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# NEPC Review: The Economic Benefits of New York City's Public School Reforms, 2002-2013

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# REVIEW OF *THE ECONOMIC BENEFITS OF NEW YORK CITY'S PUBLIC SCHOOL REFORMS, 2002-2013*

*Reviewed By*

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## Summary of Review

*The Economic Benefits of New York City's Public School Reforms, 2002-2013* attempts to estimate the economic impact of school reforms implemented during the tenure of Mayor Michael Bloomberg. The report focuses on two types of effects: direct effects on the earnings of students graduating under the reforms (who might not otherwise have done so), and indirect effects of higher graduation rates and charter school availability on residential property values. The aggregate impact on earnings and property values is estimated to exceed \$74 billion. While such estimates are always an exercise in some level of speculation, this report relies on highly inappropriate assumptions to reach its conclusions. Specifically, it attributes all gains in high school completion and college enrollment to the reforms, applies national statistics on earnings and college completion to the marginal graduate in NYC, and extrapolates cross-sectional associations between graduation rates and home prices at the zip code level as the causal effect of higher graduation rates. Without taking away from the real educational and economic gains that many students experienced during this period, this seriously flawed analysis should be taken by no one as a credible estimate of its economic impact.

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# REVIEW OF *THE ECONOMIC BENEFITS OF NEW YORK CITY'S PUBLIC SCHOOL REFORMS, 2002-2013*

*Sean P. Corcoran, New York University*

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## I. Introduction

The New York City (NYC) public schools underwent unprecedented change in the 12 years under Mayor Michael Bloomberg (2002-2013).<sup>1</sup> Among other things, the mayor eliminated the 32 community school boards that long governed the schools, replacing them with 10 regional superintendents answering directly to the Deputy Chancellor. The curriculum was standardized, teacher salaries were increased, and a new “Fair Student Funding” system allocated resources to schools based on student need. School leaders were granted autonomy over budgets and personnel in exchange for greater accountability. Schools deemed failing were phased out and closed, and new schools were opened. At the high school level, many large, underperforming (and sometimes dangerous) schools were closed and replaced by small themed schools of choice. The number of high school options increased by more than 150; at the same time the choice process was centralized and made mandatory. More than 160 charter schools opened their doors during Bloomberg’s tenure, often in neighborhoods that sorely needed high-quality schools.<sup>2</sup>

For their efforts, the NYCDOE and Mayor Bloomberg were awarded the Broad Prize for Excellence in Education in 2007. More importantly, however, student achievement in NYC improved in measurable ways during Bloomberg’s tenure. According to an analysis by Kemple (2011), NYC’s gains on the state ELA and math tests outpaced those made statewide and in New York’s other large urban districts.<sup>3</sup> He also found that graduation rates improved markedly, and at a faster pace than districts statewide. NYC’s modest gains on the NAEP raised questions about the robustness of achievement gains in the city, but by most measures Kemple found little reason to doubt that the district made significant strides during this period.

In *The Economic Benefits of the New York City’s Public School Reforms, 2002-2013*, Robert J. Shapriro of Sonecon and Kevin A. Hassett of the American Enterprise Institute aim to estimate the economic impact of the NYC reforms.<sup>4</sup> They focus on two main types of effects: direct effects on the earnings of additional students completing high school under the reforms (who might not otherwise have done so), and indirect effects of higher graduation rates and charter school availability on residential property values.

Estimating the broad social and economic impact of major policy changes is far from an exact science. These estimates—which economists like to call “back of the envelope” calculations—are inevitably crude, and depend on many, often tenuous, assumptions. They should be taken with a large grain of salt. That being said, there are responsible and irresponsible approaches to this task. This report fits squarely in the latter category. Without taking away from the real educational and economic gains that many students experienced during this period, this seriously flawed analysis should be taken by no one as a credible estimate of its economic impact.

## II. Findings and Conclusions of the Report

Sections 1-3 provide an overview of the Bloomberg-era reforms and a descriptive analysis of trends in student achievement between 2006 and 2012. Across all tested grades in NYC, mean scale scores on the state ELA and math tests rose 2% and 4%, respectively, at a pace faster than the state as a whole. Four-year graduation rates increased from 49.1% in 2006 (for the cohort entering high school in 2002) to 60.4% in 2012 (the 2008 cohort). The percentage of NYC high school graduates who enrolled in college climbed from 40.5% in 2007 to 46.4% in 2012.

Section 4 reviews relevant literature on the economic and social returns to education, while Section 5 provides core estimates of the direct earnings benefits for additional students who completed high school during this period. It estimates that between 2008 and 2012, 41,000 additional NYC students completed high school than would have been predicted had the graduation rate remained at its 2006 level. Based on some assumptions described below, the report estimates that the added net present value of lifetime earnings for these graduates is \$8.9 billion.

Further, this section estimates that 30,900 additional NYC graduates enrolled in college between 2008 and 2012 than would have been predicted had the college enrollment rate remained at its 2006 level.

Based on assumptions described below, the

report estimates that the added net present value of lifetime earnings for these additional college enrollees is \$6.4 billion. Taken together, the combined direct economic impact of the Bloomberg-era reforms on the earnings of its graduates is estimated to be \$15.3 billion.

Section 6 provides core estimates of the indirect economic effects of higher graduation rates and charter school availability on residential property values in NYC. Based on an extrapolation from the association between local graduation rates and monthly median

*This report's willingness to attribute all gains in educational outcomes in NYC to its reforms, apply national statistics on earnings and college completion to the marginal graduate, and to claim causal effects on house prices, is irresponsible.*

home sales, the report estimates that the 11.3 percentage point increase in the graduation rate (about 41,000 new graduates) accounted for a 6.7%, or \$37.1 billion, increase in residential property values between 2008 and 2012. Based on a similar extrapolation for charter school growth, the report estimates that the city's gain of 169 charter schools between 2001 and 2013 accounted for a 3.7%, or \$22.5 billion, increase in property values. Taken together, the indirect economic impact of the Bloomberg-era reforms on property values is estimated to be \$59.6 billion.

### III. The Report's Rationale for Its Findings and Conclusions

#### Direct Effects on the Earnings of New Graduates

As noted, the report attributes 41,000 additional high school graduates to the Bloomberg-era reforms. To estimate the added lifetime earnings that these students might expect having graduated from high school (rather than dropping out), the authors compare median annual earnings over the life cycle for high school graduates and dropouts using national data (full-time workers in the Current Population Survey 2007-2010). The difference in net present value of lifetime earnings for these two groups is \$218,000, which multiplied by 41,000 is \$8.9 billion.

The report also attributes 30,900 new college enrollees to the Bloomberg reforms. To estimate the added lifetime earnings that these students might expect having enrolled in college (rather than stopping at a high school diploma) the authors first estimate how far these students will likely go in their education. Using national data they assume 56.6% of the new enrollees will matriculate in four-year colleges and 43.4% in two-year colleges. Using national college completion rates for two- and four-year colleges, the report assumes 33.4% of new enrollees will complete a bachelor's degree; 13.5% will complete an associate's degree, and 53.2% will finish some college but not graduate. Comparing median annual earnings over the life cycle for workers with these levels of education (versus a high school diploma), they find an increase in the net present value of lifetime earnings of \$426,000 for college graduates, \$130,000 for graduates with an associate's degree, and \$89,500 for those with some college. Weighting by the number of new enrollees in NYC estimated to attain these levels of education, the report finds a total increase in lifetime earnings of  $(426,000 \times 0.334 \times 30,900) + (130,000 \times 0.134 \times 30,900) + (89,500 \times 0.533 \times 30,900) = \$6.4$  billion.

#### Indirect Effects on Residential Property Values

To estimate the effects of higher graduation rates and charter school growth on residential property values, the authors use regression analysis to quantify the relationship between neighborhood school quality and housing prices in NYC. Specifically, the regression relates the monthly median home sales price in a zip code to the average public school graduation rate in that zip code, controlling for past home sale prices. The assumption is that past

home sale prices will account for differences across zip codes in long-run prices, such that any additional association between sales prices and graduation rates must be attributable to the graduation rates. (They refer to this assumption as “Granger causality”.)

Their regression analysis finds that a one-point higher graduation rate in a zip code’s public schools is associated with 0.54 percent higher median home sales prices. Noting that graduation rates increased 11.3 points citywide between 2006 and 2012, the report estimates that residential property values increased by  $11.3 \times 0.54 = 6.1\%$  from the increase in graduation rates. They apply this increase to the aggregate NYC residential property roll in 2013 of \$608.3 billion to arrive at a  $\$608.3 \times 0.061 = \$37.1$  billion estimated gain in residential property wealth.

A similar regression finds that each additional charter school in a NYC zip code is associated with 3.84% higher residential property values. Noting that 169 charter schools opened between 2001 and 2012, or about 0.96 charter schools per zip code, the report estimates that residential property values increased by  $0.96 \times 3.84 = 3.7\%$  from the growth in charter schools. They apply this increase to the aggregate NYC residential property roll in 2013 to arrive at a  $\$608.3 \times 0.037 = \$22.5$  billion estimated gain in residential property wealth.

#### IV. The Report’s Use of Research Literature

The report cites several groups of studies. The first are retrospective looks at reforms adopted under Bloomberg, including the edited volume by O’Day, Bitter, and Gomez (2011)<sup>5</sup> and a more recent analysis by Kemple (2013).<sup>6</sup> The second group includes empirical studies of charter school impacts in New York City and elsewhere. The third and fourth are seminal studies by economists on the returns to education and on the relationship between school quality and housing prices.

The report’s description and use of existing studies on the Bloomberg-era reforms is appropriate, and its analyses of trends in student achievement in Section 3 are generally in line with those of other studies. The basic facts presented on the overall increase in state test scores and graduation rates during this period are not in dispute. Most credible analyses do not, however, attribute the *entire* increase in student achievement to the reforms. Rather, in these more careful analyses some attempt is made to benchmark this gain against existing trends, or against gains made in other districts, or both, as in Kemple (2011). Account should also be taken of concurrent events in NYC that may have contributed to improved student outcomes. For example, the Bloomberg-era education reforms took place immediately following the 2001 ruling of New York State’s highest court in *Campaign for Fiscal Equity, et al. v State of New York*,<sup>7</sup> which helped drive a large increase in state resources for the City’s schools—and which the authors of this report never mention.<sup>8</sup>

On the earnings returns to educational attainment, the report takes care to describe concerns with “selection bias” raised in this literature. This refers to situations in which observed differences in earnings between those with more and less education over- or understate the true earnings benefits of schooling, because educational attainment is related to other observed factors related to earnings (such as motivation or family background). The report’s attention to this issue is curious, given its own unwillingness to consider how the marginal graduate in NYC might differ from the average graduate nationwide (discussed below).

Finally, the report misapplies the literature on the relationship between housing prices and school quality. It is well-established that neighborhoods and districts with higher-quality schools tend to have more expensive homes. The report cites examples from Nassau and Westchester counties in New York, along with the results of more rigorous studies from Boston, Florida, and the U.K., consistent with this finding. Housing prices reflect *differences* in school quality, however, not the absolute level. One reason homes are more expensive in Montgomery County, Maryland, than identical homes just across the border in N.W. Washington, D.C., for example, is that Montgomery County schools are perceived to be of higher quality than those in D.C. Housing and land are relatively fixed in supply, and thus potential homeowners are willing to bid up home prices there to have access to its schools. It does not necessarily follow that housing prices will continue to rise with *absolute* changes in school performance in Montgomery County, unless the district becomes *relatively* more desirable. The implications of this misinterpretation are discussed further below.

## V. Review of the Report’s Methods

The report’s estimates of the effect of NYC’s reforms on the earnings of new graduates are flawed in several respects. First, it attributes the *entire* increase in the graduation rate between 2006 and 2012 to the reforms. There is no attempt to benchmark this gain against a control group, thus assuming there would have been no change in graduation rates in the absence of the Bloomberg reforms.<sup>9</sup> (The same assumption is made for college enrollment.) Moreover, the analysis ignores concurrent changes in the city’s schools, such as the large increase in per-pupil spending noted above, that may have also affected student outcomes. Consequently, the earnings of all 41,000 graduates are counted toward the impact estimate. Second, it uses *national* data on the difference in average lifetime earnings of high school graduates and dropouts to estimate the return for students who graduated under the reforms but would not have otherwise. It is not obvious why the nationwide difference in earnings for high school graduates and dropouts should apply to the marginal graduate in NYC. Third, it also uses national data on two- and four-year college enrollment, college completion rates, and earnings to estimate the return to students who enrolled in college between 2006 and 2012 but would not have otherwise. Two- and four-year enrollment and completion rates in NYC are not necessarily the same as the national average, and they are presumably lower for the marginal enrollee. Without



taking away from the real educational and economic gains many students experienced during this time—which surely are large—the estimate provided here is not a credible one.

The above flaws are minor, however, in comparison to the report’s analysis of indirect effects on residential property values. First, putting aside the difficulty of estimating this impact in the complex New York real estate market, the report relies on the cross-sectional association between public high school graduation rates and median home prices at the zip code level as a *causal* effect of higher graduation rates. They invoke a standard of “Granger causality” to support this claim, which no serious researcher would do.<sup>10</sup> Second, the report ignores the fact that NYC has a citywide high school choice system that students use to attend high school anywhere in the city, so there is little reason (other than convenience) to bid up housing prices to live in the same zip code as a desirable high school. Third, as discussed above, house prices reflect *relative* school quality, such that potential homeowners are willing to pay more to live in area A over area B if schools are perceived to be better there. It is possible some NYC neighborhoods became more desirable than others as their schools improved (causing demand to rise there as families re-located from elsewhere in the city), but there is no reason to think home prices *citywide* will rise with the overall graduation rate, unless demand from outside of the city increased in response. Put another way, one wouldn’t expect house values to rise much across the state if test scores rose statewide. Similarly flawed thinking applies to the report’s analysis of charter school growth.

For perhaps the best illustration of how unrealistic is this combined \$59.6 billion impact on property values, compare that gain to the *total* rise in residential property values between 2006-07 and 2012-13. During that time, the market value of Class 1 and Class 2 property in New York City grew by \$87.5 billion, which implies the impact of 41,000 new public school high school graduates, 30,900 new college enrollees, and 169 charter schools was equivalent to two-thirds of *the entire increase* in residential property values between 2007 and 2013.<sup>11</sup>

## VI. Review of the Validity of the Findings and Conclusions

The report’s conclusions about the direct and indirect economic impact of the Bloomberg-era public school reforms depend entirely on assumptions made about the likely earnings and college completion rates of new high school graduates (those unlikely to have graduated in the absence of reforms), and the causal impact of graduation rates and charter schools on residential property values. By applying national averages to the marginal high school graduate in NYC, the report likely overstates effects on earnings by a significant amount. The true impact was surely a large one, but smaller than the one estimated here. Evidence provided for the causal impact on property values, however, is merely conjectural.

## VII. Usefulness of the Report for Guidance of Policy and Practice

As noted in the introduction, “back of the envelope” estimates of the broad social and economic impact of major policy changes are always an exercise in some level of speculation. But they can also be done conservatively, with justifiable assumptions. This report’s willingness to attribute *all* gains in educational outcomes in NYC to its reforms, apply national statistics on earnings and college completion to the marginal graduate, and (worst of all) extrapolate associations at the zip code level between house prices and public school graduation rates (or charter school growth) to claim causal effects on house prices, is irresponsible. While the real educational and economic benefits that accrued during the era of the Bloomberg reforms are likely to be large, the estimates offered in this report are pure fantasy.

## Notes and References

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- 1 For an authoritative and comprehensive review of the education reforms in New York City, see:  
O'Day, J.A., Bitter, C.S., & Gomez, L.M. (2011). *Education Reform in New York City: Ambitious Change in the Nation's Most Complex School System*. Cambridge: Harvard Education Press.
- 2 While not all NYC charters can be considered "high-quality," there is evidence that students admitted to oversubscribed charter schools in NYC performed better on standardized tests and had stronger post-secondary outcomes than students who applied to these schools but were not admitted. For example, see:  
Dobbie, W. & Fryer, R. G. Jr. (2013). Getting beneath the veil of effective schools: Evidence from New York City. *American Economic Journal: Applied Economics*, 5(4), 28–60.
- 3 Kemple, J.J. (2011). Children First and student outcomes: 2003-2010, in O'Day, J.A., Bitter, C.S., & Gomez, L.M. (Eds). *Education Reform in New York City: Ambitious Change in the Nation's Most Complex School System*. Cambridge: Harvard Education Press.
- 4 Shapiro, R.J. & Hassett, K.A. (2013). *The Economic Benefits of the New York City's Public School Reforms, 2002-2013*. Washington, DC: Sonecon, Inc. Retrieved February 20, 2014, from [http://www.sonecon.com/docs/studies/Report\\_on\\_Economic\\_Benefits\\_of\\_NYC\\_Educational\\_Reforms-Shapiro-Hassett-Final-December2013.pdf](http://www.sonecon.com/docs/studies/Report_on_Economic_Benefits_of_NYC_Educational_Reforms-Shapiro-Hassett-Final-December2013.pdf).
- 5 O'Day, J.A., Bitter, C.S., & Gomez, L.M.(Eds.) (2011). *Education Reform in New York City: Ambitious Change in the Nation's Most Complex School System*. Cambridge: Harvard Education Press.
- 6 The report's citation of Kemple (2013) is incorrect. The correct citation is:  
Kemple, J.J. (2013). *The Condition of NYC High Schools: Examining Trends and Looking Toward the Future*. New York City: Research Alliance for New York City Schools. Retrieved March 27, 2014, from [http://steinhardt.nyu.edu/research\\_alliance/publications/ConditionsofNYCHS\\_March2013#.UxoMvldUrU](http://steinhardt.nyu.edu/research_alliance/publications/ConditionsofNYCHS_March2013#.UxoMvldUrU).
- 7 719 N.Y.S.2d 475
- 8 NYC school's annual revenues increased by approximately \$5,800 per pupil (adjusted for inflation) between 2002 and 2008. See:  
Stiefel, L. & Schwartz, A. E. (2011). Financing K-12 education in the Bloomberg years, 2002-2008, in O'Day, J.A., Bitter, C.S., & Gomez, L.M. (Eds). *Education Reform in New York City: Ambitious Change in the Nation's Most Complex School System*. Cambridge: Harvard Education Press.  
In their report, Shapiro and Hassett state only that "the mayor secured new funding" (p. 4), implying that Bloomberg alone was responsible for the increase.
- 9 In his analyses, Kemple (2011, 2013) uses all districts in New York State, other urban districts in the state, and pre-existing trends in NYC to establish a counterfactual outcome. While still finding a positive difference, these studies do not attribute the entire gain to the Bloomberg reforms.  
Kemple, J.J. (2013). *The Condition of NYC High Schools: Examining Trends and Looking Toward the Future*. New York City: Research Alliance for New York City Schools. Retrieved March 27, 2014, from [http://steinhardt.nyu.edu/research\\_alliance/publications/ConditionsofNYCHS\\_March2013#.UxoMvldUrU](http://steinhardt.nyu.edu/research_alliance/publications/ConditionsofNYCHS_March2013#.UxoMvldUrU).  
Kemple, J.J. (2011). Children First and student outcomes: 2003-2010, in O'Day, J.A., Bitter, C.S., & Gomez, L.M. (Eds). *Education Reform in New York City: Ambitious Change in the Nation's Most Complex School System*. Cambridge: Harvard Education Press.

- 10 “Granger causality” is applied in the analysis of time-series data, in a predictive sense. In his introductory econometrics textbook, Studenmund (2011) says the following:

Granger causality, or precedence, is a circumstance in which one time-series variable consistently and predictably changes before another variable. . . for forecasting purposes. Despite the value of Granger causality, however, we shouldn’t let ourselves be lured into thinking that it allows us to prove economic causality in any rigorous way. If one variable precedes (“Granger causes”) another, we can’t be sure that the first variable “causes” the other to change.

Studenmund, A.H. (2011). *Using Econometrics: A Practical Guide*. Boston: Addison-Wesley, 416.

- 11 New York City Department of Finance (2013). *2013-14 Tentative Assessment Roll*. Retrieved February 20, 2014, from [http://www.nyc.gov/html/dof/downloads/pdf/13pdf/ta\\_roll\\_summary\\_fy14.pdf](http://www.nyc.gov/html/dof/downloads/pdf/13pdf/ta_roll_summary_fy14.pdf).

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