Tax Sensitivity and Bond Valuation

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1. Motivation

- Municipal bond market, valued at over $4 trillion USD, is critical for local services and school districts.
  - Property tax is the largest revenue of local governments.
  - Common assumption: House price growth = Property tax growth → House price growth shapes municipal bond spreads.
  - In real world: House price growth ≠ Property tax growth, because property tax is based on assessment values, and tax rate varies.

2. Research Question

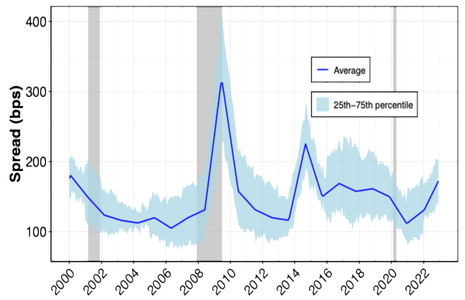
How does property taxation shape fiscal risk and municipal bond yield spreads of local governments?

3. Main Findings

1) On average, local governments adjust property taxes by smaller magnitudes than growth in house prices.
   - Average 1 pp change in house price growth → 0.4 pp change in property tax growth.
   - Change in property tax growth varies across cities, counties, and school districts; Min 0.01 pp, Max 2.89 pp.
   - I examine *sensitivity* of local government's property tax growth w.r.t. local house price growth.

2) Higher sensitivity increases municipal bond yield spreads by 23 bps.
   - Compared to average spreads of 143 bps, sensitivity increases spreads by 16%; Equivalent with downgrade from AAA → BBB.
   - Results are pronounced in economic downturns:
     - Δ House price ↓ 1 pp → Δ Property tax ↓ 0.4 pp → Municipal bond spreads ↑ 37 bps.
     - Δ House price ↑ 1 pp → Δ Property tax ↑ 0.3 pp → Minimal effect on municipal bond spreads.

Fig 1. Average Muni Bond Spreads

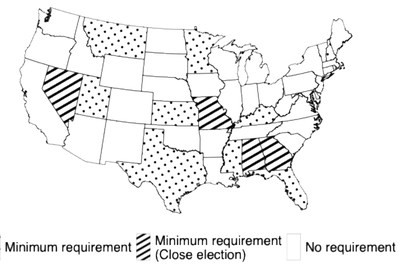


1) Municipal bond spread >0
   → Municipal bond is risky.

2) XS dispersion in muni bond spreads.
   → Local gvts face different risks.

5. School Districts Dampen Sensitivity

- State-level regulations require school districts to levy more than minimum amount of property tax revenue, where the minimum amount varies across states and applies only to school districts.



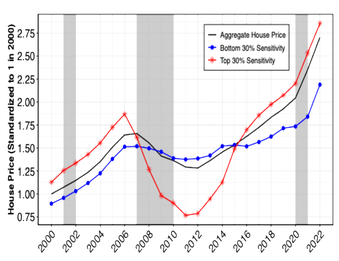
- School districts' property tax is protected in downturns.
  → Low sensitivity → Low Spreads.
- Causality: similar sensitivity for states that passed vs failed the law on close margin.

4. Measuring Sensitivity

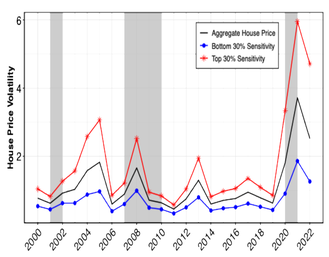
$$\Delta \mathrm{PT}_{it} = \gamma_i \Delta \mathrm{HP}_{it} + \nu_i C_{it} + \delta_t + \epsilon_{it}$$
$$\mathrm{Spread}_{bit} = \lambda \widehat{\gamma_i} + \eta_i Z_{bit} + \delta_t + u_{it}$$
$$\Delta \mathrm{HP}_{it} = \phi \Delta \mathrm{HP}_t^{national} \times \mathrm{Elasticity}_i + \delta_t + \nu_{it}$$

- Local government i, Municipal bond b, Year t.
- $\Delta \mathrm{PT}_{it}$ property tax growth, $\Delta \mathrm{HP}_{it}$ house price growth.
- γ_i : Sensitivity of local gvt's property tax growth w.r.t local house price growth.
- $\lambda > 0$: Sensitivity increases muni bond spreads.
- Causality: Conditional on demand shocks ($\Delta \mathrm{HP}_t^{national}$), local areas with low supply elasticity show larger responses in $\Delta \mathrm{HP}_{it}$ (Saiz, 2010; Baum-Snow and Han 2024; Guren et al., 2021).

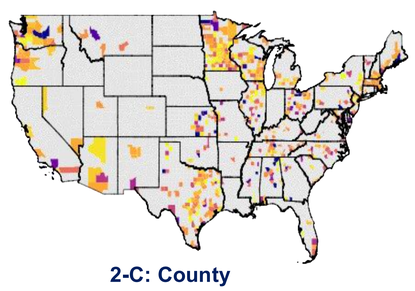
Fig 2. Variations in Sensitivity



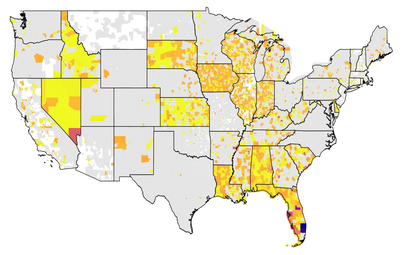
2-A: Level of House Prices



2-B: Volatility of House Prices



2-C: County



2-D: School district

- (2-A,B): High-sensitivity:
  - Larger ↓ in house prices in downturns.
  - Higher ↑ in volatility of house prices.
- Low sensitivity: neither ↓ in level, nor↑ in volatility.
- (2-C,D): School districts' sensitivities are smaller than counties.
  - School districts are protected by state-wide regulations.

6. Counties are unable to raise property tax if:

1) They face ceilings on increasing assessment values.
- Muni bond spreads are the largest in binding ceilings.
  - Local governments are in states where ceiling is:
  - Binding (B), Exists (C), Not exist (N):
  - (B): 49 bps ↑ in spreads due to sensitivity.
  - (C): 28 bps ↑, (N): 7 bps ↑.
2) Counties did not reassess for a long time.
   - House prices ↑, but property tax remains the same.
     → Municipal bond spreads ↑
   - Policy Change: CT, DE, PA, MS enacted reassessment on a regular cycle.
     → Property tax revenue ↑ first year of the reform.
     → Municipal bond spreads ↓