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DOCUMENT REVIEWED:	"Everyone Wins: How Charter Schools Benefit All New York City Public School Students"
AUTHOR:	Marcus A. Winters
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REVIEWER:	Patrick J. McEwan
E-MAIL ADDRESS:	pmcewan@wellesley.edu
PHONE NUMBER:	(781) 283-2987

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Summary of Review

The report examines whether increasing competition from charter schools has a causal effect on the achievement of public school students in New York City, using a three-year longitudinal database of student test scores. As a measure of competition, it considers the percentage of students who left a public school for a charter school in the prior year. The statistical analysis suggests that increasing competition has no statistically significant impact on math test scores, but that it has small positive effects on language scores. The report does not conclusively demonstrate that the results are explained by increasing competitive pressure on public school administrators; they may also be explained by shifting peer quality or declining short-run class sizes in public schools.

Review

I. Introduction

Quantitative studies that address the impact of charter schools usually focus on two questions. First, does attending a charter school rather than a public school cause students' outcomes to increase? Second, does the entry of charter schools in local schooling markets cause students' outcomes to increase, *even if they remain in public schools*? One potential mechanism by which public school achievement could rise is market competition. The loss (or threatened loss) of students to charter schools would, perhaps, increase incentives of public school administrators and teachers to work differently or harder.[1]

The report, *Everyone Wins: How Charter Schools Benefit All New York City Public School Students*,[2] focuses on the second question. In particular, it attempts to estimate the causal relationship between a measure of competition from charter schools and student test scores in public schools. As a measure of competition facing public schools, it uses the percentage of students in a given public school who left for a charter school in the prior year. It employs three years of longitudinal data from New York City public schools and analyzes test scores in mathematics and English Language Arts (ELA). The report posits that an increasing percentage of students leaving for charter schools accurately proxies an increasing amount of pressure on public school administrators to "compete," improve test scores, and staunch the flow of students to charter schools. The report applies a common statistical approach—a student fixed-effects regression—to control for student variables that could bias the analysis. Overall, it concludes that increasing competition produces no effects on math test scores and small positive effects on ELA scores, but that such effects are slightly larger among public school students with lower levels of baseline achievement (the exact estimates are described in section II).

Overall, the analysis does not make a strong case that these effects *exclusively* reflect the causal impact of greater competition. Even applying the fixed-effects analysis, it is plausible that an increasing percentage of students leaving for charter schools could indicate: (1) declining short-run class sizes in public schools, and (2) shifts in the peer quality of students remaining in public schools. Either could explain the slightly positive effects of ELA scores. The report does not attempt to empirically distinguish among these explanations, although it would be necessary to do so before drawing strong conclusions about the competitive effects of charter school entry.

II. Findings and Conclusions of the Report

The report's objective is to identify a causal link between competition from charter schools and the test scores of public school students in New York City. Of course, competition is a diffuse and hard-to-measure concept. To address this, the author identifies a proxy or "stand-in" variable to measure its intensity. Specifically, competition is defined as "the percentage of students in a [public] school who left for a charter school at the end of the previous year" (p. 5). Public schools with a greater proportion of "charter-leavers" are presumed to face greater competitive pressure to improve the test scores of students in the current school year. The average public school in this study's sample lost 0.2 percent of its students to charter schools (p. 6).

The paper conducts statistical analyses, described in a later section, to ascertain the empirical association between the competition proxy and student test scores. To summarize these results, it is convenient to state the effect of a 1 percentage point increase in the competition proxy variable: the percentage of public school students who left for a charter school in the prior year:

- On average, a 1 percentage point increase in the percentage of students who left for a charter school has no statistically significant effect on mathematics test scores. That is, the estimated math effect cannot be statistically distinguished from zero.
- On average, a 1 percentage point increase in the percent of students who left for a charter school has an effect on English Language Arts (ELA) test scores of 0.02 standard deviations, which is statistically significant at 10%. Two observations are warranted. First, this is a small effect, also noted in the report. Second, it is on the margin of statistical significance (i.e., it is not statistically significant at the more commonly applied significance level of 5%).
- On average, the effects of competition are larger on students from the lower quartiles of the achievement distribution. That is, lower-achieving public school students experience slightly larger effects in response to a 1 percentage point increase in the percent of students who left for a charter school, but never larger than 0.08 standard deviations (still a relatively small effect).

The report's conclusions are generally modest and aligned with the statistical findings just described. As stated by the author, the report

> find[s] some evidence that increases in the competition that a traditional New York City public school faces from charter schools for students leads to an increase in the ELA proficiency of students who remain in public schools. Competition from charter schools also benefits students with very low prior math proficiency (p. 8).

The report also correctly notes that the statistical findings do not necessarily imply that increases in the measure of competition *cause* test scores to rise (although they are correlated in some instances). For example, the effects of increasing competition could reflect the test score influences of correlated (but omitted) variables such as peer quality (p. 9). Does the competition variable exclusively proxy the competitive pressures facing public school administrators? Or, does it proxy other variables, such as a sudden shift in the peer environment because of departing students? This is an important issue to resolve, since either could be responsible for the observed pattern of test score effects. This issue is revisited in the following sections.

III. THE REPORT'S USE OF RESEARCH LITERATURE

Much of the quantitative research literature on charter schools can be divided into two sets of studies, based on their research questions. The report very briefly reviews each set, focusing on the second.

The first set of studies examines the impact of transferring from a public school to a charter school *on the outcomes of transferring students*. Put simply, does attending a charter rather than a public school have a causal effect on the outcomes of a transferring student? (By causal, I mean that charter students' achievement isn't better or worse simply because of pre-existing differences between students, such as family income.)

The best recent studies have sought to answer this question by analyzing charter school lotteries. When charter schools are over-subscribed, states typically require a randomized admissions process. The winners of charter school lotteries constitute the treatment group, and the losers (who attend the alternative of their choice) constitute a similar control group. Any differences in outcomes are ascribed to "charter school quality", broadly construed to include differences in school resources, teacher quality and practices, peer quality, and other variables. The report's author admiringly cites unpublished work by Hoxby, Murarka, and Kang, which conducted a lottery study in New York City public schools.[3] These authors find positive effects of attending a charter school on the test scores of transferring students, but the validity of these promising results has been questioned in a recently released review.[4]

A second set of studies pursues a very different research question: what is the effect of charter schools *on students who remain in public schools*. Since the majority of students will never transfer to charter schools, it is interesting to ask whether they may benefit indirectly. The basic theoretical prediction is that public schools facing greater competition from charter entrants will face incentives to increase their productivity and, hence, student outcomes. Whether this actually occurs is an empirical question, and it has been studied in several U.S. states, using rich datasets very similar to the longitudinal New York City data of this report. As measures of charter school competition, these studies usually employ measures of local charter school availability, such as the number of charter schools within a defined radius of a public school. The report cites a recent review article by Gill and Booker that reviewed the collected studies and found a mix of zero and slightly positive effects.[5]

The mixed pattern of findings is corroborated in another review article of the charter school competition literature by different authors.[6] The pattern of findings appears to vary substantially based on the particular state being analyzed and the statistical method applied.

A more comprehensive look at the literature on this topic would have alerted readers to the substantial methodological challenges of identifying the effects of competition.

Prior studies of charter school competition share an objective with this report: to identify the causal effect of competition on student outcomes. However, these studies (and the present report) face a technical challenge that the report mentions in the conclusions but does not carefully review. Whenever public schools face an increasingly competitive environment, "competition" is invariably accompanied by a re-sorting of students across public, charter, and even private schools. As stated by Hsieh and Urquiola, who addressed the problem in an evaluation of Chile's private school voucher system,[7]

> A central issue in measuring the effect of school choice is that it can simultaneously affect both schools' productivity and the extent of sorting or stratification observed in the educational system. If [school choice] influences schooling outcomes through both of these channels, then it is nearly impossible to disentangle their respective magnitudes.

Imagine that a new charter school opens and draws students from a local public school. Indeed, the proportion of public students exiting to a charter school is the measure of competition used in the report. A student exodus from the public school increases competitive pressures, to be sure, but it si-

multaneously removes a group of students from the public school (we needn't make any judgment about whether this is "cream-skimming" of high-ability students, or whether exiting students are lower-ability). If the *remaining* public students are affected by the student departures—either positively or negatively—then so-called "peer effects" on student outcomes are confounded with the productivity-enhancing effects of competition.

In the language of evaluators, two treatments occur at the same time. As a consequence, it is difficult to ascertain whether the observed impact of "competition" is driven by productivity enhancements in public schools, or simple changes in the quality of peer environments. In addition to the present report, the critique also applies to other studies that attempt to identify the causal effect of competition of public school outcomes. The next sections will consider how the empirical results can be more judiciously (and cautiously) interpreted in light of this critique.

IV. Review of the Report's Methods

Measuring Competition

The measure of charter school competition is the proportion of a public school's total enrollment that left for a charter school at end of the last school year. The calculation of this measure is facilitated by the availability of year-to-year, longitudinal data on each student's enrollment in a public or charter school.

The report is unclear about two specific features of this variable. First, it is probable that some students left a public school to attend a private school or an open-enrollment public school, rather than a charter school. The report's measure does not account for such students (except in the calculation of the subsequent year's school enrollment, the denominator of the competition variable). It is hard to imagine why public school administrators would vigorously compete in response to losses from a charter school, but not a neighboring private or public school, since both signify lost market share. (Similarly, one imagines that Dell is equally concerned about consumer defections to HP, Toshiba, Apple, and other competitors.) In light of this, the analysis should control for related measures of competition from private and other public schools and ascertain whether the current results are robust.

Second, it is not clear how the analysis treats potential student *inflows* from charter, private, or other public schools. It appears that such inflows, if they exist, are ignored or coded as a zero outflow to charter schools, although this decision is not well-explained. If a departing student poses a competitive threat in the simple framework of this study, then an arriving student, presumably, dulls the threat and exerts a countervailing effect on test scores. Again, it would be worthwhile to calculate alternative measures and assess the robustness of the main empirical findings.

Data and Variables

The report uses a rich dataset on students in New York City schools. The main sample includes up to three years of students' test scores from 2007, 2008, and 2009, and is limited to students attending public schools. Longitudinal data from administrative data systems are an increasingly prominent ingredient in education policy analysis; indeed, researchers have employed similar longitudinal data sets to study the competitive effects of charter schools in Texas, California, North Carolina, Florida, and elsewhere.

Like other studies, the report limits the sample to students attending public schools. The

report argues against including students attending charter schools because the measure of charter school competition—the proportion of students leaving for charter schools—is less relevant *within* a sample of charter schools (p. 7). But, following the limited theory on this topic, it is reasonable to assume that: (1) charter schools compete with each other; and (2) charter schools compete with public and private schools. Since these competitive responses also affect student achievement, it is worth thinking about how to comprehensively measure their effects. In the present framework, a natural starting point would be to use a richer set of competition measures that reflects outflows and inflows from all types of schools; and enlarge the sample of schools to include every publicly-funded NYC school with achievement data, including charter schools.

Empirical Approach

With the variables and sample thus defined, the report attempts to identify the statistical association between the competition variable and test scores. As the report observes, it would be foolhardy to estimate the simple correlation between these variables and ascribe it to the causal effect of competition. Suppose 10% of public school students depart, and that these 10% happen to be low achievers. In this case, the compositional changes wrought by "competition" would mechanically increase the school's test scores. One approach is to control for observed characteristics of students of students, such as gender and socioeconomic status, but this is likely to omit or miss key attributes of students that are correlated with the both the competition measure and test scores. As a sensible alternative, the authors control for "student fixed effects." The underlying statistical methods are complex, but the procedure amounts to controlling for *all student variables that do not vary across time, whether observed or unobserved*. Naturally, this controls for *observed* and easily-obtained variables like gender and race. More importantly, it controls for *unobserved* and hard-to-measure student attributes (such as innate ability) that do not vary across time.

V. REVIEW OF THE VALIDITY OF THE FINDINGS AND CONCLUSIONS

By applying a student fixed-effects analysis, does the report succeed in identifying the causal effect of competition? To answer this question, we must ask whether there are unobserved and omitted determinants of test scores that *vary across time,* and whether such variables are correlated with the measure of competition. In such a case, the measured effects of competition could reflect the impact of correlated but unobserved variables. There are two plausible scenarios under which this might occur.

First, the departure of students for charter schools (and a concomitant reduction in school enrollments) lowers class sizes in the short run. Suppose that 10% of students depart for a charter school. In most public schools, it is unlikely that small enrollment changes will lead to short-run reductions in the number of classroom sections. If the average class size is 20, then a departure of 10% of students could lower class sizes by 2 students in the following year. Of course, public schools may adjust personnel levels over several years, especially if enrollment declines are large and persistent. But, in the one-year time period over which test scores effect are measured, an increase in "competition" is likely confounded with a reduction in class size.

Second, the departure of students will modify the peer environment in public schools. The inclusion of student fixed effects con-

trols for variables that are time-invariant. However, a sudden departure of students represents an equally sudden (and time-varying!) modification of school peer groups. Thus, a short-run increase in "competition" is confounded with a change in the composition of school peer groups, with uncertain implications for student achievement. Achievement could decline if departing peers are especially motivated or high-achieving, and it could increase if departing peers have the opposite qualities. Neither effect would occur if remaining students are simply unaffected by attributes of their school or classroom peers, although the best empirical evidence confirms the importance of peer quality in determining test scores.[8]

In its conclusion, the report concurs with this analysis, noting that

> it is possible that some of the positive relationship between competition from charters and student proficiency in traditional public schools is explained by changes in peer quality rather than improvements in public schools' effectiveness (p. 9).

The report suggests that the small, positive ELA test score effect could be partially explained by an improving peer environment in public schools (termed "reverse cream-skimming"). In fact, the small positive effect on ELA scores could also be explained by a large negative effect of peer sorting, and a large countervailing effect of productivity-enhancing competition (or a large negative effect of competition, and a large countervailing peer effect!). Without further analysis, there is no way to unpack the "black box" of the empirical results. However, given the rich longitudinal data, the author missed an opportunity to do so. For example, one could calculate (time-varying) measures of peer quality or class size in each school. By including such variables as additional controls in the statistical analysis, one could determine whether the measured effects of the competition proxy are attenuated (or perhaps made even stronger).

In summary, the report's estimates of competitive effects should be interpreted with a dose of caution. To be clear, this does not mean that the current study is uninteresting, or a poor contribution to the literature on charter schools. But, it is not consistent with extant economic literature to infer that the partial correlations summarized in section II are the causal effect of increasing competition from charter schools. Rather, the estimated effects represent the *net* impact of several changes occasioned by the sudden departure of students: (1) an increase in competitive pressures and public school responses; (2) an immediate decline in class sizes; and (3) an immediate modification in the quality of school peers of remaining students. Without further study, it is impossible to disentangle these effects using the reported empirical findings, and the report does not attempt to do so.

The report's text describes the results accurately and, for the most part, provides a guarded interpretation. Unfortunately, this is not reflected in the report's optimistic title ("Everyone Wins"). A longer, dryer, and more descriptive title might be: "Some win and some lose, but, on average, they slightly win—though mainly on the ELA test and with caveats about the causal interpretation of the effects."

VI. USEFULNESS OF THE REPORT FOR GUIDANCE OF POLICY AND PRACTICE

The literature on charter schools has focused on estimating their effects on students who transfer from a public to a charter school.

Much of the attention of policy-makers and scholars continues to revolve around the important, but relatively narrow question of whether charter schools "work" in raising student achievement of a select group of students.

While important, these studies cannot address important general-equilibrium policy questions about competition. To its credit, the present report addresses these questions, although it cannot conclusively answer them. As a contribution to the body of research on this topic, the study has several strengths, shared by other recent studies:

- It is based on a high-quality, longitudinal dataset of student achievement.
- It uses appropriate statistical methods, namely student fixed-effects regressions.
- It contributes to an established literature that finds roughly consistent effects of "competition" that are often zero or slightly positive, depending on the state and method.

The study also has important weaknesses:

- The fixed-effects methods, while appropriate, are not a methodological panacea; they cannot control for several potential biases.
- As a result, the measured effects of competition could also reflect the influence of shifting peer quality, declining class size, or other unobserved variables.

While the report notes some of these weaknesses, it does not make a serious attempt to assess their validity. Thus, we still cannot conclusively understand whether "everyone wins" (or why) when charter schools compete in urban schooling markets.

Notes and References

[1] Economists have posed the same questions about competition among public schools, and competition between public and private schools. For reviews of this literature, see McEwan, P. J. (2004). "The potential impact of vouchers," Peabody Journal of Education 79(3): 57-80; and Payne, A. (in press). "Competition and student achievement," in Dominic J. Brewer and Patrick J. McEwan, eds., *Economics of Education*. Amsterdam: Elsevier.

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