Perceptions of Local Government Fiscal Health and Fiscal Stress: Evidence from Quantile Regressions

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Local financial condition – in practice

• Financial condition analysis is used by:
  • Local governments
  • Credit rating agencies
  • States that monitor/intervene in local government finances

• Methods
  • Ratio analysis
  • Benchmarking
  • Using indicators to predict adverse outcomes
Financial condition indicator examples

- **Cash Solvency**
  - Size of cash reserves
  - Size of unassigned fund balance

- **Budget Solvency**
  - Operating margin
  - Fund balance/net asset growth

- **Service-level Solvency**
  - Revenue or expenditures per capita
  - Proportion of own-source revenue

- **Long-term Solvency**
  - Debt/pension/OPEB burden
  - Capital asset condition
Local financial condition – in theory

• Financial condition is ability to meet financial and service obligations (Jacob and Hendrick 2013)

• Influenced by complex combination of policy/management decisions, external environments, institutional structures (Honadle, Costa, and Cigler 2004, Bird and Slack 2015)

• Best characterized as an open system (Justice et al. 2019)
Organizations as open systems

Inputs/External environment

Organization
- Structures
- Processes
- Technologies
- People

Outputs

Feedback mechanisms
Steady states in open systems

• System constantly adapts to its environment in order to maintain relatively stable internal conditions and ensure survival (Katz and Kahn 1966)

• Negative feedback mechanisms
  • Example (physiology): internal temperature regulation
  • Example (financial management): fiscal slack allows for counter-cyclical spending

• “Vital signs” fluctuate within and acceptable range

• “Disease” involves dysregulation of homeostatic mechanisms
  • Positive feedback
  • Volatility in vital signs
Implications for empirical research

• Importance of local official perceptions
  • Actions, reasons, and mindsets of local officials shape how inputs are converted to outputs
  • Local officials perceptions capture aspects of “true” financial condition that other measures overlook (Leiser and Mills 2019)
  • Behavioral critiques in public administration (Snider 2000)

• Fiscal health vs. fiscal stress as distinct states
  • Interpretation of indicators depends on whether the organization is in a state of health or stress/disease
  • Relationships between variables may be contingent, non-linear, or non-deterministic
Data – Michigan local governments 2013-2017

• MPPS survey data
  • “Fiscal Stress Index” (1 = Perfect fiscal health … 10 = Fiscal crisis)

• Administrative data on local government finances
  • MI Treasury F-65 – abridged and cleaned

• ACS 5-Year estimates data
  • Socioeconomic and demographic
Distribution of Fiscal Stress Index Scores 2013 -2017
N = 6,153
<table>
<thead>
<tr>
<th>Definition</th>
<th>Source</th>
<th>N</th>
<th>Mean</th>
<th>St. Dev.</th>
<th>Min.</th>
<th>Max.</th>
<th>Median</th>
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<td><strong>Dependent Variable</strong></td>
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<td>Liquidity</td>
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<td>Population</td>
<td>MI Treasury</td>
<td>14,841</td>
<td>10,839.83</td>
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<td>0.00</td>
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Quantile regression model

- Estimated at 25th, 50th, and 75th quantiles of conditional distribution
- Bootstrapped (clustered) standard errors, year fixed effects
- Avoids restrictive assumptions about distribution of errors
- More robust to presence of outliers
- Allows for testing of hypotheses that coefficients are equal across quantiles
<table>
<thead>
<tr>
<th>Fiscal Indicators</th>
<th>25th Percentile</th>
<th>50th Percentile</th>
<th>75th Percentile</th>
<th>Difference</th>
<th>OLS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquidity (ln)</td>
<td>-0.074***</td>
<td>0.020</td>
<td>-0.122***</td>
<td>0.024</td>
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<td>Short-run position</td>
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<td>0.036</td>
<td>-0.314***</td>
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<td>-0.381***</td>
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<td>0.103</td>
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<td>0.333**</td>
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<td>Fund balance growth</td>
<td>0.008</td>
<td>0.023</td>
<td>0.028</td>
<td>0.036</td>
<td>0.019</td>
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<tr>
<td>GF revenue per capita (ln)</td>
<td>-0.019</td>
<td>0.064</td>
<td>0.044</td>
<td>0.088</td>
<td>-0.037</td>
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<td>Taxable value per capita (ln)</td>
<td>-0.374***</td>
<td>0.078</td>
<td>-0.714***</td>
<td>0.105</td>
<td>-0.770***</td>
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<tr>
<td>Taxable value growth</td>
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<td>0.260</td>
<td>0.332</td>
<td>0.343</td>
<td>-0.224</td>
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<table>
<thead>
<tr>
<th>External Environment</th>
<th>25th Percentile</th>
<th>50th Percentile</th>
<th>75th Percentile</th>
<th>Difference</th>
<th>OLS</th>
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<tbody>
<tr>
<td>Population (ln)</td>
<td>-0.084***</td>
<td>0.027</td>
<td>-0.212***</td>
<td>0.037</td>
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<td>Population growth</td>
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<td>0.706</td>
<td>0.084</td>
<td>0.682</td>
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<tr>
<td>Median age</td>
<td>0.015**</td>
<td>0.006</td>
<td>0.023***</td>
<td>0.009</td>
<td>0.019**</td>
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<tr>
<td>Percent white</td>
<td>-1.153***</td>
<td>0.354</td>
<td>-1.689***</td>
<td>0.360</td>
<td>-1.698***</td>
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<tr>
<td>Median income</td>
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<td>0.000</td>
<td>0.000***</td>
<td>0.000</td>
<td>0.000***</td>
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<tr>
<td>Unemployment rate</td>
<td>-0.104</td>
<td>0.583</td>
<td>-0.128</td>
<td>0.837</td>
<td>0.699</td>
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<table>
<thead>
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<th>Jurisdiction Type</th>
<th>25th Percentile</th>
<th>50th Percentile</th>
<th>75th Percentile</th>
<th>Difference</th>
<th>OLS</th>
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</thead>
<tbody>
<tr>
<td>City</td>
<td>0.723***</td>
<td>0.103</td>
<td>0.730***</td>
<td>0.149</td>
<td>0.391**</td>
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<td>County</td>
<td>0.575***</td>
<td>0.140</td>
<td>0.831***</td>
<td>0.183</td>
<td>1.246***</td>
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<td>Village</td>
<td>0.517***</td>
<td>0.122</td>
<td>0.370***</td>
<td>0.140</td>
<td>-0.027</td>
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<tr>
<td>Constant</td>
<td>7.994***</td>
<td>0.849</td>
<td>13.607***</td>
<td>0.882</td>
<td>17.277***</td>
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</tbody>
</table>

| Notes: * p < 0.10, ** p < 0.05, *** p < 0.01; year fixed effects included in all models; bootstrapped standard errors (250 reps) in quantile model; clustered standard errors in OLS |
Estimated coefficient for Taxable value per capita (ln) at various quantiles with 95% confidence intervals and OLS for comparison

Quantile coefficient
OLS coefficient
Conclusions

• Higher stress jurisdictions are more sensitive to changes in:
  • Liquidity (GF cash + equivalents / GF liabilities)
  • Taxable value per capita
  • Population size

• Lower stress jurisdictions’ more muted coefficients are consistent with their greater ability to maintain steady state
Implications for policy and practice

• High-stress governments reactions to external shocks (e.g. a pandemic?) or internal fluctuations will likely be disproportionately larger than for low-stress governments

• A one-size-fits-all approach to monitoring fiscal condition is likely to underestimate fiscal stress in high-stress jurisdictions

• A “stress-testing” approach may be appropriate
"True" Fiscal Health

Objective Measures of Fiscal Health

Subjective Measures of Fiscal Health

A

B

C

D
Why might local officials’ subjective perceptions differ from objective measures?

- Problems with self-assessment
  - Random/systematic measurement error
  - Local officials are biased
  - Survey/response bias issues

- Problems with objective measures
  - Timing issues—lag in availability of data; annual data; retrospective data
  - Unquantifiable/unmeasured factors—e.g. infrastructure needs, financial management policies, management quality, local political conditions
  - One-size-fits-all approach
  - Mixed results on predictive validity
Existing research

- **Surveys (Marlowe 2015, Goldberg and Nieman 2014)**
  - Most closely watched indicator: GF balance
  - Biggest threats/stressors: infrastructure costs, insufficient revenue, personnel/retiree costs, debt

- **Maher and Deller (2011 and 2013)**
  - Financial indicators generally do not perform well in predicting subjective assessments for local governments in WI

- **Leiser and Mills (2019)**
  - Findings generally corroborate Maher and Deller
  - Evidence of that low-stress vs. high-stress may be more of a difference of kind than a difference of degree
Visualizing quantile regression

Bretscheider, Marc-Aurele Jr., & Wu (2005)