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Newark's Schools: The Facts

BRUCE D. BAKER & MARK WEBER
NEW JERSEY EDUCATION POLICY FORUM

Introduction

Newark, New Jersey is one of a handful of cities at the center of the national debate on public school reform. When Mark Zuckerberg, CEO and founder of Facebook, bestowed a $100 million donation toward Newark's educational improvement in 2011, the city's schools instantly came under intense scrutiny. Newspaper stories, television shows, and even a best-selling book chronicled Newark's school "reforms" following the Zuckerberg donation.

Unfortunately, many (if not most) of these reports never stopped to examine the facts. New Jersey's Department of Education and other sources regularly collect data on the state's schools, including Newark. This data is publicly available, yet few take the time to analyze it; consequently, much of the rhetoric around Newark's public schools is informed by anecdote and conjecture.

In this report, we instead rely on the facts.

This three-part brief was written originally as an appendix to a critique we wrote of recent studies[1] of supposed reforms implemented in Newark Public Schools in New Jersey, supported, in part, by the Zuckerberg donation. Our evaluation of those reports led us to conduct a deep analysis of the data on Newark's schools. We believe this analysis is necessary as Newark's schools begin to transition away from state control; therefore, we offer this brief as a standalone document.

As Newark's schools move to local control, it is more important than ever to determine whether differences in outcomes are being achieved via policies and practices that can – and, more importantly, *should* – be replicated more broadly. Stakeholders must know whether any positive effects on measured/modeled outcomes are being achieved by practices which may have broader negative (counterbalancing) consequences.

We sincerely hope this brief provides guidance for policy makers in Newark, New Jersey, and across the nation.

Executive Summary

This brief is in three sections:

In Part A, we argue that those studying school reforms must give more thorough consideration to history and context. In Newark, that context includes:

- The importance of the Abbott rulings, which brought resource advantages to Newark and similar New Jersey school districts that have effects even in the present.
- The proliferation of charter schools – specific to Newark, charters with significant resource advantages over the public district schools.
- The stabilization of poverty rates in Newark, even as poverty increased in surrounding districts.

All of these factors have influenced Newark's schools, even if they are rarely discussed.

In Part B, we argue that analyses of the relative effectiveness of Newark's schools over time should make efforts to consider variations and changes in resources available and should also consider factors that constrain those resources. Analyses should also consider how changes to outcome measures might compromise model estimates and eventual conclusions. We undertake such an analysis and find:

- Much of the "growth" of Newark's test scores, relative to the state, can be explained by the transition from one form of the state test (NJASK) to another (PARCC) in 2014-15. There is no evidence Newark enacted any particular reform to get those gains, which are actually quite modest.
- The fact that other high-poverty districts close to Newark showed similar small gains in growth also suggests those gains are not unique to Newark.
- Newark's high-profile charter schools are not exceptionally efficient producers of test score gains when judged by statistical models that account for resource differences.

In Part C, we explore some of the substantive differences that exist between Newark's high "value-added" charter schools and district schools (and other charter schools) yielding less "positive" outcomes. Those differences include:

- Newark's high-profile charters enroll substantially fewer special needs students proportionally. The special needs students those charters do enroll tend to have less severe and lower-cost learning disabilities.
- North Star Academy, one of Newark's highest-profile charters, enrolls substantially fewer students in the greatest economic disadvantage. Recent studies, however, do not acknowledge this difference, leading to unwarranted conclusions about North Star's relative productivity.
- Newark's charters enroll very few Limited English Proficient (LEP) students.
- Newark's high-profile charters show substantial cohort attrition: many students leave between grades 7 and 12 and are not replaced. As those students leave, the relative test scores of those school rise.
- Newark's high-profile charters have very high student suspension rates.

- Newark's high-profile charters have teachers who are relatively inexperienced, yet are paid more relative to similar teachers. Those teachers, however, work longer days and years.
- Newark's charters enroll students who do not live in Newark. Studies that do not account for this are, therefore, comparing students who shouldn't be compared.
- Newark's charter schools have fewer teachers, proportionally, in the arts, foreign languages, physical education, science, and social studies. This may be due to their emphasis on "tested" subjects – math and English language arts – at the expense of instruction in other parts of the curriculum.

Part A: The History and Context of Newark Education Reforms

Understanding the page space limits of scholarly publications, we believe strongly that analyses of the effects of particular reforms in context require sufficient consideration of history and context. Among those considerations should be consideration of the history of changes in resources and policies influencing resources, both in the specific context under investigation and in any contexts which serve as counterfactual or comparison settings. History and context matter, and the relative position – not merely the absolute position – of schools districts and children over time matters.

The NBER paper we reviewed - School District Reform In Newark: Within- And Between-School Changes In Achievement Growth,[2] for example, indicates[3] that the major events affecting schooling in Newark included:

- 1985: School finance litigation, resulting in court ordered reform presumably affecting funding for Newark (not measured, cited or reported by authors).
- 1995: The state government takes over Newark Public Schools.
- 2010: Mark Zuckerberg appears on the Oprah show to announce his reform-focused gift to Newark.

The incompleteness of this history is befuddling, to say the least.

Missing from this timeline are several substantive reforms that occurred statewide, with specific effects on Newark's schools, between 1998 and the time of the Zuckerberg donation. Those reforms fall into three major categories, which set the stage for more recent reforms. Further, these reforms and their consequences provide relevant context for understanding counterfactuals in any analysis of Newark Public Schools. Those reforms include:

1. 1998 Abbott rulings, which led to substantial infusion of funding into Newark and other Abbott districts, including the introduction and expansion of state-funded universal pre-k programs, a large infusion of funding for capital infrastructure, and substantial infusion of general operating state aid;[4]
2. The introduction and expansion of charter schooling, and opening of what have become the state's and city's most well-heeled operators, including TEAM/KIPP Academy, North Star/Uncommon Academy, and Robert Treat Academy;[5]
3. The 2008 adoption of the School Funding Reform Act, which initiated the scaling back of funding to high-poverty urban districts including Newark, and, until the recession a few years later, began distributing more aid to non-Abbott, high-poverty districts.[6]

The 2008 recession, which followed these reforms and had effects continuing through the Zuckerberg gift era, also had substantive effects on school resources in Newark and other districts.[7] In some cases these effects fell unevenly across districts, including the court imposed reinstatement of 5 percent aid cuts to Abbott districts, but not to non-Abbott[8] (including many high poverty) districts in 2010.

Listing events that presumably influenced resources is less informative than actually measuring changes in resources, so here we do the latter. Figure A1 shows Newark Public Schools funding levels as a ratio to their labor market average (metro area surrounding Newark) during the scale up and eventual pull back of Abbott-1998 reforms, including adoption of SFRA and the recession. Revenue and spending went from approximately average to 30% to 40% above average between 1995 and 2005, then leveled, then plummeted back to 20% above average during the recession. The initial infusion of

funding was coupled with an infusion of staff, as seen in Figure A2. But staffing reductions followed funding reductions during the recession.

FIGURE A1

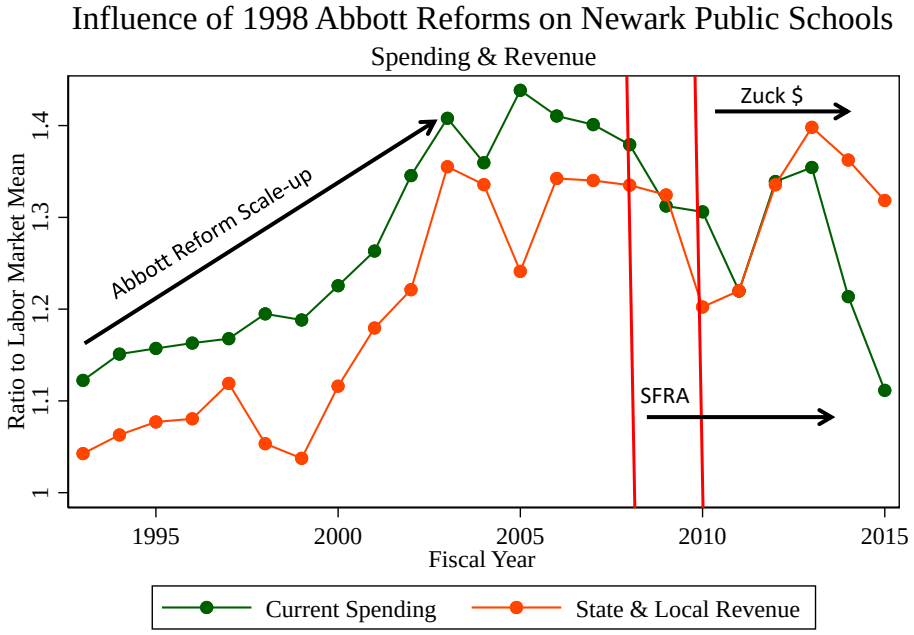
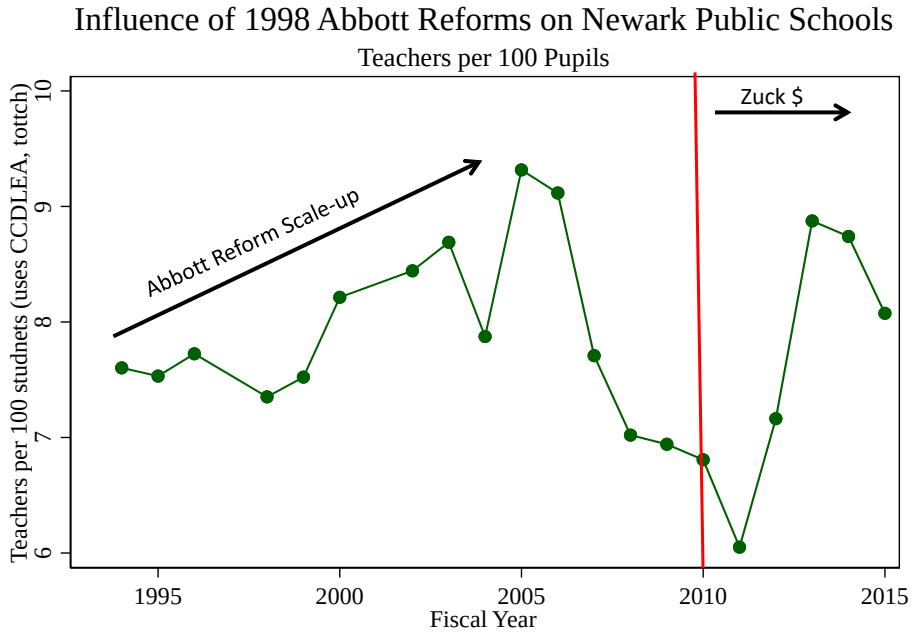


FIGURE A2



Baker, B.D., Srikanth, A., Weber, M.A. (2016). *Rutgers Graduate School of Education/Education Law Center: School Funding Fairness Data System.* Retrieved from: http://www.schoolfundingfairness.org/data-download

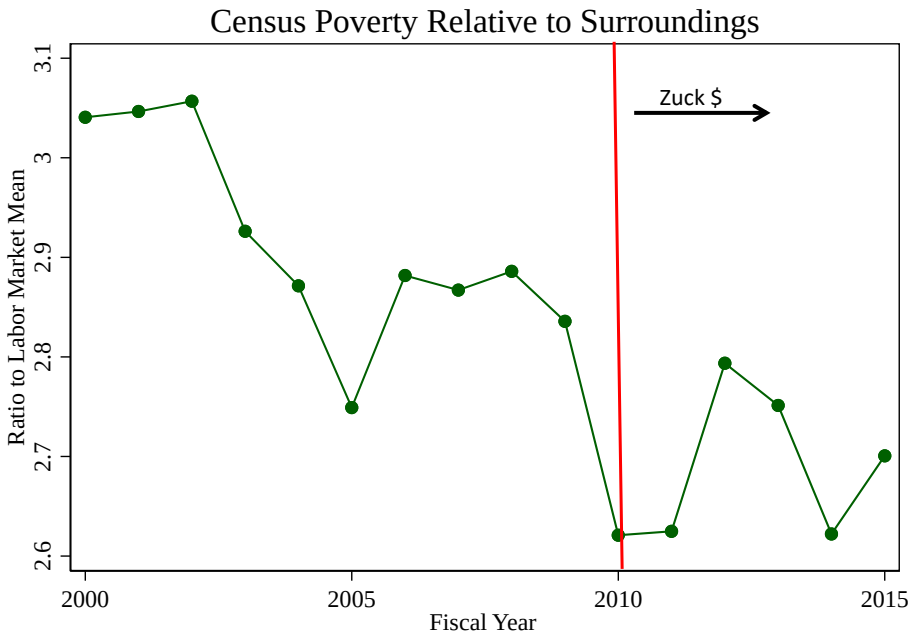
During much of this period, charter school enrollments were gradually on the rise.[9] Charter school enrollments escalated during the same time period in which NPS faced increased fiscal stress due to aid cuts and freezes during the recession. During this same period, charter school funding was held harmless, and Newark's charter sector grew to be the largest (as a share of enrollment) of any district statewide.[10]

Thus, when considering any comparisons across Newark district schools, Newark charter schools, schools in other Abbott districts and other schools in New Jersey, one must consider the significant different treatments across these groups throughout this period. Newark district schools faced cuts and freezes while charters were buffered. Other Abbott districts benefited from the restoration of 2010 cuts, while poor non-Abbotts did not. While NPS also benefited from the restoration, NPS was experiencing much greater transfer of resources and students to charter schools.

Concurrent with these reforms, while the absolute poverty rates in Newark stayed relatively constant, or increased modestly, the relative poverty rates in Newark declined as surrounding district poverty rates increased; see Figure A3 (including Orange, East Orange and Irvington). This affects any comparisons of Newark versus surrounding counterfactual districts.

FIGURE A3

U.S. Census Poverty Rates as a Ratio to the Mean of Districts in Newark Metropolitan Area



Baker, B.D., Srikanth, A., Weber, M.A. (2016). *Rutgers Graduate School of Education/Education Law Center: School Funding Fairness Data System.* Retrieved from: http://www.schoolfundingfairness.org/data-download

Part B: Estimating the Relative Productivity of Schools in Newark

Here, we use publicly available data to explore the following:

- What are the long-term trends in school performance levels on state assessments, prior to recent reforms?
- What were the shifts in school level growth estimates that occurred during the reform period, across the test-change gap (from NJASK to PARCC), using state growth estimates and comparing against nearby comparable schools?
- Are reported "high growth" or high value-added schools identified by the authors accurately characterized as such when considering additional factors, such as available resources and economies of scale?

Performance trends pre-"reform"

First, we take a brief look at pre-2010 and post-2010 changes in a) NJASK scale scores, adjusted for student population differences and b) state calculated growth percentiles prior to and bridging the move from the NJASK to PARCC. The reports' analysis of Newark public schools focuses only on value-added measures (notably, more thorough than growth percentiles) with two baseline years prior to the supposed reforms under investigation. Here, our intent is simply to provide some additional context regarding trends in scale scores, and potential issues arising from calculating growth across different assessments.

Comparisons against Abbott districts or all of District Factor Group (DFG) A are problematic due to regional diversity of the state in terms of demographic composition, economic conditions and neighborhood housing stock structure, quality and distribution. It's inappropriate, for example, to compare subsidized lunch rates, or any measure of "poverty" based on fixed income thresholds in Camden[11] with those of Newark or Jersey City. As Baker and colleagues show, there is substantial variation in regional income levels and costs which affect quality of life at any given income threshold.[12]

One alternative is to use the Baker et al. poverty adjustment factor. [13] Another more feasible approach, which captures a broader set of factors, is to compare against schools more proximally situated. Thus, we compare Newark Public Schools with Newark Charter Schools and District Factor Group A schools in Essex County, most of which lie on the edges of Newark itself, in cities such as East Orange and Irvington.

Figure B1 and Figure B2 report regression-adjusted NJASK mean scale scores in 8th grade for a) Newark Public Schools, b) Newark Charter Schools, c) DFG A schools in other Essex County Districts, and d) other schools statewide.

Figure B1 shows that Newark district and charter schools had a generally upward trajectory of English language arts performance prior to Zuckerberg reforms, but coinciding with a general upward drift in language arts scores statewide. Following 2010, charter and district school mean scores diverge, having converged prior to this period, which may result from policies favoring charters in more recent years, coupled with resources and practices discussed in Part C.

FIGURE B1

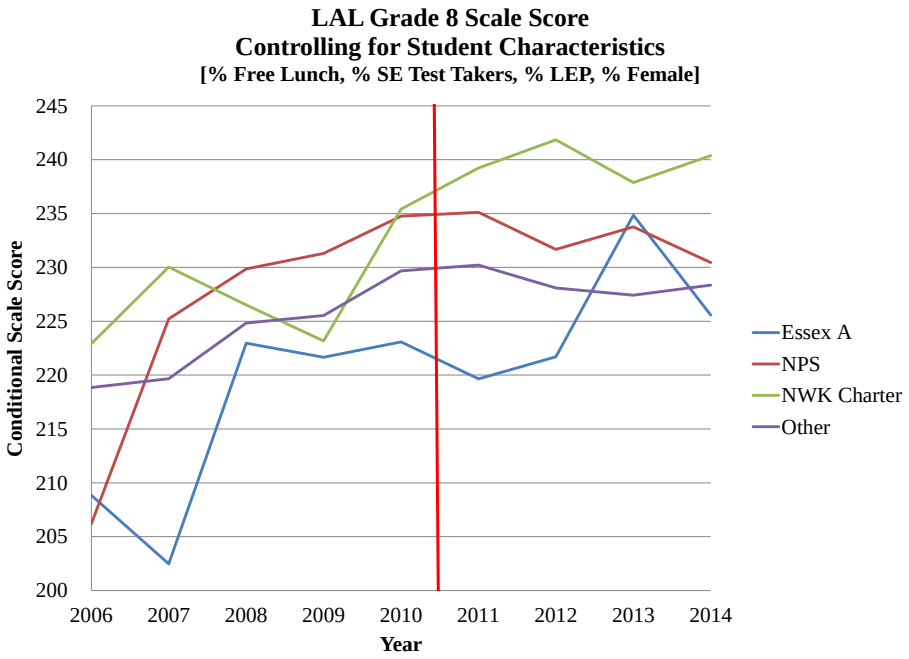
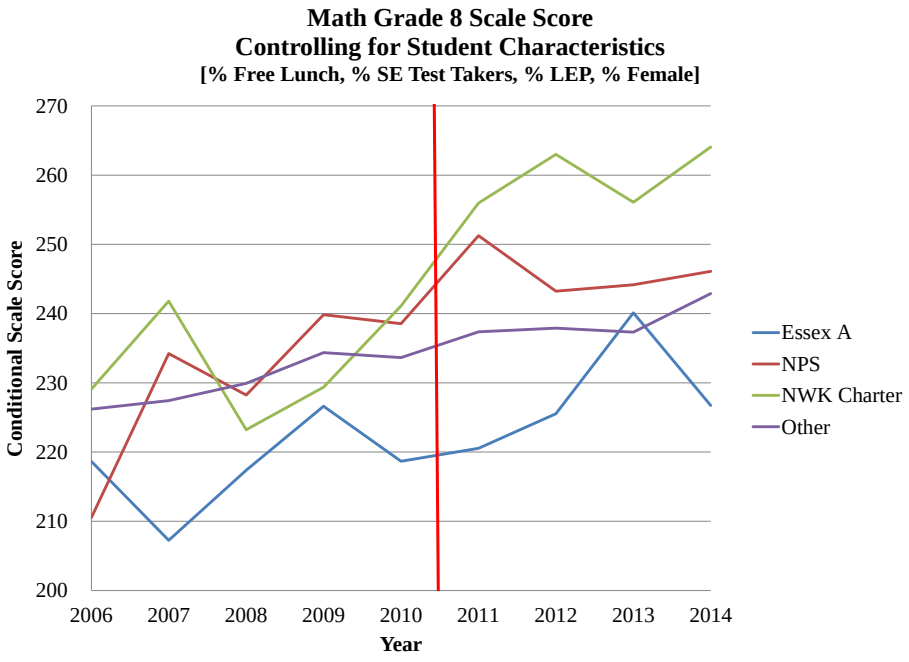


FIGURE B2



New Jersey Statewide Assessment Databases:
http://www.nj.gov/education/schools/achievement/index.html

Figure B2 shows that Newark Charter and district math scale scores were increasing at a faster rate a) than others statewide and b) prior to 2010 more so than after 2010.

Growth pre/post-"reform"

Figure B3 and Figure B4 show the enrollment weighted average of school median growth percentiles for language arts and math for a) Newark Public Schools, b) Newark Charter Schools, c) DFG A schools in other Essex County Districts and d) other schools statewide. Figure B3 establishes the relatively constant statewide (other) mean of 50 (a design feature). For the other three groups, all of which are relatively high in poverty and each of which are in Essex County, SGPs in language arts jump about 5 points between 2014 and 2015, having held more constant levels prior.

Essex DFG A schools dip then rebound between 2012 and 2014, then move parallel to Newark district and charter school between 2014 and 2015. This finding raises some suspicions regarding comparisons finding much greater growth in Newark district and charter schools when compared against more geographically and demographically diverse counterfactuals. Non-Newark DFG A schools would not have been subjected to the supposed Newark reform treatments, but seem to show similar growth in growth between 2014 and 2015.

Figure B4 reveals similar parallels between Newark district and Essex County DFG A schools for math SGPs. Both jump between 2014 and 2015 when state tests were changed. Notably, Newark charter SGPs remained stagnant for math between these years, but at a higher level. One implication is that the test re-norming and growth calculation resulted in anomalous higher growth in previously low-growth (high-poverty) settings. Again, SGPs for other schools statewide remain (as forced by the norm-referenced calculation) around 50.

FIGURE B3

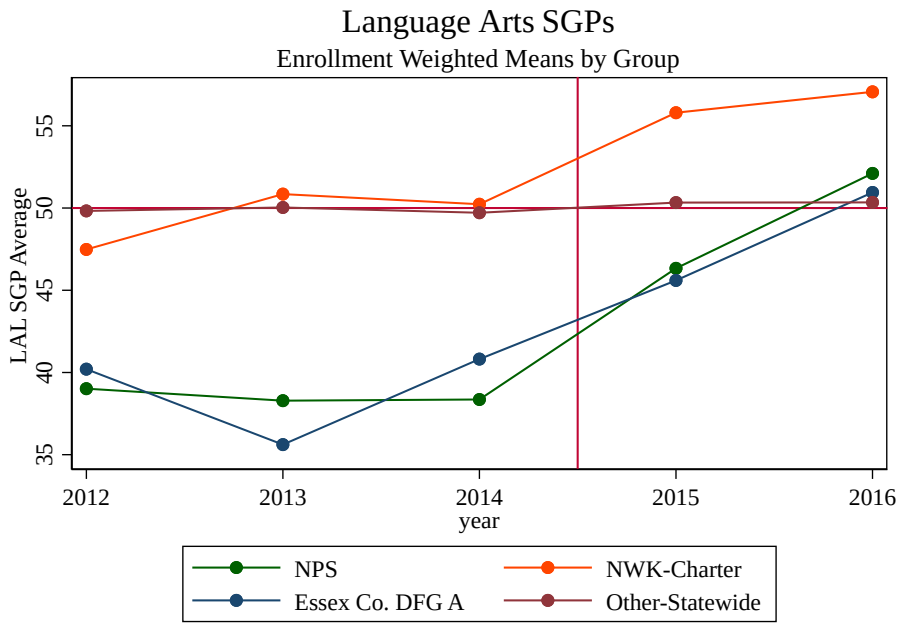
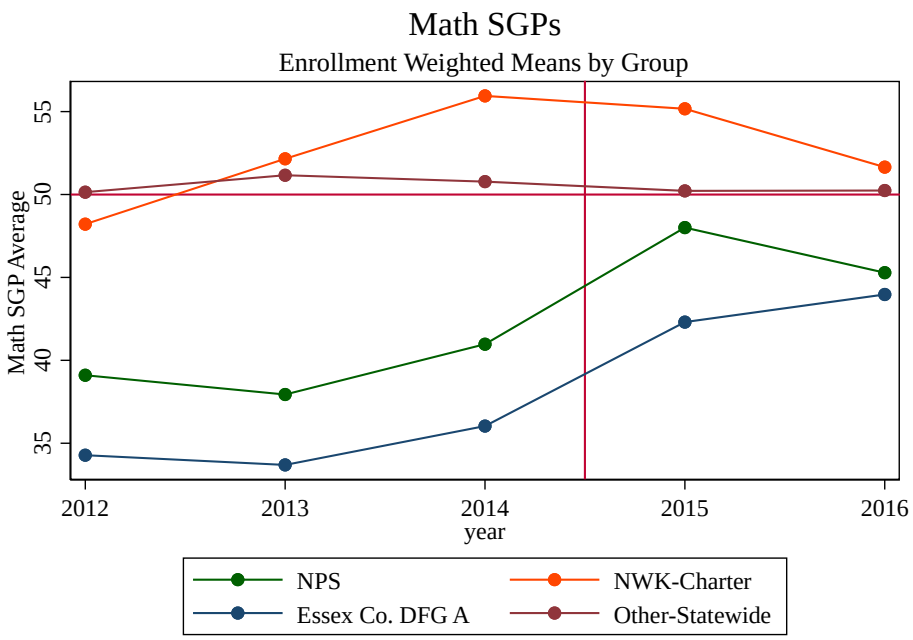


FIGURE B4



New Jersey School Performance Reports Databases: https://rc.doe.state.nj.us/ReportsDatabase.aspx

Using School SGPs to Evaluate Relative Productive Efficiency

The next several analyses explore the relative *productivity* of Newark district and charter schools. The reports purport to characterize the "productivity" of those reforms; that is, the extent to which, all else being equal, the introduction of reforms brought about by the infusion of the Zuckerberg contribution increases the relative productivity of Newark district and charter schools both collectively and separately when compared against other schools and children statewide. As noted in the previous section, it is important to consider the dynamics of those counterfactuals. Setting that question aside for the moment, we first consider what is meant by a "productivity" analysis and what methods might be used to distill changes in or differences between productivity.

The education production function considers as its dependent variable the outcomes achieved (for students) by institutions, while considering differences across institutions in controllable inputs (resources) and uncontrollable inputs (student factors, environmental factors). Given, as we have noted previously, that state and local policies have influenced the resources of Newark district schools differently from Newark's charter schools (and any other counterfactual against which we wish to compare them), it stands to reason that any legitimate productivity analysis should give consideration to resources (at least in the aggregate) and factors which may influence the costs (or production value) of those resources.

The reports, for example, assert that, on balance though not exclusively, schools that were shuttered in Newark were schools that produced lower value-added achievement gains in math (Figure 7[14] in the NBER report, used to convey this point, shows only math gains), given student characteristics and peer characteristics, including prior achievement.[15] No consideration is given to whether schools producing higher or lower achievement gains were provided equitable resources, or operated at comparable scale.

In addition, we note that many of the measures used for characterizing students were insufficiently precise – most notably, special education classification and low-income status. We address this issue in greater detail in Part C. Lack of precision in the special education measure is especially problematic because it not only directly influences outcome variations but also influences budgetary pressures and resource allocation toward measured outcome goals.[16] Schools where large shares of disability populations have more severe disabilities, requiring lower case-load ratios, have less flexibility in how resources are allocated than others. Unfortunately, in our relatively simple illustrative analyses that follow, we are unable to resolve this imprecision problem and must rely on school level aggregate disability population data (averaged over time). This imprecision creates a bias which necessarily favors Newark Charter schools which serve few, if any, more severely disabled students, a topic addressed in greater detail in Part C.

For the following series of models, we use a panel (including only schools which exist in the panel for each year) of New Jersey school level data for the years 2012 through 2016. These are the years for which the New Jersey Department of Education has produced school level median growth percentile data. School level median growth percentiles are achievement gain measures constructed using the same underlying assessment data as used by the authors in the reports. The major difference between the NBER reports' value-added model and the state SGP measures is that the SGPs are a) not conditioned on any individual or peer characteristics other than previous test scores, and b) are not conditioned on grade levels of tested students.

We apply a series of exploratory, descriptive regression models with which we assess the relative productivity – production of student achievement gains (SGPs) – for Newark district and charter schools, controlling for:

1. Student population characteristics
2. Baseline achievement levels (school mean scale scores)
3. School grade level and size
4. School resources (aggregate certified staffing salary expense per pupil)

Whether a charter or district school chooses to allocate their aggregate staff salary expense toward greater numbers of less experienced staff, to higher relative salaries, or toward seniority varies between charter operators and district schools (district schools being on a common salary schedule). This said, we acknowledge here our resource variable is a proxy that cannot fully account for the resource advantages some Newark schools – particularly charter schools – might enjoy relative to others.

These models are estimated on the population of Newark district and charter schools. That is, they are regressions that describe the differences in average SGPs across schools in relation to differences in school characteristics. Because these are population data and the regressions are descriptive they merely are what they are (statistical significance in such context being inconsequential for inferential purposes, but providing some insights regarding clarity/certainty of patterns, trends or differences).

Student population characteristics include:

1. 3-year average proportion of students identified as having disabilities.
2. Percentage of students qualified for free lunch (<130% income threshold for poverty).
3. Percentage of children who are limited in their English language proficiency.

The second and third items above were obtained through statewide school level enrollment files.[17] Special education enrollments were obtained through separate request from NJDOE. Our school level resource measure is averaged from 2012 through 2016 (due to incompleteness of 2016 data) and includes the sum of the salaries of all certified staff (prorated for their time assigned to each site) divided by school enrollments. Staffing data, including salaries are from the statewide fall staffing report (obtained from NJDOE).

Importantly, the dependent variable is statewide and norm-referenced, where the state median is the 50th percentile and state mean roughly at 50 for SGP. As such, when we model only data on Newark schools, changes in the dependent variable are still compared against the state as a whole. We use our models to first describe variations in SGPs across schools within Newark, and then to evaluate which schools over and under perform with respect to expectations. That is, which schools really are more and less productive, given not only the students they serve, but also the resources they are provided.

Table B1 shows the regressions for elementary and middle level schools (including combined grades schools) for language arts and math student growth percentiles.

TABLE B1

BASELINE PANEL MODEL OF SGPS WITH SCALE EFFECT

		Elem Panel LAL		Elem Panel Math		MS Panel LAL		MS Panel Math	
		coef	**se**	**coef**	**se**	**coef**	**se**	**coef**	**se**
% Special Ed (mean over years)		-40.086*	23.785	-47.560*	28.873	-37.047*	20.467	-54.556*	28.426
% Free Lunch		-3.126	9.967	-3.220	13.746	16.062	10.388	32.711***	12.562
% ELL		-4.030	9.278	-16.982	17.989	-15.292	9.552	-33.098**	14.615
ln_salperpupil (mean over years)		**20.555***	11.113	21.635	14.751	**18.455***	10.191	**25.398****	11.597
ln_enroll		7.064***	2.660	8.754**	4.326	5.865**	2.583	7.602**	3.266
Year (Baseline = 2012)									
	2013	-0.344	1.346	-0.038	2.233	-1.828	1.736	0.920	2.981
	2014	-0.975	1.562	2.252	2.400	-2.047	1.775	2.016	2.620
	2015	**7.683*****	2.036	**8.314*****	2.440	**7.842*****	1.977	**9.185*****	2.278
	2016	**12.665*****	1.517	**6.088*****	2.071	**11.264*****	1.597	**6.264*****	1.949
Total Mean Scale ELA		0.372***	0.128						
Total Mean Scale ELA						0.392***	0.121		
Total Mean Scale Math				0.216**	0.089				
Total Mean Scale Math								0.387***	0.061
Constant		-249.161**	124.304	-241.157	151.392	-240.655**	115.391	-323.172***	115.803
Number of observations		154		159		142		147	
R2		0.527		0.316		0.523		0.369	

note: *** p<0.01, ** p<0.05, * p<0.1

The first set of models shows that:

- Schools with more resources (higher total salaries per pupil) tend to have higher growth percentiles;
- Special education populations have substantive negative effects on growth percentiles;
- Growth dramatically jumps for schools in Newark relative to the state when shifting from NJASK to PARCC.

This third finding indicates a possibility of some anomalous affect that, we suspect, is likely an artifact of calculating growth across different tests with different distributions, under different conditions, as much if not more so than any "reforms" native to Newark exclusively.

The assertion that this large instantaneous jump is somehow a function of a treatment which suddenly kicks in at the same point in time when the testing regime is changed is at best a peculiar finding, especially since no obvious disruptive treatment occurred with timing such as to have this effect at this specific point in time. Most, if not all, reforms and non-reform drifts/changes in programs, practices and resources a) occur more gradually over time, and b) likely have longer lagged effects and less "shock-like" effects on student outcome measures.

We can use the residuals of the above models to identify which schools systematically exceed growth expectations and which schools systematically underperform. A core assertion of the reports is that the positive effects of reforms in Newark result largely from moving students out of low value-added schools and into high value-added schools, closing low value-added schools in the process. The reports further assert that Newark's charter sector is particularly effective in its production of value-added, especially the larger established operators such as North Star and TEAM Academy (a KIPP affiliate).

Table B2 shows the residuals of our model estimated using all years, separate models for individual years, and the mean of the year-by-year models. Collapsing Newark schools to their district average, we see that Newark district schools fall around the middle of the pack, with marginally below expected growth year after year (relative within year position, among schools in Newark only). The residual values in the table indicate, for example, that MV Rogers Charter School's actual SGPs were 7.13 higher than expected, on a scale of 0 to 100, with a statewide mean (and median, forcibly normally distributed) of approximately 50. North Star Academy falls just below Newark Public schools, but has volatile shifts in growth relative to expectations year over year. TEAM falls at the bottom of the list, with consistently "below expected" performance.

TABLE B2

MODEL RESIDUALS AND RANKING INCLUDING SCALE TERM (CHARTERS VS. DISTRICT)

School/ District	Panel Model	Mean of Year by Year	2016	2015	2014	2013	2012
Maria Varisco Rogers	7.13	6.76	6.71	13.56	3.88	9.40	1.86
New Horizons Community	5.57	4.67	11.20	1.98	9.46	12.19	(11.47)
Marion P. Thomas	2.22	2.17	6.35	(7.01)	5.85	3.01	1.28
Gray	2.11	1.60	5.14	5.46	(4.84)	(0.01)	6.89
Newark Educators Community	1.14	1.17	5.50	(18.65)	9.10	18.29	(8.39)
NEWARK PUBLIC SCHOOLS	(1.82)	(2.37)	(0.63)	(1.84)	(1.87)	(2.73)	(2.09)
North Star Academy	(3.65)	(5.79)	(17.90)	6.52	0.89	(12.96)	(2.53)
Robert Treat Academy	(4.19)	(3.97)	(7.37)	0.78	1.81	(3.18)	(12.87)
University Heights	(5.00)	(4.12)	(5.89)	0.13	(9.23)	(21.09)	14.17
TEAM Academy	(9.13)	(8.10)	(12.57)	(10.68)	(8.19)	(5.65)	(4.56)

Notably there is significant variation among Newark schools, including some very high and some very low performers, and others for which there exists significant year over year volatility.

Table B3 lists individual school rankings. The very small Discovery Charter schools ranks highest, but possibly because the scale measure in our model plays to their advantage. Other Newark district K-8 schools rank quite high, and as noted in Table B2, TEAM Academy ranks quite low. North Star is nearer the middle when adjusting for the factors in the model.

TABLE B3

SCHOOL RANKINGS INCLUDING SCALE

School	Grade Span	Panel Rating	Mean Across Years	2016	2015	2014	2013	2012
DISCOVERY CS	04-08	22.59	28.36	19.36	-0.76	12.69	33.22	51.13
MT VERNON PLACE SCHOOL	PK-08	9.04	9.33	10.67	9.34	15.22	5.67	6.05
FIRST AVENUE SCHOOL	PK-08	8.61	8.81	2.79	12.97	7.92	10.28	8.70
CHANCELLOR AVENUE SCHOOL	03-08	7.51	8.58	5.09	4.86	2.73	5.89	20.80
MARIA L. VARISCO-ROGERS	KG-08	7.13	6.76	6.71	13.56	3.88	9.40	1.86
HAWTHORNE AVENUE SCHOOL	KG-08	5.93	8.35	5.37	-8.88	0.11	18.77	14.55
NEW HORIZONS COMM. CS	KG-05	5.57	4.67	11.20	1.98	9.46	12.19	-11.47
ELLIOTT STREET ELEMENTARY SCHOOL	PK-04	4.51	5.10	-13.23	-11.87	24.66	11.99	13.95
CAMDEN STREET ELEMENTARY SCHOOL	PK-08	4.27	5.44	2.92	3.15	7.02	7.23	4.18

School	Grade Span	Panel Rating	Mean Across Years	2016	2015	2014	2013	2012
IVY HILL ELEMENTARY SCHOOL	PK-08	4.07	5.12	5.36	0.17	7.94	3.83	5.72
SUSSEX AVENUE SCHOOL Burnet Street School	PK-08	3.96	2.98	8.09	5.12	2.62	-6.32	9.03
HAWKINS STREET SCHOOL	PK-08	3.43	3.31	-1.37	9.27	10.69	3.13	-5.17
WILSON AVENUE SCHOOL	PK-08	2.40	3.80	2.84	-2.54	4.45	8.09	1.00
MARION P. THOMAS CS	PK-08	2.22	2.17	6.35	-7.01	5.85	3.01	1.28
GRAY CS	KG-08	2.11	1.60	5.14	5.46	-4.84	-0.01	6.89
Dr. E. ALMA FLAGG SCHOOL	KG-08	1.94	2.60	6.90	-3.95	0.90	-0.43	8.53
DAYTON STREET SCHOOL at Peshine Avenue	PK-08	1.90	2.14	5.33	-2.00	3.61	-0.62	3.74
MCKINLEY	PK-08	1.23	0.93	4.89	1.30	-1.14	-1.13	2.24
NEWARK EDUCATORS CHARTER	KG-05	1.14	1.17	5.50	-18.65	9.10	18.29	-8.39
BENJAMIN FRANKLIN ELEMENTARY SCHOOL	PK-04	0.57	2.15	5.87	-1.13	-0.73	11.24	-4.52
ROBERTO CLEMENTE ELEMENTARY SCHOOL	PK-04	0.40	1.23	6.32	3.18	-0.81	2.43	-4.99
MILLER STREET SCHOOL	PK-08	0.37	2.46	-8.94	1.96	1.83	-1.72	12.71
QUITMAN COMMUNITY SCHOOL	PK-08	0.33	-4.02	1.90	6.86	0.52	-17.36	-4.36
SOUTH SEVENTEENTH STREET SCHOOL	KG-08	0.08	0.39	-3.60	-2.99	0.43	-2.39	7.56
LOUISE A SPENCER ELEMENTARY SCHOOL	PK-08	-0.48	-2.18	0.78	-3.85	-16.13	3.61	0.73
BELMONT RUNYON ELEMENTARY SCHOOL	PK-07	-0.76	-1.92	-1.38	-3.22	-1.81	-6.14	0.73
LAFAYETTE STREET SCHOOL	PK-08	-0.87	-1.05	1.97	-2.25	-2.96	-1.66	-0.32
ABINGTON AVENUE SCHOOL	PK-08	-1.28	-1.87	7.56	-1.07	0.96	1.90	-14.28
THIRTEENTH AVENUE SCHOOL MARTIN LUTHER KING	PK-08	-1.67	-2.90	-1.25	-0.77	-4.04	-5.84	-1.16
ANN STREET SCHOOL	PK-08	-1.92	-1.85	0.17	1.75	-5.65	-7.75	4.85
SPEEDWAY AVENUE SCHOOL	PK-08	-2.07	-2.34	10.92	-3.11	0.05	-3.75	-8.98
BRANCH BROOK SCHOOL	PK-04	-2.53	-2.34	-5.20	-22.32	0.04	1.23	14.55
DR WILLIAM H HORTON ELEMENTARY SCHOOL	KG-08	-3.27	-1.85	-9.46	-4.92	-0.40	6.36	-5.64
HARRIET TUBMAN ELEMENTARY SCHOOL	PK-06	-3.29	-2.98	-4.70	-1.07	-12.18	3.07	0.00
NORTH STAR ACAD. CS OF N	KG-12	-3.65	-5.79	-17.90	6.52	0.89	-12.96	-2.53
LINCOLN	PK-08	-3.99	-3.68	-6.33	-7.19	-5.97	0.39	-0.29
ROBERT TREAT ACADEMY CS	KG-08	-4.19	-3.97	-7.37	0.78	1.81	-3.18	-12.87
OLIVER STREET SCHOOL	PK-08	-4.21	-2.89	0.40	-13.65	-6.65	1.20	1.94
UNIVERSITY HEIGHTS CS	KG-05	-5.00	-4.12	-5.89	0.13	-9.23	-21.09	14.17
GEORGE WASHINGTON CARVER ELEMENTARY SCHOOL	PK-08	-5.07	-5.51	-4.93	-1.14	-5.00	-11.52	-1.43
RAFAEL HERNANDEZ SCHOOL	PK-08	-5.60	-6.38	-7.22	1.26	5.08	-7.93	-19.11

School	Grade Span	Panel Rating	Mean Across Years	2016	2015	2014	2013	2012
American History High School	07-12	-5.94	-19.63	5.03	-10.87	-5.86	-4.17	-48.86
CLEVELAND Eighteenth Avenue School	PK-08	-6.56	-9.73	5.94	-3.40	-14.84	-16.87	-8.44
ARTS HIGH SCHOOL	07-12	-6.92	-9.81	-10.51	5.33	-12.42	-14.32	-2.71
AVON AVENUE SCHOOL	KG-08	-7.12	-6.99	-13.21	-6.28	-11.46	-4.94	-0.45
SOUTH STREET ELEMENTARY SCHOOL	PK-05	-7.84	-6.90	-5.79	-16.04	-6.53	-3.35	-2.80
TEAM ACADEMY CHARTER SCH	KG-12	-9.13	-8.10	-12.57	-10.68	-8.19	-5.65	-4.56
RIDGE STREET SCHOOL	KG-08	-11.82	-12.22	-3.04	-16.26	-19.56	-7.35	-11.39
UNIVERSITY HIGH SCHOOL	07-12	-20.80	-23.53	-16.51	-7.74	-16.02	-26.18	-28.38
SCIENCE PARK HIGH SCHOOL	07-12	-27.76	-35.70	-18.52	-16.26	-22.54	-47.34	-37.22

Unconditional growth percentiles for TEAM are relatively average and raw growth percentiles for North Star tend to be quite high, and consistently so, causing us to dig deeper into these findings. The model in Table B1 finds that on average, larger schools tend to have higher SGPs. North Star and TEAM are essentially districts operating within the Newark district, but are reported as schools in state data. By comparison to other schools, they are very large. Using the models in Table B1, where larger schools are expected to have higher SGPs ends up setting a very high "expected" bar for North Star and TEAM.

As such, we estimate a second set of models and residuals removing the school size measure. Table B4 shows the model including district and charter schools with the school size measure removed. The removal of the size measure compromises the statistical significance of the relationship between resources and outcomes, cutting the magnitude of this relationship in half (because of the way in which staffing ratios and total salary expense interact with school size). We still, however, have the anomalous jump in SGPs in 2015, the year of the switch from the NJASK to the PARCC. Our model here also explains less overall variation in SGPs (as compared to models including enrollment size).

TABLE B4

PANEL MODEL WITH SCALE EFFECT EXCLUDED

	Elem Panel LAL		Elem Panel Math		MS Panel LAL		MS Panel Math	
	coef	**se**	**coef**	**se**	**coef**	**se**	**coef**	**se**
% Special Ed (mean over years)	-19.197	19.013	-20.838	23.790	-19.105	16.778	-31.494	22.648
% Free Lunch	-7.076	10.012	-6.385	14.044	9.881	9.633	29.295**	12.166
% ELL	8.680	8.527	-1.396	16.190	-3.542	8.706	-19.401	13.344
ln_salperpupil (mean over years)	8.670	10.914	7.698	14.244	8.577	10.021	14.185	11.280
Year (Baseline = 2012)								
2013	0.190	1.365	0.668	2.172	-1.206	1.750	1.583	2.994
2014	-0.835	1.564	2.573	2.391	-1.952	1.740	2.350	2.583
2015	**7.493*** **	**1.990**	**8.288*** **	**2.305**	**7.563*** **	**1.924**	**9.215*** **	**2.199**
2016	**13.533*** **	**1.585**	**7.334*** **	**1.993**	**12.035*** **	**1.670**	**7.491*** **	**1.864**
Total Mean Scale ELA	0.347***	0.131						
Total Mean Scale ELA					0.366***	0.126		
Total Mean Scale Math			0.217**	0.087				
Total Mean Scale Math							0.395***	0.066
Constant	-94.447	116.958	-64.008	137.463	-109.061	109.012	-177.990*	102.271
Number of observations	154		159		142		147	
R2	0.496		0.276		0.499		0.333	

note: *** p<0.01, ** p<0.05, * p<0.1

We again calculate the residuals from this model without scale and present them in Table B5. Significant changes are apparent compared with residuals from the earlier model (Table B2). Here, TEAM academy is relatively average, alongside (marginally above in some years) Newark's district schools.

North Star jumps to the top of the list, but notably in some years (2013 & 2016) is only slightly above the middle. Given these models, one might consider North Star a high value-added producer. But, as we discuss in Section III, these models fail to capture some unique features of the "North Star Model."

TABLE B5

MODEL RESIDUALS AND RANKING EXCLUDING SCALE TERM (CHARTERS VS. DISTRICT)

School/ District	Panel Model	Mean of Year by Year	2016	2015	2014	2013	2012
North Star Academy	7.99	6.79	1.92	10.85	7.66	0.61	15.34
Maria Varisco Rogers	6.55	6.12	3.62	13.38	3.61	8.29	2.29
Discovery	6.01	11.29	(15.80)	(7.61)	2.88	13.62	33.52
New Horizons Community	3.61	2.93	5.53	0.61	7.84	10.35	(9.70)
Marion P. Thomas	2.94	3.15	5.44	(6.82)	6.78	3.46	4.14
TEAM Academy	0.23	2.23	3.32	(7.14)	(2.41)	5.00	9.68
THE NEWARK PUBLIC SCHOOLS	(1.70)	(2.50)	(1.39)	(1.69)	(1.95)	(2.88)	(2.02)
University Heights	(3.85)	(3.06)	(5.38)	0.51	(8.80)	(19.94)	17.46
Newark Educators Community	(4.07)	(4.47)	(5.40)	(20.85)	5.55	12.76	(14.40)
Robert Treat Academy	(5.87)	(5.68)	(13.29)	0.13	1.36	(5.67)	(13.69)
The Gray	(6.53)	(7.32)	(14.65)	1.95	(9.21)	(10.81)	(1.95)

Table B6 shows that while North Star ranks high among individual schools, two Newark district schools still rank higher.

TABLE B6

SCHOOL RANKINGS EXCLUDING SCALE

School	Grade Span	Panel Rating	Mean Across Years	2016	2015	2014	2013	2012
MT VERNON PLACE SCHOOL	PK-08	11.49	11.17	10.89	13.41	16.52	8.40	7.92
FIRST AVENUE SCHOOL	PK-08	9.83	10.01	4.58	13.19	8.65	10.91	10.81
NORTH STAR ACAD. CS OF N	KG-12	9.07	7.29	0.43	14.58	8.22	2.19	14.62
MARIA L. VARISCO-ROGERS	KG-08	7.66	6.96	2.89	16.05	4.67	9.73	2.85
CHANCELLOR AVENUE SCHOOL	03-08	5.48	6.53	-1.08	3.14	1.59	3.97	18.79
DISCOVERY CS	04-08	5.15	9.80	-18.28	-8.02	4.13	12.22	28.77
HAWTHORNE AVENUE SCHOOL	KG-08	4.28	6.76	-1.14	-9.02	-0.11	16.86	13.67
DAYTON STREET SCHOOL at Peshine Avenue	PK-08	4.10	5.23	6.81	0.09	5.99	2.91	7.55
QUITMAN COMMUNITY SCHOOL	PK-08	3.80	-1.22	4.24	9.08	2.47	-14.04	-0.21
WILSON AVENUE SCHOOL	PK-08	3.78	4.90	3.31	-0.96	5.22	9.54	2.18
MCKINLEY	PK-08	3.42	3.38	7.93	1.13	0.32	1.60	5.66
ELLIOTT STREET ELEMENTARY SCHOOL	PK-04	3.28	3.53	-18.08	-10.94	23.09	11.77	11.81
IVY HILL ELEMENTARY SCHOOL	PK-08	2.97	3.60	2.24	0.57	7.15	1.57	4.18
NEW HORIZONS COMM. CS	KG-05	2.17	1.58	4.75	0.83	6.55	8.56	-12.80
CAMDEN STREET ELEMENTARY SCHOOL	PK-08	1.90	3.01	-1.50	-0.25	5.40	4.71	1.08
HAWKINS STREET SCHOOL	PK-08	1.54	1.00	-5.58	8.41	9.31	0.47	-8.21
SUSSEX AVENUE SCHOOL Burnet Street School	PK-08	1.13	-0.10	2.14	4.33	0.94	-10.58	6.05
MARION P. THOMAS CS	PK-08	0.90	1.03	5.02	-9.13	5.05	0.12	1.44
American History High School	07-12	0.88	-14.57	7.72	-2.34	-1.41	1.43	-43.73
BELMONT RUNYON ELEMENTARY SCHOOL	PK-07	0.31	-0.24	-1.00	-1.97	-0.09	-4.78	3.92
LOUISE A SPENCER ELEMENTARY SCHOOL	PK-08	-0.36	-1.44	-0.09	-3.58	-14.88	5.17	1.78
TEAM ACADEMY CHARTER SCH	KG-12	-0.52	1.26	2.53	-7.43	-3.12	3.81	7.84
Dr. E. ALMA FLAGG SCHOOL	KG-08	-0.57	0.04	1.74	-4.98	-0.50	-3.71	5.82

School	Grade Span	Panel Rating	Mean Across Years	2016	2015	2014	2013	2012
SOUTH SEVENTEENTH STREET SCHOOL	KG-08	-0.67	0.12	-7.16	-4.03	0.44	-2.72	8.47
THIRTEENTH AVENUE SCHOOL MARTIN LUTHER KING	PK-08	-0.80	-1.38	1.27	-2.09	-3.11	-4.79	1.37
LAFAYETTE STREET SCHOOL	PK-08	-1.39	-1.53	0.82	-3.49	-3.12	-2.87	-0.29
UNIVERSITY HEIGHTS CS	KG-05	-1.56	-1.61	-6.45	3.71	-6.82	-17.46	18.29
ARTS HIGH SCHOOL	07-12	-1.97	-6.74	-3.61	12.48	-10.41	-10.31	0.50
MILLER STREET SCHOOL	PK-08	-2.39	-0.48	-15.70	0.84	0.08	-4.52	8.97
ABINGTON AVENUE SCHOOL	PK-08	-2.49	-3.15	4.60	-1.94	0.31	0.30	-15.73
ANN STREET SCHOOL	PK-08	-2.86	-3.30	-0.71	0.97	-6.86	-9.91	2.75
DR WILLIAM H HORTON ELEMENTARY SCHOOL	KG-08	-3.05	-1.60	-8.89	-4.65	-0.43	6.26	-5.13
HARRIET TUBMAN ELEMENTARY SCHOOL	PK-06	-3.08	-3.15	-9.87	0.82	-12.17	4.34	1.11
GEORGE WASHINGTON CARVER ELEMENTARY SCHOOL	PK-08	-3.46	-4.21	-4.04	0.22	-4.20	-10.71	1.12
ROBERTO CLEMENTE ELEMENTARY SCHOOL	PK-04	-3.57	-3.18	-0.14	1.71	-4.00	-1.54	-11.94
NEWARK EDUCATORS CHARTER	KG-05	-4.14	-4.50	-6.17	-19.99	5.15	13.16	-14.65
BENJAMIN FRANKLIN ELEMENTARY SCHOOL	PK-04	-4.68	-3.92	-2.24	-3.39	-4.71	5.94	-15.18
BRANCH BROOK SCHOOL	PK-04	-4.86	-5.10	-17.11	-19.76	-3.26	1.68	12.93
LINCOLN	PK-08	-5.38	-5.24	-10.63	-6.80	-6.91	-1.93	-1.24
SPEEDWAY AVENUE SCHOOL	PK-08	-5.59	-5.52	5.50	-4.98	-1.45	-8.91	-11.89
ROBERT TREAT ACADEMY CS	KG-08	-5.67	-6.35	-13.97	1.96	0.99	-6.29	-15.34
OLIVER STREET SCHOOL	PK-08	-6.17	-5.22	-3.20	-14.13	-8.64	-1.21	-1.42
AVON AVENUE SCHOOL	KG-08	-6.45	-5.90	-13.20	-6.33	-10.76	-4.65	2.75
CLEVELAND Eighteenth Avenue School	PK-08	-7.09	-10.68	1.30	-3.49	-15.09	-18.00	-8.76
RAFAEL HERNANDEZ SCHOOL	PK-08	-7.52	-8.21	-10.51	-1.16	3.91	-10.66	-20.51
GRAY CS	KG-08	-8.68	-10.21	-15.53	1.08	-11.46	-14.84	-6.44
RIDGE STREET SCHOOL	KG-08	-10.69	-11.66	-5.14	-13.00	-19.20	-6.08	-10.84
SOUTH STREET ELEMENTARY SCHOOL	PK-05	-12.08	-11.75	-15.19	-16.77	-10.04	-6.95	-9.80
UNIVERSITY HIGH SCHOOL	07-12	-15.40	-19.05	-10.00	-1.67	-12.82	-20.70	-23.61
SCIENCE PARK HIGH SCHOOL	07-12	-15.91	-25.36	-8.01	-1.88	-14.22	-33.60	-28.25

To summarize the findings of the two alternative specifications:

- TEAM is either the lowest producer of growth, a relatively average producer of growth over time, or somewhere in between.
- North Star is either a relatively average producer of growth, one of the highest producers of growth over time, or somewhere in between.
- Several NPS district schools are high performers in terms of production of annual student growth.
- There is significant volatility in these models year to year.

We also tested to see if the size effect found in our first set of models was driven primarily by the large size and high performance of North Star and TEAM; in other words, if we estimated the same model to only Newark District schools, would we still find a large positive size effect in relation to SGPs?

Table B7 shows those regressions and reveals that the size effect is robust to the exclusion of charter schools. Further, including the size effect in this case, again, adds clarity to the resource-outcome relationships. That is, there's something to the relationship between school size and outcomes in Newark (though most likely in a more complex and non-linear relationship than our log-linear transformation). Tests of alternative functional forms did not reveal additional insights.

TABLE B7

ROBUSTNESS CHECK: IS THE POSITIVE INFLUENCE OF SCALE DRIVEN BY TEAM AND NORTH STAR? (MODEL EXCLUDING CHARTERS)

	Elem Panel LAL		Elem Panel Math		MS Panel LAL		MS Panel Math	
	coef	**se**	**coef**	**se**	**coef**	**se**	**coef**	**se**
% Special Ed (mean over years)	-34.124	22.669	-47.760	30.466	-32.561*	18.570	-60.140**	30.355
% Free Lunch	-5.488	13.465	-8.757	18.383	12.007	13.499	31.056**	14.897
% ELL	-4.896	11.629	-19.353	21.956	-17.242	11.334	-39.083**	18.818
ln_salperpupil (mean over years)	19.388	12.136	21.910	15.810	19.972*	11.009	31.493**	13.100
ln_enroll	**8.867*** **	**3.130**	**11.044** **	**5.282**	**7.185** **	**3.232**	**7.817***	**4.269**
Year (Baseline = 2012)								
2013	-1.269	1.442	-1.195	2.553	-3.003*	1.750	-0.010	3.360
2014	-1.980	1.712	0.817	2.611	-3.326*	1.818	0.858	2.804
2015	6.891***	2.020	8.670***	2.562	6.914***	1.950	9.907***	2.321
2016	12.394***	1.703	6.014***	2.240	10.810***	1.765	6.633***	2.108
Total Mean Scale ELA	0.324**	0.135						
Total Mean Scale ELA					0.406***	0.147		
Total Mean Scale Math			0.183	0.114				
Total Mean Scale Math							0.455***	0.099
Constant	-240.036*	133.369	-246.756	159.462	-261.819**	125.180	-388.422***	130.163
Number of observations	135		140		121		126	
R2	0.568		0.328		0.587		0.408	

note: *** p<0.01, ** p<0.05, * p<0.1

Differential growth in charter and district schools over time?

Finally, we estimated a series of models to try to tease out the relative shifts in growth percentiles over time in charter and district schools in Newark. Table B8 shows the models of SGPs for Newark charter and district schools with a) the size term included, and with b) interactions between charter status and year. To summarize our findings:

- Again, resources are positively associated with SGPs.
- Again, we have what appears to be an anomalous, large jump in SGPs in 2015 and 2016 over their 2012 levels (as baseline year).
- Charter schools on average and across years (main effect) do not differ from district schools in their SGPs.
- Relative to baseline year, for charters, we have higher growth in 2013 and 2014, but not in 2015 and 2016, when SGPs jumped across the board.

Again, the jump in SGPs observed is large. Because these are state normed measures, this finding does indicate a large jump in SGPs relative to statewide SGP (which remain stable around 50). But again, this jump is:

- sudden,
- large,
- timed with change in test, and
- not timed with any clear, obvious, large disruptive innovation.

It is difficult at best to swallow the premise that ill-defined, subtle policy changes and ongoing enrollment shifts which occurred during this period had a sudden and large effect on achievement growth, which just so happened to coincide with a change in test.

TABLE B8

MODEL INCLUDING CHARTER EFFECT AND CHARTER BY YEAR EFFECT (WITH SCALE EFFECT)

	Elem Panel LAL		Elem Panel Math		MS Panel LAL		MS Panel Math	
	coef	se	coef	se	coef	se	coef	se
% Special Ed (mean over years)	**-42.034***	23.202	**-50.539***	28.563	**-39.229****	19.663	**-56.332****	28.713
% Free Lunch	0.605	12.201	-1.032	14.678	19.563*	11.434	32.623**	12.793
% ELL	1.538	13.133	-16.866	22.465	-10.016	12.398	-33.878*	18.796
ln_salperpupil (mean over years)	**23.462****	11.469	**23.271***	13.508	**22.176****	10.613	**26.126****	10.783
ln_enroll	8.160***	2.675	10.232***	3.819	7.075***	2.455	8.626***	2.907
Year (Baseline = 2012)								
2013	-1.344	1.463	-1.216	2.447	-3.225*	1.753	-0.238	3.320
2014	-1.927	1.724	0.976	2.558	-3.394*	1.810	0.491	2.776
2015	**6.996*****	2.001	**9.010*****	2.540	**6.926*****	1.904	**9.508*****	2.331
2016	**12.540*****	1.728	**6.323*****	2.208	**10.806*****	1.830	**6.215*****	2.093
Charter	0.979	5.584	-0.001	5.789	-2.106	5.967	-2.879	6.274
(year==2013)*charter	7.348	5.457	**10.897*****	3.073	**11.377****	5.708	**9.698****	4.523
(year==2014)*charter	**7.452****	3.714	10.550	7.201	**10.845****	4.286	**12.600***	7.595
(year==2015)*charter	4.365	8.488	-5.585	9.705	6.741	8.083	-2.343	9.670
(year==2016)*charter	-0.786	2.615	-3.782	3.896	2.711	3.233	-0.801	3.915
Total Mean Scale ELA	0.330**	0.129						
Total Mean Scale ELA					0.372***	0.114		
Total Mean Scale Math			0.202**	0.103				
Total Mean Scale Math							0.376***	0.076
Constant	-277.371**	127.445	-263.715*	137.472	-280.276**	118.208	-333.355***	104.312
Number of observations	154		159		142		147	
R2	0.548		0.354		0.551		0.402	

note: *** p<0.01, ** p<0.05, * p<0.1

Table B9 takes another run at these data, excluding the size term, leading to largely the same findings (but for mitigation of the relationship between resources and outcomes). The main effect for charters does not change substantively, nor do the charter-by-year interactions. Charters show some positive differences in SGPs in 2013 and 2014, but not in 2015 and 2016.

TABLE B9

MODEL INCLUDING CHARTER EFFECT AND CHARTER BY YEAR EFFECT (WITHOUT SCALE EFFECT)

	Elem Panel LAL		Elem Panel Math		MS Panel LAL		MS Panel Math	
	coef	**se**	**coef**	**se**	**coef**	**se**	**coef**	**se**
% Special Ed (mean over years)	-18.578	18.275	-20.254	24.928	-18.570	16.062	-31.556	24.341
% Free Lunch	-6.496	11.977	-7.698	15.504	10.188	10.782	26.677**	12.718
% ELL	12.746	12.902	-3.480	21.963	-0.235	11.787	-23.813	18.400
ln_salperpupil (mean over years)	8.982	11.839	6.308	14.410	9.343	11.099	12.565	11.618
Year (Baseline = 2012)								
2013	-0.807	1.472	-0.401	2.378	-2.531	1.735	0.539	3.326
2014	-1.843	1.713	1.374	2.539	-3.274*	1.747	0.942	2.727
2015	**6.432*** **	**1.966**	**8.679*** **	**2.494**	**6.376*** **	**1.876**	**9.374*** **	**2.325**
2016	**13.190*** **	**1.810**	**7.458*** **	**2.232**	**11.433*** **	**1.896**	**7.316*** **	**2.070**
Charter	-3.055	6.665	-4.800	6.932	-5.875	7.037	-7.224	7.496
(year==2013)*charter	8.796	5.357	12.109***	2.863	12.427**	5.525	10.686**	4.427
(year==2014)*charter	8.394**	3.655	11.214	7.271	11.181***	4.042	12.568	7.784
(year==2015)*charter	7.575	7.439	-2.030	8.352	9.124	7.267	0.176	8.642
(year==2016)*charter	2.509	3.204	-0.123	3.598	5.520	3.730	2.347	4.518
Total Mean Scale ELA	0.311**	0.133						
Total Mean Scale ELA					0.353***	0.118		
Total Mean Scale Math			0.215**	0.101				
Total Mean Scale Math							0.398***	0.085
_cons	-90.915	123.954	-49.621	140.035	-113.322	117.171	-161.018	106.458
Number of observations	154		159		142		147	
R2	0.510		0.305		0.520		0.361	

note: *** p<0.01, ** p<0.05, * p<0.1

Part C: Beneath the Veil of Newark Charter Productivity

Among the take-home points of the previous sections are that:

- Resources, when considering school size, are positively associated with growth;
- The productivity of large charter operators in Newark – TEAM and North Star in particular – depends on how we treat school size in our models;
- Jumps in student growth percentiles across the board between 2014 and 2015 are hard to explain as a function of substantive policy change – where policy and contextual changes had been happening gradually prior to and throughout the period.

From any study of the effects of changes in policy and practices on student outcomes, what we really want to know – where positive outcome effects are observed – is what can be done to distribute those positive effects across more children and settings, and/or yield even stronger positive effects.

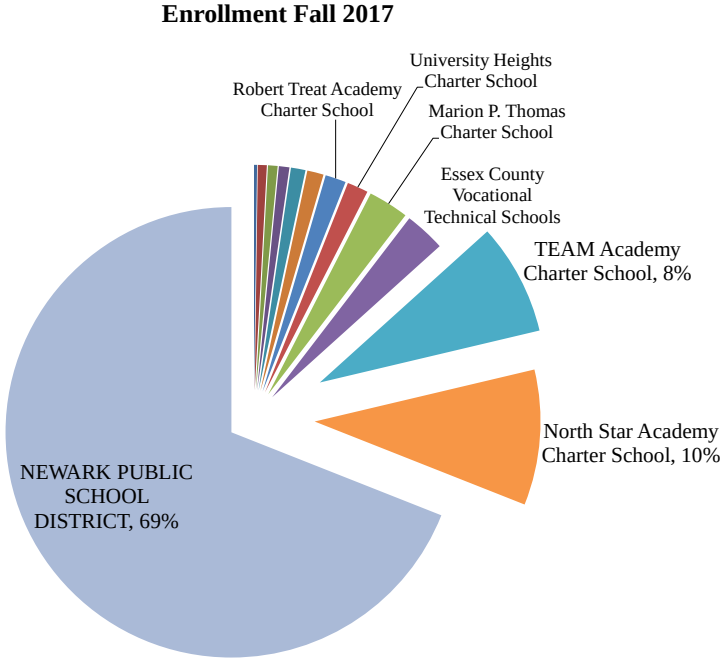
The conclusion offered in the reports is that shifting students to higher value-added schools has yielded positive growth in language arts. And thus, the logical policy conclusion is that more students should be shifted to high value-added schools. The larger the share of students placed in these schools, the higher the overall system performance will be. This may be an oversimplification, but is certainly the message that some are taking home from the reports.[18]

Figure C1 shows the present distribution of students across district and charter schools within the city of Newark. One might characterize the system as housing 3 separate K-12 school districts with a handful of smaller operators of select grade-level schools. The three comprehensive districts in question are NPS, TEAM and North Star. Analyses in the previous section (setting aside the scale question) suggest that TEAM and NPS perform similarly and that North Star tends to be the higher producer of student growth. Thus, the assertion would be that if we shift more students into North Star, more students should be better off and the system as a whole should produce better outcomes on average.

Thus the "between-school" treatment here is essentially defined as "North Starring" more students. But what exactly does that mean? Here, we attempt to provide some relevant context. Our intent is to separate the treatment of "North Starring" into those actions district leaders and policymakers might take which are desirable and scalable, versus those practices and conditions that are likely to be influencing measured outcomes but may not be scalable or desirable.

FIGURE C1

DISTRIBUTION OF DISTRICT AND CHARTER SCHOOL ENROLLMENTS IN NEWARK 2017



Source: New Jersey Department of Education, Enrollment files, 2016-17.
http://www.state.nj.us/education/data/enr/enr17/

Student Population Differences

Unfortunately, a consistent feature of North Star Academy over time has been the tendency to serve and retain less needy student populations than the broader population in the district as well as other charter operators including TEAM. Neither TEAM nor North Star serve many children with severe disabilities, but North Star serves very few with disabilities of any degree of severity. The reports' analysis fails to parse severity of disability – its influence on individual student growth, the potential peer effects of the presence of children with severe disabilities, or the extent to which larger shares of children with severe disabilities create resource allocation constraints and pressures in schools. This is a substantial omission, but one which could not be remedied given the lack of data precision.

North Star has also consistently served proportionally fewer of the lowest income children. Again, the reports' analysis fails to parse income levels across children, using only indicators of children qualified for either free or reduced priced lunch. We provide illustrations in this section demonstrating why this matters.

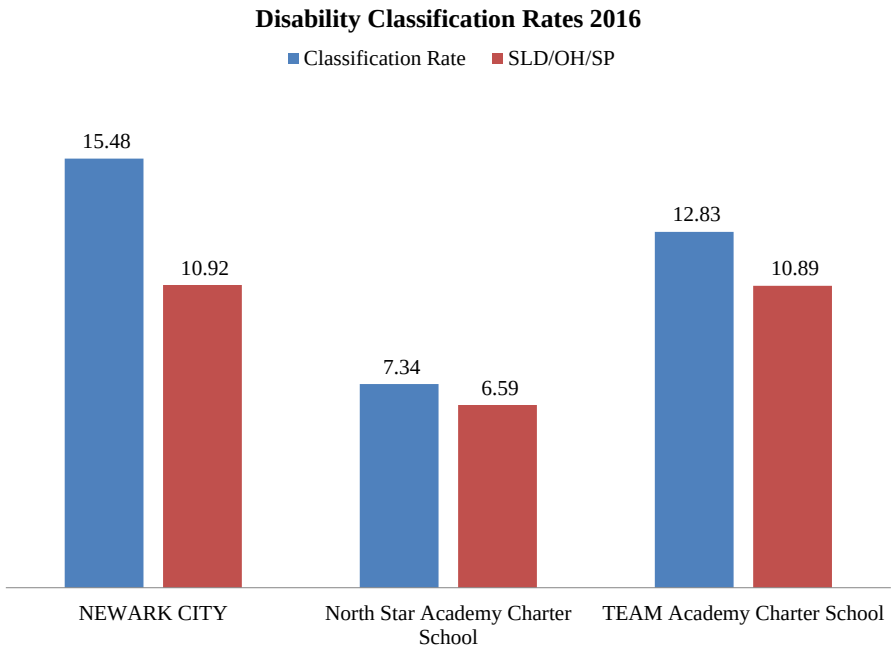
North Star serves effectively no children with limited English language proficiency, in part because North Star caters to a predominantly black student population from Newark's black neighborhoods, which remain geographically segregated from the city's Hispanic and other ethnic neighborhoods and are home to non-English speaking families.

Special education rates

We start with disability rates based on 2016 data, which are actually more similar across the three Newark districts than prior years during the period studied. Figure C2 shows the overall percent classified and percent with mild specific learning disability, other health impairment, or speech/language disability. Newark Public Schools has an overall rate higher than either of the other two and more than double that of North Star. The vast majority of children with disabilities in North Star have relatively mild and less-costly disabilities. The case is similar for TEAM. Notably, TEAM and NPS have similar rates of mild disability students, but NPS has far more severe disability students.

This finding actually serves to rebut a common argument of charter advocates regarding their lower disability classification rates. Charter advocates frequently assert that effective early grades interventions reduce their need to classify students with disabilities.[19] But even the most effective interventions would only be successful at reducing the number of children identified as having mild specific learning disabilities – children on the margins of classification. Interventions would be far less likely to reduce classification of children with traumatic brain injury, intellectual disability, emotional disturbance, or autism. It is those more severe and costly disabilities which are more prevalent in the NPS schools. Whether valid in other settings or not, this argument is unlikely to hold for differences in special education classification rates between NPS and TEAM Academy.

FIGURE C2



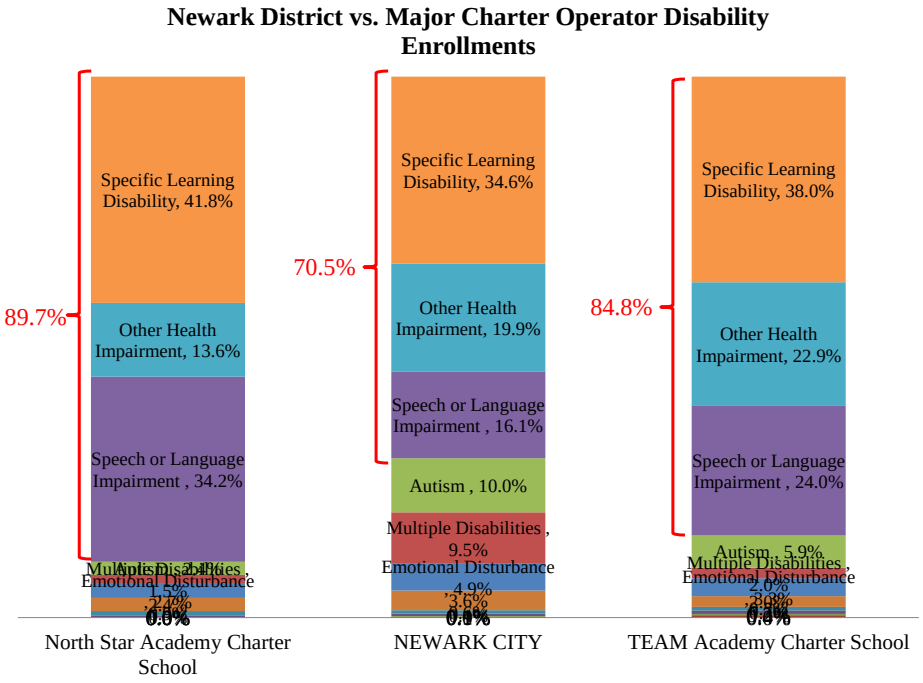
NJDOE Special Education Classification Rates:
http://www.nj.gov/education/specialed/data/2016/LEA_Classificatiom.xlsx

Figure C3 provides a more detailed breakdown, revealing that a very large share of North Star's disability population are children with Speech/Language impairment, and no particular cognitive,

behavioral, or other severe impairment which would either divert more substantial shares of resources or directly influence student achievement growth.

Most analyses of Newark district and charter school performance, matching on or controlling for disability status in the aggregate, presume that these children in North Star are equivalent to children with far more severe disabilities in NPS. Some studies specifically find that children with disabilities in charter schools show greater gains than children with disabilities in district schools.[20] In this case (and most other contexts we've studied), such a finding – applying a single measure of "disability" – would be spurious, in that obviously children with only speech language impairment on average would achieve greater growth on standardized assessments than children with multiple and severe learning disabilities.

FIGURE C3



NJDOE Special Education Classification Rates:
http://www.nj.gov/education/specialed/data/2016/LEA_Classificatiom.xlsx

To summarize, these disability population differences alone, which go unmeasured when using a single "has disability" dummy variable, affect:

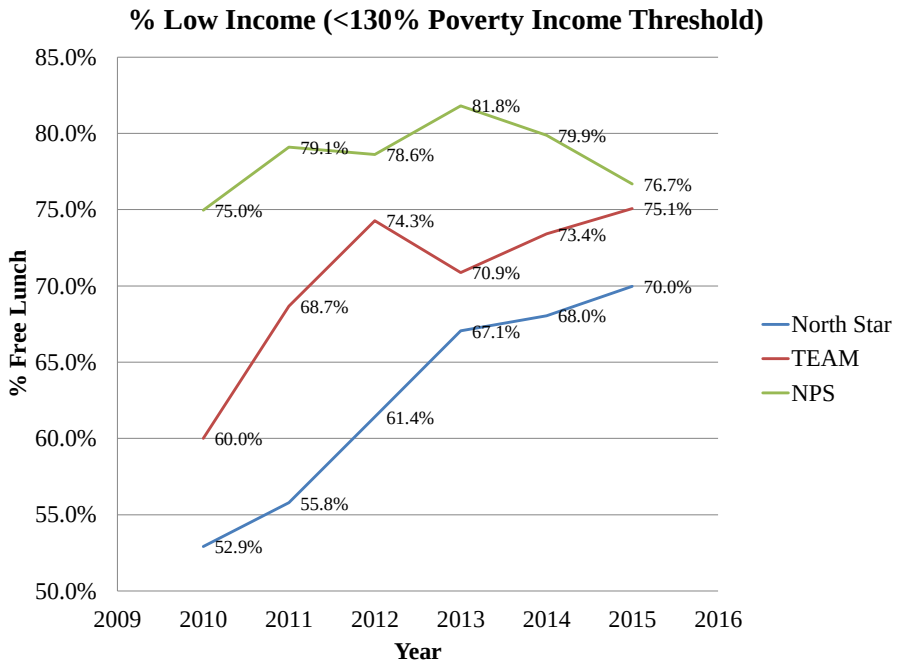
- relative growth between charter and district school students,
- the nature of peer groups (proportions of marginal vs. more severe disability students integrated into regular classrooms could affect the pace of the curriculum and disruptions in classroom time, which likely would affect growth),
- the extent to which higher need student populations create resource pressures and drive reallocation away from "general education" students.

While on the one hand these population differences raise questions regarding assumptions about the effectiveness of North Star Academy, they also raise questions about the scalability of "North Starring" and its effects on the system as a whole, even if North Star is particularly effective with the students that it does serve and retain. The more non-disabled students a single large district in the city enrolls, the more disabled students the other districts will have to serve.

Low income concentrations

During the "reform" period under study, substantive differences in the shares of children qualified for "free" lunch existed. These gaps have been closing in recent years; however, North Star continues to serve a smaller share of children who fall below the 130% income threshold for poverty than either TEAM or NPS.

Figure C4



NJDOE Staffing files, 2009-2016.

The Chin et al. study compares students only on the basis of "free + reduced" priced lunch. Single dummy variables on free and reduced-price lunch are relatively meaningless in a context where nearly all children fall below the higher threshold (less than 185 percent of the income poverty level). In fact, those qualified for reduced price lunch are among the more relatively "advantaged" students in the district and schools with higher shares of those students tend to have higher average scale scores.

Table C1 shows the correlations between percent free lunch, percent reduced-price lunch, percent free and reduced-price lunch, and growth and scale score outcome measures across Newark Schools, including district and charter schools. To summarize:

- Percent free lunch has a small negative correlation with growth percentiles and a large negative correlation with scale scores.
- Percent reduced lunch is *positively* correlated with growth and strongly *positively* correlated with scale scores.
- Percent free and reduced-priced lunch is only modestly negatively correlated with scale scores.

This is because those students from families between the 130% and 185% income threshold for poverty happen to be the more "advantaged" students in this high-poverty, urban setting. That is, at the school level, percent free and reduced-priced lunch tells us little about the "risk" of low performance largely because nearly all children in Newark fall below the 185% income threshold for poverty. In addition, it is likely that a substantial number of those who are not identified as qualifying for either in fact do qualify, yet are not listed as such because their families did not apply.

By extension, using a single dummy indicator as a covariate in student (or school) level analysis that assumes nearly all Newark students are socioeconomically identical to one another **will lead to specious findings.** Because shares of lower income children vary systematically by sector – between NPS and charters – those conclusions will be biased in favor of charters generally, and North Star specifically. While North Star has shown impressive unconditional growth, it has continued to serve fewer of the poorest children in the city. TEAM also served fewer of the poorest children throughout the period studied.

TABLE C1

CORRELATIONS BETWEEN GROWTH, ACHIEVEMENT LEVEL AND LOW INCOME POPULATIONS IN NEWARK (2016)

	LAL SGP	Math SGP	PARCC Math 8	PARCC ELA 8	% Free	% Reduced
LAL SGP	1					
Math SGP	0.5807*	1				
PARCC Math 8	0.3758*	0.4686*	1			
PARCC ELA 8	0.4836*	0.4465*	0.9043*	1		
% Free	-0.0984	-0.0734	**-0.3890***	**-0.5052***	1	
% Reduced	**0.3440***	**0.3817***	**0.6602***	**0.8062***	-0.1233	1
% Free or Reduced	0.0444	0.0779	-0.1638	-0.223	0.9348*	0.2373

In addition to compromising validity of high versus low value-added findings, the tendency of between-school mobility to sort students by income status raises scalability concerns. Put bluntly: as one school/district in a high poverty "choice" space serves more of the less-poor (among the poor) students, others must pick up the difference. Concentrating higher-poverty populations in specific schools potentially creates negative peer effects that are not picked up when using test score histories as measures of peer characteristics.

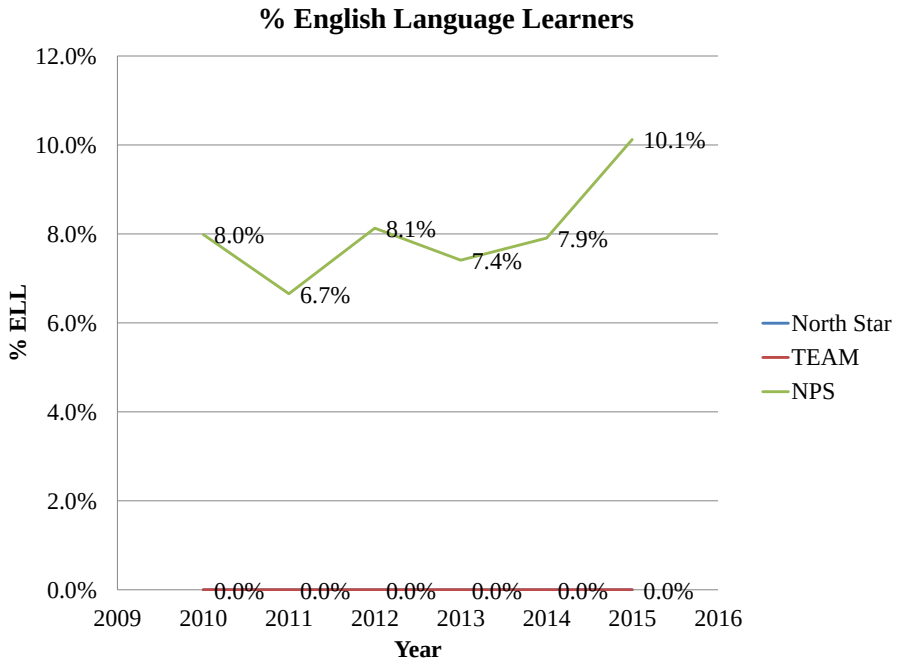
English Language Learners

Figure C5 shows that among the three districts in Newark, only NPS serves any children with limited English language proficiency. As about 10% of the NPS population is LEP/ELL, this, again, raises

questions about scalability. The more that charters in the space serve non-LEP/ELL children, the more LEP/ELL children are concentrated in the district schools. As with poverty and disability, it is also desirable to have access to more fine-grained data on the level of language proficiency.

FIGURE C5

THERE REMAIN LARGE DIFFERENCES IN SHARES OF ENGLISH LANGUAGE LEARNERS SERVED



New Jersey Department of Education School Enrollment Files: http://www.nj.gov/education/data/enr/

Cohort Attrition Rates

Figure C6 and Figure C7 track cohort attrition rates for three sequential cohorts attending TEAM and North Star. Figure C6 shows the total cohort enrollments and Figure C7 shows the cohort enrollments for black male students. Figure C8 shows the average ratio of the 12th grade enrollment to the 7th grade enrollment of the same cohort of students.

FIGURE C6

SEVENTH GRADE COHORTS, YEAR AFTER YEAR, ARE REDUCED BY 25 TO 40% AS THEY MATRICULATE TO 12TH GRADE

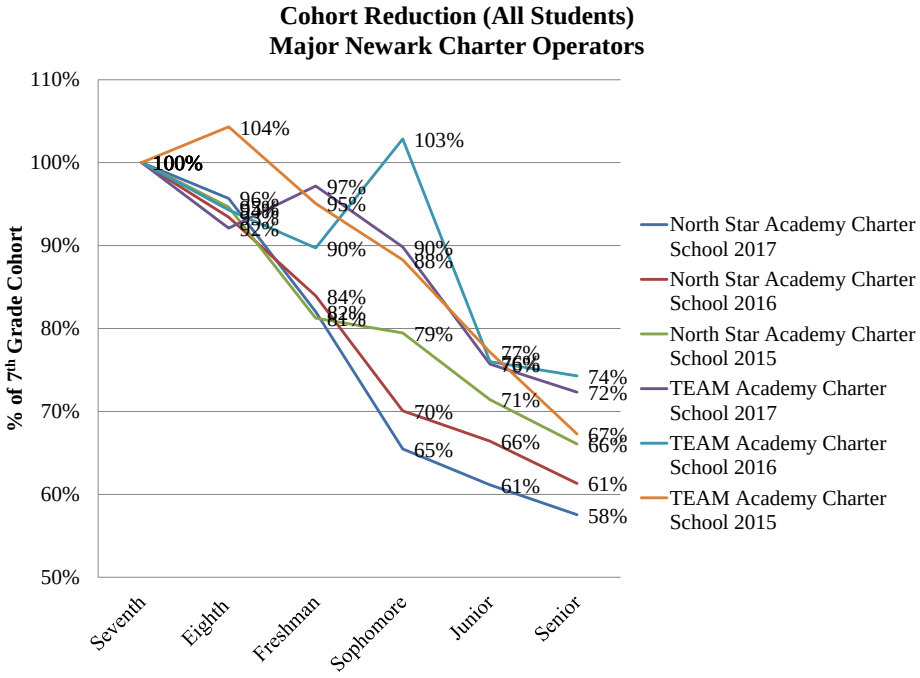
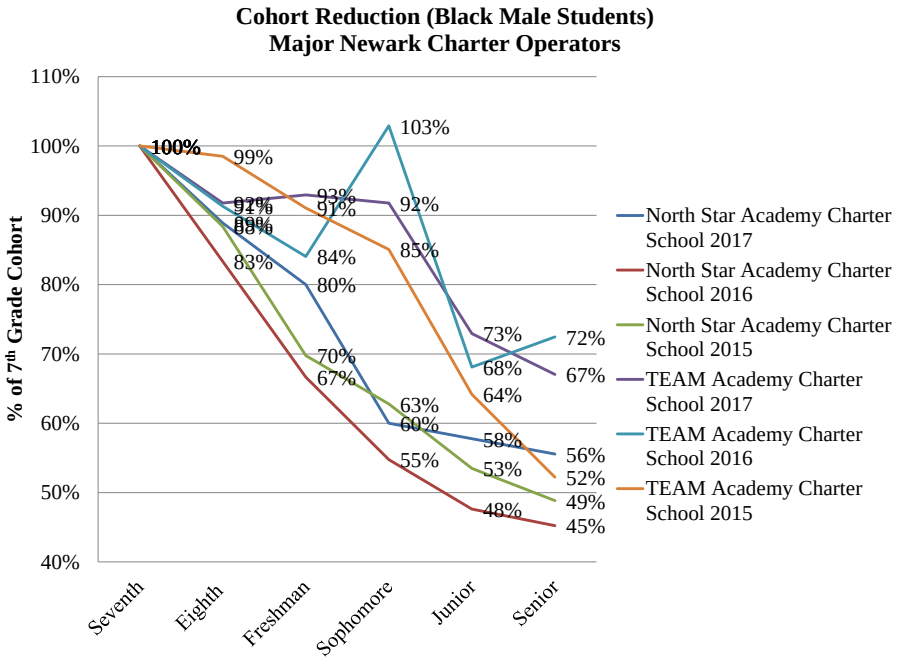


FIGURE C7

SEVENTH GRADE COHORTS OF BLACK BOYS, YEAR AFTER YEAR, ARE REDUCED BY 28 TO 65% AS THEY MATRICULATE TO 12TH GRADE

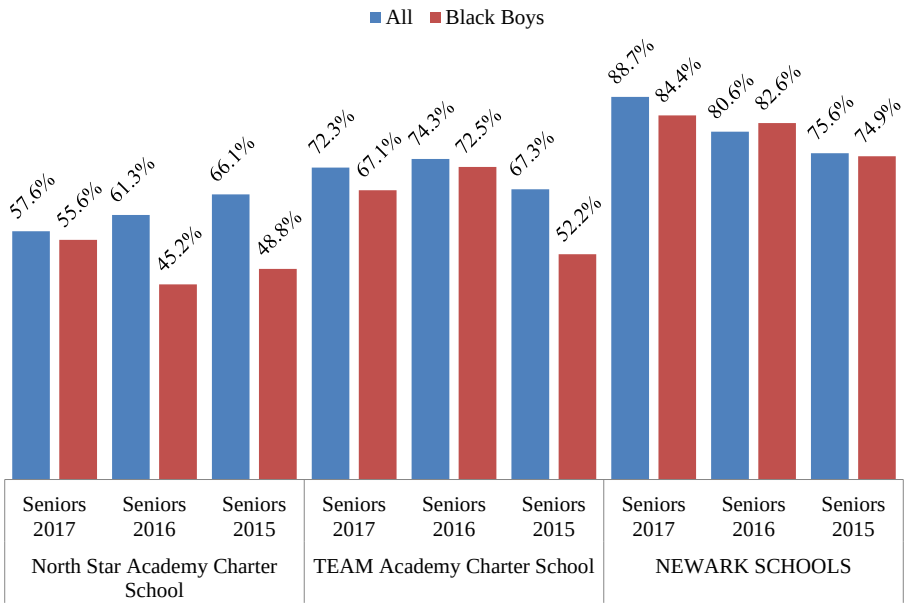


New Jersey Department of Education School Enrollment Files: http://www.nj.gov/education/data/enr/

FIGURE C8

COHORT PROGRESSION RATES ARE MUCH HIGHER FOR NEWARK PUBLIC SCHOOLS THAN FOR TEAM AND NORTH STAR

Senior Cohort as a Percent of 7th Grade Cohort (2015 – 2017)



New Jersey Department of Education School Enrollment Files: http://www.nj.gov/education/data/enr/

Certainly much can go on between 7th and 12th grade which affects these cohort enrollments. Students can be held back, boosting the prior grade in the subsequent cohort. Cohort reduction might be mitigated by what is called "back-filling" – admitting new students to fill the spaces of students who leave. Also, after 8th grade, some students may choose to leave for other schools, including selective magnet or private schools.

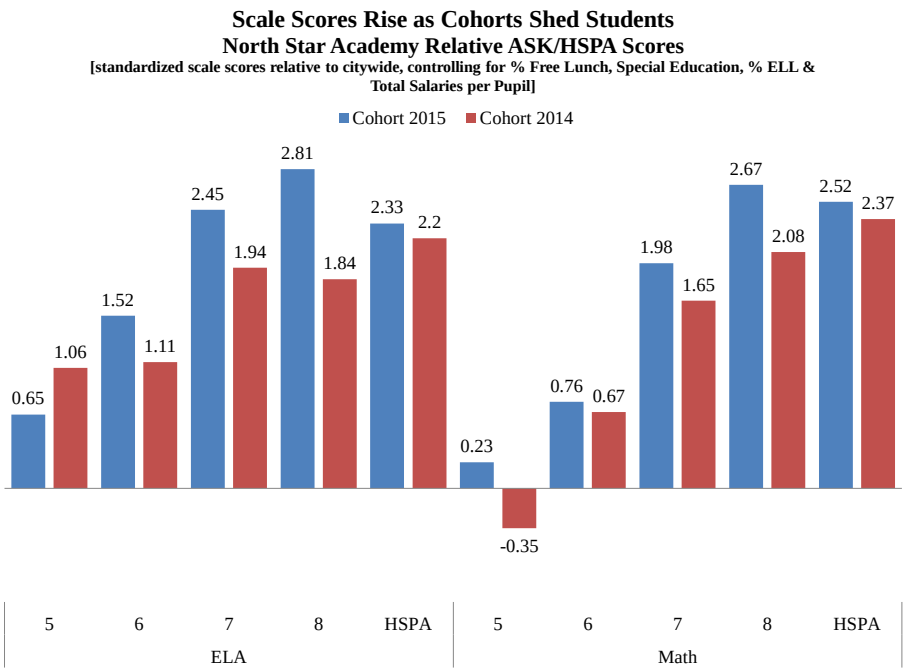
However, if a cohort by 12th grade is substantively smaller than it was in 7th grade, the most likely explanation is that students have left. This cohort attrition might include those who were pushed out and/or counseled out due to behavior or low academic performance, as well as those leaving for private and magnet schools. If the former is true (weaker and "problem" students leaving), we would expect cohort test scores to go up. If, however, the latter is true (students qualified for selective schools leaving), we might expect cohort test scores to go down. Figure C9 addresses this issue.

These figures show that both North Star and TEAM have significant cohort reduction between 7th and 12th grade for all students and even more so for black boys. Senior cohorts of black boys in North Star are half or fewer than the 7th grade cohort.

Figure C10 shows that, perhaps in part due to the attrition of black boys over time, these schools also tend to be majority female. As a result, Newark district schools are majority male.

FIGURE C9

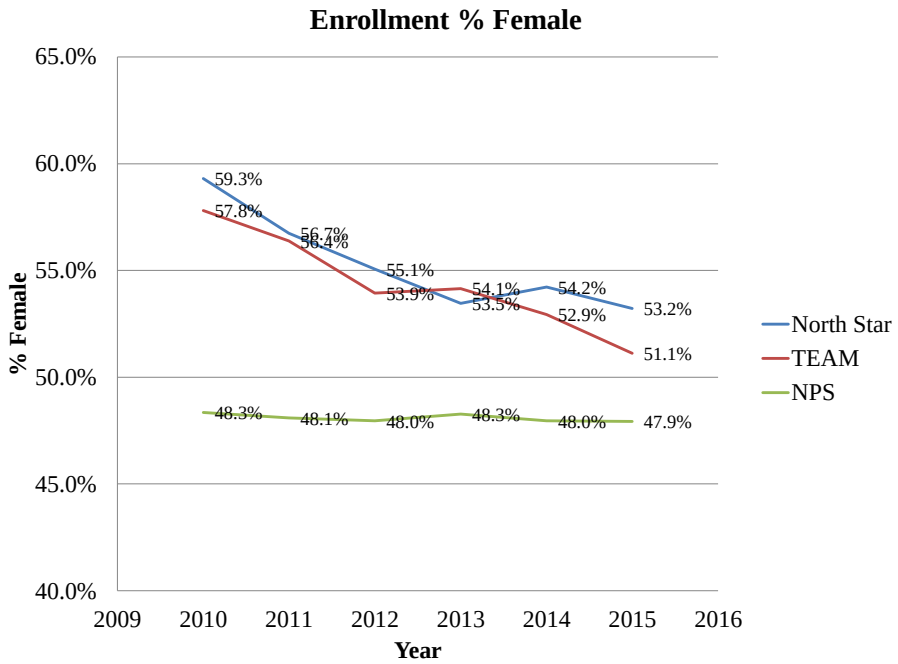
SCALE SCORES OF COHORTS THROUGH PROGRESSION/ATTRITION



New Jersey Department of Education School Enrollment Files: http://www.nj.gov/education/data/enr/
Statewide Assessment Reports: http://www.state.nj.us/education/schools/achievement/index.html

FIGURE C10

LARGE CHARTER SCHOOLS CONTINUE TO SERVE PREDOMINANTLY FEMALE POPULATIONS, PERHAPS AS A RESULT OF SHEDDING BLACK MALE STUDENTS

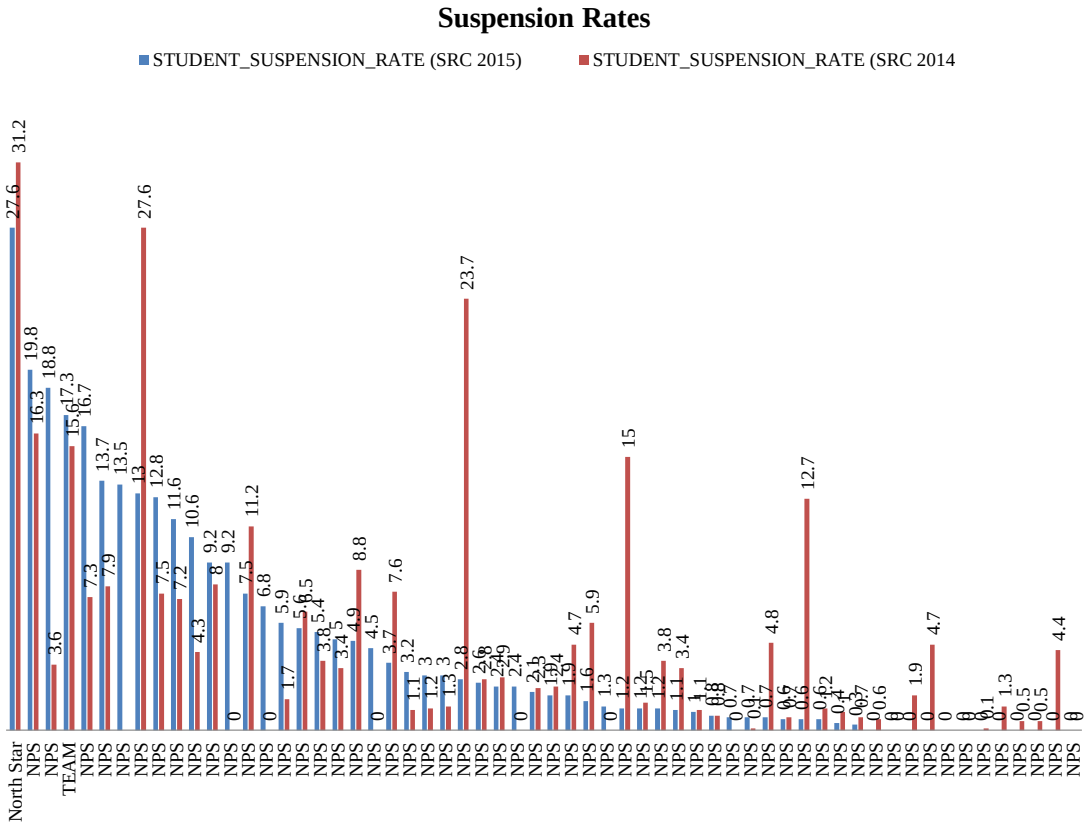


New Jersey Department of Education School Enrollment Files: http://www.nj.gov/education/data/enr/

Finally, along with very high attrition rates for black boys, North Star and TEAM Academy continue to have very high student suspension rates. As Figure C11 shows, North Star suspends 30 percent of students year after year.

FIGURE C11

NORTH STAR AND TEAM ACADEMY CONTINUE TO HAVE AMONG THE HIGHEST SUSPENSION RATES IN THE CITY OF NEWARK (SORTED BY 2015 RATE)



New Jersey Department of Education School Report Cards/ School Climate: https://rc.doe.state.nj.us/ReportsDatabase.aspx

As a matter of policy preferences for moving forward, these findings raise concerns. Again, the most prominent conclusion from the reports is that citywide gains are achieved by moving more children into high value-added schools, where the largest of those schools – a district within the district - is North Star. North Star's value-added, however, is achieved at least in part (if not in majority) by:

- not serving children with disabilities generally and serving no children with severe disabilities;
- serving very few lower-income children,
- serving no ELL children;
- having very high attrition generally, and 50% or greater attrition of black boys between 7th and 12th grade; and

- suspending large shares of children year after year.

Having studied these schools year-after-year for nearly a decade, we are confident that these factors taken together are a "feature" and not a bug when it comes to North Star, and remain a feature, though to a lesser extent, in TEAM Academy. These factors are not captured in the reports' analysis. Yet they a) limit the validity of assertions that North Star in particular could be a high value-added school for the general population and b) raise serious concerns regarding policies that would attempt to shift more students to North Star, or schools like it, without first addressing these issues.

Paying teachers more to work more hours and days

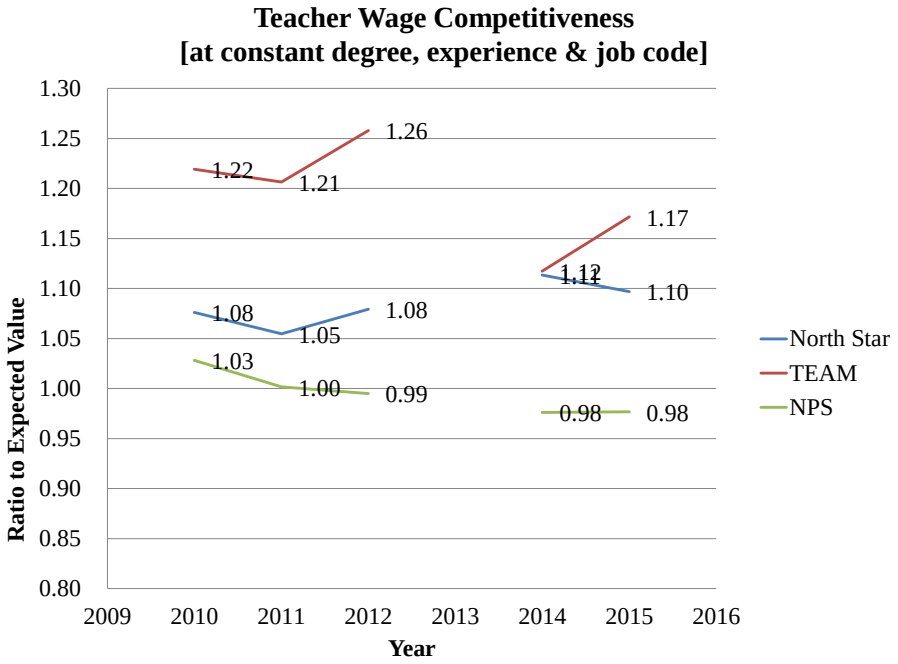
Here, we address other features of North Star and TEAM as they relate to the host district. These "resource" features may provide more relevant policy insights to the extent that they contribute, in part, to student achievement gains. Resources are legitimately manipulable and scalable features of school systems – at least more so than student sorting by disability and poverty, and selective attrition. Isolating the extent to which these resource factors relate to achievement gains, however, is difficult in the context of these other factors.

Among other things, North Star and TEAM Academy operate longer days (over 8 hours, compared to 6 to 7 for NPS schools, according to state report cards) and longer school years. Figure C12 shows that, on average, teachers in these schools are paid higher wages at similar experience and degree level for this additional time commitment. Teachers in TEAM Academy are paid as much as 20 percent more for their time, compared to teachers with similar characteristics in similar job positions throughout Essex County. Teachers in North Star Academy are paid about 10 percent more. Meanwhile, the relative competitiveness of teacher wages for NPS teachers has slipped below the wage for comparable teachers countywide.

The relevant policy question is: to what extent is this specific investment in teacher wages, for additional time, contributing to the higher value-added at North Star? These differences – time and money – are clearly part of the "treatment" which results from shifting kids from district schools to these two charter operators in particular. Yet this feature of differential treatment between district and charter schools was not addressed in the reports.

FIGURE C12

HIGHER PAY FOR LONGER DAYS AND MORE DAYS



NJDOE Staffing files, 2009-2016.

Relying Heavily on Novice Teachers

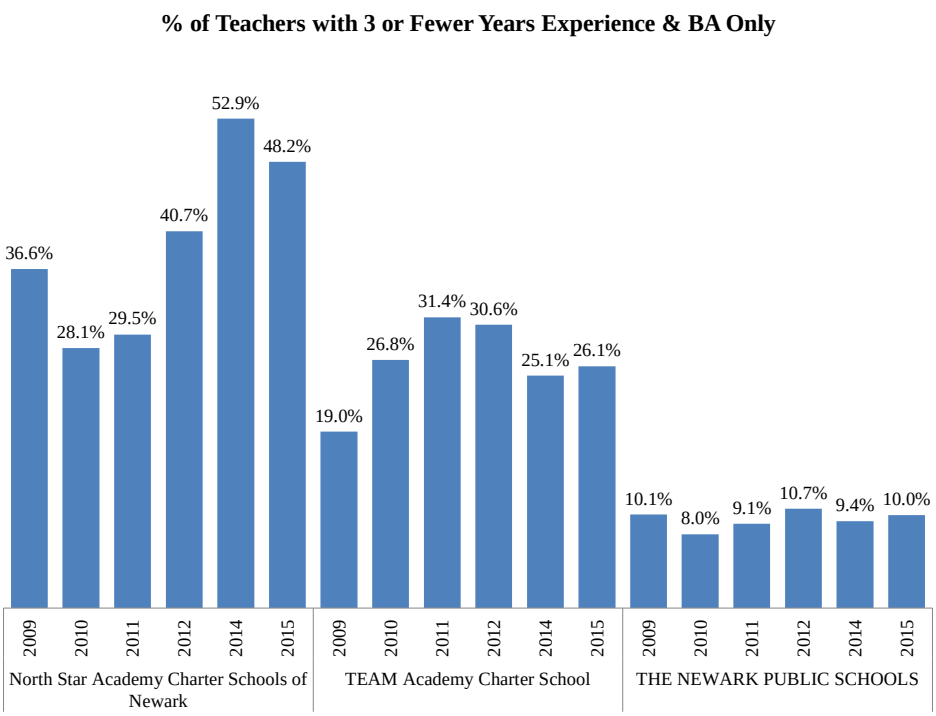
Given the relatively higher wages at TEAM and North Star and the schools' commitment to providing longer days and years, one must question how these schools can keep their ongoing total labor costs under control and sustainable over time. That is, can labor costs be managed in the long run, at even larger scale, while providing 10 to 20 percent compensation increases to support additional contractual time commitments?

Figure C13 provides one answer to how TEAM and North Star have kept their total labor costs in check. These schools maintain staffs with very high shares – up to half – of teachers having three or fewer years of experience. At those experience levels, they are paid more than they would be in the district or elsewhere around the county; however, their average salaries are lower because of their inexperience. TEAM's teaching staff is substantially less novice than is North Star's teaching staff.

One explanation for the large shares of novice teachers in these schools is that they have expanded year after year and have needed new teachers. However, the question remains whether these schools can maintain their approach of longer days and years for higher pay if these teachers stick around and become more expensive over time. If the model depends on continued turnover to keep spending under control, it may not remain sustainable, especially as it is brought to scale.

FIGURE C13

HEAVY RELIANCE ON NOVICE TEACHERS



NJDOE: Staffing files, 2009-2016.

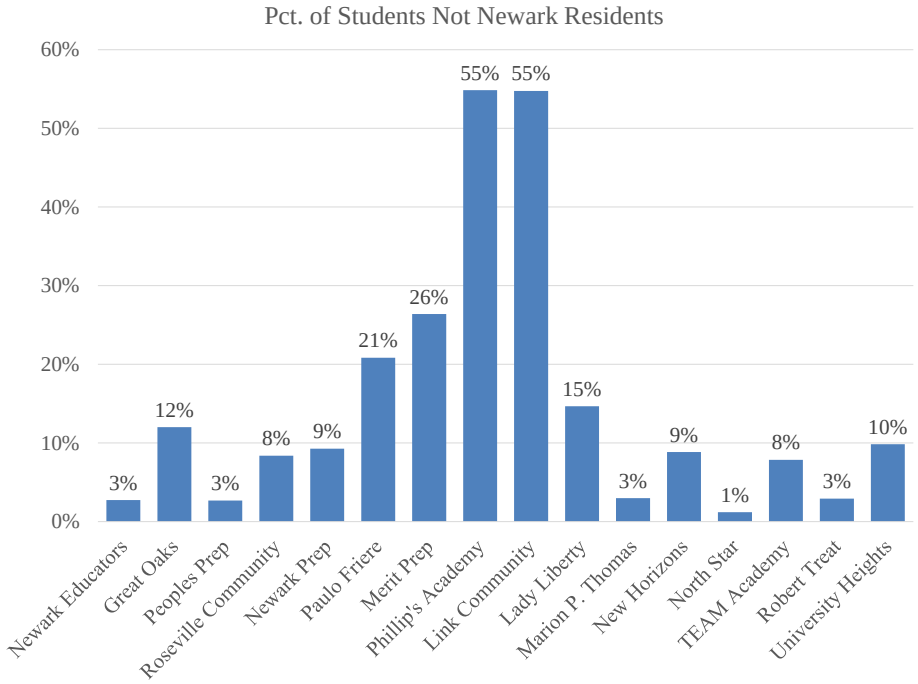
Out-Of-District Peers

According to state records, a substantial portion of Newark's charter school students are not residents of the district. In New Jersey, charter school funding comes from the district where charter students reside. We use the state's charter aid notices[21] to those districts to calculate the percentages of students who reside outside of the district. In total, 8 percent of Newark's charter school students are not residents of the city.

Figure C14 shows the percentages of non-resident students by individual charter school. Over half of the student population at two of Newark's charters do not reside in the city. Notably, 8 percent of TEAM/KIPP's students are not Newark residents, while North Star has the highest proportional enrollment of students living in Newark.

It is likely that students who have the ability to travel to another district have unobserved differences in their personal characteristics compared to students who cannot travel. This creates a potential bias in estimates that are derived from comparing non-resident charter students to resident NPS students.

FIGURE C14



NJDOE, FY17 Charter School State Aid Notices.

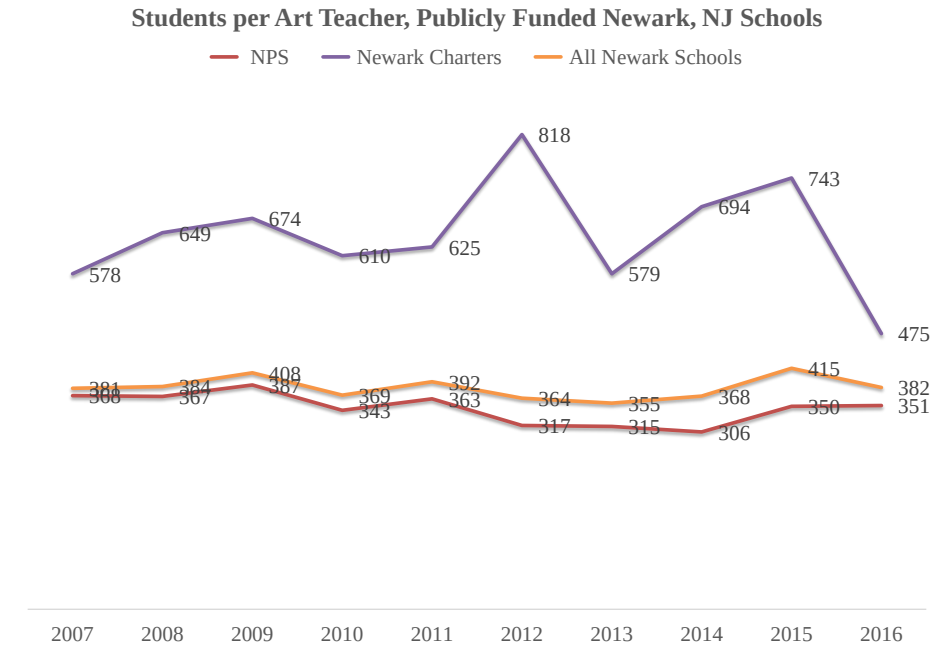
Staff Certifications and Curricular Narrowing

Programs in the arts, physical education, social studies, science, and other "non-tested" subjects require teachers who are certificated in those domains. To the extent that one school has fewer teachers (proportional to student enrollment) with a particular certification than another, we would assume that school offers less extensive programming within that certifications aligned field of study. Put simply: a school with more art teachers per 100 students will likely have more offerings in the arts.

We present here several graphs that show, over a ten-year period, how the Newark charter sector differs from the NPS district in how many teachers in particular subject areas are deployed. Our measure is "student loads": the number of students each teacher certificated in a particular subject would have to teach if the students were all divided evenly among teachers.

Figure C15, for example, shows the student load for art teachers[22] in NPS schools, the charter sector, and all publicly funded Newark schools combined. In every year, art teachers in charter schools have much greater student loads than in NPS. While not definitive proof, this deployment of staff may indicate that charters do not offer coursework in art that is as extensive as NPS schools.

FIGURE C15



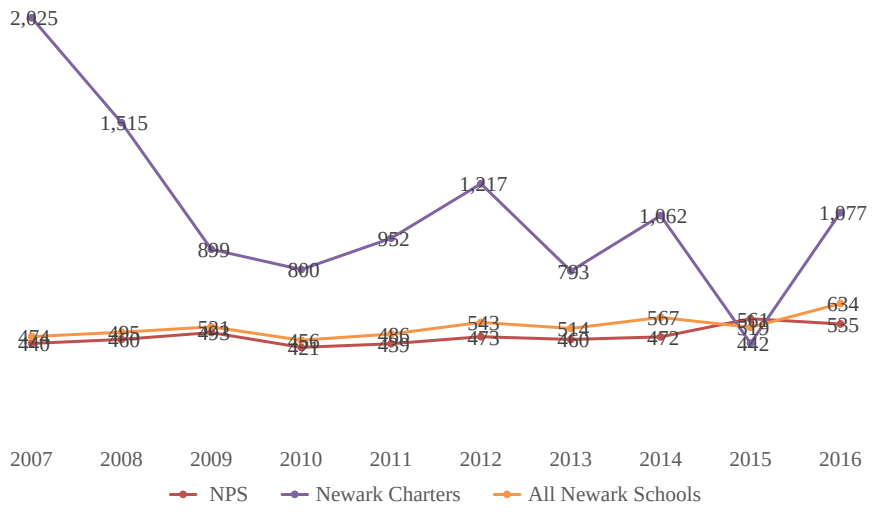
Data source: Staffing and Enrollment files, NJDOE.

While this data does show significant volatility in the charter schools, the general trend across the past decade has been that Newark charter schools do not have as many staff per student in a variety of non-tested subjects.

One caution: part of the disparity in staff may be due to differences in grade enrollments. If charters, for example, enroll a smaller proportion of high school students, they may have less need for teachers with social studies certifications. We have begun a preliminary investigation into this possibility. As of now, we do not find that the percentage of Grade 9 to 12 students in a school fully explains the difference between NPS and charter schools. Further analysis, however, may yield different results.

FIGURE C16

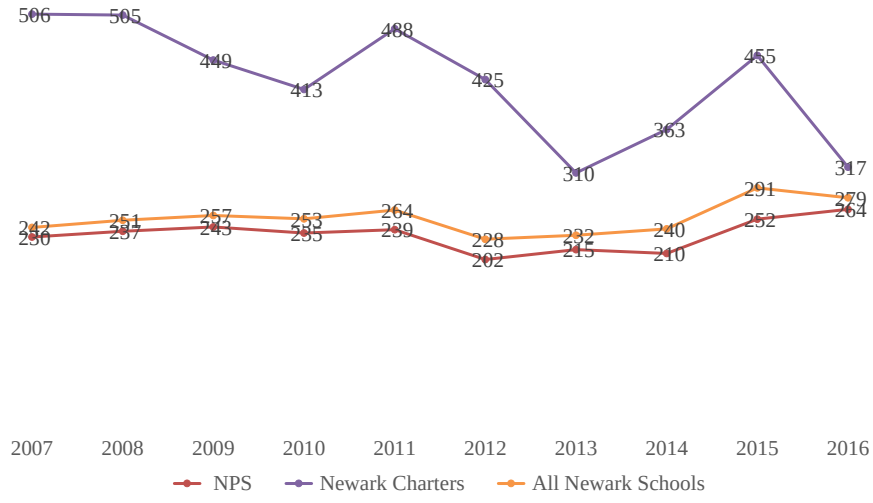
Students per Music Teacher, Publicly Funded Newark, NJ Schools



Data source: Staffing and Enrollment files, NJDOE.

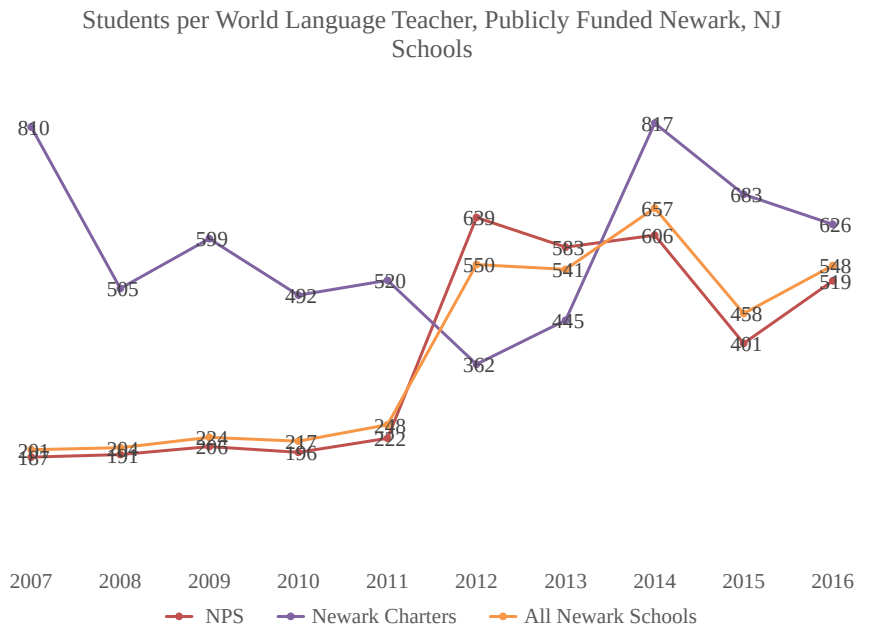
FIGURE C17

Students per Health & PE Teacher, Publicly Funded Newark, NJ Schools



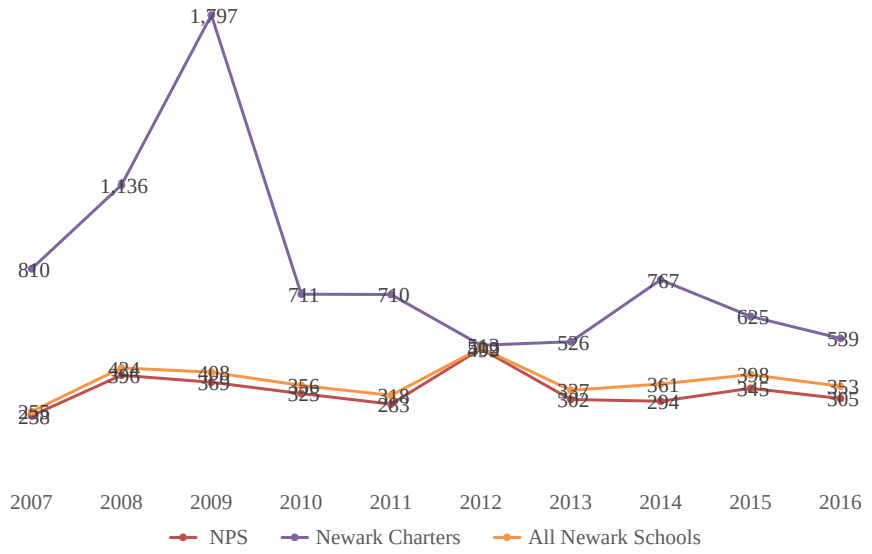
Data source: Staffing and Enrollment files, NJDOE.

FIGURE C18



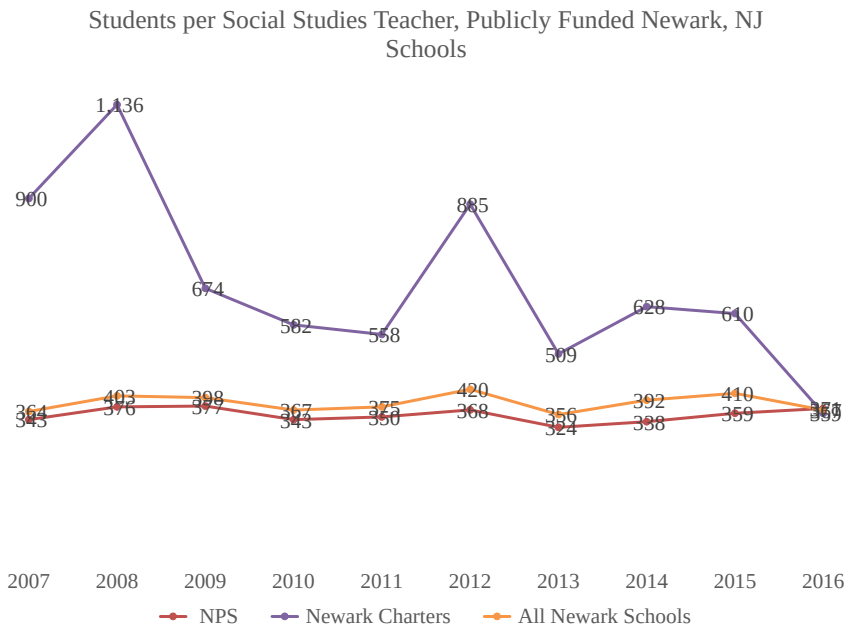
Data source: Staffing and Enrollment files, NJDOE.

FIGURE C19



Data source: Staffing and Enrollment files, NJDOE.

FIGURE C20



Data source: Staffing and Enrollment files, NJDOE.

Previous Research on Newark Schools

Baker, B. (2016, November 30). *Exploring the consequences of charter school expansion in US cities.* Washington, DC: Economic Policy Institute. Retrieved from http://www.epi.org/publication/exploring-the-consequences-of-charter-school-expansion-in-u-s-cities/

Baker, B. D., & Weber, M. A. (2016). *On the Relative Efficiency of New Jersey Public School Districts.* New Brunswick, NJ: NJ Education Policy Forum. Retrieved from https://njedpolicy.wordpress.com/2016/08/02/on-the-relative-efficiency-of-new- jersey-public-school-districts/

Weber, M.A. (2016). *New Jersey Charter Schools: A Data-Driven View, Part II - Finances and Staffing.* Princeton, NJ: Daniel Tanner Foundation. Retrieved from http://www.saveourschoolsnj.org/nj-charter-school-data/

Baker, B. & Miron, G. (2015). *The Business of Charter Schooling: Understanding the Policies that Charter Operators Use for Financial Benefit.* Boulder, CO: National Education Policy Center. Retrieved from http://nepc.colorado.edu/publication/charter-revenue

Baker, B. D., & Weber, M. A. (2015). *Research Note: On Average, Are Children in Newark Doing Better?* New Brunswick, NJ: NJ Education Policy Forum. Retrieved from https://njedpolicy.wordpress.com/2015/11/15/research-note-on-average-are- children-in-newark-doing-better/

Weber, M.A. (2015). *The (Mis-)Use of Data in Dale Russakoff's "The Prize."* New Brunswick, NJ: NJ Education Policy Forum. Retrieved from https://njedpolicy.wordpress.com/2015/09/21/the-mis-use-of-data-in-dale- russakoffs-the-prize/

Weber, M.A. (2015). *One Newark: Choosing "Great" Schools, or Merely Segregated Ones?* New Brunswick, NJ: NJ Education Policy Forum. Retrieved from https://njedpolicy.wordpress.com/2015/04/24/one-newark-choosing-great- schools-or-merely-segregated-ones/

Weber, M.A. (2015). Empirical Critique of "One Newark": First Year Update. Presented to the NJ Legislature's Joint Committee on the Public Schools, March 11, 2015.

NJ Education Policy Forum. Retrieved from https://njedpolicy.wordpress.com/2015/03/12/empirical-critique-of-one-newark-first-year-update/

Weber, M.A. (2014). *Buyer Beware: One Newark and the Market For Lemons*. New Brunswick, NJ: NJ Education Policy Forum. Retrieved from https://njedpolicy.wordpress.com/2014/05/23/buyer-beware-one-newark-and-the- market-for-lemons/

Baker, B. D., & Weber, M. A. (2014). *An Empirical Critique of "One Newark."* New Brunswick, NJ: NJ Education Policy Forum. Retrieved from https://njedpolicy.wordpress.com/2014/01/24/new-report-an-empirical-critique- of-one-newark/

Baker, B. D., & Weber, M. A. (2014). *A Response to "Correcting the Facts about the One Newark Plan: A Strategic Approach To 100 Excellent Schools."* New Brunswick, NJ: NJ Education Policy Forum.

Retrieved from https://njedpolicy.wordpress.com/2014/03/24/a-response-to-correcting-the-facts-about-the-one-newark-plan-a-strategic-approach-to-100-excellent-schools/

Weber, M.A. (2014). *New Jersey Charter Schools: A Data-Driven View, Part I - Enrollments and Student Demographics.* Princeton, NJ: Daniel Tanner Foundation. Retrieved from http://www.saveourschoolsnj.org/nj-charter-school-data/

NOTES

[1] Chin, M. J., Kane, T. J., Kozakowski, W., Schueler, B. E., & Staiger, D. O. (2017). School District Reform in Newark: Within-and Between-School Changes in Achievement Growth (No. w23922). National Bureau of Economic Research.

[2] Chin, M. J., Kane, T. J., Kozakowski, W., Schueler, B. E., & Staiger, D. O. (2017). School District Reform in Newark: Within-and Between-School Changes in Achievement Growth (No. w23922). National Bureau of Economic Research.

[3] NBER, Figure 1.

[4] Education Law Center (n.d.) The history of Abbott v. Burke. Newark, NJ: Education Law Center. Retrieved from http://www.edlawcenter.org/cases/abbott-v-burke/abbott-history.html

[5] Baker, B. (2016, November 30). Exploring the consequences of charter school expansion in US cities. Washington, DC: Economic Policy Institute. Retrieved from http://www.epi.org/publication/exploring-the-consequences-of-charter-school-expansion-in-u-s-cities/

[6] Baker, B.D. (2011, October 22), Thoughts on improving SFRA [Blog post]. Retrieved from https://schoolfinance101.wordpress.com/2011/10/22/thoughts-on-improving-the-school-funding-reform-act-sfra-in-nj/

[7] Baker, B. D. (2014). Evaluating the recession's impact on state school finance systems. *Education Policy Analysis Archives/Archivos Analíticos de Políticas Educativas*, *22*.

[8] Baker, B.D. (2011, May 24) Demystifying Today's Abbott Decision [Blog post]. Retrieved from https://schoolfinance101.wordpress.com/2011/05/24/demystifying-today%e2%80%99s-abbott-decision/

[9] Baker, B. (2016, November 30). Exploring the consequences of charter school expansion in US cities. Washington, DC: Economic Policy Institute. Retrieved from http://www.epi.org/publication/exploring-the-consequences-of-charter-school-expansion-in-u-s-cities/

[10] Rinde, M. (2016, May 17) Explainer: Getting the facts on funding for NJ's charter schools. Retrieved from http://www.njspotlight.com/stories/16/05/16/explainer-getting-the-facts-on-funding-for-nj-s-charter-schools/

[11] We note here that Camden moved to universal free lunch enrollment in September of 2014; see: http://www.camden.k12.nj.us/UserFiles/Servers/Server_340793/File/Migrate/Divisions/Division_of_E/Press_Room/News_Archives/20142015/14_Camden_schools_to_provide_free_breakfast_and_lunch_for_all_District_students.pdf As a consequence, the publicly reported FRPL percentage has decreased in recent years, as families have no need to fill out forms. There is no indication in the reports that the NBER reports' VAMs used to measure achievement growth accounted for this change.

[12] Baker, B. D., Taylor, L., Levin, J., Chambers, J., & Blankenship, C. (2013). Adjusted Poverty Measures and the Distribution of Title I Aid: Does Title I Really Make the Rich States Richer?. *Education*, *8*(3), 394-417.

[13] Baker, B. D., Taylor, L., Levin, J., Chambers, J., & Blankenship, C. (2013). Adjusted Poverty Measures and the Distribution of Title I Aid: Does Title I Really Make the Rich States Richer?. *Education*, *8*(3), 394-417.

[14] NBER, p. 40.

[15] The NBER report explains in a footnote: "…we first estimated a value-added model controlling for student demographics (indicators for race/ethnicity, gender and free and reduced price lunch status), prior achievement

(including cubic polynomials of math and ELA achievement scores interacted with grade), peer covariates, district-by-year fixed effects, grade-by-year fixed effects, and interactions between our grade-by-year fixed effects and student and peer covariates." (p. 43)

[16] Baker, B. D. (2003). State policy influences on the internal allocation of school district resources: Evidence from the common core of data. *Journal of Education Finance*, *29*(1), 1-24.

[17] http://www.nj.gov/education/data/enr/

[18] See, for example: https://relinquishment.org/2017/10/23/could-newark-have-achieved-more/

[19] Winters, M. A. (2013). Why the gap? Special education and New York City charter schools. *Manhattan Institute for Policy Research and Center for Reinventing Public Education*.

Winters, M. A., Carpenter, D. M., & Clayton, G. (2017). Does Attending a Charter School Reduce the Likelihood of Being Placed Into Special Education? Evidence From Denver, Colorado. *Educational Evaluation and Policy Analysis*, 0162373717690830.

[20] See, for example, the CREDO Urban Charter Schools study: http://urbancharters.stanford.edu/download/Urban%20Charter%20School%20Study%20Report%20on%2041%20Regions.pdf This study is cited by the reports to assert that "Newark is home to one of the most effective charter sectors in the nation in terms of student growth on standardized exams" (p. 19)

[21] We thank Dr. Julia Sass Rubin of Rutgers University, Bloustein School of Planning and Public Policy, for the data.

[22] For each of the categories given, we consolidate job codes into larger categories. For example: "art teachers" include photography, ceramics, theatre/stage, dance, etc. We use the categories provided by NJDOE for guidance.