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How Does Growth Affect Everyday Corruption?

Exit, Empowerment and Voice in Indian Public Services

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1. Introduction

This paper examines the effects of economic growth on state anti-corruption efforts in public services. Corruption is endemic in all of the fastest growing low-income democracies (Table 1), so it is surely important to understand whether these countries' increased incomes are likely to translate into reduced corruption. One might think they would, as richer countries are less corrupt than poorer countries, but this is not assured because it is unknown whether they are less corrupt *because* they are richer (Svensson 2005).¹ Public services corruption matters because it is widespread in the developing world² and is highly economically and politically salient, undermining the effectiveness of development policy, shaping citizen-state relations and affecting electoral outcomes.³ State anti-corruption efforts are systemic changes to how services are delivered and monitored that often succeed in reducing corruption by removing rent-seeking bottlenecks, increasing transparency and enhancing accountability.⁴

The puzzle of state anti-corruption effort: State efforts in high-growth societies vary significantly across services, often in a puzzling way. Economic theories of rent-seeking behavior assume that as demand for a public service grows, the resulting increase in potential rents should incentivize more corruption; and vice versa.⁵ Yet, Table 2 shows that during India's high-growth years the state moved decisively to curtail rent-seeking opportunities in a set of services that experienced massive demand growth (appearing in the top panel of the table). Meanwhile, the state exerted far less effort to check corruption in other services (appearing in the bottom panel) in which the exit of wealthier citizens curtailed demand and the extractable rents. Why would growth induce government officials to give up increasingly lucrative opportunities to make money, and yet maintain possibilities for corruption in services that became relatively less lucrative?

This puzzle cannot be resolved without considering the intensity of citizens' demands for anti-corruption reforms. Certainly, the state can reduce corruption by supplying specific systemic reforms,⁶ and technological change expands the menu of reforms it could choose to implement. However, new technologies had the potential to reduce corruption in the services listed in *both* panels of Table 2, and yet they were deployed mostly for those in the top panel. Moreover, why does the same government agency supply anti-corruption reforms for one segment of service users, and not the other? For example, the rail ministry introduced sweeping anti-corruption reforms for reserved travelers but did much less for unreserved travelers; state education departments moved more quickly to clean up influence peddling in college admissions than

corruption in rural schools; and the passport services used by business travelers and tourists were reformed far ahead of those used by migrant labor.

We resolve the puzzle by considering the consequences of growth for citizens' demands for anti-corruption effort. We show that growth has three effects on government effort to combat citizen-facing corruption in a public service. Rising incomes cause rich, influential citizens to exit the public service for private alternatives, reducing citizens' capacity to hold the state accountable.⁷ They also cause poor, less influential citizens to begin using the service, increasing the rents that officials could extract. Both of these effects reduce the state's incentive to reform the service. Conversely, growth can dramatically increase the influence of those users who continue using the service, empowering them to demand reforms.⁸ We argue that the balance between these exit, entry and empowerment effects determines whether growth induces the government to act. The result is that services that retain their richer users as their incomes rise are reformed, while those prone to growth-induced entry and (especially) exit tend to languish amidst increasing prosperity. Consequently, growth has a tendency to promote greater anti-corruption efforts in the services used by wealthier citizens, making everyday corruption increasingly a poor people's problem.

We develop this argument in two ways. First, we build a formal model showing for the first time that the above argument applies under general conditions, so long as three well-established empirical insights (detailed below) hold. Second, we illustrate how the above effects work through three case studies of Indian public services: rural schooling, the passport service and the rail service. These cases draw extensively on primary and secondary sources, including 211 interviews with citizens and intermediaries, 25 interviews with officials and sector experts, over 100 newspaper articles, institutional ethnographies of the rail ministry and a passport office, many government reports, and two nationally representative datasets of schools and their users.

We do not make any comparisons between the three cases. Instead, we analyze each one separately, using each case to illustrate a different feature of the model. Our analysis of corruption in India's rural public schools shows statistically, how, as growth induced the exit of wealthier families to private alternatives, the state failed to make feasible anti-corruption reforms. The case of the passport service shows how, in the absence of any possibility of exit to a private alternative, growth induced wealthy interest groups to successfully demand massive and far-reaching reforms. And, in the case of railways – which carry richer and poorer citizens

in separate carriages on the same trains (until recently) – we show how growth empowered richer citizens to successfully demand reforms to the reservation system, while doing much less for poorer citizens who travel in heavily overcrowded, but loss-making unreserved carriages. Together, these cases also illustrate a multitude of ways in which rising incomes empower service users to more credibly demand anti-corruption reforms, and predispose the state to listen. Among other things, growth enables these wealthier citizens to threaten to exit cash-strapped government services, offer contributions to state revenues if reforms are made, register complaints on social media, and convince the print media to take their complaints seriously. These voice mechanisms do not involve voting, and therefore help to explain why systemic reforms to reduce public-services corruption continue to be supported even when governments change.

Our argument draws on key insights from three literatures, covering whom corruption victimizes; inequality of political voice in democracies; and why voice matters to government responsiveness.

It is well established that richer citizens are less likely to pay bribes to access government services than poorer citizens (Justesen and Bjørnskov 2014). Peiffer and Rose (2018) show that this is principally because rich and poor use different sets of services. Richer citizens escape having to pay bribes by exiting some government services, while within a service, the poor are not much more likely to have to bribe. A large body of work also shows that political voice is not equally shared across different segments of society. Richer citizens possess greater voice power by dint of their status, connections, organizational capital, spending power, education and ability to return favors. By contrast, poor citizens are weakly connected to state officials and report lower state responsiveness.⁹ In addition, demand politics in general, and who has the voice to make the demands in particular, matters to governance outcomes.¹⁰ Scholars show that citizen voice shapes government policy and that the voice of the middle class plays a central role. In fact, the “middle class” is widely celebrated for its capacity to demand better institutions.¹¹

Our model takes these well-understood conditions as a given, and shows how, when activated by rapid economic growth, they serve to deliver anti-corruption reforms in services used by the middle classes and the rich but not in the services that these wealthier citizens leave behind.

Our theory comes with three scope conditions. First, we are concerned only with citizen-facing corruption – corruption that visibly reduces individual service users’ welfare. Other forms of

corruption that do not reduce citizen welfare need not result in the types of citizen voice pressure that growth amplifies. For example, when inflated costs of infrastructure projects or service delivery are not passed on to consumers, those consumers do not complain about them, as the lack of evidence about agitation against this type of corruption shows in India.¹² This paper therefore does not explain business and procurement-related corruption, which may well increase with economic growth.¹³ Second, the service must be used more than once. Otherwise, citizens have little incentive to apply voice pressure to fix it.¹⁴ Third, the institutions and actors holding the levers needed to enact these solutions must be responsive to democratic pressures, implying that our theory need not hold in autocratic environments. Our Indian setting and the forms of corruption analyzed in each of our three case studies satisfies these conditions.

The remainder of this paper is structured as follows. Section 2 presents our baseline model of growth's effects on public service corruption, which treats corruption as a tax to access the service. Case preparation methods and data sources are presented in Section 3. Section 4 presents our quantitative case study of corruption in rural schools. Sections 5 and 6 are case studies of passport and rail services. Section 7 discusses the caveats on our work and its implications for politics and policy. Appendix A shows that the qualitative effects of growth are unaltered if corruption involves pilferage from the state, rather than the extraction of money from citizens. Appendix B shows that when richer citizens cross-subsidize a public service for the poor, growth and austerity increase the influence of its richer service users without requiring them to engage in collective action. Appendix C confirms the robustness of the claims about rural school corruption made in Section 4.

2. The Model

We model the level of corruption chosen by a government agency tasked with delivering a service. We emphasize the role of service users' voice pressure in checking corruption, and examine how rising citizen incomes alter the corruption levels chosen.

We make two simplifications to maintain our focus on these dynamics. First, we assume that the agency is a unitary actor, abstracting away from the details of how corruption is organized within it (e.g., rent distribution, monitoring, politician-bureaucrat relations etc.). This is relatively benign insofar as we are concerned with decisions regarding the design of service delivery systems. In India, ministers in close consultation with senior bureaucrats take these decisions, and junior bureaucrats are expected to fall in line. Second, we assume that all users

of a service experience a common level of corruption. While this is obviously not true, our primary focus is not on variations in the within-service experience, but on the evolution of systemic design choices that bring down corruption levels for most service users (e.g., automating application processing, releasing data on system performance, introducing deadlines for processing applications). We also show in Section 4 that the mechanisms our model invokes can explain variations in corruption across citizens within a service.

We model corruption levels in the main text as a uniform bribe extracted by the agency from service users. A variant, presented in the appendix, assumes that the agency instead pilfers resources intended for public service delivery (e.g., subsidized food, budgets, employee time), reducing the quality of the service citizens receive. The pilferage model is more applicable to services catering to the poorest citizens, who lack the liquidity needed to bribe, causing venal officials to take from the government instead. Growth affects incentives and corruption very similarly in both models.

This section proceeds in three steps. First, we show how citizens of different income levels decide whether to use the service or not, and characterize the effect of changes in the systemic corruption level on their choices and welfare. Next, we model the agency's choice of corruption level, which takes into account the fact that this choice will alter who uses the service, their utility losses, and consequently both the rents and the collective voice backlash that this will induce. Finally, we show how growth changes that choice.

2.1. Service Utilization and Utility Losses

Each citizen has income $w > 0$ and purchases some amount of a general consumption good, $c > 0$, and at most one unit of a service. They decide whether to buy it from the government (G), on the private market (P), or go without it (N , for none). For some services, such as passports, there is no private alternative. The quality (q) of the government service is lower than that of the private service ($q_G < q_P$).¹⁵

The price of the private service, ρ , is exogenously determined, and exceeds the official price to the citizen of the government service, κ . Going without costs nothing, and yields no service quality ($q_N = 0$). The citizen pays the bureaucracy λ to access the government service. The difference, $\lambda - \kappa \geq 0$ is a bribe. Clearly $c = w$ if they choose N , $c = w - \lambda$ if they choose G and $c = w - \rho$ if they choose P .

Citizens choose the option that maximizes utility, which for simplicity, we model as $U(c, q; w) = c + wq$.¹⁶ It then follows that, holding prices and corruption constant, poorer citizens ($w < \alpha(\lambda; q_G) \equiv \lambda/q_G$) will choose N ; richer citizens ($w > \beta(\lambda; q_G) \equiv (\rho - \lambda)/(q_P - q_G)$) will choose P , and those in-between select G . Clearly, lifting the bribe (and therefore the price of the government service) raises α , the income threshold for choosing G over N , and reduces β , the income threshold for selecting P over G ; while increasing the quality of the government service does the opposite. Denoting the income distribution by $f(w)$, demand for the government service is $Q_D(\lambda; q_G) = F[(\rho - \lambda)/(q_P - q_G)] - F[\lambda/q_G]$. Thus:

Result 1: Increasing λ or reducing q_G reduces demand for the government service.

Note that Some citizens will never use the service - those with $w < w_{min}(q_G) \equiv \kappa/q_G$ are too poor and would go without even if there were no corruption ($\lambda = \kappa$), while those with $w > w_{max}(q_G) \equiv (\rho - \kappa)/(q_P - q_G)$ are too rich and would always choose P . We refer to those with $w \in [w_{min}(q_G), w_{max}(q_G)]$ as *potential service users*. We assume that the official price of the government service is low enough to ensure it would attract some potential users: $\kappa < \rho(q_G/q_P)$.

We define a citizen's utility loss as the difference between the utility they would have achieved if there were no corruption and the utility they actually receive. This loss is zero for those who would never use the service. Those who choose N due to corruption lose $l_N = wq_G - \kappa$ because they forgo the service and its cost, those sticking with G lose $l_G = \lambda - \kappa$ in bribes, and those pushed to the private sector lose $l_P = (\rho - \kappa) - w(q_P - q_G)$ because they must spend more but are partially compensated by the higher quality of the private service. The following result is then immediate.

Result 2: Those who choose the government service lose more utility to corruption than other citizens, and only their utility is affected by changes to the corruption level. Total utility losses from corruption are higher if G is a high-quality service.

Results 1 and 2, summarized in Figure 1, set up the key effects of growth on service utilization and citizens' incentives to demand reforms. Growth will bring additional poor service users (entry) and fewer rich service users (exit). Whether growth will increase or reduce total utility losses and how this affects anticorruption voice pressure will depend upon whose incomes are increased or reduced. In addition, any reforms that improve the quality of the service will increase the losses due to corruption, attracting citizen vigilance.

2.2. The Government Agency's Problem

The agency chooses λ to maximize the difference between bribe revenues, $R(\lambda; q_G)$, and the political cost to the agency, expressed in rupees, of citizen pressure, $V(\lambda; q_G)$.^{17,18} The revenues depend upon the bribe level it sets and the demand for its service that this results in: $R(\lambda; q_G) \equiv (\lambda - \kappa) * Q_D(\lambda; q_G)$. Political pressure is the sum of the individual voice pressure applied by each citizen. We capture this individual pressure in reduced form as $v = v(w, l)$.¹⁹ Bigger utility losses elicit more pressure ($v_l(w, l) > 0$), and citizens only apply voice pressure when they experience losses ($v(w, 0) = 0, \forall w$), so that those too poor or too rich to be potential users of the service are not part of the political constituency defending it. Voice pressure therefore comes from three groups: poor potential service users driven by corruption to go without; middle-class service users forced to bribe; and rich potential service users driven to private alternatives:

$$\begin{aligned}
 V(\lambda; q_G) = & \int_{w_{min}(q_G)}^{\alpha(\lambda; q_G)} v(w, l_N(w; q_G))f(w)dw + \int_{\alpha(\lambda; q_G)}^{\beta(\lambda; q_G)} v(w, l_G(\lambda; q_G))f(w)dw \\
 & + \int_{\beta(\lambda; q_G)}^{w_{max}(q_G)} v(w, l_P(w; q_G))f(w)dw
 \end{aligned} \tag{1}$$

We assume that high income citizens exert more voice pressure than low income citizens in response to any given level of utility loss ($v_w(w, l) > 0, \forall w, l$), and in response to increased losses ($v_{wl}(w, l) > 0, \forall w, l$). These voice-enhancing effects of income are essential to our argument, as they ensure that growth empowers service-user constituencies to push back on graft. Our case studies (Sections 4-6) show many mechanisms through which that income can have this effect. Among these, the non-financial mechanisms (access to officials, use of social, print and electronic media, time to organize, ability to make political contributions) are well established in the literature. Appendix B demonstrates the financial mechanism, showing that when the agency is required to meet a legal revenue target but is restricted to charging fixed means-tested prices under which richer users cross-subsidize poorer users, this will make the

agency more attentive to the demands of richer citizens, because only they can be charged enough to help the agency reach its legal revenue targets.

Maintaining service use among richer citizens is vital for sustaining anti-corruption voice pressure:

*Result 3: Marginal increases in the corruption level will: (i) bring increased pressure on the agency; (ii) increase pressure more if the affected citizens are rich; (iii) increase pressure only because they increase losses to those citizens who actually use the service; and (iv) increase pressure more if the service is of a higher quality.*²⁰

Proof. Differentiate (1) with respect to λ applying Leibniz integral rule. Recall that $l_G(w, \lambda; q_G) = \lambda - \kappa$, $l_N = l_G$ at $w = \lambda/q_G$, and $l_P = l_G$ at $w = (\rho - \lambda)/(q_P - q_G)$, to obtain (2). **Result 3** follows by inspection.

$$V_\lambda(\lambda; q_G) = \int_{\alpha(\lambda; q_G)}^{\beta(\lambda; q_G)} v_l(w, \lambda - \kappa) f(w) dw > 0 \quad (2)$$

The agency chooses lower, possibly even zero bribe levels, when voice pressure is strong. To avoid distractions, we focus on the case with non-zero bribes ($\lambda > \kappa$):^{21 22}

Result 4: The agency's preferred corruption level, λ^ , satisfies $R_\lambda(\lambda^*; q_G) \equiv V_\lambda(\lambda^*; q_G) > 0$, and $R_{\lambda\lambda}(\lambda^*; q_G) - V_{\lambda\lambda}(\lambda^*; q_G) \leq 0$.*

This balancing act between revenues and voice pressure implies that social or policy changes can reduce the selected bribe level through two channels: an economic channel, wherein the change reduces the marginal bribe revenues obtainable (i.e. it reduces $R_\lambda(\lambda; q_G)$); and a political channel, wherein the change makes voice more responsive to bribery (i.e., it increases $V_\lambda(\lambda; q_G)$).

It also implies that richer potential service users act as a brake on corruption, while adding to the ranks of poorer potential service users encourages more corruption.

Proposition 1: *Increasing corruption by one rupee per citizen from the agency's preferred level elicits less than one rupee of additional voice pressure from the poorest service user*

$(v_l(\alpha, \lambda^* - \kappa) < 1)$, and more than one rupee of additional voice pressure from the richest service users $(v_l(\beta, \lambda^* - \kappa) > 1)$.

Proof: Note that, because $v_w(w, l) > 0, \forall w$, and w has continuous support, $V_\lambda = \int_\alpha^\beta v_l(w, \lambda - \kappa)f(w)dw > \int_\alpha^\beta (\lambda - \kappa)f(w)dw = v_l(\alpha, \lambda - \kappa)[F(\beta) - F(\alpha)]$. Also, $R_\lambda = F(\beta) - F(\alpha) + (\lambda - \kappa)[f(\beta)\beta_\lambda - f(\alpha)\alpha_\lambda] < F(\beta) - F(\alpha)$, because $\alpha_\lambda > 0$ and $\beta_\lambda < 0$. It follows that if $v_l(\alpha, \lambda^* - \kappa) \geq 1$, this would imply that $V_\lambda(\lambda^*) - R_\lambda(\lambda^*) > [v_l(w, \lambda^* - \kappa) - 1][F(\beta(\lambda^*)) - F(\alpha(\lambda^*))] > 0$, contradicting the definition of the λ^* : $R_\lambda(\lambda^*; q_G) \equiv V_\lambda(\lambda^*; q_G)$. Thus, it must be that $(v_l(\alpha, \lambda^* - \kappa) < 1)$. Proof that $(v_l(\beta, \lambda - \kappa) > 1)$ proceeds analogously.

The intuition underlying this result is important. The agency could increase the net rents it derives from the poorest user by increasing the corruption level by (say) one rupee, because this relatively disempowered user's voice response costs the agency less than a rupee. However, the agency does not wish to do this, because it would attract a backlash costing more than a rupee from the richest user. Thus, the poor are protected from corruption by using the same service as the rich.²³

2.3. The effects of growth

Let the income distribution be $f(w)$ initially and $g(w)$ subsequently. We model economic growth as a small first-order stochastic dominant shift: $F(w) - G(w) \equiv D(w) \geq 0, \forall w$. Let λ^* denote the corruption level selected in the initial period. Growth will reduce λ^* if it increases V_λ more than R_λ . It follows that growth has often conflicting effects on corruption through the economic and political channels:

Proposition 2: *Growth can increase or decrease via the economic channel. It increases (decreases) corruption via this channel whenever it induces more (fewer) citizens to enter the government service (switch from N to G) than to exit it (switch from G to P).*

Proof: Marginal revenue with respect to λ in the initial period is: $R_\lambda(\lambda; q_G) = [F(\beta(\lambda; q_G)) - F(\alpha(\lambda; q_G))] + (\lambda - \kappa)[f(\beta(\lambda; q_G))\beta_\lambda - f(\alpha(\lambda; q_G))\alpha_\lambda]$. Time difference this, ignoring changes to the second-order term, $(\lambda - \kappa)[f(\beta)\beta_\lambda - f(\alpha)\alpha_\lambda]$, and evaluate the result at λ^* .²⁴

$$\Delta R_\lambda(\lambda^*) \approx [G(\beta) - F(\beta)] - [G(\alpha) - F(\alpha)] = \overbrace{-D(\beta)}^{\text{High-Income exit}} + \overbrace{D(\alpha)}^{\text{Low-Income Entry}} \quad (3)$$

Proposition 3: *Growth can increase or reduce corruption via the voice channel. It increases voice pressure by inducing some citizens (though they are low-voice citizens) to begin using the service and by empowering the middle-income citizens who use it; but also reduces voice pressure by inducing some richer, high-voice citizens to stop using the service.*²⁵

Proof: Time difference Equation (2) yielding $\Delta V_\lambda(\lambda; q_G) = \int_\alpha^\beta v_l(w, \lambda - \kappa)[g(w) - f(w)]dw$, integrate by parts, and evaluate at λ^* . This yields (4), which proves the result.

$$\begin{aligned} \Delta V_\lambda(\lambda^*; q_G) &= \overbrace{v_l(\alpha, \lambda^* - \kappa)D(\alpha)}^{\text{Low-Voice Entry (+)}} + \overbrace{-v_l(\beta, \lambda^* - \kappa)D(\beta)}^{\text{High-Voice, Exit (-)}} \\ &\quad + \overbrace{\int_\alpha^\beta v_l(w, \lambda^* - \kappa)D(w)dw}^{\text{Empowerment (+)}} \end{aligned} \quad (4)$$

Whether growth increases or reduces the preferred corruption level turns on whether it increases or reduces $\Delta V_\lambda - \Delta R_\lambda$, whose components appear on the RHS of (3) and (4). This is ambiguous in general, but these results show that by tracking trends in entry, exit and anti-corruption effort we can establish whether growth's main effects on corruption are political or economic; and if they are political, what brings them about:

Proposition 4: *The political channel must dominate if either (i) entry into the service exceeds exit and corruption falls, or (ii) exit exceeds entry and corruption rises. In case (i), growth's dominant effects are to increase the number of low-voice citizens incentivized to fight corruption, and to empower all service users. In case (ii) growth's main effect is to reduce the number of high-voice citizens with incentives to fight corruption.*

Proof: In both cases, corruption moves in the opposite direction to that predicted via the economic channel in Proposition 2, implying that the political channel is responsible. The roles of entry, exit and empowerment are inferred from Proposition 3.

Going further, regardless of whether entry exceeded exit, finding that growth was accompanied by falling corruption in a government service is sufficient to conclude that growth strongly

empowered services users (under our modeling assumptions). This is because it is not only high-voice exit that encourages greater venality; low-voice entry does so too:

Proposition 5: *The net effects of both growth-induced entry and growth-induced exit are to increase the preferred corruption level. Growth only reduces preferred corruption levels through its empowerment effects.*

Proof: Collecting the entry and exit terms from (3) and (4) yields (5). The net effects of entry and exit are signed by Proposition 1, and the fact that $D(w) \geq 0, \forall w$.

$$\Delta V_\lambda - \Delta R_\lambda = \overbrace{[v_l(\alpha, \lambda^* - \kappa) - 1]D(\alpha)}^{\text{Net Effect of Entry}(-)} + \overbrace{[1 - v_l(\beta, \lambda^* - \kappa)]D(\beta)}^{\text{Net Effect of Exit}(-)} + \overbrace{\int_{\alpha(\lambda; q_G)}^{\beta(\lambda; q_G)} v_l(w, \lambda^* - \kappa)D(w)dw}^{\text{Empowerment}(+)} \quad (5)$$

Intuitively, growth-induced entry and exit both encourage corruption, because entry brings additional low-voice targets who can be extorted at low political cost, while exit eliminates high-voice complainers who cost the agency more politically than they provide in bribe revenue. It follows that when economic growth is accompanied by increased anti-corruption effort (as it was in the services appearing in the top panel of Table 2), this must be because it empowered citizens to use voice; and when it is accompanied by weak anti-corruption effort, this must be because it brought limited empowerment, but large changes in who uses the service (as it did in the services in the bottom panel of Table 2). These insights resolve the puzzle at the heart of this paper.

Proposition 5 also yields an empirically testable implication: when it is not possible for the rich to exit a service, because the public sector has a monopoly, it becomes more likely that empowerment will be the dominant force, and economic growth will reduce corruption. This implication also is borne out in the examples collected in Table 2.

Finally, the model draws attention to the role of the quality of public services. Result 3 (equation 2), shows that the agency will pay a higher political cost for a given level of corruption if the service is of a higher quality. This is because the higher quality ensures a larger number of users incentivized to defend the service, including richer, high-voice citizens (i.e. a higher quality service will have a smaller α and bigger β). For the same reasons, Proposition 5 (equation 5) shows that a higher quality service will experience larger growth-

induced empowerment effects. This helps to explain why anti-corruption programs often begin by targeting quality improvements: in addition to being difficult to argue against, quality improvements enlarge the constituency committed to defending the service.

3. Empirical Methods

Comparisons of citizen-facing corruption levels across services are not possible because corruption takes different forms in each service: missing teachers and grants in government schools; bribes for speedy clearances of passports; and black-marketing of berths and extortion on railway trains. Instead, we provide careful descriptions of anti-corruption efforts in each service, followed by explicitly explained judgements about large differences in their reach across services. To arrive at these descriptions, we constructed a timeline of reforms from newspapers (25-50 relevant articles per case), and collated data on demand for services over time from public sources. We corroborated these descriptions with a review of reports by government departments, international agencies and NGOs, government forms and websites, and parliamentary questions. We also interviewed key current and former government officials, personnel from Non-Governmental Organizations and private partners involved in the reforms process. During the interviews, in addition to confirming the timeline of reforms, we probed the reasons that either triggered or held back reforms, and why some changes were prioritized over others. We paid special attention to the forces that drove and sustained the reforms, and the impact of these changes.

While anti-corruption effort is our main dependent variable, we also take a near consensus among involved touts and agents, sector experts, and citizens that a service has become more or less corrupt to be a valid indicator of the success of these efforts. To this end, we interviewed 36 travel agencies in Mumbai, 20 of whom have worked on passports, and 16 who have worked on railways, constituting a near-census of such establishments in a 1-kilometer radius of each of two major rail terminuses in Mumbai – one on the Western line, serving wealthier and more business-oriented customers, and one on the Central line, serving less affluent, more migrant customers. We checked for national representativeness through interviews with another 48 travel agents in Delhi and Chandigarh.²⁶ Other than rural schools, usable over-time data on corruption in the services we study does not exist.

For views on changes in railways- and passport-related corruption, we interviewed 65 citizens in July 2019, covering a range of economic classes from the employees of a set of companies and organizations with offices in a particular, moderate rent, Mumbai office building –

including respondents from watchmen and sanitation workers up to CFOs. In addition, for a service non-specific view of corruption, we interviewed 62 lower-income and middle-class citizens in rural and urban UP in March 2016, sampling at random from voter lists compiled by India's Election Commission.

Each of these 211 citizen and intermediary interviews lasted 10-90 minutes and was semi-structured, with a view to capturing the over-time change in the experiences of corruption and its modalities.

Finally, we analyze data from several rounds of the ASER Surveys and from the India Human Development Survey-II to confirm that corruption, exit and voice-utilization patterns in rural government schools track individual and local incomes and exit opportunities, across time and communities in the manner our model predicts (See Appendix C1 for details).

4. Rural Government Elementary Schools

Rural government schools in India serve approximately 90 million students.²⁷ They are a concurrent responsibility of state and central governments – schools are run by the states, but the center provides financial support, which it increasingly leverages to exert authority and implement nationwide initiatives.²⁸ These schools have contended with many difficulties, including high student-teacher ratios, undernourished students, inadequate materials and infrastructure, excess bureaucracy and inappropriate top-down curricula that pre-empt meeting students at their level. Some progress has been made on these fronts over the last two decades, driven in part by successive central government initiatives aimed initially at universalizing education, then at improving school facilities and, more recently, at addressing teacher training and learning itself. Learning outcomes have generally been very weak, but have improved recently in several states.²⁹ Interventions shown to improve rural schooling in controlled settings often fail when taken to scale, perhaps because of a lack of pressure and accountability,³⁰ making them a useful case in which to examine our theory.

School-related corruption in rural India takes three forms – absent teachers, missing central-government grant funds, and bribe demands to complete paperwork.³¹ School-related bribes tend to be small, and are likely to be far less consequential than absent teachers and grant money.³² Missing teachers are extremely costly to students and the exchequer, and can be traced over time down to the district level. Unlike missing grants, missing teachers are observable to parents,³³ making them likely targets of voice pressure. This section therefore

focuses on teacher absenteeism to establish that growth did not spur reforms to curb absenteeism, but we also provide some micro-evidence on patterns of missing grants. We examine anti-corruption efforts at the national level, and the relationship between absenteeism, prosperity and exit down to the school-level.³⁴ Micro-evidence comes from two sets of rural surveys of schools and households – five biennial ASER surveys from 2010 till 2018; and IHDS-II, collected in 2011-12 (see Appendix C.1 for details).

We would expect growth to empower parents to bring down chronic teacher absenteeism. However, as Figure 2 shows, absenteeism rates in government-run primary schools did not budge between 2010 and 2018. Changes in absenteeism over the same period are also uncorrelated with output growth at the state-level and with increases in asset ownership at the district and state levels (Figure 3).³⁵ Our theory is that middle-exit to private schools has contributed to this lack of progress, by depriving the constituency for anti-corruption measures of its more voiceful members.³⁶ We now illustrate this process.

Our analysis begins with a ground level view of growing prosperity and exit dynamics. Four expectations of our theory are confirmed in the ASER data (Appendix C.2): (1) exit from government to non-government schools increased over time (Figure 2); (2) where private schools were available, richer households chose them over government schools (Table C1, Panel A); (3) private school availability and utilization both grew faster in districts that became prosperous more quickly (Table C1, Panel B); and (4) the wealth-gap between families using private and government schools grew between 2010 and 2018 (Table C1, Panel C). At the same time, teacher salaries, being governed by recommendations of central pay commissions in most states, climbed relative to average rural incomes (Aslam, Rawal, and Kingdon 2021).³⁷ These trends suggest limited voice gain among government school users, and possibly voice reductions relative to government schoolteachers.

Appendix C.3 utilizes IHDS-II to trace descriptively the likely effects of this exit on one possible proxy for the voice of this coalition. It demonstrates that richer government school-using families are more likely to attend PTA meetings, but the existence of private schools leads them to exit government schools, and in so doing ensures that government schools have *lower* aggregate PTA attendance in *richer* villages.³⁸

Table 3 shows that ASER data at the school level are observationally consistent with prosperity increasing absence, but doing so much less effectively when private schools are present: wealthier villages have significantly less absenteeism, but only in villages without private

schools.³⁹ We obtain similar results for both absenteeism and for missing grants using IHDS II data, in which we can also measure prosperity by household per capita expenditures (Table C3).

The findings so far are consistent with the model's prediction that growth is less likely to drive down corruption *levels* when there is exit. We next turn to analysis of anti-corruption-*efforts*, which, as our model predicts given significant exit by the voiceful, are conspicuous in their weakness.

The literature on teacher accountability has established three types of government-interventions that, if assiduously implemented, show potential for bringing down absenteeism and possibly increasing effort.⁴⁰ First, technologies to monitor attendance (using video cameras and biometric record keeping) substantially reduce absence (Duflo and Hanna 2005; Banerjee and Duflo 2006; Duflo, Hanna, and Ryan 2012). Second, lacking the ability to sack teachers, those overseeing negligent teachers often resort to threatening unappealing transfer appointments (PROBE Team 1999). Third, one might increase accountability through performance pay (Muralidharan and Sundararaman 2011).

The Government of India's recently released *National Education Policy* (NEP), while up-front about the need to "restore the integrity of the teaching profession", makes no mention of monitoring schemes, and actually explicitly commits to curtailing discretion in the use of teacher transfers (MHRD, 2020, paras 5.3 and 5.29). While many practitioners argue that monitoring technologies treat teachers disrespectfully and are easily sabotaged⁴¹ there is much less sympathy for eliminating transfers of errant teachers. The NEP does promise performance pay – perhaps the least controversial accountability measure. However, it offers no suggestion about how performance is to be assessed,⁴² and it promises to adjust the pay structure towards this end entirely through new rewards for performance rather than penalties on non-performance (paras 5.17-5.19). This, despite the document's acknowledgement that achieving most of its goals requires the central government's educational expenditures to rise from under 3% of GDP to 6% – a target that has been reaffirmed regularly since at least 1966, and has been honored only in the breach, even after the release of the NEP (Chakrabarty 2022).

In sum, none of the three most widely discussed measures to hold already-credentialed teachers accountable have made much headway. However, the accountability-first approach has its critics, who instead advocate rooting out corruption in the teacher training and accreditation system where it begins. They argue that the most corrupt and lowest quality training institutions

specialize in 2-year teaching diplomas, which are cheap to deliver and obtain, making them an easy gateway for the corrupt to control. Phasing out these institutions in favor of more rigorous and expensive to maintain 3- to 4-year-degree granting institutions could therefore discourage racketeering around entry into the profession.⁴³ Progress in this direction has been limited. In 2011, the central government mandated that all state governments introduce Teacher Eligibility Tests (TETs). Initial failure rates on some of these tests were extremely high, leading teachers to organize, delivering crushing early legal setbacks to reformers (Swarup 2019). While the TET mandate has stuck, and is sometimes credited with improving learning outcomes, our state-by-state review of TET requirements in 2021 unearthed only two states that prevent diploma holders from taking the TET exams to qualify for teaching primary school.⁴⁴ While the NEP does call for the de-recognition of 2-year teaching diplomas, it does so only by 2030, 18 years after a Supreme Court ordered commission emphatically demanded this (Appendix C.4).

Before closing, we consider two alternative explanations of the above evidence on rural government school corruption.

First, public school teachers in India are a political force, especially at the state level.⁴⁵ They promote teacher interests like more hiring and higher salaries, and push back on accountability mechanisms like performance pay, punitive transfers, and decentralization of school management to promote community voice. This no doubt plays a role. However, vested interests that benefit from the status quo are common to most public services. Still citizen-induced pressure, as we demonstrate in the following two case studies, has been able to produce and sustain governments' anti-corruption measures and overcome these vested interests. Moreover, citizen voice pressure, if strong enough, could clearly shape national discourse on teacher absence, because it is considered illegitimate; no teacher's union, politician or political party tries to justify it. In keeping with the thrust of this paper, we have therefore focused in this section on demonstrating that the data are consistent with growth-induced exit of the voiceful from the public schools slowing anticorruption reforms. In addition, we have already demonstrated that the micro data are observationally consistent in several respects with growth-induced exit limiting the possibility of restraining corruption through local voice pressure.

Second, it might be that private schools could be established in response to higher teacher absence, rather than absenteeism responding to their availability (Muralidharan 2019). This cannot be conclusively ruled out because good instruments for private school-availability do

not exist. Yet there are good reasons to believe this does not drive our findings. Most importantly, if absenteeism drove private school establishment, private school availability should have grown faster between 2010 and 2018 in states and districts with high absenteeism in 2010, but it did not, and indeed grew more slowly in initially high-absenteeism states (Table C4, Panel A). A more plausible story is that income dynamics of the sort this paper focuses on drove the availability of private schools, with low-quality private schools being gradually culled, as growing prosperity motivated families to demand higher-quality private schools. The following trends suggest this version of events: (i) The aggregate availability of private schools did not change over time on average, but rather it fell in many districts and increased in others (Figure C1); (ii) High wealth-growth districts gained more private schools and saw more families opt to start using them (Table C1, Panel B); and (iii) Private school learning outcomes improved faster in higher-wealth-growth districts (Table C4, Panel B).

5. Passport Issuance

The Ministry of External Affairs (MEA) issues Indian passports. Acquiring passports was traditionally a cumbersome process, typically taking around 45 days. Citizens were harassed for bribes when they submitted their documents to central government run offices for processing. The original procedure required police to visit applicants' homes in order to verify their identity and address, and certify the absence of a criminal record. Applicants routinely reported being extorted for bribes by the police to complete this verification process (Borooah 2011; Janaagraha 2016). Clearly, passport issuance has offered substantial rent potential.

These potential rents from corruption around passport issuance surely increased with growth. Only the Indian government may provide an Indian passport, so exit is impossible and demand for the service rises fast with incomes. Three decades of rapid growth increased travel out of India both for work and for leisure among the middle classes. A passport is also required as an identification document for growing numbers of students who take international exams like the SAT and GRE. Lower-income migrant workers and their agents boosted demand growth further.⁴⁶ The number of passports issued annually increased from 5.3 million in 2010 to 12.8 million between 2010 and 2019 (CAG 2016; MEA 2021), with over 80 million Indians holding passports (Sai 2018). This growth in demand for passports should have increased corruption. Yet, successive federal governments have endeavored to make the acquisition process shorter and have expended significant efforts to reduce opportunities for bribe extraction, including among local police who are outside the MEA's jurisdiction.

The improvements began with the processes under MEA jurisdiction. In 2000, procedures for emergency (*Tatkaal*) passport issuance were introduced, initially with a waiting period of 7-14 days, subsequently reduced to 1-3 days, provided an applicant is willing to pay an additional fee of Rs. 3,500-4,000. A 2007 law delegated the task of receiving documents from applicants, passing them on to the police and issuing passports to 77 service centers (*Passport Seva Kendras* or PSKs) around the country, to be run by Tata Consultancy Services (TCS), a private firm with strong reputation for integrity and efficiency. In 2010, TCS launched an online application portal to automate information collection and schedule appointments to finalize application packets at the PSKs. Applicants at PSKs only meet TCS employees, who do not have the power to approve or reject applications. That power remains with government officials. This separation reduces discretion and the leverage associated with indeterminate waiting times for MEA processing. An MEA-supported phone app now allows applicants to track passport processing. The number of TCS-run PSKs has been expanded to 93 and demand for local PSKs has led to the opening of 428 PSKs run by post offices (MEA 2021). A senior bureaucrat described the change as follows: “The entire approach of the government has shifted. Earlier, the official would review the application and if something was missing, he would ask the applicant to go away telling them your request is denied. Now the official explains to you what is missing in your application and also tells you how to fulfill the requirement.”

Interviewed TCS officials said that before they entered the process, the 37 passport centers run by the MEA “were dens of corruption,” and that the passport department was one of the worst rated in the government, in terms of complaints. Individuals could get a passport on a single day’s notice by providing a bribe of Rs. 25,000-30,000. This has changed, they said, stating, “We put the touts out of business,” and pegging the size of that intermediate economy at over 2-3 times the total financial intake by the government on the passport process. Facing losses, some entrenched interests opposed the reforms. Travel agents, who mostly performed the intermediary role, challenged the reforms by filing a case against the government in the Gujarat High Court in 2012, which acknowledged the extensive corruption in the previous system and rapidly decided in favor of the government (Devani 2012). The reforms also faced opposition from within the MEA, where unionized officials were unhappy about losing their lucrative discretionary power. Regional passport officers and MEA officials concurred, reporting that the new liberalized passport rules brought transparency, made passport acquisition easier and touts irrelevant, and took away many discretionary powers from passport issuing authorities.

While police verification is conducted by local governments and is not under MEA jurisdiction, the central government has attempted to empower applicants relative to police, and is now seeking to eliminate citizen-police contact. In January 2016, it gave passport offices the discretion to allow verification to be conducted after the passport has been issued. In 2017, it introduced a citizens' charter stipulating maximum times for police verification. In 2021, it reiterated its intention to use a database centralizing the collection and dissemination of national crime statistics to make the physical verification unnecessary altogether (Sen 2021). The government tracks verification-related problems on its citizen-facing passport portal (Tembhekar 2021), and incentivizes swift police verifications by paying the local police Rs 150 per verification completed within 21 days, and only Rs 50 if it takes longer. The MEA also recognizes states with the fastest police verification processes through annual awards and ranks the performance of PSKs. The average processing time for a passport has fallen to 18 days and ranges from 2 days to 70 days (Sai 2018) .

To check for bribery related to passport issuance over time we conducted in-depth interviews with MEA and TCS officials, passport holders, and passport agents. All four sets of respondents confirm that anticorruption efforts have yielded dividends, insofar as processes under MEA control are concerned. Bribery related to police verification remains (Kumar 2018), but seems to have become less frequent and brazen. Among 24 citizens with recent experience obtaining passports, 75% reported no bribe demands at any stage, with the only bribe demands reported by the others coming during police verification. Subjects who had experienced the old and new passport issuance systems felt that the passport acquisition process had improved and bribery had decreased. "I know where my application is in the process. Now everything is online, so where is the opportunity of demanding payment," said one interview subject. Another subject noted, "I was told by friends that I should be prepared for paying the bribe; *chai pani* (money for tea and water). But, the police official did not ask." Another said, "one of the police officials hinted at it, but I ignored it. It did not delay my passport." Still another said, "My husband even offered money when they had finished the verification process, but the police officials refused." One subject observed, "Today, police does not ask for bribe directly. They will say we have to check this, we have to check that. So, you give them a little money and they will do verification in a timely way. Earlier the police demanded money shamelessly."

The passport agents also reported a reduction in the demand for bribes, with 78% stating that the process had become more transparent. The opportunities and demands for bribe during the passport application process had disappeared. "Help with passport applications is not really

required anymore,” explained an agent, “Only those senior citizens who are not computer savvy or do not like to use credit cards take our help. Previously we would help the customers fill out forms, and our boys would accompany them to go get the passports. Now, the TCS people just require applicants to go to the Tata center. The number of documents required to apply for a passport has fallen.” While the number of passport applications have increased, passport agents report that their work has decreased and the number of passport agents has fallen. Verification-related bribery has not been eradicated: 16 out of our 20 passport-servicing agents reported knowing about bribes during the police verification process. When the application process stalls on some technicality related to the applicant’s paperwork, or the address cannot be verified easily, then money is demanded to move things forward.

Interviewed MEA and TCS officials corroborated the improvements. “Getting forms, finding all manner of certification, applicants used to turn to touts for these tasks. Now all of this is simplified.” The official noted that cameras are used to monitor PSK personnel, and all interactions of applicants with PSK officers are logged.

Corruption has been reduced overall, but, as predicted, progress has been greater for citizens who are wealthier or live in high-income locations, with less voiceful citizens still subject to it. Steps like the opening of PSKs in post offices and holding passport *melas* (fairs), which make the passport application process more accessible to the less wealthy, arrived in 2016. Moreover, the process takes longer in low-income states like Uttar Pradesh and Bihar than high income ones, including Tamil Nadu and Karnataka (Dubbudu 2017). According to interviewed passport agents, applicants who are renters or whose permanent addresses are in a village or a small town, or those from poorer families, who have no previous experience of the process, are more likely to be targeted for bribes – a finding TCS officials said is corroborated by their customer data. Agents who worked with Muslim applicants headed to Gulf countries on pilgrimage also reported harassment of applicants during police verification.⁴⁷

So why, despite massive entry into the passport service, did the government act aggressively to cut corruption levels? Our model anticipates this outcome when growth empowers richer constituents who lack the possibility of exit. As the number of applicants belonging to the voiceful rich and middle-class groups has grown, different sections of these groups have exerted public pressure through multiple channels to improve the passport issuance process. Newspapers, whose circulation has increased with disposable income and literacy, have covered concerns related to bribe demands during police verification, while passport-related

complaints have featured prominently on online anticorruption platforms like *ipaidabribe.com* – whose citizen-reporters overwhelmingly come from high growth commercial states. Interviewed passport holders and agents mentioned public pressure, specifically the threat of consumer-technology-enabled evidence-based complaints and exposures. One passport holder explained the reduction in demands for bribes from police by suggesting, “Citizens are more educated and there have been sting operations, police officials know that a citizen could very well be recording the transaction on their mobile phone.” An MEA official pointed to another channel of citizen pressure, “When passport applicants face problems, they complain. We receive complaints through our web portal, the government’s general complaint portal, and through twitter.”

The business community has also pressured the government to make improvements. The government permitted RPO officials to experiment with measures that reduce passport issuance time. Significant improvements were first introduced by the Regional Passport Office in Bengaluru and Hyderabad – nerve-centers in India's software industry, in which TCS has itself been a major player since the 1970s (Saraswati 2012). The industry is, in turn, a key source of foreign currency earnings, which India requires in order to sustain the rupee as growing incomes increase its import bill. A recurrent voice in pushing for these changes is the Bengaluru-headquartered Federation of Karnataka Chambers of Commerce and Industry (FKCCI), which organizes interactions between industry and the RPO. The FKCCI has pushed hard for improvements that streamline the system for its members, whose businesses rely on international travel, often on short notice.⁴⁸ In addition, efforts by local authorities to reduce police verification times have been strongest in states where the economic cost of verification delays is highest. For example, Kerala, a high remittance state, introduced a police verification app that, in its first trial, increased the within-21-days verification rate from 55% to 99.9% within four months (*Times of India* 2018).

As expected, then, economic growth empowered wealthier citizens who could not exit the passport service to press for improvements, and the central government has worked hard to make them. So too have local authorities in the most growth-impacted cities and states.

6. Railway Tickets

Railways are the most widely used mode of long-distance travel in India. In 2019-20 alone, 8.4 billion passengers boarded Indian trains. Economic growth since 1991 has increased domestic travel within India as more people have begun to travel inside their own states as well as to

other states in search of work and better livelihoods. Travel related to leisure and pilgrimages has also increased. Indian Railways (IR) passenger traffic (in passenger-kilometers traveled), which had grown by only 3.5% annually between 1980-81 and 2000-01, grew at 7.75% per annum for the decade ending 2010-11, before decelerating slightly (Indian Railways 2019). Growth also resulted in some upper-class exit. Air travel became more accessible to richer citizens. The number of domestic airline passengers grew from 42.3 million in 2009-10 to 66.4 million by 2014-15, which is approximately one-third the number of passengers traveling in air-conditioned trains. New, high-quality highways eased road travel, leading to the emergence of luxury bus travel and more long-distance travel in private vehicles. Thus, lower-income entry into the rail system has far exceeded upper-income exit, but competition for wealthier customers demanding more comfortable and convenient travel has soared.

Any understanding of the evolution of anti-corruption and other measures for service quality improvement on IR must begin with the class structure of a long-distance train. Ninety-four percent of IR passenger revenues come from these trains (the remaining passenger revenues are from suburban trains). A traditional long-distance rake has 22-24 carriages, 2-3 of which serve travelers without a seat reservation, with no guarantee of space or seating. The remaining, reserved passenger carriages cater to different fare classes, distinguished by seating and sleeping arrangements, density, and the availability of air-conditioning. Analysis by India's Comptroller and Auditor General confirms that unreserved travel is extremely subsidized, most reserved travel is moderately subsidized, and only the air-conditioned sleeper and chair classes used by middle class travelers cover their operating costs (CAG 2019c). Much of this subsidy to passengers was historically covered by freight traffic, which provide approximately two-thirds of IR's internally generated revenues, and offered profit margins that came under increasing pressure due to containerization, improved roads and rising demand for timely local delivery. Faced with increasing budget pressures,⁴⁹ IR has therefore worked to systematically increase the share of travelers in the least-subsidized classes. Cleaning up the reservation system was essential for this.

Corruption related to railway reservations used to be rampant. One ubiquitous form of everyday corruption was bribery to obtain reserved seats on trains. A pure rent-seeking model would anticipate that increasing demand would make this practice more common and costly. Instead, IR made efforts to reduce citizens' experience of corruption, especially related to reserved travel. IR rapidly computerized the back end of its reservation system in the 1990s. Passengers looking for last-minute bookings used to pay bribes, but in the late 1990s IR began saving and

selling seats at a premium to last-minute travelers, thereby converting illegal rents into legal revenues. In 2002, the front end was revamped to permit passengers to make bookings online at authorized vendors distributed throughout population centers. Starting in 2005, the introduction of fully online reservations permitted them to do this from home. Importantly, these steps were taken despite risks of system collapse during early phases of the transition, which would have been catastrophic given the millions of passengers relying on the booking system (Nilakant and Ramnarayan 2009; Srivastava, Mathur, and Teo 2007). One explicit purpose of these changes was to make the process more transparent and reduce the discretion of railway officials (Pratap 2007).

The changes appear to have worked. Sixty-three percent of the passengers we interviewed felt that corruption related to ticket reservation had declined since online reservations were introduced. None felt that it had increased, and the rest could not say. Most noted that making reservations has become easier. “Now you can reserve a ticket much more easily without standing in long lines or going to a tout,” an interview subject said. Another recounted, “earlier we used to find many *dalals* (touts) chasing you on the platform, asking you where you are going, and offering to sell you tickets. Now you don’t see them.” During the interviews, passengers also reported a decline in bribe demands made by ticket-checkers in reserved coaches.

Ticketing agents, who assist passengers to acquire reserved tickets for a fee, corroborated these findings. Eighty-two percent of the ticketing agents interviewed agreed that ticketing-related corruption had fallen since online reservations became possible, and none felt that it had increased. An agent who had been in the profession for close to 20 years was categorical in his response, “earlier it was possible to have a setting or an arrangement with railway ticketing official to get tickets out of turn. That is difficult with the on-line booking system.” Remarkably, these improvements occurred even as unmet demand for reserved tickets increased.⁵⁰ For example, agents and passengers alike told us that in the late 1990s and early 2000s, non-AC sleeper reservations from Mumbai to Uttar Pradesh had to be made one month in advance. Today, migrant workers returning home to UP must make these reservations three to four months in advance.

Improvements have been less pronounced for unreserved travelers. Modalities for selling unreserved tickets have improved belatedly, with the piloting of vending machines starting in 2007 and a smartphone app in 2015. However, passengers who travel in unreserved coaches

often lack smartphones and credit cards, and many still have to line up at ticket windows. The app only works within 20 meters of a railway station, and vending machines are used for only 17% of sales (CAG 2019b). Travel in these coaches is uncomfortable because of severe overcrowding, and yet the number of unreserved coaches on long distance trains does not change. Inconveniently for passengers, the deadline for obtaining refunds on unused unreserved tickets was shortened to 3 hours in 2016. Railway officials acknowledge the absence of ticketing reforms for the unreserved coaches and low quality of onboard services.⁵¹ With the number of seats severely limited relative to the number of unreserved tickets issued, passengers who had travelled in the unreserved coaches complained that members of the Railway Police Force (RPF) still sometimes demand money to let passengers keep their seats or avoid searches of their belongings.

We also interviewed IR officials to corroborate our interview findings. The officials affirmed the decline in reservation-related corruption.⁵² Interviews with nine senior officials on the Railway Board, IR's apex policymaking body, pointed to two reasons why ticketing corruption was reduced, but corruption affecting unreserved travelers was not.

First was the threat of middle-class exit. Recalling discussions within the ministry in late 1990s and the early 2000s, one official said, "We had to change with the times, we had no alternative." He added, "this was a moment of choice; people suddenly had more choice in banking, entertainment, food, cars. The mindset of the middle-class passengers changed, if they were dissatisfied, they shifted to another service. As this picture began to emerge, the thinking in the review meetings was that if we did not improve the passengers' experience, we would lose more of them." Another official explained, "We saw that we were losing passengers in the top two-tier segments; First class and Second AC, even as demand for third AC and the non-AC class remained high. As far as passengers are concerned, the first, second and third AC categories are the only tiers that come close to paying for themselves." The fact that the fares of travelers in some reserved classes exceeded their incremental cost rendered the IR more attentive to these passengers' opinions without requiring them to act collectively. Middle class passengers' fares could be increased, albeit with difficulty, and only if the quality of the customer experience was improved. An increasingly cash strapped Railways was therefore sensitive to losing customers in this segment (see Appendix B for a formal model demonstrating the rationality of this differential attentiveness to richer customers). The Railways also began to run more premium trains on shorter routes to compete with airlines and buses. Targeted specifically at middle-class passengers, these 142 trains have no unreserved or

non-AC compartments, and are the least subsidized passenger trains (CAG 2019c).

Second, growth also opened more channels of influence for the middle-class segment. Traditionally, middle class customers are also the ones more likely to complain against irregularities. Newspaper and television industries that have expanded since 1991 are more attentive to their concerns. Social media increases middle-class passengers' influence. They tweet their discontent, they report experiences in blogs and on websites that document bribery, and upload videos to highlight corruption. The railways have felt this change. "There is nowhere to hide. Things can go viral quickly," explained the director of the passenger grievance cell. The Railway Board has assigned a team of officials to monitor and respond to trending complaints against the organization on twitter. Another added, "We have an entire department that handles public relations. We are very sensitive to what the public thinks of us. Most of the complaints originate from the reserved segment of our passenger trains. From the unreserved segment, where the quality of services is poor and where the RPF personnel are involved in shakedowns there are far fewer complaints."

Awakened to the prospect of mass middle-class exit and public shaming by customers, overhauling of the reservation system was one part of a broader package of changes that IR implemented once growth picked up in the 1990s, despite the fact that rising demand for railways increased rent-seeking opportunity. This suggests that IR implemented systemic changes that reduced corruption in response to growth-induced increases in the influence of richer travelers.

7. Discussion

We have provided theory and evidence that economic growth increases richer citizens' political influence, and pushes governments to step up efforts to reduce *citizen-facing* corruption, starting with public services that richer citizens continue to utilize. Corruption is surely not eliminated by this, but it is reduced. As a result, growth tends to make citizen-facing corruption more of a poor people's problem. These findings draw attention to the institutional benefits of growth, while also underscoring that these benefits are contingent on retaining richer citizens as public service users. These dynamics, presuming they existed in the past, could help to account for the cross-sectional finding that higher income societies today tend to be less corrupt

(Svensson 2005). As such, they provide some grounds for optimism, and perhaps even gesture towards some convergence in institutional quality.

Yet, such optimism must be tempered by two caveats. First, growth-fueled increases in middle-class influence require responsive institutions to translate into anti-corruption effort. That responsiveness may be in retreat alongside other democratic norms (Diamond 2022). Second, growth makes elections and other political battles more expensive to fight. With bigger war chests to fill and citizens increasingly empowered to act against corruption-induced welfare losses, politicians may well be turning to forms of corruption that do not directly reduce citizen well-being. This could explain, for instance, why corruption seems to increasingly involve stealing from the state through cost inflation, kickbacks on public procurement, rigged public tenders, and phantom service recipients. Growth, in other words, seems to reduce the forms of corruption we study here, but it may encourage others (Ang 2020).

So how can the rich be retained among the ranks of public service users? The most obvious way to do this is by increasing the target quality of public services, which, by giving most citizens more to lose from corruption, should increase voice pressure to clean things up (see Results 1, 1a, 2 and 2a).

Finally, our work points to a clear error that governments seeking to reduce corruption must avoid: They must not split the constituencies of the more and less wealthy, by either subsidizing rich-only private services,⁵³ or by creating poor-only services. Such a split will ensure that growth makes corruption more of a tax on the poor.

Figures

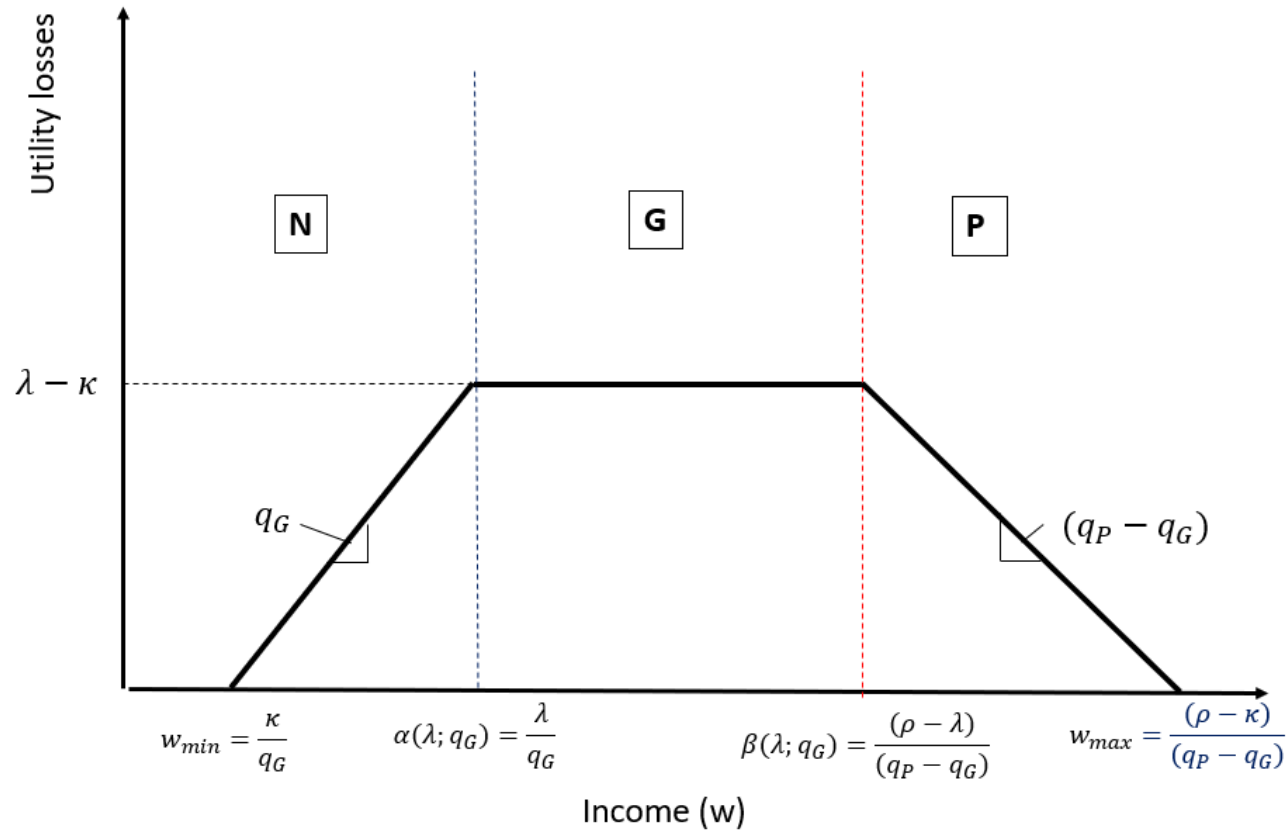
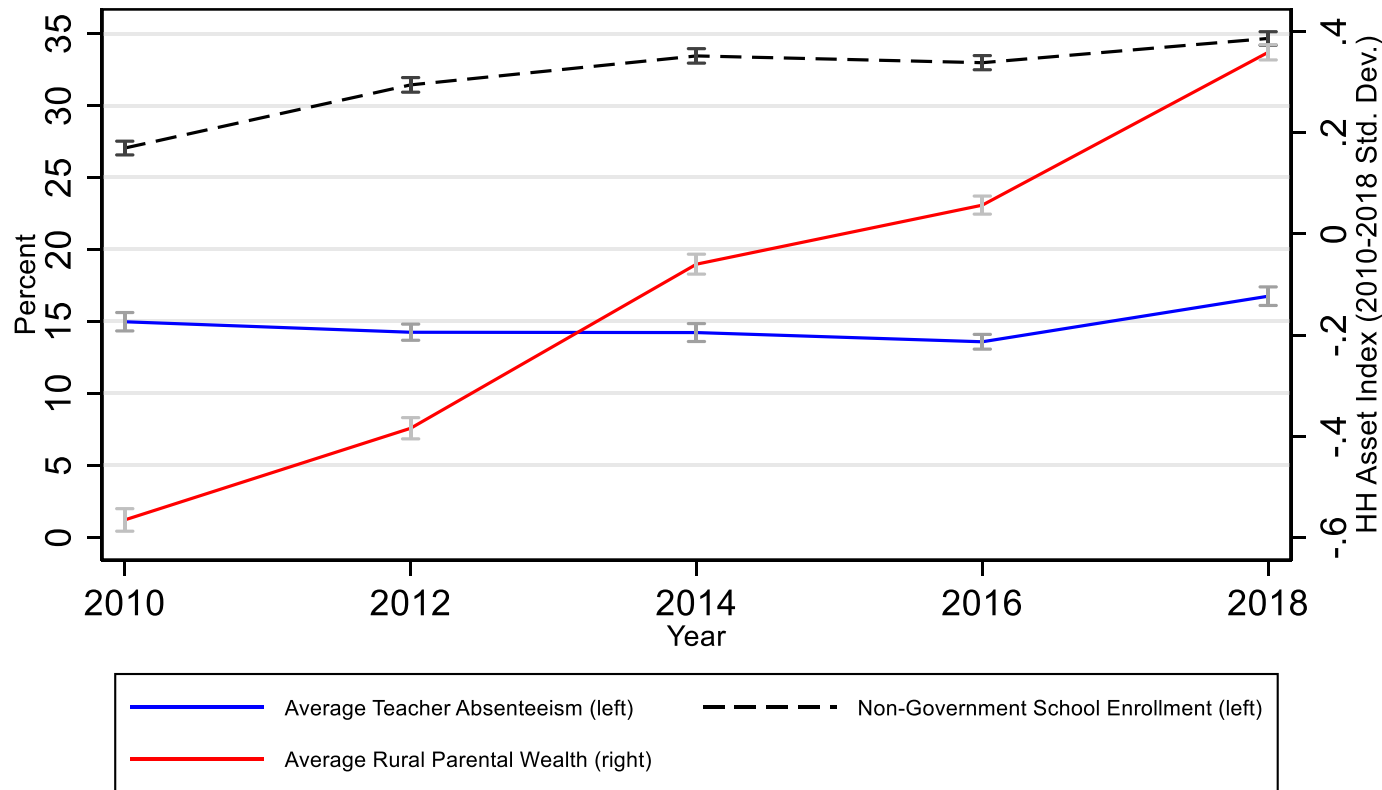


Figure 1: Utility Losses to Corruption (by income level)



Note: Authors' calculations from ASER survey data. Average teacher absenteeism is the weighted-average absenteeism rate of teachers (excluding headmasters and para-teachers) across ASER-visited schools, where weights are the sampling weights for the district multiplied by the number of teachers expected to be in attendance. Enrollment in non-government schools is the sample-weighted percentage of in-school children aged 3-16 who are enrolled in schools that are not government-run. The asset index is the standardized first principle component of indicator variables capturing the permanance of a household's dwelling, whether it has an electrical connection, toilet, TV, mobile phone, newspaper, other reading materials, and a member who can operate a computer. The sample includes approximately 550,000 children in each year. Non-government schools are privately managed schools, Madrassas, and other schools. Government-aided, privately-managed schools are presumed non-government. Standard errors are clustered on the school/village and year.

Figure 2: Wealth, Exit and Absence, the National View

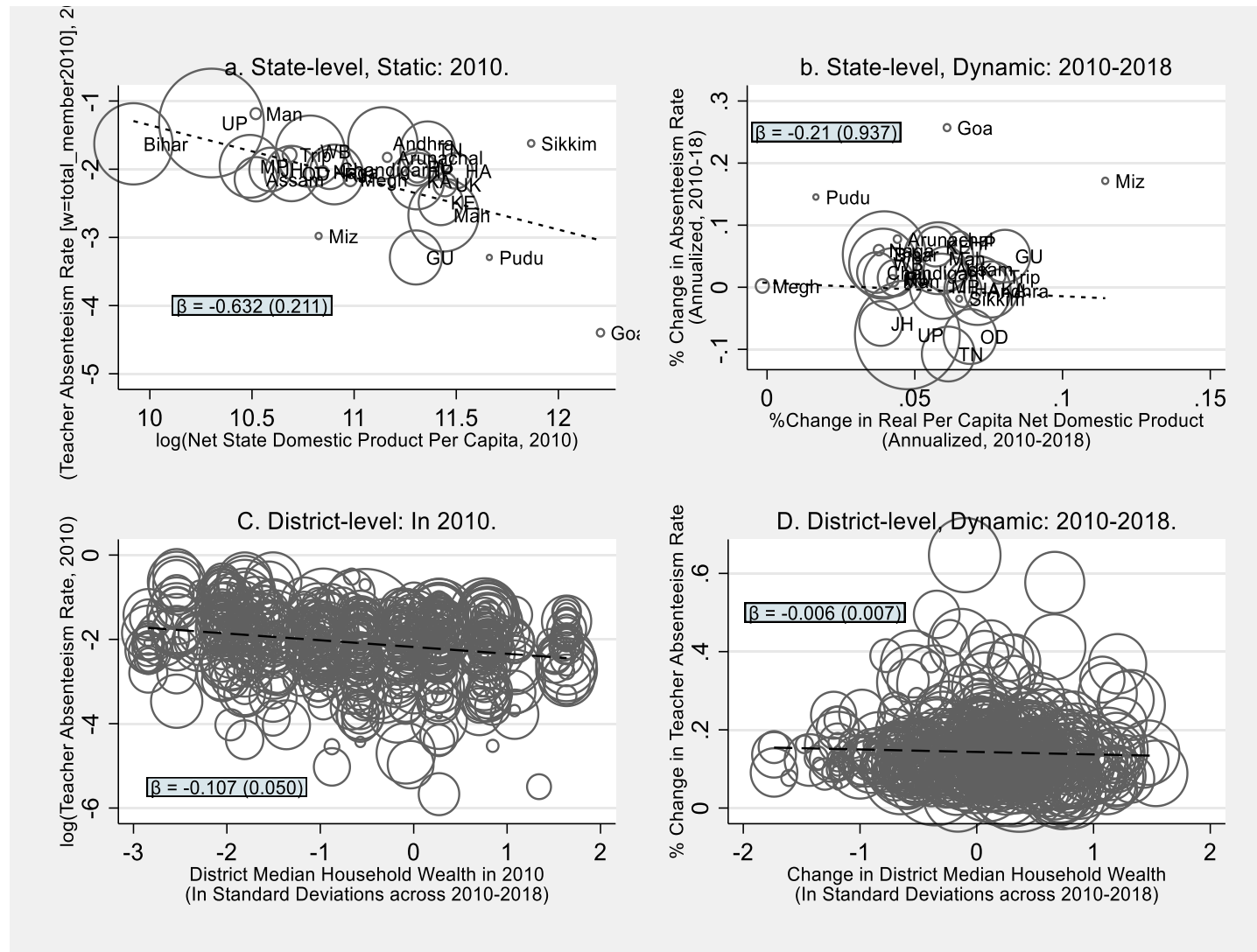


Figure 3: Prosperity, Economic Growth and Teacher Absenteeism

Tables**Table 1. Corruption Perceptions in the Fastest Growing Populous Low-Income Democracies**

	<i>Real GDP per Capita Growth (2000-2020, annualized % rate)</i>	<i>Corruption Perceptions Index (2018, out of 100)</i>
Myanmar	8.17	28
Ethiopia	5.75	39
India	4.38	40
Indonesia	3.50	38
Mozambique	3.34	26
Ghana	3.32	43
Tanzania	3.13	39
Nepal	3.02	33
Philippines	2.90	33
Peru	2.82	36
Burkina Faso	2.54	42
Nigeria	2.51	24
Zambia	2.49	33
Global mean	1.67	43.2
Global median	1.43	39

Note: The list consists of the 13 fastest growing democracies with populations over 10 million persons in 2021 and per capita GDPs below \$12,000 in 2020. We restrict attention to low-income countries given their greater potential for corruption-reducing economic growth, and to democracies in deference to our third scope condition (see Section 1). Country ordering is by real per capita GDP growth between 2000 and 2020. Global means and medians are for all countries reporting the measure, regardless of population, income level or polity score. Democracies are defined as countries with strictly positive total Polity 5 scores (Marshall and Gurr 2020). Per capita GDP and its growth rates are calculated from World Development Indicators' real PPP corrected (2017 constant USD) series. Population is also from WDI. Corruption Perceptions Index is from Transparency International (2021). We stopped at 13 countries in the interests of brevity and geographical coverage only: the next seven countries in the list (Guinea, Bolivia, Pakistan, Mali, Kenya, Benin and Malawi) all had CPI scores below 42 and 20-year real per capita GDPP growth rates above 1.47% (i.e. above 34% per capita income expansions over the 20 years).

Table 2: Users' Incomes, Forms of Corruption and Anti-Corruption Efforts across Public Services

A. Services in which anti-corruption efforts arrive early and are stronger

	<i>Citizens served:</i>	<i>Typical form of corruption</i>	<i>Sources describing clean-up efforts</i>
Reserved rail travel	Richer	Bribery and black-marketing	See Section 6
College admissions (Maharashtra)	Richer	Bribery & extortion	Authors' case study ^a
Tax assessment and payment	Richer	Bribery & extortion	Nayyar and Singh (2018)
Liquor licensing (Maharashtra)	Richer	Bribery & extortion	Govt. of Maharashtra (2022)
Ordinary Passport applications	All citizens	Bribery & extortion	See Section 5
Car registrations	All citizens	Bribery & extortion	Shome (2022)
"Loudspeaker" licenses (Mumbai)	All citizens	Extortion	Mumbai Police (2022) ^b
Telephony	All citizens	Bribery & extortion	Mukherji (2009) ^c

B. Services in which anti-corruption efforts are delayed, inconsistent or absent

	<i>Citizens served:</i>	<i>Typical form of corruption</i>	<i>Sources describing efforts or their limitations</i>
Unreserved rail travel	Poorer	Extortion	See Section 6
Rural schooling	Poorer	Misappropriated resources	See Section 4
Passports for Migrant Workers	Poorer	Extortion	Agarwala (2022)
Government Health Services	Poorer	Misappropriated resources & extortion	Nundy, Desiraju, and Nagral (2018)
MNREGA	Poorer	Misappropriated resources	Sharan (2021)
Hawking licenses	Poorer	Extortion	Rai and Mohan (2017); (Chougale 2013)

Cooking gas connections for the poor Poorer Misappropriated resources CAG (2019a)

Note: Services are classified following a careful reading of journalistic accounts, other public documents, and (where possible) academic studies.

^a In 2010, Maharashtra began evolving a centralized, online junior college application and admission system, significantly reducing colleges' discretion and capacity to require bribes for admissions. Public documents, newspaper archive review and Interviews with dozens of citizens, 4 educationists, 2 journalists and two senior government officials confirm that reforms have been broadly successful. Case study collated by authors, but excluded from the current paper for brevity.

^b Surrendering a favored pretext for extortion, the Mumbai police now grant loudspeaker licenses automatically against an online application and payment. The permitted decibel levels are modest, subject to zoning restrictions, and megaphone-style-speakers are not permitted, effectively limiting the improved licensing service to those with the means to host indoor house parties.

^c Bribes were standardly paid to obtain phone lines from public phone monopolies, a practice obviated by the advent of private mobile phone providers.

Table 3: Wealth, Exit and Rural Government Primary School Absenteeism

<i>OLS Regressions of teacher absenteeism rates</i>			
Village wealth	-1.106***	-1.004***	-0.379
	(0.230)	(0.276)	(0.264)
Village has a private school (Yes=1, No=0)	0.013		
	(0.294)		
(Vill. Wealth)*(Pvt. School Dummy)	0.634**		
	(0.0060)		
Villages with private schools included	✓	×	✓
Villages without private schools included	✓	✓	×
District-year fixed effects	✓	✓	✓
Village- and school-level controls	✓	✓	✓
Observations	61,790	34,693	29,097

Note: Sample consists of all ASER-visited rural government primary schools in 2010, 2012, 2014, 2016 and 2018. Teacher absenteeism rate is the fraction of regular teachers (excluding headmaster and para-teachers) that the ASER enumerator observed was not in school. Village wealth is the median wealth of the households sampled in that village, normalized to have a mean of zero and standard deviation of one across the sample. Calculation of household wealth indices, which are measured in 2010-2018 standard deviations, are explained in the note to Table C1. All standard errors are clustered at the village level. All regressions include dummies for basic village infrastructure (a proper road, electricity, a post-office, and internet cafe). They also correct for the grade levels served by the school (1-4 vs. 1-7/8), and the number of teachers expected to be present and their square, to allow for systematic reporting errors or incentives towards absence that vary with school type and size.

*** p<0.001, ** p<0.01, * p<0.05

Appendix A: Pilferage model

We retain all the assumptions from our bribery model about the three options citizens choose between (N, G, P) ; the income distribution, $f(w)$; the utility function, $U(c, q) = c + wq$; and how a citizen's income and the utility losses they experience due to corruption (l) determine the voice pressure each citizen applies ($v(w, l)$). However, now there is no bribery, so those picking G pay only the official price (κ), which for simplicity, we assume the bureaucracy must account for. Instead the agency makes money by choosing a service quality q_G below the official target quality, \tilde{q} , which is in turn lower than what the private sector offers $\tilde{q} < q_P$. Assuming quality is money-metric, the pocketed difference is the bureaucracy's illicit revenue: $R(q_G) \equiv (\tilde{q} - q_G)Q_D(q_G; \kappa)$, with the "corruption level" given by $(\tilde{q} - q_G)$. We only present results here, because the proofs and derivations in this model are all analogous to those in Section 2.

A.1 Service Utilization and Utility Losses

In this setting, $U_N(w) \equiv w$, $U_G(w, \kappa, q_G) \equiv w - \kappa + wq_G$, and $U_P(w) \equiv w - \rho + wq_P$. As before, at a given corruption level, poorer citizens choose N , those in the middle choose G , those richer still choose P . Also, as before, some are too poor or too rich to consume the public service even if there were no corruption. The income cutoffs are redefined and depicted in Figure A1. Demand for G is $Q_D(q_G; \kappa) \equiv F(\beta(q_G; \kappa)) - F(\alpha(q_G; \kappa))$. Result 1 from Section 2 continues to hold: Demand for G increases in its quality, $(\partial Q_D / \partial q_G > 0)$; but decreases in its price $(\partial Q_D / \partial \kappa < 0)$.

The utility losses among potential service users are defined relative to the counterfactual zero corruption case ($q_G = \tilde{q}$). They are: $l_N = \kappa + w\tilde{q}$, $l_G = w(\tilde{q} - q_G)$ and $l_P = (\rho - \kappa) - w(\tilde{q} - q_P)$, and are also depicted in Figure A1. Result 2 from Section 1 continues to hold, with respect to income and \tilde{q} .

Result A2: All three groups of potential service will lose utility if there is corruption, and have higher utility losses, the cheaper G is supposed to be (i.e. the lower κ is). Those who choose the government service lose more utility to corruption than other citizens, and only their utility is affected by changes the actual service quality.

However, one noteworthy change is that losses are now highest for those almost rich enough to prefer P over G . This is because the richest G users place the highest relative value on lost

service quality. In contrast, when there was bribery, it was citizens with w close to α that had the biggest reason to voice displeasure, because the consumption losses due to bribery were most painful to them (see Note 26). This suggests that keeping the rising middle classes in the user coalition, possibly by keeping κ low, will be particularly important for combatting corruption through citizen voice pressure when corruption takes the form of pilferage. For notational convenience, the remainder of our derivations suppress κ , implicitly holding it constant.

A.2. The government Agency's Problem

As we continue to assume that the money metric cost of voice pressure on the bureaucracy is the sum of the voice pressures applied by citizens, our usual assumptions about $v(w, l)$ imply that the pressure cost still comes only from potential users of G , and is given by (suppressing κ):

$$\begin{aligned}
 V(q_G; \kappa, \tilde{q}) = & \int_{w_{\min}(\tilde{q})}^{\alpha(q_G)} v(w, l_N(w; \tilde{q}))f(w)dw \\
 & + \int_{\alpha(q_G)}^{\beta(q_G)} v(w, l_G(w, q_G; \tilde{q}))f(w)dw \\
 & + \int_{\beta(q_G)}^{w_{\max}(\tilde{q})} v(w, l_P(w; \tilde{q}))f(w)dw
 \end{aligned} \tag{A6}$$

Given our usual assumptions about $(v(w, l))$, and Result A2, Result 3 holds even if corruption takes the form of pilferage:

Result A5 Marginal increases in pilferage (reductions in q_G) will: (i) bring increased pressure on the agency; (ii) increase pressure more if the affected citizens are rich; (iii) increase pressure only because they increase losses to those citizens who actually use the service; and (iv) increase pressure more if the target quality of the service is high.

Proof. Differentiate (1) with respect to q_G , and apply Leibniz integral rule and the definitions of $\alpha(q_G)$ and $\beta(q_G)$ to obtain the slope of voice in pilferage (2). Result 3 follows by inspection.

$$-V_{q_G}(q_G) = - \int_{\alpha(q_G)}^{\beta(q_G)} v_1(w, l_G(w, q_G)) \frac{\partial l_G(w, q_G)}{\partial q_G} f(w) dw > 0 \quad (\text{A7})$$

A.5 The government agency's problem

The agency selects the corruption level, $q_G \leq \tilde{q}$ that maximizes illicit rents net of their political cost: $\Pi(q_G) \equiv [R(q_G) - V(q_G)] \equiv [(\tilde{q} - q_G)Q_D(q_G) - V(q_G)]$. Thus, as before, ignoring the zero-corruption case:

Result A6: The agency's preferred corruption level, q_G^* , satisfies $-R_{q_G}(q_G^*) \equiv -V_{q_G}(q_G^*)$, and $V_{q_G q_G}(q_G^*) - R_{q_G q_G}(q_G^*) \leq 0$.

To minimize clutter, let $C(w, q_G) \equiv v_l(w, l_G(w, q_G))(-\partial l_G(w, q_G)/\partial q_G)$ denote the (always positive) increase in the voice pressure contributed by an individual with income w when pilferage per user is increased by a rupee (i.e. when q_G is reduced by 1). Thus (A2) can be rewritten, $-V_{q_G}(q_G) = \int_{\alpha(q_G)}^{\beta(q_G)} C(w, q_G) f(w) dw > 0$. Then we can, show, as before, that the addition of rich potential service users acts as a brake on corruption by increasing accountability, while adding to the ranks of poor potential service users tempts the agency to increase corruption.

Proposition A6: Increasing pilferage by one rupee per citizen elicits less than one rupee of additional voice pressure from the poorest service user $C(\alpha(q_G^*), q_G^*) < 1$, and more than one rupee of additional voice pressure from the richest service users $C(\beta(q_G^*), q_G^*) > 1$.

Proof. Note that, because $v_w(w, l) > 0, \forall w$, and w has continuous support, $-V_{q_G}(q_G^*) = \int_{\alpha(q_G^*)}^{\beta(q_G^*)} C(w, q_G^*) f(w) dw > \int_{\alpha(q_G^*)}^{\beta(q_G^*)} C(\alpha(q_G^*), q_G^*) f(w) dw = C(\alpha(q_G^*), q_G^*) Q_D(q_G^*)$. Also, $R_{q_G}(q_G^*) = (\tilde{q} - q_G) * Q_D'(q_G^*) - Q_D(q_G^*) > -Q_D(q_G^*)$, because $Q_D'(q_G^*) > 0$. It follows that if $C(\alpha(q_G^*), q_G^*) \geq 1$, this would imply that $R_{q_G}(q_G^*) - V_{q_G}(q_G^*) > [C(\alpha(q_G^*), q_G^*) - 1] Q_D(q_G^*) > 0$, contradicting the definition of q_G^* : $R_{q_G}(q_G^*) \equiv V_{q_G}(q_G^*)$. Thus, it must be that $C(\alpha(q_G^*), q_G^*) < 1$. Proof that $C(\beta(q_G^*), q_G^*) > 1$ proceeds analogously.

A.6 Effects of growth

We have established changing the mode of corruption changes neither the shape of the illicit revenue or voice pressure functions with respect to corruption levels and incomes, nor the fact that the least (most) wealthy users at the chosen corruption level contribute less (more) additional voice pressure in response to adjustments to the corruption level than they generate in illicit revenues. These are the only results required to prove Propositions 2-5, and so these conclusions about the effects of (First order stochastic dominant) shifts in the income distribution follow in the case of pilferage as well, with only minor changes in notation.

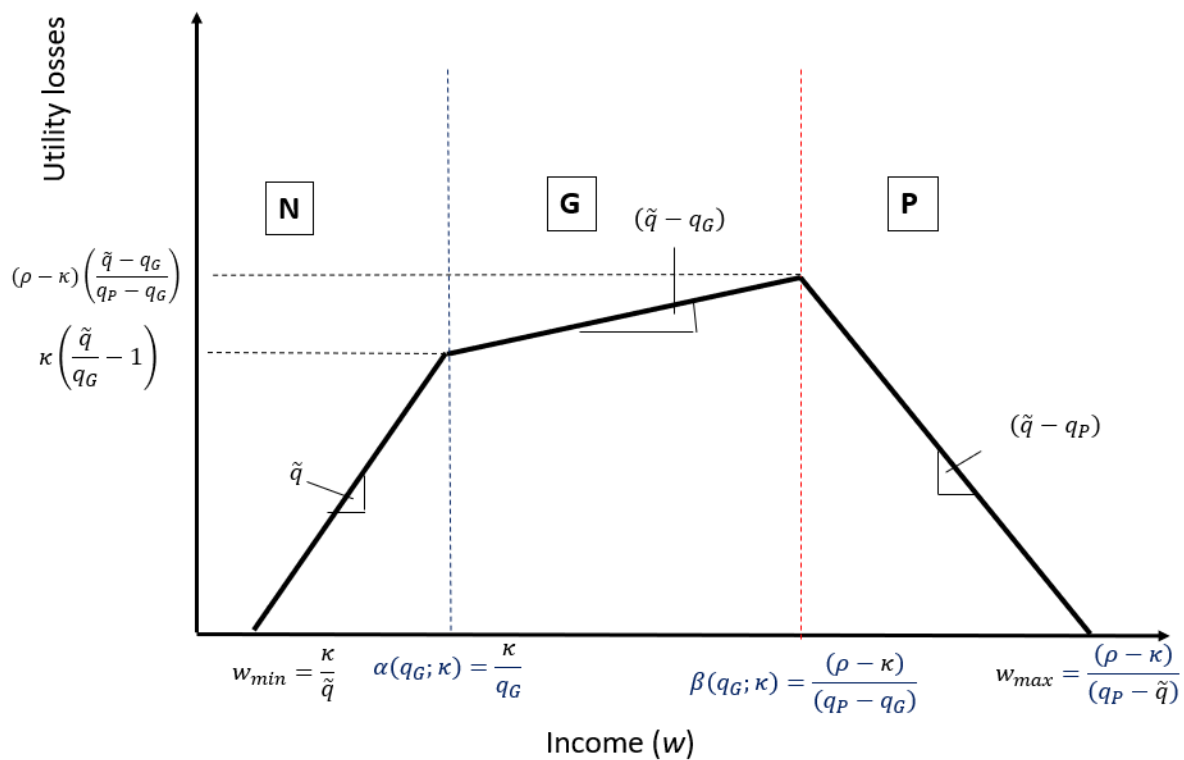


Figure A1: Utility losses due to pilfered resources, by income

Appendix B: Cross-subsidies empower the rich

This appendix demonstrates that when an agency delivering a public service subsidized only for the poor is required to hit a minimum revenue target, raising this target reduces corruption and makes the agency attentive to the preferences of richer citizens. Crucially, it does so without requiring citizens to solve any collective action problems. These revenue targets are often increased in response to rapid economic growth. This happens for two reasons. First, growth and modernization increase pressure on the exchequer by lifting the returns to, and therefore demand for, other public spending priorities (e.g., education, infrastructure, healthcare), making revenue raising more of a priority. Second, growth lifts real wages, raising the costs of services via the cost disease (Baumol 2012), inducing the government to require more licit revenues from the agencies running these services.

Maintain the same consumer preferences as in Section 2.2. Thus, as in Figure 1, for any full cost of accessing the service, λ , a citizen with income w prefers: G to N if $w \geq \alpha(\lambda)$, G to P, if $w \leq \beta(\lambda)$, and P to N if $w \geq \gamma$. Let ϕ denote the general cost of corruption, which remains constant across all users. However, now assume that politicians at higher levels of government (e.g., parliament, the executive) set an official price schedule for accessing G that increases with citizens' incomes. For simplicity, assume that citizens with $w < w_0$ are officially charged κ_L and those with $w \geq w_0$ must pay $\kappa_H > \kappa_L$. The full (corruption-inclusive) price of the government service therefore also steps up with income: $\lambda(w) = \kappa_L + \phi$ for $w < w_0$ and $\lambda(w) = \kappa_H + \phi$ when $w \geq w_0$. Let m be the incremental cost of service provision.⁵⁴ Critically, the rich cross-subsidize the poor, who are provided the service at a loss: $\kappa_H \geq m \geq \kappa_L$, so that each rich user earns the bureaucracy $\kappa_H - m$ rupees in net legal revenues, while each poor user costs it $m - \kappa_L$. The fiscal authorities require the agency to collect a minimum level of legal net revenue, \bar{L} . The agency selects the corruption level to maximize illegal rents, $R(\phi)$, subject to the minimum net revenue constraint $L(\phi) > \bar{L}$. Its solution, under these limited assumptions, could yield more legal net revenue than is required, but we limit attention to the empirically relevant case in which the legal net revenue requirement binds:

Proposition B1: *Under a binding budget constraint: (a) The agency will select a lower corruption level when the legal net revenue target is increased; (b) it does so because it is more responsive to the demands of the richest users; and (c) increasing the cross subsidy deepens this welfare-reducing unresponsiveness to the demands of middle-income citizens.*

Proof. Define the incomes of the poorest and richest government service users for a chosen level of ϕ , $\alpha(\kappa_L + \phi)$ and $\beta(\kappa_L + \phi)$. Denote $F_P(\phi; \kappa_H) \equiv F(\beta(\kappa_H + \phi))$ and $F_N(\phi; \kappa_L) \equiv F(\alpha(\kappa_L + \phi))$. Selecting ϕ then pins: $Q_D(\phi; \kappa_L, \kappa_H) = F_P(\phi; \kappa_H) - F_N(\phi; \kappa_L)$; illegal rent, $R(\phi; \kappa_L, \kappa_H) = \phi Q_D(\phi; \kappa_L, \kappa_H)$; and legal net revenue $L(\phi; \kappa_L, \kappa_H) = (\kappa_H - m)[F_P(\phi; \kappa_H) - F(w_0)] + (\kappa_L - m)[F(w_0) - F_N(\phi; \kappa_L)]$.

The agency's Lagrangian is $\mathcal{L} = R(\phi; \kappa_L, \kappa_H) + \eta[L(\phi; \kappa_L, \kappa_H) - \bar{L}]$, with FONC: $R_\phi(\phi; \kappa_L, \kappa_H) = -\eta L_\phi(\phi; \kappa_L, \kappa_H)$. The agency chooses a corruption level, given the pricing schedule, $\phi^*(\bar{L}; \kappa_H, \kappa_L, w_0)$, that is fixed by the binding legal net revenue constraint: $L(\phi^*(\bar{L}; \kappa_H, \kappa_L, w_0); \kappa_L, \kappa_H) = \bar{L}$. The Kuhn-Tucker and second-order necessary conditions for a maximum together imply that $R_\phi(\phi; \kappa_L, \kappa_H) > 0$ and $L_\phi(\phi; \kappa_L, \kappa_H) < 0$. Fully differentiating the binding legal revenue constraint yields $\partial \phi^* / \partial \bar{L} = 1/L_\phi < 0$, proving (a). Now, the effect of raising the corruption level on legal net revenues is $L_\phi = (\kappa_H - m)F'_P(\phi) + (m - \kappa_L)F'_N(\phi)$, where the first negative term captures net revenue losses from high-income users' exit to P, and the second positive term captures net revenue gains from loss-producing low-income users' exit to N. Thus $L_\phi < 0$ and $\partial \phi^* / \partial \bar{L} < 0$ at the optimum only because lowering corruption prevents revenue losses from high-income exit, proving (b).

Increasing the cross subsidy increases the budget constrained agency's incentives to respond to the needs of richer citizens when adjusting to tighter revenue requirements, because increasing κ_H increases $(\kappa_H - m)F'_P(\phi)$ while reducing κ_L drives down $(m - \kappa_L)F'_N(\phi)$. The welfare losses visited on service users are highest for citizens with incomes near $\alpha(\kappa_L + \phi)$ (See Section 2.3 and Note 26). This proves each of the elements of (c).

The intuition underlying these results is straightforward, and applies equally well to a model in which pilferage reduces service quality. The agency sets the corruption (or, in a pilferage model, service quality) level to hit the legal net revenue target. Increasing the target forces the agency to cut corruption levels (or increase quality) to attract net-revenue-providing richer users back from private alternatives. Poorer users do not help reach the target because they cost more than they pay. Thus, the more cash-strapped the agency becomes, the less corrupt, but the more beholden to the rich it becomes. Growth induces governments to lift the revenue target, triggering these changes.

Appendix C: Rural Government Schools – additional Information and results

C.1. ASER and IHDS Data Description

We analyze raw data from two sources. First, the NGO Pratham, for its Annual Status of Education Reports (ASERs), has surveyed just under 20 households in each of 30 villages in each of around 580 districts annually, starting in 2006. It reports on household demographics, asset ownership, parental education, children's schooling status, and tests each child for reading and mathematics competence. Every even-numbered year starting in 2010 ASER enumerators also visit one government school in each village, reporting on school characteristics staffing, teacher attendance, infrastructure and grant receipt. ASER data are designed to be representative of rural India at the district level – data collection is stratified on districts, with villages within districts sampled with probability proportional to their population, and twenty households in each village selected at random. Second, the India Human Development Survey (IHDS-II, 2012) also visits both households and schools. It includes a wider array of questions than ASER, but feature a smaller sample size, representative of rural India only at the national level.

During school visits, ASER numerators asked how many teachers were supposed to be present in the school that day, and then made their own visual inspection of how many were present. As most of these schools are small, these records should be quite accurate. IHDS enumerators made a roster of teachers and some basic characteristics of each (sex, age, religion, caste schooling, whether they had been trained as teachers, and how far they lived from the village). They then asked the survey respondent, typically a headmaster or senior teacher, whether each teacher was present on the day, absent but on official duties, or absent and not on official duties.⁵⁵

Both surveys also asked each school whether they received each of the three central-government grants to which all of them were entitled in the previous fiscal year. School heads are responsible for maintaining records on how the School Development and School Maintenance Grants were spent, and teachers are required to submit detailed records of their utilization of the Teacher and Learning Materials grant to their school head, who in turn signs it and forwards it to the Universal Elementary Education Mission in Delhi. While it is therefore unlikely that a school could fail to notice having received the grant, school heads were often unavailable to respond to ASER surveyors, leading to significant gaps in ASER grant receipt data. We therefore analyze IHDS data to study missing grants.

Each of these surveys also randomly sampled approximately 20 households in each village, and, amongst other things, takes an inventory of the quality of housing and lists of durable consumer goods these households own. We use this information to derive estimates of each household's wealth,⁵⁶ and then estimate median wealth in each village, district and state by averaging the estimated wealth of the sampled households in that village. IHDS also includes an extensive block of questions designed to estimate the average consumption expenditure per person in each household. We calculate the means and medians of these variables for each village and district as well.

In addition to this, both surveys provide information on village infrastructure and characteristics, which we use to control for the possibility that differences between villages other than those in household prosperity account for variation in missing resources.

Recent work cautions that district-level and over-time learning-outcomes measures from ASER are subject to significant measurement error (Johnson and Parrado 2021). We use these data for other purposes – to measure correlations between prosperity and the existence and utilization of private schools and the absence of teachers from government schools. No information on their reliability for such purposes is available. As usual, then, we expect coefficients to be attenuated towards zero to the extent that these data are affected by classical measurement error in independent variables, and reflect on this when drawing inferences.

C.2. Wealth and Exit to Private Schools: Evidence from ASER Data

Table C1 shows that wealth facilitated exit from rural government schools, did so more in faster growing districts, and this resulted in a growing wealth gap between the households using private and government schools.

Panel A shows that, among villages that have private schools, a one-standard deviation difference in a child's household wealth within the same village and year is associated with a 11-12 percentage point higher probability of them enrolling in a private rather than a government school. Similarly, a within year wealth ranking difference of ten percentile is associated with a 4.2 percentage point higher probability of private school enrolment. These are large differences, given that average private school enrolment was only 33% across the period. They are observed controlling for the child's age and gender, household size, and parents' ages.

Panel B then shows that faster-growing districts saw more private school growth. A district whose wealth index increased one standard-deviation faster between 2010 and 2018, on average saw a 2.5 percentage point increase in the share of villages with private schools, and a 3.5 percentage point increase in the share of students utilizing private schools.

Panel C shows that children enrolled in government schools came from households roughly 10 percentiles lower down the within-year wealth distribution in 2010, and that this gap widened to around 12-12.5 percentile by 2018.⁵⁷

C.3. Prosperity, Exit and Voice: Evidence from IHDS data.

Kremer et al (2005) and Banerjee et al (2006) together show that while the existence of a PTA is uncorrelated with absenteeism, how often it meets is, which suggests, reasonably, that the intensity of voice pressure on PTAs likely matters.

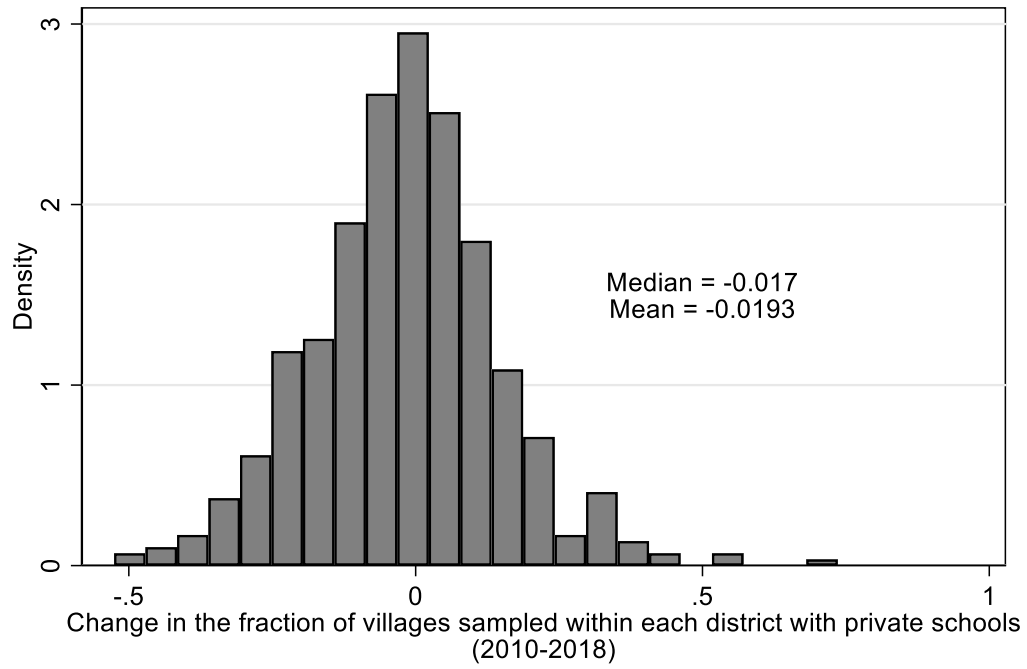
Table C2 traces the relationships between prosperity, exit options and likely voice capacity of the group of parents attending PTA meetings. Regressions (1) and (2) show that, among families using government primary schools, richer families are more likely to attend PTA meetings, even when correcting for a wide range of child and teacher characteristics. Regression (3)-(5) expand the sample to all families with primary-age children, regardless of whether those children attend private or government schools. Regression (3) reconfirms high-income exit: among all families with primary age children, richer families are less likely to enroll their children in the government school, especially if there is a private school in the village.⁵⁸ Column (4) shows that members of a household selected at random from the pool of government- and private-school-using households with school-age children are *not* more likely to attend a government school PTA meeting if they are richer. Column (5) shows that, in the presence of a private school, prosperity makes PTA attendance somewhat less likely in this broader sample. Village-level regression (6) shows that government school PTA attendance-rates are unrelated to mean village consumption levels in villages without private elementary schools, but are lower and possibly declining in village average log-expenditures in villages with private alternatives. Together, these results are consistent with growth inducing high-voice exit from the government schools, which in turn reduces the available voice pressure at the village level.

The above results are qualitatively robust to replacing expenditures with any of several PCA measures of household asset ownership.

C.4. Diplomas in Education as Corruption Facilitators: The Justice Verma Commission

India's Supreme Court commissioned retired Chief Justice, J.S. Verma, to examine the quality and regulation of teacher training institutions in response to a suit by the Government of Maharashtra (GoM, Maharashtra is the highest income state in the country). The suit was brought because, in 2009, the Western Regional Committee appointed by the central-government authorized 291 institutions to issue D.Ed. (9-month to 2-year Diploma in Education) degrees, in direct contravention of a 2007 recommendation by GoM that no new institutions be authorized to grant them. The commission listed these institutions plus 10 others for inspection, which were duly completed with the aid of education officials from other states. Only 44 qualified for recognition; 259 were shut because they did not qualify or refused inspection. The commission's report (Verma 2012) is scathing about the *quality* of teacher training, and recommended urgently that the duration of teacher training be enhanced beyond the 2-year D.Ed. (a recommendation they note was issued by a prior commission in 1966), with all teacher training provided by institutions offering higher education in many disciplines that have attached schools in which teachers can practice. Despite uncovering numerous outcomes well-understood by the public and the NEP to be symptoms of graft, the report does not mention "corruption" or any of its euphemisms anywhere, treating the problems instead as matters of "curriculum" and "regulation" instead.

Maharashtra was proactive in stopping the authorization of diploma mills and eliminated 9-month diplomas, but, as of August 2019, still permitted accredited institutions to operate and their graduates to take the TET. This case, like that of numerous court cases involving D.Ed. institutions filed in other states in the wake of decisions to introduce the TET (Swarup 2019), illustrates several key themes of this paper and case: corruption in teacher training is rampant, with short, cheap training programs particularly likely to operate as diploma mills; institutionally strong, high-income states are most pro-active in seeking anti-corruption reforms, but yet progress against incumbents is slow in the presence of exit (57% of ASER surveyed villages in 2010 and 2018 had private schools); and anti-corruption efforts tend to be justified on the basis pro-quality reforms.



Note: Authors' calculation from ASER village data in 2010 and 2018. Data cover 537 districts identifiable and sampled in both years.

Figure C1: Histogram of Changes in District Private School Prevalence

Table C1: Wealth and Exit to Private Schools*A. Coefficients on HH Wealth, LP Model of Child Private School Attendance. ^a*

<u>Wealth Measure^b</u>	<u>Coeff.</u>	<u>S.E.</u>	<u>N</u>
Main Wealth Index (in std. devs.)	0.121***	(0.001)	836,426
Within-Year Wealth Percentile (0-1)	0.418***	(0.004)	836,426
Alt. Wealth Index (in std. devs.)	0.115***	(0.002)	852,298
Within-Year Alt. Wealth Percentile (0-1)	0.406***	(0.004)	852,298

*B. District-Level Median Wealth Increase and Private Schooling Change, 2010-2018^c*Dependent Variable: % Change in Private School Availability

<u>Wealth Increase Measure^b</u>	<u>Coeff.</u>	<u>S.E.</u>	<u>N</u>
Change in HH Wealth Index	0.025***	(0.005)	533
Change in Alternative HH Wealth Index	0.025***	(0.005)	533

Dependent Variable: % Change in Private School Utilization

<u>Wealth Increase Measure^b</u>	<u>Coeff.</u>	<u>S.E.</u>	<u>N</u>
Change in HH Wealth Index	0.035***	(0.005)	539
Change in Alternative HH Wealth Index	0.034***	(0.05)	539

C. Dynamics of Wealth Differentials Between Private- and Govt.-School-Using Children^d

<u>Dependent Variable</u>	<u>Govt. School Dummy</u>	<u>Govt. School x</u>		<u>N</u>
		<u>Time Trend</u>		
Within-Year Wealth Percentile (0-100)	-9.99*** (0.17)	-0.348*** (0.04)		930,816
Within-Year Alt. Wealth Percentile (0-100)	-9.42*** (0.17)	-0.337*** (0.06)		948,714

^a Each coefficient comes from a separate linear probability model of whether a child is enrolled in a private school. Sample is ASER-surveyed children in 2010, 2012, 2014, 2016 and 2018 enrolled in private or government schools in villages that have a private school. Regressions include village-year fixed effects, and a complete set of dummy variables for each of the following: child's age, mother's age, father's age, and the number of children in the home. Standard errors are robust and clustered on the village-year.

^b The main wealth index is the standardized first principle component of indicator variables capturing the permanence of a household's dwelling, whether it has an electrical connection, toilet, TV, mobile phone, newspaper, other reading materials and a member who can operate a computer. The alternative wealth index is constructed similarly but omits information on the presence of newspapers and other reading materials.

^c Each row provides coefficients from a separate regression, across districts of the percentage change in private school availability or utilization between 2010 and 2018 on the contemporaneous change in district-median HH wealth. Availability is the share of surveyed village in the district that have a private school, while utilization is the share of children enrolled in private schools. Standard errors are robust. Districts are weighted by the average sample weight in

^d Each row provides coefficients from a separate regression of a measure of HH wealth in a pooled sample of all ASER surveyed children in 2010, 2012, 2014, 2016 and 2018 attending private or government schools in villages with a private school. Time trend is measured in years, with 2010 normalized to zero. All regressions include year and district fixed effects. Standard errors are clustered on the village and year. District sample weights are utilized.

Table C2: Per capita expenditures and voice pressure

Sample	Household level Regressions					Village Level Regressions
	Households w. 8-11 year olds in govt. schools		All households with 8-11 year olds			Villages with parents reporting on PTA attendance
Dependent Variable	Attendance of PTA Meetings		Govt. School Enrollment	Attendance of govt. school PTA meetings		% of HH w. 8-11 yr. olds attending govt. sch. PTA mtg.
	(1)	(2)	(3)	(4)	(5)	(6)
log(HH per capita expenditure)	0.063*** (0.011)	0.055*** (0.013)	-0.107*** (0.011)	-0.012 (0.012)	0.006 (0.012)	0.000 (0.018)
log(HH per capita expenditure) x indicator (Village has pvt. sch.)			-0.046*** (0.017)		-0.038* (0.020)	-0.057** (0.025)
Indicator (village has pvt. Sch.)		0.043* (0.023)	-0.130*** (0.019)	-0.018 (0.020)	-0.022 (0.020)	-0.033 (0.024)
<u>Corrects for:</u>						
- District fixed effects	✓	✓	✓	✓	✓	×
- State fixed effects	×	×	×	×	×	✓
- Age and gender of child	✓	✓	✓	✓	✓	n.a.
- Child's reading, writing and math performance	×	✓	×	✓	✓	n.a.
- Religion, caste, gender and local residence of teacher	×	✓	×	✓	✓	n.a.
- Religion and caste of household head	✓	✓	✓	✓	✓	n.a.
N	6,260	5,058	9,541	7,198	7,198	1,307
Average of Dependent Variable	0.364	0.363	0.695	0.253	0.253	0.255
R-sq	0.308	0.342	0.324	0.242	0.242	

Data Source: IHDS-II, rural sampling units only. Regressions (1)-(5) are household-level linear probability models, with robust standard errors clustered on the village, and sample weights applied. Regression (6) is a village-level Tobit model with robust standard errors clustered on the district, and each village weighted by its sample weight multiplied by the number of households in the village reporting whether they attend any PTA meetings. *** p<0.01, ** p<0.05, * p<0.1.

Table C3: Missing teachers, missing grants, and village prosperity

Sample:	Villages without private primary schools		Villages with private primary schools	
	Expenditure per Capita	Wealth	Expenditure per Capita	Wealth
Village-Level Prosperity Measure:				
<i>A. Teacher Absence</i>				
Private primary school in Village (0=No,1=Yes)	-0.080***	0.018	0.017	0.010
Village prosperity (in std. deviations)	(0.027)	(0.034)	(0.030)	(0.048)
Interaction (Pvt School Dummy x Prosperity)				
# of teachers	2011	2011	1470	1468
R-squared	0.260	0.250	0.324	0.327
<i>B. School Development Grant</i>				
Private primary school in Village (0=No,1=Yes)	-0.017	-0.085**	0.060	-0.011
Village prosperity (in std. deviations)	(0.032)	(0.034)	(0.043)	(0.047)
Interaction (Pvt School Dummy x Prosperity)				
# of schools	730	730	483	483
R-squared	0.213	0.224	0.194	0.188
<i>C. School Maintenance Grant</i>				
Private primary school in Village (0=No,1=Yes)	0.000	-0.059**	0.059	-0.041
Village prosperity (in std. deviations)	(0.028)	(0.027)	(0.040)	(0.035)
Interaction (Pvt School Dummy x Prosperity)				
# of schools	733	733	484	484
R-squared	0.247	0.256	0.192	0.187
<i>D. Teacher & Learning Materials (TLM) Grant</i>				
Private primary school in Village (0=No,1=Yes)	-0.070***	-0.013	-0.015	0.023
Village prosperity (in std. deviations)	(0.025)	(0.021)	(0.029)	(0.031)
Private School Dummy x Village Prosperity				
# of schools	731	731	484	484
R-squared	0.183	0.165	0.146	0.146

Note: All data are from IHDS-II. Standard errors are robust and clustered on the village (primary sampling unit). All regressions use state fixed effects and sampling weights. Teacher absence is an indicator that a teacher is not in school and not out on official duties. Grant receipt is measured for the previous financial year. Village prosperity is measured by the average per capita income or asset-based wealth measure across households in each village. The wealth measure is derived from the first principal component of household access to: electricity, propane (cooking gas), piped indoor drinking water, a physically separated kitchen, flush toilet, and high-quality walls, roof and floor. Teacher absence regressions control for school characteristics (highest & lowest grade levels served, number of students, number of shifts operated, numbers of teachers and parateachers, student gender mix, age of school), teacher characteristics (age, years of schooling, whether they received teacher training, gender, caste, religion, distance from home to school) and village characteristics (whether it is segregated by caste, drainage quality, road quality, number of PDS shops, distance to police station) Grant receipt regressions control only for these school and village characteristics. Grants are given annually: school Development - currently Rs. 5,000 per school for infrastructure; Maintenance - Rs. 7,500 per school; and TLM - Rs. 500 per teacher. *** p<0.01, ** p<0.05, * p<0.1

Table C4: Explaining Changes in Private School Availability and Performance*A. Did high-absenteeism locations gain private schools?*

LS Regression of %Δ(Private School Availability), 2010-18

	Across States		Across Districts	
	<u>Coeff.</u>	<u>Robust</u>	<u>Coeff.</u>	<u>Robust</u>
		S.E.		S.E.
2010 Teacher Absenteeism Rate	-0.124*	(0.063)	0.011	(0.027)
2010 Median HH Wealth	-0.008	(0.006)	0.009	(0.006)
Change in median HH Wealth (2010-2018)	0.009	(0.010)	-0.008	(0.003)
N	30		532	

B. Did private school quality increase faster in higher wealth-growth districts?

Two-way FE Regression of Share of District Private-School 5th Std. Students

Meeting Reading and Mathematics Standards^a

Coefficients on Median Household-wealth in the District and Year

<u>Level to be Achieved: Child can..</u>	<u>Coeff.</u>	<u>S.E.</u>	<u>N</u>
read words	0.013***	(0.004)	2,834
read a Std. 1 Level Text	0.016***	(0.005)	2,834
read a Std. 2 Level Text	0.002	(0.05)	2,834
recognize numbers in the range 11-99	0.023***	(0.004)	2,833
do two-digit subtraction	0.032***	(0.007)	2,833
do division (3-by-1 digit)	0.006	(0.007)	2,833

^aData from ASER 2010, 2012, 2014, 2016 and 2018. Each regression includes district and year fixed effects, and district sampling weights, with standard errors clustered on the district. District math and reading achievement is estimated as the mean across all 5th standard children attending private-school of an indicator that a child can perform at least to the specified level.

*** p<0.01, ** p<0.05, * p<0.1.

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Keywords and JEL Codes

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JEL Codes: H11, H42, D73, O12, O17

Notes

¹ It has been argued that growth reduces business corruption (Treisman 2000; Bai et al. 2013), but that natural resource booms increase corruption (Caselli and Michaels 2013). We know of no papers examining growth's effects on public services corruption.

² Chaudhury et al. (2006); Mehta and Jha (2014); Blundo et al. (2008); CMS (2010); Dreze and Khera (2015)).

³ Olken (2006); Olken and Pande (2011) Sukhtankar and Vaishnav (2015)

⁴ Reinikka and Svensson (2004); Banerjee and Duflo (2006); Olken (2007); Ferraz and Finan (2008); Duflo, Hanna, and Ryan (2012); Buntaine et al. (2018).

⁵ See Leff (1964), or most textbook discussions of price distortions (e.g., Krugman and Wells 2006, Ch. 4).

⁶ Bussell (2012); Jha (2019); Mukherji (2014)

⁷ Exit effects have been extensively analyzed in other contexts (Dreze and Sen 1989; De Donder and Hindriks 1998; Gelbach and Pritchett 2002; Himanshu and Sen 2011; Fukuyama 2013; Hirschman 1970).

⁸ Rising incomes empower citizens by giving them access to new means of making demands and exercising voice, through, for example, access to technology, information and greater geographic and occupational mobility (Stokes et al. 2013; Chand 2006; Doron 2013).

⁹ Corbridge (2005); Krishna (2017); Scott (1985); Schlozman, Verba, and Brady (2012); Kruks-Wisner (2018).

¹⁰ Kruks-Wisner (2018); Besley and Burgess (2002); Blair (2000); Acemoglu and Robinson (2020); Auerbach (2019); Bhavnani and Lee (2018); Jenkins (2007).

¹¹ Birdsall (2016); Easterly (2001).

¹² For example, consumers do not complain about the inflated cost of contracts to clean railway stations. Or, consider electricity theft. Pilfered electricity increases the welfare of consumers who receive it in ways that measurably shift election outcomes, but it reduces the welfare of other grid users who must contend with unreliability (Min 2015; Min and Golden 2014; Allcott, Collard-Wexler, and O'Connell 2016). Our argument (Appendix B) that growth should increase state attentiveness to high paying users' demands for a reliable grid is consistent with successful efforts to bring down T&D losses (Energy Information Administration 2015; Department of Economic Affairs 2021). But the fact that some citizens benefit from power theft likely complicates the political dynamics of reform in ways our model does not capture (e.g., Chatterjee 2018).

¹³ Growth increases the cost of contesting elections, which may exacerbate grand corruption, such as irregularities in government contracting and in auctions of public resources (Kapur and Vaishnav 2018, and Section 7).

¹⁴ For example, businesspeople need to *view* land records frequently, and files maintained by land records offices have been duly computerized and made available online (Nayak 2013). Meanwhile, persons seeking to *update* land records – something they do at most once in a lifetime – often report experiencing extortion. Similarly, Indian driving licenses are good for 20 years, and there has been little anticorruption agitation by citizens for reforms of drivers licensing.

¹⁵ It is commonly understood that the quality of services varies widely, with richer consumers relying on a set of higher-quality private services, public services being of a generally lower quality, and with less empowered citizens unable to access the public option simply going without (or opting for a less desirable private option - a possibility we neglect for simplicity). For example, see Balakrishnan and Ramaswami (1997); Alderman and Lindert (1998); and World Bank (2001) on public food distribution systems; PROBE Team (1999); Chaudhury et al. (2006); and Chudgar and Quin (2012) on education; Das, Hammer, and Leonard (2008); and Das and Hammer (2007) on healthcare; and World Bank (2004) on public services in general.

¹⁶ This choice of utility function simplifies the presentation, allowing us to focus on the effects of growth on service use and corruption. Our main results can be proven for any quasi-linear, CES or additively separable quasiconvex utility function, although allowing for diminishing marginal utility from consumption adds one additional effect of growth (see footnote 24).

¹⁷ Reinikka and Svensson (2004) and Mehta and Jha (2014) write models of this form.

¹⁸ Political pressure from citizens hurts the reputation of the agency, of the politicians supervising it, and of the bureaucrats running it. This loss of reputation can lead to a loss of political power, undesirable transfers, limited promotions, embarrassing inquiries, loss of social stature, and compromised claims on budget allocation.

¹⁹ We do not model citizens' decisions to exert voice pressure. This assumes away collective action problems among service users, allowing us to focus on the first-order effects of growth on anti-corruption effort. For studies that do model the decision to use voice, see Shimizu (2017) and especially Gehlbach (2006).

²⁰ Of course, larger increases in bribe levels shift citizens from the G to the N and P groups, causing them to lose utility and exert pressure, but these terms vanish for small changes in λ .

²¹ The zero-corruption case arises only when even small bribes elicit more voice pressure than revenue: $V_\lambda(\lambda; q_G)|_{\lambda=\kappa} > R_\lambda(\lambda; q_G)|_{\lambda=\kappa}$.

²² Concavity in λ of this objective function can be guaranteed only under particular functional form assumptions (for example, if w is uniformly distributed, $v = wl$ and $q_G > q_P/2$). However, as the function is twice continuously differentiable, we derive and examine the necessary conditions for a global maximum.

²³ This emphasizes the importance of our interpretation of λ as a "systemic corruption level" endemic to a service, rather than simply a bribe, which could be varied across the users of that service.

²⁴ This second order price effect must be dominated by the former, quantity effect at the monopolist's optimal price, to ensure $R_\lambda(\lambda; q_G) > 0$. Economists frequently, and without remark, dispose of changes to analogous terms by assuming arbitrarily that demand is approximately linear in prices (e.g., Krugman and Wells, p.395), as it would be if initial incomes were uniformly distributed and the shift in income distribution were small.

²⁵ Switching to utility functions in which $U_{cc} < 0$, as described in footnote 15, adds a fourth effect of growth: richer government service users experience smaller utility losses from bribery, so income growth can increase complacency. This detracts from voice pressure, increasing λ^* .

²⁶ We contacted over 100 travel agents identified using a Google search, 48 of whom were willing to talk to us.

²⁷ Authors' calculation from Department of School Education and Literacy (2018-19).

²⁸ The Central Government's role in funding public education grew through large national initiatives (the District Primary Education Program and Sarva Shiksha Abhiyan, launched in 1993-4 and 2000-2001 respectively). It has increased its influence on policy through curriculum development (e.g., the 2005 National Curriculum Framework), granting of educational rights (the 2009 Right to Education Act), establishing teacher training standards (the 2010 introduction of the Teacher Eligibility Test), and finally declaring a National Education Policy in 2020. Recognition of teacher training institutions is handled by centrally governed regional committees.

²⁹ These characterizations of challenges and reforms in rural education are described in PROBE (1999); PRATHAM (2005, 2014); Wadhwa (2014); Pritchett and Beatty (2015); Khanna (2015); Aiyar and Bhattacharya (2016); (Azam and Saing 2017); Muralidharan (2018); Chavan (2018); PRATHAM (2018); and Shah and Steinberg (2019).

³⁰ Bold et al. (2013); Pritchett (2013); Muralidharan (2019); Muralidharan and Singh (2020).

³¹ Teachers also help students to cheat on exams in order to evade accountability for poor learning outcomes (Kingdon & Muzammil, 2010, Appendix 1), but this type of corruption has been very difficult to study systematically.

³² Three experts at leading educational NGOs and five teachers interviewed in Uttar Pradesh confirm that government school users lack the liquidity to provide large bribes, a claim confirmed by surveys in 2005 and 2010 (CMS 2010).

³³ Banerjee et al. (2006) report survey evidence that parents are unaware of school grant receipt.

³⁴ Cataloging thirty states' anti-corruption efforts is beyond the scope of this illustrative case study.

³⁵ India's per capita GDP grew 40% over these eight years. The government decided not to release the results of the 2017-8 Consumer Expenditure Survey, precluding measurement of income growth in *rural* India. However, overwhelmingly positive shifts in rural asset ownership (Figure 2) indicate that prosperity increased.

³⁶ The cultural drivers of across-state variations in education quality and governance are well-established in the literature (Singh 2015; Mangla 2013), and fully consistent with the data we utilize. These variations are persistent. Our contribution is to explain what happens over time.

³⁷ For example, Aslam, Rawal, and Kingdon (2021) report that teacher salaries roughly doubled between the fifth (1994) and sixth (2008) pay commissions, during which time PovCalNet estimates imply 21% real rural income growth.

³⁸ Kremer et al. (2005) report that the existence of school PTAs is uncorrelated with teacher absence, but that villages/towns with more active PTAs have lower absenteeism. This is broadly consistent with multiple qualitative case studies of school management committees, and suggests what matters is the demand pressures exerted through such organizations, rather than their mere existence.

³⁹ Village median HH wealth is a noisy proxy for unobserved voice capacity. Together with sampling error in measuring village wealth, this implies that these results are likely attenuated. As expected under attenuation, while the same results are obtained for Uttar Pradesh, the state with the largest sample size, but coefficients within states with smaller samples are all statistically insignificant.

⁴⁰ A fourth accountability measure has been widely discussed – replacing regular teachers with worse-paid and often less-trained contract teachers, who tend to be absent less and perform somewhat better than regular teachers (Muralidharan & Sundararaman, 2013). However, a decision not to hire contract teachers does not necessarily indicate weak commitment to combatting corruption, because it is also widely thought to invite political unrest, damage morale and to lower education-quality expectations for less wealthy families (Béteille and Ramachandran 2016; Azim Premji Foundation 2017, and an interview with a senior current government education officer). It is not clear that, faced with an absent teacher, parents would advocate for their replacement with a para teacher.

⁴¹ Ibid.

⁴² The government-run National Achievement Survey, thought to be a possible input to macro-targeted performance pay, has been found totally unreliable (Johnson and Parrado 2021).

⁴³ This view was offered to us by two civil society education experts and two senior current/former education officers.

⁴⁴ Summary table with references available on request.

⁴⁵ Kingdon and Teal (2010); Kingdon and Muzammil (2013); Aslam, Rawal, and Kingdon (2021)

⁴⁶ These numbers peaked in 2014, after which Persian Gulf economies slowed down and began to focus on local hiring (Kably 2019).

⁴⁷For more on the differentiated state response to richer and poorer migrants see Agarwala (2022).

⁴⁸ The approval of 'Emigration Check Required' passports – issued to less educated overseas migrant workers on approval by the Protector of Emigrants offices, was also streamlined with the introduction of partly online applications, following complaints from the Indian Personnel Export Promotion Council, its Indian recruitment agency members, and their overseas business partners "across the Gulf". (Phone interview with a senior manager at a major recruiting agency and IPEPCIL member. June 2019).

⁴⁹ IR's bottom line has been tightened over the decades. It used to run at a large deficit that the government budgeted for separately. Pressures to reduced that deficit picked up in earnest in 2001 (Expert Group on Indian Railways 2001; Khanna, Musacchio, and Tahilyani 2009; Ministry of Railways 2015), and its budget was subsumed into the overall central government budget in 2017, effectively giving it a hard bottom line.

⁵⁰ Availability of seats on premium trains has increased because Indian Railways now holds back tickets- to sell at high prices nearer to departure, and because middle-class subsidies for travel on these trains are being removed. However only 142 out of 13,452 trains are premium express trains.

⁵¹ In the defense of the railways, they reminded us that Indian Railways had started poor people's trains like the air-conditioned *Garib Rath*s (chariots of the poor). Echoing the argument put forth in Appendix B, one official rationalized the state of affairs by pointing out that overall, railways subsidize the travel of the less wealthy in India. "Despite all the problems, we are still their best and cheapest mode of long-distance transportation. Our unreserved coaches are always packed." Interview conducted in December 2019.

⁵² These interviews generated two caveats, however. First, reservation-related corruption, when it occurs, is mostly confined to sophisticated operators who are able to hack into the reservation software. Second, they suggested that touts sometimes sell tickets on the black market during the festival season when trains and flights are overbooked and there is a significant premium on tickets on high traffic routes. Assistance from railway employees is likely required for either scheme to work.

⁵³ For example, India's subsidized but privately managed bullet trains with scheduling priority for the rich are likely to not only compete for track with ordinary trains, but are also likely to reduce the political pressure to improve the quality and timeliness of those trains. Contrast that with the historical experience, in which improvements in ticketing to reserved travelers did result in some emulation for less wealthy travelers.

⁵⁴ The results generalize to the realistic case in which incremental costs differ across classes $m_H \geq m_L$. In the case of Indian Railways, whose carriages are mostly filled to capacity, the m s are the incremental costs per passenger of adding carriages or trains, or of bogies in a rake, to serve travelers of each fare classes. These are larger than the marginal cost of adding a passenger to an existing carriage, and larger for reserved and less cramped fare classes.

⁵⁵ It is possible that in larger schools ASER enumerators simply asked school representative how many were present that day. IHDS enumerators were instructed to do this. Our analysis takes this into account by controlling for the number of teachers on the rolls at each school.

⁵⁶ We constructed our household wealth measure using principal components analysis (Filmer and Pritchett 2001). In the ASER data, of indicator variables capturing the permanence of a household's dwelling, whether it has an electrical connection, toilet, TV, mobile phone, newspaper, other reading materials and a member who can operate a computer. The alternative wealth index is constructed similarly but omits information on the presence of newspapers and other reading materials. In the IHDS data, we use multiple wealth and consumption measures, described in subsequent footnotes.

⁵⁷ We did not run these regressions using wealth levels, because our asset-based wealth indices converge to a maximum by construction.

⁵⁸ Richer families are less likely to enroll their children in government schools even in villages without private schools. These children may be attending schools outside the village.

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