

# **Property Taxation and Forest Fragmentation in Kentucky Watersheds**

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# Outline

- Watershed Parcelization
- Property Taxation
- Survey Results
- Implications
- Conclusions

# Purpose

- Identify Forest Land Assessment Methods
- Determine How Tax Bills From Various Methods Influence Forest Finances



# Introduction

- Land use patterns changing
- Ownership pattern changes
- Forest health changes
- Environmental services being lost

# Environmental Effects of Fragmentation

- Environmental services
  - Carbon sequestration, greenhouse gas regulation, hydrologic functions, erosion control, nutrient cycling
- Water quality concerns
  - Ownership patterns around watersheds
  - Increased demand for water resources
  - Increased run off volume from development

# Water Quality Importance

- Drinking water for 180 million people in U.S. (Stein et al. 2002)
- Wetlands house over 55 % of the threatened and endangered species in the U.S. (Ulack et al. 1998)
- Buffer strips are not enough (Houlahan 2003)
- Contiguous forests needed to maintain wetland integrity

# Critical Watersheds

- 15 watersheds in U.S. expected to experience increased development and fragmentation
- 2 located in Kentucky
- Green River and Lower Cumberland River  
(Stein et al. 2002)

# Forest Conversion in Kentucky

- 137 acres converted from forestland to other uses each day between 1988 and 2003

(Kentucky Environmental Quality Commission 2005)

# Influences on Conversion

- Land ownership patterns are dynamic
- Continuous industry divestiture. Over 23 million acres in the last 5 years (Wilent 2004)
- Property value and development pressure increase with proximity to urban areas

# Future Influences on Conversion

- 90 million acres of forest land were owned by people of age 65 (Sampson and DeCoster 2000)
- Expected to see major changes by 2030
  - 21.7 million acres shift from rural to urban
  - 22.5 million acres shift from rural to exurban (Stein et al. 2002)

# Tax Concerns of Forest Landowners

- Surveys of private forest landowners
  - Property tax reductions primary concern in Midwest (Baughman et al. 1998)
  - Property tax reductions second to income tax relief in Southeastern states (Megalos and Cabbage 2000)

# Kentucky Property Tax

- 1960s system: Property assessment made on FMV of land and timber
- Current system: Modified use assessment for agricultural land

# Agricultural Use Guidelines

- Developed by the Farm Service Administration
  - Based on crop or land rents
  - Capitalized at 10.18%
  - \$50 rent equals an assessed value of \$491.16

# Survey Objectives

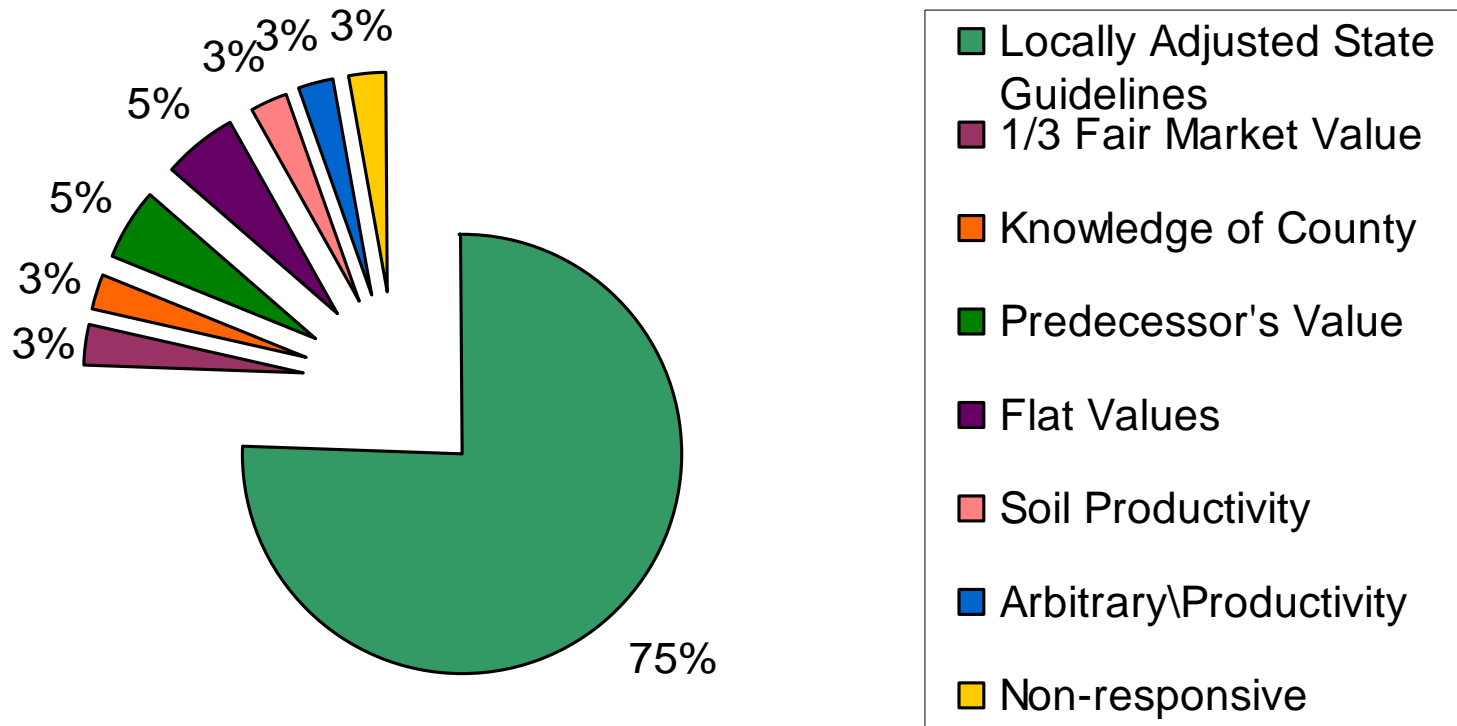
- Identify forest land assessment methods in the 37 counties of two critical watersheds in Kentucky



# Survey

- Interviews
- Obtained 2005 Assessed Value
- Obtained 2005 Property Tax Rates
- Identified Assessment Methods

# Summary of Assessment Method Groups



# Tax Values and Rates

- Assessed values ranged from \$95 to \$500 per acre with an average of \$166
- Recommended values ranged from \$90 to \$120 per acre with an average of \$111
- Tax rates ranged from 0.00513 to 0.0093 per \$100 of assessed value with an average of 0.00641

# Implications of Assessment Methods

- Calculate net present value (NPV) for each method group
- Perform regression sensitivity analysis on variables
- Break even analysis
- Conclusions

# NPV: Property Tax

- Use average assessed value for each method group
- Use average tax rate of 0.00641

# NPV: Assumptions

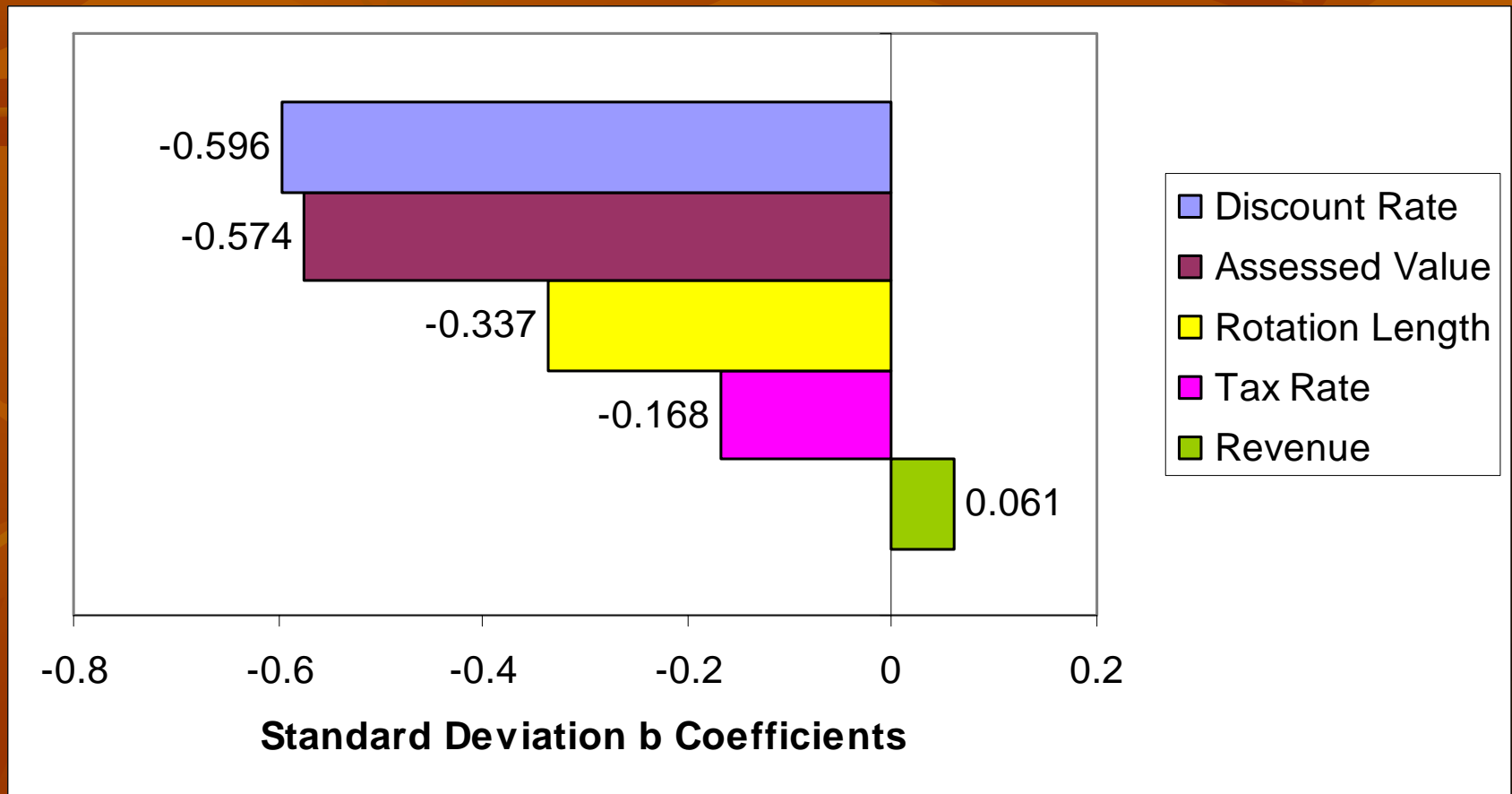
- Volume estimates from FIA data
- Volumes grouped into site productivity classes
- Timber prices
- Rotation length 60 years
- Discount rate 5% real
- No price appreciation

# NPV: Results

Valuation Method	Net Present Value by Site Productivity Class (\$)		
	Good	Average	Poor
Locally Adjusted State Guidelines	17.08	6.08	3.18
1/3 Fair Market Value	-27.95	-38.95	-41.85
Knowledge of County	-15.81	-26.81	-29.71
Predecessor's Value	9.97	-1.03	-3.93
Flat Values	9.97	-1.03	-3.93
Soil Productivity	11.49	0.49	-2.41
Arbitrary\Productivity	-27.95	-38.95	-41.85

# Sensitivity Analysis

## Regression Sensitivity for NPV



# Break Even Analysis

- Good Site      \$269.68
- Average Site   \$179.02
- Poor Site      \$155.12

# Results

- Forestry may not be a profitable land use under the assumed conditions with current property tax assessment methods

# Conclusions

- Assessment methods and values vary considerably
- Values based on adjusted state guidelines produced consistently positive NPV
- Property taxes can be a disincentive for forestry as a land use
- Need for uniform, fair assessment methods

# Literature Cited

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*“The wisdom of man never yet  
contrived a system of taxation that  
would operate with perfect equality.”*

*~ Andrew Jackson*