Tax and Transfer Progressivity at the US State Level

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Federal vs. State & Local Redistribution

- Federal income tax and transfer system is progressive
  (Guner et al. 2014, Heathcote et al. 2017, Ferriere and Navarro 2020, ...)

- Less research on progressivity at state & local level

- State & local tax revenue is large: 7% of GDP
  - Federal income taxes: 8%
  - Social security taxes: 6%

- State & local taxes include sales and property taxes
  - Standard claim: sales and property taxes are regressive
This Paper

Questions:

• How do state & local taxes and transfers contribute to redistribution across US households?

• How much does progressivity vary across states?

• What accounts for this heterogeneity?

• Has state & local progressivity changed over time?

Methodology:

• Measure progressivity of state & local taxes + transfers

• Combine household surveys, augment with gov’t statistics
Data Sources and Sample Selection

- Main data source: ASEC ("CPS March Supplement")
  - Unit of observation: household
  - Focus on labor force:
    1. Age of household head between 25-60
    2. One spouse has earned income > part-time * min. wage
       (Share of hhs dropped by income requirement: 4.1%)
- Years: 2005/06, 2010/11, 2015/16
- **Pre-government income**: wages & salaries + business & professional practice + farming + interest + dividends + rents & royalties + private transfers + realized capital gains
- **Post-government income**: Pre-government income + Transfers - Taxes
- Supplement high income households with IRS SOI data
Data Sources for Taxes and Transfers

- Income taxes: Census Bureau tax model + SOI for the top

- Transfers:
  - Self-reported in ASEC, except Medicaid (impute using modified algorithm of CBO)
  - Split Medicaid and TANF into state vs. federal part

- Construct two transfer measures:
  - **Narrow**: state: UI, TANF, WC, APFD; federal: SNAP, School lunch, VB, SI, DI & SI (SS, other)
  - **Broad**: Narrow + Medicaid, future value of old-age pensions (impute as in HSV 2017)

- Property taxes: American Community Survey (ACS), Zillow
- Sales, excise taxes: Consumer Expenditure Survey (CEX), Book of States, Census of State & Local Gov’ts, ...
Measuring Property Taxes of Home-Owners

- ASEC provides property taxes for owners but imputation does not use location information (since 2011)

- ACS has self-reported data on house values, property taxes and rents (Harris and Moore, 2013; Scarboro, 2018)

- Solution: match each ASEC household with her $k = 9$ nearest neighbor homeowners in ACS
  - Match on county (state), demographics, income, number of housing units in structure
  - Impute property taxes using mean property taxes of ACS nearest neighbors
Measuring Property Taxes of Renters

- Two assumptions:
  1. Rent is proportional to house value within a state
  2. Property taxes have full pass-through to rents
     - In line with empirical evidence (Tsoodle and Turner, 2008)

- Our imputation procedure:
  - Construct state price-to-rent ratios \((P/RENT)_s\) from Zillow
  - Combine to impute value of house rented by ACS renters \(i\)
    \[ P_i = (P/RENT)_s \times RENT_i \]
  - Impute property taxes as \(T^P_i = P_i \times t^p_{c,y}\)
    \(t^p_{c,y}\) reported by ACS owners in same county & similar income
  - Impute property taxes paid by ASEC renter using mean property taxes of \(k = 9\) nearest neighbor renters in ACS
Why Are Property Taxes So Regressive?

Because housing consumption is strongly non-homothetic:

Housing Engel Curves (ACS, 2010/11)
Measuring Sales and Excise Taxes

- Use CE to derive expenditure shares on categories \( j \):
  - **sales-taxable** goods and services
  - **excise-taxable** goods and services: tobacco, alcohol, gasoline, utilities (electricity, sewage, etc)
  - obtain \( \text{expenditure}_k^j \) for households in income group \( k \)

- Impute taxes paid by households with income \( k \) in state \( s \)
  \[
  \sum_j T_{s,k}^j \times \tau_s^j \times \text{expenditure}_k^j
  \]
  - \( j \): different sales, excise taxable goods and services
  - \( \tau_s^j \): (linearized) tax rate for category \( j \)
Estimating Progressivity Following Benabou / HSV

- \( y_i \): pre-government income of household \( i \)
- \( T_i \): tax liability net of transfers

\[
\begin{align*}
    y_i - T_i &= \lambda y_i^{(1 - \tau)} \\
    \log(y_i - T_i) &= \lambda + (1 - \tau) \log(y_i)
\end{align*}
\]

- \( \tau \) is index of progressivity

We estimate this equation in three ways:

1. \( T_i \) federal taxes-transfers only \( \Rightarrow \) federal progressivity \( \tau^f \)
2. \( T_i \) state & local taxes-transfers \( \Rightarrow \) state progressivity \( \tau^s \)
3. \( T_i \) federal + S&L \( \Rightarrow \) federal + state progressivity \( \tau \)

For 2 & 3, re-weight households at state level so pre-govt income dist. resembles national dist.
- \( \tau \) estimates reflect differences in state tax systems only
Progressivity: Federal vs. State & Local for 2010

After federal taxes and transfers

\[ \tau^f = 0.22 \]

After state taxes and transfers

\[ \tau^s = 0.03 \]
# Progressivity estimates $\tau$ for 2010

<table>
<thead>
<tr>
<th></th>
<th>Narrow</th>
<th>Broad</th>
</tr>
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<tbody>
<tr>
<td><strong>Federal</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Income Taxes</td>
<td>0.117</td>
<td></td>
</tr>
<tr>
<td>+ Transfers</td>
<td>0.164</td>
<td>0.226</td>
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<tr>
<td>+ Excise Tax ($\tau_f$)</td>
<td>0.162</td>
<td>0.224</td>
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<tr>
<td><strong>State</strong></td>
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<td></td>
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<tr>
<td>Income taxes</td>
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<tr>
<td>+ Transfers</td>
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<td>0.071</td>
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<tr>
<td>+ Property taxes</td>
<td>0.007</td>
<td>0.047</td>
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<tr>
<td>+ Sales taxes</td>
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<td>0.036</td>
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<tr>
<td>+ Excise taxes ($\tau_s$)</td>
<td>-0.015</td>
<td>0.028</td>
</tr>
<tr>
<td><strong>State + Federal ($\tau$)</strong></td>
<td>0.147</td>
<td>0.243</td>
</tr>
</tbody>
</table>
Conclusions

1. Federal income taxes and transfers are progressive

2. On average, state & local tax-transfer systems are close to proportional
   • But there is substantial heterogeneity

3. State tax base impacts progressivity
   • Mostly property & consumption taxes ⇒ typically regressive
   • Mostly income taxes ⇒ typically progressive

4. State progressivity estimates (ranking) are time persistent
State Progressivity (Narrow Transfers) Over Time
Dispersion in $\tau^s$: Narrow vs. Broad Transfers

Correlation = 0.73
Dispersion in $\tau^S$ across States

State Progressivity, Broad Transfers (2010/2011, sample: baseline)