YOUTH POLICY LAB
UNIVERSITY OF MICHIGAN

GERALD R. FORD SCHOOL OF PUBLIC POLICY
EDUCATION POLICY INITIATIVE
UNIVERSITY OF MICHIGAN

DATA LAB

Public School Funding, School Quality, and Adult Crime

Policy Brief July 2022

Public School Funding, School Quality, and Adult Crime

Authors

E. Jason Baron
Duke University

Joshua Hyman
Amherst College

Brittany Vasquez
University of Michigan

Policy Issue

Given the large costs of crime to society, there is substantial policy interest in identifying effective crime-prevention strategies. Many studies have focused on the effects of increasing the size of the police force and on the effects of tougher sanctions on criminal activity. However, as budget-constrained cities across the country face increasing calls to allocate additional dollars toward social programs and away from law enforcement, there is growing interest in identifying policies that prevent contact with the criminal justice system to begin with.

We ask whether it is possible to reduce crime rates by increasing the amount of funding to a particularly important social program—public education. Using statistical methods and a novel dataset that links public school and adult criminal justice records in Michigan, we compare the adult arrest rates of similar students that attended better- and worse-funded elementary schools due to Michigan's 1994 school finance reform.

The authors would like to thank Joseph Ryan and U-M's Child and Adolescent Data Lab for their generosity in sharing data, as well as Brian Jacob from U-M's Youth Policy Lab for his valuable feedback. Much of the data used for this project was structured and maintained by the Michigan Education Data Center (MEDC). MEDC data is modified for analysis purposes and are not identical to those data collected and maintained by the Michigan Department of Education (MDE) and/or Michigan's Center for Educational Performance and Information (CEPI). The authors would like to thank Kyle Kwaiser and Jonathan Hartman (of MEDC) for their help with the education data used for this project and for record linkages. Results, information, and opinions solely represent the analysis, information, and opinions of the authors and are not endorsed by, or reflect the views or positions of grantors, MDE, CEPI, or any employee thereof. This research was funded with help from training grants R305B170015 and R305B150012 from the U.S. Department of Education's Institute of Education Sciences, and the Early Career Scholars Grant at Policy Impacts.

Key Findings

1. Students who attended better-funded elementary schools were taught by teachers with greater experience and earning higher salaries, were exposed to smaller class sizes, and attended schools with a larger number of administrators such as vice-principals.

2. Students who attended better-funded schools were 15% less likely to be arrested through age 30.

3. A likely reason for the observed reduction in adult arrests is that students in better-funded schools had better academic and behavioral outcomes, and higher educational attainment.

4. The reductions in adult crime alone generate social savings that exceed the costs to the government of increasing school funding.

Michigan's 1994 School Finance Reform

Like many states around the country, in the 1980s and early 1990s, the state of Michigan financed K-12 public education primarily through local property taxes. Due to growing spending inequalities across school districts, as well as rapidly increasing property tax burdens, Michigan voters approved Proposal A in 1994, which centralized financing at the state level.

Under Proposal A, the state assigned each district a per-pupil allotment for "operating" expenditures (e.g., the salaries of teachers and support staff). The state gave higher allotments to school districts with relatively low school expenditures prior to the reform with the goal of equalizing spending over time. While Proposal A centralized the level of operating expenditures, the amount of capital expenditures (e.g., new buildings or major renovations to school infrastructure) remained at the discretion of school districts. For this reason, this policy brief focuses on the effects of increases in "operating" expenditures.[1]

Population, Data, and Outcomes

We use a novel dataset that links educational records from the Michigan Department of Education (MDE), the Center for Educational Performance and Information (CEPI), and the National Student Clearinghouse (NSC) to adult criminal justice records from the Michigan State Police (MSP). Our dataset consists of nearly 1.2 million students who were first-time kindergarteners in Michigan public, non-charter schools between the 1994-95 and 2003-04 academic years.

> Some students attended elementary school in a school district and year in which the state assigned large increases in spending… We compare the outcomes of these "treated" students to those of children attending elementary schools in districts and years that did not receive large increases in funding.

Our main outcome of interest is whether or not the student was ever arrested in Michigan by age 30. We are also interested in other educational outcomes, including daily attendance rates and high school and college graduation.

Methods

The best way to determine the true causal impact of increasing school funding on adult crime is to conduct a randomized controlled trial in which a set of school districts (the treatment group) receives additional funding, while another group of districts (the control group) does not. Random assignment of treatment ensures that the treatment and control groups are highly similar but differ only on their treatment status. As a result, any subsequent differences in the outcomes of students in treated and control districts can be attributed to the increase in school funding.

In the absence of such a politically infeasible experiment, we use a feature of Michigan's Proposal A that mimics some of the desirable properties of a randomized controlled trial. Michigan's school funding equalization process led to otherwise similar students receiving drastically different funding amounts during elementary school. Some students attended elementary school in a school district and year in which the state assigned large increases in spending in order to equalize funds across districts. We compare the outcomes of these "treated" students to those of children attending elementary schools in districts and years that did not receive large increases in funding ("control" students).

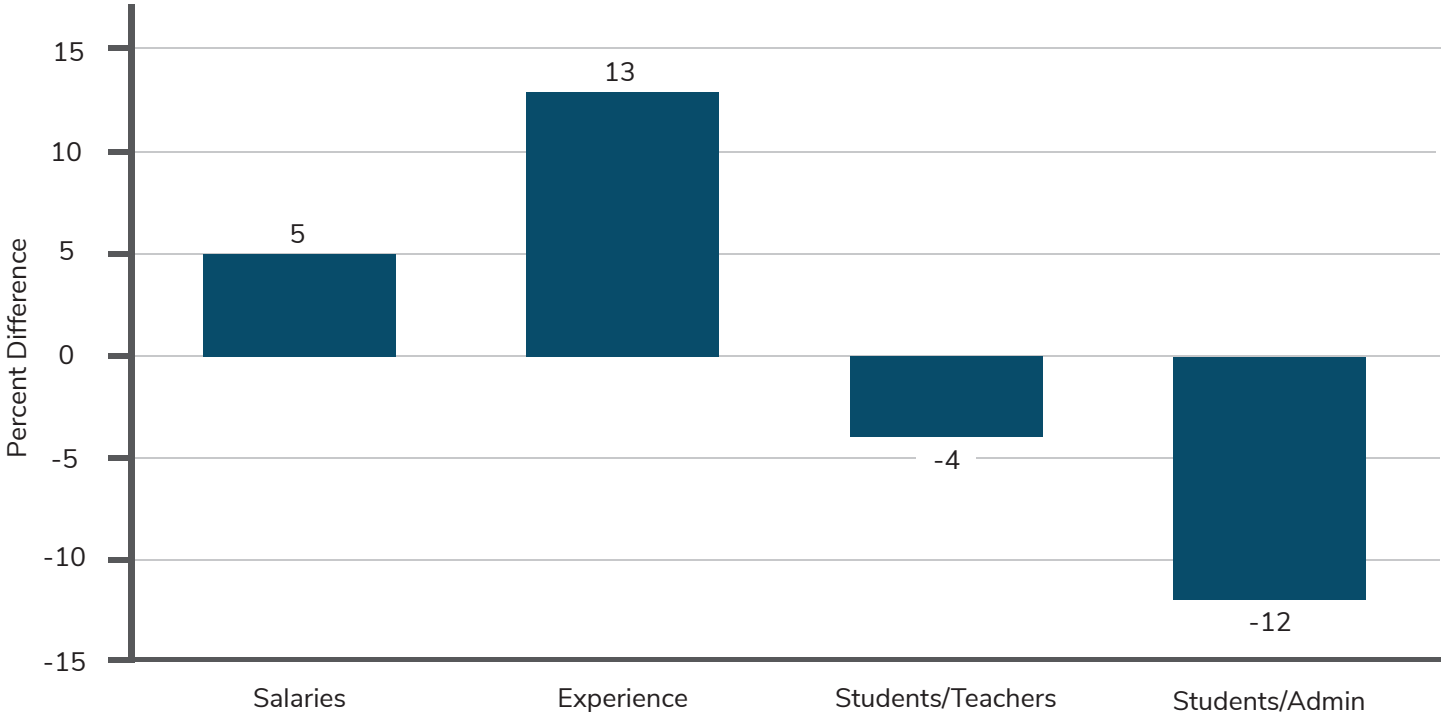
Findings

1. Increases in operating expenditures from Proposal A translated into improvements in school quality: higher teacher salaries and experience, lower class sizes, and additional school administrators.

We find that, on average, "treated" students were exposed to 10% more school funding (or $1,000) each year during elementary school than otherwise similar "control" students. We explored the ways in which this additional funding impacted key indicators of school quality for treated students. We focused on four critical indicators identified by previous studies as important determinants of student success: teacher salaries, teacher experience, class sizes, and school administrators.[2]

Exhibit 1 shows that, during elementary school, treated students were taught by teachers earning roughly $4,000 (5%) higher salaries and with 2 additional years (13%) of experience. Treated students also attended elementary schools with a 4% smaller student-teacher ratio and a 12% smaller student-administrator ratio.

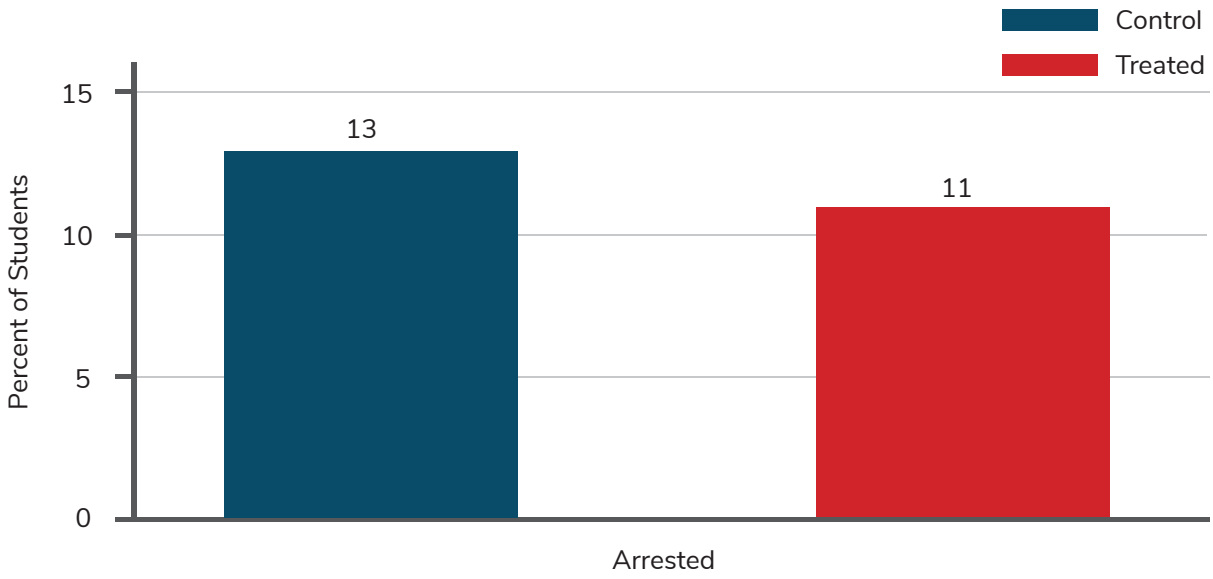
Exhibit 1. Percent Difference in the Elementary School Inputs of Treated versus Control Students



2. Treated students were less likely to be arrested as adults.

Exhibit 2 shows that 13% of "control" students were arrested at least once in early adulthood (ages 17 through 30). In contrast, only 11% of highly similar "treated" students were arrested at least once. Thus, treated students were 2 percentage points (or 15%) less likely to be arrested in early adulthood because of the additional funding during their elementary school years.

Exhibit 2. Percent of Treated and Control Students Arrested in Adulthood

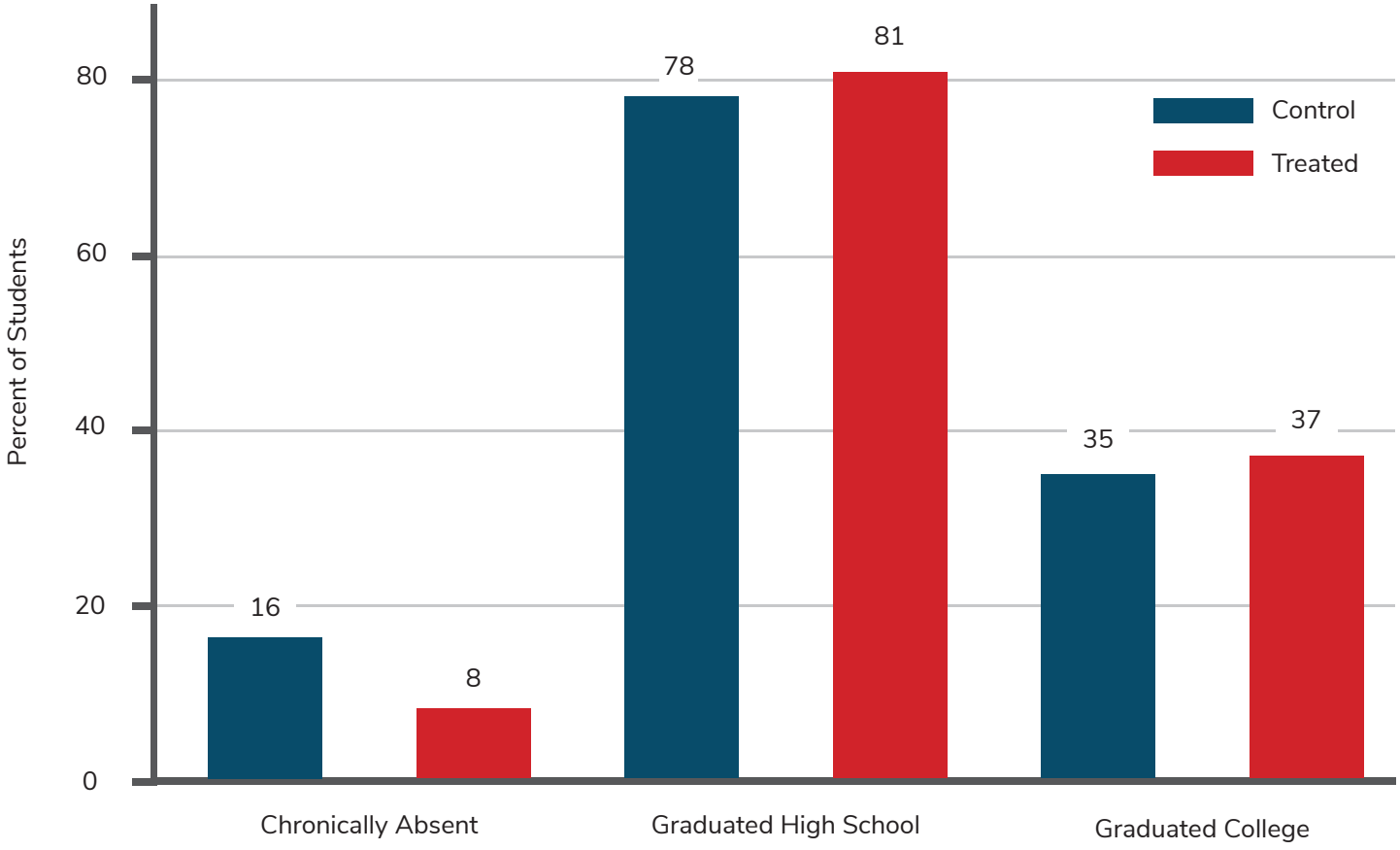


3. A likely reason for the observed reduction in adult arrests is that treated students had better academic performance and behavioral outcomes, and higher educational attainment.

We find that treated students were 8 percentage points (50%) less likely to be chronically absent in 8th grade (defined as missing over 10% of school days during the academic year), were 3 percentage points (4%) more likely to graduate high school, and 2 percentage points (6%) more likely to graduate college.

Overall, these findings suggest that improvements in the quality of elementary schools helped keep children attending and engaged in school. It is likely that, by graduating high school and college, treated students had better outcomes in the labor market that made committing crime less appealing.

Exhibit 3. Percent of Treated and Control Students Who Were Chronically Absent in Eighth Grade, Graduated High School, and Graduated College



4. The reductions in adult crime alone generate social savings that exceed the costs to the government of increasing school funding.

We calculated the "Marginal Value of Public Funds," a tool used in economics to calculate the "bang for the buck" of a given policy. This tool compares the benefits that a policy provides to society to the cost to the government of implementing it.[3] Using this framework, we estimate that, for every government dollar to increase public school funding, the associated reduction in crime alone generates roughly $2 in social benefits.

Policy Takeaways

Our findings yield two policy takeaways.

1 *Increases in public school funding early in children's lives can reduce adult crime.*

Criminal activity imposes enormous costs to society each year. As a result, there is substantial policy interest in identifying effective crime-prevention strategies. While many policies focus on the crime-deterring effects of additional policing or tougher criminal justice sanctions, our findings highlight that early investments in children's lives can prevent contact with the adult criminal justice system. Specifically, our results show that improving public schools can keep children on a path of increased school engagement and completion, thereby lowering their criminal propensity in adulthood.

2 *Increases in public school funding generate important benefits to society, outside of improvements in academic outcomes and educational attainment.*

The primary economic justification for the public provision of education is one of positive benefits to society at large, and not just individual returns. Yet most studies examining the benefits of increases in school funding focus on outcomes primarily measuring individual returns such as student test scores or educational attainment.[4] Our results show that increases in school funding can indeed bring positive benefits to society through reductions in criminal activity and that investing in social programs may have benefits that extend beyond their intended purpose and recipients. These important societal returns should be considered when conducting cost-benefit analyses of social programs.

EPI Mission Statement

The central mission of the Education Policy Initiative is to inform evidence based policy making in education. EPI has long been a leader in using causal inference methods to identify the impact of specific policies, programs, and practices to improve student success and educational outcomes. Using this leading-edge methodological expertise, EPI works to:

- Produce rigorous empirical evidence.
- Inform education policy debates and discussions nationwide.
- Build capacity among policymakers, educational practitioners, parents, and students for evidence-based education reform.
- Train the next generation of education policy researchers.
- Extend and strengthen the network of professionals who share an interest in education reform.

Education Policy Initiative | Gerald R. Ford School of Public Policy
Joan and Sanford Weill Hall, Suite 5100
735 South State Street, Ann Arbor, MI 48109
734-615-6978 | edpolicy.umich.edu | @edpolicyford

Notes

1. Our working paper also examines the effects of increases in capital expenditures on adult crime. In short, we find that improving school infrastructure by increasing capital expenditures can lead to large reductions in the probability that students commit crimes in adulthood. See Baron, Hyman, and Vasquez (2022) for more details.

2. Specifically, higher teacher salaries may allow school districts to attract and retain higher-quality teachers. Increases in teacher experience have been shown to improve student test scores directly (Papay and Kraft, 2015; Rockoff, 2004). Furthermore, the increase in teacher experience could reflect a decline in teacher turnover, which can be disruptive to instruction (Ronfeldt, Loeb, and Wyckoff, 2013). Similarly, smaller class sizes have been shown to increase standardized test scores, the likelihood of completing high school and college, and earnings (Krueger and Whitmore, 2001; Bloom and Unterman, 2014; Dynarski, Hyman, and Schanzenbach, 2013; Fredriksson, Ockert, and Oosterboeek, 2013). Finally, administrators such as principals and superintendents can have a strong influence on school cultures, and often play a role in responding to disciplinary and truancy incidents (Bacher-Hicks, Billings, and Deming, 2019).

3. See Hendren and Sprung-Keyser (2020) for more details.

4. Specifically, recent quasi-experimental studies primarily relying on variation from school finance reforms have shown that additional school resources improve short- and medium-term student outcomes such as test scores and educational attainment (Brunner, Hyman, and Ju, 2020; Hyman, 2017; Lafortune, Rothstein, and Schanzenback, 2018), and longer-term outcomes such as wages, employment, and intergenerational mobility (Biasi, 2021; Jackson, Johnson, and Persico, 2016; Rothstein and Schanzenbach, 2021). See Jackson (2018) for a detailed literature review.

References

Bacher-Hicks, Andrew, Stephen B. Billings, and David J. Deming. 2019. "The School to Prison Pipeline: Long-Run Impacts of School Suspensions on Adult Crime." *NBER Working Paper #w26257*.

Baron, E. Jason, Joshua Hyman, and Brittany Vasquez. 2022. "Public School Funding, School Quality, and Adult Crime." *NBER Working Paper #w29855*.

Biasi, Barbara. 2021. "School Finance Equalization Increases Intergenerational Mobility: Evidence from a Simulated-Instruments Approach." *Journal of Labor Economics*, Forthcoming.

Bloom, Howard S., and Rebecca Unterman. 2014. "Can Small High Schools of Choice Improve Educational Prospects for Disadvantaged Students?" *Journal of Policy Analysis and Management* 33(2): 290–319.

Brunner, Eric, Joshua Hyman, and Andrew Ju. 2020. "School Finance Reforms, Teachers' Unions, and the Allocation of School Resources." *Review of Economics and Statistics* 102(3): 473–489.

Dynarski, Susan, Joshua Hyman, and Diane Whitmore Schanzenbach. 2013. "Experimental Evidence on the Effect of Childhood Investments on Postsecondary Attainment and Degree Completion." *Journal of Policy Analysis and Management* 32(4): 692–717.

Fredriksson, Peter, Björn Öckert, and Hessel Oosterbeek. 2013. "Long-Term Effects of Class Size." *The Quarterly Journal of Economics* 128(1): 249–285.

Hendren, Nathaniel and Ben Sprung-Keyser. 2020. "A Unified Welfare Analysis of Government Policies." *The Quarterly Journal of Economics* 14(1): 1-39.

Hyman, Joshua. 2017. "Does Money Matter in the Long Run? Effects of School Spending on Educational Attainment." *American Economic Journal: Economic Policy* 9(4): 256–80.

Jackson, C Kirabo. 2018. "Does School Spending Matter? The New Literature on an Old Question." *NBER Working Paper #25368*.

Jackson, C. Kirabo, Rucker C. Johnson, and Claudia Persico. 2016. "The Effects of School Spending on Educational and Economic Outcomes: Evidence from School Finance Reforms." *The Quarterly Journal of Economics* 131(1): 157–218.

Krueger, Alan B., and Diane M. Whitmore. 2001. "The Effect of Attending a Small Class in the Early Grades on College-Test Taking and Middle School Test Results: Evidence from Project STAR." *The Economic Journal* 111(468): 1–28.

Lafortune, Julien, Jesse Rothstein, and Diane Whitmore Schanzenbach. 2018. "School Finance Reform and the Distribution of Student Achievement." *American Economic Journal: Applied Economics* 10(2): 1–26.

Papay, John P., and Matthew A. Kraft. 2015. "Productivity Returns to Experience in the Teacher Labor Market: Methodological Challenges and New Evidence on Long-Term Career Improvement." *Journal of Public Economics* 130: 105–19.

Rockoff, Jonah E. 2004. "The Impact of Individual Teachers on Student Achievement: Evidence from Panel Data." *American Economic Review* 94 (2): 247–52.

Ronfeldt, Matthew, Susanna Loeb, and James Wyckoff. 2013. "How Teacher Turnover Harms Student Achievement." *American Educational Research Journal* 50 (1): 4–36.

Rothstein, Jesse, and Diane Whitmore Schanzenbach. 2021. "Does Money Still Matter? Attainment and Earnings Effects of Post-1990 School Finance Reforms." *Journal of Labor Economics*, Forthcoming.