The Housing Crisis and State and Local Government Tax Revenue: Five Channels

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Federal Reserve Board of Governors

The Crisis in Real Estate and its Impact in Public Finance
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Paper at:
Motivation

• The housing market experienced the largest contraction since the Great Depression.
  – House prices plunged by nearly 30 percent from 2006 to 2009.
  – Existing home sales fell by 36 percent.
  – The number of new housing starts dropped by 75 percent.

• State and local tax revenues have been hit hard.
  – State and local tax revenues fell by almost 5½ percent in 2009, the first nominal decline since the Great Depression.
Research Question

• How important is the impact of the housing market downturn on state and local tax revenues relative to the broader impact of the recession?

• Five Channels:
  – Property tax
  – Real estate transfer tax
  – Direct sales tax (e.g. construction material)
  – Indirect sales tax (e.g. housing wealth effect)
  – Personal income tax (e.g. construction workers and real estate agents)

• Rough sense of the magnitude of direct effect of housing, not strictly causal estimates
Research Question (cont.)

• We take an aggregate approach

• Strength of approach
  – Important to know average effect
  – Baseline for experiences of individual states and localities
  – Avoids tendency to focus on the most affected states and localities
  – Aggregate data is available on a more timely basis

• Weakness of approach
  – Aggregate data lacks detail
  – Estimates may not be informative for a particular state or locality
Preview of Findings

• We find that property tax collections have been surprisingly resilient for two reasons.
  1. Assessment values lag market values significantly.
  2. Policy makers tend to offset declines in house prices by raising tax rates.

• We find that the direct impact of the housing downturn from remaining four channels on state and local tax revenues is modest relative to the general economic recession.
Figure 2: State and Local Tax Revenues

Source. Census Bureau, *Quarterly Summary of State and Local Tax Revenue*. 

Property Tax

• Lutz (2008): relationship between home values and property tax collections

• **Timing**: The effect of house price changes on property taxes does not occur until three years following house price changes.
  – Backward looking
  – Assessment practices
  – Property tax caps and limits

• **Magnitude**: The elasticity of property tax revenue with respect to home prices equals 0.4.
  – Policy makers offset house price changes by adjusting property tax rates.
House Price Appreciation and Property Taxes

Source. Loan Performance; Census Bureau, *Quarterly Summary of State and Local Tax Revenue.*
Property Tax Analysis

• Analysis focused explicitly on episode of declining home prices
  – Historical event study
    • state-level data on total property tax collections (state and local) and house prices
    • Trace out the evolution of tax collections following house price declines
    • “Stacking the deck” in favor of finding that house price declines cause property tax declines
  – Contemporaneous case studies
Distribution of Changes in Property Tax Collections 1976-2007

Proposal A School Finance Reform: Michigan

Proposition 13: California

Percent Change in Property Tax Collections

Density

-0.4 -0.2 0 0.2 0.4
Percent Change in Property Tax Collections Following House Price Declines

Years Since House Price Decline

- 75th Percentile
- 25th Percentile
- Mean

153 Episodes
Percent Change in Property Tax Collections Following Large House Price Declines

The graph shows the percent change in property tax collections over different years since a house price decline. The data is presented for 26 episodes with the following observations:

- 75th Percentile
- 25th Percentile
- Mean

The graph indicates that property tax collections experience a significant percent change following a house price decline, with changes ranging from 0% to 12%. The data is visualized with a line graph that includes error bars for each year since the price decline, illustrating the variability and central tendency of the percent change.
Percent Change in Property Tax Collections Following House Price “Busts”

<table>
<thead>
<tr>
<th>Years Since House Price Decline</th>
<th>25th Percentile</th>
<th>Mean</th>
<th>75th Percentile</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
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<td></td>
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<td>4</td>
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</tbody>
</table>
Case Study: Nevada

Index
(2000 = 100)

Tax Rate
(millage)

Fiscal Year

Market Value

Assessed Value

Property Tax Collections

Tax Rate


18 21 24 27 30 33 36

50 100 150 200 250 300 350

100 150 200 250 300 350 400

100 200 300 400 500 600 700

100 200 300 400 500 600 700
Case Study: Arizona

Index (2000=100) vs. Fiscal Years

- Market Value
- Assessed Value
- Property Tax Collections
- Tax Rate

Tax Rate (millage)

Fiscal Years: 2001 to 2009
Case Study: California

Index
(2000 = 100)

Tax Rate
(millage)

Market Value
Assessed Value
Property Tax Collections
Tax Rate

Fiscal Years

Case Study: Minnesota

<table>
<thead>
<tr>
<th>Fiscal Years</th>
<th>Index (2000=100)</th>
<th>Tax Rate (millage)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>100</td>
<td>20.0</td>
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<tr>
<td>2002</td>
<td>150</td>
<td>22.5</td>
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<td>2004</td>
<td>175</td>
<td>22.5</td>
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<tr>
<td>2006</td>
<td>175</td>
<td>15.0</td>
</tr>
<tr>
<td>2008</td>
<td>225</td>
<td>10.0</td>
</tr>
</tbody>
</table>

Legend:
- Market Value
- Assessed Value
- Property Tax Collections
- Tax Rate
Case Study: Georgia

Index (2000=100) vs. Tax Rate (millage) over Fiscal Years 2000 to 2008:
- Market Value
- Assessed Value
- Property Tax Collections
- Tax Rate
Case Study: Colorado

Index (2000=100) vs. Fiscal Years

- Market Value
- Assessed Value
- Property Tax Collections
- Tax Rate

Tax Rate (millage)
Case Studies: Conclusions

• Lots of Heterogeneity
• Significant lag which has helped insulate local governments from the housing downturn
• Tendency for policy makers to offset decline by raising effective tax rates
Four Non-Property Tax Channels

- We conduct two exercises to gauge the impact of each of the four channels on state tax revenues.

1. “Peak Year” method:
   - Compare state tax revenue in 2009 with that in 2005
   - Calculating change in tax base due to housing market over this period within each state and applying state tax rates

2. “Trend Growth” method:
   - Compare state tax revenue in 2009 with the counterfactual level of taxes in 2009 implied by the 1995-2002 trend

- We first focus on national aggregates and then show heterogeneity across states.

- Lots of different data sources and assumptions
Real Estate Transfer Tax

Source. Census Bureau, Quarterly Summary of State and Local Tax Revenue.
Real Estate Transfer Tax

• Use state specific data on housing market volumes and prices

• Peak Year Method:
  State government transfer tax revenue declined by $6 billion (or 53 percent) from 2005 to 2009.

• Trend Growth Method:
  State government transfer tax receipts would have been $5 billion (or 110 percent) higher in 2009 if house prices and transaction volumes continued the 1995-2002 trend.
Direct Sales Tax

• Builders typically pay sales or use tax on materials

• New Construction
  – State specific data on number of new homes, average square footage, average material costs

• Renovations
Direct Sales Tax

State Sales Tax Revenues from Material Inputs to Residential Construction

Billions of real (2005) dollars

year

1995 1997 1999 2001 2003 2005 2007 2009
Direct Sales Tax

• Peak Year Method:
  State tax revenues from sales of construction materials declined by $7 billion (or 3 percent) from 2005 to 2009.

• Trend Growth Method:
  State tax revenues from sales of construction materials would have been $11 billion (or 6 percent) higher in 2009 had spending continued its 1995-2002 trend.
Indirect Sales Tax

• If housing wealth affects consumption, then a decline in house prices may reduce sales tax revenue

• We assume MPC=0.03

• Housing wealth effect to phases-in over three years: 60 percent in the first year, 90 percent in the second year, and 100 percent in the third year.

• Use state-level measures of total housing wealth and sales taxes and exemptions
Indirect Sales Tax

Housing Wealth Effect on Sales Taxes

Calendar Years

Effect on Sales Taxes

Billions

2000 2001 2002 2003 2004 2005 2006 2007 2008 2009
Indirect Sales Tax

• Peak Year Method:
  State sales tax revenues due to the housing wealth effect on consumption declined by $5 billion (2 percent) from 2005 to 2009.

• Trend Growth Method:
  State sales tax revenues due to the housing wealth effect on consumption would have been $6 billion (3 percent) higher had house prices and construction activity continued their 1995-2002 trend.
Personal Income Tax

• We calculate the loss in personal income tax revenue from the construction and real estate sectors

• State data on wages by sector

• We use NBER Taxsim to calculate the average state income tax burden for construction workers and real estate agents in each state in each year

• Then obtain total income taxes by multiplying the average tax burden by the number of employees in the sector
Personal Income Tax

![Graph showing the comparison between construction and real estate income tax in billions of real (2005) dollars over the years 2000 to 2009.](#)
Personal Income Tax

• Peak Year Method:
  State personal income tax revenues from housing-related industries *increased* by $3 billion (or 1 percent) from 2005 to 2009.

• Trend Growth Method
  State personal income tax revenues from housing-related industries would be $9 billion (or 4 percent) higher in 2009 had average wages and employment in these industries continued their 1995-2002 trend.
## Peak Year Method

<table>
<thead>
<tr>
<th>State</th>
<th>2009 housing - 2005 housing ($millions)</th>
<th>(2009 housing - 2005 housing )/ (2005 total) (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>transfer direct sales indirect sales personal income total</td>
<td>transfer direct sales indirect sales personal income total</td>
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<tr>
<td>FL</td>
<td>-3,564 -1,476 -535 0 -5,575</td>
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<td>MN</td>
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<td>ND</td>
<td>0 5 1 13 19</td>
<td>. 1 0 5 1</td>
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<tr>
<td>LA</td>
<td>0 -16 3 280 268</td>
<td>. -1 0 13 3</td>
</tr>
<tr>
<td>TOTAL</td>
<td>-6,416 -7,375 -4,753 3,246 -15,297</td>
<td>-53 -3 -2 1 -2</td>
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</table>
## Trend Growth Method

<table>
<thead>
<tr>
<th>State</th>
<th>2009 housing - predicted 2009 housing ($millions)</th>
<th>(2009 housing - predicted 2009 housing)/(2009 total) (%)</th>
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<tr>
<td></td>
<td>transfer</td>
<td>direct sales</td>
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<tr>
<td>TOTAL</td>
<td>-4,525</td>
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</table>
Conclusions

• **Property Tax**
  – Historical data and case studies suggest that it is quite unlikely that property tax collections will fall *steeply* in the next a few years.
  – Even if property taxes do decline, the significant lag between this event and housing market downturn provided time for the general economy to recover.

• **Four Non-Property Tax Channels**
  – The direct impact of the housing market downturn on state tax revenues has been modest.