Discussion of Babina et al (2015)

"Heterogenous Taxes and Limited Risk Sharing: Evidence from Municipal Bonds"

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Lorenz Kueng

Northwestern and NBER

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- **Research question:** How does market segmentation/ ownership concentration affect the sensitivity of asset prices (returns) to various shocks
- **Problem:** Ownership choice (portfolio) depends on expected returns and hence is endogenous
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The paper contains a lot of information, so I will use my time to

- provide a Mickey Mouse version of what (I think) is going on
- use it to suggest how the paper could be further improved

Mickey Mouse version of paper. Let

- $\bar{r}_s$ be the expected return on muni bonds issued by/in state s,
- $shock_s$ be a shock to the state's bond market (more below),
- seg_s be the degree of bond market segmentation of state s (inverse of risk-sharing)

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1. need to **find exogenous shocks** to the bond market
2. **Endogenous** seg_s**:** need to solve the endogeneity issue of the return sensitivity to market segmentation
   - We know that the portfolio choice of an investor – i.e., seg_s – depends on the expected return ($\bar{r}_s$) and on the risk. The risk in turn depends on how sensitive the return is to shocks, which in turn affects expected returns in equilibrium...

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$\Rightarrow$ this is difficult!!!

Solutions: Two approaches come to mind

1. **specify a model** of portfolio choice with endogenous market segmentation, which provides reduced-form equations that map returns $\bar{r}_s$ to primitives, for which we have to find proxies in the data
2. **find an instrument** that varies market segmentation without affecting expected returns directly

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and the paper in fact does (sort of) both!!

Let me focus on the IV approach first since I think my comments are most useful for this part (and come back to the model later if I have time)

IV Approach

Idea: Need to argue that **variation in income tax exemptions for in-state investors** happens for exogenous reasons unrelated to bond returns, e.g., since local governments don't understand issue

Two sources of **variation**

1. **over time**
    a. some states change tax rates (intensive margin)
    b. some states change tax-exemption status (extensive margin)

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Two sources of **variation**

1. **over time**
   a. some states change tax rates (intensive margin)
   b. some states change tax-exemption status (extensive margin)
2. **across states**
   a. states with higher tax rates induce more ownership concentration (intensive margin)
   b. some states don't discriminate between in- and out-of-state investments (extensive margin)
      - because they exempt both (e.g., Idaho, Ohio, Pennsylvania)
      - because they tax both investments equally (e.g., Illinois, Utah)
      - because they don't have an income tax (e.g., Florida, Texas)

Note: There seem to be some misclassifications in Table 2

- None of these seem to be a slam dunk for an instrument
  - Typically they are used as IVs at the individual level, but here we use them at the local market level
  - However, **some variation is more likely endogenous**. In particular, **choice of exemption status** is probably not made without thinking about expected return/interest expenses
- **Case studies** of why some states choose different tax exemptions (extensive margin) would be useful
  - **Tennessee** (not included) would be another interesting case as it has an income tax only for unearned income (interest + div)
- Alternatively, one could try to **isolate motivations** for changes in tax rates (and exemption status) say by using a **narrative approach** similar to Romer and Romer (AER 2010) and classify changes as endogenous or exogenous (orthogonal)

Why am I emphasizing this?

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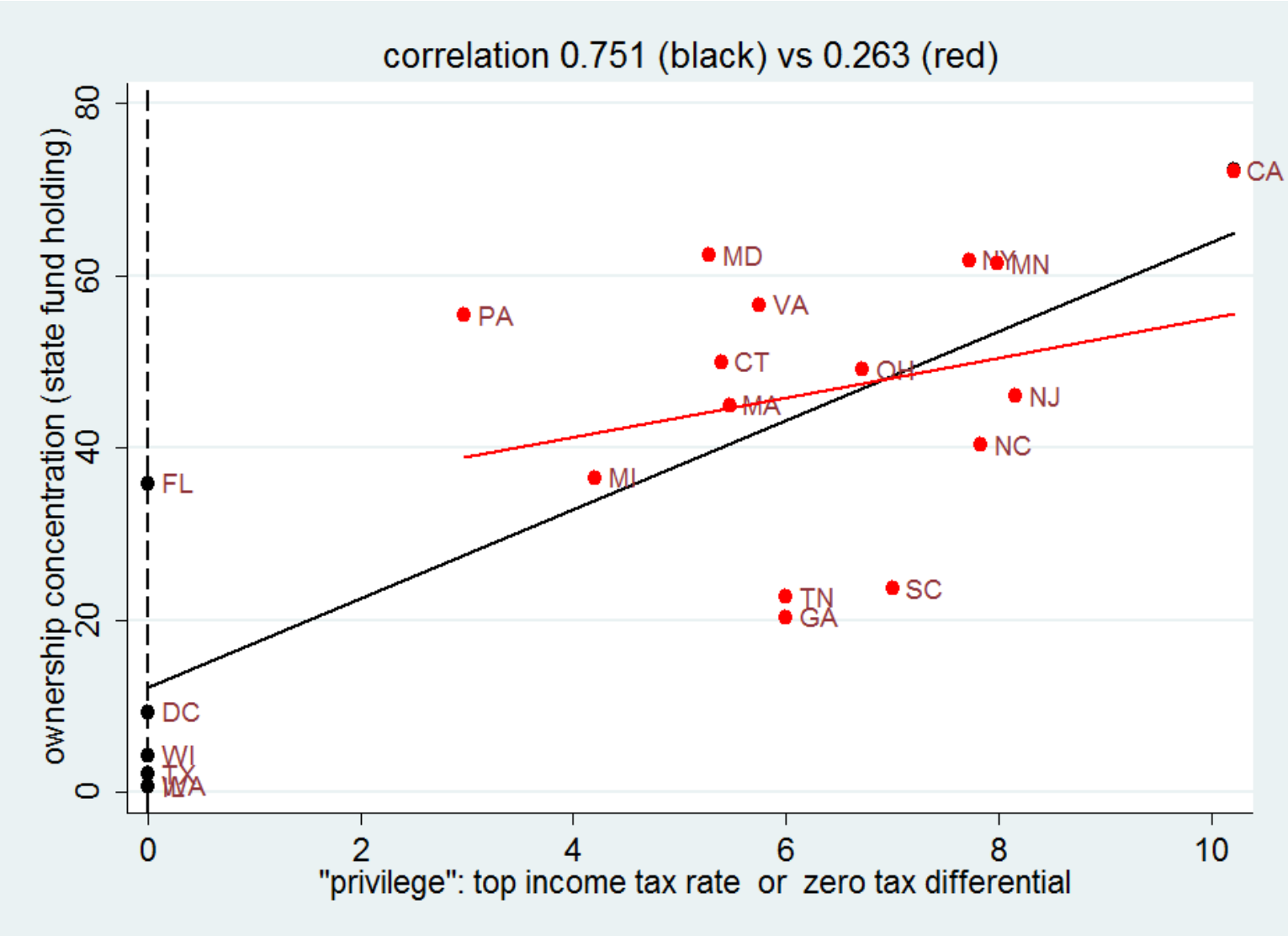

(data taken from Table 2, roughly replicating Figure 3)

1st stage:

```
. reg SFH privilege

------------------------------------------------------------------------------
         SFH |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   privilege |    5.18142   1.045737     4.95   0.000     2.992668    7.370172
       _cons |   12.10841   5.898805     2.05   0.054    -.2379272    24.45476
------------------------------------------------------------------------------

. reg SFH privilege if privilege>0

------------------------------------------------------------------------------
         SFH |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   privilege |   2.314997   2.359244     0.98   0.344    -2.781839    7.411833
       _cons |   31.91532    15.7463     2.03   0.064      -2.1025    65.93314
------------------------------------------------------------------------------
```

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1. Need to **identify exogenous shocks**
   - Paper uses 3 (!) shocks
     - idiosyncratic risk (σ_s), proxied by close elections
     - supply shock (S_s)
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   - **Issues:**

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   - **Issues:**
     - Each shock would need a careful **discussion of the exclusion restriction**, which is minimal in the paper. Personally, I would prefer focusing on one shock that is well identified
     - Should **show that proxy actually works** whenever possible

       – E.g., show that close election periods are indeed associated with higher return volatility and hence are a shock to σ_s

       – Could use muni transaction **data from MSRB** at higher frequency to measure monthly/quarterly return volatility, say for most liquid state bonds

2. Specification of regressions

- **OLS**

$$\bar{r}_s = \beta_{sh}^{ols} \cdot (shock \times SFH) + \beta_s \cdot shock + \beta_h^{ols} \cdot SFH + u$$

  - *SFH*: fraction held by state bonds = proxy for segmentation
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- **IV**
  - 1st stage: $\widehat{SFH} = \hat{\gamma} \cdot \tau$
  - 2nd stage:

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Currently, the paper instead interacts the instrument with the endogenous variable (column 4 of Tables 4, 6, 7)

$$\bar{r}_s = \beta_{sh} \cdot (shock \times SFH \times \tau) + \beta_s \cdot shock + \beta_h \cdot SFH \times \tau + u$$

Moreover

- I didn't follow why variables are turned into indicators, especially the IV
- and most specifications omit main effects, hence results are hard to interpret

Structural Approach

- Model uses mean-variance preferences $\Rightarrow$ closed-form solutions for return sensitivity
- Model yields expressions for response heterogeneity in terms of the other two fundamental shocks. Example: $\frac{\partial \bar{r}_s}{\partial \sigma_s^2} = \delta \cdot S_s / W^i$
  - The authors provide a plausible proxy for $\mathbf{S_s/W^i}$, which thus **takes on the role of the instrument above**
- This yields the regression specification

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- Instead, the paper uses (column 5 in Tables 4,6,7)

$$\begin{aligned} \bar{r}_s \quad = \quad & \beta_{sh}^{ols} \cdot (shock \times S_s/W^i) + \beta_s \cdot shock + \lambda_1 \cdot shock \times SFH \times \tau \\ & + \lambda_2 \cdot (SFH \times \tau) \times S_s/W^i + \lambda_3 \cdot (SFH \times \tau) + u \end{aligned}$$

I'm confused... Why does the endogenous SFH reappear in this regression?

Takeaways

- This is an interesting paper and I enjoyed reading it!
- It's ambitious with many moving parts
- It requires a little more work
- It's hard to find totally credible instruments for such questions (although I do like the Florida case)
- Much of the hard work has already been done

  $\Rightarrow$ I encourage the authors to focus on the empirical implementation

THANK YOU!