Fiscal competition and tax instrument choice: the role of income inequality

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Abstract

School districts in Ohio have the choice of two tax instruments with which to raise revenue: the property tax and a residence-based income tax. Economic theory predicts that local governments, if given the choice, would prefer to diversify their tax base to reduce the political costs associated with excessive reliance on one tax. Why then, do some school districts not utilize the income tax? This paper extends earlier work on this issue by showing that income inequality is negatively associated with the choice of an income tax.

1   Introduction

School districts rely primarily on the property tax to raise local revenue. While other sources such as income and sales taxes have increased for municipalities in recent years, local school districts continue to generate most of their local revenue from the property tax. During the fall 2001 school year the average U.S. school district received 78 percent of local school district revenue from the property tax (U.S. Department of Education 2004). That represents an increase of two percentage points since the fall 1989 school year.

Continued reliance on the property tax by school districts is curious given that the property tax is universally considered to be the most disliked tax. From the property tax revolts of the 1970s to the school finance reform lawsuits of the 1980s and 1990s, taxpayers continue to agitate for reduced reliance on the property tax. While property tax collections have slowed somewhat and intergovernmental transfers have reduced reliance on the property tax, school districts continue to rely heavily on the property tax for raising own-source revenue.

One explanation for the continued reliance on property taxes is most school districts have no choice over tax instruments. In most states, local school districts are required by law to use the property tax when generating local revenue. Even in states that allow school districts to choose among tax instruments, however, local school districts continue to rely heavily on the property tax. Ohio is one of two states (the other being Iowa) that allow school districts to choose between a property tax and an income tax and Ohio school districts raise less than five percent of their local revenue from school district income taxes.

Looking at the aggregate, however, loses sight of the fact that some districts rely fairly heavily on the income tax. Wyoming City in Hamilton County raises nearly half (47.75 percent) of its local revenue from the income tax, highest in the state. Of the 607 regular local school districts in Ohio during the fall 2001 school year, 129 of them utilized the school district income tax to some extent, and more than 50 school districts obtain half of their local revenue from the income tax.

Hettich and Winer (1984) suggest that local politicians have an incentive to diversify the tax base of their government. Their argument is that the political cost of a single tax is an increasing function of the government's reliance on that tax. Thus it is less costly from a politician's perspective to diversify revenue sources across multiple tax bases. Nechyba (1997) points out that tax bases differ in their mobility. The property tax base is fairly fixed in the short run while the income tax base is fairly mobile. In Nechyba's model, if high-income households have free mobility then the equilibrium outcome is complete reliance on the property tax. Local governments are unwilling to adopt an income tax because high-income households will just move to a nearby district without an income tax. As the costs of mobility increase (interjurisdictional competition declines) the model predicts that school districts will begin adopting the income tax.

The unique nature of the Ohio school district income tax presents a unique opportunity to study empirically the impact that interjurisdictional competition has on local government choice among different tax instruments. Spry (2005) tests Nechyba's model using data on Ohio school districts and finds that school districts are more likely to adopt income taxes when interjurisdictional competition is low. This paper extends Spry's work in two important ways. First, a different and more common definition of interjurisdictional competition is utilized to check the robustness of Spry's estimation. Second, this paper looks at the effect

of income inequality on the choice among tax instruments. If the fear is that utilizing an income tax will cause high-income taxpayers to flee to nearby districts, the higher the ratio of mean-to-median income in a school district, the lower the probability that school district will adopt an income tax.

2   The Ohio School District Income Tax

All Ohio school districts are required to have a property tax in order to participate in the state foundation program, which provides intergovernmental education grants. The property tax covers all residential, agricultural, public utility, and business property. A property tax limitation enacted in the 1970s called House Bill 920 limits school districts to levying new property taxes by amount, not as rates. When property values increase property tax millage is automatically adjusted downward by the county auditors to maintain the voted-on level of revenue. The result is that Ohio school districts have to return to the ballot for not only new revenue but to replace the value of revenue eroded by inflation. As a result, school levies are a regular occurrence in most school districts.

The Ohio school district income tax is a residence-based tax. As such, it does not tax non-residents like the property tax. To the extent that the property tax is exported to non-residents, therefore, a dollar raised in local revenue through the property tax is less expensive to local residents than a dollar raised through the income tax. The tax is levied on Ohio adjusted gross income and collected by employers and remitted to the Ohio Department of Taxation, which process the payments for school districts. School officials do not have to offer voters the choice to adopt an income tax as a single issue; rather they can package an increase in the income tax with a reduction in the property tax.

One advantage to replacing property tax revenue with income tax revenue is that revenue raised through the income tax grows with inflation unlike revenue raised through the property tax. To the extent that levies are politically costly for school officials, this provides another reason for them to prefer to substitute income taxes for property taxes. Since the Ohio school district income tax is residency-based, however, mobile high-income individuals might flee as a result of the imposition of an income tax. That might provide some explanation for why only 129 school districts had adopted a school district income tax by the fall of 2001. Since they can escape the tax by moving to a nearby district but yet still remain in the same job, Spry (2005) suggests that residence-based income taxes provide a good test of Nechyba's (1997) hypothesis on the effects of taxpayer mobility on choice of tax instruments.

3   Relevant Literature

There has been a limited amount of empirical work on the choice among tax instruments among local governments. The tax structures of local governments have become increasingly diverse over the last quarter-century as local governments reduce their reliance on the property tax (Sjoquist, Wallace, and Edwards 2004). The theory of revenue instrument choice by local governments has been addressed by Hettich and Winer (1984, 1998) who argue that the

choice among tax instruments can be modeled either as a benevolent social planner choosing among the appropriate instruments or as self-interested politicians. The latter model provides an explanation why departures from an economically efficient tax system might be the result of rational political decision-making, not mistakes in policy formation (Poterba 1998).

While not formally modeled here, the general theoretical framework employed is similar to that of Hettich and Winer (1984) in that politicians attempt to minimize the political costs of raising additional revenues. The empirical literature on choice among tax instruments provides some useful information to help give perspective on some of the political costs and benefits facing school district officials thinking of placing a school district income tax on the ballot. Blackley and DeBoer (1987) look at data on Indiana counties replacing property tax revenue with an income tax and find that the ability of a county to export its property tax burden to non-resident property owners reduces the probability that a county will adopt an income tax. Sjoquist (1981) finds that areas where non-residential property is a larger percentage of the tax base rely more on the property tax. Looking at voting patterns on a Georgia referendum to replace property taxes with sales taxes, Biegeleisen and Sjoquist (1988) find that precincts voting for the referendum had a large percentage of senior citizens, higher property values, and large estimated reductions in property taxes.

In addition, there exists an enormous literature on school referenda. For example, Hicks (1972) analyzed factors influencing school district referenda in Ohio. More recently, Romer and Rosenthal (1982), Brokaw, Gale and Merz (1990), Romer, Rosenthal, and Munley (1992), and Balsdon, Brunner, and Rueben (2003) have studied the issue of school district referenda. The amount of research on referenda is large because referenda generally are assumed to provide a good empirical test of the median voter model (Holcombe 1980). Voters only face choice along one dimension and, given Tiebout (1956) sorting, it is reasonable to assume single-peaked preferences. Following, this literature I assume that the median household is the decisive voter.

4   Data and Empirical Results

The data used here come from the Ohio Department of Education, the special school district tabulation of the 2000 Census, and the Ohio Department of Taxation. Census data were matched to the data from the Ohio Department of Education and Department of Taxation. Definitions and summary statistics of all variables are presented in the Appendix.

The primary variable of interest is the measure of interjurisdictional competition. As stated earlier, Spry (2005) uses an intuitively more obvious but less conventional measure of interjurisdictional competition. His measure is the number of districts within 10 miles of a school district. Similar to Hoxby (2000) and others, I utilize a Herfindahl index to measure the degree of market concentration a district has in the area. The Herfindahl index measures the probability that two students drawn at random from a county are from different school districts. Formally, the Herfindahl index takes the form of:

$$\mathrm{C}_m = 1 - \sum_{j=1}^{J} S_{jm}^2$$

where S_{jm} is equal to district j's share of enrollment in county m. A county with only one

district will have a value of 0 and a hypothetical county with a perfectly competitive Tiebout district would equal 1 as the number of districts and students approach infinity.

The other key variable is the mean-to-median income ratio. This variable is calculated by taking the ratio of the mean household income in the district to the median household income in the district. Districts with a large number of high-income households are more likely to have a mean household income higher than the median, thus the higher the mean-to-median income ratio, the greater the income inequality in the district. While not perfect, given that mean and median household income is the only income data available at the school district level this is the best measure of income inequality available. It is hypothesized that the higher the mean-to-median-income ratio, the lower the probability that a school district utilizes an income tax, other things equal.

The other variables are the percentage of assessed property that is commercial and the percentage of revenue from state sources. The more business property in a school district the more the tax burden can be exported to non-residents. Districts with a larger percentage of business property are likely to have a lower probability of utilizing an income tax. The sign of state aid is difficult to predict apriori. Districts with high levels of state aid are likely to have few high-income taxpayers to lose from passing an income tax. On the other hand, districts with a low percentage of state aid have to go back to the ballot box more frequently and thus might be more likely to swap property taxes to reduce the set-up cost of having to return to the ballot box frequently.

Table 1

Probit Results: Dependent Variable is Dummy Variable Indicating Income Tax Usage

RHS Variables	1		2		3	
Constant	0.947	*	4.510988	***	4.506121	***
	(1.71)		(4.08)		(4.07)	
Herfindahl Index	-1.37482	***	-1.376212	***	-1.370999	***
	(2.62)		(2.57)		(2.55)	
% Business Property	-0.03602	***	-0.034439	***	-0.033204	***
	(6.46)		(5.98)		(5.68)	
% State Revenue	0.008482	*	0.004324		0.003985	
	(1.87)		(0.87)		(0.80)	
Mean to Median Income Ratio			-2.833988	***	-2.571684	***
			(3.74)		(3.27)	
% Senior Citizen					-0.025745	
					(1.13)	
No. of observations	607		607		607	
Pseudo R^2	0.111		0.137		0.139	

Absolute z-statistics in parentheses.

Table 1 presents the results from a binary Probit regression. The dependent variable is a dummy variable representing 1 if the district had an income tax for the fall 2001 school year and 0 if it did not. As can be seen, the measure of interjurisdictional competition has the expected sign and is significant at the five percent level. The variable for the percentage of total revenue from state sources is positive and statistically significant at the one percent level in the first regression but becomes insignificant once the mean-to-median income ratio is introduced. The variable measuring income inequality, the mean-to-median income ratio, has the expected negative sign and is statistically and economically significant. Thus the level of income inequality in a district as measured by the ratio between the mean and median household incomes leads to less use of an income tax. Presumably, this is because of the fear that high-income taxpayers might migrate to school districts without an income tax. Finally, the variable for the percentage of property within the district that is business has the expected negative sign and is significant at the one percent level.

5   Conclusion

There exists a well-documented link between interjurisdictional competition and the choice among tax instruments. In this paper I have confirmed the results of Spry (2005) using a different measure of interjurisdictional competition. In addition, income inequality is shown to play an important role in the choice of whether or not to adopt an income tax. School districts where the mean-to-median income ratio is high are less likely to utilize an income tax, presumably out of fear that high-income property owners will move in response.

An area of further inquiry not explored in this study is the spatial nature of interjurisdictional tax competition. Following the work of Brueckner and Saavedra (2001) it is possible that local school districts are engaging in strategic tax competition. It is likely that the ability of a school district to pass a school district income tax is influenced substantially by the presence of an income tax in neighboring school districts. If so, the resulting estimates of Spry (2005) and this paper may be biased and spatial econometrics techniques more appropriate.

References

[1] Balsdon, E., E. Brunner, and K. Rueben. (2003) "Private Demands for Public Capital: Evidence from School Board Referenda" *Journal of Urban Economics* **54**, 610-38.

[2] Biegeleisen, J. and D. Sjoquist. (1988) "Rational Voting Applied to Choice of Taxes" *Public Choice* **57**, 39-47.

[3] Blackley, P. and L. DeBoer. (1987) "Tax Base Choice by Local Governments" *Land Economics* **63**, 227-236.

[4] Brokaw, A. J. Gale, and T. Merz. (1990) "The Effect of Tax Price on Voter Choice in Local School Referenda: Some New Evidence from Michigan." *National Tax Journal* **43**, 53-60.

[5] Brueckner, J. and L. Saavedra. (2001) "Do Local Governments Engage in Strategic Property-Tax Competition?" *National Tax Journal* **54,** 203-229.

[6] Hettich, W. and S. Winer. (1984) "A Positive Model of Tax Structure" *Journal of Public Economics* **24**, 67–88.

[7] Hettich, W. and S. Winer. (1998) "What Is Missed If We Leave Out Collective Choice in the Analysis of Taxation?" *National Tax Journal* **51,** 373–89.

[8] Hicks, R. (1972) "Influences on School Referenda in Ohio" *American Journal of Economics and Sociology* **31**, 105-08.

[9] Holcombe, R. (1980) "An Empirical Test of the Median Voter Model" *Economic Inquiry* **18**, 260-274.

[10] Hoxby, C. (2000) "Does Competition among Public Schools Benefit Students and Taxpayers?" *American Economic Review* **90**, 1209-1238.

[11] Nechyba, T. (1997) "Local Property and State Income Taxes: The Role of Interjurisdictional Competition and Collusion" *Journal of Political Economy* **105**, 351-84.

[12] Poterba, J. (1998). "Public Finance and Public Choice" *National Tax Journal* **51**, 391-96.

[13] Romer, T. and H. Rosenthal. (1982) "Median Voters or Budget Maximizers: Evidence from School Expenditure Referenda" *Economic Inquiry* 20, 556-78.

[14] Romer, T., H. Rosenthal, and V. Munley. (1992) "Economic Incentives and Political Institutions: Spending and Voting in School Budget Referenda" *Journal of Public Economics* **49**, 1-33.

[15] Sjoquist, D. (1981) "A Median Voter Analysis of Variations in the Use of Property Taxes Among Local Governments" *Public Choice* **36**, 273-85.

[16] Sjoquist, D., S. Wallace, and B. Edwards. (2004) "What a Tangled Web: Local Property, Income and Sales Taxes" in *City Taxes, City Spending: Essays in Honor of Dick Netzer* **by** Amy Schwartz, ed. Northampton: Edward Elgar, 42-70.

[17] Spry, J. (2005) "The Effects of Fiscal Competition on Local Property and Income Tax Reliance" *Topics in Economic Analysis and Policy* **5**, 1-19.

[18] Tiebout, C. (1956) "A Pure Theory of Local Expenditures" *Journal of Political Economy* **64**, 416-24.

[19] U.S. Department of Education. 2004. "National Public Education Financial Survey 1989–90 to 2001–02" Common Core of Data (CCD), National Center for Education Statistics.

Appendix
Variable Definitions and Summary Statistics

Variable Name	Definition	Mean	St. Dev.
Income Tax	Dummy variable equal to 1 if the school district has an income tax, 0 otherwise.	0.213	0.409
% Business Property	Percentage of property valuation in the school district classified as business	32.99	14.31
% Senior Citizen	Percentage of school district residents 65 and older	13.38	3.407
% State Revenue	Percentage of school district revenue from state sources	48.01	15.32
Herfindahl Index	Degree of interjurisdictional competition; see text for further explanation	0.796	0.112
Mean to Median Income Ratio	Ratio of mean household income in the school district to median household income	1.214	0.105