Journal of Urban Economics 87 (2015) 100–113

Contents lists available at ScienceDirect

Journal of Urban Economics

www.elsevier.com/locate/jue

The impact of Chicago's small high school initiative

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ARTICLE INFO

Article history:
Received 2 March 2013
Revised 2 February 2015
Available online 19 February 2015

JEL classification:
I2

Keywords:
School size
Urban schools
School reform
Small schools
High schools
Student outcomes

ABSTRACT

This project examines the effects of the introduction of new small high schools on student performance in the Chicago Public School (CPS) district. Specifically, we investigate whether students attending small high schools have better graduation/enrollment rates and achievement than similar students who attend regular CPS high schools. We show that students who choose to attend a small school are more disadvantaged on average, including having prior test scores that are about 0.2 standard deviations lower than their elementary school classmates. To address the selection problem, we use an instrumental variables strategy and compare students who live in the same neighborhoods but differ in their residential proximity to a small school. In this approach, one student is more likely to sign up for a small school than another statistically identical student because the small school is located closer to the student's house and therefore the "cost" of attending the school is lower. The distance-to-small-school variable has strong predictive power to identify who attends a small school. We find that small schools students are substantially more likely to persist in school and eventually graduate. Nonetheless, there is no positive impact on student achievement as measured by test scores.

1. Introduction

There is a building consensus among policy makers, educators, parents, and future employers that American high schools are in need of significant reform. Nationwide, only about 75% of high school freshmen graduate from high school within 4 years (Snyder and Dillow, 2012). Students from poor families and students of color are more likely to drop out than more advantaged youth. Improvements that have recently been seen in lower grades (possibly because of the introduction of accountability reforms like *No Child Left Behind*) have failed to carry over to high school performance. According to the National Assessment of Educational Progress (NAEP), 74% of 12th graders have math skills below the proficiency level, and 88% and 93% of Hispanic and Black students, respectively, fail to meet the bar.[1] Further, over 60% of employers complain that high school graduates do not have good math and writing skills (U.S. Department of Education, 2003).

The organization of schools has a potentially large impact on the performance of students (Barker and Gump, 1964; Chubb and Moe, 1990). In the recent past, high schools have been accused of being rather large, impersonal educational "factories" where teachers know little about the students in their charge, and the learning environment is not very supportive (Sizer, 1984, 1997). In response, reform efforts known as the "Small Schools Movement" have been mounted to reduce the size of high school learning communities by breaking up existing large schools and creating new schools that are small by design. The Bill & Melinda Gates Foundation was a major supporter of this reform, making over $2 billion in grants to invest in small schools (Gates Foundation, 2009). The Annenberg Foundation, Carnegie Foundation, and Department of Education also contributed substantial resources to small schools (Shear and Smerdon, 2003).

Despite the substantial financial investment in small school reforms, there have been few experimental or quasi-experimental evaluations of their impacts on student outcomes. This project attempts to isolate the causal impact of the 22 new small high schools created in Chicago between 2002 and 2006 under the Chicago High School Redesign Initiative (CHSRI). We use individual-level longitudinal data from the Chicago Public Schools (CPS) and employ an instrumental variables design based on a student's residential proximity to a small high school to measure their impacts on enrollment and graduation up to 5 years after a student began high school.

We document substantial negative selection into small high schools in Chicago. When we control for background characteristics, the correlation between small school attendance and

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[1] Cited statistics are 2013 NAEP test score results for 12th grade students reported at the website www.nationsreportcard.gov.

http://dx.doi.org/10.1016/j.jue.2015.02.002
0094-1190/

enrollment indicates that small school students are somewhat less likely to drop out and more likely to progress on time and graduate. The instrumental variables estimates are substantially larger than the OLS estimates and suggest that small schools increase the likelihood that a student graduates from high school on time by 20 percentage points on a base of 48%. At the same time, however, we find no evidence that small high schools raise student test scores. These findings are consistent with the broader literature that finds strong impacts of high school improvement on educational attainment, but more mixed results on test scores. For example, Evans and Schwab (1995) and Altonji et al. (2005) find that Catholic high schools increase educational attainment but not test scores. On the other hand, as described below the literature on small high schools in New York City has found mixed results on scores (Bloom and Unterman, 2014; Schwartz et al., 2013; Abdulkadiroglu et al., 2013).

2. Background on the small schools movement

The small schools movement grew out of the observation that poor, urban students who already have lower levels of academic performance are more likely to drop out of large high schools (Toch, 2003; Bryk and Thum, 1989; Maeroff, 1992). There are several theories about why small schools can be more effective, largely involving improved relationships between teachers and students in small schools (Rossi and Montgomery, 2004). In smaller schools, teachers may be able to get to know their students better and tailor their teaching approaches to students' interests and strengths; students may feel more connected to a small school community which leads to reduction in violence and dropping out; and expectations may be raised for the high achievement of all students. In addition, teachers are thought to be more collaborative, creative and effective in small schools.

Policies to expand the availability of small schools in urban environments were motivated by mostly correlational research from an earlier generation of small school interventions that showed positive outcomes (Cotton, 1996; Haller, 1993; Howley, 1989). Small schools had been shown to have lower dropout rates, smaller achievement gaps, and better access to challenging coursework (Bryk et al., 1990; Darling-Hammond et al., 2002; Holland, 2002; Pittman and Haughwout, 1987). However, the research was not universally positive; one-half of the studies reviewed in Cotton (1996) showed no impact of small schools.

Fueled by this theory and empirical evidence, over 1600 new, mostly urban small schools were founded in the early 2000s (Toch, 2010). While the guideline for enrollment was no more than 600 – and ideally closer to 400 students – it is important to note that the intervention of the small schools movement was intended to be about more than just the number in the student body. The small schools were expected to have an additional set of attributes including common focus, high expectations, a culture of respect and responsibility, performance standards, and effective use of technology.

Despite much previous research on small schools, our knowledge of the potential impact of policies encouraging the formation of new small high schools in urban districts is limited. Early studies on the introduction of small schools in Chicago found positive impacts on measures of student engagement, but no impact on gross measures of achievement (Kahne et al., 2005; Wasley et al., 2000; Hess and Cytrynbaum, 2002). The lack of findings on achievement may be due to evaluating the schools "too early" after their opening while schools were still struggling with basic start-up organizational challenges or because selection into the new schools was not properly addressed. Additionally, the first small high schools to open in Chicago differ from later-opening small schools in potentially important ways. Namely, the first schools were so-called "conversion" schools that divided a large high school into a number of small schools in the same building.[2] The schools chosen for conversion were previously among the lowest-performing schools in the city (Kahne et al., 2006). Later-opening schools were more typically new-start schools, which were potentially better positioned to choose faculty and enroll students who were more committed to the small schools approach. All small schools were given flexibility to structure their curriculum, schedule, and other school attributes (Sporte et al., 2004).

As we demonstrate in Table 1 below, the student body in small schools was, on average, negatively selected relative to their 8th grade classmates. Qualitative studies indicate a variety reasons that students chose to attend small schools (Sporte et al., 2004). Some students report being drawn to the schools because of the small size and the resulting additional attention from teachers. Others reported reasons such as "my counselor made me" and "because it's close to home." Still, others reported being assigned to the schools because they did not express a different preference, or because they were not accepted to other high schools. Note that the guiding principle for the small schools initiative in Chicago was the desire for small schools to serve students from their local neighborhoods. Using longer run data, Sporte and de la Torre (2010) find that small school students in Chicago have better attendance and persistence than a demographically similar control group, but perform no better on test scores. They find similar impacts for both conversion and new-start schools. Our paper is the first to use a quasi-experimental design to address negative student selection into the small schools and to evaluate the performance of small schools in Chicago.

The most credible causal evidence on the impacts of small high schools comes from three recent studies of New York City public schools. Bloom and Unterman (2014) use lotteries for admission to over-subscribed small high schools to compare outcomes for lottery winners who go on to attend one of the new small high schools to lottery losers who attend one of the other types of public high schools available in New York City. Because lottery winners were randomly chosen, on average the two groups should have identical observable and unobservable characteristics. The authors find that winners of the grade nine admission lotteries were 9.5 percentage points more likely to graduate from high school within 4 years. They also find that lottery winners were more likely to score at or above 75 points on the English Regents exam, the level at which the City University of New York exempts students from taking remedial English classes. They find no impact on Regents exam math scores. Using a somewhat different lottery design and longer-run data, Abdulkadiroglu et al. (2013) replicate many of these findings and additionally find positive test score impacts in all subjects and increased college enrollment rates.

In work most closely related to our paper, Schwartz et al. (2013) also study the effect of new small high schools on student outcomes in New York City using distance from student zip codes to the nearest schools by size and age as instrumental variables for attending a new small school, a new large school, an old small school, or an old large school. They find that students who attend one of the new small high schools are 17 percentage points more likely to graduate from high school than students who attend a large high school. Further, new small high school students are more likely to attempt a Regents math or English test by around 16 percentage points. In contrast to the findings from the lottery studies, however, Schwartz et al. (2013) find that new small high school students perform no differently on the mathematics

[2] Most of the small conversion schools were merged back into large schools between 2008 and 2011.