

# 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

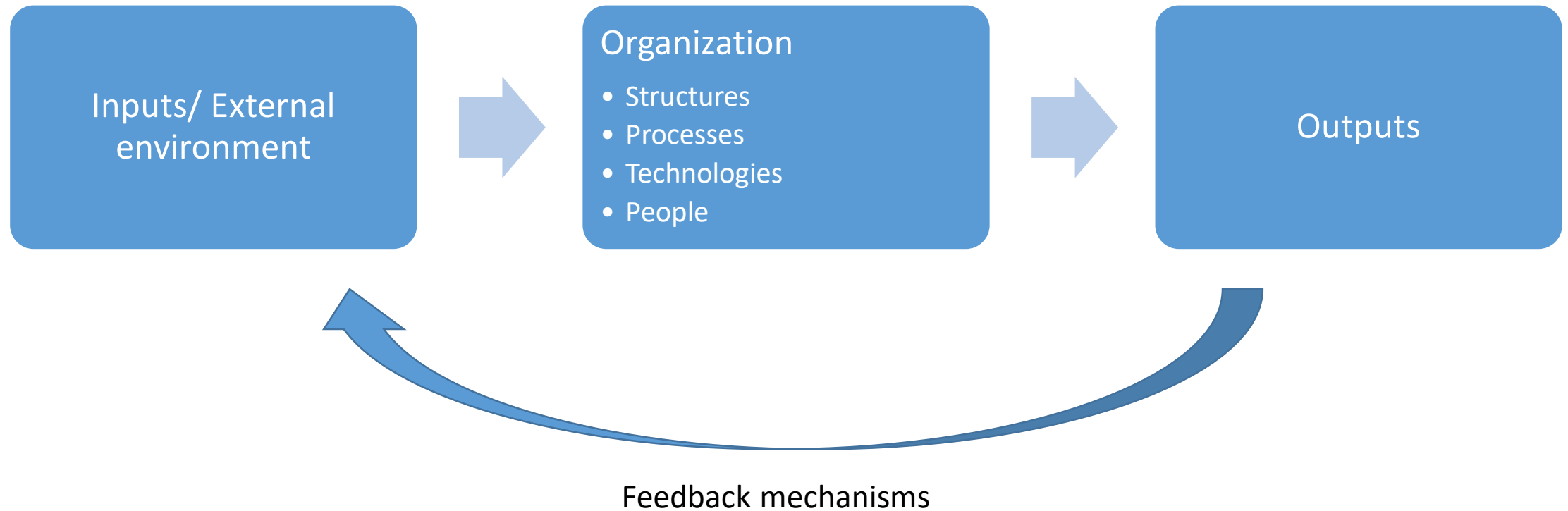
Debt/pension/OPEB burden

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



# 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

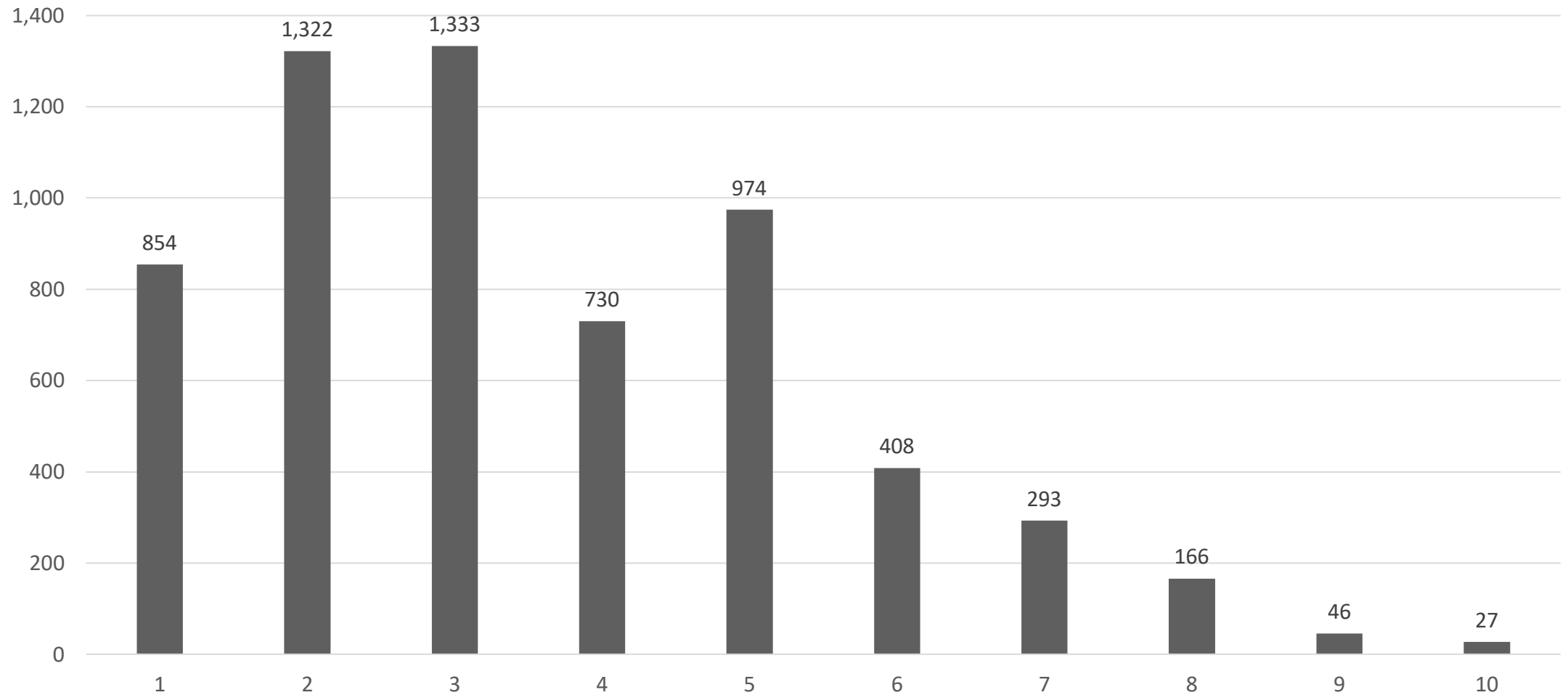
# Data – Michigan local governments 2013-2017

- 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



	Definition	Source	N	Mean	St. Dev.	Min.	Max.	Median
<b><i>Dependent Variable</i></b>								
Fiscal Stress Index	Overall level of fiscal stress 1 = perfect fiscal health ... 10 = fiscal crisis	MPPS	6,153	3.54	1.94	1.00	10.00	3.00
<b><i>Fiscal Indicators</i></b>								
Liquidity	GF cash and cash equivalents / GF liabilities	MI Treasury	12,357	2.98	1.91	-15.17	11.88	2.98
Short-run position	Unassigned GF balance / GF total revenue	MI Treasury	14,085	1.11	0.98	-3.98	34.77	0.90
Margin	Growth in unassigned GF balance / GF total revenue	MI Treasury	11,923	0.03	0.40	-29.89	3.53	0.04
Fund balance growth	Growth in unassigned GF balance / Prior year GF balance	MI Treasury	11,924	7.27	780.17	-175.60	85,192.00	0.05
GF revenue per capita	GF total revenue / Population	MI Treasury	14,701	345.62	543.56	0.00	19,745.20	210.16
Taxable value per capita	Total taxable value / Population	MI Treasury	14,833	42,446.98	50,212.43	5,584.96	1,721,922.00	32,082.85
Taxable value growth	Growth in taxable value	MI Treasury	12,977	0.01	0.07	-0.61	2.45	0.01
<b><i>External Environment</i></b>								
Population	Annual population estimate	MI Treasury	14,841	10,839.83	62,769.22	9.00	1,820,584.00	2,005.00
Population growth	Growth in population / Prior year population	MI Treasury	12,984	0.00	0.07	-0.81	4.24	0.00
Median age	Median age	ACS 5-year	14,848	42.86	6.43	20.70	69.50	42.15
Percent white	Percentage of residents who are white	ACS 5-year	14,848	0.93	0.10	0.01	1.00	0.96
Median income	Median household income	ACS 5-year	14,848	48,033.10	15,936.01	14,651.00	250,001.00	45,103.00
Unemployment rate	Civilian unemployment rate	ACS 5-year	14,848	0.11	0.05	0.00	0.44	0.10

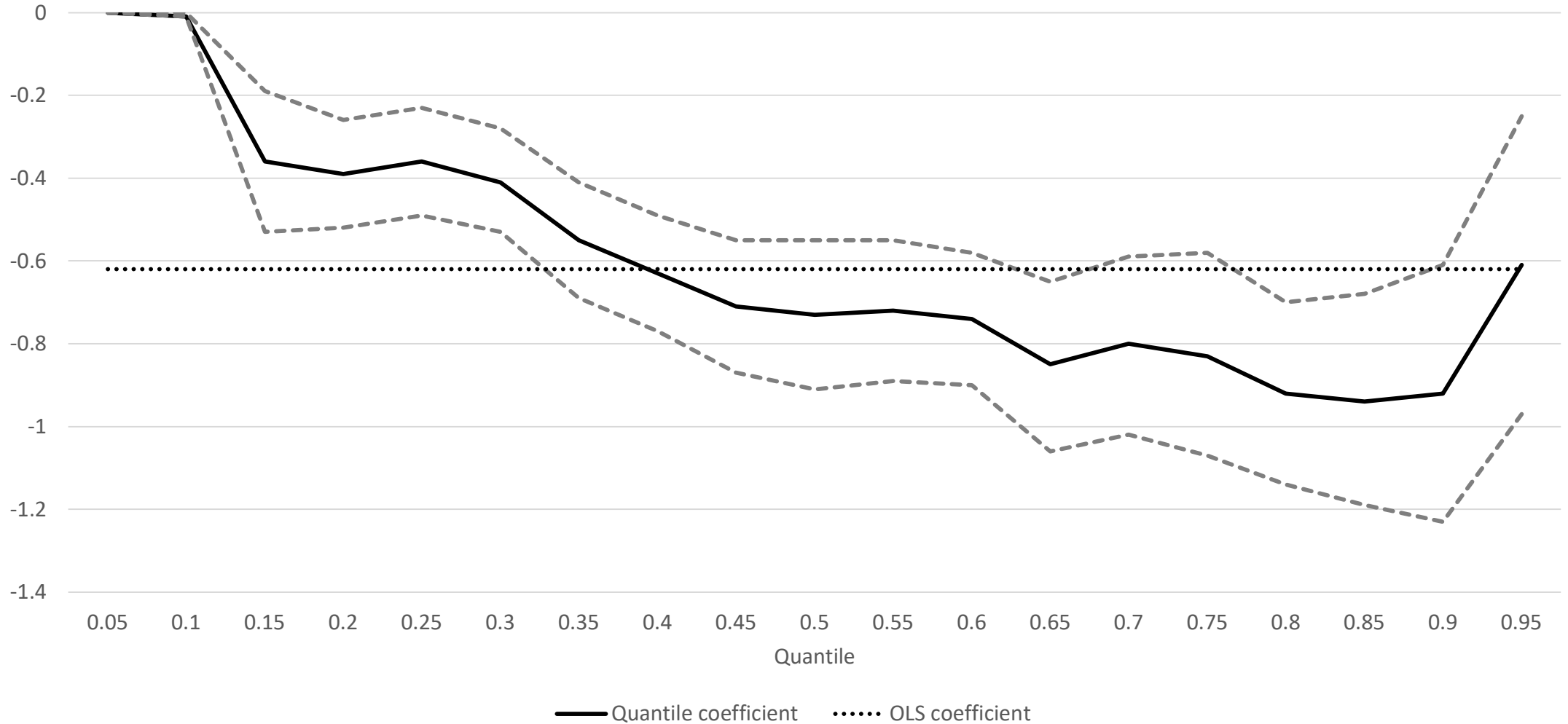
# Quantile regression model

- Estimated at 25<sup>th</sup>, 50<sup>th</sup>, and 75<sup>th</sup> 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

	25th Percentile		50th Percentile		75th Percentile			OLS	
	Coeff.	Std. Error	Coeff.	Std. Error	Coeff.	Std. Error	Difference	Coeff.	Std. Error
<b>Fiscal Indicators</b>									
Liquidity (ln)	-0.074***	0.020	-0.122***	0.024	-0.164***	0.029	**	-0.127***	0.019
Short-run position	-0.289***	0.036	-0.314***	0.052	-0.381***	0.059		-0.307***	0.040
Margin	0.315***	0.103	0.246**	0.108	0.333**	0.139		0.309***	0.093
Fund balance growth	0.008	0.023	0.028	0.036	0.019	0.031		0.023**	0.010
GF revenue per capita (ln)	-0.019	0.064	0.044	0.088	-0.037	0.119		-0.022	0.069
Taxable value per capita (ln)	-0.374***	0.078	-0.714***	0.105	-0.770***	0.112	***	-0.580***	0.071
Taxable value growth	0.325	0.260	0.332	0.343	-0.224	0.430		-0.168	0.304
<b>External Environment</b>									
Population (ln)	-0.084***	0.027	-0.212***	0.037	-0.329***	0.044	***	-0.208***	0.030
Population growth	-0.480	0.706	0.084	0.682	-0.257	1.094		-0.283	0.291
Median age	0.015**	0.006	0.023***	0.009	0.019**	0.009		0.015**	0.006
Percent white	-1.153***	0.354	-1.689***	0.360	-1.698***	0.474		-1.214***	0.298
Median income	0.000***	0.000	0.000***	0.000	0.000***	0.000		0.000***	0.000
Unemployment rate	-0.104	0.583	-0.128	0.837	0.699	1.131		0.160	0.656
<b>Jurisdiction Type</b>									
City	0.723***	0.103	0.730***	0.149	0.391**	0.196		0.557***	0.118
County	0.575***	0.140	0.831***	0.183	1.246***	0.261	**	0.818***	0.148
Village	0.517***	0.122	0.370***	0.140	-0.027	0.189	**	0.162	0.112
Constant	7.994***	0.849	13.607***	0.882	17.277***	1.188		12.833***	0.739
N	5,053							N	5,053
Pseudo R2 (25th)	0.0793							Prob > F	0.0000
Pseudo R2 (50th)	0.1052							R2	0.1686
Pseudo R2 (75th)	0.0827								

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



# 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

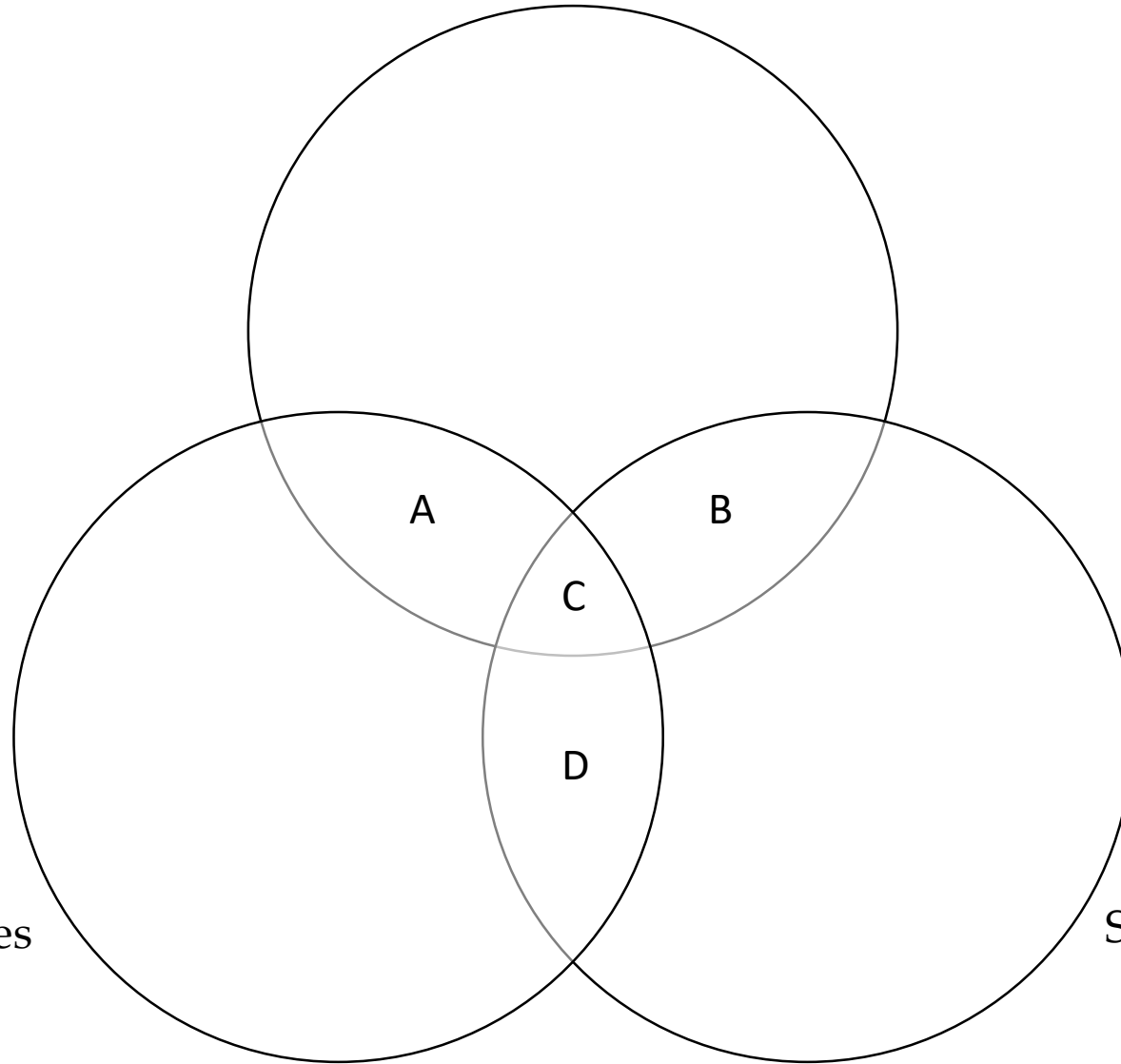
# Implications for policy and practice

- 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

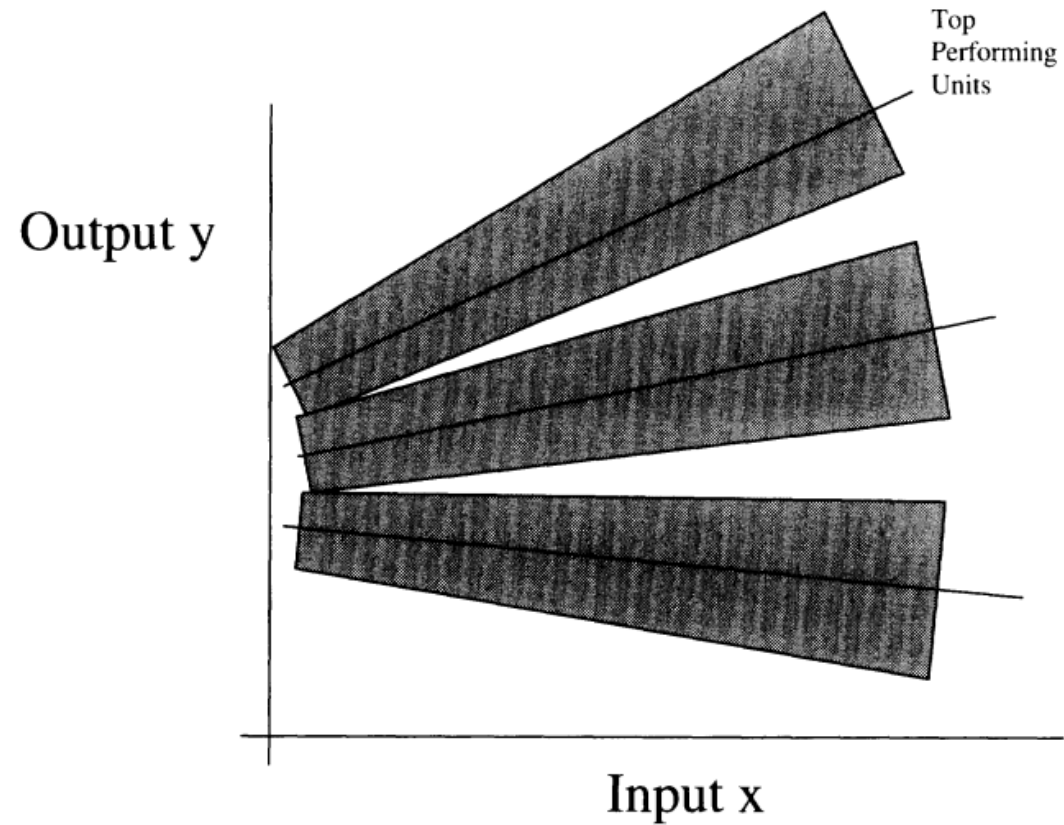
# Why might local officials' subjective perceptions differ from objective measures?

- 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



[Bretschneider, Marc-Aurele Jr., & Wu \(2005\)](#)