Credit Cluster and Contagion Risk Related to Distressed Municipalities

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Presentation at The Municipal Finance Conference at the Brookings Institute
July 12, 2016
Credit Clusters: The Spillover Effect Involving Distressed Municipalities
(State and Local Governments)

New York

Puerto Rico

Chicago
The Potential for Contagion and Interdependent Relationships -- State Centric

COMMON OVERLAPPING INFLUENCES Stemming from State:
• Economic Base
• Debt and Pensions Overlay
• Tax Overlay
• Infrastructure
• Statutory Framework (e.g. pensions)
The Potential for Contagion and Interdependent Relationships – Local Centric

COMMON OVERLAPPING INFLUENCES Stemming from City:
• Economic Base
• Debt and Pensions Overlay
• Tax Overlay
• Infrastructure
Common Influences: Shared Economic Base
Select Large Cities with Declining County Populations
Periods from 1980 to 2014 and 2000 to 2014

Source: Merritt Research Services based on U.S. Census
Large Cities with Highest Per Capita Overlapping Debt

**Net Direct + Overlapping Debt Per Capita**

<table>
<thead>
<tr>
<th>City</th>
<th>Net Dir + Overlap Debt Per Capita</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEDIAN for All Cities</td>
<td>7223</td>
</tr>
<tr>
<td>Houston, CA</td>
<td>4754</td>
</tr>
<tr>
<td>San Francisco City &amp; Cnty, CA</td>
<td>4734</td>
</tr>
<tr>
<td>Anaheim, CA</td>
<td>6898</td>
</tr>
<tr>
<td>San Diego, CA</td>
<td>4754</td>
</tr>
<tr>
<td>New York, NY</td>
<td>6340</td>
</tr>
<tr>
<td>San Antonio, TX</td>
<td>6075</td>
</tr>
<tr>
<td>Oakland, CA</td>
<td>9812</td>
</tr>
<tr>
<td>Detroit, MI</td>
<td>5012</td>
</tr>
<tr>
<td>Chicago, IL</td>
<td>8832</td>
</tr>
<tr>
<td>Denver City &amp; Cnty, CO</td>
<td>8009</td>
</tr>
</tbody>
</table>

**Net Direct + Overlapping Debt + Unfunded Liability Per Capita**

<table>
<thead>
<tr>
<th>City</th>
<th>Net Dir + Unfd Liab + Overlap P/C</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEDIAN for All Cities</td>
<td>14593</td>
</tr>
<tr>
<td>Houston, CA</td>
<td>6929</td>
</tr>
<tr>
<td>San Francisco City &amp; Cnty, CA</td>
<td>5807</td>
</tr>
<tr>
<td>Anaheim, CA</td>
<td>6929</td>
</tr>
<tr>
<td>San Diego, CA</td>
<td>5872</td>
</tr>
<tr>
<td>New York, NY</td>
<td>6929</td>
</tr>
<tr>
<td>San Antonio, TX</td>
<td>5726</td>
</tr>
<tr>
<td>Oakland, CA</td>
<td>8009</td>
</tr>
<tr>
<td>Chicago, IL</td>
<td>6929</td>
</tr>
<tr>
<td>Denver City &amp; Cnty, CO</td>
<td>7587</td>
</tr>
</tbody>
</table>

Source: Merritt Research Services, LLC  All ratios apply to FY 2014. Detroit’s 2014 unfunded liability is estimated.
Total Overlapping Pension Liability for City of Chicago Taxpayers -- $32.4 Billion – Excludes State Pensions (Figures In $ Millions)

- City of Chicago Overlapping Unfunded Pension Liability
- Cook County Forest
- Chicago Park District
- Greater Chicago Water Reclamation
- Cook County
- Chicago Public Schools
- Chicago

Debt and Pension Impact on Taxpayers Usually Understated by Traditional Debt Ratios

Example -- City of Chicago – Per Capita Burden FY 2014

![Bar Chart]

Net Direct Debt Per Capita
Net Direct & Overlapping Debt Per Capita
Net Direct & Overlap + Unfd Pens Liab Per Capita
Net Direct &Overlap Debt + Unfd Pens Liab + Overlap Unfd Pens Liab P/C

Source: Merritt Research Services LLC and City of Chicago Official Statement, Series 2015 C. All Cities Medians includes 1657 cities for Net Direct; 1099 for Dir and Overlap and 517 for Dir & Overlapping Debt plus pensions.
Debt and Pension Impact on Taxpayers Usually Understated by Traditional Debt Ratios

Example -- City of Chicago – As a % of Full Value FY 2014

- **Chicago**
  - Net direct Debt as % of FV: 4.74%
  - Net Direct + Overlapping as % of FV: 10.1%
  - Net Direct Debt +Overlapping + City Unfd Pens Liab as % of FV: 20.6%
  - Net Direct & Overlapping Debt + Unfd Pens Liab + Overlapp Unfd Pens Liab to FV: 27.6%

- **All Cities**
  - Net direct Debt as % of FV: 0.8%
  - Net Direct + Overlapping as % of FV: 2.8%
  - Net Direct Debt +Overlapping + City Unfd Pens Liab as % of FV: 4.2%

Source: Merritt Research Services LLC and City of Chicago Official Statement, Series 2015 C. All Cities Medians includes 1532 cities for Net Direct; 1073 for Dir and Overlap and 506 for Dir & Overlapping Debt plus pensions.
Pension Requirements for Chicago and Big Cities:
Annual (Actuarial) Pension Cost as % of General Fund – Single Employer Plans only
(2007-2014)

Source: Merritt Research Services, LLC. Data.
The median total Governmental Activities Total Tax Revenue Per Capita for cities over 500,000 population is $835. The median total revenue per capita for large city school districts is $681. Chicago’s consolidated tax revenue per capita for FY 2014 was $2,328 (41% of New York and 56% of San Fran) to $2511 with new taxes.
Key Comparative Ratios: Taxing Capacity
Total Tax Revenue (Gov. Activities) to Estimated Full Market Value %
Cities over 500,000 Population

The median total Governmental Activities Total Tax Revenue as a % of Full Value for cities over 500,000 population is 1.02%. The median total revenue to FV for large city school districts is .64 of 1%. Chicago's consolidated tax revenue per capita for FY 2014 was 3.25% (56% of New York and 52% of Detroit) rising to 3.5%.
Infrastructure: Aging Infrastructure Creeping Up on Cities by Average Age of Property, Plant & Equipment

Annual Median for Cities: 2006-2015

Average Age of PPE for Select Large Cities (Most recent FY available):

- Detroit: 21.9
- Philadelphia: 23.3
- Pittsburgh: 22.8
- Chicago*: 16.7
- Providence: 18.0
- Cleveland*: 16.4
- Milwaukee*: 24.3

*FY 2014. All others apply to FY 2015.

### Select City & County Areas with Highest Elevated Cluster Risk
(Statistical Model Results Based on National Ranking using FY 2014 Financials and Census Data)

#### Ranked In Order of Most Cluster Risk by City

<table>
<thead>
<tr>
<th>City</th>
<th>Cluster Risk Rank</th>
<th>CreditScope Credit Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Percentile (City/Med. for County Cities)</td>
<td>Percentile (City/Med. for County Cities)</td>
</tr>
<tr>
<td>New Orleans, LA</td>
<td>.46 / NA</td>
<td>7.2 / NA</td>
</tr>
<tr>
<td>Detroit/Wayne, MI</td>
<td>.63 / 9.55</td>
<td>1.02 / 13.86</td>
</tr>
<tr>
<td>Newark/Essex, NJ</td>
<td>.98 / NA</td>
<td>3.92 / 22.15</td>
</tr>
<tr>
<td>Philadelphia City &amp; County, PA</td>
<td>1.17 / NA</td>
<td>1.51 / NA</td>
</tr>
<tr>
<td>Pittsburgh/Allegheny, PA</td>
<td>1.66 / 13.19</td>
<td>8.26 / 42.29</td>
</tr>
<tr>
<td>Chicago/Cook IL</td>
<td>1.77 / 13.22</td>
<td>2.22 / 35.1</td>
</tr>
<tr>
<td>Syracuse/Onondaga, NY</td>
<td>1.82 / 2.58</td>
<td>1.18 / 33.95</td>
</tr>
<tr>
<td>Cincinnati/Hamilton, OH</td>
<td>3.7 / 9.49</td>
<td>4.36 / 62.27</td>
</tr>
<tr>
<td>St. Louis, MO</td>
<td>2.86 / NA</td>
<td>.41 / NA</td>
</tr>
<tr>
<td>Birmingham/Jefferson AL</td>
<td>2.91 / 27.04</td>
<td>8.64 / 42.07</td>
</tr>
</tbody>
</table>

#### Key Factors

- **Median Year Houses Built in County**
- **Population Shrinkage**
- **Net Direct & Overlapping Debt**
- **Unfunded Pension Liability**
- **Median County Household Income**
- **Total Taxes Per Capita**
- **Infrastructure Age and Useful Life**
- **Unrestricted Net Assets to Governmental Act Exp**

**Source:** Merritt Research Services, LLC. Data based on FY 2014 financials, US Census data and Merritt Statistical Model Scores. Cluster Burden represent statistical model results based on inputs related to stress factors. The two cluster risk rankings relate first to the city-centric orientation while the second ranking refers to the median for cities followed by Merritt that belong to the same county. The CreditScope rankings reflect a Merritt developed quantitative model credit standing assessment for the city, specifically, and the median for all city credit rankings in the county.

Rankings to the left in red indicate bottom 15% ranking of all cities or counties.
The Compound Effect of a Distressed Municipality on Overlapping Governments – Example: Flint, MI
Shared Weakened Credit Profiles Based on 2014 Data and Rankings

**Flint School District**
- CreditScope Rank Bottom 1%
- Enrollment down near 50% since 2008
- Fund Balance to Expenditures - 21%
- Unrestricted Net Assets to Governmental Expenditures (-26%)
- Average Age of PPE is 33 years

**City of Flint**
- CreditScope Rank- Bottom 1%
- High Area Burden Risk -Bottom 7%
- Financial Condition: Total Fund Balance to Expenditures (-18.3%)
- Unrestricted Assets to Expenditures (-159.7)
- High Unfunded Pension Liability (52%) with 8% Discount Rate -- 2x retirees to active employees
- Average Age of Infrastructure 20.5 years.
- Flint Water –among highest water rates in nation.

**Genesee County**
- CreditScope Rank - Bottom 2%
- FV per cap. of County $44,465- Bottom 1% of all Counties
- Financial Condition:
  - Zero Days Cash on Hand for Gen Fd.
  - & 31 days for Govt Act.
  - Unrestricted Net Assets to Govt. Expenditures is -2%
- 75% Pension Funding Ratio using 8% discount rate
  - 2x more retirees than active employees

Source: Merritt Research Services, LLC
Credit Risk Not Always Recognized by the Market

Sample Yield Spreads for Cluster Sensitive Cities

Recent Basis Point Spread to MMD AAA and AA Scales

Summary and Conclusions

- “Cluster Risk” is real but “Guilt by Association” is not.
  - A municipal cluster is a geographic concentration of interconnected governments or agencies that have common elements and the potential to spread distress.

- Finding the right elements is the key to identifying the most vulnerable cluster risk city-locales.
  - Population, debt burden, pension liability, tax burden, infrastructure age are on our list of primary risk factors that make some areas more prone than others.

- Cities and counties deemed by our model as most vulnerable are challenged; but, not predestined for distress.

- Both the market and policymakers often don’t properly recognize or address Cluster Risk & Contagion until distress becomes advanced and more difficult to solve.
Notes and Disclosures

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