The rapid rise of affordable and purportedly high quality private schools in South Asian rural communities is one of the most exciting developments in the education sector in decades. Private schools account for an ever rising share of children attending school – in 2005, 33% of Pakistani primary school students and 20-24% of Indian rural primary school students attended a private school, and the students in these private schools consistently outperform their government school counterparts, even when controlling for observable student characteristics (**????????**). This has given rise to the hope that private schools may someday circumvent reform-resistant government schools and finally deliver quality education to the hundreds of millions of children in the region.

Despite the promise of these developments, however, the true significance of the rapid emergence of private schools hinges critically on the question of whether (a) these private schools are actually delivering superior educations, or whether (b) they just attract students who are more academically inclined or come from families that prioritize educational attainment. In other words, are observed differences in school performance due to better teaching or student sorting on unobservable academic potential.

To help answer this question, this paper takes advantage of an observable source of variation in student sorting – caste politics. In particular, this paper shows that in caste-homogeneous villages, students tend to sort on perceived academic potential, with parents sending their more academically gifted children to private schools. In caste-heterogeneous villages, however, school choice is also shaped by a desire to keep children in caste-homogeneous schools. High-status families tend to send their children to private schools to keep them in homogeneous social settings *regardless of their perceived academic abilities*, leading to less academic sorting in these villages.

This paper argues that as a result, differences in the private school / government school test-score gap between heterogeneous and homogeneous villages can be attributed to differences caused by differential sorting on unobservable academic potential, offering an opportunity to estimate the impact of this otherwise difficult-to-measure phenomenon.

To take advantage of this variation, this analysis proceeds in three steps. First, this analysis estimates the performance differential between government and private schools using lagged-value-added models applied to a four-year panel of child test scores with demographic controls. This technique is currently considered to be the most rigorous method of studying observational education data (**???**). It estimates the test-score gap between government and private school students that remains after controlling not only for observable differences in child demographics, but also some non-observable differences (a value often referred to as each school-type's "value-added").[1] This constitutes a baseline estimate of the government-private school performance differential using non-experimental data.

This analysis then compares differences in the government-private test-score gap in homogeneous villages with the test-score gap in heterogeneous villages. Because school choice is primarily based on academic potential in homogeneous villages and not in heterogeneous villages, under a mild set of assumptions detailed below, differences in the test-score gaps found in homogeneous and heterogeneous villages can be attributed to differences in academic sorting.

This analysis finds that while private schools outperform government schools in all villages, the amount they outperform government schools falls by half when moving from homogeneous villages to heterogeneous villages. This implies that *at least half* of the estimated superior performance of private schools is due not to better teaching, but rather to unobservable differences in the quality of students in private schools that cannot be accounted for by lagged-value-added models.

[1] Lagged-value-added models control for unobservable differences that affect test score *levels*, although they cannot control for unobserved heterogeneity in learning rates. These issues are discussed in more detail in Section **??**.

This conclusion is supported by two other sets of results presented in this analysis. First, and most importantly, this analysis is unable to find any other differences between homogeneous and heterogeneous villages which might account for changes in test-score gaps. As shown in Section **??**, for example, caste heterogeneity does not appear to be well correlated with village median wealth, adult literacy, land inequality, the number of schools per household, or number of households. Moreover, other factors often cited as explanations for the government-private performance differential – like performance pay in private schools or differences in school resources – do not appear to vary systematically with village heterogeneity **??**.

Second, at the level of villages there is no evidence that *overall* learning outcomes vary with village caste composition. As detailed in Section **??**, the decrease in the government-private school test-score gap is the result of off-setting convergence in test scores between the two school types, not a change in overall learning outcomes. This is consistent with a re-distribution of student talent rather than actual differences in teaching quality.

There are two nuances to the conclusions drawn here that are worth noting. First, the difference between homogeneous and heterogeneous villages is best interpreted as a *lower-bound* on the contribution of sorting to estimates of the government-private performance differential. There is likely still *some* sorting on potential in heterogeneous villages. Thus the comparison between heterogeneous and homogeneous villages is best understood as a comparison between villages with sorting and villages with *less* sorting, not a difference between villages with and without sorting.

Second, this analysis is motivated by the assumption that sending high-caste children to private schools and low-caste children to government schools does not constitute sorting on ability. For this to be true, it must be the case that residual academic potential – potential that cannot be accounted for by factors like parental education and wealth that enter into lagged-value-added models – must be equally distributed across different castes (or be distributed slightly in favor of lower status *biraderis*). As shown in Section **??**, however, there is no evidence that those from higher social status *biraderis* have higher residual talent than those from low status *biraderis*; student caste does not appear to have any consistent effect on test scores.

It is difficult to overstate the potential importance of the answer to this question for education policy in the developing world. Not only do private schools constitute a substantial portion of current enrollments in South Asia, but enrollment is also growing explosively. From 2000 to 2005 in rural Pakistan, for example, the number of private schools in Pakistan rose from 32,000 to 47,000. (**?**, p. vi), and evidence suggests this growth continues today. Moreover, private schools deliver educations at a fraction of the cost of government schools by not requiring formal teacher training and by hiring local, secondary-educated women as teachers rather than college-educated teachers who have to move to the villages where they teach (**?**). Thus the question of whether these lower-cost educations are of similar quality to government school educations also speaks to the importance of different teacher training and employment practices.

The findings of this paper are unlikely to put to rest the debate over whether private schools are superior to government schools. Indeed, private school students continue to outperform government school students even in the most heterogeneous villages, just by a dramatically smaller margin. But even after using some of the most sophisticated econometric methods available, this paper still establishes (as a "lower bound") that sorting explains a very large portion of the government-private test-score gap. This should give analysts pause when examining other empirical results that claim to fully control for sorting.[2]

[2]It also bears noting that experimental studies of government-private school test differentials are, as currently im-

This paper is organized as follows: Section **??** provides an overview of the rural Pakistan context from which data for this analysis is drawn. Section **??** details how the determinants of school choice vary with village caste heterogeneity. Section **??** then shows how the government-private test-score gap varies with caste heterogeneity, and presents evidence this is due to differences in student sorting. Section **??** then examines and rules out a number of alternative possible explanations for this empirical regularity. Finally, Section **??** discusses the strengths and weaknesses of these findings and their interpretation.

plemented, not an empirical silver bullet. Randomizing school assignments is untenable, but in two major cases private school vouchers have been randomly assigned. Even these randomizations have proven problematic, however. **?** examines a voucher lottery system in Colombia and finds a small positive effect of vouchers, but inference is clouded by the fact that voucher students who performed poorly were at risk of losing their vouchers, making it impossible to separate this incentive effect from the private school effect. And several studies have been conduced of a voucher system in Chile, but as **?** notes, the slight private-school advantage these studies show may be down to the fact that private school admissions are selective and poorly performing students can be expelled from private schools, making it difficult to disentangle selectivity from school effects.