Closing Schools in a Shrinking District: Does Student Performance Depend on Which Schools are Closed?

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Many Urban Districts Face Declining Enrollments, High Costs, and Low Achievement Levels

- Due to outward migration to suburbs and the emergence of other schooling alternatives such as charter schools, many urban districts are operating schools at below-capacity, which creates financial pressures.
- Many districts have aging schools that are expensive to maintain.
- These urban districts often have chronically low-achieving schools with system-wide achievement gaps between high- and low-SES students and majority and minority students.
- The Obama administration is also pushing to close low-performing schools, many of which are in urban districts.
Because Of These Pressures, Many Urban Districts Are Closing Schools

- Districts such as Chicago, Detroit, Cleveland, Kansas City, Pittsburgh, and Philadelphia have closed schools in recent years due to shrinking enrollment
- School closures are often justified as cost cutting measures
- Districts often choose which schools to close based on the physical condition of building or political considerations

Can school closures be an opportunity to improve student outcomes?
We Examine An Anonymous Mid-size Urban District That Chose Which Schools to Close Based on Recent Performance Ratings

- About 5 years ago, this district closed over 20 schools in an attempt to reduce overcapacity, improve its finances and improve achievement
- The superintendent chose to close or reconstitute low-performing schools rather than using physical condition or political considerations
- Low-performing schools were identified by student-level test score gains rather than levels
- The district also initiated other reforms, which were controlled for in our analysis
- No high schools were closed as a part of these reforms
This Study Focuses on the Impact of Relocating Students Due to School Closures

- What was the overall impact for students who transferred from closed schools?
  - Test scores (grades 3 through 8)
  - Attendance (grades K through 8)

- Did dislocated students have higher achievement gains when they transferred to schools with a history of higher achievement gains?

- Did transferring large numbers of students into existing schools have adverse effects on students already enrolled in these schools?
How Can School Closures Improve Student Achievement?

- Improved student outcomes for transferring students can be accomplished through:
  - Exposure to higher-quality curriculum and instruction
  - Exposure to higher-achieving peers

- However, there are risks to this approach:
  - Given that many of the teachers in the schools that were closed were transferred to existing schools, can better instructional practices be sustained in the receiving schools?
  - Could the influx of students into existing schools create a disruption or an exodus of strong students from these schools?
The District Provided High-Quality Data for Analysis

- Students are linked to their grade and school and can be followed over time
- Data include demographics, SES, attendance patterns, and test scores for each student in every district school
- The default school (i.e., feeder pattern school) and actual school (e.g., magnet or open enrollment) is known for each student
The District Used School Performance Score (SPS) to Guide School Closing and Reconstitution Decisions

SPS is a continuous scale between 0 and 5, with 5 representing the highest performance.
Many Students in Grades K through 8 were Affected By The Closures

1. About 25% of students in grades K through 8 were in schools that closed.
2. The year after the closures, there was large variation in the amount of student influx among the remaining schools:

[Bar graph showing school-level distribution of the percentage of students from closed schools in 2006]
Most Students From Closed Schools Were Assigned to Schools with Higher Performance, But Many Chose to Attend Schools with Lower Performance Than The One Assigned

30% of students from closed schools did not attend their new assigned school
The Effect of School Closure was Estimated Relative to Pre-Closure Outcome Measures

- **Abs**<sub>it</sub> = (# absences/#days in the district)*180 for student i in year t, where t=0 is the year before schools were closed:
  \[
  \log(\text{abs}_{it} + 1) = \beta_0 + \beta_1 \log(\text{abs}_{i0} + 1) + \beta_2 P_{it} + \beta_3 X_{it} + \epsilon_{it}
  \]

- **Y**<sub>it</sub> is the achievement level for math or reading for student i in year t, where t=0 is the year before the schools were closed:
  \[
  Y_{it} = \beta_0 + \beta_1 Y_{i0} + \beta_2 P_{it} + \beta_3 X_{it} + \epsilon_{it}
  \]
Closures and Reforms are Represented by Several Policy Variables $P_{it}$

- $P_{it}$ includes closure measures:
  - a dummy if student $i$ was in a **closed school**, interacted with $t=1,2 & 3$
  - the **difference in the SPI** in $t=0$ between the closed school and the school the student attends in year $t$ *(in achievement equations only)*
  - the fraction of the school that student $i$ attends in year $t$ which is comprised of **students from closed schools**

- $P_{it}$ also includes reform measures:
  - a dummy if student $i$ attends a **reconstituted** school in year $t$
  - dummies to distinguish **K-8** schools from K-5 and middle schools

All elements of $P_{it}$ use information on **actual school attended** but are **instrumented** with information on **assigned school** to avoid bias from self-selection of actual school
Characteristics of the Student and His/Her School are Included In $X_{it}$

- $X_{it}$ includes time-invariant characteristics:
  - race and gender dummies and interactions
  - special needs, gifted and English learner dummies, free or reduced lunch dummy

- $X_{it}$ also includes time-varying characteristics:
  - voluntary mobility dummy
  - the fraction of the school that student $i$ attends in year $t$ which is comprised of students who moved in from open schools (i.e. voluntary mobility rates)
## Estimated Effects of School Closure on Absences

<table>
<thead>
<tr>
<th>Years After Closure</th>
<th>Relocation Dummy (CL)</th>
<th>Percent Influx from Closures (PC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.11* (0.05)</td>
<td>0.06 (0.24)</td>
</tr>
<tr>
<td>2</td>
<td>0.02 (0.05)</td>
<td>-0.24 (0.20)</td>
</tr>
<tr>
<td>3</td>
<td>0.04 (0.04)</td>
<td>0.06 (0.18)</td>
</tr>
</tbody>
</table>

Robust standard errors in parentheses. * p-value < 0.05

- Initial spike in absenteeism that completely disappears by second year
- Small and insignificant relationship between the percentage of students coming in from closed schools
**Estimated Cumulative Effects of School Closures on Student Achievement**

<table>
<thead>
<tr>
<th>Years After Closure</th>
<th>Relocation Dummy (CL)</th>
<th>Difference in SPS (SD)</th>
<th>Percent Influx from Closures (PC)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
<tr>
<td>MATH</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>-0.19* (0.05)</td>
<td>0.09* (0.02)</td>
<td>-0.18 (0.25)</td>
</tr>
<tr>
<td>2</td>
<td>-0.17 (0.10)</td>
<td>0.07* (0.02)</td>
<td>-0.44 (0.41)</td>
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<tr>
<td>3</td>
<td>-0.14 (0.08)</td>
<td>0.06* (0.03)</td>
<td>-0.16 (0.31)</td>
</tr>
<tr>
<td>READING</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>-0.20* (0.05)</td>
<td>0.08* (0.02)</td>
<td>-0.42 (0.22)</td>
</tr>
<tr>
<td>2</td>
<td>-0.07 (0.05)</td>
<td>0.06* (0.02)</td>
<td>0.02 (0.27)</td>
</tr>
<tr>
<td>3</td>
<td>-0.04 (0.05)</td>
<td>0.04 (0.03)</td>
<td>0.22 (0.20)</td>
</tr>
</tbody>
</table>

Robust standard errors in parentheses. * p-value < 0.05

- Negative and statistically significant effect in the first year if the student is moved to a school with a similar SPS
- However, the effect was approximately zero for a student at the 75th percentile gain in SPS (-0.03, s.e. = 0.04)
- Again, small and insignificant relationship between achievement and the percent of students coming in from a closed school
Achievement Effect of Relocation Depends on Performance of New School

Math Achievement Effect for Students Who Move to a School of Higher Quality (75th Percentile Change in SPI)

Math Achievement Effect for Students Who Move to a School of Similar Quality (25th Percentile Change in SPI)
These Results Have Implications Both For NCLB And The Obama Administration’s Current Initiatives

- ESEA Reauthorization (known as NCLB) includes school closure as possible sanction for schools that chronically fail to meet academic targets.

- The Obama administration is also pushing for the closing of low-performing schools and reopening new schools under Title I grants.

- Our results suggest the careful selection of schools to be closed can minimize the adverse effects of closures.
  - We found no adverse effects for students relocating to better schools.
  - We found no adverse effects for students in the receiving schools.