

The Value of Land Use Patterns and Preservation Policies

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THE BIG QUESTIONS

- 1 How do different local land-uses get capitalized into home values?
 - 2 How do local preservation efforts impact home values?
- Much of a home's value derives from its location
 - How close to shopping?
 - How close to a park?
 - How dense is development in my neighborhood?

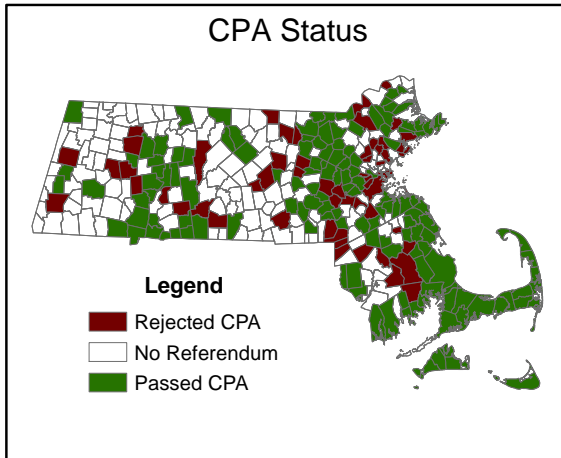
Massachusetts Community Preservation Act

- Massachusetts Law provides matching funds for property tax surcharge to meet three goals
 - Open-Space preservation
 - Historic Preservation
 - Community Housing
- Passed 2000, In Effect 2001
- Enacted (or not) at the town level
 - Two-stage approval process: town meeting and referendum
 - Surcharge up to 3%
 - Possible exemptions: low-income, first \$100K of value, commercial/industrial property
 - Once enacted, in place for at least 5 years

Massachusetts Community Preservation Act

- 142 Communities have enacted the CPA (out of 351 towns/cities)
- 58 Communities have rejected the CPA in referenda
- Average Surcharge 2.23%, 52% of communities set at 3%
- 75% exempt low-income; 79% exempt first \$100K of value, 3.5% exempt commercial/industrial
- No communities have withdrawn once enacted
- 3 communities have adjusted rate upwards
- Enacting communities largely suburban (not rural, not urban)
- Average distribution across uses: 35% Open Space; 22% Housing; 13% Recreation; 30% Historic

Massachusetts Community Preservation Act



Source: Community Preservation Coalition

What drives the passage of preservation referenda?

- Kotchen and Powers (2006, *JEEM*)
 - Open Space Provision a Normal Good
 - Most support in non-urban, non-rural areas

What are the effects of preservation referenda?

- Heintzelman (forthcoming, *Land Economics*)
 - Case Study approach
 - Looks at 4 towns, 2 adopters and 2 non-adopters
 - Open space a public good, preferred to other land-uses
 - No general treatment impact from CPA
 - Treatment impact heterogeneous in home value

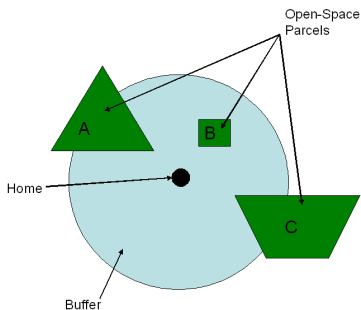
- Open Space generally has positive impact on property values
 - Magnitudes differ for different regions(McConnell and Walls, 2005)
 - Also heterogeneous within samples (Heintzelman, forthcoming)
 - Open-Space more valuable for higher value homes
 - Open-Space and private lots substitutes?
- Historic Preservation also generally positive, but small impacts (Mason, 2005)
- Limited Evidence on Affordable Housing (Nguyen, 2005)

This Study

- This study will use data for the entire state of Massachusetts to address the research questions
 - What is the effect of the CPA on property values?
 - How does local land-use impact property values?
- Data on every residential property transaction in the state for the period 2000-2007
 - Includes price, location, lot size, home size, and more
 - Use GIS to join local land use and zoning information, as well as CPA status
 - Also includes preliminary data on town-level CPA expenditures by category
- Regress observed sales price on home characteristics, local land use and zoning, and CPA status
- More than 600,000 observations

Measurement of Land Use

- Measure acres of different parcel types intersecting a 0.1 mile buffer around parcel centroid



- Endogeneity of Referendum Passage
 - Outside factor(s) affecting both CPA passage and property values
- Solutions
 - Fixed Effects
 - Take advantage of “pooled cross-section” data
 - Controls for any time-invariant local factors
 - Still in play - dynamic co-incident factors
 - Controlling for Dynamic factors
 - State-wide Year-dummies
 - Month dummies (seasonal effects)
 - Region/County-level price normalization
 - Town-level monthly unemployment rate

Full-Sample Results

	Regression 1	Regression 2	Regression 3
Dependent: Log(Normalized Sale Price)	Coef.	Coef.	Coef.
CPA Dummy	-0.017712**	-0.014293**	-
CPA Surcharge Rate	-	-	-0.006478**
Monthly Town-Level Unemployment Rate	0.005706**	0.004321**	0.004306**
Distance to Highway	5.016914**	3.092564**	3.092980**
Distance to Active Rail Line	1.393850**	1.592044**	1.592469**
Cropland (Acres)	0.000072†	0.000107**	0.000107**
Pasture (Acres)	-0.000135	0.001028**	0.001028**
High-Density Residential (Lots less than 1/4 Acre, Acres)	-0.000042**	-0.000054**	-0.000054**
Medium Density Residential (Lots 1/4 to 1/2 Acre, Acres)	-0.000039**	-0.000031**	-0.000031**
Low Density Residential (Lots more than 1/2 Acre, Acres)	0.000002	0.000073**	0.000073**
Commercial Land (Acres)	-0.000014	-0.000321**	-0.000321**
Industrial Land (Acres)	-0.000283†	-0.000205	-0.000205
Urban Open Space (Parks, Acres)	0.000096	-0.000197*	-0.000197*
Transportation (Roads, Highways, Rail Corridors/Stations, Parking, Acres)	-0.000105**	-0.000125**	-0.000125**
Waste Facilities (Acres)	-0.001467	-0.003337*	-0.003336*
Year Dummies	Yes	Yes	Yes
Month Dummies	Yes	Yes	Yes
Fixed Effects Level	Census-Block	Block-Group	Block-Group
Number of Obs	623163	623163	623163
Adj R-squared (Within)	0.2946	0.3687	0.3687

Significance levels : † : 10% * : 5% ** : 1%

Summary of Results

- CPA passage *reduces* normalized sales prices by 1.5% on average
- House Characteristics have expected sign and are significant
- Land-use terms mostly of expected sign
 - Cropland/Pasture (mostly) positive
 - Commercial/Industrial/Transport/Waste negative
 - High and Medium density residential negative
 - Urban parks, surprisingly negative
 - Maybe negative congestion effects
- Scale of fixed effects matters, mostly for significance
 - Not enough variation within blocks
- Unemployment Rate positive?
 - Positive result mostly robust to alternative specification, dependent on scale of fixed effects
 - CPA results ARE robust to dropping/changing unemployment specification

Repeat Sales Model

- Restricting sample to only homes that sell more than once in sample
- Fixed Effects control for ALL UNOBSERVED property/town/region characteristics
- CPA reduces normalized prices by 1.3%
 - Consistent with full sample results
- Unemployment still positive

- Alternative Specification: Surcharge Rate
 - A 1 percentage point increase in the surcharge lowers normalized prices by .65%
- Interaction Terms
 - County Interactions suggest heterogeneity in CPA effect
 - Positive in Hampshire, Nantucket, and Plymouth Counties; Negative in Middlesex and Norfolk Counties
 - Land-Use Interactions
 - High-Density Residential and Industrial Land have positive effects on referendum effect
 - Low-Density Residential has a negative effect on referendum effect
- Spending Variables
 - Including Total Spending moderates effect on dummy variable, still negative significant
 - Total Spending negative, significant, Quadratic Positive
 - Shares to different uses insignificant
 - Some evidence that Affordable Housing Expenditures particularly negative

Interpretation of Results

- Treatment effect
 - Median additional annual tax is \$112 (Present Value \$2,352 at $r=5\%$)
 - Median impact on normalized price is \$1,991
 - Implies 85% capitalization of tax increase
- Why passing given decline in values?
- Might explain why fewer than half of towns have passed
 - Heterogeneity (median voter?)
- Land Use Results
 - Experiment - Convert 1 acre of Pasture to:
 - Commercial - Reduce Price \$178.50
 - Industrial - Reduce Price \$164.09
 - Waste - Reduce Price \$578.14

- Increase buffer size
 - Check robustness to varying this factor
- Spatial Econometrics
- Instrumental Variables Approach
 - Potential Instrument: Political Party Registration
- Possible Regression Discontinuity Approach