THE EFFICIENCY OF EQUITY IN LOCAL GOVERNMENT FINANCE

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For generations, debates over what level of government should pay for local government services—most notably school funding—have largely boiled down to a simple pair of assumptions. Having the state or federal government pay for services promotes equality across rich and poor areas, but hampers local tailoring and thereby reduces citizens' choice sets. Economists call this an equity-efficiency trade-off—centralized funding promotes equity but undermines efficiency.

This Article argues that this presumed trade-off is not as stark as generally thought, as it ignores important and underappreciated reasons that centralization promotes choice and thus efficiency. Specifically, more centralized funding helps people live where they prefer to live, unburdened by artificially needing to pay more for services in poor jurisdictions with large numbers of impoverished households who can pay little for services themselves. This insight should not only shift the scholarly debate on the equity-efficiency trade-off, but also supply important, real-world payoffs for debates over school funding and similar programs. Put simply, centralized funding promotes equality and, by promoting choice, efficiency.

The Article does not merely make a theoretical argument; it also empirically tests the claim using natural experiments across the country in centralizing state funding for schools. The Article finds large efficiency benefits. The results also show that more centralized financing has encouraged people to move back to central cities, suggesting a second, hidden efficiency benefit to more centralized financing: It promotes the positive externalities associated with central city living. The Article could thus broaden support for more centralized funding of local services, something that could fundamentally reshape not just academic debates over fiscal federalism, but also state and local fiscal policy and urban living.

Introduction

For generations, debates have raged in scholarly journals, judicial opinions, and legislatures across the country over what level of government should pay for local services like schools.[1] These debates, still

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[1] For the academic debate, see, for example, Robert P. Inman & Daniel L. Rubinfeld, *The Judicial Pursuit of Local Fiscal Equity*, 92 Harv. L. Rev. 1662, 1663–65, 1747 n.220 (1979) (offering a skeptical view of the ability of courts to achieve greater equity in education funding without more centralized funding); Daniel Shaviro, *An Economic and Political Look at Federalism in Taxation*, 90 Mich. L. Rev. 895, 896–98 (1992) (arguing that neutrality of taxes across locations often suggests greater centralization in taxation); and David A. Super, *Rethinking Fiscal Federalism*, 118 Harv. L. Rev. 2544, 2550 (2005) (arguing, among other things, that states should revise their fiscal constitutions to take account of recessions). For the debate in courtrooms, see, for example, *San Antonio Indep. Sch. Dist. v. Rodriguez*, 411 U.S. 1, 18, 47 (1973) (finding that the poor do not constitute a suspect class that would trigger the strict scrutiny test under the Equal Protection Clause of the U.S. Constitution and that local control of schools constitutes a rational reason to maintain local financing, despite the great disparities in taxable property across jurisdictions); Serrano v. Priest, 487 P.2d 1241, 1241 (Cal. 1971) (finding that the Equal

hot today,[2] have been dominated by a simple trade-off.[3] Centralized funding of services (i.e., funding by the federal or state government) promotes equity, since the center can pay for the services equally across communities rich and poor.[4] But, the assumed cost of centralized funding is that it reduces choice, and therefore efficiency, since local communities are unable to choose their desired levels of spending and perhaps also what to spend that money on if the center decides to attach strings to the funding.[5] Decentralized funding (i.e., funding by local governments) would address these concerns. Or, so suggests the dominant model in local government law, the "Tiebout model," which argues that when households can choose among a variety of options for local service provision (e.g., choosing well-financed parks or schools, versus having lower taxes), they will best be able to satisfy their preferences, yielding efficient location choices and public service provision.[6] In other words, this debate has been framed as what economists would call an equity-efficiency trade-off: Centralized funding promotes equity but harms efficiency.[7]

But this trade-off misses much of the picture. This Article argues that more centralized funding for some local services also has under-appreciated and important *efficiency* virtues, and this Article empirically tests those virtues' importance. When funding is decentralized, and local communities pay for their own services, the wealth of the community becomes a key determinant in how much a community can

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Protection Clauses of the U.S. and California constitutions guarantee more equal funding across school districts, leading to more centralized funding).

[2] For example, school finance cases over state funding for local schools are ongoing in Connecticut, Florida, and New York. *See, e.g.*, Conn. Coal. for Justice in Educ., Inc. v. Rell, No. X07HHDCV145037565S, 2016 WL 4922730, at *2 (Conn. Super. Ct. Sept. 7, 2016); Citizens for Strong Schs., Inc. v. Fla. State Bd. of Educ., No. 1D16-2862 (Fla. Dist. Ct. App. Oct. 6, 2016); Maisto v. State, 51 N.Y.S.3d 800, 801–02 (Sup. Ct. Sept. 2016).

[3] Of course, this simple dichotomy does not capture the entire debate. For example, one could argue that centralized funding also promotes economies of scale. However, that argument pertains more to centralized spending rather than centralized funding. This Article focuses on centralized funding, not centralized spending.

[4] JOHN E. COONS ET AL., PRIVATE WEALTH AND PUBLIC EDUCATION 33 (1970) (explaining that a "completely centralized state system" could remedy the existing wealth-based inequities in the provision of education); Richard Briffault, *The Role of Local Control in School Finance Reform*, 24 CONN. L. REV. 773, 805–06 (1992) (explaining how local fiscal responsibility is both a cause and effect of wealth inequality).

[5] Charles M. Tiebout, *A Pure Theory of Local Expenditures*, 64 J. POL. ECON. 416, 424 (1956); HARVEY S. ROSEN, PUBLIC FINANCE 530–35 (3d ed. 1991).

[6] Tiebout, *supra* note 5, at 424.

[7] *See* JONATHAN GRUBER, PUBLIC FINANCE AND PUBLIC POLICY 53 (4th ed. 2013) (describing equity-efficiency trade-offs); Thomas A. Husted & Lawrence W. Kenny, *Evidence of the Impact of State Government on Primary and Secondary Education and the Equity-Efficiency Trade-Off*, 43 J.L. & ECON. 285, 287 (2000) (same, in the context of education).

pay for services like schools. Current decentralized funding of local services such as education is like charging residents of poor places but not rich ones for Medicaid, the program funded primarily by the federal government to provide medical care to the poor. Doing so artificially bundles expenses for poverty into living in a particular location and thereby discourages others from living in the same jurisdiction as the poor—locations in which they might otherwise prefer to live for reasons like having a short commute to work or access to other amenities.[8]

Indeed, without some centralization of funding, this dilemma is an inherent feature of American local government law: Due to state constitutional requirements for the provision of education and for uniform taxation of property, local governments *must* provide education to the poor but cannot tax them much to pay for it.[9] In any jurisdiction with poor individuals who can afford to pay little to educate their children, others must pay a disproportionate amount to educate the poor. More centralized funding levels the local finance playing field and reduces this artificial barrier, or "poverty fine," to living in one place over another on account of how much one's neighbors can pay in taxes, and promotes choice and thereby efficiency.

The Article not only develops the theory behind the hidden choice- and efficiency-promoting benefits of centralized funding but also empirically tests their importance. To know how large these efficiency benefits are requires knowing how many people's choices are distorted by the poverty fine associated with decentralized funding. For example, maybe poor cities would remain unappealing for middle-class households even if there were a level local finance playing field, meaning that there could be little distortion from decentralized funding. To make such a measurement, this Article takes advantage of the natural experiments in school finance across the country over the past several decades.[10] The Article's normative analysis applies to all

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8   *See* Joseph Gyourko, *Place-Based Aid Versus People-Based Aid and the Role of an Urban Audit in a New Urban Strategy*, 3 CITYSCAPE 205, 205 (1998) (pointing out the consequences of fiscal disparities between jurisdictions); Janet Rothenberg Pack, *Poverty and Urban Public Expenditures*, 35 URB. STUD. 1995, 1995 (1998) (similar).

9   Robert C. Ellickson, *Suburban Growth Controls: An Economic and Legal Analysis*, 86 YALE L.J. 385, 452 (1977); *see infra* notes 52–53 and accompanying text.

10   The literature on school finance litigation is vast. *See, e.g.*, Carlee Poston Escue, William E. Thro & R. Craig Wood, *Some Perspectives on Recent School Finance Litigation*, 268 EDUC. L. REP. 601, 601–03 (2011) (summarizing recent developments in school finance litigation); Michael Heise, *State Constitutions, School Finance Litigation, and the "Third Wave": From Equity to Adequacy*, 68 TEMP. L. REV. 1151, 1152–53 (1995) (overviewing school finance litigation through the mid-1990s); Kevin R. McMillan, *The Turning Tide: The Emerging Fourth Wave of School Finance Reform Litigation and the Courts' Lingering Institutional Concerns*, 58 OHIO ST. L.J. 1867, 1868 (1997) (describing the decline of the

forms of locally financed goods, but school funding is a good case study because it is by far the largest component of local government spending.[11] Since the early 1970s, largely responding to state supreme court orders, legislatures have mandated vastly increased state spending in poor school districts to reduce large inequalities in spending across poor and rich locations.[12] Courts in some states, but not others, have required this more centralized state funding. These decisions level the local finance playing field and allow households to move to places where they can achieve a higher quality of life.[13] This Article measures migration to low-income places that benefit from increased state aid for schools. The results show that a huge number of people—6.6 million—moved from rich places to poor ones because of the state school aid, taking advantage of the greater freedom in location choice and showing that the efficiency gains of the policy are very large.[14]

The empirical analysis also reveals a second unknown benefit of centralized funding (which the Article uses interchangeably with "state aid," and "redistribution" to refer to increased state funding for local services in poor areas): It has been a major cause of the "return to the central city," drawing residents back to central cities (i.e., cities

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third wave of school finance litigation and positing the emergence of a fourth wave); Douglas S. Reed, *Twenty-Five Years After* Rodriguez*: School Finance Litigation and the Impact of the New Judicial Federalism*, 32 L. & Soc'y Rev. 175, 177 (1998) (comparing successful and unsuccessful school finance litigation, and concluding that school finance litigation can impact both the equity and adequacy of states' educational systems); William E. Thro, Note, *To Render Them Safe: The Analysis of State Constitutional Provisions in Public School Finance Reform Litigation*, 75 Va. L. Rev. 1639, 1646–47 (1989) (examining how the differences in states' constitutional education requirements impact courts' interpretations of education as a "fundamental" right).

[11] *State and Local Finance Initiative: State and Local Expenditures*, Urb. Inst., (June 7, 2017, 4:48 PM), http://www.urban.org/policy-centers/cross-center-initiatives/state-local-finance-initiative/projects/state-and-local-backgrounders/state-and-local-expenditures (showing elementary and secondary education as 39.9% of local government expenditures, dwarfing the next largest, at 9.3% for health and hospitals).

[12] *See, e.g.*, Serrano v. Priest, 487 P.2d 1241 (Cal. 1971). For a list of state court decisions, see Nat'l Ctr. for Educ. Stats., School Finance Litigation, by Year, Case, and Status, by State: 1970–2009 (2009), http://nces.ed.gov/edfin/litigation.asp (last visited June 18, 2017). For an overview from the economics perspective, see David Card & A. Abigail Payne, *School Finance Reform, the Distribution of School Spending, and the Distribution of Student Test Scores*, 83 J. Pub. Econ. 49 (2002).

[13] For example, jobs are disproportionately located in poor central cities, and state aid helps people live closer to those jobs. *See* Edward L. Glaeser & Matthew E. Kahn, *Decentralized Employment and the Transformation of the American City*, 2001 Brookings-Wharton Papers on Urb. Aff. 1, 5–6 (2001) [hereinafter Glaeser & Kahn, *Decentralized Employment*] (showing that, in 1996, only 20% of people lived within three miles of central business districts, but 25% worked there in 1996).

[14] *See infra* note 127 and accompanying text (explaining the methodology for measuring this result).

at the center of metropolitan areas), which, on average, are much poorer than suburbs and therefore are beneficiaries of the increased state spending on schools in poor areas.[15] Indeed, the Article is a test and confirmation of the novel hypothesis that state aid for schools in poor cities is an important cause of the return to the central city. Many scholars believe that central city living promotes positive externalities by increasing productivity through "agglomeration spillovers" and reduces the negative externalities of "suburban sprawl" like increased greenhouse gas emissions, long congested commutes, and segregation, making this "return to the central city" an unanticipated efficiency virtue of increased centralization for the funding of the costs of educating the poor.[16] And these benefits are reinforced by the possibility of a "virtuous cycle" effect in politics as well: When the middle class chooses to return to poor cities, they have a bigger stake in having good public services, and so may add to the political power of poor cities, further driving efficiency (as well as equity) gains.[17]

By making the case for these two efficiency virtues, this Article could broaden the political support for state aid for more funding of local services in poor areas. And it fundamentally reshapes not just academic debates over "fiscal federalism" (i.e., the study of which level of government should raise funds and provide services), but also state fiscal policy and urban living in several ways. Most basically, the Article suggests that state legislators and Congress should consider these efficiency virtues when deciding their contribution to the financing of local services, alongside the existing concerns of equality and the values of local control that can be undermined by more centralized funding.[18] In particular, the Article shows how supporters of more centralized funding for services like schools in poor cities can use arguments of free choice. Counterintuitively, centralized funding in some ways allows people *more* free choice in making one of the most important decisions in their lives: where to live and receive public services like schooling. As well, supporters of more centralized funding can point to the externality-busting benefits of central city living that are promoted by such funding.

But the implications extend well beyond these basic ones. For example, though the most recent empirical evidence suggests that increased funding for schools does improve educational outcomes, court orders requiring more centralized school funding have long been

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[15] Edward L. Glaeser et al., *Why Do the Poor Live in Cities? The Role of Public Transportation*, 63 J. Urb. Econ. 1, 1 (2008).

[16] *See infra* note 213 and accompanying text.

[17] Briffault, *supra* note 4, at 805–06.

[18] *See infra* notes 83–84, 273–74 and accompanying text.

criticized for not leading to such gains.[19] Of course, better school out-comes are important. But this Article shows that they are not neces-sary for more centralized school funding to enhance well-being. Instead, as the Article shows in the case of Connecticut, most of the funding for schools may *not* go to schools, but instead goes to local tax reductions.[20] If the only goal is promoting equality of opportunity in schools, this outcome versus the alternative of all the funds going to schools is problematic. Indeed, though there are ways to try to avoid such outcomes that the Article discusses, such leakage likely is to some extent unavoidable. However, opening up the normative frame and considering the two efficiency reasons this Article develops reveals that these tax reductions are not problematic from all perspec-tives. In particular, both improved school quality and lower local taxes can reduce the distortion to location choice and promote city living, making the leakage less concerning.

The Article also has implications for so-called "place-based" poli-cies, which target funding at places, rather than people. These policies have long been the subject of controversy, the target of scorn by some economists, and defended by their beneficiaries in the targeted low-income areas.[21] Without resolving the debate, the Article offers sub-stantial grist to the beleaguered proponents of place-based policies. Consider, for example, sending state money to Detroit for its schools on the basis of the city's poverty. Critics of the policy see the money both as encouraging people to stay in a city that has lost over 60% of its population, and as doubling down in a place that continues to be beset by a host of problems.[22] The Article militates in favor of a reversal of the narrative: Partly because of factors outside of the city's

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[19] *Compare* C. Kirabo Jackson et al., *The Effects of School Spending on Educational and Economic Outcomes: Evidence from School Finance Reforms*, 131 Q.J. ECON. 157, 160–61 (2016) (finding substantial positive educational impacts of school finance reforms) and Julien Lafortune et al., *School Finance Reform and the Distribution of Student Achievement*, AM. ECON. J.: APPLIED ECON. (forthcoming) (manuscript at 27–28) (similar) *with* Julian R. Betts, *Does School Quality Matter? Evidence from the National Longitudinal Survey of Youth*, 77 REV. ECON. & STAT. 231, 232, 246 (1995) (finding no such impacts) and Eric A. Hanushek, *The Economics of Schooling: Production and Efficiency in Public Schools*, 24 J. ECON. LIT. 1141, 1141–42 (1986) (similar).

[20] For a review of the Connecticut experience, see Lauren A. Wetzler, *Buying Equality: How School Finance Reform and Desegregation Came to Compete in Connecticut*, 22 YALE L. & POL'Y REV. 481 (2004). *See also* Michael Heise, *State Constitutional Litigation, Educational Finance, and Legal Impact: An Empirical Analysis*, 63 U. CIN. L. REV. 1735, 1738–39 (1994) (finding unclear evidence of increases in spending in Connecticut and Wyoming after school finance decisions).

[21] *See infra* note 240 and accompanying text.

[22] *See* Edward L. Glaeser, *Can Detroit Find the Way Forward?*, N.Y. TIMES (Feb. 22, 2011), https://economix.blogs.nytimes.com/2011/02/22/can-detroit-find-the-road-forward/?_r=0 (criticizing place-based spending on Detroit).

control (e.g., the decline of manufacturing) and partly because of problematic public policy, Detroit has been beset by problems, causing it to lose many of its wealthy and middle-class residents. But because many of its services are funded locally, the departure of its higher-income residents increased the burden on its remaining residents, encouraging yet more to leave, in a vicious cycle. The Article shows that the cycle is not only vicious but also inefficient: Without the artificial need to pay more for services in Detroit because of the ever-increasing share of impoverished households who can pay little for services themselves, people would move back. That is precisely what the empirical results show: When state aid for poor places increases, and location choices are no longer distorted, people move back to poor areas.

The Article also opens up new arguments in school finance litigation and strengthens old ones,[23] explores how the results could influence future state legislation on school finance and other forms of state and federal tranfers to local governments,[24] and develops other policy implications.

The Article proceeds as follows. Section I discusses the scholarly debate between supporters and critics of the centralization of funding for services. Section II explains how tying the costs of poverty to residential location choice yields an inefficiency and how to test for the magnitude of that inefficiency. Section III describes the history of school finance litigation in the United States. Section IV conducts the empirical test on how much centralization expands location choice. Section V presents a case study on Connecticut and shows that much of the state funding there has gone to tax cuts, among other results. Section VI develops implications for policy.

I

THE THEORY OF FISCAL FEDERALISM

The question in fiscial federalism of how centralized government finance should be has long been dominated by a simple trade-off: the efficiencies of local choice argue for decentralization, but the equity of more equalized funding argues for centralization. For those arguing for decentralization, the Tiebout[25] model has long been the dominant

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[23] *See infra* Section VI.C.

[24] *See infra* Section VI.D.

[25] ILL. CONST. art. X, § 1; KY. CONST., § 183; MD. CONST. art. VIII, § 1; MINN. CONST. art. XIII, § 1; N.J. CONST. art. VIII, § 4 ¶1; OHIO CONST. art. VI, § 2; PA. CONST. art. III, § 14; S.D. CONST. art. VIII, § 15; TEX. CONST. art. VII, § 1; W. VA. CONST. art. XII, § 1; WYO. CONST. art. VII, § 9. *See infra* Section VI.C for a discussion of how these provisions have been interpreted.

economic paradigm for understanding local government law.[26] The
model's supporters have generally argued for decentralized provision
of services, and its critics have generally argued for more centralized
provision.[27] Charles Tiebout argued that, with an infinite number of
cities to choose among and costless mobility, individuals will sort into
a jurisdiction with others who have preferences and resources iden-
tical to their own. As a result, everyone will be provided with their
preferred bundle of services, since identical people will demand iden-
tical services from their governments. Social welfare will be maxi-
mized without any provision of services at a level of government
above the city.[28] This decentralized local governance structure may
also promote competition among cities in the provision of public ser-
vices like schools, thereby improving performance.[29]

Tiebout develops the idea of "consumer-voters" who choose
among communities that provide different levels of different public
goods.[30] Just as consumers in markets can choose the number of
bananas they wish to buy, consumer-voters can choose the "quality of
such facilities and services as beaches, parks, police protection, roads,
and parking facilities."[31] The consumer-voter evaluates the services
available in the various communities and chooses the community that
matches her preferences by costlessly moving there. Doing so pro-
motes the standard economics "Kaldor-Hicks" definition of efficiency,

[26] Richard Briffault, *The Rise of Sublocal Structures in Urban Governance*, 82 MINN. L.
REV. 503, 503 (1997) ("The dominant law and economics model of local government, based
on the work of Charles M. Tiebout, assumes that decentralization of power to local
governments promotes the efficient delivery of public goods and services."); David
Schleicher, *The City as a Law and Economic Subject*, 2010 U. ILL. L. REV. 1507, 1508
(2010) ("The study of the relationship between local government law and economics has
long had one central text: Charles Tiebout's famous 1956 article, *A Pure Theory of Local
Expenditures*.").

[27] Various other issues can affect the desirability of taxing at different levels of
government. For example, to the extent that taxation is related to provision of the service,
there can be economies (or diseconomies) of scale at different levels of government.

[28] Tiebout, *supra* note 5, at 424.

[29] *Compare* Caroline M. Hoxby, *Does Competition Among Public Schools Benefit
Students and Taxpayers?*, 90 AM. ECON. REV. 1209, 1236–37 (2000) (arguing that empirical
evidence shows that more competition between schools improves school quality), *with*
Jesse Rothstein, *Does Competition Among Public Schools Benefit Students and Taxpayers?
(2000)*, 97 AM. ECON. REV. 2026, 2026 (2007) (critiquing Hoxby's econometric results as
unsound). A further argument in favor of small jurisdictions is that larger governments
may have diseconomies of scale. *See* Briffault, *supra* note 4, at 791 ("In addition to
promoting the opportunities for local choice, it has been asserted that local control
constrains the unit costs of government services. These efficiency benefits derive from the
relatively small size and greater homogeneity of most school districts, compared to the
state or to possible metropolitan-area-wide districts.").

[30] Tiebout, *supra* note 5, at 417.

[31] *Id*. at 418.

which is essentially a monetized version of utility, and therefore takes into account whatever improves people's well-being, including living in places that increase well-being by, for example, being closer to work or simply more enjoyable places to live.[32] Tiebout argues that just as free markets provide an efficient amount of production and allocation of privately produced goods and services to consumers, the process of consumer-voters choosing communities will lead to an efficient amount of production and allocation of government-produced goods and services.[33]

Applying this argument to the focus of this Article—what level of government should pay for local schools—the Tieboutian efficiency argument suggests at least two problems with centralized funding. First, some people may want to spend more or less money on education—to have better teachers or better facilities, for example—and centralized financing reduces efficiency by restricting the ability of citizens to choose their preferred education spending. Second, with more centralized funding, the state government may attach strings to money on, say, the curriculum or teacher tenure practices, thereby thwarting the desires of local residents and again reducing efficiency.

While decentralized funding and the Tiebout model have been critiqued from many perspectives,[34] the dominant critique has been the stark inequalities associated with decentralized funding. U.S. cities vary tremendously in their wealth, especially in recent decades.

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[32] *See* Zachary D. Liscow, *Is Efficiency Biased?* 2–3 (Mar. 26, 2017) (unpublished manuscript) (on file with author) (explaining the meaning of Kaldor-Hicks efficiency). In contexts where income inequality is important, Kaldor-Hicks efficiency and utility can be quite different, but that is not the issue in this paper. *Id*.

[33] Tiebout, *supra* note 5, at 424.

[34] These other critiques have tended to focus not on what *level of government* should *pay* for local services but rather on the *size of the jurisdiction* that should *spend* the money and *regulate* local affairs. For example, the Tiebout model does not incorporate cross-jurisdictional spillovers, which generate problems with small jurisdictions, since localities may not fully consider the impacts their actions have on neighboring jurisdictions. *See*, *e.g.*, Richard Briffault, *Our Localism: Part II—Localism and Legal Theory*, 90 Colum. L. Rev. 346, 426–27 (1990). Furthermore, high contracting costs may prevent small jurisdictions from contracting to address these externalities. *See* Clayton P. Gillette, *The Conditions of Interlocal Cooperation*, 21 J.L. & Pol. 365, 367 (2005) ("My underlying claim . . . is that the most significant obstacles to cooperation lie in high contracting costs."). Various factors increase contracting costs, including difficulty monitoring behavior and courts' reluctance to get involved, especially in budgetary matters. Clayton P. Gillette, *Regionalization and Interlocal Bargains*, 76 N.Y.U. L. Rev. 190, 257–60 (2001). As well, small jurisdictions may thwart "agglomeration" benefits from dense development, such as "reduced transportation cost for goods, increased labor market depth, and intellectual spillovers." Schleicher, *supra* note 26, at 1507. Schleicher argues that the presence of many small governments promotes Tiebout sorting by giving residents many options, but does not promote optimal agglomeration benefits, since these benefits are felt across jurisdictional boundaries, and it may be difficult for a large number of cities to coordinate to maximize them. *Id.* at 1513.

Tiebout wrote in 1956: around that time, central cities and suburbs had roughly the same income, with center city residents actually having a higher per capita income than suburbanites by 5%.[35] But by 1987, suburbs had average incomes that were dramatically higher—by 69%—than those in central cities, and that is just taking the average.[36] With this inequality in resources comes inequality in spending, especially since local school funding almost entirely comes from local property taxes, which hit the poor especially hard because they spend a high fraction of their income on housing.[37] As a result, some places will be able to spend less on local services, an inequality that is particularly jarring for some in the case of education for children.

Legal scholars were arguing by the late 1960s that the equal provision of educational opportunity requires "centralization and uniformity."[38] These scholars argue that decentralized systems of education finance unfairly result in lower-quality school systems in poor school districts than in rich ones, even as residents of poor areas bear high tax burdens.[39] They explain that educational "subsidiarity," a decentralized system of finance motivated by a preference for policy decisionmaking by smaller units of government, is fundamentally at odds with fairness across school districts.[40] They challenge the claim that decentralized finances allows "localities to determine their own tax burden according to the importance which they place upon public schools"[41] by explaining that for a poor school district to equally provide education to its students, residents must be subjected to a significantly greater tax burden than their wealthy counterparts.[42] And, indeed, a bipartisan report on education by the Advisory Commission on Intergovernmental Relations in 1969 called for states to assume greater financial responsibility in the provision of education due to the

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[35] Georgette C. Poindexter, *Towards a Legal Framework for Regional Redistribution of Poverty-Related Expenses*, 47 WASH. U. J. URB. & CONTEMP. L. 3, 10 (1995) (presenting data from 1960).

[36] *Id.*

[37] Arthur E. Wise, *School Finance Equalization Lawsuits: A Model Legislative Response*, 3 YALE REV. L. & SOC. ACTION 123, 123–25 (1971) (using examples from *Serrano* to show how much more of a burden paying for education can be for poor communities compared to rich ones); J. ALAN THOMAS ET AL., FULL STATE FUNDING OF SCHOOLS 1–2 (1970) (explaining that the reliance on property taxes is "highly regressive" and disproportionately burdensome for low-income families).

[38] John E. Coons et al., *Educational Opportunity: A Workable Constitutional Test for State Financial Structures*, 57 CALIF. L. REV. 305, 319 (1969).

[39] COONS ET AL., *supra* note 4, at 21.

[40] Coons et al., *supra* note 38, at 318.

[41] McInnis v. Shapiro, 293 F. Supp. 327, 333 (N.D. Ill. 1968), *aff'd sub nom.* McInnis v. Ogilvie, 394 U.S. 322 (1969).

[42] Coons et al., *supra* note 38, at 317.

large discrepancies in resources and tax burdens between rich and poor school districts.[43]

Put differently, centralization advocates argue that, with decentralized finances, not the differences in tastes but rather the differences in income drive differences in spending between jurisdictions, with severe consequences for inequality.[44] "In theory, one locality might prefer a municipal golf course, another a new computer lab for its schools, a third might opt to repave its roads, and a fourth might decide to lower taxes and spend less on local services."[45] In fact, as advocates for centralization argue, many local taxing and spending decisions are based not on idiosyncratic local taste differences, but on the stark fiscal disparities that divide localities within each metropolitan area.[46]

These inequities from decentralized financing can build on themselves. For example, Richard Briffault argues that local financial control "reinforces the consequences of the initial inequality by creating a regional 'centrifugal force,' that leads the affluent to physically segregate themselves from the less affluent, to deploy local land use powers to heighten the barriers to local economic integration, and to incorporate separately" to protect their property from higher taxation.[47] Worse yet, "local financial responsibility may 'skim off' the ablest, most active, and most effective parents from inner city communities that need them most, thereby leaving those communities not only with fewer economic resources, but bereft of the political resources necessary to secure the accountability of local political institutions."[48] For example, as William Julius Wilson argued, the absence of middle-class

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[43] ADVISORY COMM'N ON INTERGOVERNMENTAL RELATIONS, STATE AID TO LOCAL GOVERNMENT 4–6 (1969).

[44] COONS ET AL., *supra* note 4, at 21 (discussing the way in which the uneven distribution of wealth across districts determines each district's ability to pay for education).

[45] Briffault, *supra* note 4, at 789–90.

[46] *See* GARY J. MILLER, CITIES BY CONTRACT 167–72 (1981) (arguing that Tiebout's "tastes" explanation does not explain spending differences in Los Angeles's localities). *See also* HELEN F. LADD & JOHN YINGER, AMERICA'S AILING CITIES: FISCAL HEALTH AND THE DESIGN OF URBAN POLICY 291–93 (1989) (describing the fiscal deterioration of cities and their limited prospects for an improved financial condition); Briffault, *supra* note 4, at 789–90 (observing that even with high tax rates relative to more affluent communities, lower wealth communities can only support comparatively lower educational spending levels). *See also* Richard Schragger, *Consuming Government*, 101 MICH. L. REV. 1824, 1834–35 (2003) (raising distributive justice objections to the local allocation of "public goods based on ability to pay").

[47] Briffault, *supra* note 4, at 789–90, 805.

[48] *Id.* at 805–06.

black professionals may especially harm the prospects for the black youths who remain in central cities.[49]

And so the debate has continued: Decentralized funding lets locals choose, promoting efficiency. Centralized funding promotes equality between locals in jurisdictions of different wealth levels. This Article makes a different point: This debate, framed as the choice between the choice-promoting efficiency benefits of decentralization and the equity-promoting benefits of centralization, misses the key choice-promoting *efficiency benefit of centralization*. The American system of local financing "bundles" together living in poor cities with the need to pay for the cost of services for the poor, and thereby discourages individuals from living in locations that they otherwise would prefer, reducing choice and efficiency. It is to the explanation of these efficiency costs and testing for their magnitude that the Article now turns.

II
LOCATION CHOICE AND THE POVERTY FINE: THEORY AND TESTING

A.   *The Inefficiency of the Poverty Fine*

Decentralized finances tie the "fixed costs" of poverty—costs that society will bear regardless of where a poor individual lives—to residential location choice, which yields inefficiencies in where people live, since their decisions are distorted by artificial costs. As developed in this subsection, a taxation scheme that charges individuals more for the same service in some locations than others (assuming that providing it costs the same across the locations) without an offsetting benefit distorts[50] individuals away from their preferred residential locations and reduces efficiency (in the standard Kaldor-Hicks sense of monetized utility).[51]

I call the increase in taxes and reduction in the quality of services that people face to pay for the costs of poverty in their jurisdiction the "poverty fine." It is an inherent result of two features of American state constitutions, which essentially require local redistribution to the poor in the absence of state or federal funding for the cost of educating the poor. First, state constitutions require the provision of

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[49] WILLIAM JULIUS WILSON, THE TRULY DISADVANTAGED 56 (1987) (discussing how the lack of a middle-class black population in some central cities reduces the strength of important institutions, such as churches and recreational facilities, resulting in an absence of positive role models who can highlight to black youths the value of education).

[50] By "distorts," I mean to describe a policy that reduces efficiency relative to another policy.

[51] *See* Liscow, *supra* note 32, at 2–3 (explaining Kaldor-Hicks efficiency).

"free" elementary and secondary education.[52] Second, state constitutions generally prohibit differential property tax rates.[53] All residential property must be taxed at the same uniform tax rate. As a result, residents of a town are "in it together" in a way that they would not be if schools were paid for by state-provided vouchers redeemable anywhere, or if enclaves of the rich in a poor city could have lower property tax rates to attract them to the city. Similarly, "[w]hen a municipality finances a service from general revenues, it is usually obligated to distribute the benefits of that service in roughly equal shares, irrespective of the general taxes the individual citizen may have paid."[54] As a result of these factors, if a middle-class person wants to live in a poor city, he often must pay the "entry fee" of having higher taxes and worse services, which distorts residential location choice, an effect not considered in the Tiebout model. For example, some may want to live near work but will not because of high tax rates.[55]

Two features of American cities then combine with these features of American law to make the "poverty fine" inefficient: the presence of high concentrations of poor households in cities and the fact that, unlike in the Tiebout model, space exists. If all households could costlessly sort into newly formed cities, the rich would not colocate with poor households in cities.[56] But in reality, of course, cities have people of mixed income levels. Households like amenities that exist in some places and not others; one important amenity is living close to work, and since the well-off work with lower-income coworkers and

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[52] Ellickson, *supra* note 9, at 452. One might argue that this minimum required expenditure is a recent development, arising out of the school finance litigation in the 1970s. However, the constitutional requirements are longstanding, and it is the disparities in income between locations that are new. *See supra* note 35 and accompanying text.

[53] Ellickson, *supra* note 9, at 452. Note though that assessment formulas do not need to be the same. For example, some states systematically discriminate against industrial uses and in favor of single-family homes.

[54] *Id.* at 455.

[55] *Id.* at 457 n.212 ("There is widespread agreement among economists that fiscal variations can create allocational problems.") (citing James M. Buchanan & Charles J. Goetz, *Efficiency Limits of Fiscal Mobility: An Assessment of the Tiebout Model*, 1 J. Pub. Econ. 25, 26–27 (1972) and Michelle J. White, *Fiscal Zoning in Fragmented Metropolitan Areas*, *in* Fiscal Zoning and Land Use Controls 31, 31 (Edwin S. Mills & Wallace E. Oates eds., 1975)). The problem is particularly stark because the wealthy have the highest opportunity cost of time, making it perhaps most natural for the well-off to live closest to work—even as they may be the ones most discouraged from living in poor central cities near their workplace. This distortion may be particularly large since household heads with the strongest incentive to live outside jurisdictions with high taxes and poor services are those with school-age children, which is likely correlated with being of prime working age and therefore having a desire to live near jobs.

[56] Of course, if wealthy households had a preference for living nearby low-income households, then they still could do so.

demand services from lower-income providers, there are incentives for households of different income levels to coexist.

To illustrate, consider the following example, which vastly simplifies much of the complexity of location decisions but shows the core of the idea. Suppose that there are two cities, Sun City and Cloud City; they are nearby each other.[57] The cities are the same, except that Sun City is sunny and Cloud City is cloudy. Think of the sunniness of Sun City as a stand-in for the amenities (e.g., avoiding a long commute to work) that poor central cities may have for some people versus rich suburban Cloud City. For now, suppose that there are three equally sized groups of households, each of which will live in one of these two cities. Each household has one child to educate. There are poor people, all of whom live in Sun City, and there are two types of middle-class people. One type of middle-class person will always live in Cloud City (the "cloudy middle class"). They dislike the sun. Another type of middle-class person prefers sun (the "sunny middle class"), but is close enough to the margin that they might live in either place. Suppose further that the city governments produce only education and that education costs the same in the two cities. Individuals' utility depends on only their income, the taxes they pay, and the amount that they value amenities. Suppose that their utility is calculated as follows: *Utility = income – taxes + value(amenities)*. With this utility function, everyone gets equal utility from money (one dollar of income always increases utility by one dollar), so efficiency and utility are equivalent and can be measured in dollars.[58] My claim is that, when education is financed locally, efficiency may be substantially reduced.

To make the example more concrete, I put numbers on the relevant parts of the problem. Suppose that each year middle-class households earn $100,000, and poor households earn $25,000. Suppose that education has a fixed cost of $12,500 everywhere. One can consider this cost of education the amount mandated by all state constitutions, which require the provision of public education. It is financed by a tax on property; for simplicity, I assume that all individuals spend the

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[57] Suppose, for example, that one is in the rain shadow of a mountain, and the other is not.

[58] In other words, this utility function abstracts away from distributional concerns, so that maximizing efficiency and maximizing utility are the same thing. Also, the assumption of fixed income, which does not depend upon the tax rate, abstracts away from the differential distortion from varying tax rates. However, since it is generally believed that the distortion from taxation rises with the square of the tax rate, the way to minimize this distortion is to equalize the tax rates for all individuals, which reinforces the point made here.

same percent of their income on housing.[59] The sunny middle-class group members value the sun at $7,000 and the clouds at $0.[60] Education finance can either be decentralized, with each city paying for its own education, or centralized, with everyone sharing costs.

Table 1 lists the tax rates (i.e., taxes as a percent of income) and utilities for a representative member of each of the three groups that result under the centralized and decentralized regimes. Since the location choice of the poor and cloudy middle class do not depend on the school finance regime, the key decision is that of the sunny middle class, so I focus on that decision. When education funding is decentralized, the sunny middle class will live in Cloud City; despite its preference for the sun, its utility is higher in Cloud City because its taxes are so high in Sun City. If it were to live in Sun City under the decentralized regime, Sun City's taxes would equal 20% of income.[61] As a result, the utility of a member of the sunny middle class would be $87,000 under the decentralized regime.[62] This group instead lives in Cloud City, since it pays a lower tax rate there, at only 12.5%, resulting in a higher utility (of $87,500 per person[63]); it sacrifices sunshine to pay substantially lower taxes. As laid out in Table 1, the resulting total utility under the decentralized regime is therefore $187,500 across the representative group members.

In contrast, in a regime with centralized funding, the sunny middle class lives in Sun City. Here the logic is simple: Since the sunny middle class faces the same tax rate of 16.67% in both locations, but gets to enjoy the sun only in Sun City, its members will live in Sun City. The resulting total utility is $194,500 for the representative members, a large efficiency gain relative to decentralization of $7,000 annually. Of course, in the real world, these numbers would scale up, with $7,000 in gains for three people, $14,000 for six people, and so on.

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[59] As required by state constitutions, the tax rate on property must be uniform. In reality, richer individuals actually spend a *smaller* fraction of their income on housing.

[60] Suppose also that members of the cloudy middle class value living in Cloud City at $0 and in Sun City at -$100,000, and the poor value living in Sun City at $0 and Cloud City at -$100,000. These assumptions ensure that their locations are fixed.

[61] Taxes are paid by both the sunny middle class and the poor, who live in Sun City in equal numbers, since the groups are of equal size by assumption. The average income of the two groups is $62,500, so a 20% tax rate is required to fund an education that costs $12,500. Recall that property tax *rates* are typically uniform, so the middle class will still pay more in taxes, since they consume more property, even if they pay the same rate.

[62] They earn $100,000 in income, pay $20,000 in taxes, and gain $7,000 of utility from the sun.

[63] They earn $100,000 in income, pay $12,500 in taxes, and gain no utility from the sun.

TABLE 1. EFFICIENCY GAINS FROM CENTRALIZATION

| | School Finance Scheme | |
	Decentralized	Centralized
Tax Rate		
Sun City	50.00%	16.67%
Cloud City	12.50%	16.67%
Utility		
Poor	$12,500	$20,833
Sunny Middle Class	$87,500	$90,333
Cloudy Middle Class	$87,500	$83,333
Total Utility	$187,500	$194,500

This result may at first seem like magic: The two cases have the same services provided, the same amount of total taxation, and the same amount of sun shining in Sun City—yet there is a big gain in efficiency from the move to centralized finances. This efficiency gain arises because the decentralized regime causes a distortion: With decentralization, sunny middle-class households live in Cloud City and therefore miss out on the sunshine because they are forced to bear a disproportionate share of the cost of educating the poor if they move to Sun City. At the same time, under decentralization, there are no net efficiency benefits for others: The same amount of money is spent on education regardless of where anyone lives. The only thing that affects total utility is whether the sunny middle class can improve their quality of life by having their sunshine, which is why the increase in total efficiency ($7,000) is exactly equivalent to the gains that members of the sunny middle class make by moving to Sun City and equal to the amount that they value the sun.

There are distributional impacts of centralization, but those do not matter for efficiency. Table 1 shows that there are three differences to utility. First, the utility of the sunny middle class improves because they live in the "right" city. Second, the poor benefit from having a richer tax base (and therefore lower taxes). Third, the members of the cloudy middle class are harmed by sharing the burden of educating the poor. Utility is redistributed from the cloudy middle class to the poor because of the changing tax rates. However, this redistribution does not matter for efficiency, because the redistribution alone—putting aside the efficiecy gain—represents a zero-sum transfer from one group to another.[64]

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[64] If redistribution to the poor were welfare-enhancing, then the increase in welfare from a shift to a centralized tax base would be even more pronounced than the increase in efficiency, since the poor gain from the shift.

Of course, this simple model is not a complete analysis in several ways. First, centralization may not only decrease Sun City's taxes but also improve its schools; in any case, both effects help reduce the distortion between living in Sun and Cloud City for those with children attending school, since both lower taxes and better schools would be appealing to those families. Second, although it is set up as a decision that the middle class makes, in reality everyone has an incentive to avoid living around other poor individuals, including the poor themselves, who must pay more in taxes and therefore have their decisions distorted as well. Third, of course, the analysis does not consider the potential benefits of local financing (e.g., the state government imposes harmful mandates because it gains control of funding), which could offset the distortion described here. Finally, I assume that education quality and spending are the same everywhere. In reality, these both differ, and the impact of spending on quality could also differ.[65] Nevertheless, the model captures an important part of reality: When there are higher fixed costs of poverty in some locations than others,

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[65] Key to this analysis was that the expense of educating the poor was "fixed." Society had to pay that expense regardless of where people lived. In reality, the costs of providing services may vary depending upon where people live; they are "variable," in that they depend upon some behavioral response. For example, if teachers need to be paid more to teach in poor cities, then the overall cost of educating middle-class children may increase if more middle-class families moved to poor cities. That additional cost should not be centralized on efficiency grounds. Similarly, if moving more people closer to high-crime areas increases society's overall policing expenses, or if garbage disposal service is more expensive in high-density locations, these costs should also not be shared on efficiency grounds. Doing so would increase the overall societal cost of providing services by allowing some to pay less than the marginal cost of providing services to them. By the same token, if a banana costs more on top of a mountain, or individuals wish to buy more anti-theft devices in high-crime locations, these costs should not be equalized across locations; these are variable costs that depend upon where people live.

It is important to distinguish these variable costs, for which equalization would increase the overall cost of providing services by inducing individuals to live in higher-cost locations, from similar fixed costs that do not. (In practice, distinguishing fixed from variable costs may be difficult in a host of borderline cases.) For example, if police costs are higher in cities because of intra-gang violence that does not affect the cost of protecting a middle-class person thinking of moving to a city, there are efficiency gains to centralizing funding for that service. The social costs of policing gangs (or, alternatively, having little policing and having worse gang violence) will be borne by someone, regardless of where the marginal middle-class household chooses to live. The point of this Article is that, in large part, the costs of poverty are fixed; they do not depend upon where households live. The effect in aggregate of forcing local residents to bear those costs is to reduce efficiency by making it costlier for households to live where they want to live, without any offsetting efficiency gains.

Finally, note that I focus on the behavioral response of residents. Another potential behavioral response is in government activities. If the actions of local governments themselves increase the number of poor individuals in society, then those costs are no longer fixed and the analysis would require modification.

there's a distortion to where people live and a resulting reduction in well-being.

But this is all just theory. Estimating how quantitatively important this phenomenon is in reality—how many people actually would like to take advantage of the amenities of poor cities in the absence of local-level redistribution—requires empirical estimation. Fortunately, this model makes clear what the question is that needs to be answered: How many people move if funding changes from decentralized to centralized? The size of the sunny middle class determines the efficiency gains from centralized funding, since this is the marginal group that wishes to live in the city, but does not because of the school finance structure. And the group shows its preferences by moving location after centralization. The above example assumed equal population shares for all three groups of people (poor, sunny middle class, and cloudy middle class). Figure 1 shows how efficiency gains increase proportionally with the percent of the population that moves after centralization. Suppose that there is no sunny middle class at all and instead the population is 1/3 poor and 2/3 cloudy middle class. Then there are no efficiency gains at all from centralization in aggregate, since no one moves if school finances are centralized. In between a sunny middle class size of 0 and 1/3 of the population, the efficiency gains scale linearly, as plotted in Figure 1. For example, while the gain is $7,000 for an average three members of the population when movers are 1/3 of the population, the gain is $3,500 when movers are only 1/6 of the population. The reason is simple: When movers constitute 1/3 of the population, there are twice as many people that have the opportunity to improve their well-being with centralization. So the key empirical parameter to measuring the distortion that results from the local financing of education is how much of the population actually moves after centralization.

FIGURE 1. EFFICIENCY GAINS FROM CENTRALIZATION BY PERCENT
OF POPULATION MOVING AFTER CENTRALIZATION
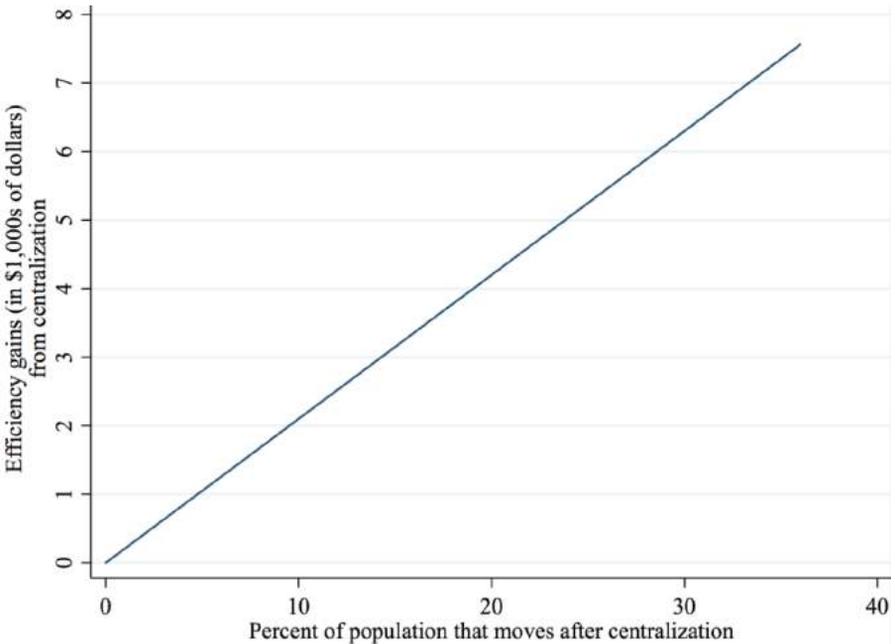
B.   Using State Aid for Schools as a Test

This subsection explains how state aid for poor schools shifts pop-
ulation to poor areas if there is, indeed, a significant stock of people
losing out by living in richer areas to avoid paying the poverty fine. I
develop a simple model, isolating a few essential variables to explain
where housing development will occur; the model will help to guide
the understanding of the empirical results. Consider a typical poor
central city, which has a disproportionately large number of poor
people, perhaps because it provides access to public transit or for
other reasons.[66] Figure 2 graphically represents the poor central city.[67]
The housing market in the city at time period 1 is described by the
Housing demand¹ and *Housing supply* lines, resulting in home price
P^1 and quantity of homes Q^1. Suppose that, in time period 1, the poor
city receives little funding from the state government. Its inhabitants
likely will receive relatively bad services yet be subject to a high prop-

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[66] *See* Glaeser et al., *supra* note 15, at 2 (providing empirical evidence that public
transit access drives the presence of poor in cities and suggesting other reasons).

[67] The housing quantity can be thought of consisting of "housing unit-equivalents,"
which converts houses of different sizes into a uniform measure. *See* JEROME
ROTHENBERG ET AL., THE MAZE OF URBAN HOUSING MARKETS: THEORY, EVIDENCE,
AND POLICY (1991) (using the term "housing unit-equivalents").

erty tax rate because even a high tax rate on poor residents will yield relatively little tax revenue. As a result, potential residents will be able to buy a similar house for a lower price in the central city than in the suburbs, but will also face higher tax rates and assessments.

Suppose that, in time period 2, the state starts providing more aid to poor cities, improving services and lowering tax rates. (The model above focused just on lowering tax rates, but—as noted—services may also improve, leading to similar effects on population.) Unless the housing supply is perfectly inelastic or perfectly elastic, this change will do two things.[68] First, it will increase property values for the existing housing supply, since the city will be a more desirable place to live. Second, developers will build more homes on undeveloped land (and, in a more complicated model, people will renovate old homes), allowing more people to move to the city, attracted by improved services or reduced tax rates. These changes are represented by the outward shift in housing demand to *Housing demand²*, which results in an increase in home price from P^1 to P^2 and increase in the quantity of homes to Q^2, with $Q^2 - Q^1$ new homes built. The increase in home price from P^1 to P^2 due to the increased desirability of living in the place represents "capitalization." That is, since lower taxes and higher service levels increase demand to live in a place, the value of land in those places will increase.[69]

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[68] This analysis assumes that housing demand is downward-sloping, as in the Figure 2.

[69] *See* Daniel L. Rubinfeld, *The Economics of the Local Public Sector*, *in* 2 HANDBOOK PUB. ECON. 571, 593–94 (Alan Auerbach & Martin Feldstein, eds., 1987) (explaining that, other things equal, increased tax rates will decrease property values, while efficient provision of services will increase property values); Paul Gary Wyckoff, *Capitalization, Equalization, and Intergovernmental Aid*, 23 PUB. FIN. Q. 484, 485 (1995) (explaining that if a community either lowers taxes or raises expenditures, its property values will increase).

FIGURE 2. EFFECT OF A SHIFT IN HOUSING DEMAND FROM
INCREASED TRANSFERS
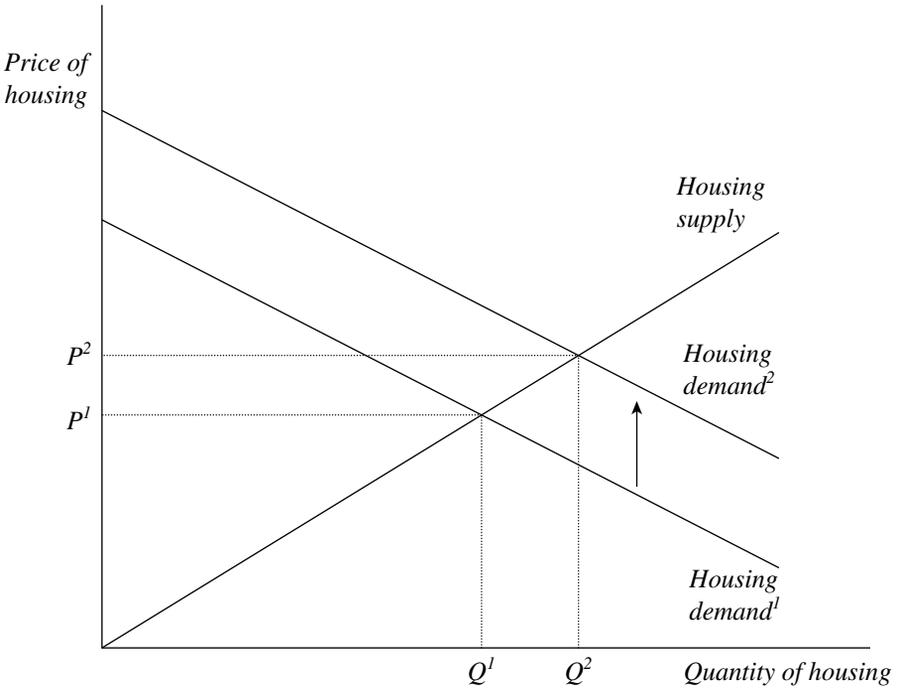
The role of capitalization is important to emphasize. In particular, the easier it is to build new housing, the flatter the housing supply line is, and the less capitalization there is into housing prices. One can see this by imagining that the housing supply line is perfectly horizontal (i.e., housing supply is "infinitely elastic," or infinitely responsive to changes in price). If that is the case, when housing demand increases, P^2 would be the same as P^1, and there will be no capitalization at all. In contrast, if the housing supply line is perfectly vertical (i.e., housing supply is "infinitely inelastic"), there will be no change in quantity, and all of the change will be in price—all the benefit of the increased state funding will be capitalized into housing prices. A larger housing quantity response goes along with a smaller capitalization response, all else equal.

Housing supply elasticities depend on both geographic and regulatory constraints. A town will have a perfectly inelastic housing supply if regulators permit no new housing, and housing supply becomes more elastic as regulators become more permissive. Likewise, housing supply tends to be more inelastic in geographical areas where there is less easily developed land, since developers must either build in costlier locations or build taller buildings on existing sites,

both of which increase costs. A city with completely permissive regulators and an infinite supply of identical unbuilt sites will have a perfectly elastic housing supply; one may think of this as an extreme version of Houston. Albert Saiz recently estimated the housing supply elasticity across U.S. metropolitan areas and found that it ranged from a relatively (but not perfectly) inelastic 0.60 in Miami to a very elastic 5.45 in Wichita, Kansas.[70] The supply elasticity of 0.60 for Miami means that a price increase of 1% is related to a housing quantity increase of 0.60%; a housing supply of 0 is perfectly inelastic. Hence, even with the most inelastic metropolitan area supply, an increase in housing prices leads to a substantial quantity response—in other words, the housing supply is fairly elastic. This Article studies the change in population, which should respond to increased state aid as long as the housing supply is not perfectly inelastic.[71]

The question this Article asks is to what extent improving services and lowering taxes in the poor city encourages future builders to put their houses in poor places. If the effects measured here are small, it will appear that few people benefit from improved location choices because of the state aid. If the effects are large, then many people have had their location choices distorted by decentralized school finance.

III
School Finance Reform in the United States

The American political system has generated a variety of responses to the dilemma of what level of government should fund one of the most important functions of local governments: the provision of public education. In this Article, these various means of funding education generate the statistical variation that I study empirically; the population response to state aid is how I test for the efficiency gains from location choice, by showing the extent to which tying the payment for the fixed costs of poverty to location matters.

Schools have long been primarily the responsibility of local governments, though some state and federal involvement is longstanding.[72] For example, the Federal Land Ordinance Act of 1795 and

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[70] Albert Saiz, *The Geographic Determinants of Housing Supply*, 125 Q.J. Econ. 1253, 1283–84 (2010).

[71] Saiz estimates the housing supply elasticity in the New Haven-Bridgeport-Stamford-Danbury-Waterbury metropolitan statistical area (MSA) as 0.98 and in the Hartford MSA as 1.50. *Id.* at 1283.

[72] *See* Patrick J. McGuinn, No Child Left Behind and the Transformation of Federal Education Policy, 1965—2005 25 (2006) (describing the history of U.S. school finance).

the Northwest Ordinances of 1787 set aside funds for school construc-
tion.[73] Federal involvement expanded substantially as part of Presi-
dent Lyndon Johnson's "War on Poverty" with the passage in 1965 of
the Elementary and Secondary Education Act, which provided
funding to schools with disadvantaged students.[74] As a result, the fed-
eral share of education spending increased from less than 3% in 1958
to about 10% in 1968.[75] In most states prior to the 1970s, the vast
majority of funding for schools came from property taxes raised at the
local level.[76]

The dominance of local governments in local school finance
began to erode in the beginning of the 1970s, largely prompted by
litigation.[77] In subsequent decades, state courts in half the states
began mandating some kind of school finance equalization.[78] Legal
scholars have divided this litigation from the 1970s through today into
three phases.[79] The first phase included arguments based on the
Federal Equal Protection Clause. In the path breaking 1971 case
Serrano v. Priest,[80] the California Supreme Court held that the state's
local financing of schools violated the California and U.S.
Constitutions' equal protection clauses.[81]

The U.S. Supreme Court could have chosen to follow *Serrano*
and require more equalization of funding across school districts as a
Federal Constitutional matter, but in the 1973 case *San Antonio
Independent School District v. Rodriguez* it opted not to do that.[82]
Education reformers had hoped that the Court would rule in their
favor given the favorable language in cases like *Brown v. Board of
Education*, which declared that the "opportunity [of an education] . . .
is a right which must be made available to all on equal terms."[83] Over

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[73] *Id*. at 26.

[74] Pub. L. No. 89-10, 79 Stat. 27 (codified as amended at 20 U.S.C. § 70 (1965)).

[75] McGuinn, *supra* note 72, at 33.

[76] Jackson et al., *supra* note 19, at 161.

[77] *Id*. at 162.

[78] *See* Zachary D. Liscow, *Are Court Orders Sticky? Evidence on Distributional
Outcomes from School Finance*, J. Empirical Legal Stud., App. (forthcoming 2017)
(listing the decisions). The appendix is available at https://sites.google.com/site/liscow/.

[79] *See* Heise, *supra* note 10, at 1152–53 (describing the three phases).

[80] 487 P.2d 1241, 1263 (Cal. 1971).

[81] *Serrano* led to a long debate about its ultimate impact on school funding. *Compare*
William A. Fischel, *How* Serrano *Caused Proposition 13*, 12 J.L. & Pol. 607, 608–09 (1996)
(arguing that *Serrano* ultimately reduced school spending), *with* Kirk Stark & Jonathan
Zasloff, *Tiebout and Tax Revolts: Did* Serrano *Really Cause Proposition 13?*, 50 UCLA L.
Rev. 801, 807 (2003) (challenging Fischel's claim). I combine school finance reforms across
the country in my empirical analysis, both those like California and those unlike it.

[82] 411 U.S. 1, 55–56 (1973) (finding no federal constitutional right to education
equalization).

[83] 347 U.S. 483, 493 (1954).

vigorous dissents arguing that the "fundamental right" to education seemingly guaranteed by previous decisions was not instantiated by the Court,[84] the majority found that the poor do not constitute a suspect class that would trigger the strict scrutiny test under the Equal Protection Clause of the U.S. Constitution. Instead, echoing the reasoning of Tiebout, the Court found that local control of schools constitutes a rational reason to maintain local financing, despite the great disparities in taxable property across jurisdictions.

That decision largely left to the states the issue of school finance, thereby generating most of the variation in funding between states that I exploit in this Article. The cases based only on state constitutional claims constitute the next two waves of litigation. In the second wave, "equity" theory cases were argued based on equal protection clauses in state constitutions. These cases tended to focus on spending disparities and input measures like per pupil spending.[85] The first post-*Rodriguez* school finance decision issued by a state supreme court was *Robinson v. Cahill*[86] in New Jersey. Partly because of doctrinal difficulties in defining what "equal" meant, some scholars contend that these cases arguably have had limited success.[87] Typically, cases required "substantial" equality rather than full equality, perhaps bowing to the reality that equality would be very difficult to achieve.[88]

In the third wave, "adequacy" cases were argued based on the fact that all state constitutions require the state to provide some level of education for children.[89] These decisions challenge not the spending itself, but rather the quality of the education—for not meeting an adequate threshold of quality required by the

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[84] *Rodriguez*, 411 U.S. at 62–63 (Brennan, J., dissenting); *id.* at 63–70 (White, J., dissenting); *id.* at 70–72 (Marshall, J., dissenting).

[85] *See* Heise, *supra* note 10, at 1153. After 1983, the cases were aided by the publication of *A Nation at Risk: The Imperative for Educational Reform*, which helped alert Americans to the need for education reform. THE NAT'L COMM'N ON EXCELLENCE IN EDUC., A NATION AT RISK: THE IMPERATIVE FOR EDUCATIONAL REFORM (1983) (criticizing the quality of the American educational system and offering recommendations for improvement).

[86] 303 A.2d 273 (N.J. 1973), *cert. denied*, 414 U.S. 976 (1973).

[87] Heise, *supra* note 10, at 1162. *See also* JAMES E. RYAN, FIVE MILES AWAY, A WORLD APART 157 (2010) (arguing that school finance litigation has had limited impacts on outcomes overall). *But see* Jackson et al., *supra* note 19, at 157 (showing improvements in educational outcomes and increases in earnings as a result of increases in education spending); Lafortune et al., *supra* note 19, at 1 (same).

[88] RYAN, *supra* note 87, at 132.

[89] RICHARD BRIFFAULT & LAURIE REYNOLDS, CASES AND MATERIALS ON STATE AND LOCAL GOVERNMENT LAW 521 (7th ed. 2009). *See also* Peter Enrich, *Leaving Equality Behind: New Directions in School Finance Reform*, 48 VAND. L. REV. 100, 103 (1995) (arguing in favor of shifting to an adequacy-based approach instead of an equity-based approach, which Enrich argues had proven inadequate).

Constitution.[90] For example, in *Rose v. Council for Better Education, Inc.*,[91] the Kentucky Supreme Court decided one of the first adequacy cases,[92] declaring that, on the basis of "accepted national standards," even Kentucky's relatively rich school districts required more funding.[93] This litigation continues today, with the Washington Supreme Court recently finding the state legislature in contempt for not adequately funding schools, as required by previous litigation.[94]

As suggested by the events in the State of Washington, school finance reform has involved a complicated interplay between courts, seeking to interpret state constitutions, and legislatures, seeking to stave off unfavorable judicial rulings and implement new judicial mandates. For example, by 2009, the New Jersey Court had issued 23 opinions[95] since it first invalidated the state's school finance system in 1973 in *Robinson v. Cahill*.[96] Similarly, the Texas Supreme Court recently declared the state's education finance scheme constitutional,[97] after a Texas District Court declared it unconstitutional in 2014,[98] which in turn was after the Texas Supreme Court declared it unconstitutional in 2005.[99] As noted by James Ryan, "in no state has one trip to the courthouse been enough to secure long-term relief."[100]

These school finance schemes have taken various forms. Although there are a variety of schemes for categorizing the reforms, a recent paper by the economists Kirabo Jackson, Rucker Johnson, and Claudia Persico divide school finance schemes into five non-mutually-exclusive categories.[101] First, foundation plans establish a

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90 Some question the strict dichotomy between equity and adequacy cases. *See* RYAN, *supra* note 87, at 132 (arguing that equity cases have adequacy elements and vice versa).

91 790 S.W.2d 186 (Ky. 1989).

92 Heise, *supra* note 10, at 1163.

93 790 S.W.2d at 198.

94 Court order at 4–5, McCleary v. State, 269 P.3d 227 (Wash. Sept. 11, 2014) (No. 84362-7) (holding state legislature in contempt). *See also* Joseph O'Sullivan, *Contempt Ruling Ups Ante in Fight to Fund Public Schools*, SEATTLE TIMES (Sept. 12, 2014, 8:52 PM), http://seattletimes.com/seattle-news/contempt-ruling-ups-ante-in-fight-to-fund-public-schools/ (describing the litigation).

95 BRIFFAULT & REYNOLDS, *supra* note 89, at 515 (typically requiring more school funding).

96 303 A.2d 273, 297 (N.J. 1973).

97 Morath v. Texas Taxpayer & Student Fairness Coal., 490 S.W.3d 826, 868 (Tex. 2016).

98 Texas Taxpayer & Student Fairness Coal. v. Williams, No. D–1–GN–11–003130, at 6 (200th Dist. Ct., Travis County, Tex., Aug. 28, 2014). *See also* Terrence Stutz, *Texas' School Finance System Again Overturned in Court*, DALL. MORNING NEWS (Aug. 28, 2014), http://www.dallasnews.com/news/education/headlines/20140828-texas-school-finance-system-again-overturned-in-court.ece.

99 Neeley v. W. Orange-Cove Consol. Indep. Sch. Dist., 176 S.W.3d 746, 797–98 (Tex. 2005).

100 RYAN, *supra* note 87, at 152.

101 *See* Jackson et al., *supra* note 19, at 162 (listing the categories).

certain amount of funding, determine how much localities must provide based on local income and wealth, and distribute the difference as state aid.[102] Second, flat grants provide a similar per student grant to all school districts.[103] Third, equalization plans provide more aid to districts with lower incomes (categorical aid) or property values (power equalization plans).[104] Fourth are "reward for effort plans," which provide more aid when districts enact higher tax rates, typically with a greater reward for poorer districts.[105] Finally, some states imposed a spending limit on how much a district could spend, potentially recapturing amounts in excess of the spending limit.[106]

This Article exploits this variation in judicial and legislative action. Due to differences in state constitutions, the composition of state supreme courts at particular points in time, the composition of legislatures at particular points of time, the quality of the litigation, the favorability of facts in the case, whether the judges are elected or appointed, the racial composition of plaintiffs, and a host of other contingencies, the United States has great heterogeneity in its school finance systems across the states.[107] I use these differential changes in local financing structure as a natural experiment to understand the degree to which people move in response to state aid for schools—and thus how much they care about a more level school finance playing field.

IV

National Empirical Analysis

A. Main Results

To measure the number of people who were able to achieve a more efficient location as a result of state aid, I study this "natural experiment" in local government finance resulting from school finance redistribution from rich to poor places. This is a good natural experiment to study because the changes were large in magnitude, making it more likely that changes can be detected. For example, in 1999, New Haven, Connecticut, received $1,140 per *resident* (or $7,967 per student) from the state government for schools, while its rich suburb Orange received a comparatively minuscule $64 per resi-

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[102] *Id.*

[103] *Id.*

[104] *Id.* at 163.

[105] *Id.* at 162.

[106] *Id*. Texas, Kansas, and Vermont use such plans, and they have been very controversial. *See* Ryan, *supra* note 87, at 130.

[107] *See* Ryan, *supra* note 87, at 129 & n.4 (listing reasons for differences in school finance across the states).

dent.[108] This is a stark change from 1970, when New Haven received $193 per resident (in inflation-adjusted 1999 dollars) and Orange received $304 per resident.[109] In aggregate, vast sums of money are at stake; by 2000, state governments spent $200 billion on elementary and secondary education; that was about $2,000 per household, or 4.5% of median household income.[110]

My hypothesis is that these large sums of money for schools have caused at least one of two outcomes in poor places: improved school services or reduced local tax rates due to the fungibility of the transfers. As a result, more residents have been drawn to live in poor places.[111] In other words, an unintended consequence of state school aid has been making poor places more desirable places to live and thereby increasing their populations. The question is the number of people who were able to achieve more efficient location choices because of the decision: many or few? When measuring the effect on population growth of redistribution across communities of different income levels, a key concern is that these communities might have grown at different rates even absent changes in redistribution. As a result, it is important to compare otherwise similar cities in states with different amounts of redistribution. Then, as long as income does not have a different effect on population growth in different states for reasons other than differential state redistribution, the results are valid. Consider the example in Table 2, a two-by-two table with two states, each of which has a relatively poor place and a relatively richer remainder of the state. Essentially, the goal of the empirical analysis is to see if population growth rates between 1980 and 2010 follow a particular pattern. First, I measure the population growth rates of poor cities like Colorado Springs, Colorado, and Salt Lake City, Utah, relative to the rest of their respective states. Then I calculate whether poor cities tend to have higher relative population growth rates in high-redistribution states like Colorado than low-redistribution ones like Utah. In other words, I measure whether poor places in high-redistribution states had higher than expected population growth rates.

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[108] These statistics are my calculations of data from *Annual Survey of Governments*, NAT'L BUREAU OF ECON. RES., http://data.nber.org/asg/ASG_release/ (last visited June 29, 2017).

[109] *Id.*

[110] *Id.* (for aggregate spending on education); U.S. CENSUS BUREAU, *Census 2000 Profile: U.S. Summary: 2000,* https://www.census.gov/prod/2002pubs/c2kprof00-us.pdf (July 2002) (for number of households); Federal Reserve Bank of St. Louis, *Real Median Household Income in the United States,* FRED Economic Data: St. Louis, (May 31, 2017), https://fred.stlouisfed.org/series/MEHOINUSA672N (for median household income).

[111] A third outcome, improved non-school services, is also possible.

TABLE 2. POPULATION GROWTH RATE, 1980–2010

	Poor Place	Richer Rest of State	Difference in Growth Rate
High-Redistribution State	Colorado Springs, CO (93%)	Rest of Colorado (72%)	21% (93% - 72%)
Low-Redistribution State	Salt Lake City, UT (14%)	Rest of Utah (99%)	-85% (14% - 99%)
Difference in Differences in Differences: 106% (21% - −85%)			

Consider how this two-by-two grid addresses the two key biases that arise in measuring the effect of increased state aid to poor places. The first concern is "state bias": that states that increased state aid may also have had different population growth trends than states that did not, thereby affecting population growth. For example, if states that redistributed more also had weaker economic circumstances driving slower population growth, then the results would incorrectly show that more redistribution reduced population growth if this bias were unaddressed. The grid addresses this issue by comparing the "experimental" city of Colorado Springs to the rest of the cities in Colorado as a control, and doing the same to Salt Lake City versus the rest of cities in Utah. Comparing poor cities to the rest of their state thus removes any impact that states' differing population growth trends could have on the result.

The second concern is "poor place bias": that relatively poor cities themselves may have had a certain trend in population growth unrelated to redistribution.[112] For example, if poor cities overall tend to grow more slowly, then the results may improperly show that state aid to poor places reduces population growth if this bias goes unaddressed. Subtracting the population growth of the "control" poor city, Salt Lake City, from the population growth of Colorado Springs thereby addresses this bias by controlling for the growth rate of poor cities.

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[112] An additional example of "poor place bias," motivating the multi-state empirical strategy, is illustrated by the example of local restrictions on housing development. There is evidence that liberal places restrict housing development more than conservative places do. *See* Matthew E. Kahn, *Do Liberal Cities Limit New Housing Development? Evidence from California*, 69 J. URB. ECON. 223, 227 (2011). Liberal places also often have high poverty rates and thus also likely receive more funding for education. Thus, looking only within state, it may appear that school financing had little effect on population growth, but the financing actually could have a positive effect that is just confounded by the negative effect of having housing-restricting liberals running many of the poor cities receiving large amounts of funding. Comparing *across* states, between ones that redistribute a lot and ones that redistribute a little, alleviates this concern.

This analysis leads to the following calculation: (Population growth rate of Colorado Springs – Population growth rate of the rest of Colorado) – (Population growth rate of Salt Lake City – Population growth rate of the rest of Utah). Conducting this analysis reveals that, while Colorado Springs's growth rate of 93% exceeded that of Colorado (72%) by 21 percentage points, Salt Lake City's surprisingly slow growth rate of 14% was 85 percentage points less than that of Utah as a whole (99%). Subtracting from excess growth of Colorado Springs over that of Colorado the analogous number for Salt Lake City yields a 106% excess growth for Colorado Springs—in other words, a doubling of Colorado Springs's population.

Of course, attributing all of this doubling of population to school finance redistribution in this two-city example is not credible. There is not enough data to draw a statistical inference. Though Colorado Springs and Salt Lake City had similar 1980 populations (215,150 and 163,033, respectively),[113] similar 1980 median incomes ($15,948 and $13,211, respectively), and are in the same region, the cities differ in many ways.[114] I could have used other examples of sets of poor cities in which the poor city in the high-redistribution state grew faster than a somewhat similar poor city in a low-redistribution state. For example, Kansas City, Missouri, grew more quickly than Kansas City, Kansas.[115] Tallahassee, Florida, grew more quickly than Birmingham, Alabama, and Jackson, Mississippi.[116] Grand Rapids, Michigan, grew more quickly than Canton, Ohio.[117] Portland and Salem, Oregon,

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[113] *Population of the 100 Largest Urban Places: 1980 (Table 21)*, U.S. BUREAU OF THE CENSUS (June 15, 1998), https://www.census.gov/population/www/documentation/twps0027/tab21.txt.

[114] NAT'L HIST. GEOGRAPHIC INFO. SYS., https://www.nhgis.org/ (last visited June 28, 2017).

[115] Kansas City, Missouri's population (median income 1980: $15,859) grew from 448,159 in 1980 to 460,651 in 2010, while Kansas City, Kansas' population (median income 1980: $15,210) fell from 161,087 to 146,020. NAT'L HIST. GEOGRAPHIC INFO. SYS., https://www.nhgis.org/ (last visited Feb. 10, 2017) (for median income in 1980); *Population of the 100 Largest Urban Places: 1980 (Table 21)*, *supra* note 113 (for population in 1980).

[116] Tallahassee, Florida's population (median income 1980: $11,750) grew from 81,548 in 1980 to 181,376 in 2010, while Birmingham, Alabama's population (median income 1980: $11,951) fell from 284,413 to 212,072, and Jackson, Mississippi's population (median income 1980: $14,800) fell from 202,895 to 173,796. *Population of the 100 Largest Urban Places: 1980 (Table 21)*, *supra* note 113 (for population in 1980); *U.S. Geographic Summary Data and Boundary Files*, NAT'L HIST. GEOGRAPHIC INFO. SYS., https://www.nhgis.org/ (last visited June 27, 2017) (for median income in 1980); *United States QuickFacts*, U.S. CENSUS BUREAU, https://www.census.gov/quickfacts/ (last visited July 2, 2017) (for 2010 city populations); *Characteristics of the Population: Number of Inhabitants, Florida*, U.S. DEP'T COMM BUREAU OF THE CENSUS, Feb. 1982, https://www2.census.gov/prod2/decennial/documents/1980a_flABCs1-01.pdf (for Tallahassee population in 1980).

[117] Grand Rapids, Michigan's population (median income 1980: $15,452) grew from 181,843 in 1980 to 187,998 in 2010, while Canton, Ohio's population (median income 1980:

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grew more quickly than Seattle and Tacoma, Washington.[118] Chicago, Illinois, grew more quickly than St. Louis, Missouri.[119] But even with these other cities, there is not enough data to draw a statistical inference, since the cities may be different in many ways. For this reason, I use natural experiments across the country with a dataset of over 20,000 places, with the effect that these idiosyncratic differences average out. These idiosyncratic differences between places will not matter as long as poor places in high-redistribution states did not have some reason to *systematically* outperform poor cities in low-redistribution states, other than the school finance redistribution itself.

The main empirical analysis is essentially a version of this four-city example—but with over 20,000 data points. I assemble data from two sources. First, as described in the Methodological Appendix, I use data from other authors on how redistributive states' school finance systems have become. Second, I use the Decennial Census, which collects data at the "place" level.[120] Places are usually cities or towns, but also may be unincorporated areas recognized as places for the Census's statistical purposes. I use place-level data because the place is roughly the jurisdiction that we expect to benefit from school finance transfers. The Census records places' population and median household income across time. I then study the thirty-year population change between 1980 and 2010 because responses to changes in redis-

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$13,900) fell from 93,077 to 73,007. *Population of the 100 Largest Urban Places: 1980 (Table 21)*, *supra* note 113 (for population in 1980); *U.S. Geographic Summary Data and Boundary Files*, *supra* note 116 (for median income in 1980); *United States QuickFacts*, *supra* note 116 (for 2010 city populations); *About Us – City Statistics,* THE CITY OF CANTON, https://cantonohio.gov/?pg=citystats (last visited July 2, 2017) (for Canton population in 1980).

[118] Portland, Oregon's population (median income 1980: $14,782) grew from 366,383 in 1980 to 585,776 in 2010, and Salem, Oregon's population (per capita income 1980: $15,075) grew from 89,233 to 154,637, while Tacoma, Washington's population (median income 1980: $14,546) only grew from 158,501 to 198,397, and Seattle, Washington's population (median income 1980: $16,254) only grew from 493,846 to 608,660. *Population of the 100 Largest Urban Places: 1980 (Table 21)*, *supra* note 113 (for population in 1980); *U.S. Geographic Summary Data and Boundary Files*, *supra* note 116 (for median income in 1980); *United States QuickFacts*, *supra* note 116 (for 2010 city populations); *Population History and Projections*, MARION COUNTY, ORE., http://www.co.marion.or.us/PW/Planning/Documents/exhibitbbackgroundinventoryskugb.pdf (last visited July 2, 2017) (for Salem population in 1980).

[119] Chicago, Illinois's population (median income 1980: $15,301) declined from 3,055,072 in 1980 to 2,697,000 in 2010, while St. Louis, Missouri's population (median income 1980: $11,511) fell from 453,085 to 319,258. *Population of the 100 Largest Urban Places: 1980 (Table 21)*, *supra* note 113 (for population in 1980); *U.S. Geographic Summary Data and Boundary Files*, *supra* note 116 (for median income in 1980); *United States QuickFacts*, *supra* note 116 (for 2010 city populations).

[120] *U.S. Geographic Summary Data and Boundary Files*, *supra* note 116.

tribution cannot happen immediately and may be very slow. The changes must be recognized, houses must be built, and people must move. Perhaps more importantly, feedbacks resulting from a "return to the city" may be even slower. For example, it could take many years to draw in higher-income residents who themselves improve the tax base, or more politically active individuals able to secure the accountability of local political institutions.[121]

I use regression analysis to relate these variables statistically. The large number of data points allows statistical inference and adds precision to the results, and the ability to use natural experiments across many states reduces concerns of bias. The "difference-in-differences" methodology is common in economics: The idea there is to compare places that did and did not receive a policy treatment (first difference) before and after the treatment (second difference), thereby controlling for how changes over time could confound the results while also controlling for background differences between the treated and untreated groups. This Article one-ups that common methodology, by adding *another* difference. Essentially, this methodology is a continuous version of a "difference-in-differences-in-differences" regression, measuring the difference in an outcome before versus after, between poor (treated) places versus rich (control) places, in high-redistribution (treated) states versus low-redistribution (control) states. Viewed this way, the "identifying assumption" required for the results to be valid is similar to the familiar "common trends" assumption for any difference-in-differences regression. The identifying assumption here can be simply stated: In the absence of school finance redistribution, the difference in population growth rates between big poor places and small rich places would have been the same within high-redistribution states as within low-redistribution states.

Further details of the regression analysis are in the Methodological Appendix. Instead, Figure 3 presents a graphical representation of the results, plotting population growth[122] by places' median household income separately for high-redistribution states and low-redistribution states.[123] In low-redistribution states, represented by blue circles, richer places grew more quickly than poorer places, as shown by the upward-sloping line. In contrast, in

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121 *See* Briffault, *supra* note 4, at 806 (arguing that there can be feedback loops in school finance, such as greater funding attracting more politically active residents who will support better services).

122 Technically the figure plots change in the logarithm of population, which is roughly equivalent to population growth.

123 High-redistribution states are the 40% of states with the most state aid for poor places. Low-redistribution states are the 40% of states with the least aid for poor places.

high-redistribution states, represented by red triangles, poor and rich places grew at roughly the same rate, as shown by the roughly flat line. Because of the state aid for poor places, the trend line *rotates* so that it flattens in the high-redistribution states, reflecting relatively higher growth rates of the poor places benefitting from the state aid. This is precisely what my model predicts with the advent of state aid if there are substantial efficiency advantages of the aid: With the local finance playing field more level between rich and poor places, people move to poor places.

FIGURE 3. POPULATION GROWTH BY PLACE INCOME AND STATE REDISTRIBUTION
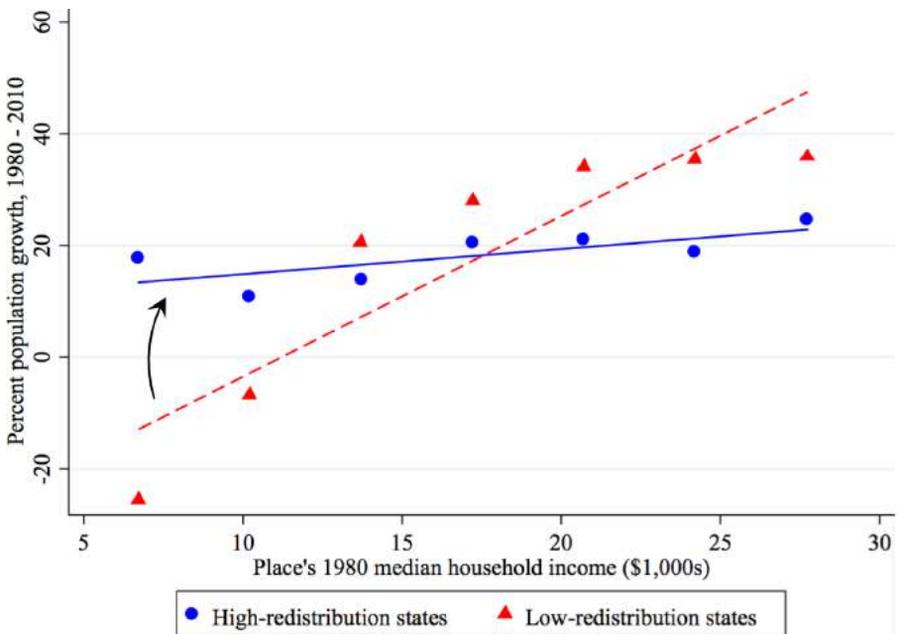
The results from the regression analysis, available in the Methodological Appendix, measure how many people move to poor areas in the aftermath of school finance redistribution.[124] The result is highly statistically significant.[125] What the result means is that, on average, poor places grew faster in states with more redistribution, relative to the rest of the places in their respective states. In particular, if two places began with 1980 median income at $100 less than the median income of the average place, the place in the state that redis-

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[124] For those who wish to review the appendix, -0.0150 is the main result, from column (6) of Appendix Table 2.

[125] The result has a *t*-statistic of 2.36 and a *p*-value of 0.018.

tributed an extra $1 because of that $100 lower income grew 0.015 percentage points faster than the place in the state that did not redistribute the extra $1. For the state with the average amount of redistribution, that redistribution resulted in growth that was 0.054 percentage points higher for each $100 decline in a place's median household income.

To understand what this result means for the number of people whose location choice was freed up by the expansion of state aid, consider the number of people who moved from "rich" places to "poor" places as a result of the state aid. For illustrative purposes—and because I will return to it below when interpreting the results as causing part of the "return to the central city"—consider as a "poor place" the typical income of a central city and as a "rich place" the typical income of a suburb, which have a typical income difference of $6,953 (in 1990 dollars).[126] Given this income difference between rich and poor places, the magnitude of the results of the impact of state aid on population shifts, and the amount of state aid actually observed, the results mean that *6.6 million people* moved from rich places to poor ones because of the state aid.[127] This response is a huge shift, meaning that the efficiency gains from the choice-enhancing benefits of centralized funding for poor schools is very large, since many people—by revealed preference—are able to move somewhere that they prefer as a result of the state aid.

B.   *Alternative Explanations*

Any good empirical analysis must answer the question: What about other explanations that could bias the results? Answering this question requires first understanding the types of critiques to which the empirical methodology is vulnerable and those to which it is not. One methodological approach would be to try to control for all potential confounding variables. That is not the approach I take, since it is difficult to know when one has controlled for all potential confounds.

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[126] I calculate this statistic as follows. I first take the average place median household income in my data from 1980, which is $16,959. I then multiply this number by an estimate of the difference between suburban and central city incomes of 41%. Poindexter, *supra* note 35, at 10 (reporting that in 1987 the per capita income of city residents was 59% of per capita suburban income).

[127] This number comes from multiplying together the difference in median household income between cities and suburbs of $6,953, the average amount of redistribution of $3.625 per $100 decline in median household income, and the coefficient of 0.0150 relating these two quantities to population growth yields population growth of 4.28 percentage points. This means that there has to be 2.14% of the population (half of 4.28) pushing up the growth of poor places and pushing down the growth of rich places. And 2.14% of the 2010 U.S. population of 309 million people is 6.62 million people.
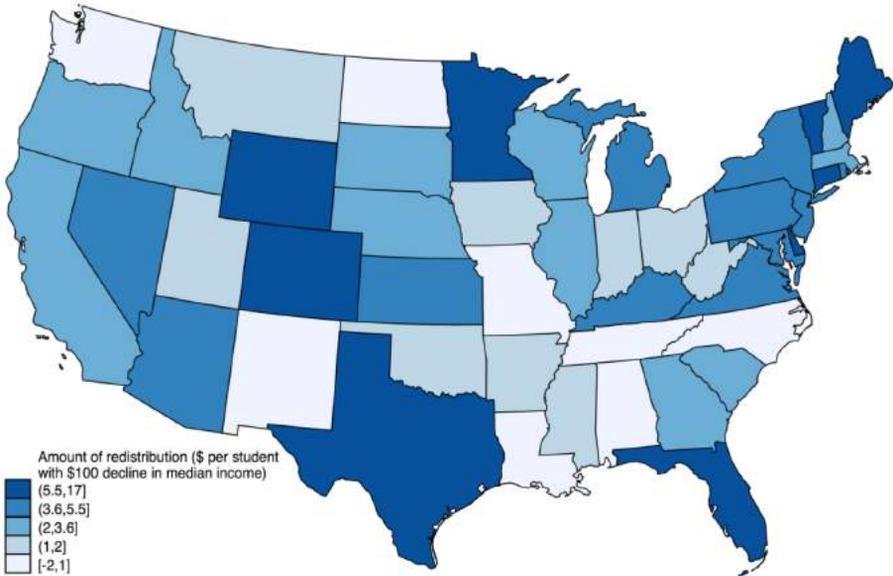
Rather, my approach depends upon the differences-in-differences-in-differences methodology, which effectively automatically controls for a wide range of variables. For these results to be valid, in the absence of school finance redistribution, the average difference in growth rates between poor and rich places must have been the same within high-redistribution states and low-redistribution states. To unpack that, consider what is controlled for in the regression analysis: anything happening across the country, anything happening across places within a state, anything happening to poor areas across the country, anything happening to rich areas across the country, and anything at all that is constant with time. So, for example, one might argue that American Millennials have more favorable attitudes about living in poor cities than earlier generations, resulting in population movement to poor areas. While a perfectly legitimate explanation of population mobility, this critique probably does not create problems for the analysis, since a generational shift in attitudes is presumably something that happens across the country. It would not differentially affect states that happened to expand school finance. Similarly, one might argue that liberal states might be more generous to areas with poor people. That might be true, but it is not a problem for the results because I control for all fixed characteristics of not only states but indeed individual places over time. So greater generosity alone would not generate a problem for the results.

Rather, to invalidate the results, it would have to be something quite narrow that is true: For the results to be invalid, it would have to be the case that there is not only a change in the high-aid states that does not take place in the low-aid states, but also a change *within* the high-aid states that *differentially* impacts poor and rich areas that does not happen in the low-aid states. This is the virtue of the differences-in-differences-in-differences methodology: Anything that differs between rich and poor places doesn't matter, anything that differs between states doesn't matter, and anything constant with time doesn't matter. That is, for the results to be problematic, there must be something that disproportionately affects states with increased state aid, disproportionately affects poor areas, *and* causes a change in population. Despite the narrowness of the empirical concerns left after having such a rigorous methodology, some problems could potentially remain, which I address in this subsection.

Figure 4 maps the amount of redistribution by state, with darker colors indicating more redistribution. It helps to alleviate concerns about bias. The Northeast, as one might expect, is more redistributive than much of the rest of the country. But generally, the most and least redistributive states are quite geographically and politically heteroge-

neous. For example, the most redistributive state in the data is Wyoming. Colorado redistributes much more than the neighboring state of New Mexico. Texas and Florida redistribute a lot—more than New York and Massachusetts, for example. So the simple story that only liberal or northeastern states have redistributive state aid—and those were states that were going to have poor places grow quickly anyways—is not supported by a visual inspection of the data.

FIGURE 4. MAP OF STATE SCHOOL FINANCE REDISTRIBUTION

Amount of redistribution ($ per student
with $100 decline in median income)
(5.5,17]
(3.6,5.5]
(2,3.6]
(1,2]
[-2,1]

Turning to statistical analysis of the data for robustness checks, a first potential concern might be that states with poor places that would have done particularly well economically even without the change in school finance are the states that redistributed more, thus artificially generating the relation between a large amount of redistribution in a state and the strong population growth of poor cities in the state. Further analysis bears out the initial observation that there is apparently a significant amount of arbitrariness in the location of high-redistribution states. In particular, if one's concern is that poor places in regions with high amounts of redistribution may have grown more quickly than poor places in regions with small amounts of redistribution—and done so for economic reasons unrelated to school finance redistribution—a way to address the concern is to measure the effect of having more redistribution *within* a region. Controls for the effect of income, within region, need to be added in this case. Adding controls for each

of the nine Census Divisions[128] times each of median income, median income squared, and median income cubed (for a total of twenty-seven controls) barely changes the results relative to the main finding.[129] Similarly, adding the equivalent twenty-seven controls for population instead of income—thereby controlling not only for the impact of population but also the regional impact of population— barely changes the results.[130] This evidence shows that regional differences in the growth rates of poor places for reasons other than school finance redistribution do not appear to drive the results.

Second, states with a large amount of redistribution might also happen to be states with large amounts of annexation activity. If larger (and therefore, on average, poorer) cities tend to grow more by annexation, annexation activity would bias the results by spuriously generating larger population growth in poor large cities in states with large amounts of redistribution. To address this concern, I collected data on all the annexations between 1990 and 2010 reported to the U.S. Census Bureau, comprising 184,041 data points.[131] I then measured the statistical relation between how much land was annexed during these years (as a fraction of total state land area) and how redistributive the state's school finance system is. The result suggests that there is no relationship (*p-value* = 0.715) and, to the extent that there is one, it goes in the opposite direction to the one that would be concerning for the results above; that is, more annexation activity correlates with *less* state redistribution.

Third, one may be concerned that states with large amounts of redistribution had the largest drop in crime in their cities, thereby explaining the movement toward poor cities in places with large amounts of school finance redistribution. Arguably, crime rates could be an "endogenous variable" affected by school finance redistribution itself, since some of the school funding from the state may have freed up funds in local budgets for crime prevention. But controlling for crime rates remains a useful robustness check. Although relevant crime data are not available at the place level, they are available at the state level from the Federal Bureau of Investigation's Uniform Crime

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[128] U.S. Census Bureau, Economic Census (2007), http://www.census.gov/programs-surveys/economic-census/data/tables.2007.html (last visited June 27, 2017) (providing data source).

[129] Indeed, the coefficient actually goes *up* a little in magnitude to -0.0185, with a standard error that stays very similar at 0.0075.

[130] The result here is -0.0169, with a standard error of 0.0070.

[131] *See* U.S. Census Bureau, Boundary and Annexation Survey (2015), http://www.census.gov/geo/partnerships/bas/bas_annex.html (last visited June 27, 2017) (providing data on annexation).

Reports.[132] I construct a proxy variable to account for changes in crime by multiplying together (1) each place's median household income and (2) the change in violent crime rates between 1980 and 2010 for the place's state. If states that had large amounts of school finance redistribution also had poor areas that had particularly large declines in crime and this drove population gains, then the effect of being a poor city should be largest where crime dropped the most and including this variable should at least partially solve the omitted variable problem. With the full set of controls, plus the addition of the crime control, the main coefficient is very similar to the one without the control.[133] Though the control is imperfect, this is reassuring evidence that crime is not an important omitted variable.

Fourth, one might be concerned that states that redistribute more to local governments based on income also have increasingly redistributed more for other reasons besides education, yielding results that exaggerate the effect of school finance redistribution. This concern is mitigated substantially by the fact that school funding is the most important source of redistribution directly received by local governments.[134] Nevertheless, to help address this concern directly, I control for states' political leanings, since perhaps the most likely way that school finance redistribution would be correlated with other forms of redistribution to poor cities is via the states' politics. To measure states' political leanings, I use the 2012 vote share for President Obama and interact it with 1980 median household income as I did with drops in crime.[135] To two significant digits, the results stay the same, providing some reassurance that other forms of spending correlated with school finance redistribution are not driving the results.

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[132] *Uniform Crime Reporting Data Online*, FED. BUREAU OF INVESTIGATION, https://www.ucrdatatool.gov/Search/Crime/Crime.cfm (last revised Jan. 26, 2017) (providing data and explanation of data).

[133] The result is -0.0179 (SE = 0.0077).

[134] *See, e.g.*, *infra* Table 3.

[135] In general, it is superior to use measures from the beginning of the period under study, to avoid the possibility that the control variable is itself affected by the object under study; for example, school finance redistribution could conceivably have attracted liberal voters to a state. However, the 1980 Presidential vote may not accord with many individuals' notion of what makes a state "liberal." For example, the region that voted most strongly for Democratic candidate Jimmy Carter was the South. As a result, I use more recent data to measure political leanings. In any case, using controls that are potentially affected by the variables under study (in this case, state aid) tends to bias the results toward zero—that is, away from finding significant results. So the fact that the results do not substantially shrink is all the more meaningful in light of the use of recent data.

Thus, to the extent that I can develop ways of addressing alternative explanations, the explanation that state aid for schools drives the results remains solid.

C. State School Aid and the "Return to the Central City"

This analysis shows that leveling the local finance playing field opens up choice to millions of Americans, who opt to move to poor places once their location choices are no longer distorted. That people are moving to poor places suggests that they are also moving away from suburbs and toward central cities,[136] since cities are far poorer than suburbs—with much higher poverty rates (19%) than suburbs (7.5%)—and are often the main beneficiaries of state aid for schools.[137] And indeed the share of the U.S. population living in cities at the center of metropolitan areas ("central cities") reached its nadir in 1980. Since 1980, central cities have grown so fast that they have not only maintained their share of the national population but actually increased it. In 2010, 33% of the U.S. population lived in central cities, the highest proportion since 1950.[138] This empirical analysis is a test of the novel hypothesis that state aid for schools has driven this widely-remarked-on "return to the central city."[139]

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[136] The country's 554 central cities were defined by the Office of Management and Budget in 1999 and "generally consist of one or more of the largest population and employment centers of a metropolitan area." *Central Cites of Metropolitan Areas*, U.S. Census Bureau (Jan. 28, 2002), http://www.census.gov/population/estimates/metro-city/cencty.txt.

[137] Glaeser et al., *supra* note 15, at 1. The authors find that the main reason for high poverty in cities is the presence of public transportation. Of course, there are many other potential explanations of the concentration of the poor in cities, including intentional siting of public housing, an older housing stock, and exclusionary policies in suburbs. My own analysis corroborates this income difference between cities and suburbs and shows how strikingly richer places have substantially smaller populations. I regress 1980 log population (multiplied by 100) on 1980 median household income (divided by \$1,000), yielding a coefficient of −9.18 ($t = 4.48$, $p = 0.000$). The results mean that, on average, as a place's median household income increases by \$1,000, its population decreases by 9.18%, showing a strong association between income and place size.

[138] For data on the phenomenon, Mark Mather et al., *Reports on America: First Results from the 2010 Census*, POPULATION REFERENCE BUREAU 15 (July 2011), http://www.prb.org/pdf11/reports-on-america-2010-census.pdf.

[139] *See id*. For popular media reaction to the phenomenon, see Abhijeet Chavan et al., *Top Planning Issues of 2008*, PLANETIZEN, http://www.planetizen.com/node/36734 (Jan. 1, 2009) (containing a series of articles on the "Return to the City"). Note that this trend was less visible when looking only through the 2000 Census. *See* Edward L. Glaeser & Jesse M. Shapiro, *Urban Growth in the 1990s: Is City Living Back?*, 43 J. REGIONAL SCI. 139, 139 (2003) (finding no evidence of a return to large cities based on the 2000 Census).

A variety of explanations have been offered for this "return to the central city."[140] Some suggest drops in crime[141] and increases in the value of agglomeration.[142] Others suggest that increased immigration may have contributed, since immigrants live disproportionately in central cities.[143] Likewise, delayed childbearing has changed the demographic structure to one with a larger fraction of childless young adults, who are more likely to live in cities than are young adults with children, possibly because they need less space.[144] Smaller families may have a similar effect.[145] Other proposed explanations include rising fuel prices, which encourages city living (which is less energy intensive),[146] and a shift in preferences in younger generations toward city living.[147]

I offer a novel additional explanation: These state courts ordered that, in effect, state legislatures increase subsidies for city living in the form of state aid for poor schools.[148] In particular, increased state aid for schools in poor central cities have unintentionally made them more desirable places to live. And, indeed, the results have a natural interpretation applicable to this question. Recall that, when finding the number of people whose choices became undistorted because of the change in state aid, I used the difference in the typical income of central cities and suburbs to show that 6.6 million residents moved to central cities as a result of state aid.[149] That result means that state

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[140] *See e.g.*, Leigh Gallagher, The End of the Suburbs: Where the American Dream Is Moving 192 (2013) (arguing that there has recently been a resurgence among American cities); Chavan et al., *supra* note 139 (containing a series of articles on the "Return to the City").

[141] *See* Julie Berry Cullen & Steven D. Levitt, *Crime, Urban Flight, and the Consequences for Cities*, 81 Rev. Econ. & Stat. 159 (1999) (on the link between the decline of cities and crime); Edward L. Glaeser & Joshua D. Gottlieb, *Urban Resurgence and the Consumer City*, 43 Urb. Stud. 1275 (2006) (attributing the resurgence of cities to, among other factors, the reduction in big city crime that made it possible for residents to enjoy cities' social amenities).

[142] *See* Edward Glaeser, Triumph of the City (2011).

[143] Leah Boustan & Allison Shertzer, *Population Trends as a Counterweight to Central City Decline, 1950-2000*, 50 Demography 125 (2013) (studying the choice between living in the suburbs and city between 1950 and 2000).

[144] *See id.* at 125.

[145] *See* Gallagher, *supra* note 140, at 161.

[146] *See* Alan Ehrenhalt, The Great Inversion and the Future of the American City 8 (2012) (arguing that rising fuel prices has helped drive city living).

[147] *See* Gallagher, *supra* note 140, at 157–58.

[148] Others have studied the effect of school finance reform on spending and educational outcomes, but not on the return to the central city. *See* Jackson et al., *supra* note 19, at 157. Of course, increased redistribution not explicitly driven by court orders has similar impacts and is also included in the estimates presented here.

[149] To confirm that people are moving to central cities and not poor rural places, I measure whether the effects of state aid are disproportionately felt in small, rural places. They are not. (I do so by interacting the main variable of interest with population and

school aid explains *31.4%* of the "return to the central city" between 1980 and 2010.[150]

This result reverses the traditional narrative about urban "sprawl," the increase in area and decrease of population density of metropolitan areas. Americans in metropolitan areas overwhelmingly used to live in central cities; in 1910, 75% of people in metropolitan areas lived in them. But, by 1980, this ratio had decreased to 40%.[151] Many have suggested public policy contributions to reductions in urban living and increases in sprawl, including excessive zoning and land use regulation,[152] federal mortgage interest subsidies,[153] the interstate highway system,[154] low school quality,[155] crime,[156] and flight from racial minorities or blight.[157] These are many of the same issues the reversal of which some believe helped lead to the return to the central city. But the leading economic explanation for sprawl

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seeing if that interaction yields significant results.) In fact, the effects of state aid are disproportionately felt in *large* places, though that difference is not statistically significant, thereby providing reassurance that the return to the central city is driven in part by increased aid for schools in poor cities.

[150] I calculate this statistic as follows: Central cities grew 13.7% faster than the rest of the country between 1980 and 2010. Multiplying together the difference in median household income between central cities and suburbs of $6,953, the average amount of redistribution of $3.625 per $100 decline in median household income, and the coefficient of 0.0150 relating these two quantities to population growth yields population growth of 4.28 percentage points, which is 31.4% of the total population growth to be explained.

[151] Frank Hobbs & Nicole Stoops, U.S. CENSUS BUREAU 33, *Demographic Trends in the 20th Century*, http://www.census.gov/prod/2002pubs/censr-4.pdf (2002).

[152] *See* Ellickson, *supra* note 9, at 385 (for the seminal analysis of suburban land use controls); Edward L. Glaeser et al., *Why Is Manhattan So Expensive?: Regulation and the Rise in Housing Prices*, 48 J.L. & ECON. 331, 331 (2005) (arguing that land use regulation has decreased urban housing supply and thereby driven suburbanization); Edward L. Glaeser & Bryce A. Ward, *The Causes and Consequences of Land Use Regulation: Evidence from Greater Boston*, 65 J. URB. ECON. 265 (2008) (arguing that more land use regulation has reduced urban housing supply and driven suburbanization in metropolitan Boston).

[153] *See* WILLIAM A. FISCHEL, THE HOMEVOTER HYPOTHESIS 231–32 (2001) (arguing that there is a link between federal mortgage interest subsidies and suburbanization). *See also* Richard Voith, *Does the Federal Tax Treatment of Housing Affect the Pattern of Metropolitan Development?*, FED. RES. BANK OF PHILA. BUS. REV. 3, 3–4 (1999) (same).

[154] *See* Nathaniel Baum-Snow, *Did Highways Cause Suburbanization?*, 122 Q.J. ECON. 775, 775 (2007) (arguing that the interstate highway system increased suburbanization).

[155] *See* Isaac Bayoh et al., *Determinants of Residential Location Choice: How Important Are Local Public Goods in Attracting Homeowners to Central City Locations?*, 46 J. REGIONAL SCI. 97, 97 (2006) (arguing that low quality of public goods like schools help drive suburbanization).

[156] *See* Cullen & Levitt, *supra* note 141, at 159 (arguing crime helped drive suburbanization).

[157] *See* William H. Frey, *Central City White Flight: Racial and Nonracial Causes*, 44 AM. SOC. REV. 425, 425 (1979) (arguing that flight from racial minorities played a role in suburbanization); Edwin S. Mills & Luan Sendé Lubuele, *Inner Cities*, 35 J. ECON. LIT. 727, 734 (1997) (developing a model of flight from blight).

combines technological and economic causes: Cars have allowed people to move to suburbs, where they can enjoy large homes and large lots.[158] This explanation supposes that people want to live in the suburbs—and that the car has enabled them to do so. In other words, if one believes the traditional Tiebout-oriented equity-efficiency trade-off view, then people are moving places for a simple reason: because they want to.

This Article flips the script, suggesting that sprawl is not a representation of efficient choice but rather a reflection of an inefficient *restriction* on choice: Because of the disproportionate presence of poverty in cities, tax rates are high and services are poor, artificially discouraging people from living in cities, where they might have wanted to live because of proximity to work or other amenities. Section VI returns to the normative implications of the unintended "return to the central city" induced by greater state aid for local services.

V
Understanding the Mechanism: A Case Study on Connecticut

To better understand the mechanisms driving the effect of financial transfers on population, I examine in detail the local finances of Connecticut as a case study. Focusing on one state enables an analysis of the sources, destinations, and ultimate uses of funds, including tax reductions, increases in spending on education, and spending increases in other areas. Doing this on a national scale is very difficult because local finances differ greatly from state to state.

Connecticut is a good state to study for two reasons. First, it had a substantial amount of redistribution, resulting partly from the aftermath of the 1977 Connecticut Supreme Court case *Horton v. Meskill*,[159] which mandated increased state school aid.[160] For example, in the 2012–2013 proposed Connecticut state budget, New Haven received $8,286 per student and its wealthy suburb of Madison

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[158] *See* Edward L. Glaeser & Matthew E. Kahn, *Sprawl and Urban Growth*, *in* 4 Handbook of Regional and Urban Economics 2481, 2490–504 (J.V. Henderson & J.F. Thisse eds., 2004) (arguing that automobiles helped drive suburbanization). Robert A. Margo adds that rising incomes have increased the demand for land, increasing sprawl. Robert A. Margo, *Explaining the Postwar Suburbanization of Population in the United States: The Role of Income*, 31 J. Urb. Econ. 301, 301 (1992).

[159] 376 A.2d 359 (Conn. 1977).

[160] *Id*. at 374–75.

received $428 per student from the state.[161] Second, its government structure makes it unusually suitable for empirical analysis. There are essentially only two levels of government in the state: the state and the town. County government does not exist.[162] As well, in almost all cases, school districts share the same borders as towns—very few special districts cross town boundaries. This simplicity makes tracking transfers to local governments more feasible than elsewhere in the country.[163] Additionally, the state government spends almost no money directly on elementary and secondary education, instead transferring nearly all the money to localities, which makes tracking the destination of the funds yet easier.[164]

A.   *The Connecticut Story*

Although Connecticut has long transferred state revenue to localities for education, litigation in state courts shifted aid toward poor communities.[165] In *Horton v. Meskill*, the Connecticut Supreme Court found Connecticut's system of predominantly local financing of schools inconsistent with the state constitution.[166] When the action was brought on behalf of plaintiff Barnaby Horton in 1974, a kindergartner at Canton Elementary School, all school districts received $215 per student from the state.[167] In 1975, as the case was being litigated in lower courts, the legislature increased the grant to $250 per student and provided an additional grant of $12.50 per student, funded by new state lotteries, for poorer towns.[168] The court found this insufficient. The Connecticut Supreme Court noted that state

> legislation . . . delegates to municipalities of disparate financial capability the state's duty of raising funds for operating public schools within that municipality. That legislation gives no considera-

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[161] *Proposed 2012–13 Education Cost Sharing Entitlements Comparisons*, CONN. DEP'T OF EDUC., http://www.governor.ct.gov/malloy/lib/malloy/ECS_FY2013_Proposed_Increase.pdf (last visited July 2, 2017).

[162] Letter from Judy A. Watson, Legislative Fellow, Conn. Office of Leg. Res., to Unnamed Constituent (Jan. 30, 1998), https://www.cga.ct.gov/PS98/rpt%5Colr%5Chtm/98-R-0086.htm (explaining the reasons county government was abolished in Connecticut, most notably their ineffectiveness).

[163] A further reason is that there are virtually no annexations as a confound to population growth.

[164] The state spent literally no money on elementary and secondary education through 1994, and then very small amounts after that. NAT'L BUREAU OF ECON. RES., *supra* note 108.

[165] *See* Nicholas R. Carbone & Evelyn Brody, *PILOTs: Hartford and Connecticut*, *in* PROPERTY-TAX EXEMPTION FOR CHARITIES: MAPPING THE BATTLEFIELD 233, 236 (Evelyn Brody ed., 2002) (reviewing the history of state aid for schools in Connecticut).

[166] *See* 376 A.2d 359, 374–75 (Conn. 1977).

[167] *See Horton*, 376 A.2d at 366 (citing CONN. GEN. STAT. § 10-262 (1974)).

[168] *See id*. at 369 (citing 1975 Conn. Acts, No. 75-344; 1975 Conn. Acts, No. 75-341).

tion to the financial capability of the municipality to raise funds sufficient to discharge another duty delegated to the municipality by the state, that of educating the children within that municipality.[169]

After reviewing data describing how poorer places have a smaller property tax base, less spending, but higher tax rates,[170] it concluded that the system failed to secure the "fundamental right" to elementary and secondary education under strict scrutiny under the state constitution.[171] It upheld the trial court's requirement of the "adoption by the state of a financing program designed to achieve a substantial degree of equality of educational opportunity" while still "permit[ting] all towns to exercise a meaningful choice as to educational services to be offered to students."[172] The court emphasized that "[o]bviously, absolute equality or precisely equal advantages are not required and cannot be attained except in the most relative sense."[173]

After *Horton*, in 1979, the legislature substantially revised the funding formula established in 1975 to provide more funding for poorer towns.[174] As well, following the holding in *Galullo v. Waterbury*[175] that municipalities could use state education grants to pay for tax decreases or other services instead of education, the legis-

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[169] *Id.* at 374.

[170] *See id.* at 367–68.

[171] *Id.* at 374, 377. The Connecticut Supreme Court rooted its findings in three sections of the Connecticut Constitution. *See id.* at 375. These three sections in their entirety read as follows:

> "All men when they form a social compact, are equal in rights; and no man or set of men are entitled to exclusive public emoluments or privileges from the community," CONN. CONST. art. I, § 1; "No person shall be denied the equal protection of the law nor be subjected to segregation or discrimination in the exercise or enjoyment of his or her civil or political rights because of religion, race, color, ancestry, national origin, sex or physical disability," CONN. CONST. art. I, § 20; "There shall always be free public elementary and secondary schools in the state. The general assembly shall implement this principle by appropriate legislation," CONN. CONST. art. VIII, § 20. The trial court had held "that although local control of public schools is a legitimate state objective, since local control of education need not be diminished if the ability of towns to finance education is equalized, the local control objective is not a rational basis for retention of the present financing system; that the state has not selected the less drastic means for effectuating the local control objective and, therefore, the system, beyond a reasonable doubt, violates the constitution of Connecticut." *Horton*, 376 A.2d at 370.

[172] *Id.* at 376.

[173] *Id.*

[174] D'Ann Mazzocca, *School Funding and the Courts*, OLR RESEARCH REPORT (Aug. 17, 1995), http://search.cga.state.ct.us/r/basic/dtsearch.asp?cmd=getdoc&DocId=11177&Index=I%3a%5czindex%5c1995&HitCount=1&hits=1224+&hc=2708&req=funding+or+School+&Item=10 (describing the history of litigation and legislative response surrounding state funding of K-12 education in Connecticut).

[175] 397 A.2d 103 (1978).

lature added a minimum expenditure requirement.[176] In 1988, the legislature adopted the Education Cost Sharing (ECS) formula, which has been periodically revised to respond to state fiscal constraints and to "reallocate available state aid to different kinds of towns."[177] Though there have been year-to-year variations, the key point is that, since 1979, the state has sent substantially more to towns with lower "wealth," defined in terms of the equalized property tax base as measured by the state of Connecticut.[178] Broadly ECS aid is calculated in three steps: 1) Measure the ratio of town property wealth to the guaranteed wealth level and then subtract this ratio from 1 (so that poorer towns receive more money), 2) multiply this ratio by a foundation level of spending, and 3) multiply again by the number of students.[179]

The litigation continued with claims of segregation between schools, which helped result in legislation increasing funding for school construction that was disproportionately used by poor towns. In 1996, the Connecticut Supreme Court held in *Sheff v. O'Neill*[180] that the right to substantially equal access to educational opportunity is undermined by extreme racial and ethnic isolation.[181] The court left the remedy to the legislature. As a consequence, the legislature

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[176] The case arose from the decision by the Board of Aldermen of Waterbury to lower its property tax to 84.85 mills from a proposed 87 mills, after learning that its share of lottery funds would be about $1 million higher than expected. The city allocated the entire expected revenue increase to tax reductions and none to increased education spending. *Id.* at 104. The court held this despite the provision in the law that stated, "all aid distributed to a town pursuant to the provisions of [the guaranteed tax base program] shall be expended for school purposes only." *Id.* at 105 (quoting CONN. GEN. STAT. § 10-262e) (repealed). As well, the court acknowledged that "[t]he remarks made in the senate in support of [this provision] indicate that it was in fact intended to force the towns to distribute the aid to their boards of education." *Id.* Nevertheless, the Court upheld the trial court in its finding that the state funds were used for education; implicitly, the local funds that had been proposed for education spending were the ones used for the tax reductions. *See id.* at 186. The Court added that "[t]he legislative history of the [provision] indicates that legislators were aware of the possibility that tax-burdened cities might see the availability of additional state funds for education as an opportunity to reallocate existing city revenues and reduce taxes." *Id.* To find the actions of Waterbury problematic, the law would have needed a "provision . . . which compels cities to use instant lottery funds to *supplement* the education allotment in their budgets." *Id.*

[177] Judith S. Lohman, *Changes in Education Cost Sharing Formula Since 1988*, OLR RESEARCH REPORT (Mar. 26, 1998), http://search.cga.state.ct.us/r/olrbasic/dtsearch. asp?cmd=getdoc&DocId=6500&Index=I%3a%5czindex%5c1998&HitCount=7&hits=6a+ 84£f†a+108+11a+1ae+&hc=8994&req=changes+and+in+and+education&Item=40 (describing historical changes in state aid for K-12 education).

[178] *Equalized Net Grand Lists for Purposes of Educational Equalization Grants*, CONN. GEN. STAT. § 10-261a (defining how equalized property tax base is calculated).

[179] Mazzocca, *supra* note 174 (describing the formula for calculating state school aid).

[180] 678 A.2d 1267 (Conn. 1996).

[181] For additional analysis on *Sheff*, see James E. Ryan, *Sheff, Segregation, and School Finance Litigation*, 74 N.Y.U. L. REV. 529, 529 (1999) (arguing that "school 'finance' litigation need not, and perhaps should not, be solely about money" and that instead

quickly passed the Enhancing Educational Choices and Opportunities Act.[182] The legislation included substantial funding for school construction aimed at reducing segregation; the funding was allocated mainly in two ways. First, the state would completely fund construction of interdistrict magnet schools if the districts committed to the school for at least twenty years.[183] Second, schools would receive additional funding if their construction projects served to integrate local schools. Still, the magnitude of school construction spending was substantially smaller than that for equalization of operating expenses; the state spent a total of $4 billion on school construction from 2001 to 2012,[184] while ECS grants totaled nearly $20 billion.[185]

The resulting school financing system in Connecticut is quite different from that in California, the most-studied case of court-ordered school finance reform. In particular, the California Supreme Court required that some portion of high-spending districts' property wealth was "recaptured" for redistribution to low-wealth school districts.[186] Arguably as a result of the holding, voters supported the Proposition 13 initiative, which further limited the ability of localities to raise taxes to fund local services.[187] In Connecticut, in contrast, there is no "recapture" when school districts spend a lot on schools and no limit on their ability to raise taxes for local schools.

State transfers to poor cities have increased for a second reason in addition to the school financing: Connecticut's pioneering payments in lieu of taxes (PILOT) program, in which the state compensates

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"nonmonetary remedies [such] as racial and socioeconomic integration and school choice" should be explored).

[182] Conn. Acts 1997, No. 97-290.

[183] Sheff v. O'Neill, 733 A.2d 925, 929 (Conn. Super. Ct. 1999) (describing the construction subsidies). For additional information on Connecticut's funding of interdistrict magnet schools, see Judith Lohman, *State Funding for Interdistrict Magnet Schools*, OLR RESEARCH REPORT (Mar. 9, 2010), http://www.cga.ct.gov/2010/rpt/2010-R-0056.htm.

[184] CCM PUB. POL'Y REP., EDUCATION FINANCE IN CONNECTICUT: OVERRELIANCE ON THE PROPERTY TAX 16 (Nov. 2012), http://advocacy.ccm-ct.org/Resources.ashx?id=524d59 81-e780-4b8f-bd8d-701de00ca464 (giving figures on state spending on school construction). Connecticut has sometimes not authorized the appropriations up to the level of the permissible statutory limit. *See* Orlando J. Rodriguez & Jacob Siegel, *Problems with Connecticut's Education Cost Sharing Grant*, CONN. VOICES FOR CHILDREN (Feb. 2011) http://www.ctvoices.org/sites/default/files/Bud11CTEduCostSharingGrantProblems.pdf.

[185] This statistic is from my calculations of data from Education Grants Database, CONN. OFF. OF POL'Y & MGMT., http://data.ctdata.org/dataset/education-cost-sharing (last visited Jan. 4, 2017).

[186] Stark & Zasloff, *supra* note 81, at 804.

[187] *Id*. ("Unwilling to sit idly by as their property taxes were routed through Sacramento to low-wealth districts, voters in 'wealthy' districts abandoned the property tax altogether and threw their support to [Prop. 13].").

towns for property tax revenue lost due to property tax exemptions.[188] Before 1978, only state-owned property was part of the state's PILOT program.[189] Due in part to lobbying by cities and increasing pressure to levy a tax on nonprofits to help cities pay for the services they provided to them, Connecticut passed the College and Hospital PILOT program in 1978.[190] At that point, the state reimbursed localities for 25% of taxes that state-owned properties would have paid if they had been taxed, and that grew to 45% two decades later.[191] The amount of reimbursement for colleges and hospitals has increased with time as well, from 25% when passed, to 40% in 1987, 50% in 1988, 60% in 1991, and 77% in 1999.[192] In fiscal year 2001, total PILOT payments for colleges, hospitals, and state-owned property totaled $163 million and went disproportionately to poor communities, which tend to be central cities with large amounts of tax-exempt property.[193] By fiscal years 2011 to 2013, Connecticut was spending about $200 million per year on PILOT payments—a substantial amount of money, though approximately one tenth of the $2 billion per year the state spent on ECS payments.[194]

B. *Empirical Analysis*

The primary dataset for studying Connecticut's local finances is the Annual Survey of Governments from the Census Bureau, which has annual data from 1970 to 1999[195] for all Connecticut towns' revenues and expenditures, including breakdowns by type and source.[196] I

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[188] *See* Carbone & Brody, *supra* note 165, at 233.

[189] *Id*. at 241.

[190] *Id*. at 242–43.

[191] *Id*.

[192] *Id*.

[193] *See id*. at 243 (The total PILOT for private colleges and hospitals was $97 million, while the total contribution from Connecticut state property was only $66 million, totaling $163 million.).

[194] Benjamin Barnes, *FY2010–11, FY2011–12 and FY2012–13 Estimates of State Formula Aid to Municipalities*, OFF. OF POL'Y & MGMT. 15, 25 (Sept. 20, 2012) http://www.ct.gov/opm/lib/opm/budget/2012_midterm_budget/pdfs/FINAL_Municipal_Fiscal_Estimates_Book_Sept_20.pdf (detailing state aid to towns).

[195] Note that the time span covered by the Connecticut finance data (1970–1999) differs from that for the national population growth data (1980–2010). This difference is driven by data constraints and the desire to use as much data as available. That said, the time periods also dovetail nicely with the goals for using each dataset. It is desirable to start earlier with the Connecticut data because school finance reform started in the 1970s, so tracing the finances starting then is helpful. Likewise, ending later is desirable for the population data because, as argued above, the responses to changes in school finances are likely to involve substantial lags.

[196] *Annual Survey of Governments*, *supra* note 108.

focus on the portion of total revenues (including for school buildings and PILOT)[197] coming from intergovernmental sources.

Figure 5 shows the share of revenue coming from intergovernmental sources from 1970 to 1999 in the top and bottom deciles of Connecticut towns by median income.[198] It shows that there has been a revolution in Connecticut's local finances. In 1970, bottom-decile towns received only seven percentage points more of their revenue from intergovernmental sources than top-decile towns.[199] In the subsequent twenty-nine years, though, the intergovernmental share to the poorest towns approximately doubled to 49.3%, while the intergovernmental share to the richest towns declined by more than half, to 8.5%. In those three decades, the local budgets of Connecticut's poorest towns have been transformed, with nearly half of their revenues coming from the state and federal government, while state and federal government transfers have declined substantially as a percent of revenue in the richest cities.

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[197] U.S. Census Bureau, Federal, State, and Local Governments: Government Finance and Employment Classification Manual: Descriptions of Intergovernmental Revenue Categories (2011), http://www.census.gov/govs/www/class_ch7_ir.html (defining intergovernmental revenues).

[198] The median income is from *Connecticut Income Data: U.S. Census 2000 Economic Data*, Conn. Dep't of Econ. & Cmty. Dev., http://www.ct.gov/ecd/cwp/view.asp?a=1106&q=250652 (last visited Feb. 17, 2017). Median income from 1970 would be more desirable, before any of the changes under study took place, but data from 2000 were more easily accessible, and towns' median income ranking has changed little over the past several decades. For example, the correlation between median household income in 1980 and in 2007 among the subset of seventy-nine towns available in the Census data is very high, at 0.956. (The correlation is weighted by 1980 population).

[199] Bottom-decile towns received 24.8% of their revenue from intergovernmental sources, while top-decile towns received 17.8%.

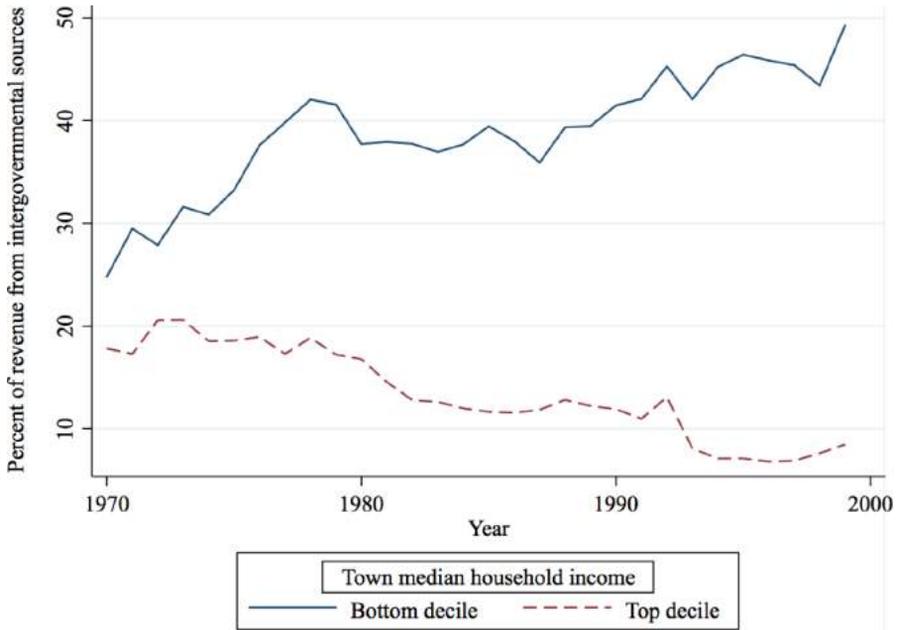FIGURE 5. INTERGOVERNMENTAL REVENUE BY TOWN MEDIAN
HOUSEHOLD INCOME

Figure 6 is a scatterplot showing the percentage of a place's revenue that came from intergovernmental sources in 1997, the last year with full data in Figure 5, and median income in 2000. So that more of the town names are visible, I limit the scatterplot to towns with a population greater than 25,000. It shows that there is a very strong and generally linear relationship between median household income and intergovernmental revenues. In the figure, towns are generally where one might expect them to be; Hartford, Bridgeport, and New Haven—cities with large poor populations—are in the top left corner of low incomes and high intergovernmental transfers, while the rich suburb of Greenwich is in the bottom right corner. Nevertheless, there is a fair amount of dispersion in transfers among cities of roughly similar median income.

Table 3 shows how intergovernmental revenue in Connecticut is spent, as reflected in data from 1997. Connecticut towns received $2.4 billion in intergovernmental revenue in 1997, nearly all of which (94.5%) was from the state government.[200] Of those intergovern-

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[200] A caveat to this tally is that the federal government provided $255 million in intergovernmental revenues to the state government of Connecticut "for education." Unfortunately, the data are not broken down by elementary, secondary, and post-secondary education, so it is not possible to determine how much of this funding was in

mental transfers from the state, the vast majority was for education, constituting 68.7% of all intergovernmental transfers. This table confirms that, for Connecticut at least, the focus in the first part of the Article on transfers from the state and for schools was appropriate.

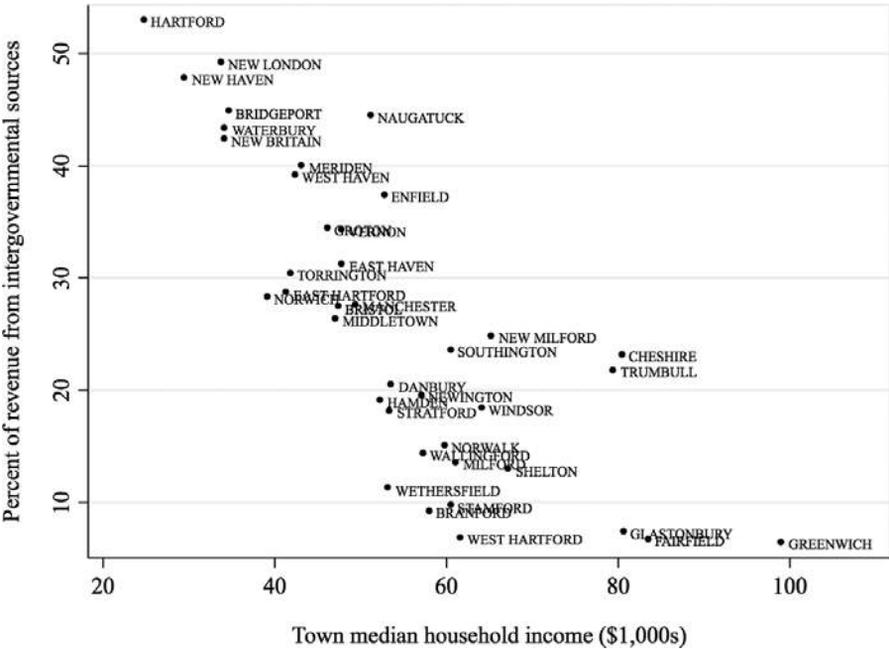FIGURE 6. INTERGOVERNMENTAL REVENUE BY TOWN MEDIAN HOUSEHOLD INCOME

TABLE 3. CONNECTICUT INTERGOVERNMENTAL REVENUE IN 1997

	Revenue ($ millions)	Percent of total intergovern- mental revenue
Total intergovernmental revenue	2,373	100.0%
Federal intergovernmental rev.	110	4.6%
State intergovernmental rev.	2,242	94.5%
State education transfers	1,631	68.7%

Note: Local intergovernmental revenue forms the remainder.
Source: Census of Governments.

turn passed to localities for elementary and secondary education. The data do contain the information that the state government directly spent only $179,000 on elementary and secondary education, so—to the extent that the federal funding was for elementary and secondary education—it was virtually all passed on to localities. Thus, the table understates the extent of federal funding as a source of intergovernmental revenue and overstates the role of the state.

Increased transfers can be used to do several things: increase spending to try to improve services in the intended area like education, increase spending to try to improve services in other areas, and reduce locally raised taxes.[201] Table 4 uses annual data from 1970 to 1999 for all Connecticut towns to show how localities have chosen to allocate their government transfers.[202] All the regressions include year and town fixed effects to control for anything that varies across all towns with time and any time-invariant town-level characteristics that may be correlated with how revenue is spent. Also, all regressions are scaled by town population, so that all quantities are measured per capita.[203] Finally, all standard errors are clustered at the town level.

TABLE 4. HOW TOWNS SPENT THE TRANSFERS

	(1) Per capita total revenue	(2) Per capita local tax revenue	(3) Per capita total revenue	(4) Per capita local tax revenue	(5) Per capita education spending
Per capita intergovernmental revenue	0.639*** (0.096)	-0.383*** (0.070)			
Per capita educational intergovernmental revenue			0.446*** (0.157)	-0.628*** (0.089)	0.337*** (0.066)
R-squared	0.913	0.891	0.901	0.900	0.886
Town fixed effects	X	X	X	X	X
Year fixed effects	X	X	X	X	X

Note: The regressions have 4,311 observations. Standard errors clustered at the town level.
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

In Table 4, all results are highly statistically significant, at the 1% level. Column (1) shows that, for every $1 of intergovernmental revenue, total local revenue goes up by $0.64. Consistent with that, column (2) shows that, for every $1 of intergovernmental revenue, local tax collection goes down by $0.38. These two coefficients should add up to 1, and they roughly do. These results suggest substantial crowdout—that is, money transferred from the state crowded out local funds spent on education.[204] But, of the funds spent on services, what do they purchase?

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[201] For a summary of literature on the extent to which money is spent on its intended purpose (i.e., the "flypaper effect"), see James R. Hines, Jr. & Richard H. Thaler, *Anomalies: The Flypaper Effect*, 9 J. ECON. PERSP. 217 (1995).

[202] Some years are not available for some towns.

[203] I measure the data per capita, rather than per student, because—as the regressions show—much of the spending is captured not by the students but by town residents.

[204] Jackson et al., *supra* note 19, at 157, also show increased spending as a result of school decisions, but they do not calculate crowdout regressions and are unable to measure the effect on local taxes and spending other than schools, since they study only school districts. Lafortune et al., *supra* note 19, at 44, show less crowdout than I do, showing that

Since the focus of the Article is measuring how state funds intended for education are used, in columns (3) – (5), I switch the main explanatory variable from total per capita intergovernmental revenue to per capita intergovernmental revenue intended for education.[205] The results show that, of an extra dollar of education intergovernmental revenue, total revenue increases by \$0.45 (column (3)), tax revenue decreases by \$0.63 (column (4)), and education spending increases by \$0.34 (column (5)).[206] These results suggest that the majority of education transfers go to reductions in taxes, and, of the remainder, about three-quarters goes to education spending, while another quarter goes to other forms of spending.

These results are, at least to some extent, specific to Connecticut. For example, law specific to Connecticut likely affects the extent to which towns can use state funds designated for education for something other than their intended purpose. As noted, in the 1978 case *Galullo v. City of Waterbury*, the Connecticut Supreme Court held on statutory grounds that towns could divert money intended for schools to other purposes, and then the legislature added a minimum expenditure requirement.[207] Other states could have different court rulings and statutes, which would affect the extent of crowdout.

VI
POLICY IMPLICATIONS

A.   *Efficient Decentralization Versus Efficient Centralization*

This section disrupts the conventional belief that decentralized financing is efficient, while centralized financing is equitable, combining the theory from Section II and the empirical results from Sections IV and V to demonstrate two *efficiency grounds for centralization*. First, centralizing the costs of providing services to the poor

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school decisions result in a \$907 per student increase in education spending by school districts, and a \$912 per student increase in intergovernmental revenue that school districts receive from the state. These increases coincide with a \$146 per capita decrease in local revenue (i.e., local taxes and fees).

[205] The downside of studying intergovernmental revenue intended for education specifically is that, if per capita spending on education is correlated with other types of spending, the regressions may be biased. For example, if more per capita non-educational intergovernmental revenue is correlated with more per capita educational intergovernmental revenue (controlling for state and year fixed effects), and both types of intergovernmental revenue lead to increases in education spending, then the estimated impact of educational intergovernmental revenue will be biased upward. This bias is limited by the fact that such a high fraction of intergovernmental revenue is for education.

[206] These numbers do not sum to one either because of the imprecision inherent in statistical analysis and/or because some of the money was spent on non-education services.

[207] 397 A.2d 103, 105–06 (Conn. 1978).

helps promote efficient location choices as residents who live in jurisdictions with poor individuals are no longer forced to bear the cost of educating the poor and hence are no longer discouraged from living in the most efficient locations. Second, in encouraging the return to the city, school finance redistribution avoids the negative environmental, social, and economic externalities of sprawl. These reasons tilt arguments about the financing of local services substantially in the direction of more equitable, centralized funding. I discuss each of these reasons in turn.

1. Promoting Efficient Residential Sorting

As explained in Section II, two features of state constitutions essentially require local redistribution to the poor in the absence of state or federal funding for the cost of educating the poor. In particular, state constitutions require the mandatory provision of public education, meaning that *someone* will have to pay for education, and the common state constitutional requirement of uniform property tax rates means that the rich will have to pay more when they are in jurisdictions with households that have less valuable property and therefore pay less than their proportional share of taxes.

This fixed minimum cost of educating the poor must be borne by someone; the question is by whom. Purely local financing of education introduces an inefficiency in where people live by interfering with location choice. Consider what would happen if Medicaid, the program funded primarily by the federal government to provide medical care to the poor, were funded by charging $1,000 to middle-class residents of cities, but not to middle-class residents of suburbs. That would yield a distortion in residential location choice by encouraging people to live in suburbs.[208] But, when education is purely financed

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[208] Discussion of the allocational issues arising from differential taxation across locations dates back at least to 1970. *See* James M. Buchanan & Richard E. Wagner, *An Efficiency Basis for Federal Fiscal Equalization*, *in* THE ANALYSIS OF PUBLIC OUTPUT 139 (Julius Margolis ed., 1970). Kirk Stark studies how a federal equalization scheme would work across states. Kirk J. Stark, *Rich States, Poor States: Assessing the Design and Effect of a U.S. Fiscal Equalization Regime*, 63 TAX L. REV. 957, 958 (2009). He focuses on the locational distortion between states; the concern is probably much bigger within metropolitan areas since there is likely much more mobility within metropolitan areas. His efficiency goal is to equalize "net fiscal benefits," which can arise either from differential availability of source-based taxes (e.g., because of natural resources or a high concentration of wealth) or local redistributive taxation. *Id*. at 964. The idea is that comparable "tax effort" would raise the same income in communities of different fiscal capacities. Stark reviews the different types of equalization, including total table resources, representative tax systems, and representative revenue systems. *Id*. at 981–84. Note though that some have argued that, under a certain unrealistic set of assumptions, locational tax neutrality does not matter. David E. Wildasin, *Locational Efficiency in a Federal System*,

locally, this system of charging the well-off residents of cities for society's fixed obligation to pay for educating the poor—in addition to all other publicly-provided services like policing the streets of poor neighborhoods—replicates the impact of this Medicaid thought experiment.

Without empirical evidence, though, we cannot know how much tying payment for services for the poor to location choice disrupts residential sorting. This Article provides that empirical evidence. For example, it could be that few people would move to poor cities even if the cost of educating the poor there were completely paid for by the state, thus suggesting that the "poverty fine" generates little inefficiency. The results measure how large an inefficiency stems from tying payment for the fixed costs of poverty to location choice. State aid for schools is exactly the natural experiment needed to measure the degree to which unbundling these payments from location choice affects where people live.[209] As is conventional in the economics of public finance, a large behavioral response indicates a large inefficiency. If few people respond to the bundling of costs to location, then this deviation from the Tiebout model is unimportant; little welfare is lost. In the extreme case, if no one moves as a result of school finance redistribution, then there can have been no inefficiency (of the type I describe here), since, even when the "poverty fine" is removed, no one chooses to change locations; so there can have been no harm. In contrast, if the behavioral response is large, then many people are harmed by the policy, generating a large inefficiency.

The meaning of a large versus a small behavioral response can be demonstrated using the framework suggested by Figure 2 in Section II. Suppose that the state transfers funds to a poor city in a way that fully compensates for the presence of the poor.[210] As a result of the transfers, the housing demand curve shifts up: For each quantity of housing, potential residents are willing to pay more (or, equivalently, at any price, more potential residents demand housing). The question then is by how much the quantity of housing—or assuming full occupancy, the population—changes. Figure 7 shows graphically how the

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10 REGIONAL SCI. & URB. ECON. 453, 453 (1980) (arguing that, if there are no congestion costs and non-distortionary local taxes, there is no distortion).

[209] The evidence in the Article—on how population changes with a place's median household income—can be seen as a proxy for the ideal measure, which would measure the change with average per capita property tax base. But the two are strongly correlated, so median household income is a good proxy.

[210] The analysis is simplified in several ways. For example, the elasticity of housing supply also plays a role in determining the size of the deadweight loss: The more elastic the supply is, the greater the scope for a behavioral response, and therefore the greater the size of the deadweight loss.

size of the deadweight loss, the traditional measure in economics of inefficiency, varies with the behavioral response.[211] The area measured from zero quantity to the equilibrium quantity between the supply and demand curves represents the amount of social surplus and the deadweight loss represents the amount of inefficiency due to financing at the local level.[212] If with state transfers the quantity increases only from Q^0 to Q^a, because the demand curve is the inelastic *Demand^a*, there is only a relatively small "deadweight loss," amounting to the area with horizontal lines. With little quantity response, there is little efficiency loss, since few people care about moving back to the city. However, if the quantity increases to Q^b, because the demand curve is the elastic *Demand^b*, there is a substantially larger deadweight loss (the whole area with vertical lines), suggesting that there was a lot of pent-up demand to move back to cities and that state financing of education for the poor relieves it. The parameter that matters is by how much population changes for a given amount of transfers from the state, which is exactly the parameter I measure. Since I find a large population response because of the transfers, the results suggest that the inefficiency resulting from tying payment for the fixed costs of poverty to location are large.

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[211] This deadweight loss is also known as a "Harberger triangle." Arnold C. Harberger, *The Measurement of Waste*, 54 AM. ECON. REV. 58, 58 (1964) (deriving the triangle method of analyzing deadweight loss); Arnold C. Harberger, *Taxation, Resource Allocation, and Welfare*, *in* THE ROLE OF DIRECT AND INDIRECT TAXES IN THE FEDERAL REVENUE SYSTEM 25 (John F. Due ed., 1964) (applying the triangle method to estimate deadweight losses due to income taxes in the United States). *See also* James R. Hines Jr., *Three Sides of Harberger Triangles*, 13 J. ECON. PERSP. 167 (1999) (providing additional and more contemporary explanations of Harberger triangles).

[212] Note that this is a somewhat unconventional diagram in that the policy change moves *toward* the more efficient outcome.

FIGURE 7. EFFICIENCY EFFECTS OF INCREASED STATE SCHOOL AID
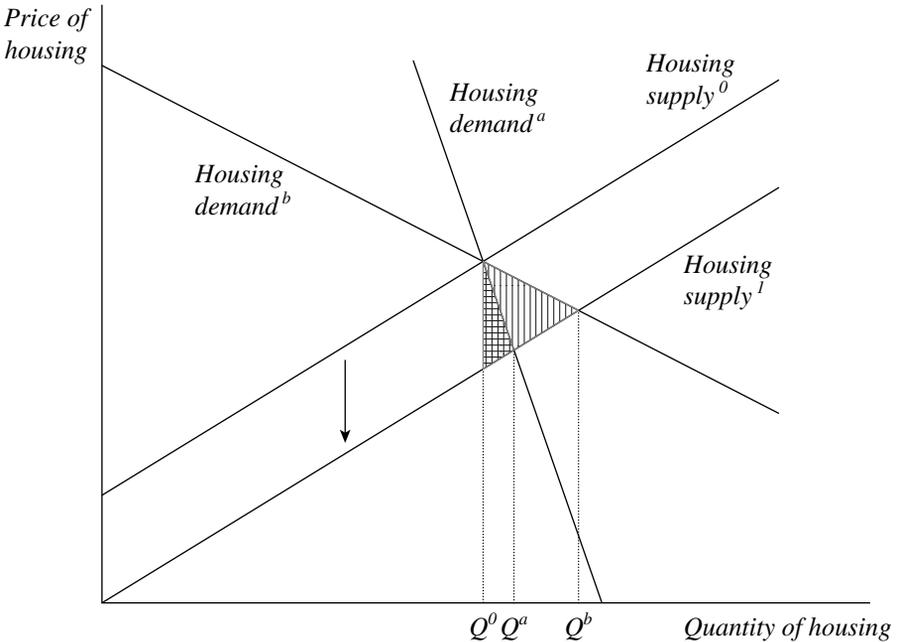
2. *Reducing the Negative Externalities of Sprawl*

Second, the problems arising from fiscal distortions of location choice are compounded by the foregone potentially large positive—and uncorrected[213]—externalities associated with living in cities. The current tax regime promotes land use decisions that are contrary to current policy objectives to promote central cities' positive externalities. In particular, with the goal of reducing greenhouse gas (GHG) emissions and improving residents' quality of life, states around the country have sought to encourage development near jobs and transit hubs, precisely where taxes tend to be the highest and local services the worst.[214] Living in central cities reduces a person's GHG emis-

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[213] The presence of externalities alone does not justify policy interventions. The externalities need to be uncorrected as well; that is, the government cannot already have policies in place promoting the activities leading to the positive externalities or discouraging policies leading to negative externalities. Indeed, targeted policies to address externalities are generally viewed as superior to untargeted ones. However, in the absence of targeted policies like a cap-and-trade scheme for greenhouse gas emissions or a subsidy to promote agglomeration—unlikely prospects at best—then untargeted policies are still efficiency-enhancing. Of course, in states like California and those in the northeast party to the Regional Greenhouse Gas Initiative that have imposed a price on carbon, further subsidizing city living to reduce GHG emissions is less desirable.

[214] *See, e.g.*, Mark Zaretsky, *Malloy Announces New Panel to Address Transit Development in Connecticut*, NEW HAVEN REGISTER (Dec. 10, 2012), http://www.nh register.com/articles/2012/12/10/news/doc50c65cb67291d290294827.txt?viewmode=fullstory

sions first by reducing vehicle miles travelled in cars because of the availability of transit and proximity to jobs.[215] According to the Urban Mobility Report, in 2011, congestion led Americans to travel 5.5 billion hours more and purchase an extra 2.9 billion gallons of fuel; together, these generated a cost of $121 billion.[216] These costs are not all attributable to sprawl, but with 26% of jobs and only 21% of the population located within three miles of central business districts, sprawl is a significant contributor.[217] Cities also reduce residents' GHG emissions because the higher-density multifamily development likely to occur in cities also uses less energy per square foot than single-family dwellings do, in part because city units are surrounded by other units rather than the outside.[218] Estimates from Edward Glaeser and Matthew Kahn suggest that, between greater home energy consumption and transportation behavior, suburbanites generate about $7 billion annually in externalities from their extra emissions of carbon alone.[219]

In addition to the environmental concerns, many scholars argue that cities induce agglomeration economies resulting from spillovers in ideas and greater labor market depth.[220] Finally, other social benefits may be promoted by the middle class's return to the city.[221] For example, with politically powerful middle-class individuals returning

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(describing Connecticut Governor Dannel Malloy's attempt to increase transit-oriented development).

[215] Reductions in vehicle miles travelled also reduces congestion and the need to build more highways, which is important as the funds available for highway construction decline. *See Funding Challenges in Highway and Transit*, THE PEW CHARITABLE TRUSTS (Feb. 24, 2015), http://www.pewtrusts.org/en/research-and-analysis/analysis/2015/02/24/funding-challenges-in-highway-and-transit-a-federal-state-local-analysis (explaining that as temporary federal funding increases expire, state and local governments will struggle to overcome shortfalls in their transportation infrastructure budgets).

[216] David Schrank, Bill Eisele & Tim Lomax, *TTI's 2012 Urban Mobility Report*, TEX. A&M TRANSP. INST. 1 (2012) (reporting these statistics).

[217] Glaeser & Kahn, *Decentralized Employment*, *supra* note 13, at 6 (producing these statistics).

[218] *See, e.g.*, Edward L. Glaeser & Matthew E. Kahn, *The Greenness of Cities: Carbon Dioxide Emissions and Urban Development*, 67 J. URB. ECON. 404, 414 (2010) (arguing that residents in cites emit fewer greenhouse gases per capita).

[219] *Id*. at 415. This calculation comes from multiplying (1) the approximate extra per-household social cost of carbon emitted for living in suburbs versus central cities and (2) the number of suburban households.

[220] *See* Schleicher, *supra* note 26. For a review of the empirical evidence for agglomeration economies, see Enrico Moretti, *Local Labor Markets*, *in* 4 HANDBOOK OF LABOR ECONOMICS 1237, 1282–86 (Orley Ashenfelter & David Card eds., 2011). In addition to these positive agglomeration externalities, there can be negative congestion externalities from more people living in densely-populated areas.

[221] There is at least anecdotal evidence that the middle class is returning to cities. *See* EHRENHALT, *supra* note 146, at 9.

to cities,[222] political accountability and service quality may improve, attracting yet more middle-class individuals in a virtuous cycle, while reducing segregation and improving the quality of life for existing residents of cities.[223] And, as argued by William Julius Wilson, middle-class individuals attracted to cities may be particularly valuable as role models to youths.[224] Of course, gentrification can cause its own harms if it displaces existing residents—a concern discussed along with others in the following subsection.

Before moving on, though, it is important to emphasize how both efficiency virtues of state aid for poor areas do not depend upon the money going to or not going to its intended purpose, like schools. Either better schools or tax cuts can make a place more desirable to live and level the playing field between poor and rich places in ways that promote efficiency. Many have critiqued school finance for not improving schools—which is, of course, important. And some suggest that any funds not going to schools represent wasted funds. However, these results show that, whether going to schools or not, state aid targeted at poor cities promotes these two efficiency virtues.

3. Limitations

My results suggest the importance of considering efficiency reasons for centralized financing of local services for the poor, alongside other costs and benefits of such financing. In the trade-off between the benefits of decentralization as described by Tiebout and the costs in equity and efficiency in residential location choice, this Article provides the first empirical evidence on the large magnitude of the distortion resulting from financing the costs of poverty at the local level. Tiebout's reasoning may remain compelling, but this Article's results offer new reasons for policymakers to discount them and to fund local services for the poor more centrally. These results show that increasing transfers to poor cites increases their spending on services and reduces taxes on their residents, making the cities comparably more attractive and thereby leading to increases in their populations. Yet, despite these transfers, poor places in Connecticut at least still tend to have the highest property tax rates, discouraging people from

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[222] Recent evidence suggests that those returning to cities are disproportionately high-income, well-educated individuals. *See* Victor Couture & Jessie Handbury, *Urban Revival in America* 1 (University of California, Berkeley, Working Paper 2016); Nathaniel Baum-Snow & Daniel Hartley, *Accounting for Central Neighborhood Change, 1980-2010* 1 (Federal Reserve Bank of Chicago Working Paper No. 2016-09, 2016).

[223] *See* Briffault, *supra* note 4, at 805–06 (making this argument).

[224] Wilson, *supra* note 49, at 56.

living in those poor places.[225] See Figure 8, which plots 2012 annual property tax rates[226] (as a percent of property value) and median household incomes in Connecticut's towns. Richer places do not always have lower taxes, but a general inverse relationship between tax rates and income obtains. For example, Connecticut's large poor cities of Hartford, Waterbury, New Haven, and Bridgeport have the state's highest tax rates, despite the high state transfers. And, despite these high taxes and high state transfers, poor cities in Connecticut also have the worst schools and the highest crime.[227] This evidence is only suggestive evidence of the continuing distorting effect of the "poverty" fine in Connecticut, since poor cities could also have higher taxes because of different policy choices or inefficient spending, but it is striking nonetheless.
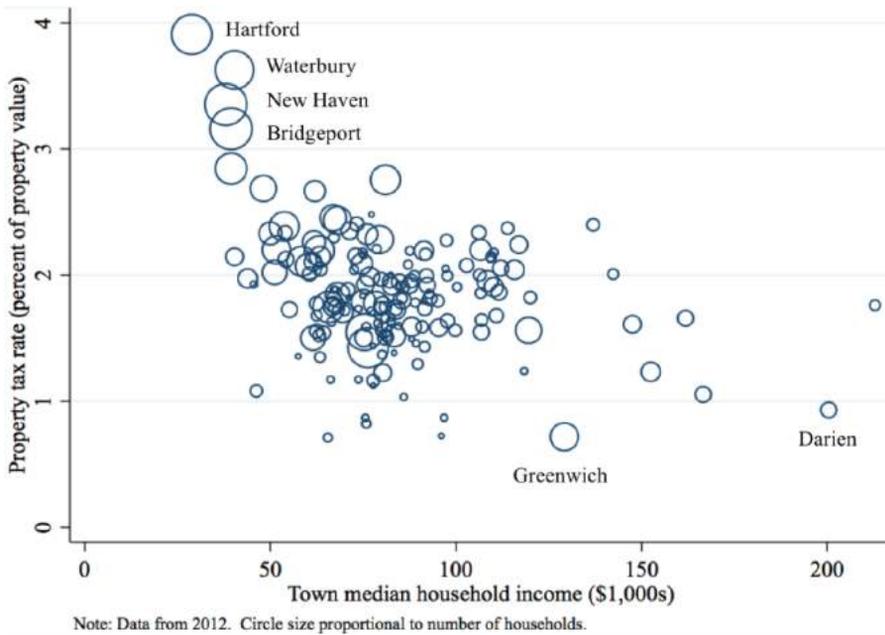
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[225] The extent to which poor places have high tax rates nationally remains an open question. There is no comprehensive national dataset on the variation in service quality and taxes across U.S. cities and, to my knowledge, no one has even conducted such an analysis for even a single state, making the following analysis for Connecticut all the more valuable.

   Places with high poverty may not have high tax rates because of the presence of commercial property in cities. For example, Manhattan has many valuable offices to tax, and that helps to offset New York City's high poverty rate. Indeed, such an argument was cited in *Rodriguez* as a reason that local school finance does not discriminate against the poor; the Court cited statistical analysis of Connecticut towns in a *Yale Law Journal* Note as support. San Antonio Indep. Sch. Dist. v. Rodriguez, 411 U.S. 1, 22–23, n.53 (1973) (citing Note, *A Statistical Analysis of the School Finance Decisions: On Winning Battles and Losing Wars*, 81 YALE L.J. 1303, 1328–29 (1972)). So an analysis of contemporary Connecticut data is all the more instructive. In Connecticut, my own analysis shows that 81% of real property is residential—so that the scope for making up for a weak residential tax base with commercial property is limited. In any case, though, the correlation between median household income and equalized per household commercial, industrial, and public property is actually *positive* (with a correlation coefficient of 0.22); that is, richer towns actually have *more* non-residential property tax per household. See Appendix Figure 1 for a scatterplot of this relationship. Note that the three towns highest on the y-axis are Greenwich, Darien, and Stamford. The data source is *Equalized Net Grand List by Town*, CONN. OFF. OF POL'Y & MGMT, http://www.ct.gov/opm/cwp/view.asp?A=2987&Q=385970 (last visited Feb. 6, 2017).

[226] The Connecticut Office of Policy and Management produces "equalized" mill rates which value property according to a state formula by making aggregate property values comparable across towns. Without these equalized property values, towns could under-value properties overall to receive more school finance funds or under-value certain properties to reduce the property tax burden to their owners. With the property values equalized, the Office can calculate the equalized mill rate by dividing the amount paid in taxes by the equalized property values. *Mill Rates*, CONN. OFF. OF POL'Y & MGMT, http://www.ct.gov/opm/cwp/view.asp?Q=385976 (last visited Jan. 28, 2017).

[227] The poorest towns tend to have the lowest-rated schools and highest crime rates. Andrew Brady & Patricia Grandjean, *Rating the Towns 2011*, CONN. MAG. (Nov. 1, 2011), http://www.connecticutmag.com/Connecticut-Magazine/November-2011/Rating-the-Towns/ (last visited Jan. 9, 2017).

FIGURE 8. PROPERTY TAX RATE BY TOWN MEDIAN HOUSEHOLD INCOME

Note: Data from 2012. Circle size proportional to number of households.

My empirical results and the continued disparity in tax rates sug-gest that, when a developer is considering building a home, it is signifi-cantly less likely to choose to build in a poor city because new residents must shoulder part of the fiscal burden of living in the same municipality as poor families.[228] The fact that state school aid has such a large effect on population growth suggests that some of the unattrac-tiveness of poor cities for new residents may be an artifact of local financing structures, a factor not considered in the Tiebout model.[229] My results show the importance of local financing structures in reducing development in central cities and increasing sprawl.

I limit my claim in three ways. First, places differ from one another in many ways. In some places, schools, housing, and other goods and services cost more to produce than in others. Local govern-ments may make different policy choices, redistributing more or less or spending different amounts of money on services. Some local gov-ernments may be less efficient at spending money. What distinguishes

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[228] More precisely, these incentives affect potential homeowners, either directly or through builders anticipating the preferences of potential buyers of their homes.

[229] Following the basic maxim of economics that larger distortions result when more elastic behavior is "taxed," the distortion from the "poverty fine" must be large since location choice is quite elastic.

all of these differences from the concern of this Article is that none represents a fixed societal commitment, which will be borne regardless of where people live. If more people live in places where it is expensive to produce goods and services, the total societal cost of providing goods and services will increase, so that it is important that residents bear these increased costs. Redistributing more than the fixed societal commitment is a choice that local governments make that can increase social welfare; I do not speak to that choice. I am concerned only with the *fixed* societal obligation to pay for the education (and arguably other services) of the poor. Tying that fee to where individuals choose to live distorts their decisions without any offsetting benefits, since the costs still need to be borne by someone.

Second, I do not claim that all school finance redistribution is good or even that school finance redistribution is good on net. School finance redistribution can take many forms. I offer an efficiency reason for state-level or federal-level payments for the education of the poor, not—for example—for capping education spending as has happened in California.[230] And there are reasons to be skeptical of school finance redistribution—for example, some may fear loss of control of local schools. In the overall assessment of costs and benefits of school finance redistribution, I offer additional evidence on the benefits side. It can improve efficiency by unbundling paying for the fixed costs of poverty from residential location choice and reducing the costs of sprawl, and my empirical results show significant scope for this efficiency gain.

Finally, let me be clear about my results' implications for distributional concerns. I have been discussing the implications of the results for efficiency. Although I do not make claims about their implications for overall *welfare*, it is nevertheless instructive to consider distributional concerns, including the potential goal of promoting equity—by which I mean distributing more resources to the poor.[231] I have two relevant results: (1) The mobility response to school finance redistribution is large, and (2) much of the money intended for schools may go to tax reductions. There are also two relevant questions: First, does school finance redistribution appear more or less equitable in light of the results, relative to what one would expect if there is little mobility response and little of the money goes to tax cuts? Second, in light of

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[230] JOHN CHAFFEE, CAL. STATE DEP'T OF EDUC., CALIFORNIA SCHOOLS BEYOND SERRANO: A REPORT ON ASSEMBLY BILL 65 OF 1977 2, 16–17 (1979), https://eric.ed.gov/?id=ed169669.

[231] Of course, "equity" is a far more capacious concept than distributing more resources to the poor. However, since that is the most relevant concern with school finance redistribution, I will limit my analysis to this subset of concerns about equity.

the results, does school finance redistribution still appear to redistribute resources to poor children as intended?

The overall implications of the results for the first question, on how the results affect how equitable school finance redistribution appears, are unclear. First, consider whether mobility back into cities promotes equity. On the one hand, there are reasons to think that this mobility promotes equity. If the people who return to cities have higher incomes than current residents, then their presence may increase the tax base.[232] As well, higher-income students may provide better peers in schools.[233] On the other hand, if new, wealthier residents displace poorer residents through gentrification, those existing residents may be worse off, with longer commutes from the suburbs.[234] However, the extent of the displacement is limited as we observe large increases in overall population, the main finding of the Article.

The implications of using school funds for tax cuts are also unclear, but likely tilt against equity. In absolute dollar savings, property tax cuts disproportionately benefit the well-off, who own more property and pay more in taxes.[235] Poor city residents are quite likely to send their children to public schools though, so they benefit greatly from school spending. The immediate effects of a property tax cut may make the poor worse off in the short run due to the diversion of funds for schools to tax cuts. However, the downstream effects of tax cuts could be more complicated: If they help bring back to cities good peers, more responsive government, and safer streets, then it is possible that much of the downside to the diversion of school funds could be countervailed.

Turning to the second question, even if the results suggest that state school aid is less equitable than it previously appeared, the aid still likely promotes substantial redistribution to poor children as

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[232] Their presence may also lower the per-student subsidy from the state, but by a smaller amount than tax revenue increases.

[233] *See* Bruce Sacerdote, *Peer Effects in Education: How Might They Work, How Big Are They and How Much Do We Know Thus Far?* 3 HANDBOOK ECON. EDUC. 249, 251 (2011) (providing an overview of the literature and citing multiple articles that estimate large peer effects).

[234] Another potential downside to mobility into cities is the need to share the existing commercial and industrial tax base with more residents. Of course, it is an empirical question how the commercial and industrial tax base changes with more residents. What is known is that, at least in Connecticut, the commercial and industrial share of the overall tax base is relatively small, at only 17%, so the importance of this factor is limited by the much greater importance of the residential tax base.

[235] Note that it matters which types of taxes places reduce in response to school finance transfers. For example, reducing property taxes could have different distributional impacts than reducing sales taxes.

intended. Even with some of the funds going to tax reductions, a substantial portion still goes to funding education. And, though there is a large econometric debate on the question, the most recent evidence shows that the funding has improved educational outcomes for poor students.[236] In any case, those local property tax cuts are heavily progressive as a percent of income, since they target low-income areas and poorer people spend a higher fraction of their income on housing than rich people—and, as I show in other work, low-income households do not pay much higher state taxes as a result of the increased state school financing.[237] Furthermore, as long as the mobility response does not lead to such a large displacement of the poor that it overwhelms the combination of benefits of the education spending and improvements in the quality of life of cities, the net effect on cities' poor is likely positive. And, as noted above, since the main result of the Article shows a large population increase, the scope for displacement is limited. Overall then, the results suggest reasons that school finance redistribution promotes efficiency, while still redistributing to the poor.

B.   *Policies Targeted at Places*

This work also informs the debate about the value of place-based policies, which "target transfers toward particular geographic areas rather than groups of individuals."[238] First, this research emphasizes what school finance redistribution actually is—one of the largest, if not the largest, programs of place-based subsidies in the country.[239]

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[236] *See* Card & Payne, *supra* note 12, at 50–51 (showing improved educational outcomes from increased spending); Jackson et al., *supra* note 19, at 160–61 (same); Lafortune et al., *supra* note 19, at 5 (same). However, some older research fails to find effects. *See, e.g.*, Betts, *supra* note 19, at 232 (finding limited impacts); Jeff Grogger, *Does School Quality Explain the Recent Black/White Wage Trend?*, 14 J. Lab. Econ. 231, 233 (1996) (same); Hanushek, *supra* note 19, at 1148 (same).

[237] Zachary Liscow, *Are Court Orders Sticky? Evidence from School Finance Litigation*, J. Empirical Legal Stud. (forthcoming, December 2017) (showing these results empirically).

[238] Matias Busso, Jesse Gregory & Patrick Kline, *Assessing the Incidence and Efficiency of a Prominent Place Based Policy*, 103 Am. Econ. Rev. 897, 897 (2013). *See also* Timothy J. Bartik, Who Benefits from State and Local Economic Development Policies? (1991) (providing a comprehensive taxonomy of place-based policies).

[239] The Government Accountability Office estimates that the federal government spends about $15 billion annually on economic development grants to communities with high rates of poverty and unemployment. U.S. Gov't Accountability Off., GAO-12-938R, The Distribution of Federal Economic Development Grants to Communities with High Rates of Poverty and Unemployment 2 (2012). A recent *New York Times* article estimated that state and local governments spend $80 billion annually for similar purposes. Louise Story, *As Companies Seek Tax Deals, Governments Pay High Price*, N.Y. Times, Dec. 1, 2012, at A1. State governments spent a much larger $200 billion on schools in 2000. *Annual Survey of Governments*, *supra* note 108.

Consider whether school finance redistribution is better considered as benefitting a "geographic area" (poor cities) or a "group of individuals" (poor students). In particular, consider a poor individual deciding between living in a rich place and a poor place in a state that has just increased state aid for poor school districts. As a result of the school finance redistribution, the poor city will likely now have better schools and lower taxes than it had before, so it is more attractive for the poor person than it was before. However, the same is true for a rich person. The poor place will, of course, have a disproportionately large number of poor people, so poor people will disproportionately benefit from the policy—but this is precisely what place-based policies do. A "person-based" policy could provide a voucher to a poor person to attend a private school or just provide a transfer to the individual; the benefits from these policies would be largely captured by the person, not the place. To my knowledge, school finance redistribution has not previously been framed as a place-based policy.

The lens of place-based policy-making is important for assessing the value of school finance redistribution and vice versa: The experience with school finance redistribution is helpful for assessing the value of other place-based policies. The "standard" economics view is skeptical of such policies, which are seen as subsidizing precisely the places that are least productive.[240] Indeed, taking the traditional skeptical view, place-based policies merely move people from one place to another without increasing welfare.

However, recent research has called this traditional skepticism into question.[241] In particular, the traditional economic models depend on an idea of "spatial equilibrium," which implies that each individual is indifferent between where he lives and every other

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[240] *See* Louis Winnick, *Place Prosperity vs. People Prosperity: Welfare Considerations in the Geographic Redistribution of Economic Activity*, *in* Essays in Urban Land Economics 273 (1966) (arguing that place-based policies merely redistribute the location of employment and housing, rather than increasing welfare in aggregate). *See also* Edward L. Glaeser & Joshua D. Gottlieb, *The Economics of Place-Making Policies*, Brookings Papers on Econ. Activity, Spring 2008, at 155, 227 ("[P]olicies that aid poor places are not necessarily redistributive and will have indirect consequences, for example pushing up housing costs and inducing poor people to move to poor areas.").

[241] Busso, Gregory & Kline, *supra* note 238, at 898 ("If most agents are inframarginal in their commuting and residential decisions, deadweight loss will be small and local workers will reap the benefits of place based interventions. If, on the other hand, agents have nearly identical preferences . . . deadweight loss will be substantial and government expenditures will be capitalized into land rents."). See also the earlier critique of Jerome Rothenberg et al., *supra* note 67, at 69, which emphasizes the importance of inertia and housing submarkets. Gyourko, *supra* note 8, at 226, also advocates for place-based policies.

place.[242] These models do not take into account that individuals differ from each other. In particular, because of idiosyncratic preferences for local amenities, moving costs, social networks, location-specific skills, and a variety of other factors, individuals are not indifferent between living in one place and living in all others. That everyone is not indifferent between their current location and every other location has important implications for place-based policies: Individuals can benefit from such policies, which may be a desirable way to target needy individuals. But this Article qualifies this strand of recent theory: Since there actually *has* been a large movement in population in response to school finance redistribution, many of the individuals benefitting from the redistribution may not be the intended beneficiaries.

Recent economics research has also emphasized a second reason to be more sympathetic to place-based policies. It argues that even if much of what place-based policies accomplish is moving people from one place to another, that could be advantageous, if certain agglomeration economies are at work.[243] For example, if place-based policies move people to cities, and those additional people make current residents more productive without having a fully offsetting effect on the places from which they are moving, then place-based policies can improve overall welfare just by moving people from one place to another. Hence, if agglomeration externalities are significant in cities, then the place-based policies that bring more people to cities should seem more valuable because the results of this Article show that more people move to cities in response to those policies.

This Article suggests two new reasons to embrace place-based policies that benefit cities—or at least place-based policies focused on paying for the costs to the local public fisc of poverty. First, the class of positive externalities extends beyond agglomeration economies to environmental and social externalities. Second, place-based policies benefitting cities counteract other implicit place-based policies resulting from the structure of local finances that discourage city living. Again, even if place-based policies only induce people to move,

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[242] The classic statements of spatial equilibrium are Jennifer Roback, *Wages, Rents, and the Quality of Life*, 90 J. POL. ECON. 1257 (1982), and Sherwin Rosen, *Hedonic Prices and Implicit Markets: Product Differentiation in Pure Competition*, 82 J. POL. ECON. 34 (1974).

[243] Patrick Kline, *Place Based Policies, Heterogeneity, and Agglomeration*, 100 AM. ECON. REV. 383, 383 (2010) ("My conclusions are shown to depend critically upon the degree of preference heterogeneity in the population and the structure of any agglomeration economies."). *See also* Patrick Kline & Enrico Moretti, *Local Economic Development, Agglomeration Economies, and the Big Push: 100 Years of Evidence from the Tennessee Valley Authority*, 129 Q.J. ECON. 275, 278–80 (2014) (measuring the agglomeration economies resulting from the Tennessee Valley Authority and showing that, while there were agglomeration economies, they were offset by losses elsewhere).

that can be a good thing. The traditional critique of place-based poli-
cies—that they change people's locations without improving wel-
fare—no longer holds when the existing fiscal structure's "poverty
fine" discourages people from living in cities.[244] In fact, the traditional
critique of place-based policies is flipped on its head: Instead of place-
based policies being ineffective because they merely redistribute pop-
ulation, place-based policies are effective precisely to the extent that
they *do* redistribute population to where it is most efficient for them
to live. The critics of place-based policies would find money spent on
places with declining populations like Detroit wasteful. But this anal-
ysis suggests that place-based policies may have an important role in
thwarting an inefficient feedback loop in which the departure of
middle-class households, partly because of economic shocks like the
decline of manufacturing, prompts yet more people to leave—not
because it is an inherently undesirable place to live, but rather
because of the local nature of financing services. That is, more state
aid could help people live where they would otherwise prefer to live.

The foregoing analysis has reviewed the value of place-based pol-
icies relative to dim earlier beliefs about their value—a relevant dis-
cussion when there may be real-world constraints on the use of
vouchers. I have not discussed their value relative to that of person-
based policies. For the value of place-based versus person-based poli-
cies, the two efficiency reasons differ in their implications. To promote
efficiency by increasing agglomeration externalities and reducing
greenhouse gas emissions from sprawl, place-based policies may be
superior to person-based policies, since the latter would not target city
living as effectively. In contrast, both types of policies promote effi-
cient location choices. Place-based policies, like aid to cities to pay for
educating the poor, and person-based policies, like vouchers to pay
for educating the poor, reduce the "poverty fine" that links location
choice to paying for services for the poor.[245] Overall, though, the
important implication is that, in contrast to earlier beliefs that place-
based policies are a waste of money, the results here suggest reasons
that they have substantial value.

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[244] This is a version of the "theory of second best," stating that once there is already a
distortion, a second "distortion" can actually be welfare-improving. *See* R. G. Lipsey & R.
K. Lancaster, *The General Theory of Second Best*, 24 Rᴇᴠ. Eᴄᴏɴ. Sᴛᴜᴅ. 11, 11–12 (1956)
("[I]n a situation in which there exist many constraints which prevent the fulfillment of the
Parteian [sic] optimum conditions, the removal of any one constraint may affect welfare or
efficiency either by raising it, by lowering it, or by leaving it unchanged.").

[245] Person-based policies may have other benefits like permitting the poor to move with
the subsidy. Vouchers may also help ensure that the poor capture a larger fraction of the
benefits.

C. School Finance Litigation

The result that more centralized financing of local services like schools promotes efficient location—and therefore school—choices suggests an important new argument in school finance litigation. That case begins with the understanding that state constitutional rights are quite different from U.S. constitutional rights in that state constitutions confer socioeconomic rights that the U.S. Constitution does not.[246] Most relevant to this Article, all states confer a right to education.[247] In conferring this right, fourteen state constitutions require that the systems of education are "efficient."[248]

My results could appeal to these constitutional requirements, by emphasizing the efficiency costs resulting (1) from discouraging people from living where they would prefer because of the "poverty fine" and (2) from the externalities associated with encouraging suburban living. Indeed, what might be described as the problem of the poverty fine has already been discussed by the Texas Supreme Court as a contextual factor. In striking down Texas's school finance system as inequitable, the court noted,

> Property-poor districts are trapped in a cycle of poverty from which there is no opportunity to free themselves. Because of their inadequate tax base, they must tax at significantly higher rates . . . yet their educational programs are typically inferior. The location of new . . . development is strongly influenced by tax rates and the quality of local schools. Thus, the property-poor districts with their high tax rates and inferior schools are unable to attract new . . . development and so have little opportunity to improve their tax base.[249]

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[246] Helen Hershkoff, *"Just Words": Common Law and the Enforcement of State Constitutional Social and Economic Rights*, 62 STAN. L. REV. 1521, 1523–24 (2010) (explaining how state constitutions confer socioeconomic rights). Note, however, that *Rodriguez* says in dicta that the Constitution might guarantee "some identifiable quantum of education" to allow the expression of fundamental rights like free expression. San Antonio Indep. Sch. Dist. v. Rodriguez, 411 U.S. 1, 36 (1972).

[247] Molly McUsic, *The Use of Education Clauses in School Finance Reform Litigation*, 28 HARV. J. ON LEGIS. 307, 311 (1991) (showing that all states confer such a right).

[248] ARK. CONST. art. XIV, § 1; DEL. CONST. art. X, § 1; FLA. CONST. art. IX, § 1; ILL. CONST. art. X, § 1; KY. CONST., § 183; MD. CONST. art. VIII, § 1; MINN. CONST. art. XIII, § 1; N.J. CONST. art. IV, § 1; OHIO CONST. art. VI, § 2; PA. CONST. art. III, § 14; S.D. CONST. art. VIII, § 15; TEX. CONST. art. VII, § 1; W. VA. CONST. art. XII, § 1; WYO. CONST. art. VII, § 9. For the text of some of the constitutional provisions, see MOLLY A. HUNTER, EDUC. L. CTR., STATE CONSTITUTION EDUCATION CLAUSE LANGUAGE (on file with the Law Review).

[249] Edgewood Indep. Sch. Dist. v. Kirby, 777 S.W.2d 391, 393 (Tex. 1989). The quote is actually discussing the location of *business* development, but the location of high-income individuals has the same effect on the tax base. Indeed, the results here could strengthen the argument from business to both business and residential development.

By showing empirically the importance of decoupling poverty from incentives for new development, I strengthen the Texas Supreme Court's account of what generates the need for school finance redistribution: A cycle of poverty results from a low tax base, high tax rates, and low-quality services, discouraging development.

In at least the states requiring "efficient" systems of education and arguably others as well, those challenging school finance systems can argue that unequal school finance systems provide a large impediment to the efficient spatial allocation of residents. No state constitutional court that I am aware of has explicitly included such considerations in its definition of "efficient," but some courts have articulated capacious conceptions of efficiency that could accommodate efficiency in residential location arising from school funding. For example, as noted by the Texas Supreme Court,

> There is no reason to think that "efficient" meant anything different in 1875 from what it now means. "Efficient" conveys the meaning of effective or productive of results and connotes the use of resources so as to produce results with little waste; this meaning does not appear to have changed over time.[250]

My results essentially show that the current system of school finance generates quite a bit of waste. It distorts where people live, thereby creating waste not only because people do not live where it would privately be most efficient to live but also because they tend to live in high negative-externality locations.[251] It may be unlikely that the constitutional framers considered efficiency in location. However, as the Texas Supreme Court itself noted, the system of local financing worked when enacted in the late nineteenth century, but wealth dis-

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[250] *Id*. at 395.

[251] The Texas Supreme Court based its opinion invalidating the school finance system, in part, on the "efficiency" language. In interpreting the efficiency language, however, the Supreme Court interpreted "efficiency" as meaning something arguably more akin to equality, writing

> We conclude that, in mandating "efficiency," the constitutional framers and ratifiers did not intend a system with such vast disparities as now exist. Instead, they stated clearly that the purpose of an efficient system was to provide for a "general diffusion of knowledge." (Emphasis added.) The present system, by contrast, provides not for a diffusion that is general, but for one that is limited and unbalanced. The resultant inequalities are thus directly contrary to the constitutional vision of efficiency.

Id. at 396. Thus, the focus has been on the adequacy of the education provided in poor school districts, rather than on the inefficiency arising from the location choices of residents, which the results here address. *See also* Rose v. Council for Better Educ. Inc., 790 S.W.2d 186, 189, 212–13 (Ky. 1989) (using "efficiency" language in a state constitution to strike down a school finance system, but using the language to require an adequate education for children, rather than emphasizing the inefficiencies described here).

parities between locations grew over time.[252] So the distortion I document provides new ammunition for addressing these disparities as a matter of economic efficiency.[253]

This account notwithstanding, there are reasons to believe that courts would be skeptical of an interpretation of "efficient" that includes how funds are raised, not just how they are spent, given the unlikeliness that the drafters of state constitutions had it in mind. Since many of these constitutional provisions were adopted in the late nineteenth century, "efficient" may be taken to mean "effectiveness" in spending rather than efficient means of raising funds.

Nevertheless, the Kentucky Supreme Court's jurisprudence could provide a useful precedent for considering efficiency in how funds are raised. Kentucky's constitutional provision is quite short, consisting only of: "The General Assembly shall, by appropriate legislation, provide for an efficient system of common schools throughout the State."[254] Based merely upon this requirement of efficiency, the Kentucky Supreme Court in *Rose v. Council for Better Education*,[255] required as an aspect of efficiency "a uniform [property] tax rate" to pay for schools.[256] The Kentucky Supreme Court thus extends efficiency beyond "effective" spending of money, and beyond even uniformity in the spending of money, to uniformity in the *raising* of money. This is a precedent for efficiency considerations in the raising of money to fund schools, for which this Article argues and provides evidence. Its conclusion of considering efficiency in the raising of funds is bolstered by my results, making it more attractive elsewhere.[257]

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[252] Edgewood Indep. Sch. Dist. v. Kirby, 777 S.W.2d at 396.

[253] Similarly, such an argument could appeal to the goal stated in Kentucky's 1890 constitutional convention "to seize every opportunity to make [public schools] more efficient." *Rose*, 790 S.W.2d at 194 (quoting from 3 PROCEEDINGS & DEBATES IN THE CONSTITUTIONAL CONVENTION: CONSTITUTION OF THE STATE OF KENTUCKY 4463 (1890)).

[254] KY. CONST., § 183.

[255] 790 S.W.2d at 215.

[256] *Id*. at 216.

[257] Another potential argument in support of efficiency considerations in school finance litigation is that arguably the original intention of the state constitutional framers has played little role in the state supreme court opinions. At least some authors argue that, with the possible exception of a couple of recently enacted education clauses, there is little evidence from state constitutional debates that framers of state education clauses intended "to create judicially enforceable provisions to be used in overturning legislative judgments regarding school financing." John Dinan, *The Meaning of State Constitutional Education Clauses: Evidence from the Constitutional Convention Debates*, 70 ALB. L. REV. 927, 978 (2007). This lack of basis in original intent suggests that the original conception of "efficiency" may be of similarly little relevance.

D.   *Legislative Action on the Financing of Local Services*

An alternative to judicial action is legislative action. This Article documents how large an effect the uneven playing field of local finance has on residential location choices, generating significant inefficiencies. This distortion is problematic on its own and also because keeping people away from cities increases their negative externalities on others. The results then lend support to several policy proposals. Legislators who were previously unaware of these inefficiencies could take action in several ways. For example, consolidating metropolitan tax bases or even consolidating localities into metropolitan area governments would address the problem identified here.[258] Consolidating metropolitan areas into single governments, however, would likely do much more than equalize funding—it could change *how* money is spent for schools and other city services, how land is zoned, and the character of the whole range of local functions. These issues are beyond the scope of this Article. While the evidence here could make policymakers more favorable toward metropolitan consolidation, whether such a policy should be adopted would depend on many other factors not studied here.

Rather, this Article's most direct policy implication is that it strengthens on efficiency grounds the case for more centralized funding of the costs of providing services in poor localities.[259] The lesson applies broadly, to any kind of financing of local services. In the context of Connecticut education funding, for example, the results here may bolster the policy of education reformers who argue that the state should "fully fund" its Education Cost Sharing grants.[260] Year after year, the Connecticut legislature has failed to authorize the maximum statutory amount of grants to poor school districts.[261] Since

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[258] *See, e.g.*, ANTHONY DOWNS, NEW VISIONS FOR METROPOLITAN AMERICA 132 (1994) (arguing for metropolitan consolidation); MYRON ORFIELD, METROPOLITICS: A REGIONAL AGENDA FOR COMMUNITY AND STABILITY 11–13 (1997) (same).

[259] Many proposals exist for remedying inequalities in school financing. Laurie Reynolds develops a proposal for a statewide property tax. Laurie Reynolds, *Uniformity of Taxation and the Preservation of Local Control in School Finance Reform*, 40 U.C. DAVIS L. REV. 1835, 1871–86 (2007).

[260] CCM PUB. POL'Y REP. *supra* note 184, at 4; Orlando J. Rodriguez & Jacob Siegel, *Problems with Connecticut's Education Cost Sharing Grant*, CONN. VOICES FOR CHILDREN (Feb. 2011), http://www.ctvoices.org/sites/default/files/Bud11CTEduCostSharingGrant Problems.pdf.

[261] A separate issue barely addressed in this Article is "fiscal zoning"—that is, wealthier communities using zoning, especially by requiring large lot sizes, to keep out poorer individuals who can pay less in taxes. To the extent that state funds make up for the tax deficit resulting from a poor individual living in a locality, the incentive for fiscal zoning should be reduced. However, to the extent that the state provides *less* money to wealthier communities, as has been the case in Connecticut, the incentive for fiscal zoning increases,

Connecticut redistributes a relatively large amount, other states likely have even more scope to increase their grants to poor school districts. As well, the results could generate new supporters of school finance redistribution, including those wishing to reduce GHG emissions, promote productivity through agglomeration spillovers, or improve residents' quality of life. Finally, the result that a large fraction of the benefits may go to tax cuts could increase support for school finance redistribution among those who have neither children in school nor real estate that stands to appreciate through better schools.

My argument does not imply that local finances should be fully equalized across localities. The motivating insight of the Tiebout model remains compelling: Different people have different preferences, and it is inefficient to force different types of people to consume the same services. Some people desire higher taxes and more parks, while others desire lower taxes and fewer parks. Fully equalizing local funding would harm this element of free choice, while allowing localities to spend different amounts on the variety of services they provide preserves free choice. Rather, my results strengthen the case for state or federal funding for one element of the costs of local governments—the costs of services for the poor that will be borne regardless of who is paying. The results make a *level* local finance playing field more compelling, since households would be unburdened by the "poverty fine" when choosing whether to live in a city with high poverty rates.[262]

There are limits to the extent that states may engage in such equalization—well short of full equalization—without harming their competitive advantage relative to other states. For example, the more Connecticut raises its income tax on the rich to fund redistribution to low-income towns, the more the rich are likely to leave Connecticut.[263] The limitations on states' abilities to redistribute and the continuing locational distortions suggest that federal involvement

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since the communities must depend more on their own residents to fund services, making their ability to pay taxes matter more. *See, e.g.*, White, *supra* note 55, at 63.

[262] For example, the results provide additional support for "district power equalization," in which state governments guarantee that the same local tax rates generate the same revenue per capita, regardless of local wealth. Such an approach lets communities tailor their education spending to their own preferences, without disadvantaging poor communities. *See* Gail F. Levine, Note, *Meeting the Third Wave: Legislative Approaches to Recent Judicial School Finance Rulings*, 28 HARV. J. ON LEGIS. 507, 510 (1991) (describing such a system in Texas).

[263] Note, however, that there is little credible evidence of the geographic mobility of the rich in response to income taxes. One recent study, though, shows that the country of residency of European soccer players is quite responsive to tax rates, which is relevant if mobility between American states is similar to mobility between European countries. Henrik Jacobsen Kleven, Camille Landais & Emmanuel Saez, *Taxation and International*

may be useful. Indeed, the argument that redistribution is a national public good has been used throughout Supreme Court jurisprudence.[264]

My results thus raise the question of whether the federal government should contribute more to education in poor cities to improve efficiency in where people live.[265] In 2016, the federal government provided $14.9 billion[266] in aid to local education agencies for students at schools with large numbers of poor students,[267] as provided for in Title I of the Elementary and Secondary Education Act of 1965[268] and amended by the Every Student Succeeds Act of 2015.[269] An earlier amendment, the No Child Left Behind (NCLB) Act of 2001,[270] authorized increasing appropriations, up to $25 billion in 2007.[271] However, these funds have still not been authorized by Congress. To put even this number in context, if the federal government redistributed as much per capita as Connecticut did in 2012, it would provide $165 billion in school financing. My results strengthen the case for fully funding NCLB or even expanding funding, on grounds of efficiency.

With increases in federal and state funds to local school districts, legislators might achieve not only the greater equality long sought by education reformers, but also improvents in efficiency in where people live and their quality of life. Efficiency would improve because leveling the local finance playing field gives people the opportunity to live in their desired locations without facing a higher tax burden and worse services in jurisdictions with a large number of poor people. But

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Migration of Superstars: Evidence from the European Football Market, 103 Am. Econ. Rev. 1892, 1892 (2013).

[264] *See, e.g*., United States v. Darby, 312 U.S. 100, 115 (1941) (upholding under the Commerce Clause labor market regulations that sought to redistribute to the poor via better workplace conditions because "interstate commerce should not be made the instrument of competition in the distribution of goods produced under substandard labor conditions, which competition is injurious . . . to the states from and to which the commerce flows" through a race to the bottom in labor practices).

[265] This argument supports as a policy matter the legal argument of Goodwin Liu that the federal government should spend more on education. Goodwin Liu, *Interstate Inequality in Educational Opportunity*, 81 N.Y.U. L. Rev. 2044 (2006).

[266] U.S. Dep't of Educ., Fiscal Year 2017 Budget: Summary and Background Information 16 (2017), https://www2.ed.gov/about/overview/budget/budget17/summary/17summary.pdf.

[267] Some of this money is passed through states, but it ultimately reaches local school districts.

[268] 20 U.S.C. § 6301 (2013) (providing the funding).

[269] Pub. L. No. 114-95, §§ 1015–1017, 129 Stat. 1802, 1878–79 (2015) (revising the funding).

[270] Pub. L. No. 107-110, § 1002, 115 Stat. 1425, 1440 (2002).

[271] 20 U.S.C. § 6302 (2013).

efficiency would also improve because evidence is accumulating that city living is socially beneficial. Increasing aid at the *federal* level would promote these goals not only by further leveling the playing field within states, but also by reducing the ability of the wealthy to avoid the taxes needed to fund this aid by moving across state borders, which would introduce another locational inefficiency.[272]

Of course, to expand aid to poor cities, many details would have to be worked out and various pitfalls avoided—though detailed discussion of these issues is beyond the scope of this Article. For example, if the aid is nominally "for schools," policymakers would need to decide if the aid would be per capita or per pupil—and, if the latter, how to treat charter schools. Federal and state authorities should also be alert to the concern about wasted money;[273] they could use audits and minimize the extent to which worsening a city's fiscal situation increases aid (e.g., by conditioning payments on poverty rather than budget deficits). Ultimately, while no policy will be without concerns, this Article improves the argument for place-based aid to poor cities.

Two concerns about additional centralization in funding should be addressed, however. First, more centralized funding may reduce local control, the main interest cited in *Rodriguez* for not requiring greater state funding of schools. However, state governments could redistribute with few strings attached, and how much increased state school financing impacts local control over school functioning is a largely unanswered empirical question.[274] Second, one might be concerned that more aid would be throwing good money after bad. I cannot exclude the possibility that money is wasted in schools. However, if individuals are responding to the aid with their residential location choice, then the money is likely not wasted; if it were, there would be no reason to move in response to the transfers. For example, local governments cannot waste the money spent on tax reductions, since they are not spending it on government programs. If policymakers are very concerned about this problem, and efficiency in where people live and not equity in school financing is the concern, then certain types of school financing formulas look more appealing

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[272] For example, Kirk Stark argues that redistribution should take place primarily at the federal level. Kirk J. Stark, *Fiscal Federalism and Tax Progressivity: Should the Federal Income Tax Encourage State and Local Redistribution?*, 51 UCLA L. Rev. 1389, 1394–95 (2004) (arguing against the federal income tax deduction for state and local taxes as currently designed).

[273] For example, officials in Detroit stole money. Mary M. Chapman, *Former Mayor of Detroit Guilty in Corruption Case*, N.Y. Times, Mar. 11, 2013, at A12.

[274] *See* Briffault, *supra* note 4, at 774.

than others. In particular, if equity is the main goal, then reward-for-effort plans are particularly appealing, since they encourage more spending on schools; localities only get more funding if they spend more. However, if efficiency is the goal and if one is concerned about wasteful spending on schools, then such plans look less appealing, since they make it more difficult to use school finance funds for tax reductions. Instead, flat grants or other plans that do not require a certain amount of school spending achieve efficiency without requiring spending that some may consider perverse.

CONCLUSION

Debates about funding local services have largely been framed as a trade-off between the equity of centralized funding and the efficiency of decentralized funding. This Article argues that there are two efficiency benefits from more centralized funding for services in poor areas. First, contrary to the conventional wisdom that decentralized funding promotes choice, centralized funding for these services also promotes choice and therefore efficiency by reducing distortion to households' location choices, improving their quality of life. Second, state aid has helped drive the return to the central city, encouraging living in places with greater social benefits. The Article's empirical work backs up these theoretical arguments with evidence that the magnitude of these efficiency gains is large. At a time of heightened interest in inequality, with great interest in achieving more equitable economic outcomes but without substantially harming economic efficiency and growth, this message is an encouraging one: In the case of more equitable centralized funding for services for poor areas, there is much less of a trade-off between equity and efficiency than is generally believed.

The results suggest a host of legal payoffs. The Article focuses on the financing of public schools: the efficiency reasons to justify state legislative action to increase funding for poor schools. But the arguments that apply to local school funding also apply to other locally provided services, like police, housing, homeless services, and health care, to name just a few. There is much future empirical and legal work to be done testing for these efficiency benefits in other settings and, if appropriate, linking them to particular programs, litigation strategies, and opportunities in state legislatures and Congress.

METHODOLOGICAL APPENDIX

A.   *Regression Framework*

The outcome variable in the analysis is the population growth rate. Here I use the change in the logarithm of population between 1980 and 2010 ($\Delta logpopulation_p$), a measure of the population growth rate at the place (denoted with the subscript "p") level.[275] The first explanatory variable—and the one of greatest interest here—is whether the location is a poor city in a high-redistribution state. To create this variable in the regression, I "interact" (i.e., multiply together) the 1980 median income of the place ($median\_income_p$) and the amount of redistribution its state (denoted "s") undertakes ($redistribute_s$). Correctly measuring the effect of this variable is the goal of the regression, like the goal in my example of measuring the effect of increased school aid on population growth in Colorado Springs. Then, as in the example, I subtract the population growth in the rest of each state. I do this by adding "fixed effects" for each state (I^s); in other words, I include in the regression a variable for each state.[276] As a result, the average population growth rate in Colorado will be subtracted from the growth for places in Colorado, and the same will be true of every other place and state. Finally, like I needed to subtract the growth of Salt Lake City from that of Colorado Springs, I need to control for the population growth of places of similar income. Hence, I control for the 1980 median household income ($median\_income_p$) of the place. This is the same variable that I used in the interaction term, but here the variable enters the regression alone. In the two-by-two grid example, I also needed to subtract the population growth of Utah as a whole; the state "fixed effects" do exactly this.

The following regression results from the combination of these variables:

(1) $\Delta logpopulation_p = \beta_1 redistribute_s \cdot median\_income_p + \beta_2 median\_income_p + \varepsilon_p$

I have explained what each of these variables means with the exception of the "error term," ε_p, with which the model acknowledges that the variables included in the regression will not fully explain the differences in population growth across over 20,000 places. I am measuring the effect of the interaction between how much a state redis-

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[275] Taking the logarithm is common in economics and serves two purposes: First, it allows the results to be interpreted as changes in growth rates rather than levels, and second, it reduces the influence that statistical outliers have on the results.

[276] Note that normally interaction terms require that there is a separate control for each variable in the interaction. Here, I control for median income, but not state-level school redistribution. However, controlling for state fixed effects controls not only for differences between states in school redistribution but also for *all other* differences between states.

tributes and a place's median household income on the change in the log population in that place (approximately the percentage change in population), controlling for a place's median income and the place's state.[277]

The key product of this regression is the coefficient β_1. This is the effect of the interaction term of the amount of redistribution in a state and the place's median income. Following the theory in Section II, we predict $\beta_1 < 0$, since in states with more redistribution, the effect of having a higher 1980 income should be more strongly negative because richer places receive less state funding in those states. For example, in states like Utah, with little school finance redistribution, the growth rate of poor places like Salt Lake City should be slower relative to the rest of the state than the growth rate of poor places like Colorado Springs relative to the rest of Colorado, which engages in much more school finance redistribution.

B. Data

Census data come from the National Historical Geographic Information System.[278] I use three variables from the Census, population in 1980 and 2010 and median household income in 1980.[279] I use 1980 because it is the earliest date at which a nearly comprehensive database of places is available. The cost of using the place level is that data on few variables are available, but fortunately the variables that I need are available.[280]

As a measure of how much states redistribute across school districts with different incomes, I use data from a paper by David Card and Abigail Payne.[281] Their paper contains data for all states except

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[277] Another way to think about the equation is as the reduced-form regression that would result if the outcome variable were actual state transfers and the interaction of the measure of state-level redistribution and median income were an instrument. A benefit of not using actual transfers is that those could be "endogenous" to political decisions—for example, to target particularly needy cities. Thus, using actual transfers could bias the results toward zero if these needy places would have had particularly low growth rates in the absence of redistribution, since it would appear that poor places in high-redistribution states had low growth rates. Using instead the linear relationship within each state between a place's median household income and the amount of state transfers it receives mitigates these concerns because this measure largely removes within-state city-to-city variations.

[278] *U.S. Geographic Summary Data and Boundary Files*, *supra* note 116.

[279] The fact that household size has shrunk over time will not affect the results as long as household size does not both 1) change differentially in poor places in states with high redistribution versus other places and 2) affect the population growth of those places.

[280] Note that the "place" may not be the level of government that receives the transfer from the state. For example, in unincorporated areas, there may be no entity to receive such a transfer. However, places are contained within areas that do receive such transfers, and the place level is recognized throughout the country by the U.S. Census.

[281] *See* Card & Payne, *supra* note 12, at 58–60 (describing construction of the data).

for Alaska and Hawaii, and this Article follows suit.[282] Using the Census of Government and the Census of Population, Card and Payne regress school-district-level state 1992 transfers to schools on school-district-level median household income. Conducting this regression separately for each state yields a slope coefficient that measures how much each state redistributes across school districts. Having data from 1992 allows state residents to have time to react to the redistribution, while still being toward the middle of the time period under study. Using state-level coefficients based on data at the school district level avoids the difficult task of collecting data on school finances for each city.[283] This would be extremely difficult because each state has a different form of local government, and there are often substantial variations within a state, including many school districts that are not coincident with cities.

Appendix Table 1 presents summary statistics for the key variables, weighted by 1980 population. There are 20,499 observations with complete data at the place level in 1980 and 2010. These observations cover 151,374,780 individuals, who constitute 67% of the 1980 U.S. population. The mean change in log population, multiplied by 100, is 17.22, so that the average population-weighted place increased population by roughly 17% between 1980 and 2010. The average place's median household income in 1980 was $16,960.

APPENDIX TABLE 1. SUMMARY STATISTICS

Variable	Mean	Std. Dev.	Min.	Max.
Change in log population (x100), 2010 - 1980	17.22	41.85	-494.42	430.42
Median household income ($100), 1980	169.60	53.16	0.00	750.01
State redistribution: change in state aid per student when school district median household income decreases by $100	3.63	2.32	-1.34	16.32
Interaction of median household income and redistribution	619.39	445.04	-366.95	6,579.25

Note: There are 20,499 observations. Statistics are weighted by 1980 population.

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[282] Hawaii has a single, statewide school district. As a result it cannot have redistribution among school districts. John A. Thompson & Stacey E. Marlow, *Hawaii*, NAT'L CTR. FOR EDUC. STATS., http://nces.ed.gov/edfin/pdf/StFinance/Hawaii.pdf (last visited Feb. 2, 2017). Data issues preclude the use of Alaska. *See* Card & Payne, *supra* note 12, at 60, n.16.

[283] Using estimates of actual spending also avoids the problem with using official formulas that may not be fully-funded by the legislature and therefore may not reflect actual spending levels.

The average amount of the state redistribution measure is 3.63. That is, in the average (population-weighted) state, when a school district's median income decreased by $100, state aid per student increased by $3.63 per pupil. States range from highly progressive at 16.32 (Wyoming), to actually regressive, at -1.34 (Louisiana), in which a decrease of $100 in a district's median income *decreases* state transfers by $1.34 per pupil. I then interact the place median income and state redistribution terms to produce the interaction term, which has a mean of 61.39. The Results section explains how to interpret the coefficient on this number.

C.   Results

Appendix Table 2 presents the main empirical findings, all of which are weighted by 1980 population. I focus on the main coefficient of interest, 1 in equation (1), which is the coefficient on the interaction between a place's median income and the amount of redistribution in the place's state. Column (1) contains the results of the regression of population growth on the interaction term. The result is a positive coefficient on the interaction term, suggesting that, the more redistributive the state, the more a place's higher median income increases its population growth. This initial result is the opposite of the expectation of a decrease in population growth. Column (2) adds in state fixed effects, addressing "state bias." These regressions add for each state a variable that takes the value zero unless the observation is from that state, in which case it equals 1, thereby controlling for all of the average characteristics of each state. Here, the coefficient of the interaction term increases and retains the same sign. Column (3) adds to the column (1) regression the other part of the interaction, 1980 median income, addressing "poor place bias"; the coefficient shrinks, but stays positive. Column (4) includes both the state fixed effects and median income, and the interaction coefficient's sign reverses, with a value of -0.0158.[284]

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[284] Since the variation being studied takes place at the place level, standard errors are not clustered. However, clustering the standard errors at the state level does not change the results' statistical significance.

Appendix Table 2. Effect on Change in Log Population, 1980–2010

	(1)	(2)	(3)	(4)	(5)	(6)
Interaction of median household income and redistribution	0.0123*** (0.002)	0.0214*** (0.004)	0.00726*** (0.002)	-0.0158** (0.007)	-0.0142** (0.006)	-0.0150** (0.006)
Median household income ($100) squared, 1980			0.0882*** (0.166)	0.1830*** (0.273)	0.4726*** (0.399)	0.8290*** (0.892)
Median household income ($100) squared, 1980					-0.0065*** (0.006)	-0.0205*** (0.031)
Median household income ($100) cubed, 1980						0.00016*** (0.000)
State fixed effects		X		X	X	X
R-squared	0.017	0.242	0.027	0.253	0.264	0.266

Note: There are 20,499 observations. Statistics are weighted by 1980 population.

Robust standard errors in parentheses

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

The coefficient's reversal in sign shows the importance of addressing biases by controlling for both cross-state differences and differences in income levels across localities. In particular, the results show the importance of comparing states with different levels of redistribution to effectively get a counter-factual of states with little redistribution for states with large amounts of redistribution. For example, merely studying one state would yield results that look, on average, like column (2), which does not control for the place's median income. As the positive coefficient on median income in column (4) shows, a higher median income is positively associated with increased population growth. But it is precisely the fact that higher-income places receive less redistribution from the state through education that I am studying. The key is to separate out these two effects of higher income—the positive effect related to better economic tailwinds and the negative effect related to school finance redistribution—by controlling for median income directly and then

comparing places across states that give different levels of school finance redistribution for places with the same median income.[285]

Columns (5) and (6) add terms for median income squared and cubed, respectively. These are potentially important controls in case the effect of median income on population growth is nonlinear.[286] In these regressions, though, the additional terms have little effect on the interaction coefficient, changing it from -0.0158 in (4) to -0.0142 in (5) with income squared and -0.0150 in (6) with income squared and income cubed.[287] This coefficient is interpreted in the main text in Section IV.
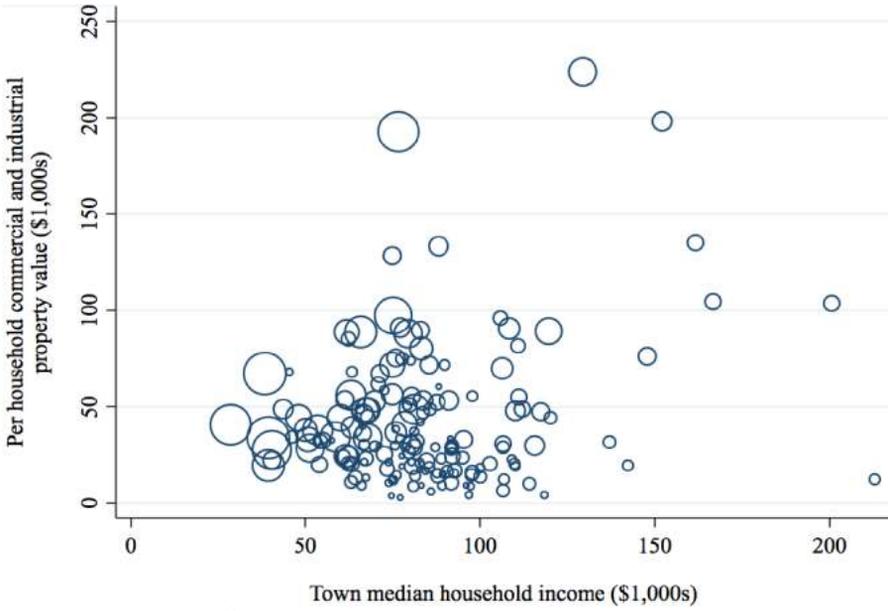
Finally, note the large positive effect that median income has on the change in log population, indicating that population has increased more in wealthier places. The coefficient on median income is positive and significant in all columns. The relationship appears to be nonlinear; the negative coefficient on the income squared term shows that the effect of having a high income on population growth tapers off somewhat at higher incomes.

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[285] In technical terms, when trying to compare redistribution across locations of different income levels while controlling for median income, the regressor of interest and control would be collinear.

[286] To understand why it is important to add higher-order terms, consider the case in which terms a and b are interacted and separately controlled for, and a also has a nonlinear quadratic relationship with outcome variable y. Suppose as well that a and b are positively correlated; as a result, the interaction term will partly reflect the quadratic relationship of a with y and not the effect of the interaction on y. Including a quadratic term for a puts all of the loading of the quadratic relationship on the quadratic term and lets the coefficient on the interaction term express only the effect of the interaction.

[287] The results are virtually identical when New York City is excluded.

APPENDIX FIGURE 1. PER HOUSEHOLD COMMERCIAL AND
INDUSTRIAL, PROPERTY VALUE BY TOWN MEDIAN
HOUSEHOLD INCOME

Note: Data are from 2011.