An Experimental Economics Investigation of the Land Value Tax: Efficiency, Acceptability, and Positional Goods

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Introduction

- Land Value Tax (LVT) or a Split Rate Tax (SRT) has been advocated by Economists since Henry George because they raise revenue for public good without distortions
- But LVT is rarely used partly because it is a tax on unrealized capital gains and it creates winners and losers
- The efficiency and acceptability of LVT is complicated by positionality of housing

Objectives

- First use of experimental/ behavioral economics to explore efficiency of LVT and the positional-goods characteristics of housing
- Using a simple majority voting process to test the acceptability of LVT
- Using heterogeneous induced values, the experiment examines how different groups behave both in terms of landed wealth and income wealth

Theoretical Model

- Households with heterogeneous preferences (a) allocate net income (after tax) between property improvement x_{it} and normalized consumption good y_{it} to maximize monetized utility:

$$: U_{it} = x_{it}^{a}\, y_{it}^{1-a}$$

$$\text{s.t.: } x_{it} + y_{it} = I_{it} - Tax_{it} + TR_{it}$$

- Property Value (PV) defined as the sum of land (LV) and improvement value (IV):

$$PV_{it} = LV_{it} + IV_{it}$$

- Improvement has an intertemporal effect on the household. Improvements accumulate to IV in next period without depreciation.

$$IV_{it} = IV_{it-1} + x_{it}$$

- Externality: Improvements to one property capitalize in neighbors' LVs because the neighborhood is now "nicer":

$$LV_{it} = LV_{it-1} + g\sum_i x_{it}$$

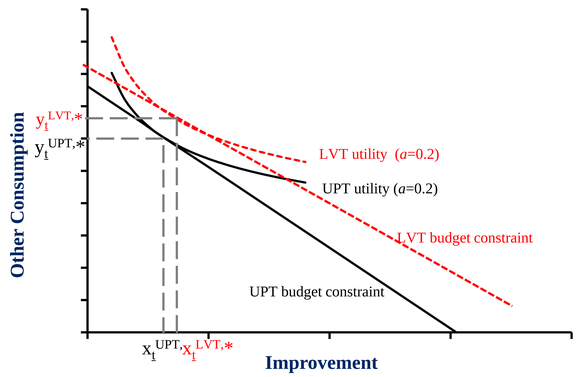
Tax Institution

- Uniform Property Tax (UPT): Same tax rate on LV and IV
- Split Rate Tax (SRT): Higher tax rate on LV and lower rat on IV
- Land Value Tax (LVT): No tax on IV and high tax on LV
- Revenue Neutrality rate set at t=0 and assume $\beta * LV_{i0} = IV_{i0}$ to get:

$$\tau_0(1+\beta) = \tau_L + \tau_I \beta = \tau_{LL}$$

- Tax return (Extra tax revenue returned to all 15 subjects equally):

$$TR_{it} = (Tax_{it} - Tax_{i0})/15$$



Experiment Data and Hypotheses

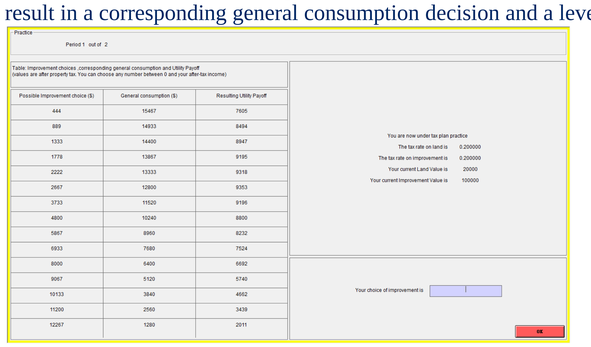
- 15 tablet computers were linked to an administrator computer using z-Tree software (Fischbacher 2007) at the University of Delaware Center for Experimental and Applied Economics

	Neighborhood Property Value and Income		
	Low	Mid	High
Property Value	$49,200	$78,000	$169,100
Land Value	$10,925	$17,320	$37,551
Improvement Value	$38,275	$60,679	$131,549
Income	$31,468	$49,930	$84,878

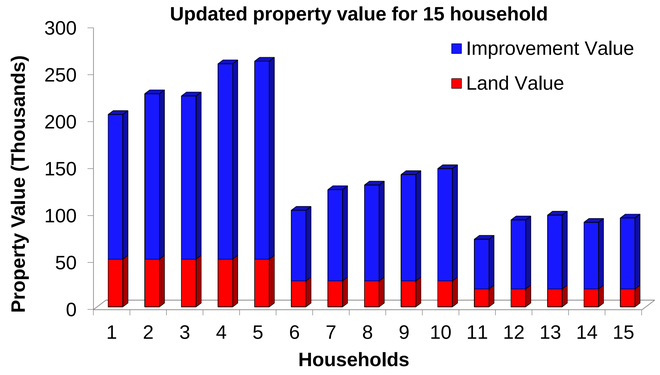
- Parameterization constructed using Harrisburg, PA, which uses SRT with a 6.0 ratio, where tax on land is 28.67 mills and on improvements is 4.78 mills
- 15 participants in each of 8 sessions (120 participants in total)
- 3 treatments in each session; 1 practice and 5 periods in each treatment

	UPT=1	*SRT*=1	*LVT*=1
Vote=1	I	II	III
PG-Graph=1	n.a.		
Vote=1	IV	V	VI
PG-Graph=0	n.a.	n.a.	
Vote=0	VII	VIII	IX
PG-Graph=1			
Vote=0	X	XI	XII
PG-Graph=0		n.a.	

- A calculation aid was a table of 15 possible improvement choices, each of which would result in a corresponding general consumption decision and a level of earnings



- To communicate the positional-goods elements, a graph of the evolved neighborhood constructed from real time data were displayed before starting the next period. Households in the same neighborhood starts with the same property value (same height of the bar)

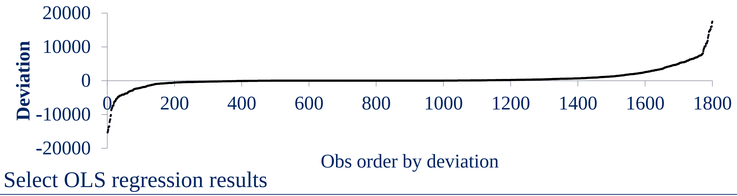


Results

- Hypotheses Testing

Hypotheses for LVT	Support in Simulation	Support in Experiment
LVT increases community investment (measured as property values) relative to UPT	Yes	Yes
LVT increases social welfare relative to UPT	Yes	No. LVT generated higher social welfare in one third of the experiment sessions
LVT increases investment in near term but this impact dissipates over time for the "low preference" owners	Yes	Yes. But "low preference" owners over-invested
Owners vote against (for) LVT when they observe higher (lower) tax compared to UPT	Yes	Some support, but some failures
LVT can generate sufficient tax revenue (tested as positive tax growth)	Yes	Yes
Owner tends to overinvest when they can observe their relative status in the neighborhood	No	Yes

- Significant over-investment (positive deviation) caused by positional-good elements



- Select OLS regression results

Variables of interest	Dependent variable and number of observations				
	Improvement (N=1,800)	Improvement (N=960)	Deviation (N=1,800)	Deviation (N=810)	Earnings (N=1,800)
LVT	1,341*** (337)	1,442*** (351)	450.1* (268.2)	413.1 (398.1)	-3.29 (100.36)
SRT	521* (302)	543* (287)	161.4 (264.9)	36 (372.3)	-19.90 (145.19)
PG-Graph	241 (222)	319 (287)	196.4 (194.1)	36 (372.3)	-94.19 (103.38)
LVT* PG-Graph	420 (395)	342 (418)	530.4* (292.0)	914.5** (467.0)	-0.41*** (0.04)
Deviation					0.11*** (0.03)
R^2	0.62	0.65	0.09	0.13	0.67

- Other regression results: Low preference households have significantly higher deviation to "catch up" with the high preference ones
- Suboptimal deviations (overinvestment) in earlier period also change the rational voting path in subsequent periods

Discussion and Conclusion

- LVT did not consistently produce the most efficient outcome, despite a design where the UPT were induced to generate slightly less welfare than LVT
- This seems to be driven by systematic over-improvement in LVT among low-improvement types. In other words, the capitalization externality and positional-goods characteristic of housing are exacerbated in the LVT and SRT treatments
- Participants did not reject LVT and SRT as often as expected

References:

- Bourassa, Steven C. 2009. "The Political Economy of Land Value Taxation." In *Land Value Taxation: Theory, Evidence, and Practice*, ed. Richard F. Dye and Richard W. England. Cambridge, MA: Lincoln Institute of Land Policy.
- Fischbacher, Urs. 2007. "Z-Tree: Zurich Toolbox for Ready-Made Economics Experiments." Experimental Economics 10 (2): 171-178.

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