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The Incidence of Property Taxes Across Local Jurisdictions

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Abstract

This paper develops a new method for determining the incidence of property tax differences across jurisdictions. Drawing on the literature on local government fiscal health, this paper argues that standard incidence approaches are not appropriate because local governments are able to set their own property tax rates. As an alternative, this paper develops the concept of a fiscal burden for jurisdictions with given a finance system, such as the system for funding local education, which relies heavily on the property tax. A local government's fiscal burden is the revenue that it must raise to fund a selected level of local public services after accounting for educational costs, state aid, state-funded property tax relief, and tax exporting. This concept is applied to the education finance system in New York State in 2011. This system is shown to be mildly regressive and to be characterized by extensive horizontal inequity.

Introduction

This paper examines the incidence of the local property tax across jurisdictions. The concepts and result are illustrated using data for school districts in New York State in 2011.

An intuitive starting point for this discussion is to determine how the property tax rate varies with income from one jurisdiction to another. Indeed, the standard incidence analysis plots taxes as a share of income against income. A negatively (positively) sloped line indicates a regressive (progressive) tax. For the purposes of this paper, the observations are units of government, not individuals. This relationship for 616 school districts in New York State in 2011 is plotted in Figure 1.[1] New York City is excluded, as are a few small districts with incomplete data. This figure suggests that the property tax may involve significant vertical inequity (a lower tax rate at higher incomes) and significant horizontal inequity (variation in the tax rate at a given income level).

Upon further reflection, however, the standard framework for incidence analysis does not fit the property-tax case. In the standard analysis, a governmental unit sets a tax rate and the supply and demand curves adjust to reflect this rate. From the point of view of an individual, the tax rate is exogenous. The primary incidence question is how the introduction of this rate affects economic wellbeing across individuals with different incomes. With the property tax, each local government picks its own tax rate. The standard approach can be applied to variation in tax burdens within a jurisdiction, at least when all property owners face the same effective tax rate. However, this paper is concerned with a difference incidence question, namely, how the burden of the property tax varies across communities with different incomes. It makes no sense to say that the property tax imposes a higher burden on jurisdictions that select higher property tax

rates. Something must be standardized. The objective of this paper is to provide a first pass at the required standardization.[2]

The first step in this process is to recognize that the property tax is part of the local public finance system set up by a state. This system includes the property tax, along with provisions, such as tax limitations and homestead exemptions, that govern it; state aid to local governments; and perhaps other revenue sources. The question for across-jurisdiction incidence that is analogous to the standard incidence question is who bears the burden of this local public finance system.

States create local public finance systems to support local public services, but they allow public service outcomes to vary across jurisdictions. To obtain the appropriate standardization, the economic burden of a local public finance system must be calculated at the same level of local public services in each jurisdiction. Consider the case of a local public finance system that is made up of an unfettered property tax. Without some kind of standardization, an evaluation of this system would conclude that jurisdictions selecting higher quality public services have a higher tax burden even though their tax rate is one they have selected. If tax burdens are selected based on the same level of public services in each jurisdiction, however, endogeneity is removed from the burden calculation, just as it is in the standard case with the same tax rate for all individuals.

This type of standardization appears in the literature on local government fiscal health. Ladd and Yinger (1991) define a local government's fiscal health as the difference between its revenue-raising capacity and its expenditure need, all based on factors outside the control of local public officials. These concepts are discussed in more detail below, but the basic idea is that revenue-raising capacity is the amount of money a jurisdiction can raise at a given burden on

its residents and expenditure need is the amount of money a jurisdiction must spend to obtain a given level of local public services.

The analysis in this paper follows a similar logic by defining "fiscal burden" as the amount of money residents must pay to meet their expenditure need after accounting for the revenue provided by nonresidents in the form of state aid or some other inflow such as property tax exporting. This burden, which is outside the control of local residents, can be expressed as a percentage of resident income to determine whether the distribution of this fiscal burden is progressive or regressive across jurisdictions.

Calculating Fiscal Burdens

We now turn to explaining each of the components of this "fiscal burden" measure.

Expenditure Need

As noted earlier, this paper makes use of the data on school districts in New York State compiled for Eom et al. (2014). Descript statistics for these data are provided in Table 1. These districts differ widely in population, income, and other characteristics.

Expenditure need is the amount a district must spend to deliver the school-quality target set by the state. Suppose the state wants all districts to meet, at a minimum, the current median quality target. Consider the unrealistic (and soon to be examined) assumption that every district can obtain the median quality target with the median spending. This spending target is obviously a much higher share of income in districts with relatively low income. The linear relationship between median spending as a share of income and income per capita is plotted in Figure 2 and described in the second column of Table 2. Median spending can be considered a seriously incomplete measure of fiscal burden. It suggests that the school finance system in New York

State may be highly regressive, but we cannot be certain of this conclusion until we add other components of fiscal burden.

The first component to add is educational costs. As shown by a large literature, it costs more to obtain a given school quality outcome in districts with high poverty rates, with high concentrations of students with severe handicaps, with relatively small enrollments, or with a high-wage environment. This literature is reviewed in Duncombe et al. (2015). Educational costs for 2011are estimated by Eom et al. (2014) for the school districts described in Table 1. These estimates make it possible to calculate the spending required to reach median spending in each district, which is what we mean by expenditure need.

The results for expenditure need as a percentage of income relative to income per capita are plotted in Figure 2 and described in column 3 of Table 2. Adding cost corrections lowers the regressivity in the expenditure numbers, but not by a large amount. In addition, Table 2 indicates that a cost adjustment lowers the R-squared of the burden-income regression, which suggests that variation in burden at a given income level, which is what we mean by horizontal inequity, goes up when costs are considered.

State Aid

The next step in the analysis is to look at the role of state aid, which obviously lower's a district's fiscal burden. Moreover, state aid per capita is negatively correlated with district income per capita ($\rho = -.45$), so state aid adds a progressive element to the school finance system. This negative correlation reflects the common practice of giving more aid to school districts with lower wealth and/or with more at-risk students, defined as students who come from poor families or who have other disadvantages.[3] In fact, Figure 2 and the fourth column of Table 2 indicate that state aid dramatically lowers the regressivity of the fiscal burden. A $10,000 increase in

income lowers this (still incomplete) burden measure [(expenditure need – state aid)/income] by 0.19 percent, whereas the same increase lowers the without-aid measure by 0.93 percent. Another striking finding is that adding state aid to the burden measure lowers the R-squared of the linear regressivity regression from 0.3440 to 0.0639, which indicates a large increase in the unexplained variation in the burden, that is in horizontal inequity.

Property Tax Exemptions

Some states include property tax provisions that involve state compensation to local governments. A key example, which is used in New York State and many other states, is a "homestead exemption."[4] In general terms a homestead exemption exempts the first X dollars of a house's value from taxation. In some states, local government lose the money they would have collected on this $X exemption, but in some other state, including New York, the State compensates the local government for the lost revenue. This type of compensated exemption, called STAR, was in place for school districts in New York in 2011, and we can observe the amount of money involved.

Homestead exemptions clearly raise the progressivity of the property tax <u>within</u> a jurisdiction. The basic formula for an exemption is $T = t(V - X)$, where T is the property tax payment, t is the effective property tax rate, V is the assessed value (equalized to account for assessing practices) and X is the exemption. Consider the case of X = $40,000. Then homeowners with V <= $40,000 do not pay any property tax and homeowners with V= $80,000 pay half of what they would pay without the exemption. The resulting impact on progressivity is summarized in Figure 3.[5] Effective property tax rates plummet for the owners of inexpensive houses, but do not change much for households whose houses are very expensive.

New York's homestead exemption also affects across-district property tax incidence in two ways. (See Eom et al. (2014).) First, renters do not receive a comparable exemption. As a result, the STAR subsidy per capita is larger in largely owner districts than in largely renter districts. Second, the New York STAR program includes a "sales price adjustment factor," which leads to a higher value of X in districts located in counties with relatively high sales prices for houses than in other districts. The differences in X are large. The value of X is $30,000 in most of the state but in 2011 the SPDF boosted it to as much as $99,300 in Westchester County.

As shown in Figure 2 and the fifth column of Table 2, the STAR payments make the (incomplete) fiscal burden results slightly less regressive. This result is surprising at first, because STAR payments per capita are positively correlated with income per capita ($\rho = 0.36$). However, these payments are also positively correlated with expenditure need ($\rho = 0.42$), presumably because cost adjustments reflect the higher wages in downstate counties where the SPDF is high.

Tax Exporting

The final step in calculating a local jurisdiction's fiscal burden with a property tax is to consider the possibility that some of this tax is exported, that is, paid by nonresidents. This section considers exporting separately for owner-occupied housing, rental housing, and commercial and industrial property.

Although a developer or a bank could be a party in a house sale, the vast majority of house sales are between two households, the buyer and the seller. After the sale, the buyer writes the property tax checks to the government. Anticipated future taxes at the time of sale could be capitalized into a lower sales price, so one might think that some of the tax burden could be shifted to the seller. After all, this capitalization effect is analytically equivalent to the seller

sending a check to the buyer every year to cover a share of the property tax payment. In fact, however, both services and taxes are capitalized into the price of housing. In some cases, the present value of anticipated property taxes may equal the present value homebuyers place on the associated local public services. This situation leads to zero net capitalization and no property tax shifting. Net capitalization may not be exactly zero, of course, but there is no reason to think it leads to extensive shifting of the tax burden onto sellers.

Moreover, even if sellers do bear a significant share of the property tax burden, many of them will remain in the same community. In this case, the property tax burden is shared by buyers and sellers but there is no exporting because both parties are residents of the taxing jurisdiction.

Although I have no data to bring to bear on this issue, it appears to me that property tax exporting onto house sellers is likely to be minimal. Differences in anticipated public services and the taxes that pay for them are likely to be small in most cases, and many sellers may stay in the jurisdiction so that no exporting is involved even if they pay some of the tax. My assumption, therefore, is that the districts in my sample cannot export any of the property tax on owner-occupied housing.

One study, Carrol and Yinger (1984), looks at the incidence of across-city variation in property tax rates in the Boston area. They find that property tax rates can be shifted onto tenants in the form of higher rents only to the extent that tax rate differences are associated with differences in public service quality. They estimate that, in the average city, about 15 percent of a property tax increase will fall on tenants. A more recent study (Schwegman and Yinger 2020) builds on a natural experiment to estimate tenants share of a property tax increase. They also estimate a tenant share equal to 15 percent. One can therefore assume that most of the property

tax on rental housing falls on landlords. Taxes paid by nonresident landlords are a type of property tax exporting.

Even less evidence is available for the across-district incidence of property taxes on commercial and industrial property (henceforth business property).[6] Some of this tax may be shifted to consumers and workers, who may or may not be district residents. Moreover, some of the tax will be paid by business owners, who may live in the suburbs or even be stockholders who live around the country. In addition, the share of the tax that falls on current business owners may be affected by capitalization. Net capitalization is less likely to equal zero for business property than for owner-occupied houses, because the public education financed by the property tax is likely to have lower value to businesses than to homebuyers. Some share of the property tax on business property may therefore be exported to people who sell business property but do not live in (or remain in) the taxing jurisdiction. In sum, some exporting of the tax on commercial and industrial property is likely, but the extent of it is impossible to measure.

My New York data set does not include measures of the value of rental property or of business property. However, it does include median house value, the number of households, the share of households who are homeowners, total property values, and the district property tax rate. With these data I can estimate the value of all property other than owner-occupied housing and apply the district tax rate to obtain the property tax revenue from rental and business property put together. Then I can apply an assumption (i.e., a wild guess) about the extent to which these property taxes are exported. My assumption is that 50 percent of this tax revenue is exported, which means that it is paid by nonresidents.

One final issue is that property taxes can be imported, as well as exported. Suppose a landlord owns a building in district A but lives in district B. From the point of view of district A,

the property taxes on this building that fall on the landlord are an example of tax exporting. From the point of view of district B, however, these property taxes are an extra burden on its citizens—i.e., an example of tax importing, Thus, my assumption about exporting should be interpreted as an assumption about net exporting, not exporting alone.

The final fiscal burden calculations are presented in Figure 2, Figure 4, and the last column of Table 2. Bringing in exporting lowers the regressivity of the fiscal burden by a small amount, as shown by the flattening of the fiscal burden line in Figure 2. As show in in Table 1, the estimated value of exporting is not large, so a higher or lower assumed export percentage would not alter these regressivity results by a substantial amount.

Conclusions

In sum, the fiscal burden for education finance in New York State is mildly regressive with a burden that goes from 3.58 percent of income at the 5th percentile of income per capita to 3.05 percent at the 95th percentile. This relatively low regressivity largely reflects the progressivity built into New York State's education aid formula.

The results in this paper also show that the New York State education finance system exhibits a large degree of horizontal inequity. As shown by Figure 4 and the R-squared in the last column of Table 2, the fiscal burden varies widely across districts at any given level of district income per capita.

Recall that the fiscal burden as defined in this paper is a product of the education finance system created by the New York State government and is outside the control of school officials. A reasonable objective for this education finance system, in my view, is moderate progressivity

and limited horizontal inequity. The analysis in this paper points to some of the issues that arise in trying to design such a system.

This paper began with a plot (Figure 1) of the property tax burden relative to income per capita. Somewhat surprisingly, the final graph (Figure 2) looks similar, although it has a lower average burden. This outcome is not entirely a coincidence, because districts receiving more aid per capita, which are mostly poorer districts, tend to have lower property tax burdens than other districts. Nevertheless, the similarity in these two outcomes is not guaranteed, and the two graphs might differ more significantly in other applications. Fiscal burden calculations provide a more compelling foundation for studying inter-district inequality than property tax burdens alone.

Table 1. Descriptive Statistics, School Districts in NY State, 2011

Variable	Mean	Median	Std. Dev.	Maximum	Minimum
Population	17,178	9,921	22,097	261,021	824
Income PC	$30,441	$21,185	$33,411	$420,333	$8,147
Property Tax PC	$1,672	$1,265	$1,100	$6,634	$140
Expenditure Need PC	$2,655	$2,658	$471	$5,722	$1,313
State Aid PC	$1,236	$1,177	$642	$4,093	$119
STAR Revenue PC	$206	$186	$94	$610	$20
Property Tax Exports PC	$262	$172	$306	$2,065	$0

This table describes key features of the data set used by Eom et al. (2014), plus entries for "Expenditure Need" and "Property Tax Exports" based on those data (and explained in the text). "PC" stands for "Per Capita."

Table 2. Linear Fiscal Burden Results, School Districts in NY State, 2011

	Property Tax Revenue	Median Spending	Expenditure Need	Expenditure Need - State Aid	Expenditure Need - State Aid - STAR	Expenditure Need - State Aid - STAR - Exporting
Intercept	0.0656	0.1478	0.1428	0.0596	0.0498	0.0370
t-Statistic	(51.05)	(77.08)	(68.40)	(58.22)	(48.08)	(32.02)
Slope	-0.0002	-0.0009	-0.0008	-0.0002	-0.0001	-0.0001
t-Statistic	(-5.60)	(-21.24)	(-17.94)	(-8.55)	(-6.47)	(-3.37)
R-Squared	0.0485	0.4235	0.3440	0.0639	0.1279	0.0058
Standard Error	0.0236	0.0352	0.0383	0.0188	0.0190	0.0212
Burden at 5th %ile	6.34%	13.49%	13.10%	5.68%	4.77%	3.58%
Burden at 95th %ile	5.35%	7.89%	7.95%	4.48%	3.85%	3.04%

Results for regressions of the variable in the column heading as a share of income on income per capita. The sample is 616 school districts in New York State in 2011. The last two rows give the implied fiscal burdens for each measure at the 5th and 95th percentile of the income-per-capita distribution. All of these burdens are incomplete until the last column.

Figure 1. Property Taxes as a Percentage of Income, School Districts in NY State, 2011

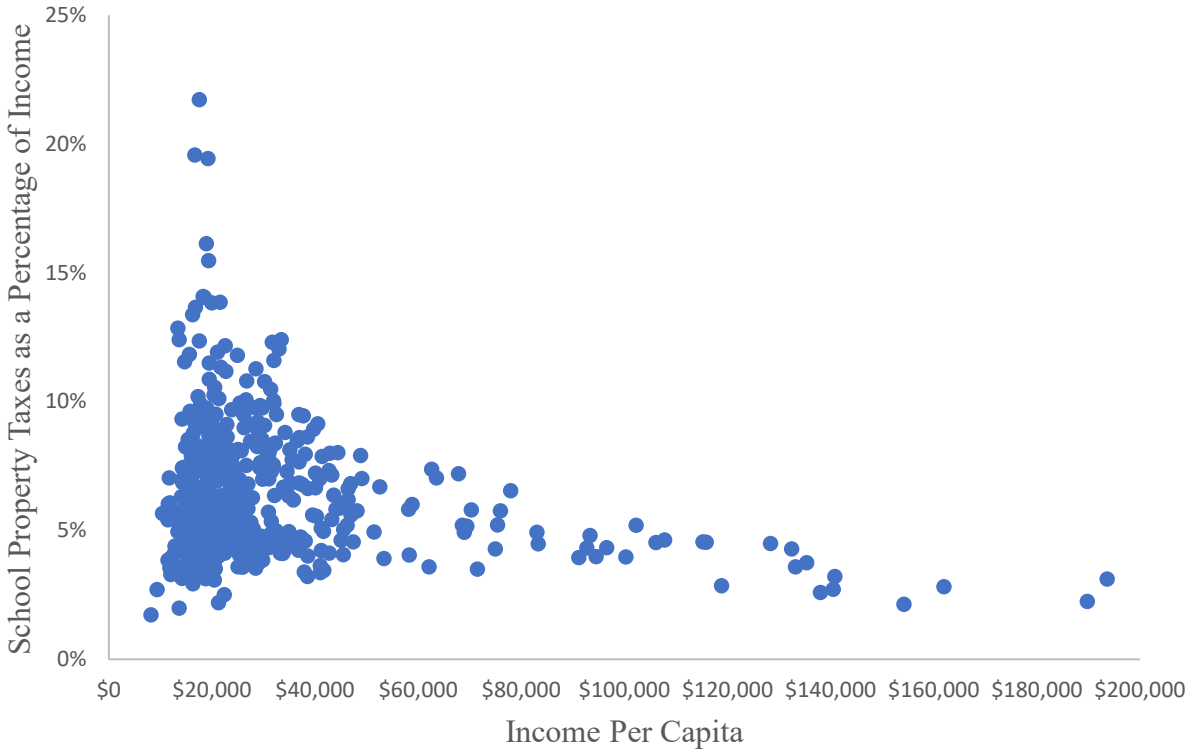
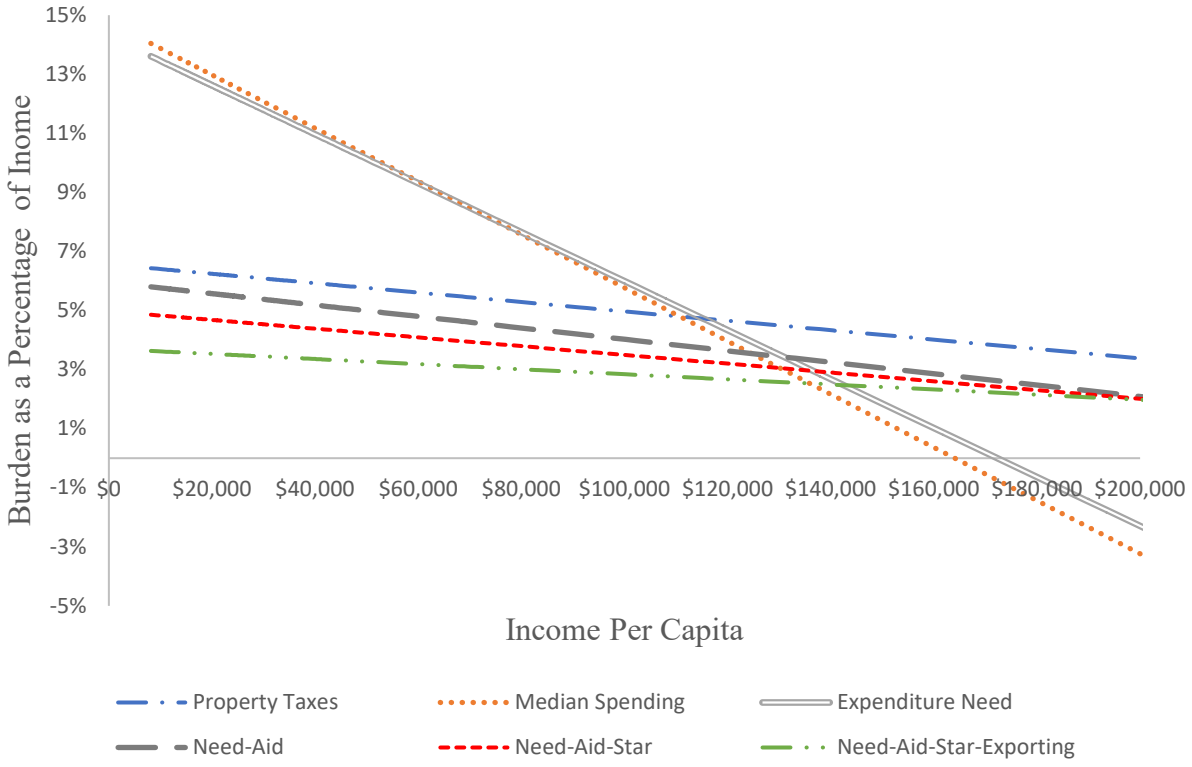
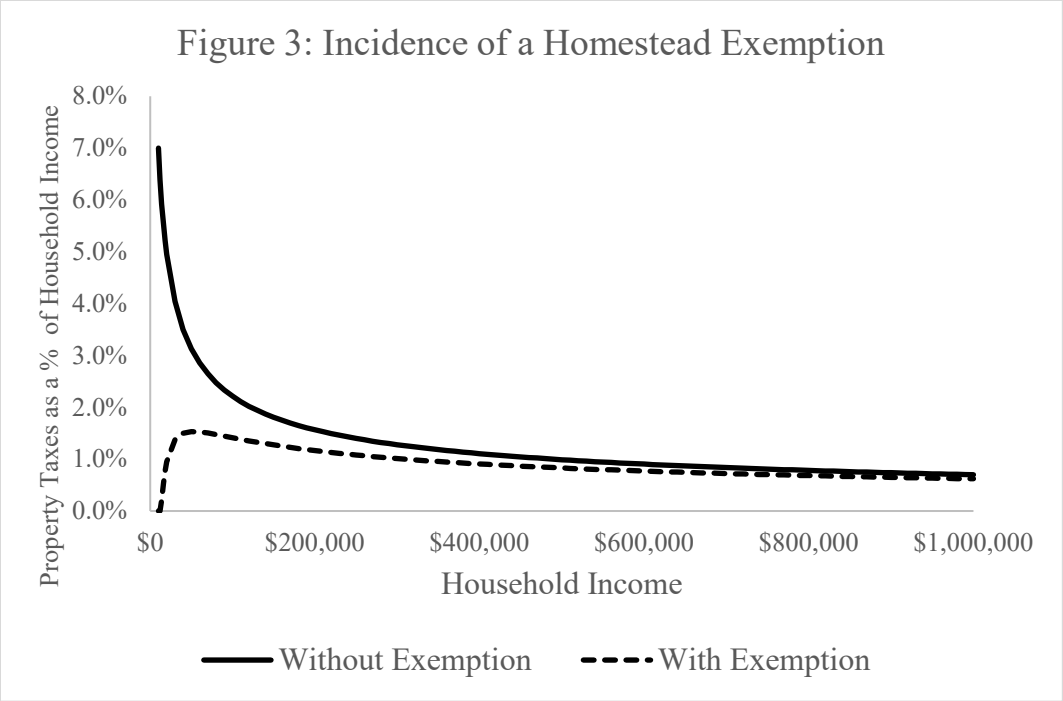


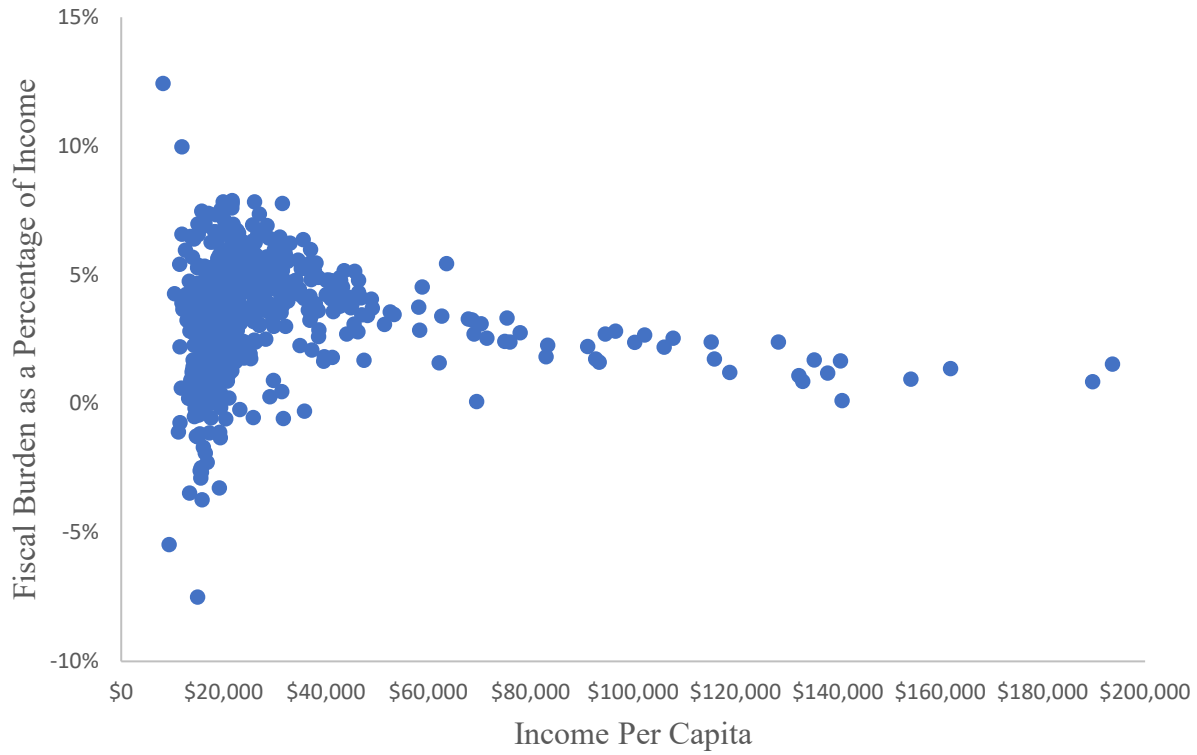
Figure 2. Across-District Property Tax Incidence, School Districts in NY State, 2011





Source: Yinger (2020).

Figure 4. Fiscal Burden as a Percentage of Income, School Districts in NY State, 2011



References

Carroll, Robert J., and John Yinger. 1994. "Is the Property Tax a Benefit Tax? The Case of Rental Housing." *National Tax Journal* 47 (2) (June): 295-316.

Duncombe, William D., Phuong Nguyen-Hoang, and John Yinger. 2015. "Measurement of Cost Differentials." In *Handbook of Research in Education Finance and Policy*, 2nd Edition, M.E. Goertz and H.F. Ladd (eds.), New York: Routledge, pp. 260-278.

Eom, Tae Ho, William D. Duncombe, Phuong Nguyen-Hoang, and John Yinger. 2014. "The Unintended Consequences of Property Tax Relief: New York State's STAR Program." *Education Finance and Policy* 9 (4) (Fall): 446-480.

Fisher, Ronald C. 2015. *State and Local Public Finance, 4th Edition.* Routledge

Kotlikoff, Laurence J., and Lawrence H. Summers. 1987. "Tax incidence." In *Handbook of Public Economics, Volume 2*, Alan J. Auerbach and Martin S. Feldstein, eds., Amsterdam: North Holland, pp. 1043-1092.

Ladd, Helen F., and John Yinger. 1991. *America's Ailing Cities: Fiscal Health and the Design of Urban Policy*, Updated Edition. Johns Hopkins University Press.

Nguyen-Hoang, Phuong, and John Yinger. 2020. "The Flypaper Effect: Methods, Magnitudes, and Mechanisms." *Journal of Education Finance* 46 (2) (Fall): 158-188.

Nguyen-Hoang, Phuong, and John Yinger. 2011. "The Capitalization of School Quality into House Values: A Review." *Journal of Housing Economics* 20 (1) (March): 30-48.

Schwegman, David J., and John Yinger. 2020. "The Shifting of the Property Tax on Urban Renters: Evidence from New York State's Homestead Tax Option." U.S. Census Working Paper CES-20-43, December.

Verstegen, Deborah A., and Robert C. Knoeppel. 2012. "From Statehouse to Schoolhouse: Education Finance Apportionment Systems in the United States." *Journal of Education Finance* 38v (2) (Fall): 145-166.

Yinger, John. 2020. "The Property Tax in the United States." In *Poverty and Proficiency: The Cost of and Demand for Local Public Education*, J. Yinger (ed.), Chapter 1. New Jersey: World Scientific Publishing.

Yinger, John, Howard S. Bloom, Axel Börsch-Supan, and Helen F. Ladd. 1988. *Property Taxes and House Values: The Theory and Estimation of Intrajurisdictional Property Tax Capitalization*, Academic Press.

Zodrow, George R. 2016. "Who Pays the Property Tax?" *Land Lines*, April.

Zodrow, George R. 2001. "Reflections on the New View and the Benefit View of the Property Tax." In *Property Taxation and Local Government Finance*, Wallace E. Oates, ed., Cambridge MA: Lincoln Institute of Land Policy, pp. 79-111.

Endnotes

[1] I am grateful to Phuong Nguyen-Hoang for assistance in compiling these data.

[2] Alternative approaches to inter-jurisdiction incidence can be found in Kotlikoff and Summers (1987) and Fisher (2015). A general treatment of property tax incidence is provided by Zodrow (2001, 2006).

[3] For state aid provisions across the states, see Verstegen and Knoeppel (2012).

[4] Details of homestead exemptions and other tax relief policies in every state are described at: http://datatoolkits.lincolninst.edu/subcenters/significant-features-property-tax/about.aspx .

[5] This figure comes from Yinger (2020). It is based on the assumptions that X = $40,000, that t = 0.02, and that the income elasticity of demand for housing equals 0.5.