Discussion of

"How Do Households Value the Future? Evidence from Property Taxes"

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Disclaimer

The views expressed herein are those of the authors, and should not be attributed to the Bank of England.

1 Summary of the Paper

- Estimation of nominal net of growth discount rates.
- Using UK data on:
  - Council tax differences across councils.
  - Housing transactions:
    - Spatial dimension.
    - Time dimension.
    - Quality dimension.
- Question: Value difference = PDV of tax difference (c.p.)?
- Main result:
  - 3.7% net (of growth) nominal discount rate.
  - 7.5% gross nominal discount rate.
  - Lower discount rates for more "sophisticated" and richer borrowers.
- Comparison: Close to market borrowing rates.
- Conclusion: Households are rational and optimizing.

2 Simple Tax Analytics

- Assumptions for derivations:
  - 1 period $=$ 1 year.
  - Nominal interest rate i is constant.
  - Nominal land rental value y_t:
    - Available at year-end.
    - Grows at the constant nominal rate n^y.
    - Real growth rate g^y.
  - Nominal taxes τ_t:
    - Due at year-end.
    - Grow at the constant nominal rate n^τ.
    - Real growth rate g^τ.
  - Public goods financed through taxes p_t:
    - Available at year-end.
    - Grow at the constant nominal rate n^τ.
    - Real growth rate g^τ.

- Other assumptions of the paper:
  - τ is lump-sum $\Rightarrow$ does not directly affect y_t.
    - τ is not proportional to land asset values V_t.
    - τ is not proportional to land rental values y_t.
  - Ratio of marginal utilities $\lambda_{t,t+s}$ can be set to 1.
  - Tax capitalization ratio β need not equal 1.
  - It is acknowledged that higher τ_t can lead to higher p_t.
  - Fixed housing supply: Land, not structures.
  - Literature: Real estate value changes mainly driven by land.
- Ignore risk premia: Cannot be identified separately from expected growth.

- Value of land from a standard land Euler equation (not for structures!):

$$\begin{aligned} V_t &= \sum_{s=0}^{\infty} \lambda_{t,t+s} \frac{y_{t+s} - \beta\left(\tau_{t+s} - p_{t+s}\right)}{(1+i)^{s+1}} \\ &\approx \sum_{s=0}^{\infty} \left(\frac{y_t \left(1+n^y\right)^s}{(1+i)^{s+1}} - \frac{\beta\left(\tau_t - p_t\right)\left(1+n^\tau\right)^s}{(1+i)^{s+1}} \right) \\ &= \frac{y_t}{i-n^y} - \frac{\beta\left(\tau_t - p_t\right)}{i-n^\tau} \approx \frac{y_t}{r-g^y} - \frac{\beta\left(\tau_t - p_t\right)}{r-g^\tau} \end{aligned}$$

- In the notation of the paper:
  - Land asset values ($r_H = r - g^y = i - n^y$, $r_T = r - g^\tau = i - n^\tau$):

$$V_{i,t} = \frac{\pi H_{i,t}}{r_H} - \frac{\beta\left(T_{i,t} - P_{i,t}\right)}{r_T}$$

  - Land rents $R_{i,t} = V_{i,t} r_H$:

$$R_{i,t} = \pi H_{i,t} - \beta \frac{r_H}{r_T} T_{i,t} = \pi H_{i,t} - \tilde{\beta}\left(T_{i,t} - P_{i,t}\right)$$

3 Estimation I: Capitalization Ratio

- Estimating β from rents:

$$R_{i,t} = \pi H_{i,t} - \tilde{\beta} T_{i,t} + f\left(P_{i,t}\right) + \phi_{\kappa bt} + \omega_{i,t}$$

- No time differencing due to limited data.
- Spatial differencing using boundary effects b and public spending $P_{i,t}$.
- Result 1: $\tilde{\beta} = \beta r_H / r_T$ not statistically different from 1.
- Result 2: Inner London $r_H = 3.0\%$, very close to estimated r_T (see below).
- Implication: $\beta = 1$ is a reasonable assumption.
- The literature does not contradict this strongly.

4 Estimation II: Discount Factor

- Interjurisdictional equation:

$$\Delta V_{i,\tilde{t}} = -\frac{\beta}{r_T}\Delta T_{i,\tilde{t}} + \phi_{\kappa b\tilde{t}} + \Delta\omega_{i,t} + \frac{\Delta\pi_{\tilde{t}}}{r_H}H_{i,t} + \frac{1}{r_P}\Delta f(P_{i,\tilde{t}})$$

- Estimate in differences to eliminate unobserved characteristics:
  - Impossible to fully know $H_{i,t}$.
  - $\Delta\pi_{\tilde{t}} =$ change in preferences for attributes (size, age, open space).
- Estimate at LA boundaries to eliminate public spending benefits:
  - Relative $P_{i,t}$ goes to zero at the boundary. Non-excludable.
  - But with $\Delta f(P_{i,\tilde{t}})$ test this more directly. $f =$ polynomial.
- Fixed effects $\phi_{\kappa b\tilde{t}}$:
  - $\kappa =$ tax band (8 bands).
  - $\tilde{t} =$ pair of years when property sold (2.3 million pairs).
  - $b =$ boundary between a pair of local authorities (326 LAs): 1km-2km.

- Interjurisdictional estimation result:
  $r_T = 3.7\%$ and $n^\tau = 3.8\%$ (data) $\Rightarrow i \in [3.7\%, 7.5\%]$.

- Intrajurisdictional estimation result:
  $r_T = 2.9\%$ and $n^\tau = 3.8\%$ (data) $\Rightarrow i \in [2.9\%, 6.7\%]$.

- Why the ranges?
  - $P_{i,t}$ tightly comoves with $T_{i,t}$.
  - If it's valued the same, tax growth has no net effect on values.
  - Question: Does that not contradict the estimation specification?
- Comparison opportunity cost rates range: $i \in [3.8\%, 5.7\%]$:
  - Risk-free rate: 3.8%.
  - Fixed mortgage rate: 4.4%.
  - Variable mortgage rate: 5.7%.

- Time pattern:
  - Close comovement until 2008 at lower end of range (i.e. incl. $P_{i,t}$).
  - Discount rates remain flat after 2008.
  - But market rates drop a lot.
  - Hypothesis: Due to 2008 downward revision in expected tax growth n^{τ}.
  - Question: Does that not require upward revision of pre-2008 n^{τ}?

- Cross-sectional pattern: Lower discount rates for
  - More "sophisticated" borrowers.
  - Richer borrowers, e.g. without mortgage finance.

5 Comments

- This is a published paper:
  I am sure the empirical part has been put through the grinder.
- The issue here is rationality and optimal behavior:
  - 1 pp difference b/w discount rate and opportunity cost would be large.
  - The range of estimates presented covers 4 percentage points.
  - So results are suggestive but not conclusive concerning optimal behavior.
- Why do we not look only at the upper end of the range?
  - The estimation specification has 2 controls for the effects of spending.
  - Any residual effect should therefore be purely due to taxes.
  - Unless the idea is that there is spatial variation inside each LA: Spending does matter away from the boundary.
  - If that is the idea, it should be spelled out.
  - At the upper end of the range, buyers discount the future by too much.
  - How do we interpret that?

- Some more corroboration:
  - Kumhof, Tideman, Hudson and Goodhart (2022) on land value taxation.
  - Versions of this paper exist for the US and the UK.
  - UK after-tax return to land in 2018: 4.2%.
  - This falls within the range of this paper.

- Bottom line:
  - Very valuable contribution to the literature.
  - My only major comment:

    I would like a bit more help concerning which part of the considerable range for implicit discount rates I should pay most attention to.

THANK YOU