Federal Tax Deductions and the Provision of Local Public Goods

Authors: Brent Ambrose & Maxence Valentin

Discussant: Tang Cheng Keat
ABFER 9th Annual Conference

School of Social Science
Division of Economics
NTU

May 22, 2022

NANYANG TECHNOLOGICAL UNIVERSITY

Overview

- Demand for public goods affected by property tax deductions on taxable income: Property tax deductions can $\uparrow$ demand for public goods; public goods $\rightarrow$ house prices $\rightarrow \uparrow$ property taxes
- Exploit the variation in the decline of property owners filing for deductions due to changes in federal tax codes driven by TCJA in 2017 $\rightarrow$ \$10,000 deduction limit on SALT $\rightarrow$ 61% $\downarrow$ in residents filing for tax deductions.
- Examine how the $\downarrow$ in % residents deducting property taxes influences demand for public goods. [10% $\downarrow$ in deducting residents $\downarrow$ 5.1% "Yes" votes for school spending]
- Examine the heterogeneous marginal effects of education spending on housing values for high & low deduction areas [+ (-) effects for high (low) deduction neighborhoods]
- Conclude that there is over- (under-) provision of public goods in low (high) deduction neighborhoods

NANYANG TECHNOLOGICAL UNIVERSITY

Overall comments

1. I have learnt a lot. A well written piece of work.
2. Important research question with policy implications to many fields, including tax design and provision of public goods.
3. Attractive & direct proposition to solve a difficult problem - equitable & efficient distribution to public goods using tax design.
4. Clean theoretical framework to link tax deductions to provision of public goods.
5. Externally valid research design incorporating nationwide data
6. Focus my discussion on the empirical parts. Main comments:
   - Testing of theoretical predictions with empirics can be improved.
   - First [voting] & Second [capitalization] section of the paper seems detached.

1: Endogeneity concerns over Capitalization tests

Comparative statics assumes an exogenous shift in parameters of interest, but the variable(s) of interest in the empirical tests are likely to be endogenous.

Empirical specification:

$$log(V_j) = \alpha_{m(j)} + \bar{\delta} Exp_j + \phi DedShare_j + X_j'\beta + \epsilon_j \quad (14)$$

and

$$\begin{aligned} log(V_j) &= \alpha_{m(j)} + \delta^{ND} Exp_j + \delta^{D}(Exp_j \times DedShare_j) \\ &\quad + \phi DedShare_j + X_j'\beta + \epsilon_j \end{aligned} \quad (15)$$

School spending (EXP_j) & % Deduction ($Dedshare_j$) likely to be correlated with: local factors & neighborhood characteristics. Requires exogenous variation in school spending to conclude whether public goods are efficiently provided & % Deduction to claim that Δ tax deductions can affect the efficiency in public goods provision. Tricky to test the theoretical predictions with existing empirical model.

Some tell-tale signs.....

Share of deduction highly correlated with median income and education levels.

Table A2: Correlation table

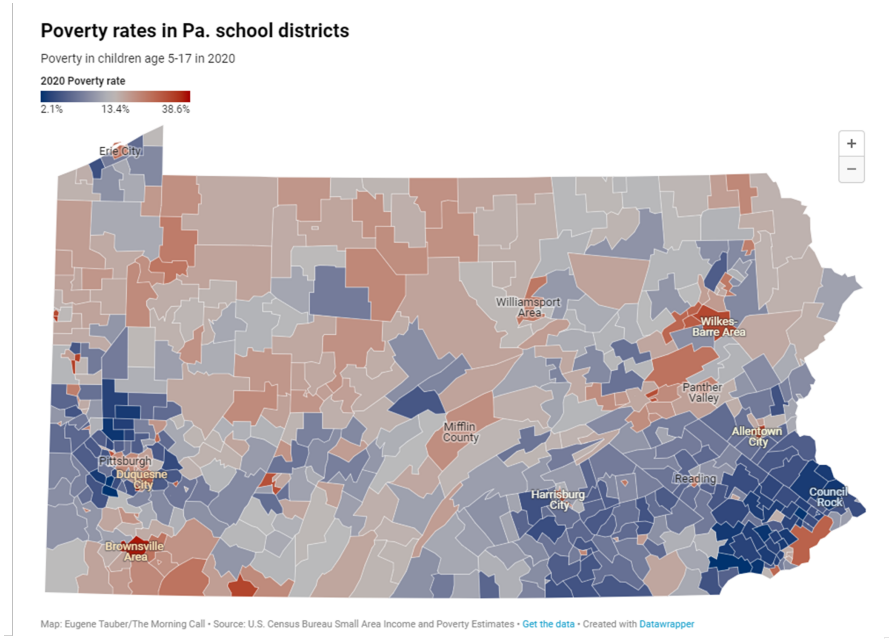
This table reports the correlation coefficients of the main variables used the main analysis. All variable

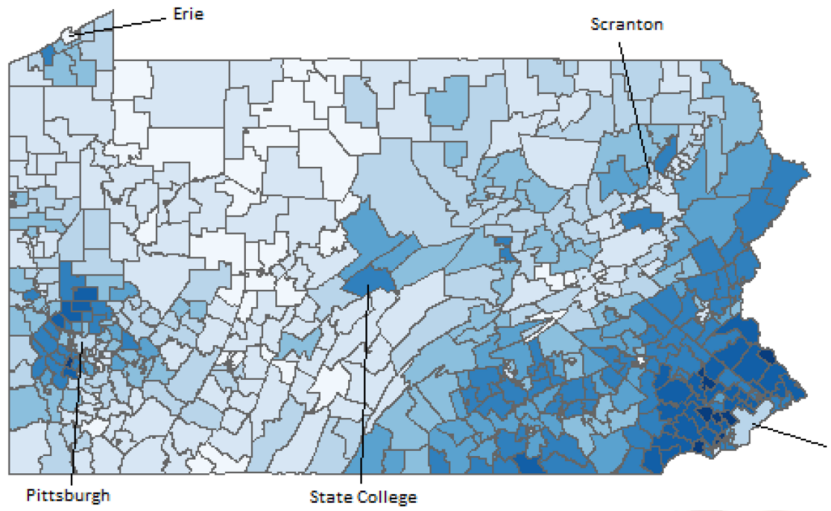
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) Median house value (000's)	1	0.551	0.081	0.121	0.647	0.022	-0.076	0.029	0.115	0.633
(2) Share of property deducters - DedShare (%)	0.551	1	0.018	0.154	0.803	0.408	-0.111	0.040	-0.085	0.774
(3) Number of pupils	0.081	0.018	1	-0.085	0.007	-0.116	0.057	-0.146	0.199	0.096
(4) Adjusted expenses per pupil (000's)	0.121	0.154	-0.085	1	0.163	-0.060	-0.226	0.210	-0.050	0.176
(5) Income median (000's)	0.647	0.803	0.007	0.163	1	0.515	0.020	-0.043	-0.106	0.809
(6) Home ownership (%)	0.022	0.408	-0.116	-0.060	0.515	1	0.034	0.062	-0.391	0.227
(7) Share of population less than 19 (%)	-0.076	-0.111	0.057	-0.226	0.020	0.034	1	-0.680	0.166	-0.106
(8) Share of population more than 65 (%)	0.029	0.040	-0.146	0.210	-0.043	0.062	-0.680	1	-0.321	0.037
(9) Share of minority (%)	0.115	-0.085	0.199	-0.050	-0.106	-0.391	0.166	-0.321	1	0.011
(10) Share population with bachelor degree (%)	0.633	0.774	0.096	0.176	0.809	0.227	-0.106	0.037	0.011	1

** P.S: This is clearly highlighted by the authors....

NANYANG TECHNOLOGICAL UNIVERSITY

Deductions are prevalent in richer neighborhoods and non-existing in poorer districts in Pennsylvania. [Not sure if this is the case in California] 61% in the deductions [driven by TCJA] could disproportionately come from richer neighborhoods?





NANYANG TECHNOLOGICAL UNIVERSITY

Some tell-tale signs.....

Police Spending	Dependent variable: log(house value)					
	(1a)	(1b)	(2a)	(2b)	(3a)	(3b)
Share of property deducters - ϕ	2.917***	2.893***	1.447***	1.453***	1.765***	1.772***
	(0.165)	(0.165)	(0.210)	(0.211)	(0.235)	(0.235)
Expenses per resident (standardized) - $\bar{\delta}$	−0.027***		−0.024***		−0.029***	
	(0.008)		(0.008)		(0.008)	

School Spending	Dependent variable: log(house value)					
	(1a)	(1b)	(2a)	(2b)	(3a)	(3b)
Share of property deducters - ϕ	0.656*	0.589	0.669**	0.610*	0.655**	0.592**
	(0.359)	(0.383)	(0.327)	(0.338)	(0.289)	(0.295)
Expenses per pupil (standardized) - $\bar{\delta}$	0.011		0.004		0.013**	
	(0.010)		(0.005)		(0.006)	

Negative (or Null) coefficients associated with police (school) spending and house prices: Less desirable neigborhoods spending more on crime & schooling $\rightarrow$ unobserved neighborhood characteristics correlated with spending and house prices. Previous literature attempts to identify exogenous variation in spending (Brueckner, 1982; Barrow & Rouse, 2004; Bayer *et al.*, 2020) when estimating HP regressions.

NANYANG TECHNOLOGICAL UNIVERSITY

Under or Over provision or something else?

Hence, positive correlation between capitalization & % deduction $\rightarrow$ is it capturing a higher WTP for school quality? Bayer *et al.* (2007) has shown, intuitively, that richer and/or more educated households have a larger WTP for better schools.

Table 7. Heterogeneity in Marginal Willingness to Pay for Average Test Score and Neighborhood Sociodemographic Characteristics

		Neighborhood Sociodemographics		
	Average Test Score +1 s.d.	+10% Black vs. White	+10% College Educated	Blk Group Avg Income + $10,000
Mean MWTP	19.69	-10.50	10.46	36.3
	(7.41)	(3.69)	(3.18)	(6.60)
Household Income (+$10,000)	1.38	-1.23	1.41	0.86
	(0.33)	(0.37)	(0.21)	(0.12)
Children Under 18 vs. No Children	7.41	11.86	-16.07	2.37
	(3.58)	(3.03)	(2.25)	(1.17)
Black vs. White	-14.31	98.34	18.45	-1.16
	(7.36)	(3.93)	(4.52)	(2.24)
College Degree or More vs. Some College or Less	13.03	9.19	58.05	0.31
	(3.57)	(3.14)	(2.33)	(1.40)

Note: The first row of the table reports the mean marginal willingness-to-pay for the change reported in the column heading. The remaining rows report the difference in willingness to pay associated with the change listed in the row heading, holding all other factors equal. The full heterogeneous choice model includes 135 interactions between nine household characteristics and fifteen housing and neighborhood characteristics. The included household characteristics are household income, the presence of children under 18, and the race/ethnicity (Asian, black, Hispanic, white), educational attainment (some college, college degree or more), work status, and age of the household head. The housing and neighborhood characteristics are the monthly user cost of housing, distance to work, average test score, whether the house is owner-occupied, number of rooms, year built (1980s, 1960-1979, pre-1960), elevation, population density, crime, and the racial composition (% Asian, % black, % Hispanic, % white) and average education (% college degree) and household income for the corresponding Census block group. Standard errors are reported in parentheses.

NANYANG TECHNOLOGICAL UNIVERSITY

Some remarks:

Therefore, it is strong statement to conclude that:

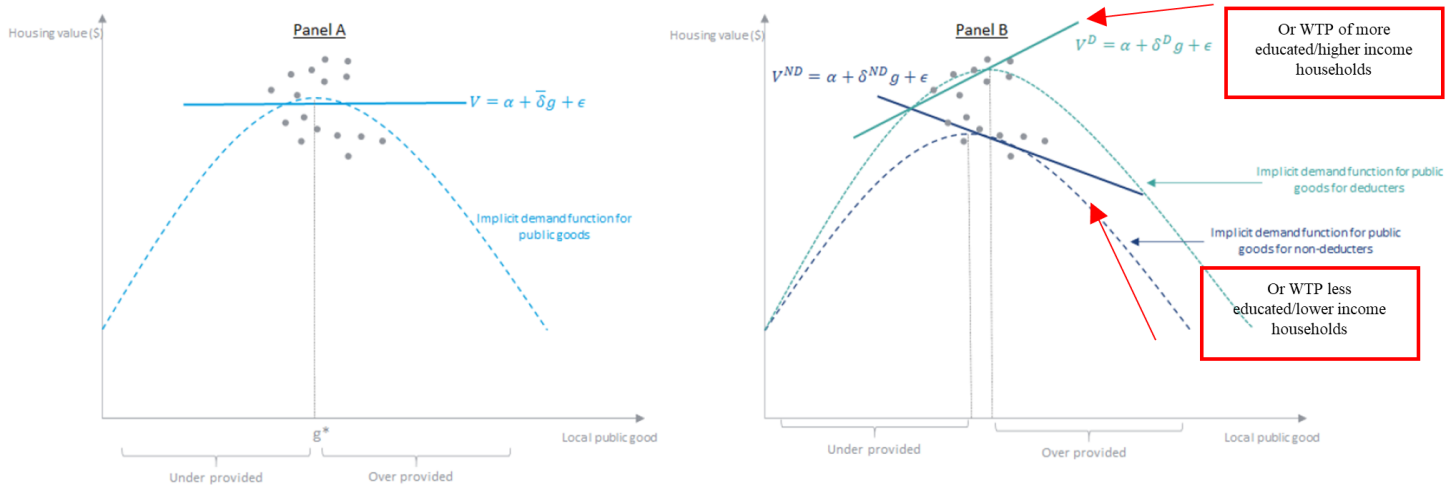
- negative (positive) capitalization = over-provision (under-provision) of public goods in neighborhoods without deductions (with deductions)
- no capitalization = efficient provision

My concern is...

- cross-sectional school spending & tax deductions $\rightarrow$ correlated with neigborhood/socio-economic factors.
- positive capitalization = larger WTP from more educated & richer households.
- negative capitalization = smaller/negative WTP from lowly educated & poorer households.
- Δ in deductions from TCJA $\rightarrow$ richest/most educated neigborhoods gets the biggest Δ in deductions. Could be too strong to claim that the variation driven by TCJA is exogenous.

If cross-sectional school spending is exogenous....

Figure 3: The implicit demand function for local public goods



Some suggestions:

1. Panel data to partial out time-invariant neighborhood characteristics that could be correlated with school spending and deduction share.
2. Instruments for school spending & deductions.
   - School spending: Barrow & Rouse (2004) $\rightarrow$ predicted school spending. Bayer *et al.* (2020) $\rightarrow$ school spending reforms. [Might need panel data]
   - Deductions: ??? Can we use the variation from TCJA? Problem is there is no spatial variation?
3. Tricky since the main variable of interest is the interactions of spending & deductions; can consider using a control function approach (Wooldridge, 2015). Interact exogenous variation of key variables (spending and deductions) , by controlling for endogenous variations (residuals of 1st stage).

NANYANG TECHNOLOGICAL UNIVERSITY

2: Empirical specification for school spending referendums

The current specification takes the following form:

$$WinningMargin_{j,t} = \alpha_j + \alpha_t + \gamma(ChangeDed_j \times Post_t) + X'_{j,t}\beta + \epsilon_{j,t} \quad (2)$$

If I am not wrong, *ChangeDed*$_j$ is time invariant measure of deductions between 2017 & 2018. Why adopt a level - change specification? Is this driven by data limitations?

- Do we expect existing changes in deductions have any effects on historical referendum winning margins? [Parallel Trend Test]
- I suggest restricting the analysis to the years of 2017, 2018 and 2019, including deductions in levels. Alternatively, can estimate a first - difference school district level regression.
- *ChangeDed*$_j$: Do we see the largest (smallest) changes in the richest (poorest) districts?

3: Aligning deduction & voting and capitalization analyses

- The two set of empirical analyses can be more compatible:
  - Different settings - Voting is on California while Capitalization is across US $\rightarrow$ consider repeating the analysis just for school districts in California.
  - Exploiting the variation in deductions from 2017 TCJA for capitalization analysis.
- Doing so could facilitate the discussion of results.
- Can consider discussing the economic implications of tax deductions using your estimates.

Concluding remarks

- Important paper with an interesting proposition. Theory is straightforward and clear.
- Novel to relate how tax deductions can influence the provision of public goods.
- Several (identification) problems were highlighted by the authors in the paper.
- Hard to interpret the results of heterogeneous effects [Section 5] if spending and deductions are endogenously determined.
- Improvement in empirics, with a focus on identifying exogenous variation in the 2 endogenous variables (spending & deductions), will make this paper much more convincing.

Reference List I

Barrow, Lisa, & Rouse, Cecilia Elena. 2004. Using market valuation to assess public school spending. *Journal of Public economics*, **88**(9-10), 1747–1769.

Bayer, Patrick, Ferreira, Fernando, & McMillan, Robert. 2007. A unified framework for measuring preferences for schools and neighborhoods. *Journal of political economy*, **115**(4), 588–638.

Bayer, Patrick, Blair, Peter Q, & Whaley, Kenneth. 2020. *A national study of school spending and house prices*. Tech. rept. National Bureau of Economic Research.

Brueckner, Jan K. 1982. A test for allocative efficiency in the local public sector. *Journal of public Economics*, **19**(3), 311–331.

Wooldridge, Jeffrey M. 2015. Control function methods in applied econometrics. *Journal of Human Resources*, **50**(2), 420–445.

NANYANG TECHNOLOGICAL UNIVERSITY