8/20/2008

Corrigendum for Table 4 of
"Teaching to the rating: School accountability and the distribution of student achievement," (2008),
***Journal of Public Economics* 92, 1394-1415.**

In a recent issue of the *Journal of Public Economics*, I analyzed the effects of school accountability incentives on student achievement. Before proceeding to the main analyses, I presented results based on a discrete measure of accountability incentives in Table 4. Regrettably, the text (p. 1402) and the notes to Table 4 incorrectly stated that the treatment variable may only equal one if "none of school j's other pass rates during year t-1 were more than five percentage points below this requirement." Due to my own programming mistake, the results presented in Table 4 were based on a model that did not actually apply this restriction. I thank Tim Gronberg for bringing this coding issue to my attention, and I apologize to the readers, referees, and editors for not catching this error prior to publication. I present the corrected estimates in Table 4* below. The estimates in Table 4* actually align more closely with the school-level incentive results presented later in the published article, (i.e., Table 7), and reveal interesting differences in the distributional effects of incentives on the test performance of students of various races.

Table 4* presents the actual estimates based on equation 5 in the article, in which students are considered to be "treated" if they contribute to a test pass rate with a prior year value lying below the current year requirement and if none of the school's prior year test pass rates were more than five percentage points below this requirement. For the full sample, about 17 percent and 10 percent of the student-level observations are in the treatment groups for the math and reading achievement models respectively.

The results displayed in the first column of Table 4* suggest that low achieving students perform better than normal when schools face strong accountability incentives to improve pass rates for their subgroup, and higher achieving students perform worse in reading when schools face strong reading incentives. Additional gains in math are decreasing based on students' prior year math scores and not present at all for the relatively high achievers. Additional gains in reading are only present for the lowest achievers. The lowest achieving students' changes in reading scores are .062 standard deviations better than normal, whereas the higher achieving students' changes are .040 standard deviations *worse* than normal.

Columns 2 through 4 of Table 4* display estimates of these slopes for students in schools aiming for specific accountability ratings. These samples include schools with prior year pass rates that would place them moderately below, (i.e., no more than five percentage points below), the required threshold for that rating or would place them above that rating but substantially below, (i.e, more than five percentage points below), the next highest rating. The results in columns 2 through 4 differ substantially from those in column 1, because much of the identification in column 1 is derived from numerous comparisons of schools that are already above the Acceptable rating thresholds and are either moderately below or substantially below the Recognized rating thresholds. In columns 2 through 4, the largest additional gains for all types of students occur when schools are aiming for the third highest rating, Recognized (column 3). The lowest achieving students do not perform better than normal when their school needs to moderately improve a relevant math pass rate to achieve the second highest rating, Acceptable (column 2), suggesting that these relatively low achieving schools tend to strategically focus on the math performance of students who have a realistic chance of passing. None of the estimated achievement effects for schools aiming at the highest possible rating are statistically significant, though the standard errors are relatively large. Based on the rating-specific models for reading achievement, students of all abilities perform better than usual, or at least not worse than usual, when they contribute to a reading pass rate that is moderately below a critical level. Students make particularly strong gains when they contribute to a critical reading pass rate for schools aiming at the second highest rating (see column 2). The largest additional reading gains generally occur for students in the "low achieving" and "marginal achieving"

groups, consistent with the positive estimates of student-level reading incentives reported in the published article.

The remaining columns of Table 4* restrict the sample based on students' racial or family income classifications. White students of all abilities tend to perform better in math when they contribute to a relevant math pass rate that is critical for the school's rating that year. For reading achievement, however, white students in the treatment group do not perform better at statistically significant levels, and the higher achieving white students in the treatment group perform significantly worse than normal. Even stronger distributional effects occur for students who are African American or Hispanic. African American students whose prior year score was in one of the lowest three categories make greater gains in either math or reading when their school faces a strong incentive to improve the relevant pass rate in that subject, whereas "higher achieving" African American students have score changes that are .074 standard deviations worse than normal in math or .038 standard deviations worse than normal in reading. Higher achieving Hispanic students also perform worse than usual in either math or reading when their school faces strong incentives to improve the relevant pass rate in that subject, with especially large declines in reading performance. These stronger distributional effects are echoed amongst students from economically disadvantaged families, with better than normal performance from lower achieving students and worse than normal performance from higher achieving students.

Table 4*: Heterogeneous Achievement Gains based on whether Students' Groups' Prior Pass Rate was Moderately Below the Current Year's Target, Regressions Controlling for School Fixed Effects

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
All Schools or Those Moderately Below/Above Particular Ratings?	All	Acceptable Rating+	Recognized Rating+	Exemplary Rating+	All	All	All	All
Types of Students Included in Sample	All	All	All	All	White	African Amer.	Hispanic	Econ. Disadvant.
Coefficients of $TREAT_{i,j,s,t}$ Interacted with Students' Prior Year Scores Ranges:	MATH INCENTIVES AND MATH ACHIEVEMENT GAINS							
30-44 (Lowest Achieving)	.062	-.013	.075	.079	.079	.125	.006	.037
	(.010)	(.014)	(.045)	(.083)	(.022)	(.020)	(.013)	(.011)
45-54 (Very Low Ach.)	.051	-.003	.064	-.057	.065	.025	.033	.038
	(.007)	(.011)	(.024)	(.040)	(.012)	(.016)	(.010)	(.009)
55-64 (Low Achieving)	.046	.024	.057	.015	.052	.049	.025	.029
	(.005)	(.010)	(.015)	(.022)	(.007)	(.013)	(.008)	(.007)
65-74 (Marginal Ach.)	.026	.034	.069	.012	.035	.014	.007	.010
	(.004)	(.010)	(.011)	(.013)	(.005)	(.011)	(.006)	(.006)
75-84 (Higher Ach.)	-.00005	.025	.057	.003	.019	-.074	-.038	-.041
	(.003)	(.011)	(.008)	(.009)	(.003)	(.011)	(.005)	(.005)
# of Observations	2,539,890++	1,890,701	419,339	175,560	1,169,014	437,812	901,668	1,215,631
	READING INCENTIVES AND READING ACHIEVEMENT GAINS							
30-44 (Lowest Achieving)	.062	.209	.034	.024	.009	.117	.067	.049
	(.016)	(.064)	(.032)	(.092)	(.027)	(.039)	(.023)	(.019)
45-54 (Very Low Ach.)	.017	.213	-.005	.008	-.0005	.100	-.001	.007
	(.017)	(.059)	(.020)	(.054)	(.017)	(.028)	(.016)	(.013)
55-64 (Low Achieving)	-.010	.339	.023	.015	-.014	.044	-.018	-.007
	(.007)	(.054)	(.013)	(.032)	(.011)	(.020)	(.011)	(.009)
65-74 (Marginal Ach.)	-.016	.293	.043	.055	-.012	.005	-.024	-.028
	(.005)	(.047)	(.010)	(.022)	(.007)	(.016)	(.008)	(.007)
75-84 (Higher Achieving)	-.040	.124	.031	.021	-.022	-.038	-.066	-.055
	(.004)	(.055)	(.008)	(.017)	(.005)	(.013)	(.006)	(.006)
# of Observations	1,875,536++	1,430,583	292,051	108,565	747,330	357,950	745,629	1,014,977

Notes to Table 4:* Each column displays estimated coefficients from two regressions, (one for each subject), based on equation 5, a student-level regression model controlling for school fixed effects, lagged peer achievement, time-varying school characteristics, and student-level race and poverty variables. $TREAT_{i,j,s,t}$ is an indicator equal to one if student *i* contributes to a test pass rate with a prior year value lying no more than five percentage points below the current year requirement ***and*** if none of the school's prior year test pass rates were more than five percentage points below this requirement. (The original, published version of Table 4 did not impose the latter requirement for placement in the treatment group.) Robust (Huber-White) standard errors are in parentheses.

+ To allow for model identification, the rating-specific models use only linear terms for the school-level control variables rather than cubic terms.

++ These sample sizes are very slightly smaller than those used for the summary statistics in Table 3 of the article, because these models control for quintile mean lagged peer test scores and thus drop students who had fewer than five peers in their grade at their school that year.