

Assessing the Effects of Place Based Scholarships on Urban
Revitalization: The Case of Say Yes to Education

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I. Introduction

Place-based scholarship programs award grants for college tuition based on residence in a specific school district or city rather than merit or need. The Kalamazoo Promise is frequently identified as the first, major place-based scholarship program, and since it was announced in 2005, place-based scholarship programs have been established in over 20 cities and districts across the country.¹ The scholarship programs are sometimes accompanied by additional educational supports for students and serve as a catalyst for community-wide efforts to improve schools.

Like other financial aid programs, placed-based scholarships seek to improve college access among groups that are underrepresented in higher education. Unlike other financial aid programs, however, place-based scholarships often explicitly include local community development goals. These programs have typically been established in central cities that have high rates of poverty and that have experienced economic decline. By offering generous educational benefits to residents, the scholarships may create an important locational advantage to these areas in efforts to attract new residents and businesses. Thus, these programs are often promoted as a potential catalyst for local economic development (Miller-Adams 2015).

This article examines the impacts of a prominent placed-based scholarship program, Say Yes to Education. Specifically, we examine changes in school enrollments and housing prices following the initiation of the Say Yes to Education program in Syracuse, New York in 2008 and in Buffalo, New York in 2012. Changes in enrollments and housing prices are indicators of the

¹ See the list compiled by Michelle Miller-Adams at the Upjohn Institute, http://www.upjohn.org/sites/default/files/promise/Lumina/Promisescholarshipprograms.pdf?_ga=1.266472014.1147411544.1394049270. The list includes 21 city- or district-wide programs, that provide substantial funding for multiple years, and that can be used at a range of colleges state- or nation-wide. At least two of those programs, New Haven Promise and Hartford Promise, use significant merit-based criteria as well as residency requirements in making awards, and some of these programs, such as Denver's, combine place-based targeting with financial need criteria.

extent to which these cities are attracting or retaining residents, which is the primary mechanism through which place-based scholarship programs may spark community revitalization.

Existing studies of the effects of place-based scholarships on enrollments and housing prices have typically focused on a single program in a single location, such as the Kalamazoo Promise, which limits the ability to draw more general conclusions or to examine the heterogeneity of effects across locations. Adoption of place-based scholarships at two different discrete points in time in different locations allows us to provide informative analysis that exploits discontinuities in trends, and help to develop a broader perspective on the potential effects of place-based scholarships.

Examining district enrollment trends from 2000 through 2014, we find that after years of steady declines in enrollments both Syracuse and Buffalo saw enrollment increases that coincide with the adoption of the Say Yes to Education program. These increases occurred at different points in time in each city. Over the same post-treatment periods, enrollments continued to decline in the suburbs surrounding these cities and in similar upstate New York city school districts without the program, suggesting that these increases were city-specific and not due to broader developments affecting the region. Supplementary analyses show that the enrollment increases in Syracuse public schools coincided with declines in enrollment in nearby suburbs, while increases in enrollment in Buffalo public schools coincided with decreases in private school enrollments in the Buffalo area. Moreover, in each location, enrollment increases during the post-Say Yes period were concentrated in the district's higher performing schools.

To isolate the impact of Say Yes on housing prices, we use a panel data set on individual home sales to estimate hedonic price models that control for neighborhood fixed effects and trends, as well as analyses that make use of repeat sales, and which compare housing price

changes across similar upstate New York cities. The results provide some evidence that increases in housing prices accompanied the adoption of Say Yes in Syracuse, but not in Buffalo. These results are consistent with findings that enrollment growth in Buffalo may have been driven by students who would otherwise have attended private schools, while enrollment growth in Syracuse may have been driven by students who would otherwise have attended school in the surrounding suburbs.

The results suggest that the ability of place-based scholarships to attract residents into a central city is likely to depend on both the specific provisions of the program and the context in which it is implemented, and in the concluding section of this article, we discuss the implications for policy and future research. The remainder of the paper is organized as follows. Section II provides background on the Say Yes to Education program, place-based scholarships more generally, and the existing research on these programs. Section III describes the data used in our analyses. Section IV presents our analysis of enrollments, and Section V lays out the method used in and results of our analysis of housing market values. The final section of the paper discusses the implications of our findings.

II. Background on Say Yes to Education and Place-Based Scholarships

Say Yes to Education combines “place-based” college scholarships with intensive student supports. Former United States Secretary of Education Arne Duncan, among others, has described the program as a potential model for reviving public schools and spurring economic revitalization in the nation’s declining central cities (Mariani, 2009).

The first district-wide Say Yes initiative was announced in Syracuse, NY in 2008 as a partnership between the Say Yes to Education Foundation, the Syracuse City School District (SCSD) and Syracuse University. In 2012, Buffalo, New York became the second school district

to adopt the Say Yes program. The programs in Syracuse and Buffalo share many important features. First, neither program places merit-based restrictions on scholarship awards; all students who have attended for specified lengths of time and have graduated from the cities' public schools, and who have been admitted to and maintain good standing in college are eligible for the award. Second, students from both cities can use the scholarships at the same expansive set of colleges that includes all community colleges, all public four-year colleges and universities in New York State, and approximately 90 private institutions across the country ranging from Ivy League universities to small liberal arts colleges. All students are eligible for free tuition at any public university in New York State; for most private institutions, free tuition is limited to students with family incomes under \$75,000. Students from families with income greater than \$75,000 who attend a private university are eligible for \$5,000 scholarships. Third, the scholarship is a last-dollar scholarship; students must apply for any state and federal financial aid they are eligible to receive, and Say Yes pays the difference between the amount of aid they receive and tuition. Finally, as part of each initiative, the Say Yes foundation has provided staff and funding to promote the development of student support services, after- and summer-school programs, and school improvement efforts.

There are also differences in program details between the two sites. In Syracuse, scholarships cover 100 percent of tuition for any student who has attended a public school in the city for at least three years prior to graduation. The Buffalo program requires twelve years of attendance in the Buffalo Public Schools (BPS) for full tuition, and provides partial tuition scholarships for students spending less than twelve years in the BPS. Students entering the BPS in grades 1, 2 and 3 are eligible for 95 percent scholarships, those entering grades 4, 5 and 6 are eligible for 80 percent scholarships and those entering in grades 7, 8 and 9 are eligible for 65

percent scholarships. Also, students in Syracuse are eligible for full-tuition scholarships at Syracuse University regardless of family income, while students in Buffalo have a \$100,000 income cap for Syracuse University. The Say Yes foundation works with each district to identify student needs and community priorities, and then coordinates with the district, other local governments, and community groups to fill service gaps. Consequently, the set of student support services and school improvement efforts that Say Yes supports differs across the two cities.

In a recent review of “place-based” scholarship programs, Miller-Adams (2015) emphasizes that programs across the country differ in potentially important features—including eligibility requirements, participating colleges and universities, and accompanying initiatives. The Say Yes programs in Syracuse and Buffalo are similar to the Kalamazoo Promise program in that they place minimal restrictions on scholarship eligibility. This feature distinguishes what Miller-Adams calls “universal programs” from the programs in Pittsburgh, New Haven, and Hartford that have more restrictive GPA and attendance requirements. Also, many programs provide scholarships for a single local college or a very limited set of local colleges. Even some of the more expansive programs, including the Kalamazoo Promise, are limited to in-state, public colleges and universities. In contrast, Say Yes students can receive scholarships at a wide range of private institutions across the country as well as in-state public colleges and universities. Finally, while the introduction of place-based scholarships often spurs school improvement efforts and community-wide action to improve student and family supports, such efforts are more explicitly part of the Say Yes intervention than in some other locations. Despite the differences across place-based scholarship programs, Say Yes to Education shares with these other programs the goals of increasing college access, building a college-going culture, and spurring community

development by offering well publicized scholarships based primarily on place of residence and a credible guarantee that scholarship offers will continue long-term (Miller-Adams 2015).

An element of place-based scholarships that distinguishes them from other financial aid programs is the explicit goal of promoting local economic development. Most place-based scholarship programs have been adopted in central-city school districts that, like Syracuse and Buffalo, have experienced decades of economic decline. In this context, the residency requirements are “widely interpreted as a strategy to draw families into the area’s urban core and retain those already there (Miller-Adams 2015).”

Changes in district enrollments and housing values can be viewed as indicators of whether place-based scholarship programs are helping to attract and retain families as intended. Most of the evidence on the impacts of place-based scholarships on enrollments and housing values come from evaluations of the Kalamazoo Promise program. Initial analyses found that enrollment in the Kalamazoo public schools increased by 12 percent in the two years immediately following announcement of the Promise program, after falling by over five percent in the three years immediately preceding the announcement (Miron and Cullen, 2008). Bartik, Eberts, and Huang (2010) estimated that enrollments in Kalamazoo in 2009 were nearly 25 percent higher than what they were projected to be in the absence of the program. These authors also find that the Promise stabilized the racial-ethnic composition in the district by stemming decades of white-flight. Later work finds that the majority of new students in Kalamazoo came from other Michigan districts, and most markedly from one adjacent, relatively high poverty suburban district (Hershbein, 2013).² Miller (2011) uses nine years of data on home sales in the

² Early evidence from Pittsburgh also found that after many years of steady decline, public school enrollment stabilized following the announcement of the Pittsburgh Promise (Gonzalez, Bozick, Tharp-Taylor, and Phillips 2011; Iriti, Bickel, and Kaufman 2012).

county and finds no evidence that the Promise increased home values in Kalamazoo despite the positive impacts on enrollment and other school characteristics.

In an unpublished paper, LeGower and Walsh (2014) estimate enrollment and housing value effects across multiple place-based scholarship programs. They find that place-based scholarships have been associated with increases in public school enrollments and increases in housing prices relative to their surrounding suburbs.³ Comparison with surrounding suburban communities, however, is potentially problematic for two reasons. First, within a metropolitan area, enrollments and housing prices in the central city and suburban areas may move in opposite directions, making the suburbs a questionable basis for estimating the counterfactual enrollments and/or housing prices for the central city.⁴ Second, if a place-based scholarship serves to draw families into the city who would otherwise choose the surrounding suburbs, then enrollment and housing prices in the suburbs may themselves be influenced by the treatment.

Our analyses add to the existing literature in at least three ways. First, we are able to estimate the effects of place-based scholarship programs that are similar in important details but implemented in two different places at two distinct points in time. Second, although our strategy for estimating housing value effects is similar to that used by LeGower and Walsh (2014) in some respects, our analysis includes controls for neighborhood-specific trends and also uses cities drawn from very similar metropolitan areas rather than suburban districts in the same metropolitan area as comparisons. Third, our analyses focus on one of the most expansive place-based scholarship programs and one of the few to include private higher education institutions.

³ Syracuse is included in both the samples used to analyze enrollments and housing values, but Buffalo is not.

⁴ Below we show evidence the trends in housing prices in the Buffalo and Syracuse differ substantially from those in their surrounding suburbs in the years preceding the announcement of Say Yes.

The Syracuse program, in particular, sets a very low bar for eligibility (attendance in the city schools for grades 10–12) and includes the city’s major private university.

III. Data

The enrollment data used in our analyses are from the New York State School Report Cards, which report enrollments by grade, ethnicity, and eligibility for free- and reduced-price-lunch, English as second language, and special education services from the fall of 2000 to the fall of 2014. We augment district enrollment counts provided by the School Report Cards with counts of student residing in each district who attend charter schools, which we obtained by request from the New York State Education Department.

In addition to examining enrollment trends in Buffalo and Syracuse, we examine concurrent enrollment trends in other public and private schools in the metropolitan areas surrounding these cities using data on private school enrollments from the New York State Education Department.⁵ Finally, we also examine trends in Rochester, New York, and its surrounding metropolitan area. Rochester is a district located between Buffalo and Syracuse (less than 90 miles from each) that did not implement the program but had similar student demographics and enrollment trends prior to the adoption of Say Yes.

To examine the effect of Say Yes on housing values, we use data on home sales from the New York State Office of Real Property Services (ORPS). These data include the universe of property transfers in the state of New York (excluding New York City) from 2000 through the second quarter of 2014, and include the sales price and date. We limit our sample to arms-length sales and also apply a number of filters to ensure that the data exclude extreme outliers and include only valid sales of single residence homes. These files also include property addresses

⁵ <http://www.p12.nysed.gov/irs/statistics/nonpublic/home.html>

that we use to place the properties in Census block groups and thereby link to neighborhood characteristic information collected by the Census Bureau. Finally, we link each property to tax assessment files, also provided by ORPS, which have a wide range of information on property characteristics. Because we have sales data for the entire state, we are also able to compare changes in Syracuse and Buffalo to changes in other school districts in the surrounding metropolitan areas and to changes in Rochester and its surrounding districts.

IV. Enrollment Analysis

Figure 1 shows public school enrollment trends for Syracuse, Buffalo, and Rochester, and their surrounding suburbs. In each case, enrollment counts include counts of students who reside in the district boundaries and who attend either district run schools or charter schools, as students in both types of public school are eligible for Say Yes. Enrollment counts are normalized so that average enrollment in the district (or the set of districts in the cases of the suburban time-series) across all years equals 100.⁶

As shown in Figure 1, after years of declines, averaging 1.4 percent annually over the eight years preceding the announcement of Say Yes in Syracuse, enrollments leveled off in the first year and then increased in the second year after Say Yes began. Enrollment in Syracuse dropped by 1,376 students, 6.3 percent, in the three years preceding Say Yes, but increased by 397 students, 1.9 percent, in the three years following the announcement of Say Yes. Enrollment was still 908 students higher seven years after Say Yes than in the last year prior to Say Yes. In contrast, enrollments in the suburbs surrounding Syracuse continued on their pre-existing downward trend following the adoption of Say Yes in the city.

Enrollment patterns in Buffalo are similar to those in Syracuse. After years of declines

⁶ Specifically, the average enrollment across all years for the district (or set of districts) is subtracted from the enrollment count in each year, divided by the average enrollment and multiplied by 100.

that averaged 1.7 percent annually, enrollment increased by an average of 1.4 percent annually in the first three years following the adoption of Say Yes. Over the same period, enrollments in the suburban districts around Buffalo continued to decline.

Public school enrollments in Rochester, in contrast, do not show clear changes that coincide with the adoptions of Say Yes in Syracuse or Buffalo. In the four years following the announcement of Say Yes in Syracuse, enrollments in Rochester fell by 220 students, or 0.7 percent. In the three years following the announcement of Say Yes in Buffalo, enrollments in Rochester declined by 452, or 1.4 percent.

Estimation Methods

To estimate the changes in enrollments associated with the adoption of Say Yes, we employ three analyses. The first uses enrollment data solely from the district that adopted Say Yes to estimate the following model:

$$\ln Y_t = \beta_0 + \beta_1 D1_t + \beta_2 D2_t + \beta_3 D3_t + \beta_4 T_t + \varepsilon_t, \quad (1)$$

where $\ln Y_t$ is the natural log of enrollment in year t ; $\beta_0 + \beta_4 T_t$ represents the intercept and slope of the linear enrollment trend in the district; and $D1_t$, $D2_t$, and $D3_t$ indicate the first, second, and third year, respectively, after the announcement of Say Yes in the district. We limit the sample to three years after the announcement of Say Yes, so these dummy variables are exhaustive of the post-period.⁷ This model uses pre-treatment enrollment counts to fit a trend line, projects that trend into the post-period, and then β_1 , β_2 , and β_3 measure the

⁷ In the case of Buffalo only three post-treatment years are available in our data. We also limit the sample to three years post-Say Yes in the Syracuse analysis for three reasons—consistency with Buffalo; it allows us to use Buffalo as a comparison for Syracuse because Buffalo was not exposed to Say Yes for the first three years after the announcement of Say Yes in Syracuse; and the further into the post-treatment period that a pre-treatment trend is projected, the more potential bias there is in impact estimates due to misspecification of the trend and the more other intervening events that are to complicate interpretation of deviations from trend.

difference between observed and projected enrollment in each of the post-Say Yes years. Since the dependent variable is the log of enrollment, the coefficient estimates (multiplied by 100) can be interpreted as percent increase in enrollment associated with Say Yes.

In the second analysis, we add control districts that have not been exposed to the treatment during the period observed. When analyzing changes in enrollment associated with Say Yes in Syracuse we add Buffalo and Rochester to the sample. When analyzing changes associated with Say Yes in Buffalo we add Rochester. Using these samples, we estimate the following model:

$$\ln Y_{it} = \beta_0 + \beta_1 D1_{it} + \beta_2 D2_{it} + \beta_3 D3_{it} + \phi_{1i} + \phi_{2i} T_t + \gamma_t + \varepsilon_{it} \quad (2)$$

In this model, $\beta_0 + \phi_{1i} + \phi_{2i} T$ capture the intercept and slope of each district-specific trend line, and γ_t captures year-specific enrollment shocks that are common across treatment and comparison districts. The estimates of β_1, β_2 , and β_3 in this model can be interpreted as difference-in-differences estimates. Specifically, they capture the difference between the deviation from projected trends in the Say Yes district in each post-Say Yes year and the deviation from projected trends in the other large city districts in western New York that had not (yet) adopted Say Yes.

The difference-in-differences estimates effectively control for any factors or events that might have influenced enrollments in the cities of Syracuse, Buffalo and Rochester similarly. The difference-in-differences estimates do not necessarily control for factors that had a unique influence on enrollments in a particular metropolitan area during the post-Say Yes period, however. Thus, as a robustness check, we implement an alternative estimation strategy that controls for any metropolitan-specific shocks that influence all districts in a metropolitan area equally. Mechanically, this alternative procedure is computed in the manner of a triple-

differences estimator, which compares the difference between deviations from trends in the treated district and its surrounding suburbs to the similar differences between the central city and the suburban districts in the comparison metropolitan area(s). This estimator has the advantage of controlling for metropolitan-specific shocks that might coincide with the adoption of Say Yes. If Say Yes affected enrollments in the suburbs surrounding the city with the program, however, then this triple-differences estimate cannot be interpreted as the increase in enrollment in the Say Yes district that resulted from Say Yes. Rather, it should be interpreted as indicator of whether or not Say Yes may have contributed to a divergence (or convergence) in enrollments between the city where it was adopted and its surrounding suburbs.

Specifically, we use enrollments in the treated and comparison districts, and their surrounding suburbs to estimate equation (3).

$$\begin{aligned}
\ln Y_{dct} = & \alpha_0 + \alpha_1(D1 \times City \times Treated)_{dct} + \alpha_2(D2 \times City \times Treated)_{dct} \\
& + \alpha_3(D3 \times City \times Treated)_{dct} + \beta_1(D1 \times City)_{dct} + \beta_2(D2 \times City)_{dct} \\
& + \beta_3(D3 \times City)_{dct} + \gamma_d + \varphi_d T_t + \eta_{ct} + \varepsilon_{dct}
\end{aligned} \tag{3}$$

where Y_{dct} is the log of enrollment in district d in metro area c in year t . For suburban districts, we sum enrollment in each year across all the suburban districts in the metropolitan area surrounding a particular city district and treat that as a single district. $D1_t$, $D2_t$, and $D3_t$ represent the first, second, and third year after the announcement of Say Yes, $City$ indicates the central city of the metropolitan area (Buffalo, Rochester, or Syracuse), and $Treated$ indicates the district where Say Yes is adopted. β_i is the difference in the deviation from pre-Say Yes trends in the central city district and the suburban districts in the comparison metropolitan area(s) during post-Say Yes year i , and α_i is the triple-difference estimate of the effect of Say Yes on

enrollments. $\gamma_d + \varphi_d T$ controls for district-specific trends and η_{ct} is a metropolitan area-by-year fixed effect.⁸

All models are estimated using eight and four years of pre-Say Yes data, as well as three years of post-Say Yes data. The expansion of charter schools was most rapid during the 2000 to 2005 period, and charter school expansion may serve to draw students from private schools into the public schools. As a result, the estimate of pretreatment trends based on eight years of data might underestimate the declines in enrollments due to underlying economic and demographic factors, which can distort estimates of the effects of Say Yes. For this reason, we believe the estimates using four-years of pre-Say Yes data may provide a more valid estimate of counterfactual enrollments.

Results

Table 1 presents the results of our estimations for Syracuse and Buffalo. In keeping with the graphical depiction in Figure 1, the first and fourth column of the top panel of Table 1 indicates that enrollments in Syracuse during the post-Say Yes years are higher than predicted by the pre-Say Yes trend. Specifically, three years after the announcement of Say Yes, enrollments are approximately 8.6 percent higher than projected when four-years of pre-Say Yes observations are used, and 4.1 percent higher when eight-years of pre-Say Yes data are used. The estimates are somewhat imprecise though and the estimated increases in enrollments are only marginally statistically significant.

When the enrollment increases associated with Say Yes in Syracuse are estimated using the difference-in-differences framework of equation (2), as well as the triple-differences

⁸ In the difference-in-differences analysis, equation (2), the sample includes only one district in each metropolitan area and so the year fixed effect in equation (2) is equivalent to the metropolitan area-by-year fixed-effect used in this analysis.

framework of equation (3), however, the estimated increases in enrollment associated with Say Yes are smaller. These smaller estimated enrollment increases reflect the fact the rate of enrollment declines in Buffalo and Rochester also slowed during years following the recession of 2008, which coincides with the post-Say Yes period for Syracuse. Unlike in Syracuse, however, neither Buffalo nor Rochester saw actual increases in enrollments during this period, and both the difference-in-differences and triple-differences estimates do show that enrollment increases relative to prior trends during the post-Say Yes period were larger in Syracuse than in Rochester and Buffalo. These difference-in-differences and triple differences estimates are, however, not reliably different from zero.

In the case of Buffalo (in the bottom panel of Table 1), estimated increases in enrollment are 6.4 percent or 7.5 percent higher than projected trends, depending on whether four or eight years of pre-Say Yes observations are used. The enrollment increases associated with Say Yes are a bit more precisely estimated in the case of Buffalo and are statistically significant at conventional levels in the sample with eight years of pre-Say Yes observations. For Buffalo, the difference-in-differences and triple-differences estimates also indicate that post-Say Yes enrollments increased more relative to prior trends than they did in Rochester during the same period. The estimated increases in enrollment three years after the adoption of Say Yes in Buffalo are approximately 7 to 8 percent when four years of pre-Say Yes data are included and approximately 6 percent when eight years of pre-Say Yes data are used, and the estimated differences are mostly statistically significant.

Identifying the Source of Enrollment Increases

If the Say Yes program is drawing new students to city schools, there are three plausible sources of these students: schools outside the region, other public schools in the region, and

private schools. Although we cannot track migration of individual students, we can compare enrollment trends across different types of schools in each region. Specifically, for both Syracuse and Buffalo, we estimate a version of equation (1) separately for four different sets of schools: the central city (Say Yes) district, the adjacent, inner ring suburban public school districts, outer ring suburban public school districts in the same county, and private schools. In these estimates we use enrollment counts rather than the log of enrollment, so that we can interpret the estimated coefficients on the post-Say Yes variables as changes in enrollment counts relative to projected trends. Table 2 presents the results for Syracuse and Buffalo, respectively. For each analysis we use four years prior to the announcement of Say Yes in the focal district to extrapolate trends.⁹

Table 2 indicates that increases in enrollments above projected trends in Syracuse during the Say Yes period were accompanied by decreases in enrollments relative to projected trends in the suburban districts around Syracuse. In contrast, enrollment increases relative to projected trends in Buffalo were accompanied by decreasing enrollments in private schools in the area, relative to pre-existing trends. These results suggest that in Syracuse, the enrollment increases that followed the announcement of Say Yes were driven by students who otherwise would have enrolled in the nearby suburbs. But enrollment increases in Buffalo came primarily from students who otherwise would have enrolled in private schools.

The Catholic Diocese of Buffalo has closed and consolidated a number of Catholic schools in the Buffalo area over the last decade, which raises questions about whether the increase in enrollments in Buffalo that followed the announcement of Say Yes can be attributed to Say Yes. We do not think Catholic school closures can fully explain the deviation from enrollment trends that followed the announcement of Say Yes. First, the largest set of private

⁹ 2014–15 private school enrollments were not available, and so only two years of post-Say Yes data are included for the Buffalo analysis.

school closures took place in 2006–07, which is before the window of data used to measure trends in Table 2. Second, there were no private school closures in 2012–13 or 2013–14, the years immediately surrounding the announcement of Say Yes. Third, although the need to close Catholic schools in Buffalo was announced by the Diocese in 2011, schools were not actually closed until 2014–15 (the third year after Say Yes), and the 10 schools that were closed in 2014–15 did not show unusual or large drops in enrollment in either of the first two years after the announcement of Say Yes.

Heterogeneity in Enrollment Changes

Table 3 shows estimated deviations from pre-Say Yes enrollment trends for various subgroups of students. In both Syracuse and Buffalo, declines in white enrollment in the years leading up to Say Yes were particularly marked. In Syracuse, year-to-year decreases in white enrollment averaged 6.4 percent over the ten years preceding Say Yes. In the first three years following Say Yes, decreases in white enrollments slowed to an average of 2.9 percent per year. Similarly, in Buffalo, year-to-year decreases in white enrollments averaged 4.6 percent over the ten years preceding Say Yes, and slowed to 1.5 percent per year in the three years following the announcement of Say Yes. Compared with projected trends, the number of white students in Syracuse city public schools increased by over ten percent over predicted values three years after the start of the program, a substantially larger increase than for non-white students, though the increase is not significant at conventional levels. In Buffalo, there was a significant increase in white students of almost seven percent, which was matched by the increase in non-white students. Thus, the share of white students in the district did not change over the period.

In Syracuse, the increase in enrollments of free-lunch eligible students above projected trends three years after the announcement of Say Yes was roughly the same as that for students

not eligible for free-lunch. In Buffalo, increases in enrollments above projected trends were concentrated among students eligible for free-lunch, and thus, the increase in the percent of students in the district eligible for free-lunch has accelerated slightly during the post-Say Yes period.¹⁰ If Say Yes served to attract students to public schools from private schools this result is, perhaps, not surprising,. Many non-free lunch eligible students would have family incomes that made them ineligible for the Say Yes tuition guarantee at private universities, and thus, the incentive to transfer from private to public schools would be stronger among those who are free-lunch eligible.

Finally, in Table 4, we examine enrollment changes by school performance levels. Specifically, we split the sample of elementary schools in each district into three groups based on average fourth grade math and English language arts test scores in the last year prior to the start of Say Yes. Then, using each sample, we regress the log of enrollment on indicators of post-Say Yes years, school fixed effects, and a school-specific time trend. The Say Yes scholarship offer is more valuable to families who expect to send their children to college, and particularly four-year colleges, and thus, we expect that enrollment increases in reaction to Say Yes would be concentrated in higher performing schools. Indeed, the results in Table 4 indicate that in both Syracuse and Buffalo, increases in enrollment above trends were concentrated in the district's higher performing schools. Although many other factors could be driving larger-than-usual increases in higher performing schools, these findings are consistent with the idea that Say Yes is drawing students into the district schools.

In sum, both Syracuse and Buffalo public schools saw enrollment increases relative to projected trends controlling for enrollment changes in the similar nearby cities in the three years

¹⁰ It is important to note that changes in the percent free-lunch reflect changes in the status of individual students as well changes in the mix of students in the district.

following the announcement of Say Yes. In both districts, the increases in enrollment were concentrated in high performing schools. The increases in enrollments relative to projected trends in Syracuse were accompanied by decreases in enrollment relative to the projected trends in the nearby suburbs, and the increases in enrollments relative to projected trends in Buffalo were accompanied by unusually large decreases in private school enrollments in the area. There is some reason to believe that the increase in enrollments following Say Yes in Syracuse were the result of more general changes in the mobility of students across the city and the suburbs in western and central New York during the years following the Great Recession. It is, however, unlikely that private school closure can account for the shift of enrollments from private schools to the Buffalo city public schools.

V. Housing Market Analysis

One might suspect that increases in enrollments, particularly if those enrollments are drawn from surrounding districts, would be accompanied by increased demand for housing and thus, increased housing prices in the central cities. Figure 2 presents a time-series of median residential housing sales prices in Syracuse, Buffalo, Rochester, and their surrounding suburbs. Median sale prices are normalized to the average median sales price over all the years within each time-series.

In Syracuse, median home sales prices did in fact increase substantially above previous trends in the first three years following the adoption of Say Yes, while average prices in the suburbs surrounding Syracuse dropped below prior trends over the same period. These changes in trends are consistent with people relocating from the suburbs to the central city. A similar pattern in housing prices in the central city and its surrounding suburbs is, however, evident for Rochester and Buffalo during this period, which suggests that increases in home sales prices in

Syracuse in the years following the announcement of Say Yes may reflect general changes in metropolitan housing markets in western and central New York during the Great Recession, rather than any impact of Say Yes. There is no indication of any increases in median home sales prices following the announcement of Say Yes in Buffalo in Figure 2. In fact, median home sales prices dropped steeply in the years immediately following the announcement of Say Yes, although that decline began the year prior to the announcement of Say Yes.

Of course, the simple time-series of median home prices reflects a wide range of factors. For example, the sample of homes sold in a district changes each year, and so changes in median sale prices reflect changes in the types of homes being sold as well as changes in the prices of individual houses. In this section, we use hedonic housing price models estimated using individual home sales to try to isolate changes in housing values associated with the adoption of Say Yes.

Estimation Methods

To estimate the increase in housing values associated with Say Yes, we employ a difference-in-differences approach comparing deviations from pre-existing trends in house values in the Say Yes districts to deviations from trends in comparison districts during the same period. Figure 2 suggests pre-Say Yes trends in housing values in Syracuse were similar to those in Buffalo and Rochester, and the three cities are also similar in terms of socioeconomic and demographic characteristics, the age of their housing stock, and their role in their larger metropolitan economies. Thus, Buffalo and Rochester are appropriate comparisons for Syracuse. For similar reasons, Rochester is an appropriate comparison for Buffalo.

Housing values in the suburbs surrounding Syracuse and Buffalo exhibit different trends than those in the cities in the years leading up to Say Yes, thus they may not be appropriate

comparison districts. Also, if Say Yes attracts families to Syracuse and Buffalo who might otherwise choose to live in the nearby suburbs, then the Say Yes program could influence housing prices in those suburbs as well, again making it an inappropriate comparison group. Nevertheless, the pre-Say Yes trends in housing values in the suburban areas of Syracuse, Buffalo, and Rochester are all similar to each other. We exploit this fact to implement an alternative estimation strategy discussed below.

We implement our difference-in-differences estimator in two different ways. First, we use all home sales in the treated and comparison districts for the eight years prior to the adoption of Say Yes and the three years following the adoption of Say Yes¹¹ to estimate a regression that controls for neighborhood fixed effects and trends as well as individual housing characteristics.¹² Specifically, we estimate the following regression:

$$\ln P_{int} = \alpha_0 + \alpha_1 D1_{nt} + \alpha_2 D2_{nt} + \alpha_3 D3_{nt} + X_{int} \Phi + \gamma_n + \varphi_n T_t + \eta_t + \varepsilon_{int} \quad (4)$$

where the dependent variable is the log of the sales price for property i in census tract n in year t ; the treatment variables are defined as they were in the enrollment analysis; X is a vector of housing characteristics; $\gamma_n + \varphi_n T_t$ are the intercept and slope of a neighborhood-specific trend, and η_t is a year-specific effect. The strength of this first strategy is that it uses all housing sales in the district to estimate effects. However, it only provides adequate control for changes in the types of houses sold each year if—controlling for observed housing characteristics—homes sold within neighborhoods are sufficiently homogeneous.

¹¹ For Syracuse, we use Rochester and Buffalo as the comparison districts, and for Buffalo, we use Rochester as the comparison. We also computed estimates using four years of pre-Say Yes observations, and the results were substantively very similar, although less precise. In order to save space, we only report the results using eight years here. The results using four years of pre-Say Yes data are reported in Appendix Table A1.

¹² Housing characteristics included as controls are square feet of living area, square feet of garage and basement, overall condition, age of home, number of stories, number of rooms, number of bedrooms, number of full bathrooms, number of half bathrooms, whether or not there is a finished recreational room, whether or not the house has central air conditioning, and heat type.

The second strategy to control for changes in the types of homes sold is to limit the sample to homes that have sold multiple times, and estimate the following regression.

$$\ln P_{int} = \alpha_0 + \alpha_1 D1_{nt} + \alpha_2 D2_{nt} + \alpha_3 D3_{nt} + \lambda_i + \varphi_n T_t + \eta_t + v_{int} \quad (5)$$

In this regression, we replace the neighborhood fixed effect in equation (4) with an individual property fixed effect, which is possible because each home is observed multiple times. We continue to control for neighborhood trends. Because we only observe housing characteristics at a single point in time, their effect on housing prices cannot be estimated separately from the individual property fixed effect and thus drop out of this model. Including the individual housing fixed effect provides a more complete control for changes in the types of housing sold in different years. In this model, however, the effects of Say Yes are identified by changes in the price of homes sold multiple times in a relatively short period of time, which may be unrepresentative of changes in values across all homes that are sold.

Conducting proper inferences for estimates of the treatment effects in equations (4) and (5), α_i , is not straightforward. Although we observe thousands of individual home sales, these sales are clustered in three districts in the case of the estimated impact of Say Yes in Syracuse, and only two districts in the case of Say Yes in Buffalo, and in each case, there is only one treated cluster. In the presence of this type of clustering, standard error estimates that assume independent observations can be biased downward substantially. The standard solution to this problem—cluster robust standard errors—relies on having a large number of treated and comparison group clusters, and which clearly is not the case here (Wooldridge 2003, 2006; Donald and Lang, 2007; Conley and Taber, 2011; Cameron and Miller, 2015).

To conduct proper inferences, and specifically to obtain correct p -values, we estimate equations (4) and (5) using the two-step procedure suggested by Donald and Lang (2007). In the

first step, the log of housing prices are regressed on all variables that vary at the individual or neighborhood level (namely, the individual property covariates, neighborhood or property fixed effects, neighborhood trends), and a set of district-by-year fixed effects. In the second step, the estimated district-by-year fixed effects are regressed on variables that vary at the district level, namely the treatment variables, a district-specific time trend, and year fixed effects, weighting by the number of observations in each district-by-year. As demonstrated by Donald and Lang (2007), this two-step procedure is an efficient estimator and provides appropriate p -values in the case of a small number of clusters under relatively unrestrictive assumptions.

As in the enrollment analysis, the difference-in-differences estimates effectively control for any factors that might have influenced property values in Syracuse, Buffalo, and Rochester similarly. However, the difference-in-differences estimates do not necessarily control for factors that had a unique influence on property values in a particular metropolitan area during the post-Say Yes period. Thus, as a robustness check, we again use a triple-differences estimator, which compares the difference between deviations from trends in the treated district and its surrounding suburbs to the similar differences between the central city and the suburban districts in the comparison metropolitan area(s). This estimator has the advantage of controlling for metropolitan-specific shocks that might coincide with the adoption of Say Yes. However, if Say Yes influences property values in the suburbs surrounding the city where it is adopted, then this triple-differences estimator cannot strictly be interpreted as the increase in property values in the Say Yes district resulting from Say Yes.

Specifically, we use data on all home sales in the treated and comparison districts, and their surrounding suburbs to estimate equation (6).

$$\begin{aligned}
\ln P_{inmt} = & \alpha_0 + \alpha_1(D1 \times City \times Treated)_{nmt} + \alpha_2(D2 \times City \times Treated)_{nmt} \\
& + \alpha_3(D3 \times City \times Treated)_{nmt} + \beta_1(D1 \times City)_{nmt} + \beta_2(D2 \times City)_{nmt} \quad (6) \\
& + \beta_3(D3 \times City)_{nmt} + X_{inmt} \Phi + \gamma_n + \varphi_n T_t + \eta_{mt} + \varepsilon_{int}
\end{aligned}$$

As in estimation of the difference-in-differences, we control for individual housing characteristics, neighborhood-specific fixed effects and trends, and in this case, metropolitan-by-year fixed effects, η_{mt} . As in the enrollment analysis, β_i is the difference in the deviation from pre-Say Yes trends in the central city district and districts in the comparison metropolitan area(s) during post-Say Yes year i , and α_i is the triple-differences estimate of the effect of Say Yes on the log of property values. We also estimate an equation similar to (6) in which we replace the individual property covariates and neighborhood fixed effects with an individual property fixed effect using properties with multiple sales. To ensure proper inferences, we estimate both the all sales and repeated sales regression using the two-step procedure that we used to implement the difference-in-differences estimator.

Results

Table 5 displays the results of our primary housing value analysis. For both the difference-in-differences and the triple-differences analyses, estimated changes in housing values associated with Say Yes are similar whether all sales or multiple sales are used. The triple differences estimates tend to be larger in absolute value and less precise than the corresponding difference-in-differences estimates. Nonetheless, the results from the difference-in-differences and the triple-differences are qualitatively similar.

Both the difference-in-differences and triple-differences suggest that Syracuse experienced a larger increase in property values after Say Yes relative to pre-existing neighborhood trends than did Rochester and Buffalo. The results are statistically significant only in the case of the triple-differences estimates during the third year after the announcement of Say

Yes, which show rather large increases of between 14 and 17 percent. Overall, the estimated increases in property values associated with the adoption of Say Yes in Syracuse ranged between 6.5 percent and 16.9 percent depending on the sample and model.

The fact that the triple differences estimates are larger than the difference-in-differences estimates for Syracuse, suggest that the announcement of Say Yes is associated with decreases in property values in the surrounding suburbs as well as increases in property values in Syracuse. To test that hypothesis more directly, we computed in difference-in-differences estimates of the effect of Say Yes on property values in the suburbs around Syracuse. To compute these difference-in-differences, we estimate equations (4) and (5) above using the sample of home sales in the Syracuse, Rochester, and Buffalo suburbs during the eight years preceding and three years following the announcement of Say Yes in Syracuse, and consider the homes sales in the Syracuse suburbs following the announcement as treated observations.

The results of this analysis of suburban property values is presented in Table 6. As implied by the results in Table 5, the changes in properties values in the Syracuse suburbs associated with the adoption of Say Yes are negative and large, and are also statistically significant. Three years after the adoption of Say Yes in Syracuse properties values in the suburbs decreased between 7 percent and 9 percent, relative to the projection of pre-existing trends and controlling for deviations from projected trends observed in the Rochester and Buffalo suburbs during the same time period. The results in Table 6 reinforce the point that the triple-difference estimates in Table 6 should not be interpreted as the increase in property values in the city of Syracuse following the adoption of Say Yes. Rather the results indicate that the announcement of Say Yes was associated with both increases in property values in the city and

decreases in property values in the surrounding suburbs, which is consistent with the idea of people who might otherwise have lived in the suburbs moving to or remaining in the city.

Returning to Table 5, the estimated changes in property values associated with Say Yes in Buffalo are all negative. The triple-differences estimates are slightly more negative, but also less precise, than the difference-in-differences estimates. The estimated changes in housing values are statistically significant only for the second year after the adoption of Say Yes, when all sales are used. The estimated second-year changes in the multiple sales sample, when more complete controls for housing characteristics are employed, are less precise and not statistically different from zero.

Although the results in the bottom panel of Table 5 suggest that a decline in property values in Buffalo relative to projections may have accompanied the adoption of Say Yes, Figure 2 suggests that the start of the decline preceded the start of the program. To test this possibility, we add to each of the models estimated in Table 5 variables indicating the first, second, and third year pre-Say Yes. If the estimated coefficients on these pre-treatment variables are substantially different from zero, it suggests that the estimates in Table 5 cannot be interpreted as the causal impacts of Say Yes.

The results of this “event history” analysis are presented in Tables 7a (Syracuse) and 7b (Buffalo). In Syracuse, the coefficients for the pre-Say Yes years are largely, though not always, positive and are not significant in any model. The post-Say Yes coefficients are substantially larger than the pre-Say Yes coefficients. The post-Say Yes coefficient are also slightly larger in this model than in the previous models, and still significant in the triple-differences model for the third year of Say Yes. Thus, the estimates do not provide any indication the observed housing market changes began before the start of Say Yes in Syracuse.

Table 7b shows that the pre-Say Yes coefficients in Buffalo are all positive and imprecisely measured. The post-Say Yes coefficients are much smaller than the pre-Say Yes coefficient estimates and those in Table 5, and no longer significant, suggesting that the price decreases in Buffalo were not the result of Say Yes.

We also estimated the changes in housing values associated with the adoption of Say Yes by neighborhood income level. Specifically, we divided the sample of treatment and control neighborhoods into thirds based on median housing income in the neighborhood. We then estimated our difference-in-differences models for each sample separately. The results suggest that changes in property values associated with the adoption of Say Yes were concentrated in low and middle income neighborhoods in Syracuse and in low income neighborhoods in Buffalo. However, the estimates of changes in housing values were generally quite noisy and thus, we are reluctant to draw any strong conclusions from this analysis.

VI. Summary and Discussion

The analyses presented above examine potential early indicators of urban revitalization—school district enrollments and housing prices—in Syracuse and Buffalo, NY in the wake of Say Yes to Education’s start in each city. We find consistent evidence of enrollment increases in both Syracuse and Buffalo following the announcement of the program and that these increases occurred after years of largely declining enrollments. Moreover, the increases coincided with the start of the program and grew over time, though the program began in different years in each city. While the Syracuse increases were accompanied by large enrollment declines in surrounding suburban districts, the Buffalo increases coincided with large declines in private school enrollments in the area. The increases in both cities, and particularly in Syracuse, appear to be largely concentrated in the districts’ highest performing schools. However, it must also be

noted that the cities of Buffalo and Rochester also saw enrollment increases relative to projected trends following the announcement of Say Yes in Syracuse, suggesting that at least part of the increase in enrollments in Syracuse might be attributable to factors other than Say Yes.

Using difference-in-differences and triple-differences models, we find evidence of substantively meaningful increases in home prices in Syracuse after the program's announcement, as well as decreases in housing values in the suburbs surrounding Syracuse, both of which are consistent with the hypothesis that Say Yes helped to attract to the city people who would otherwise have located in the suburbs. We do not find evidence of similar housing price changes in Buffalo.

These results, then, raise questions about why responses to the program would be different in Syracuse than in Buffalo. We have no definitive answers, but it is quite likely that the different contexts and program benefits between the two cities may help to explain the findings. First, the Syracuse program is arguably more generous than the Buffalo program. Syracuse requires only three years of high school attendance for full scholarship eligibility, while Buffalo requires twelve years. Additionally, tuition at Syracuse University, listed at over \$40,000 per year during this period, is available for all Syracuse Say Yes students but only for those from families with income under \$100,000 in Buffalo. Given its location, Syracuse University is also likely to be a more attractive option for students from Syracuse than from Buffalo. The more generous benefits available in Syracuse may be more likely to induce families to move from the suburbs to the city, or to stay in the city, to take advantage of the program, thereby increasing demand for housing. In Buffalo, the program appears to have drawn students largely from private schools. If these families already lived in the city, the housing market effects would likely be smaller.

The contexts of Syracuse and Buffalo may also help to explain some of the differences in responses to Say Yes across the two cities. As described above, Buffalo's large Catholic school sector was undergoing consolidation and closures during the years before Say Yes began. While these events did not coincide with the start of Say Yes, the uncertainty surrounding private schools, combined with the programmatic and scholarship benefits of Say Yes, may have accelerated movement toward city public schools. In Syracuse, with a smaller private school sector, suburban schools may represent the more relevant alternative for many parents who do not want to send their children to public city schools. Ultimately, though, understanding the mechanisms underlying these differential effects is worthy of additional study in future research.

The results also provide some evidence on the potential for place-based scholarships to spur economic revitalization in distressed cities. Both Syracuse and Buffalo have suffered through decades of economic decline and shrinking tax bases. Between 1950 and 2000 Buffalo lost half of its population, the fourth largest decline among large cities in the United States, while Syracuse lost one-third of its population (Office of the New York State Comptroller, 2004). Evidence from the Say Yes to Education program suggests that providing a substantial and highly visible amenity such as free college tuition may be effective at stemming these ongoing population losses and inducing some households to remain in central cities or to move from nearby suburbs, though the magnitude of the effect may be modest. From a metropolitan perspective this growth may be a zero sum game, with gains in cities offset by losses in neighboring communities. Additionally, providing free college to large numbers of students may be an expensive model if the gains are small, though the last-dollar nature of the scholarships reduces overall costs. Future work will be needed to determine whether these cities are able to

maintain the enrollment gains and whether they are, in fact, leading indicators of broader economic development.

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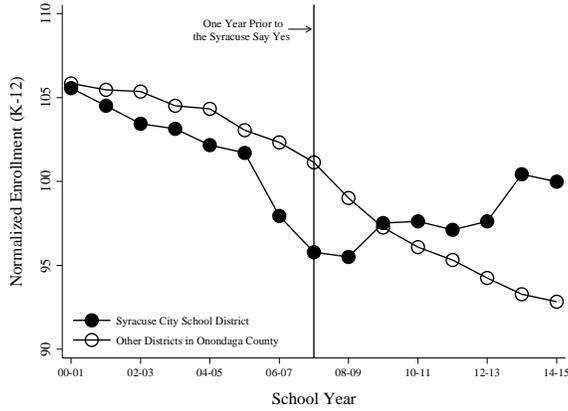
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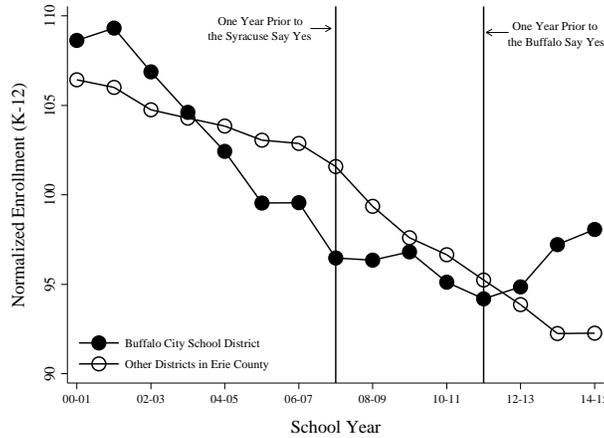
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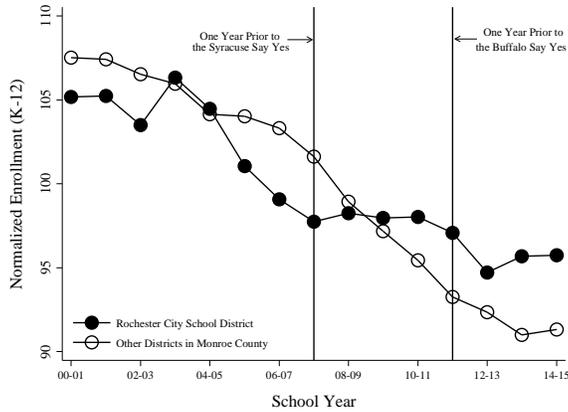
Figure 1: Enrollment Trends, Cities and Suburbs



Syracuse City School District vs. Other Districts in Onondaga County

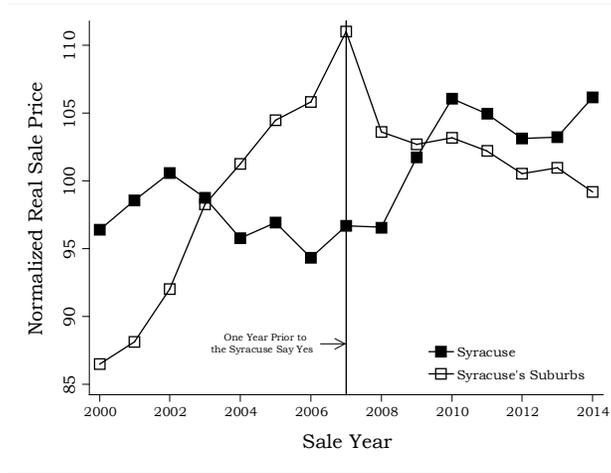


Buffalo City School District vs. Other Districts in Erie County

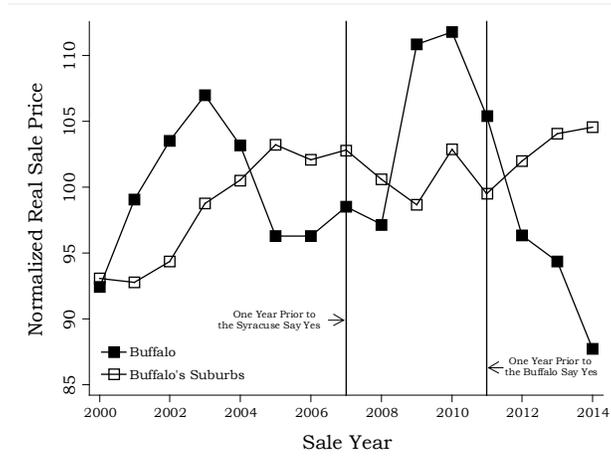


Rochester City School District vs. Other Districts in Monroe County

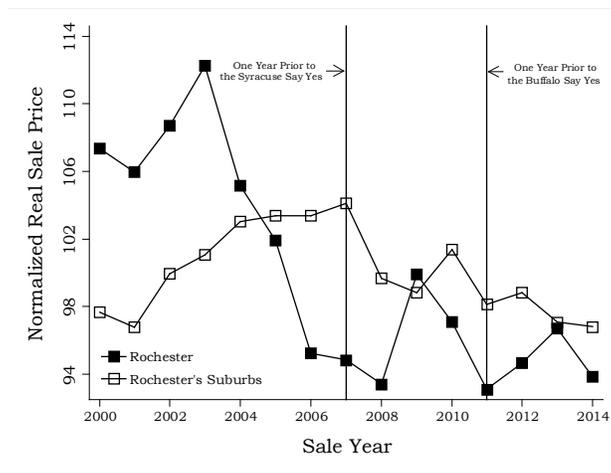
Figure 2: Median Housing Values, Cities and Suburbs



Panel A. Syracuse vs. Its Suburbs



Panel B. Buffalo vs. Its Suburbs



Panel C. Rochester vs. Its Suburb

Table 1: Changes in Enrollment Trends Associated with Adoption of Say Yes

Explanatory Variable	Four-Years Pre-Say Yes Included			Eight-Years Pre-Say Yes Included		
	Pre-Post	Difference-in-Differences	Triple-Differences	Pre-Post	Difference-in-Differences	Triple-Differences
<u>Panel A. Syracuse</u>						
1 Year Post Say Yes	0.018 (0.016) [0.368]	-0.004 (0.019) [0.829]	-0.007 (0.018) [0.716]	-0.006 (0.015) [0.705]	-0.014 (0.017) [0.420]	-0.011 (0.017) [0.516]
2 Year Post Say Yes	0.062* (0.019) [0.083]	0.019 (0.023) [0.425]	0.019 (0.022) [0.404]	0.027 (0.017) [0.126]	0.004 (0.018) [0.811]	0.012 (0.018) [0.515]
3 Year Post Say Yes	0.086* (0.023) [0.064]	0.032 (0.027) [0.277]	0.030 (0.026) [0.284]	0.041* (0.018) [0.060]	0.012 (0.019) [0.539]	0.020 (0.019) [0.315]
No. of Observations	7	21	42	11	33	66
<u>Panel B. Buffalo</u>						
1 Year Post Say Yes	0.013 (0.011) [0.349]	0.037 (0.012) [0.150]	0.041** (0.011) [0.018]	0.025 (0.013) [0.155]	0.029* (0.013) [0.065]	0.032 (0.033) [0.351]
2 Year Post Say Yes	0.047* (0.014) [0.075]	0.057* (0.015) [0.060]	0.064** (0.013) [0.008]	0.056** (0.013) [0.006]	0.046** (0.014) [0.016]	0.053 (0.036) [0.163]
3 Year Post Say Yes	0.064* (0.016) [0.059]	0.069** (0.017) [0.057]	0.080** (0.015) [0.007]	0.075** (0.014) [0.002]	0.057** (0.015) [0.009]	0.065 (0.038) [0.112]
No. of Observations	7	14	28	11	22	44

Notes: Each column of figures are coefficients, with associated standard errors and p -values in parentheses and brackets, respectively, from separate regression. “Pre-Post” correspond to equation (1), “Difference-in-Differences” correspond to equation (2), and “Triple-Differences” correspond to equation (3). Estimates include controls for pre-Say Yes enrollment trends. * indicates that the coefficient estimate is statistically distinguishable from zero at 0.10, ** indicates statistically that the coefficient estimate is statistically distinguishable from zero at 0.05, and *** indicates statistically that the coefficient estimate is statistically distinguishable from zero at 0.01.

Table 2: Changes in Enrollment Trends Associated with Adoption of Say Yes, by Type of District

Explanatory Variable	Countywide	City Public Schools	Public Schools in Adjacent Districts	Public Schools	
				in Other Districts in the County	Private Schools
<u>Panel A. Syracuse</u>					
1 Year Post Say Yes	115.5 (573.0)	394.5 (335.2)	-328.5** (75.6)	-176.5 (131.5)	226.0 (396.1)
2 Year Post Say Yes	523.4 (697.1)	1,323.4* (407.8)	-544.1** (92.1)	-550.1* (160.0)	294.2 (481.9)
3 Year Post Say Yes	776.5 (834.3)	1839.3* (488.1)	-585.7** (110.2)	-856.7** (191.5)	379.4 (576.8)
No. of Observations	7	7	7	7	7
<u>Panel B. Buffalo</u>					
1 Year Post Say Yes	-851.0 (546.4)	518.5 (430.7)	-3.5 (104.3)	-16.0 (175.2)	-1,350.0* (341.7)
2 Year Post Say Yes	806.2 (664.7)	1,804.1* (524.0)	-84.8 (126.7)	209.0 (213.2)	-1,122.1* (415.7)
No. of Observations	6	6	6	6	6

Notes: Each column of figures are coefficients, with associated standard errors in parentheses, from separate estimation of equation (1), each using four years of pre-Say Yes observations. Untransformed enrollment counts, rather than the natural log of enrollment counts, are used as dependent variables. Estimates include controls for pre-Say Yes enrollment trends. * indicates that the coefficient estimate is statistically distinguishable from zero at 0.10, ** indicates statistically that the coefficient estimate is statistically distinguishable from zero at 0.05.

Table 3: Change in Trends in Enrollment Associated with Adoption of Say Yes, by Race and Free-Lunch Eligibility

Explanatory Variable	By Race			By Free-Lunch Eligibility		
	In White Enrollment	In Non-White Enrollment	Share White	In Free-Lunch Eligible Enrollment	In Non-Free-Lunch Eligible Enrollment	Share Free-Lunch Eligible
<u>Panel A. Syracuse</u>						
1 Year Post Say Yes	0.025 (0.033)	0.000 (0.036)	0.006 (0.007)	-0.013 (0.059)	0.064 (0.052)	-0.014 (0.024)
2 Year Post Say Yes	0.091 (0.040)	-0.027 (0.043)	0.015 (0.009)	0.026 (0.072)	0.116 (0.064)	-0.014 (0.029)
3 Year Post Say Yes	0.106 (0.048)	0.039 (0.052)	0.017 (0.011)	0.074 (0.087)	0.065 (0.075)	0.018 (0.034)
No. of Observations	7	7	7	7	7	7
<u>Panel B. Buffalo</u>						
1 Year Post Say Yes	0.025 (0.012)	0.012 (0.022)	0.002 (0.006)	0.071 (0.030)	-0.201 (0.149)	0.041 (0.030)
2 Year Post Say Yes	0.068** (0.014)	0.070 (0.027)	0.000 (0.007)	0.096 (0.037)	-0.017 (0.179)	0.019 (0.037)
No. of Observations	6	6	6	6	6	6

Notes: Each column of figures are coefficients, with associated standard errors in parentheses, from separate estimates of equation (1). Estimates include controls for pre-Say Yes enrollment trends estimated using four years of pre-Say Yes observations. Charter school enrollments included in the estimates. * indicates that the coefficient estimate is statistically distinguishable from zero at 0.10, ** indicates statistically that the coefficient estimate is statistically distinguishable from zero at 0.05, and *** indicates statistically that the coefficient estimate is statistically distinguishable from zero at 0.01.

Table 4: Changes in Enrollment Trends Associated with Adoption of Say Yes, By School

Explanatory Variable	Low-Performing	Middle-Performing	High-Performing
<u>Panel A. Syracuse</u>			
1 Year Post Say Yes	0.009 (0.029)	0.030 (0.028)	0.046* (0.025)
2 Year Post Say Yes	0.027 (0.036)	0.035 (0.035)	0.087*** (0.030)
3 Year Post Say Yes	0.010 (0.043)	0.063 (0.041)	0.135*** (0.036)
No. of Observations	49	49	49
<u>Panel B. Buffalo</u>			
1 Year Post Say Yes	-0.003 (0.032)	0.033 (0.036)	0.016 (0.054)
2 Year Post Say Yes	0.005 (0.039)	0.075* (0.044)	0.169** (0.065)
3 Year Post Say Yes	0.101** (0.046)	0.144*** (0.052)	0.138* (0.078)
No. of Observations	63	70	63

Notes: Each column of figures are coefficients, with associated standard errors in parentheses, from separate regressions. Regression equation estimated in each case is similar to equation (1) except district-specific trends are replaced with school-specific trends. All estimates are based on four-year pre-Say Yes and three-year post Say Yes observations. * indicates that the coefficient estimate is statistically distinguishable from zero at 0.10, ** indicates statistically that the coefficient estimate is statistically distinguishable from zero at 0.05, and *** indicates statistically that the coefficient estimate is statistically distinguishable from zero at 0.01.

Table 5: Changes in Housing Prices Associated with Adoption of Say Yes

Explanatory Variable	D-in-D All Sales	D-in-D Multiple Sales	Triple-Diff. All Sales	Triple-Diff. Multiple Sales
<u>Panel A. Syracuse</u>				
1 Year Post Say Yes	0.052 (0.035) [0.159]	0.046 (0.045) [0.317]	0.071 (0.046) [0.136]	0.089 (0.064) [0.174]
2 Year Post Say Yes	0.022 (0.036) [0.544]	0.016 (0.046) [0.731]	0.075 (0.464) [0.119]	0.089 (0.066) [0.189]
3 Year Post Say Yes	0.065 (0.044) [0.159]	0.068 (0.056) [0.243]	0.143** (0.057) [0.020]	0.169** (0.079) [0.044]
District-by-Year Obs.	33	33	66	66
Individual Property Sales	49,624	23,540	270,011	115,324
<u>Panel B. Buffalo</u>				
1 Year Post Say Yes	-0.024 (0.035) [0.518]	-0.028 (0.044) [0.552]	-0.042 (0.048) [0.399]	-0.060 (0.067) [0.390]
2 Year Post Say Yes	-0.097* (0.036) [0.035]	-0.072 (0.044) [0.154]	-0.111** (0.049) [0.035]	-0.107 (0.069) [0.146]
District-by-Year Obs.	20	20	40	40
Individual Property Sales	39,112	18,989	186,554	80,530

Notes: Each column of figures are coefficients, with associated standard errors and p -values in parentheses and brackets, respectively, from separate regressions. D-in-D All Sales correspond to equation (4), D-in-D Multiple Sales correspond to equation (5), and Triple-Diff. All Sales correspond to equation (5). Triple-Diff. Multiple Sales is based on equation similar to equation (5) with individual property covariates and neighborhood fixed effects replaced by individual property fixed effects. All estimates are based on eight-year pre-Say Yes and three-year post Say-Yes observations. * indicates that the coefficient estimate is statistically distinguishable from zero at 0.10, ** indicates statistically that the coefficient estimate is statistically distinguishable from zero at 0.05, and *** indicates statistically that the coefficient estimate is statistically distinguishable from zero at 0.01.

Table 6: Changes in Housing Prices in the Syracuse Suburbs Associated with Adoption of Say Yes

Explanatory Variable	D-in-D	D-in-D
	All Sales	Multiple Sales
1 Year Post Say Yes	-0.012 (0.013) [0.338]	-0.035** (0.016) [0.046]
2 Year Post Say Yes	-0.047** (0.013) [0.002]	-0.072** (0.016) [0.000]
3 Year Post Say Yes	-0.072*** (0.015) [0.000]	-0.094** (0.019) [0.000]
District-by-Year Obs.	33	33
Individual Property Sales	49,624	23,540

Notes: Each column of figures are coefficients, with associated standard errors and p -values in parentheses and brackets, respectively, from separate regressions. D-in-D All Sales correspond to equation (4), D-in-D Multiple Sales correspond to equation (5). All estimates are based on samples that include eight-year pre-Say Yes and three-year post Say-Yes observations of home sales in suburban areas around Syracuse, Buffalo, and Rochester. * indicates that the coefficient estimate is statistically distinguishable from zero at 0.10, ** indicates statistically that the coefficient estimate is statistically distinguishable from zero at 0.05, and *** indicates statistically that the coefficient estimate is statistically distinguishable from zero at 0.01.

Table 7a: Changes in Housing Prices Associated with Adoption of Say Yes in Syracuse

Explanatory Variable	D-in-D	D-in-D	Triple-Diff.	Triple-Diff.
	All Sales	Multiple Sales	All Sales	Multiple Sales
1 Year Post Say Yes	0.083 (0.035) [0.192]	0.080 (0.045) [0.255]	0.103 (0.062) [0.117]	0.097 (0.069) [0.179]
2 Year Post Say Yes	0.058 (0.036) [0.400]	0.056 (0.046) [0.471]	0.112 (0.068) [0.124]	0.098 (0.077) [0.221]
3 Year Post Say Yes	0.106 (0.045) [0.200]	0.113 (0.056) [0.219]	0.184* (0.079) [0.036]	0.180 (0.089) [0.062]
1 Year Pre Say Yes	0.037 (0.035) [0.477]	0.068 (0.045) [0.253]	0.041 (0.052) [0.435]	0.058 (0.058) [0.335]
2 Year Pre Say Yes	0.004 (0.036) [0.916]	-0.025 (0.046) [0.604]	-0.003 (0.043) [0.948]	-0.065 (0.049) [0.200]
3 Year Pre Say yes	0.036 (0.044) [0.322]	0.039 (0.056) [0.337]	0.046 (0.036) [0.217]	0.027 (0.041) [0.518]
District-by-Year Obs.	33	33	66	66
Individual Property Sales	49,624	23,540	270,011	115,324

Notes: Each column of figures are coefficients, with associated standard errors and p -values in parentheses and brackets, respectively, from separate regressions. D-in-D All Sales correspond to equation (4), D-in-D Multiple Sales correspond to equation (5), and Triple-Diff. All Sales correspond to equation (5). Triple-Diff. Multiple Sales is based on equation similar to equation (5) with individual property covariates and neighborhood fixed effects replaced by individual property fixed effects. All estimates are based on eight-year pre-Say Yes and three-year post Say Yes observations. * indicates that the coefficient estimate is statistically distinguishable from zero at 0.10, ** indicates statistically that the coefficient estimate is statistically distinguishable from zero at 0.05, and *** indicates statistically that the coefficient estimate is statistically distinguishable from zero at 0.01.

Table 7b: Changes in Housing Prices Associated with Adoption of Say Yes in Buffalo

Explanatory Variable	D-in-D	D-in-D	Triple-Diff.	Triple-Diff.
	All Sales	Multiple Sales	All Sales	Multiple Sales
1 Year Post Say Yes	0.033 (0.053) [0.579]	0.051 (0.059) [0.454]	-0.003 (0.067) [0.971]	0.011 (0.102) [0.915]
2 Year Post Say Yes	-0.031 (0.059) [0.629]	0.018 (0.065) [0.803]	-0.072 (0.074) [0.373]	-0.025 (0.113) [0.833]
1 Year Pre Say Yes	0.044 (0.048) [0.430]	0.057 (0.053) [0.362]	0.031 (0.061) [0.632]	0.055 (0.092) [0.566]
2 Year Pre Say Yes	0.084 (0.043) [0.148]	0.117 (0.048) [0.094]	0.065 (0.055) [0.281]	0.103 (0.083) [0.262]
3 Year Pre Say yes	0.026 (0.035) [0.508]	0.037 (0.039) [0.416]	0.011 (0.044) [0.812]	0.031 (0.067) [0.661]
District-by-Year Obs.	20	20	40	40
Individual Property Sales	39,112	18,989	186,554	80,530

Notes: Each column of figures are coefficients, with associated standard errors and p -values in parentheses and brackets, respectively, from separate regressions. D-in-D All Sales correspond to equation (4), D-in-D Multiple Sales correspond to equation (5), and Triple-Diff. All Sales correspond to equation (5). Triple-Diff. Multiple Sales is based on equation similar to equation (5) with individual property covariates and neighborhood fixed effects replaced by individual property fixed effects. All estimates are based on eight-year pre-Say Yes and three-year post Say Yes observations. * indicates that the coefficient estimate is statistically distinguishable from zero at 0.10, ** indicates statistically that the coefficient estimate is statistically distinguishable from zero at 0.05, and *** indicates statistically that the coefficient estimate is statistically distinguishable from zero at 0.01.

APPENDIX

Table A1: Changes in Housing Prices Associated with Adoption of Say Yes (Four Years of Pre-Say Yes Observations)

Explanatory Variable	D-in-D All Sales	D-in-D Multiple Sales	Triple-Diff. All Sales	Triple-Diff. Multiple Sales
<u>Panel A. Syracuse</u>				
1 Year Post Say Yes	0.046 (0.046) [0.346]	0.032 (0.069) [0.660]	0.064 (0.049) [0.226]	0.078 (0.075) [0.320]
2 Year Post Say Yes	0.018 (0.053) [0.741]	-0.005 (0.081) [0.950]	0.070 (0.056) [0.248]	0.074 (0.087) [0.147]
3 Year Post Say Yes	0.060 (0.066) [0.398]	0.038 (0.010) [0.718]	0.136 (0.071) [0.089]	0.147 (0.109) [0.207]
District-by-Year Obs.	21	21	42	42
Individual Property Sales	35,821	16,668	175,494	75,012
<u>Panel B. Buffalo</u>				
1 Year Post Say Yes	-0.050 (0.046) [0.390]	-0.069 (0.067) [0.413]	-0.057 (0.055) [0.333]	-0.086 (0.075) [0.285]
2 Year Post Say Yes	-0.013* (0.055) [0.145]	-0.129 (0.081) [0.251]	-0.128** (0.066) [0.089]	-0.140 (0.090) [0.158]
District-by-Year Obs.	12	12	24	24
Individual Property Sales	19,735	9,700	126,565	53,606

Notes: Each column of figures are coefficients, with associated standard errors and p -values in parentheses and brackets, respectively, from separate regressions. D-in-D All Sales correspond to equation (4), D-in-D Multiple Sales correspond to equation (5), and Triple-Diff. All Sales correspond to equation (5). Triple-Diff. Multiple Sales is based on equation similar to equation (5) with individual property covariates and neighborhood fixed effects replaced by individual property fixed effects. All estimates are based on eight-year pre-Say Yes and three-year post Say Yes observations. * indicates that the coefficient estimate is statistically distinguishable from zero at 0.10, ** indicates statistically that the coefficient estimate is statistically distinguishable from zero at 0.05, and *** indicates statistically that the coefficient estimate is statistically distinguishable from zero at 0.01.