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The Impact of Diversity on Dropout Rates at the School District Level

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Abstract

The 1954 Brown v. Board of Education case ruled that separate schools for blacks and whites was unconstitutional, and desegregation plans were put in place soon thereafter. Current desegregation programs are designed to send students, generally underrepresented minorities, to schools in districts with a large population of non-minority students. Angrist and Lang (2004) find for one suburban, majority white district that test scores were unaffected by the presence of additional underrepresented minorities. However, desegregation's effect on dropout rates is less clear at a district level. Using school district-level data from the U.S. Department of Education's Common Core of Data (CCD), I investigate the relationship between the racial diversity of a district and its dropout rate. The CCD is an annual set of five surveys sent to eighteen thousand public school districts. I control for school revenue and expenditure, county median income, and county unemployment.

Introduction & Background

In 1955, the Supreme Court stated in *Brown v. Board of Education II* that schools should be integrated "with all deliberate speed." In many places, however, integration took many years or was incomplete (Angrist 2004). Minority groups have lower test scores and school completion rates than non-minority students (US Department of Education 2016). Hanushek (2002), and others, propose that the black and white achievement gap is partly due to school segregation. While there is a large body of work on the result of desegregation on academic achievement, little focuses on its effects on dropout rates. With this in mind, I proposed the following research question: How does the racial diversity of a school district affect the dropout rate of that school district?

Literature

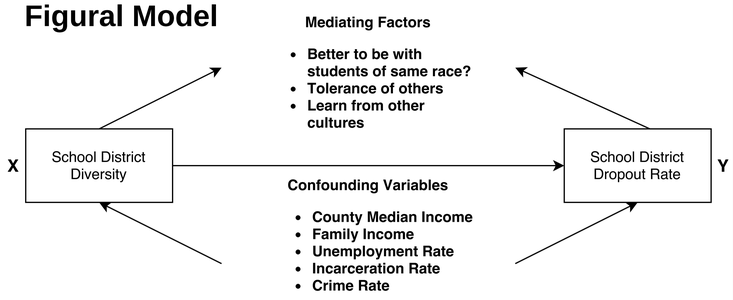
- Guryan (2004), using census data, finds that desegregation plans from the 1970s reduce dropout rates of African Americans, but no change is found for whites.
- Echenique et al. (2006) measure in-school segregation by examining how much students socially interact with students of their race. Theirs is the first empirical study on within-school segregation and its outcomes.
- Boisjoly et al. (2006) investigate changes in attitudes and behaviors of students who are placed with a roommate of another race during their first year in college. They find that white students who were placed with a black roommate are more likely to interact with people of another race, and, in general, that this mixing with other groups makes individuals more empathetic of other groups.
- Fairlie et al. (2014) ask whether minority students benefit from taking courses with minority instructors. They find a significant drop in class dropout rates when a course is taught by a minority professor.
- Bagde et al. (2016) study an affirmative action program used at colleges in India that fixes admissions quotas for women and disadvantaged castes. They determine that this program increases attendance of the targeted students.
- Angrist et al. (2004) take advantage of the Metropolitan Council for Educational Opportunity (METCO), a large desegregation program that sends Boston students to school in nearby affluent suburbs. While METCO is found to reduce test scores in participating districts, but have no impact on the scores of white, non-METCO students. They find that any peer effects from the integration program are small and short lived.
- Krueger et al. (1992) provide systematic evidence on racial differences of a wide range of measures of school quality. The Common Core Data is used to examine segregation in schools, where it is found that there is much segregation—in 1989, on average, a black student attended a school where 65 percent of students were non-white, but an average white student went to school where only 17 percent of students were non-white. Segregation is found to be much greater in public schools in large cities. They also investigate the effect of school segregation on years of schooling completed. They find that attending a school with a higher proportion of black students has a statistically significant effect on years of schooling.

Theory

Whether the diversity, or ethnic composition, of a school district affects its dropout rate is considered within a production function framework. From inputs in the form of students characterized by a number of attributes, including race and ethnicity, the school district "produces" graduates, or alternatively, dropouts. Several mediating factors may have a causal effect on an district's dropout rate, namely: minorities (on a national level) may be better off surrounded by other minorities, learning tolerance of others, and learning skills from other cultures. The net effect of racial diversity on the dropout rate is theoretically ambiguous, however.

- A minority group at a national level may not be a minority within a particular LEA if there is equal representation of all races
- Students who are discriminated against with any frequency would be at increased risk to drop out to avoid such discrimination in the school environment
- It may be that students will also perform better when surrounded by minority peers
- Students who perform better are less likely to underestimate their human capital and their potential and therefore are less likely to dropout
- Low school revenue will mean less money is available to purchase quality textbooks and other learning materials
- With little income, a school will be hard pressed to hire quality teachers. A multitude of low-quality teachers in a school leads to subpar learning among students, and lower academic performance. Routinely receiving low grades due to poor teaching and not poor student potential can cause students to underestimate their human capital and the worthwhileness of staying in school
- Unemployment rate and median income may indicate families have less resources with which to invest in their child's learning

Figural Model



Data

- Common Core of Data: All school related data
  - National Center for Education Statistics (NCES)
  - School, district, and state level data on an extensive list of items including dropouts, financial data, and other general information
- Statistics of Income: County Income Data
  - Internal Revenue Service: Statistics of Income (SOI)
  - Median income in every county
- Local Area Unemployment Statistics: County unemployment data
  - United States Department of Labor: Bureau of Labor Statistics (BLS)
  - Unemployment rate in every county
- Cross-section panel data spanning 2000-2009 school years
- Analysis done on school district level
- **Dissimilarity Index:** The proportion of a group that would need to move for a uniform population distribution

Summary Statistics

	Mean	SD	Min.	Max.
Dropout Rate	0.05	0.07	.00023	1.90
Dissimilarity	0.49	.00982	0.02	0.56
Total Revenue (Millions of $)	51.7	185	0	16,000
Total Expenditure (Millions of $)	52.9	199	0	16,600
Teaching Salaries (Millions of $)	18.8	74.3	0	6,630
Median Income (Thousands of $)	53.59	9.68	30.85	86.74
Unemployment	4.55	1.22	1.90	11.90

Empirical Model

- Fixed effects model
- Number of observations (districts): 60,572
- Number of groups (years; districts): 10; 10,389

$$dropout_{it} = \beta_0 total\ revenue_{it} + \beta_1 median\ income_{it} + \beta_2 unemployment_{it} + \beta_3 dissimilarity_{it} + \alpha_t + u_{it}$$

Dropout	OLS	FE (year FE's)	FE (district FE's)	FE (year, district FE's)
Dissimilarity	0.43 *** (0.032)	0.29 *** (0.03)	0.03 (0.02)	0.031 (0.044)
Total Revenue	7.24×10^{-12} *** (1.69×10^{-12})	5.31×10^{-12} *** (1.65×10^{-12})	-1.51×10^{-11} ** (6.20×10^{-12})	-1.51×10^{-11} *** (6.20×10^{-12})
Median Income (Thousands of $)	-7.56×10^{-4} *** (3.09×10^{-5})	-1.05×10^{-3} *** (3.14×10^{-5})	0.00039 *** (0.00005)	3.94×10^{-4} * (4.99×10^{-5})
Unemployment	.00178 *** (.000245)	.00217 *** (.000317)	-0.0006 *** (0.0002)	-0.000549 * (.000189)
Constant	-0.14 *** (0.02)	-0.03 ** (0.02)	0.01 (0.02)	0.01 (0.21)

Results & Conclusions

- Diversity is significant in both OLS and FE: Dissimilarity and dropout are directly related, so more segregated districts generally have higher dropout
- However, once district is controlled for, the significance disappears
- Median income has a sensible sign- as the average home income drops, dropout increases
- Unemployment has an intuitive coefficient as well- higher unemployment areas have higher dropout.
- Total revenue has a curious sign, showing that a higher revenue means a higher dropout. The coefficient is miniscule, but still significant
- Results still ambiguous since controlling for both year and district removes significance

Future Work

- If data becomes available, use dropout rates by race
- Use school level data instead of district
- More years of data: go back further, closer to when desegregation efforts started after *Brown. V. Board*
- Control for more confounding variables (Omitted Variable Bias)
- If possible, distinguish between dropouts and transfers