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DOCUMENT REVIEWED:	"The Impact of Milwaukee Charter Schools on Student Achievement"
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Summary of Review

A recent report from the Brookings Institution presents panel data analyses using student fixed effects models to estimate the impact of Milwaukee charter schools on student achievement. The report finds that attendance at a charter school is associated with small positive increases in math test scores and with no significant differences in reading scores. The positive effects estimates for math are largely limited to earlier years of the charter school program and to gains made during the first year in a charter, and the results might be dependent on the study's approach to modeling transfers between schools. The review identifies several questions about the internal and external validity of the reported estimates. Nevertheless, the methods used in the study do have important strengths. When the results are considered together with the large body of research on charter schools, the conclusion that charter schools should not be expected to have large effects on achievement in urban schools is reasonable.

Review

I. INTRODUCTION

The report reviewed here briefly presents the results of an analysis of charter school impacts in Milwaukee.[1] The analysis was conducted as part of a multi-state project examining the impacts of charter schools[2] and represents one of the latest contributions to what is now a large literature on charter schools and student achievement. The analysis presented in this report uses student-level panel data and fixed effect estimation strategies that have been employed in several other studies.[3] Like those earlier studies, the analysis focuses primarily on estimating the impact of attending a charter school on student test scores, and secondarily examines the effect of charter schools on student achievement in nearby traditional public schools.

By replicating analyses done elsewhere this work in Milwaukee can help to inform our understanding of charter school impacts. Isolating the contributions of charter schools to student learning, however, is a difficult challenge, and the results derived from any single estimation strategy are subject to doubts and questions. Additional analyses and robustness checks are needed before any strong conclusions about the effects of charter schools in Milwaukee can be drawn.

II. FINDINGS AND CONCLUSIONS OF THE REPORT

The report highlights five findings about charter schools in Milwaukee. (1) Charter school students have significantly higher math test score gains than they did in traditional public schools, and similar gains on reading exams. (2) The positive results in mathematics are restricted to the earlier years of the charter school program—gains in charter schools are statistically indistinguishable from those in traditional public schools for the most recent years examined. (3) The statistically significant gains in math achievement associated with charter school attendance are limited largely to students in their first year in a charter school. (4) Charter schools that have operated for more years and that operated previously as traditional public schools are associated with larger increases in test score gains than newly created charter schools. (5) There is no evidence that the presence of charter schools influences performance in traditional public schools.

The report concludes that "charter schools may help the education of urban youth," but also emphasizes that "charter school attendance in Milwaukee at best has a modest positive effect" and that charter schools "should not be expected to be the silver bullet that some reformers seek."

III. THE REPORT'S RATIONALE FOR ITS FINDINGS AND CONCLUSIONS

The report's estimates of the impacts of attending a charter school are derived from student-level fixed effect regression models. Specifically, changes in an individual student's normalized test score measures between two consecutive grades are regressed on an indicator of whether the student was in a charter school and an indicator of whether or not the student transferred to a new school in the year for which test score changes are measured. Fixed effects regression techniques are used to control for an individual student's mean test score gain and for average grade-by-year differences in test results.

The resulting estimates can be interpreted as the difference between the average test score gains that students make while in a charter school and the test score gains that those same students make while they are in traditional public schools. Consequently, only those students observed in both traditional public and in charter schools contribute to the estimation of charter school effects. Estimates are also limited to charter schools authorized by the Milwaukee Public Schools, which range in number from 4 in 2000-01 to 38 in 2005-06 and 35 in 2006-07.

Spell-fixed effect models were used to estimate the impact of charter schools on nearby traditional public schools. In these models, a measure of distance to the nearest charter school and also the number of charter schools within 2.5 miles are used to capture variation in the exposure of traditional public schools to charter school competition. Fixed effects techniques are used to control for the average gain of a student during his or her time in a particular school, i.e. a spell. In this type of model, the effect of charter schools is estimated by comparing the test score gains of students in traditional public schools to the gains those same students make while in the same school as the number of or distance to nearby charter schools changes.

IV. THE REPORT'S USE OF RESEARCH LITERATURE

The methods used here for estimating both the effect of attending a charter school and the impact of charter schools on nearby traditional public schools have been used in several other charter school studies, and a recent report from a panel of experts on school choice research promotes these methods as among the best available.[4] Plus, these analyses were conducted as part of a multi-state evaluation of charter schools, which employed identical methods to estimate the impact of charter schools in six other states. By replicating methods used in other studies, this Milwaukee study helps us to make sense of the effects of a diverse set of charter school programs that share important features, but which also differ in important ways.

While the methods used to isolate the impact of charter schools have widely recognized strengths, these methods have come under sharp criticism in recent years. As explained in the next section of this report, these criticisms have exposed some of the assumptions required to interpret the resulting estimates as causal impacts of charter schools, and they highlight the importance of using multiple methods to ensure that impact estimates are robust to changes in these assumptions. Although not described in the brief Governance Studies report, the broader RAND report indicates that several robustness checks suggested by the literature were conducted to address possible sources of bias. However, not all of the alternative estimations one might like to see are presented, either in this Governance Studies report or in the larger RAND report, and the careful qualifications of conclusions contained in the RAND report are largely missing from the summary of results presented in this shorter piece.

V. REVIEW OF THE REPORT'S METHODS

The student-level panel data methods used in the analyses presented here have important strengths. Many studies of charter schools, including some that are widely cited, have been plagued by the threat of selection bias.[5] Because charter school students or their families self-select, they may differ in important and difficult-to-

observe ways from students in nearby traditional public schools. By deriving estimates of charter schools from comparisons of the gains students make in charter schools to the gains those same students make in traditional public schools, these methods provide powerful protection against selection bias.

Recent articles, however, have made clear that this approach does suffer from potentially serious threats to internal and external validity.[6] The RAND report provides a nice summary of the primary concerns. First, this method assumes that the trajectory of test score gains for students who transfer into or out of charter schools would, in the absence of charter schools, be similar to the trajectory of the test score gains of other students. This assumption cannot be directly tested. However, the act of switching schools suggests that the prior schooling experience, and thus the expected trajectories, of these charter students might be different than those of other students. Caroline Hoxby and her colleague, as well as the RAND report, argue that this assumption is particularly questionable for students who switch midstream—that is, for students who transfer in a grade that is not a typical transition grade.[7]

Second, estimates are based entirely on students observed in both traditional public schools and in charter schools. Because these students might differ from students who are only observed in charter schools, the estimates provided by this method might not be representative of the effect of charter schools on the typical charter school student. In particular, effect estimates exclude students who enroll in charter schools from the outset of the period and remain in those schools throughout. In addition, because these estimates rely on sector switchers, students who were poorly served by their charter school and so decide to exit might be overrepresented, thereby biasing estimates of the average charter school effect.

In addition to these general concerns with using student fixed effects models to estimate charter school impacts, the particular application of these methods in the Milwaukee analysis raises other concerns. One concern is that during the years represented in the longitudinal data set, state tests were changed from the Terra Nova to the Wisconsin Knowledge and Concepts Examination. A change in tests raises concerns for any analysis that uses test score gains as a measure of learning. Subtle changes in the weight given to different skill and knowledge domains can influence measures of test score gains. It is possible that part of the changes in test score gains observed for students who transfer into charter schools might be an artifact of changes in tests. If the change in tests affects the gains of some students differently than others, normalizing test scores using grade- and year-specific distributions will not necessarily address this problem. The equating here was not done by psychometricians and does not take into account any shifts in test content. The Brookings report does point out that the tests had changed, and the authors state that statistical methods were chosen to address that issue, but neither that report nor the RAND report explain how, if at all, the statistical methods address the issue. Accordingly, the reader cannot know whether this is a substantial threat to the validity of the ultimate findings.

A second concern raised specifically by this study is the way the analysis controls for the effect of switching schools. It is reasonable to suspect that changing schools at natural transition points, for instance when a student moves with most of his classmates from an

elementary school to a middle school, has different effects than changing residence or otherwise changing schools. Although it is not entirely clear, it appears that the analysis presented in this report assumes that these different types of school transfers have the same average effects on achievement gains.[8] Doubts about this assumption raise doubts about the positive effect estimates for math. As the report shows, these positive results are driven largely by students during their first year in a charter school. This result might reflect superior instruction in charter schools, but might also result if transfers into charter schools are less likely to be accompanied by a change of residence or because charter transfers are more or less likely to occur at a natural transition point, e.g. the move from elementary to middle school.

To understand this concern, it is helpful to look at the full regression results, which are reported in the RAND report appendix. These results indicate that transferring to a new school, whether or not the transfer involves a charter school, reduces math gains in the first year after the transfer by 0.08 standard deviations. Thus, the positive effect estimated for charter schools during the first year does not indicate that a transfer into a charter school is accompanied by an increase in test score gains, but rather that it is accompanied by a *smaller decrease in test score gains than typically accompanies a transfer between schools*. Specifically, a transfer into a charter school is associated with only a 0.03 standard deviation drop in math gains (the -0.08 effect of the transfer plus the 0.05 effect of charter school attendance). However, if different types of school transfers have different effects on learning, then this interpretation of the results—applying the same -0.08 effect to all types—might be misleading. For instance, assume that a school transfer not accompanied by a change in residence is less disruptive and has a smaller effect on test score gains. Specifically, assume that this type of transfer only reduces math gains by 0.03 standard deviations in the year after the transfer, and that virtually all transfers into a charter school are not accompanied by a change of residence. In this case, the actual effect of charter schools on math gains would be zero. Because the analysis does not distinguish the effect of transfers not accompanied by a change in residence from other transfers, it could very well be over-adjusting for the effect of a transfer not accompanied by a change of residence.[9]

Given the threats to the validity of the estimates presented in this report, robustness checks and alternative estimates are important. Although this brief report doesn't discuss robustness checks, some of the checks provided in the RAND report are informative. Others that would be useful are not reported either in this report or in the larger RAND report.

- The RAND report convincingly argues that the general concerns with the fixed effects methods are greater for the analysis of achievement in primary charter schools than in middle schools and high schools. Measures of student test score gains prior to entering a charter are available for most students in charter secondary schools. As a result, fixed-effects estimates of secondary charter school effects do not rely heavily either on students who switch sectors mid-stream or on students who exit charter schools, as is the case with primary charter schools. For these reasons, the RAND report presents estimates of charter school effects that include only charter schools with entry grades high enough to allow calculation of pre-charter school gains for students

who transfer into that entry grade, concluding that these results are more reliable. Applying that approach to the Milwaukee charter schools, math gains move closer to zero and are no longer statistically significant, as compared to the estimates reported in the Governance Studies report.

- The report combines data from both types of switchers: those who move into charters and those who leave. Analyses that distinguish the effects of charter schools on those who are observed entering from those who are observed exiting would be informative, but are not reported.

- Results from value-added models that do not use measures of test score gains as a dependent variable are not presented. Several different models of this kind can be estimated. One alternative model would use test score levels rather than gains as the dependent variable, and measures of pre-charter school test scores as control variables in the regression model. Such a model could be estimated with and without controls for student fixed effects. Neither this report nor the RAND report presents alternative estimates from these types of models. Although some of these alternative model specifications suffer from the threat of selection bias, Ballou and his colleagues have argued that in some cases the selection bias in these models might be smaller than the biases discussed above that threaten student fixed effects models.[10] In addition, some value-added models that use prior test score measures as control variables are not biased by the changes in tests (from the Terra Nova to the Wisconsin Knowledge and Concepts Examination, as noted above) in the same way as models that use test score gains as a dependent variable. The argument here is not that alternative value-added models are superior to the analyses presented in this report, but rather that we could have more confidence attributing causal impacts if different methods, with different strengths and weaknesses, yield similar effect estimates.

- Finally, given the concerns about the controls for student mobility discussed above, it would be useful to see if the results are sensitive to alternative controls for the effect of transferring schools. Particularly, it would be informative to see charter school effect estimates from regression models that allow the effect of a transfer during a transitional grade to differ from the effect of a "mid-stream" transfer. Similarly, it would be informative to see estimates that allow the effect of transfers accompanied by a change in residence to differ from other transfers. Unfortunately, these robustness checks are not provided.

As difficult as estimating the effect of attending a charter school on student achievement has proven to be, estimating the effect of charter schools on nearby traditional public schools is even more challenging. Charter schools are not randomly located. There are plausible reasons to believe that they may locate either close to low-performing schools or close to high-performing schools. Thus, attempts to estimate the effect of charter schools on nearby traditional public schools not only have to control for differences between students in different schools, but also for differences in unobserved aspects of school quality not influenced by charter schools.

The spell-fixed effects models used in this analysis and described above are a reasonable attempt to meet this challenge and have been used in other charter school studies.[11] However, because such estimates are based on comparisons of the gains of the same students while they are in the same school, they can only detect short-term effects that occur a year or two after increases in charter school competition. Most of the mechanisms by which charter schools might influence nearby traditional public schools, and specifically the influence of any changes in school practices and policies made in response to increased competition for students, can only be expected to influence school performance over the longer term. The primary short-term mechanisms for test-score improvement would involve things like "trying harder" and moving around existing resources to focus more on test preparation.

Perhaps even more difficult for analyzing effects on traditional public schools is the challenge of capturing meaningful variation in exposure to the charter school treatment. For reasons highlighted in the RAND report, distance from a charter school or the number of charter schools within a 2.5 mile radius are not necessarily a good indications of how much competitive pressure school officials feel from the introduction of charter schools or good indications of how charter schools affect student composition or resources in a traditional public school. For instance, charter school competition might influence the decisions of district officials, which would influence all schools in the district and not merely those located closest to charter schools. Also, the mere threat of charter schools setting up nearby might be sufficient to create competitive pressure on school officials even in schools not currently located near a charter school.

VI. REVIEW OF THE VALIDITY OF THE FINDINGS AND CONCLUSIONS

The results of these analyses are not by themselves sufficient to support strong conclusions about the causal effects of charter schools in Milwaukee. The conclusion that charter schools have had positive effects on the math achievement of their students is particularly suspect, but it is important to note that some of the threats to validity discussed above could create downward bias in the estimates of charter school effects as well. Augmenting the report's analyses with the robustness checks and alternative estimates suggested above might provide a clearer picture, but based on the analysis presented here, strong conclusions cannot be drawn. Interestingly, the RAND report comes to a similar conclusion, suggesting "great caution in interpreting the results of Table 3.1,"[12] which are the precisely the results highlighted in this Governance Studies report.

Even less can be made of the fact that this analysis did not detect any effects of charter schools on student achievement in nearby traditional public schools. This finding, based on the limited available data, says very little about the potential of competition to improve school performance. By the same token, this finding cannot assuage the fears of those who believe charter schools may hurt traditional public schools by draining student, parental, or financial resources.

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

The results of the analyses presented in the Governance Studies report, as well as the larger multi-state project conducted by

RAND, are most informative when considered in the context of the larger body of research on charter schools. Like this study, other studies that use similar methods—which have now been conducted in at least 10 different states—find at best modest effects on student performance. In fact, studies from other states have found negative effects as often as positive ones, and none provide convincing evidence that charter schools consistently or unequivocally outperform traditional public schools.[13] Thus, the report's conclusion that charter schools "should not be expected to be the silver bullet that some reformers seek" is reasonable.

Whether charter schools can be expected to make even modest contributions to improving average levels of achievement among urban students is a more difficult question. Additional analyses are needed before this work in Milwaukee can contribute some insight into that question, and strong conclusions about the effect of Milwaukee's charter schools cannot be drawn from this report.

Notes and References

[1] Lavertu, S. & Witte, J. (2009, March). *The Impact of Milwaukee Charter Schools on Student Achievement.* Washington, DC: Brookings Institution.

[2] This review refers often to the report recently released by RAND on the larger multi-state project because that full-length report provides much of the details on the methods and analysis that underlie the results presented in this Governance Studies report. See Zimmer, R., Gill, B., Booker, K., Lavertu, S., Sass, T.R., & Witte, J. (2009). *Charter schools in eight states: Effects on achievement, attainment, integration, and competition.* Santa Monica, CA: RAND Corporation. I try to make clear when I am referring to information provided in the RAND report and when I am referring to the Governance Studies report which is the subject of this review.

[3] These data and analyses are explained below. But the key point that readers should understand is that the data set allowed the researchers to follow individual students over time and compare their test scores after controlling for differences such as whether they had recently transferred schools and whether they were enrolled in a charter school.

[4] Betts, J. R., & Hill, P.T. (2006). *Key issues in studying charter schools and achievement: A review and suggestions for national guidelines.* Seattle, WA: Center on Reinventing Public Education, Daniel J. Evans School of Public Affairs, University of Washington, National Charter School Research Project.

[5] AFT. (2004). *AFT's closer look,* August 27, 2004. Washington: American Federation of Teachers. Retrieved April 29, 2009, from http://www.aft.org/pubs-reports/closer_look/082704.htm.

Hoxby, C.M. (2005). Do charter schools help their students?" *Manhattan Institute, Civic Bulletin* 38 (February): 1-5.

Lubienski, C. & Lubienski, S.T. (2006). School sector and academic achievement: A multi-level analysis of NAEP mathematics data. *American Education Research Journal* 43(4): 651-698.

For a useful discussion of these early studies and their role in policy debates see Henig, J.R. (2008). *Spin cycle: How research is used in policy debates: The case of charter schools.* New York: Russell Sage Foundation.

[6] Ballou, D., Teasley, B. & Zeidner, T. (2007). "Charter Schools in Idaho." In M. Berends, M.G. Spriner, & H.J. Walberg, eds., *Charter School Outcomes*, New York: L. Erlbaum Associates, pp. 221-241.

Hoxby, C.M. & Murarka. (2007). "Methods of Assessing the Achievement of Students in Charter Schools." In M. Berends, M.G. Springer, & H.J. Walberg, eds., *Charter School Outcomes*, New York: L. Erlbaum Associates, pp. 221-241.

[7] Hoxby, C.M. & Murarka. (2007). "Methods of Assessing the Achievement of Students in Charter Schools." In M. Berends, M.G. Spriner, & H.J. Walberg, eds., *Charter School Outcomes*, New York: L. Erlbaum Associates, pp. 221-241.

[8] The regressions are run using all Milwaukee students. Thus, it is all students who make any type of school transfer that are used to estimate the effect of transferring. However, although all students are included in the regression, only those who are observed switching sectors contribute to the estimation of the charter school effect.

[9] Failure to distinguish the effects of different types of transfers might also lead to underestimates of the charter school effect. For instance, if "midstream" transfers (those occurring in grades when students don't usually switch schools) are more disruptive and a higher proportion of transfers into and out of a charter school are "midstream" than transfers between traditional public schools, then the charter school effect would be biased downward.

[10] Ballou, D., Teasley, B. & Zeidner, T. (2007). "Charter Schools in Idaho." In M. Berends, M.G. Spriner, & H.J. Walberg, eds., *Charter School Outcomes*, New York: L. Erlbaum Associates, pp. 221-241.

[11] Bifulco, R. & Ladd, H.F. (2006). The impacts of charter schools on student achievement: Evidence from North Carolina." *Education Finance and Policy* 1(1): 50-90.

Sass, T.R. (2006). Charter schools and student achievement in Florida." *Education Finance and Policy* 1(1): 91-122.

[12] Zimmer, R., Gill, B., Booker, K., Lavertu, S., Sass, T.R., & Witte, J. (2009). *Charter schools in eight states: Effects on achievement, attainment, integration, and competition*. Santa Monica, CA: RAND Corporation, p. 39.

[13] For a review of studies of charter school programs other than those included in the RAND report see Bifulco, R. & Bulkley, K. (2008). Charter schools. In H.F. Ladd & E.B. Fiske, eds. *Handbook of Research in Education Finance and Policy*. New York: Routledge, pp. 435-446.

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