performing teachers at risk of being dismissed left the district, and that high-performing teachers who received a bonus improved their performance (Dee & Wyckoff, 2015).

While all the evidence cited above is from the US, and this literature is still too nascent to make definitive recommendations, there is at least a *prima facie* case for experimenting with practice-based training. The TA program may be an especially promising opportunity to re-imagine training along these lines. The proposal makes the following suggestions pertaining to TA training.

Selected high-quality accredited teacher training institutes should be invited to create a modular teacher training program that lasts four years and includes three months per year of lecture-based instruction and eight to nine months per year of classroom teaching as an apprenticeship under the guidance of a senior regular teacher. The three-month modules can be implemented during the summer vacation and other school breaks and can also include weekend classes. They should be designed to be sequential so that a new recruit with no teaching experience can function effectively in a classroom as a TA after the first three-month module (i.e. the first module will focus mostly on classroom management and instruction skills, with later modules adding more theoretical components).

Thus, a TA who is selected through the recruitment guidelines laid out above can be selected without any teacher training, but then undergo an initial three-month training module (with tests and grading) before entering the classroom as an apprentice. Over four years, the successful completion of all the training modules combined with evaluations of classroom performance, will lead to a formal education credential issued by the accredited teacher training institute. The TAs will be paid their regular stipend during their training period (subject to passing modular exams), which minimizes financial risk to them. Many of these students would have otherwise paid large amounts of money to enroll in low-quality teacher training programs that do not lead to teaching jobs.

### **3.1.5. Pay and integration into regular teacher track**

The salary for this position will range from Rs. 5,000 to Rs. 10,000 per month, depending on qualification and experience. This is considerably lower than the pay scales of regular government teachers (in the range of Rs. 20,000 – Rs. 40,000 per month), and will roughly be 20-25% of a regular teacher's salary, which is what will make it feasible to hire three to four TAs for the same cost as one regular teacher. But as documented in several studies, this pay scale compares very well with the pay offered to similarly qualified candidates in rural India, and it is *higher* than the average salary paid by private schools in rural areas (Muralidharan and Sundararaman 2013). Evidence suggests that there is likely to be an excess supply of qualified candidates at this salary (Kingdon and Sipahimalani-Rao 2010). 

After serving four years as TAs, candidates who are college graduates and have obtained the D.Ed. or B.Ed equivalent through the modular training program, can apply to be hired as a regular civil-service teacher. They must take the Teacher Eligibility Test (TET) and go through the standard selection procedure, but they will receive additional credit for each year of experience as a TA. Ideally, this credit will be performance-based, but I recognize that effective performance evaluation and employee performance rating is rarely done effectively at lower levels of government. But even if fine-grained evaluation is not possible, it may be feasible to have annual ratings of TAs on a forced curve of outstanding (20%); average (middle 60%) and below average (bottom 20%). After four years, applicants can get extra marks on the entrance exam for regular hiring for each year of service based on their ratings (say 4%, 2%, and 0% for each year of service at each rating).

In practice, it is possible that even such a 3-tiered forced curve may be difficult to implement in an objective manner. It may therefore be prudent to start with simply providing credit for each year of successful service as an apprentice during the process of regular hiring. This way, the high-stakes regularization will still follow the existing protocols, but with extra credit for the apprenticeship period. Over time, with improvements in measurement technology, it may be possible to include more objective performance measures during the apprenticeship period (such as attendance and time on task) and provide additional marks for these.<sup>19</sup> The exact formula can be determined at the state level, but the key idea is to provide credit for experience as a teaching assistant in the regular teacher hiring decision (with a gradual shift over time to performance-based credit).

Thus, top-scoring candidates on the TET may qualify for direct recruitment as regular teachers (without going through the TA experience), but for two candidates with the same exam marks, classroom experience as TAs will enhance their probability of selection as regular teachers. As a result, the TA position will typically be the first step in a career ladder, and the recruiting system will recognize the value of classroom experience in addition to pure theoretical knowledge, as reflected by formal qualifications. Equally importantly, this system will help candidates discover whether they actually enjoy teaching and are good at it before deciding whether teaching should be a life-long career. This will reduce the cases of 'mismatches' where candidates train to be a teacher and realize later that they actually do not like the job or are not good at it.

Candidates who complete the modular D.Ed./B.Ed but do not get selected for regular positions through the TET will be eligible for an exit payment of Rs. 1 lakh after four years of successful service. Some TAs may choose to take this exit payment and attempt other careers. Others may choose to continue working as TAs, and make additional attempts to qualify for selection as a regular teacher through the TET (if they are college graduates) until they reach the age limit for selection as a regular teacher.<sup>20</sup> Candidates who complete the modular D.Ed. and choose to remain as TAs for the longer-run without aiming for selection as regular teachers (because they are not college graduates or they do not want a transferrable job) can be eligible

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<sup>19</sup> For instance, the Government of Delhi's pilot initiative to introduce Closed Circuit TV (CCTV) cameras in schools and classrooms may make it possible to obtain objective measures of teacher performance such as attendance and time on task within the classroom, which can then be used at the time of regular hiring.

<sup>20</sup> It may be desirable to limit the number of years of credit that can be obtained for successful service as a TA in regular hiring and to cap this at four or five years, but this is a detail that can be worked out later.

for longer-term TA contracts at the village school. There is also likely to be increased demand for these candidates as teachers in private schools, which will increasingly need trained teachers to meet RTE requirements.

The payment of Rs. 1 lakh as a lump sum at the end of four years of successful service has several attractive features. First, it provides candidates who would not like to continue in teaching with the resources to explore other career options at a young age. Second, it is also likely that many of the candidates for TA positions will be young women who may only plan to work as teaching assistants when they are 18 to 22 years old, before getting married or starting a family. The lump-sum payment would significantly enhance female independence and empowerment and raise the value placed on girls in patriarchal settings (especially, in rural North India). Many state governments already offer lump-sum incentives of around Rs. 60,000 to girls who complete twelfth standard and stay unmarried till then.<sup>21</sup> The suggestion here follows the same approach and extends it to the ages 18 to 22, but in this case provides payments for working in a role that will improve service delivery and can help achieve universal functional literacy and numeracy in the next five years. More broadly, it creates a social contract with educated youth (especially, young women) by saying that "you invest in the next generation of school-going children and we (the government) will invest in you." 

### **3.1.6 Summary of Program Benefits**

The key benefits of adopting the approach summarized here are the following. First, it provides schools with the additional teaching resources needed to realistically deliver on the Twelfth Plan goal of making sure that all children master basic reading and numeracy skills by class 2. The proposal facilitates the reduction of PTR to below 14:1 and the provision of substantially greater individual (or small-group) attention to children who are not reaching basic competencies in reading and numeracy. Second, it has the potential to make teacher training more effective by integrating lecture-based theoretical training and classroom practice, and it provides a sound foundation for building effective teachers. Third, the modified pathway to teacher recruitment, training, and promotion to 'regular teacher' is likely to significantly improve teacher quality over time due to: (a) the better integration of teacher training and practice; and (b)

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<sup>21</sup> The Ladli Laxmi Yojana in Madhya Pradesh is perhaps the best known such scheme and this has now been replicated in several North Indian states including UP, Bihar, and Jharkhand.

the fact that high-performing TAs will be more likely to obtain regular teacher appointments, and TAs who find themselves to be poorly suited for teaching are less likely to do so. Fourth, it will provide employment to educated youth (especially women) who may be unwilling or unable to work outside their village. Finally, the policy is likely to significantly increase female empowerment – by providing educated young girls with a job, a steady income and greater financial independence, increased respect in the village, and greater control over marriage and fertility decisions. A further benefit is the generation of strong positive role model effects for younger school-going girls. The visibility of these jobs in villages is also likely to increase the perceived 'returns to education', and consequently, increase the demand for education among girls and their parents (Jensen 2012). 

### **3.1.7 Key Differences between Teaching Assistants and Contract Teachers**

As discussed earlier, some parts of this idea are not new. Specifically, many states have hired para-teachers or contract teachers in the past to meet teacher shortages. However, despite the evidence that contract teachers may be less absent and as effective as regular teachers who are paid much higher salaries (which is the empirical finding that underpins the teaching assistant proposal), the contract teacher model was not a practical success for three broad sets of reasons.

First, contract teachers were hired as *substitutes* for regular teachers and not *supplements* (which is what the TA proposal does). Thus, the idea never got support and traction among the education community, which saw the policy as driven by short-term fiscal concerns at the expense of long-term education quality. In particular, they were worried about the negative consequences of de-professionalizing teaching in the long-run (Kumar et al 2001). Second, the idea of contract teachers ran into legal trouble for not conforming to the norm of equal pay for equal work. Since contract teachers were working side-by-side with regular teachers and doing the same job, courts often ruled in favor of granting contract teachers regular status, which led to severe fiscal pressures on states (see Robinson and Gauri 2011 for a discussion of contract teacher cases in the Indian courts). Finally, since many cohorts of contract teachers were hired alongside a freeze in regular teacher hiring, it became politically very difficult to resist demands for regularization, which were often granted prior to elections.

The teaching assistant proposal leverages the strengths of community and village-based teachers, while carefully addressing all the three main weaknesses of the contract teacher model described above.

First, as the discussion regarding best practices on training makes clear, the aim of the TA proposal is to *increase* teacher quality and professionalism by: (a) integrating lecture-based theoretical training and classroom practice to create a more effective teacher training program; and (b) regularizing only high-performing TAs. Second, the legal issue of 'equal pay for equal work', which has been a challenge under the contract teacher model, is addressed by clearly defining the roles differently. A regular teacher will have much greater responsibility including that of coaching and supporting the TAs and taking overall responsibility for child learning outcomes, while the TA position is an apprenticeship to be completed while undergoing training and obtaining practical experience for a fixed period of time.

Finally, the political challenge of demands for mass "regularization" is addressed by creating a clearly defined pathway for TAs to be promoted to regular teacher status. Note that the process of regular teacher hiring will not be frozen and will mostly stay the same – but TAs will get additional credit for years of successful service. The top-performing TAs are much more likely to get promoted to regular teacher status. Those who do not meet those high standards will receive an exit payment of Rs. 1 lakh to recognize their contribution as TAs, and to help them make a transition to other jobs.

Here is a different way to see how the TA proposal addresses the legal and political challenges that have limited the effectiveness of contract teachers. No one expects candidates who make multiple unsuccessful attempts to pass public-service exams to be entitled to a government job. Taking the exam multiple times may increase the chances of obtaining the government job, but does not guarantee it or create an entitlement to it. Similarly, completing an apprenticeship successfully for a few years will provide an advantage when competing for public-sector jobs (likely more so than studying and taking the exam multiple times), but does not guarantee selection for the job if the performance on the other components of the selection process (including exams and interviews) are not good enough to get selected (even with the advantage provided by the extra credit for years of apprenticeship).

Overall, the TA proposal is an example of a new approach to public sector hiring that defines the apprenticeship as a separate step in a career-ladder for employees, and it is part of an integrated human resource strategy for entering permanent government positions. In addition to strengthening the long-term quality of permanent government employees, it also offers the promise of significantly expanding the availability of front-line service delivery staff and thereby improving the overall quality of service delivery – *without* significantly increasing spending. But it is also important to fully spell out this integrated strategy at the outset to ensure clarity on the career path and requisites for success among candidates, as well as broader stakeholders in society including politicians and the judiciary.

### **3.2. Case Study 2: Police Youth Brigade**

While the TA proposal above has been developed in detail, a similar approach is possible in other sectors as well. Perhaps, most relevant is the recent initiative by the Government of Tamilnadu to recruit a "Special Police Youth Brigade" (SPYB) to support the regular police force. The program was initiated by the Chief Minister and the Tamilnadu Assembly passed a bill in 2013 to approve the raising of the SPYB. The stated objective for this initiative suggests that the Government of Tamilnadu (GoTN) was trying to address the core service delivery challenges caused by a shortage of staff identified earlier in this paper. Specifically, the bill mentions that the police had to be engaged in several peripheral functions that detracted from their core functions of law and order, crime control, and investigation. The functions of the SPYB were defined as including driving police vehicles, delivering mail, entering data, maintaining police quarters, and assisting the police with saving the lives of the victims of accidents (The Hindu 2013).

The pay of candidates recruited under the SPYB was Rs. 7,500 per month, whereas a regular police constable is paid over Rs. 20,000 per month. Nevertheless, there was still considerable excess demand for these positions: the applicant-to-position ratio was over 10:1. It is clear that GoTN's broader motivation for the SPYB was to improve service delivery (in the field of policing) in a fiscally feasible way. However, there is a risk that this initiative may end up the same way as contract teacher programs because it appears to be a bit of a "stop gap" arrangement without a long-term human resource strategy. In particular, it is possible that once the number of

members of the SPYB reaches a critical mass, they will also demand to get regularized, which may be granted under pressure before elections.

On the other hand, this initiative can be a poster-child for the new approach to recruiting outlined in this paper. Consider the following modification. Right now, the training to the SPYB consists of driving heavy and light vehicles, using wireless communications, patrolling during the night, operating computers, and performing basic duties in crime prevention, first aid, and public relations. This could become a "level one" certificate in law enforcement. Once a trainee acquires this certificate, he/she would be deemed qualified to perform this type of functions. However, it should be possible under the new National Skills Qualification Framework to introduce packages of training and skills that constitute "level two", "level three" and subsequent skill levels. Passing each of these levels would qualify a candidate to perform more advanced functions and increase the ability of the state to deploy more front-line police to improve law and order, women's security, and prevent and report crimes early. Such a modular approach to training is also an excellent opportunity to train future law-enforcement officers in soft skills such as citizen-centric policing and sensitivity to gender issues, which current police personnel are widely perceived to lack.

SPYB personnel could become apprentices if they are provided with (performance-linked) credit for each year of successful service at the time of regular recruitment.<sup>22</sup> Over time, this will lead to improved match quality between the "non-CV" skills of police recruits and the needs of a citizen-centered police force. Senior officers could observe the performance of potential entrants on the job for a few years and evaluate their prospect for a long-term career in policing. Candidates who do not make the selection cut after four or five years as SPYB staff will receive an exit payment and certificates of training and performance that can aid their transition to other sectors of the economy, including the private security industry.

Overall, an integrated approach along the lines above will lead to the best candidates (as evaluated by on-the-job performance) being selected for permanent government positions. It will also raise the skills of all apprentices (even those who do not make it to permanent positions),

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<sup>22</sup> A similar forced curve of 20-60-20% of staff being rated each year as outstanding, good, and below average can be used for each annual evaluation of the SPYB personnel. Alternately, credit can simply be provided based on years of service.

thus having a positive spillover effect on skill levels in the rest of the economy. A fundamental market failure in skilling in the status quo is that there is no credible certification of skills. This means that the market will not pay a wage premium for skills, which in turn leads to a lack of demand for skilling. Combining this new approach to public sector hiring with the new National Skills Framework provides an excellent opportunity to not only define skill levels, but to establish a wage premium for credible demonstration of skills. This could be done using public sector recruiting as a credible way to deliver a wage premium for skills.

### **3.3. Case Study 3: Anganwadi Workers**

A similar integration of the new National Skills Framework and this new approach to public sector hiring can be implemented in the case of *anganwadi* workers. Global research on human capital accumulation increasingly points to the critical importance of providing health, nutrition, and mental stimulation to children in the 0-6 age range (Grantham-McGregor et al., 2007; Heckman, 2008; Heckman & Masterov, 2007; Shonkoff & Phillips, 2000). Yet, the ICDS, which is the main policy vehicle for providing this support to infants and young children, is remarkably weak (PEO 2011). In particular, it is severely under-staffed in most states, and it is plausible that augmenting ICDS centers with an additional locally-hired worker will have large social returns (for instance if one worker focuses on health and nutrition and the other one on education).

However, this is not being done for the most part for fiscal reasons. Further, training of *anganwadi* workers is ad hoc, and does not lead to any credible signals of skills or achievement. An integrated skilling and recruiting approach that reduces barriers to entry through large-scale apprenticeship/assistantship programs would allow ICDS centers to augment their ability to provide higher-quality services by providing additional staff members. Having these apprentices obtain modular training that is mapped into milestones under the National Skilling framework will improve their skills. It would also make later training modules be more effective because they will build on extensive practical experience, as well as completion of earlier modules.

Candidates selected for apprenticeship positions can have their modular training programs paid for by the government (just like in the TA proposal). This will increase the attraction of the apprenticeship position (despite its low nominal salary level) and clearly establish a career ladder through which individuals can progress with modular skill acquisition and practical experience.

Each step of this ladder will both increase the stipend during the apprenticeship period (providing a direct and immediate return to skills and experience), and increase the probability of being selected as a regular government worker.

#### **4. Implementation Roadmap and Conclusion**

The poor quality of service delivery across a range of core government functions is one of the most vexing governance challenges facing India today. One striking indicator of the weakness of the Indian state in service delivery is the large market share of fee-charging private providers in education and health even in the presence of *free* publicly provided education and health.<sup>23</sup> Indeed, one reason for why the crisis in service delivery may not be capturing more policy attention is that elites and middle classes have dealt with failing public services by opting out of them for the most part.

Yet, improved public services are perhaps the most direct way for policy and practice to improve the daily lives of hundreds of millions of citizens. There should also be political incentives for democratically-elected state governments (under whose jurisdiction most front-line service delivery functions fall) to improve the quality of public services. Yet, state governments appear to be in a near-impossible situation with regard to their ability to improve services because of the fiscal challenges that they face and their resulting inability to hire enough front-line service providers. Previous attempts at using less-trained contractual employees to mitigate this problem have been unsuccessful at a systemic-level because of professional, legal, and political limitations of such stop-gap models.

This paper suggests one possible way out of this suboptimal equilibrium where too few providers are hired, partly because salaries are too high, and where the current structure of training and credentialing does not seem to create or identify effective employees. I first document a series of distortions and inefficiencies induced by the current structure of public sector labor markets. Then, I propose a unified approach to reforming public sector hiring that can mitigate several of these distortions. The main features of this approach are the following: First, reducing the barriers to entry into service delivery professions by hiring a large number of entry-level staff at the apprentice/assistant level who are locally-hired from the areas that they

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<sup>23</sup> Recent estimates suggest that over 30% of children in rural India attend fee-charging private primary schools (Pratham 2014) and that the market share of fee-charging private healthcare providers for primary care in rural Madhya Pradesh was over 80% (Das et al. 2015).

need to serve, and are paid stipends that are competitive by market standards, but substantially below the pay scales of permanent government employees – which allows a fiscally-feasible expansion of front-line service-delivery staff. Second, modular training and skilling that is integrated with the new National Skills Framework and can be provided by accredited public or private providers. Third, performance-based credit given for years served as an apprentice at the time of regular recruitment. Fourth, and finally, exit payments to candidates who are not selected into regular government positions after either a fixed period of time or number of attempts to help them transition to other professions or similar roles in the private sector.

I also argue that the current point in time is extremely well-suited to implementing such a modified approach to public sector hiring. The Fourteenth Finance Commission award has significantly increased the fiscal space for states to experiment with new models of service delivery. Of course, the corresponding reduction in central government allocations to centrally-sponsored schemes implies that the short-run flexibility may be limited (as state-level funds are used to fund expenditures committed under the assumption of continued central government fund flows). Yet, the medium-term flexibility is much higher. This provides an opportunity for a willing state to experiment with this new approach.

It should be relatively easy for states like Tamilnadu, which have already commenced experiments like the TN Special Police Youth Brigade, to build on this foundation and make it the first step in an integrated human resource policy for public sector hiring. Learning from successful state-level (or even district and block-level) experiments with such a new approach can then be deployed across states (including lessons on pitfalls to avoid). It is also important for states to use their newfound fiscal space wisely and avoid committing to irreversible, large expenditures, which may be of limited effectiveness. In particular, the evidence (see de Ree et al. 2015) strongly cautions against implementing across-the-board salary increases for public sector workers (for which there will no doubt be political pressure and temptation). Modest district-level experiments in a few sectors with this new approach (accompanied by careful, independent impact evaluations) may be a more prudent way forward.

The timing is also excellent with regard to coinciding with the release of the new National Skills Framework. The idea of modular training and credentialing that is interspersed with practical experience is very well suited to an integrated skills framework. Laying down such frameworks, and independently testing and accrediting employee skill levels is a public good

with economies of scale and scope that is best provided at the national level. This will then allow both public and private providers of training services to develop modular coursework to provide these skills. The government is the largest employer by far, so adopting a human resource strategy for public sector hiring along the lines outlined in this paper can help catalyze the translation of the skills framework into real impact on the economy. It will help create both supply and demand for skills because these will now be rewarded on the labor market (led by the public-sector labor market).

Service delivery in India is in a crisis and expanding business as usual is unlikely to work. It is also unlikely to be fiscally viable across all the sectors that claim that they need more resources. It is imperative to do "more with the same" rather do "more of the same", and the approach suggested in this paper offers one way of doing so, which may be of interest to states contemplating ways of improving service delivery in a fiscally-feasible manner.

## References:

- AKERLOF, G. A. (1982): "Labor Contracts as Partial Gift Exchange," *The Quarterly Journal of Economics*, 543-569.
- BANG, A. T., R. A. BANG, S. B. BAITULE, M. H. REDDY, and M. D. DESHMUKH (1999): "Effect of Home-Based Neonatal Care and Management of Sepsis on Neonatal Mortality: Field Trial in Rural India," *The Lancet*, 354, 1955-1961.
- BASTIAN, K. C. (2013): "Do Teachers' Non-Cognitive Skills and Traits Predict Effectiveness and Evaluation Ratings?," Chapel Hill, NC: University of North Carolina at Chapel Hill.
- BAU, N., and J. DAS (2011): "Buy More, Pay Less: Measuring the Performance of Pakistani Contract Teachers," Cambridge, MA: Harvard University.
- BERGEN, M. (2013): "India's Alarming Police Shortage."
- BESLEY, T., and T. PERSSON (2010): "State Capacity, Conflict, and Development," *Econometrica*, 78, 1-34.
- BÉTEILLE, T. (2009): "Absenteeism, Transfers and Patronage: The Political Economy of Teacher Labor Markets in India," Stanford, CA: Stanford Graduate School of Education (SGSE).
- CALLEN, M., S. GULZAR, A. HASANAIN, Y. KHAN, and A. REZAEI (2015): "Personalities and Public Sector Performance: Evidence from a Health Experiment in Pakistan," Cambridge, MA: National Bureau of Economic Research (NBER).
- CHATTERJI, K. J. (2011): "Teacher Shortage – the Tip of the Iceberg."
- CHETTY, R., J. FRIEDMAN, and J. ROCKOFF (2014): "Measuring the Impacts of Teachers I: Evaluating Bias in Teacher Value-Added Estimates," *American Economic Review*, 104, 2593-2632.
- (2014): "Measuring the Impacts of Teachers II: Teacher Value-Added and Student Outcomes in Adulthood," *American Economic Review*, 104, 2633-2679.

- CORRELL, J., B. PARK, C. M. JUDD, and B. WITTENBRINK (2002): "The Police Officer's Dilemma: Using Ethnicity to Disambiguate Potentially Threatening Individuals," *Journal of Personality and Social Psychology*, 83, 1314-1329.
- DAS, J., A. HOLLA, A. MOHPAL, and K. MURALIDHARAN (2015): "Quality and Accountability in Healthcare Delivery," Washington, DC: The World Bank.
- DE REE, J., K. MURALIDHARAN, M. PRADHAN, and F. H. ROGERS (2015): "Double for Nothing? Experimental Evidence on the Impact of an Unconditional Teacher Salary Increase on Student Performance in Indonesia," Washington, DC: The World Bank.
- DEE, T., and J. WYCKOFF (2015): "Incentives, Selection, and Teacher Performance: Evidence from Impact," *Journal of Policy Analysis and Management*, 34, 267-297.
- DNA (2014): "Police to People Ratio: 3 Cops for Every Vip but Just 1 for 761 Commoners."
- DOBBIE, W. (2011): "Teacher Characteristics and Student Achievement: Evidence from Teach for America," Cambridge, MA: Harvard University.
- DUCKWORTH, A. L., P. D. QUINN, and M. E. SELIGMAN (2009): "Positive Predictors of Teacher Effectiveness," *The Journal of Positive Psychology*, 4, 540-547.
- FINAN, F., B. A. OLKEN, and R. PANDE (2015): "Government Workers in Developing Countries," Berkeley, CA: University of California, Berkeley.
- GRANTHAM-MCGREGOR, S., Y. B. CHEUNG, S. CUETO, P. GLEWWE, L. RICHER, and B. TRUPP (2007): "Developmental Potential in the First 5 Years for Children in Developing Countries," *The Lancet*, 369, 60-70.
- GROSSMAN, P., S. LOEB, J. COHEN, and J. WYCKOFF (2013): "Measure for Measure: The Relationship between Measures of Instructional Practice in Middle School English Language Arts and Teachers' Value-Added Scores," *American Journal of Education*, 119, 445-470.
- HAINES, A., D. SANDERS, U. LEHMANN, A. K. ROWE, J. E. LAWN, S. JAN, D. G. WALKER, and Z. BHUTTA (2007): "Achieving Child Survival Goals: Potential Contribution of Community Health Workers," *The Lancet*, 369, 2121-2131.
- HANUSHEK, E. A. (1971): "Teacher Characteristics and Gains in Student Achievement: Estimation Using Micro Data," *The American Economic Review*, 280-288.
- (1986): "The Economics of Schooling: Production and Efficiency in Public Schools," *Journal of Economic Literature*, 24, 1141-1177.
- (1992): "The Trade-Off between Child Quantity and Quality," *Journal of Political Economy*, 84-117.
- HAZARIKA, I. (2013): "Health Workforce in India: Assessment of Availability, Production and Distribution," *WHO South-East Asia Journal of Public Health*, 2, 106-112.
- HECKMAN, J. J. (2008): "Schools, Skills, and Synapses," *Economic inquiry*, 46, 289-324.
- HECKMAN, J. J., and D. V. MASTEROV (2007): "The Productivity Argument for Investing in Young Children," *Applied Economic Perspectives and Policy*, 29, 446-493.
- JACOB, B. A., and L. LEFGREN (2008): "Can Principals Identify Effective Teachers? Evidence on Subjective Performance Evaluation in Education," *Journal of Labor Economics*, 26, 101-136.
- JEFFREY, C. (2010): *Timepass: Youth, Class, and the Politics of Waiting in India*. Stanford University Press.
- JENSEN, R. (2012): "Do Labor Market Opportunities Affect Young Women's Work and Family Decisions? Experimental Evidence from India," *The Quarterly Journal of Economics*, 127, 753-792.

- KANE, T. J., and D. O. STAIGER (2011): "Learning About Teaching: Initial Findings from the Measures of Effective Teaching Oroject," Seattle, WA: Bill and Melinda Gates Foundation.
- KANE, T. J., and D. O. STAIGER (2012): "Gathering Feedback for Teachers: Combining High-Quality Observations with Student Surveys and Achievement Gains," Seattle, WA: Bill and Melinda Gates Foundation.
- KANE, T. J., E. S. TAYLOR, J. H. TYLER, and A. L. WOOTEN (2011): "Identifying Effective Classroom Practices Using Student Achievement Data," *Journal of Human Resources*, 46, 587-613.
- KAPUR, D., and A. SUBRAMANIAN (2013): "Rebuilding the Indian State."
- KINGDON, G. (2011): "Private Versus Public Schooling in India."
- KINGDON, G., and V. SIPAHIMALANI-RAO (2010): "Para-Teachers in India: Status and Impact," *Economic and Political weekly*, 45, 59-67.
- KOHLI, N. (2015): "Not in the Class: A Story of India's Missing Teachers."
- KRAFT, M. A., and D. BLAZAR (2014): "Improving Teachers' Practice across Grades and Subjects: Experimental Evidence on Individualized Coaching," Providence, RI: Brown University.
- KREMER, M., K. MURALIDHARAN, N. CHAUDHURY, F. H. ROGERS, and J. HAMMER (2005): "Teacher Absence in India: A Snapshot," *Journal of the European Economic Association*, 3, 658-667.
- KRISHNAN, K. P., and T. V. SOMANATHAN (2005): "Civil Service: An Institutional Perspective," in *Public Institutions in India: Performance and Design*, ed. by D. Kapur, and P. B. Mehta. New Delhi, India: Oxford University Press, 258-319.
- (2013): "The Civil Service in the 21st Century," New Delhi, India.
- KUMAR, K., M. PRIYAM, and S. SAXENA (2001): "The Trouble with 'Para-Teachers'," *Frontline*, 18.
- MATHEW, S., and M. MOORE (2011): "State Incapacity by Design: Understanding the Bihar Story," London, UK: Institute of Development Studies (IDS), 1-31.
- MHRD (2011): "Icds Mission: The Broad Framework for Implementation," New Delhi, India: Ministry of Women and Child Development, Government of India.
- MURALIDHARAN, K. (2012): "Long-Term Effects of Teacher Performance Pay: Experimental Evidence from India," San Diego, CA: University of California, San Diego.
- (2013): "Priorities for Primary Education Policy in India's 12th Five Year Plan," *India Policy Forum 2012-13*, 9, 1-46.
- MURALIDHARAN, K., N. CHAUDHURY, J. HAMMER, M. KREMER, and F. H. ROGERS (2011): "Is There a Doctor in the House? Medical Work Absence in India," San Diego, CA: University of California, San Diego.
- MURALIDHARAN, K., J. DAS, A. HOLLA, and A. MOHPAL (2014): "The Fiscal Cost of Weak Governance: Evidence from Teacher Absence in India," Cambridge, MA: National Bureau of Economic Research (NBER).
- MURALIDHARAN, K., P. NIEHAUS, and S. SUKHTANKAR (2014): "Building State Capacity: Evidence from Biometric Smartcards in India," Cambridge, MA: National Bureau of Economic Research (NBER).
- MURALIDHARAN, K., and K. SHETH (2016): "Bridging Education Gender Gaps in Developing Countries: The Role of Female Teachers," *Journal of Human Resources*, 51, 269-297.

- MURALIDHARAN, K., and V. SUNDARARAMAN (2011): "Teacher Performance Pay: Experimental Evidence from India," *The Journal of Political Economy*, 119, 39-77.
- (2013): "Contract Teachers: Experimental Evidence from India," Cambridge, MA: National Bureau of Economic Research (NBER).
- MURALIDHARAN, K., and Y. ZIELENIK (2014): "Chasing the Syllabus: Measuring Learning Trajectories in Developing Countries with Longitudinal Data and Item Response Theory," San Diego, CA: University of California, San Diego.
- NANDAN, T. (2014): "With Severe Shortages, India's Security Forces Face Toughest Test with Lesser Men to Guard Citizens."
- PAPAY, J. P., M. R. WEST, J. B. FULLERTON, and T. J. KANE (2012): "Does an Urban Teacher Residency Increase Student Achievement? Early Evidence from Boston," *Educational Evaluation and Policy Analysis*, 34, 413-434.
- PATHAK, V. (2014): "Acute Shortage of Primary Teachers in India; up, Bihar Worst-Hit States."
- PEO (2011): "Evaluation Report on Integrated Child Development Services," New Delhi, India: Programme Evaluation Organisation, Planning Commission, Government of India.
- PERSSON, T., and T. BESLEY (2009): "The Origins of State Capacity: Property Rights, Taxation and Policy," *The American Economic Review*, 99, 1218-1244.
- PIANTA, R. C., J. BELSKY, N. VANDERGRIFT, R. HOUTS, and F. J. MORRISON (2008): "Classroom Effects on Children's Achievement Trajectories in Elementary School," *American Educational Research Journal*, 45, 365-397.
- PRATHAM (2014): "Annual Status of Education Report 2013," New Delhi, India: ASER Centre.
- PRITCHETT, L. (2009): "Is India a Flailing State? Detours on the Four Lane Highway to Modernization," Cambridge, MA: Harvard Kennedy School of Government.
- RAO, M., K. D. RAO, A. K. S. KUMAR, M. CHATTERJEE, and T. SUNDARARAMAN (2011): "Human Resources for Health in India," *The Lancet*, 377, 587-598.
- RIVKIN, S. G., E. A. HANUSHEK, and J. F. KAIN (2005): "Teachers, Schools, and Academic Achievement," *Econometrica*, 73, 417-458.
- ROBINSON, N., and V. GAURI (2011): "Education, Labor Rights, and Incentives: Contract Teacher Cases in the Indian Courts," *Comparative Labor Law and Policy Journal*, 32.
- ROCKOFF, J. E., B. A. JACOB, T. J. KANE, and D. O. STAIGER (2011): "Can You Recognize an Effective Teacher When You Recruit One?," *Education Finance and Policy*, 6, 43-74.
- ROCKOFF, J. E., and C. SPERONI (2011): "Subjective and Objective Evaluations of Teacher Effectiveness: Evidence from New York City," *Labour Economics*, 18, 687-696.
- ROCKOFF, J. E., D. O. STAIGER, T. J. KANE, and E. S. TAYLOR (2012): "Information and Employee Evaluation: Evidence from a Randomized Intervention in Public Schools," *American Economic Review*, 102, 3184-3213.
- SCHLEIFER, A., and R. W. VISHNY (1993): "Corruption," *The Quarterly Journal of Economics*, 108, 599-617.
- SHONKOFF, J. P., and D. A. PHILLIPS (2000): *From Neurons to Neighborhoods: The Science of Early Childhood Development*. Washington, DC: National Academy Press.
- SILVA, T., A. MCKIE, V. KNECHTEL, P. GLEASON, and L. MAKOWSKY (2014): "Teaching Residency Programs: A Multisite Look at a New Model to Prepare Teachers for High-Need Schools," Princeton, NJ: Mathematica Policy Research.

- SIM, J. J., J. CORRELL, and M. S. SADLER (2013): "Understanding Police and Expert Performance When Training Attenuates (Vs. Exacerbates) Stereotypic Bias in the Decision to Shoot," *Personality and Social Psychology Bulletin*, 39, 291-304.
- SUKHTANKAR, S., and M. VAISHNAV (2015): "Corruption in India: Bridging Academic Evidence and Policy Options," *India Policy Forum*.
- TAYLOR, E. S., and J. H. TYLER (2012): "The Effect of Evaluation on Teacher Performance," *American Economic Review*, 102, 3628-51.
- THE HINDU (2013): "Bill on Police Youth Brigade Introduced," Chennai, Tamil Nadu.
- WADE, R. (1985): "The Market for Public Office: Why the Indian State Is Not Better at Development," *World Development*, 13, 467-497.
- WORLD BANK (2003): "World Development Report 2004: Making Services Work for Poor People," Washington, DC: Oxford University Press for the World Bank.