To evaluate whether a managerial autonomy lacks controls for students with disabilities and English language learners.

**Pre-Reading**

Event Study design: Heterogenous effects by year relative to 96-5.

Reading delivered managerial autonomy provides estimates of how turnaround effects develop over time.

Small sample of treated schools (13 schools) may impact generalizability.

Innovation Schools effects fade out over time.

Enacted in 2008, Innovation Schools treated in 2009. Turnarounds may require effort beyond implementation period to sustain.

It may be possible to rapidly improve school performance through small sample of treated schools (13 schools) may impact generalizability. School-level vs. student-level data allows less control for student characteristics; Lacks controls for students with disabilities and English language learners. Outcomes are high stakes exam scores, which are subject to gaming.

Leveraging Managerial Autonomy to Turn Around Low Performing Schools: Evidence from the Innovation Schools Program in Denver Public Schools

Philip Gigliotti, MPA, PhD Candidate

Department of Public Administration and Policy, University at Albany

Contact: pgigliotti@albany.edu

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**INNOVATION SCHOOLS PROGRAM IN DENVER PUBLIC SCHOOLS**

- The Innovation Schools program is a managerial autonomy-based turn around reform in Denver Public Schools.
- Context: Denver struggled with persistent performance deficits and implemented school choice and accountability systems to turn around the district.
- Enacted in 2008, the Innovation Schools program delivered managerial autonomy to 30 public schools to facilitate reforms:
  - Provided a formal waiver process exempting schools from district policies.
  - Schools self-initiate the waiver process and submit a reform plan to district.
  - Innovation School strategies: In-house teacher evaluation, control over teachers, longer school days and years, private fundraising and consulting, curricular reforms (see Table 1).

**STUDY OBJECTIVES**

1. To evaluate whether a managerial autonomy-based turn around reform effects school performance.
2. To investigate how the effects of the program develop over time.

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**DATA SOURCES AND METHODS**

- Data Sources: Publicly available data from Colorado Department of Education.
  - School level data on approximately 200 schools in Denver Public Schools.
  - Panel covers 2006-07 to 2013-14 academic years (8 year panel).
- Study Population: 13 Innovation Schools that transition to Innovation status. (17 opened as Innovation Schools and lack pre-treatment period. These two groups are mutually exclusive and together account for all Innovation Schools (see Figure 1)).
  - First Innovation Schools treated in 2009-10; Treatment initiation staggered over the next 4 years.
- Outcomes: Writing, reading and math standardized test scores (school-level means) standardized by year.
- Empirical Strategy:
  - Two-Way Fixed Effects Difference-in-Differences design:
    \[ \gamma_{it} = \gamma_{0} + \gamma_{1} \text{Innovation School} \times \text{Post} + \gamma_{2}X_{it} + \gamma_{3}X_{it} + \gamma_{4}X_{it} + \epsilon_{it} \]
  - Event Study design: Heterogenous effects by year relative to treatment initiation:
    \[ \gamma_{i} = \gamma_{0} + \gamma_{1} \text{Innovation School} \times \sum_{t=1}^{T-1} \text{Treatment Year} i_{st}, \gamma_{2}X_{it} + \gamma_{3}X_{it} + \gamma_{4}X_{it} + \epsilon_{it} \]
  - Controls: Enrollment, student-teacher ratio, % free lunch eligibility, % black, % Hispanic.
  - Comparison groups: 1) All district schools, 2) Propensity score matched sample.
  - Robust cluster standard errors and Wild Bootstrap hypothesis testing.

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**ADOPTION AND IMPLEMENTATION OF INNOVATION SCHOOLS**

Table 1: Waivers Requested by Innovation Schools

<table>
<thead>
<tr>
<th>Category Provision Waived</th>
<th>Percentage of Schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accountability</td>
<td>100%</td>
</tr>
<tr>
<td>Budgetary Control</td>
<td>100%</td>
</tr>
<tr>
<td>Curriculum</td>
<td>100%</td>
</tr>
<tr>
<td>Educational Program and Notebook</td>
<td>100%</td>
</tr>
<tr>
<td>Incentive Standards</td>
<td>100%</td>
</tr>
<tr>
<td>Insurance</td>
<td>100%</td>
</tr>
<tr>
<td>Employee Performance</td>
<td>100%</td>
</tr>
<tr>
<td>Environment</td>
<td>100%</td>
</tr>
<tr>
<td>Employee Selection and Pay</td>
<td>100%</td>
</tr>
<tr>
<td>Employee Dress Code</td>
<td>100%</td>
</tr>
<tr>
<td>Employee Professional</td>
<td>100%</td>
</tr>
<tr>
<td>Teacher Training</td>
<td>100%</td>
</tr>
<tr>
<td>Teacher Licensing</td>
<td>100%</td>
</tr>
<tr>
<td>Teacher Contracts</td>
<td>100%</td>
</tr>
<tr>
<td>Teacher Probation</td>
<td>100%</td>
</tr>
<tr>
<td>Teacher Transfers</td>
<td>100%</td>
</tr>
<tr>
<td>Police for Violation</td>
<td>80%</td>
</tr>
<tr>
<td>Procedure for Dismissal</td>
<td>80%</td>
</tr>
<tr>
<td>Procedure for Dismissal</td>
<td>80%</td>
</tr>
<tr>
<td>Due Date</td>
<td>80%</td>
</tr>
<tr>
<td>New Innovation School Day and School Year</td>
<td>80%</td>
</tr>
</tbody>
</table>

**RESULTS: EVENT-STUDY ESTIMATES**

Figure 1: Adoption of Innovation Schools Program

Figure 2: Event Study (Writing Score)

Figure 3: Event Study (Reading Score)

Figure 4: Event Study (Math Score)

Table 2: Effects of Innovation Schools on Academic Outcomes

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>(1) Writing</th>
<th>(2) Math</th>
<th>(3) Reading</th>
<th>(4) Math</th>
<th>(5) Reading</th>
<th>(6) Math</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovation schools</td>
<td>0.111* (0.0669)</td>
<td>0.108 (0.0660)</td>
<td>0.136* (0.0649)</td>
<td>0.113+ (0.0598)</td>
<td>0.232* (0.0969)</td>
<td>0.225* (0.0970)</td>
</tr>
<tr>
<td>Full Sample</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Matched Sample</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>School FE</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Rear FE</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Observations</td>
<td>1,015</td>
<td>464</td>
<td>1,015</td>
<td>464</td>
<td>1,015</td>
<td>464</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.083</td>
<td>0.090</td>
<td>0.086</td>
<td>0.134</td>
<td>0.092</td>
<td>0.084</td>
</tr>
<tr>
<td>Number of panels</td>
<td>148</td>
<td>62</td>
<td>148</td>
<td>62</td>
<td>148</td>
<td>62</td>
</tr>
</tbody>
</table>

Robust standard errors in parentheses, clustered by school

Wild Bootstrap p-values in third row

* p<0.01, * p<0.05, + p<0.1

**RESULTS: DIFFERENCE-IN-DIFFERENCES ESTIMATES**

Table 2: Effects of Innovation Schools on Academic Outcomes

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**POLICY IMPLICATIONS**

- It may be possible to rapidly improve school performance through managerial autonomy-based turnaround reforms.
- It may be difficult to sustain the impacts of turnaround reforms in the long run.
- Turnarounds may require effort beyond implementation period to sustain results.

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**LIMITATIONS**

- Small sample of treated schools (13 schools) may impact generalizability.
- School-level vs. student-level data allows less control for student characteristics;
- Lacks controls for students with disabilities and English language learners.
- Outcomes are high stakes exam scores, which are subject to gaming.

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**CONTRIBUTION**

- Provides causal estimates of turnaround effects in a unique context.
- Provides estimates of how turnaround effects develop over time.
- Suggests relationship between managerial autonomy and school performance.

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**KEY FINDINGS**

- Innovation Schools program led to rapid performance improvements.
- Improvements seen in all 3 outcomes, though largest in math.
- Innovation Schools effects fade out over time.

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