AN EYE ON YOUR WORK:
THE CASE OF STATE FISCAL STRESS MONITORING SYSTEM

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Weiners & Losers/Al-Qaeda's Mac

TIME

Overdrawn and over h
cities also threatened

Istanbul, Florence, Naples, Madrid, Barce
Europe are facing funding shortfalls and

BUSINESS

China's local government
but gets kicked down the r

BLOOMBERG

HONG KONG/BEIJING/SHANGHAI – China has
imposing some discipline on debtors in its
troubled debtors are local governments' fi
has long seemed on the cards. But it just is

Moody's Investors Service thought the first
two years later, there have been some close
payment by a unit owned by Qinghai provi
caused ripples through the investment community — but no default.

N.Y. / REGION

Deficits Push N.Y. Cities and Counties to Desperation

By DANNY HAKIM MARCH 10, 2012

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ALBANY — It was not a good week for New York's cities and counties.

On Monday, Rockland County sent a delegation to Albany to ask for the authority to close its widening budget deficit by issuing bonds backed by a sales tax increase.

On Tuesday, Suffolk County, one of the largest counties outside New York City, projected a $530 million deficit over a three-year period and declared a financial emergency. Its Long Island neighbor, Nassau County, is already so troubled that a state oversight board seized control of its finances last year.

And the city of Yonkers said its finances were in such dire straits that it had drafted Richard Ravitch, the former lieutenant governor, to help chart a way out.

Even as there are glimmers of a national economic recovery, cities and counties increasingly find themselves in the middle of a financial crisis. The problems are spreading as municipalities face a toxic mix of stresses that has been brewing for years, including soaring pension, Medicaid and retiree health care costs. And many have exhausted creative accounting maneuvers and one-time spending cuts or revenue-raisers to bail

VEHICLES, LGFV

Motivation

- Fiscal stress in local governments as policy issues
- Different types of intervention by state/central governments in the inter-governmental fiscal relation

- One of the emerging practices used to prevent fiscal stress or bankruptcy as an early warning system
- Fiscal Stress Monitoring System
  - 1) assess local governments' fiscal condition/fiscal health
  - 2) assign fiscal stress labels(e.g., A, B, C, D, E)
  - 3) provide its rating information to the public (or/and) immediate fiscal management assistance for local governments

Motivation

- These systems have been adopted by several state governments in the US, such as New York, North Carolina, Ohio, and Michigan, as well as central governments such as South Korea

Motivation

- One of the first tasks in this system is to measure the level of fiscal stress that localities face
- Long-standing literature has much paid attention to development of various measures:
  - Ratio analysis, the Advisory Commission on Intergovernmental Relations (ACIR), Wang's cash solvency index, and the Brown 10-point fiscal index
- However,
  - Limited evidence on role of fiscal stress monitoring system

Research Questions

- What is the effect of fiscal stress monitoring system in NY, which was introduced in 2012, on local governments' financial outcome?

Related Literature

- Determinants of Fiscal Stress
- Definition and Measure of Fiscal Stress
- Effect of Fiscal Stress Monitoring System

Literature:

Determinants of Fiscal Stress

- External Factors
  - Expenditure: change in fiscal demands, population change, political motives, budget-maximizing behavior
  - Revenue: population change, intergovernmental grant, decentralization without financial support
- Internal Factors (financial management)
  - Mishandling budget process, incapacity in accounting practices, response to fiscal stress, the failure of balanced budget, debt management

Literature:

Definition and Measure of Fiscal Stress

- A variety of definition with subtle difference: fiscal health, fiscal soundness, fiscal stress, fiscal burden, fiscal crisis

- Extensive research on ways to measure the fiscal health since 1970s(ACIR 1973; Brown 1993, 1996; Dollery et al., 2007; Groves et al., 2003; Groves & Valente 1994; Honadle et al., 2004; Kloha et al., 2005b; Coe 2008).

- Two approaches (Mead 2013):
  - Fiscal approach
  - Financial approach

Literature:

Effects of Fiscal Stress Monitoring System

- Few empirical studies in evaluating this system (Exception is Thompson (2016) and Spreen and Cheek (2015))
  - School districts in Ohio, labelled as fiscally stressed, decrease capital and operating with larger percentage reductions in capital, and increase local tax revenue (Thompson 2016)
  - Michigan Fiscal Stress Indicator System led to small and statistically insignificant changes in financial outcome compared to neighboring state without system (Spreen and Cheek 2015)

Theoretical Grounds

- Why fiscal stress monitoring system would work?

- The disclosure of performance information could affect organizational performance due to
  - Concerns over organizational reputation (Pawson 2002; Bevan and Hood 2006)
  - Political pressure (Pawson et al. 2005; Van de Walle and Roberts 2008)
  - Exit and voice mechanism
  - Public image (Hibbard et al. 2003)
  - Risk avoidance (James and John 2007)

Theoretical Grounds

- However, the effect of information disclosure policy depends on

- Formal rewards or punishments (Heckman et al 1997; Lavy 2009)
- High-salience policy fields (Olsen 2015)
- Dissemination strategies (Bird et al 2005)

- Unique traits of fiscal stress monitoring system in NewYork

The NewYork Case

- NewYork State introduced fiscal stress monitoring system in 2012

NewYork Case

Table 1. New York Fiscal Stress Monitoring Indicator

Category	Financial Indicator	Max Points	Weights
Year-End Fund Balance	Assigned and Unassigned Fund Balance	4	50%
	Total Fund Balance	4	
Operating Deficits	Operating Deficit	3	10%
Cash Position	Cash Ratio	3	20%
	Cash % of Monthly Expenditure	3	
Use of Short-Term Debt	Short-Term Debt Issuance	3	10%
	Short-Term Debt Issuance Trend	3	
Fixed Costs	Personal Services and Employee Benefits % Revenues	3	10%
	Debt Service % Revenues	3	
	Total	29	

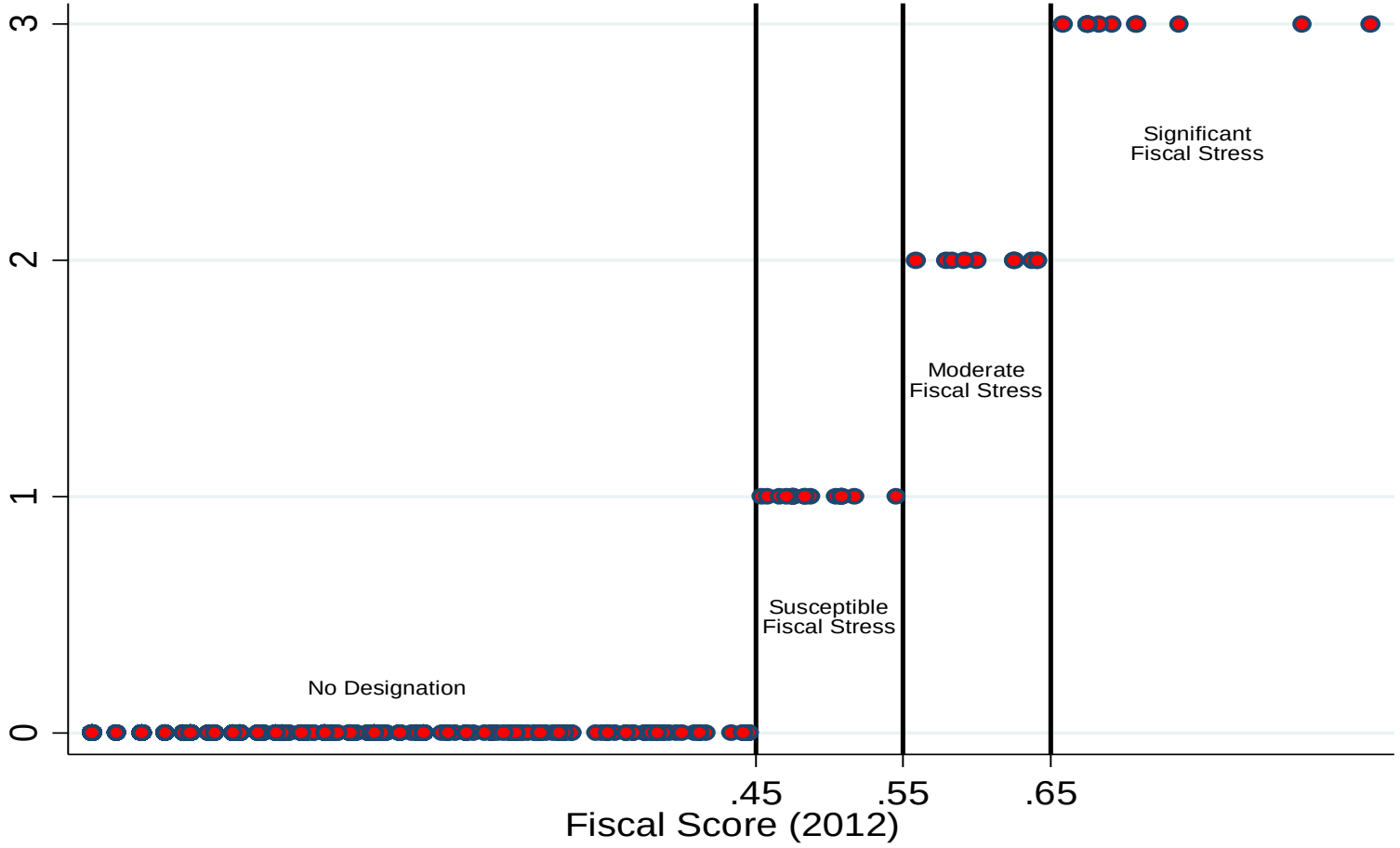
Source: Office of New York State Comptroller (2014) Fiscal Stress Monitoring System

The NewYork Case

- Based on five categories,
  1) Year-End fund balance
  2) Operating deficits
  3) Cash position
  4) Use of short term debt
  5) Fixed cost

- Fiscal Labelling
  - No Designation if fiscal score is less than 45
  - Susceptible fiscal stress if fiscal score is between 45 and 55
  - Moderate fiscal stress if fiscal score is between 55 and 65
  - Significant fiscal stress if fiscal score is greater than 65

The NewYork Case



Notes: Each dot represents a local government.

Research Questions

- What is the effect of NY fiscal monitoring system on local governments' financial outcome
  - 1) local governments with 'fiscal stress' label vs. local governments without 'fiscal stress' label
  - 2) local governments as a whole before pre and after post reform periods

The NewYork Case

- Release fiscal score information every year
  - fiscal score for FY 2012 is released in the early period during FY 2013
  - fiscal score for FY 2013 is released in the early period during FY 2014
- Short term vs. Long term effect

Data and Method

- Data
  - Financial information in annual update documents (AUD)
- Financial outcome as a dependent variable
  - The ratio of fund balance to gross expenditure

- Method
  - Difference-in-Difference
  - Regression Discontinuity Design

Empirical Specifications: Regression Discontinuity Design

- The Single Cutoff Case

(1) $$Y_i = \beta \cdot I\{f_i \geq C\} + \gamma Z_i + \varepsilon_i$$

  - $I\{f_i - C \geq 0\}$ is an indicator whether a local government (i)'s fiscal score in 2012 is greater than or equal to the cutoff C
  - Z_i is a set of local government(i)'s covariates during pretreatment period
  - Y_i is the fiscal outcome in local government (i) for 2013

Empirical Specifications: Regression Discontinuity Design

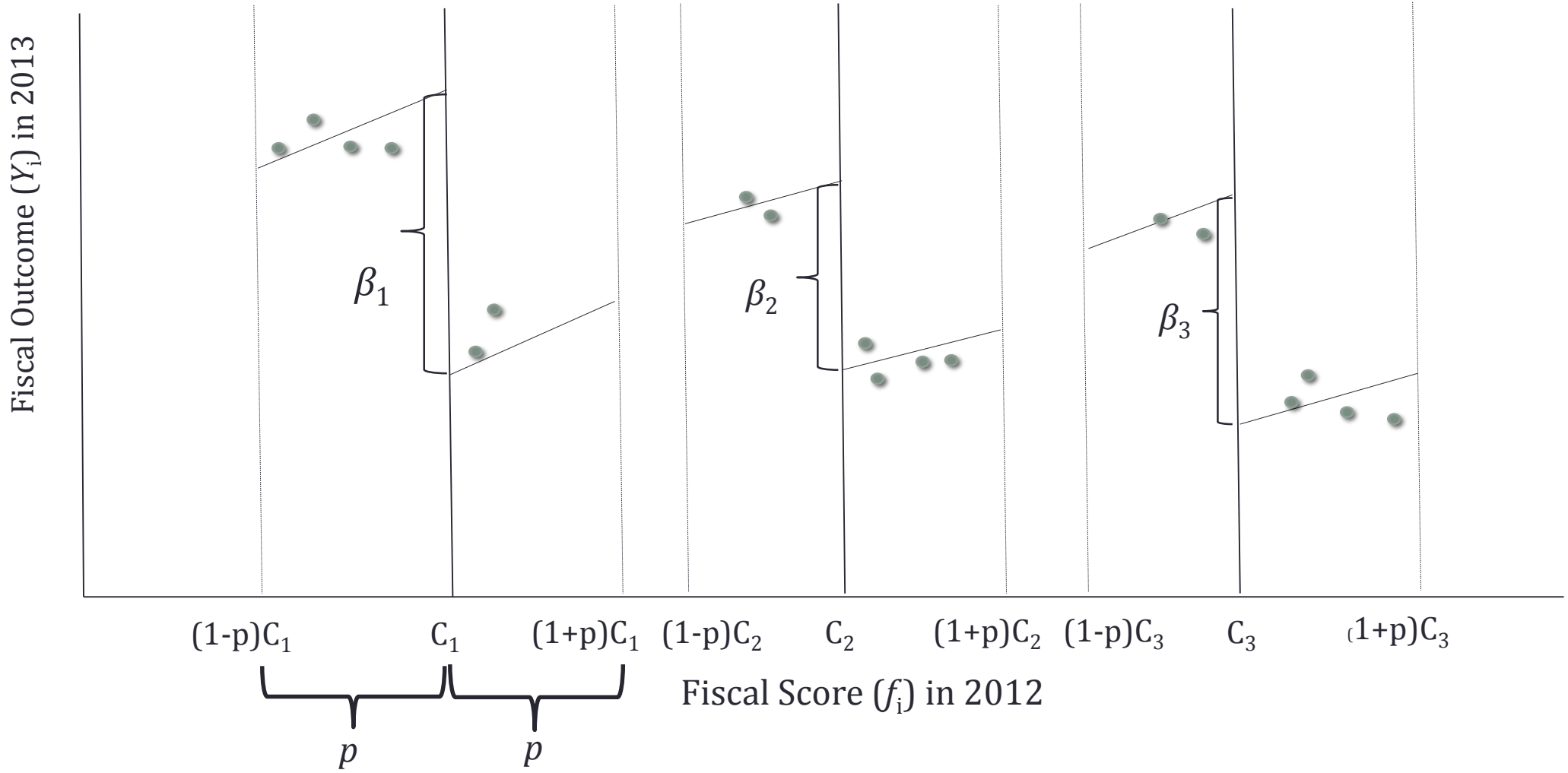
- Multiple Cutoffs Case

(2)

$$Y_i = [\boldsymbol{\beta_1} \cdot I\{f_i \geq C_1\} + \alpha_{10} f_i + \alpha_{11}(f_i) \cdot I\{f_i \geq C_1\}] \cdot I_{1p} + [\boldsymbol{\beta_2} \cdot I\{f_i \geq C_2\} + \alpha_{20} f_i + \alpha_{21}(f_i) \cdot I\{f_i \geq C_2\}] \cdot I_{2p} + [\boldsymbol{\beta_3} \cdot I\{f_i \geq C_3\} + \alpha_{30} f_i + \alpha_{31}(f_i) \cdot I\{f_i \geq C_3\}] \cdot I_{3p} + \gamma Z_i + \varepsilon_i$$

where $I_{jp} = I\{C_j (1-p) < f_i < C_j (1+p)\}$, j=1, 2, 3; p=3, 4, 5 percent

Empirical Specifications

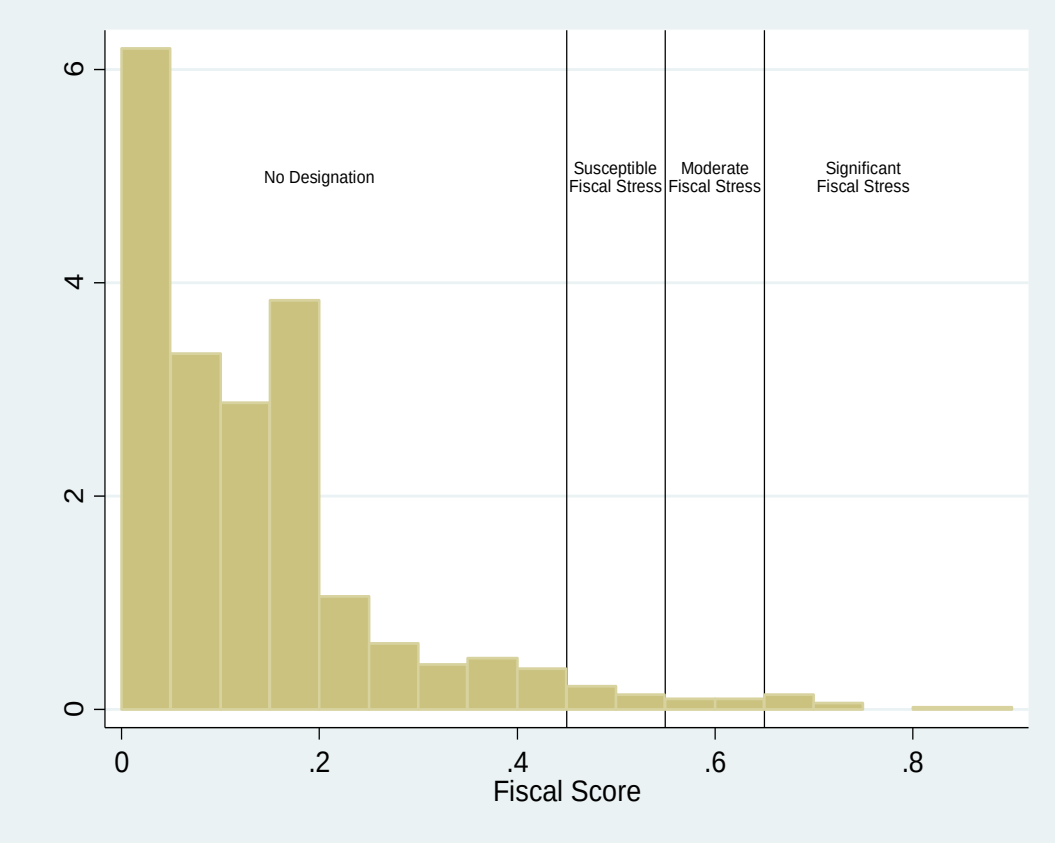


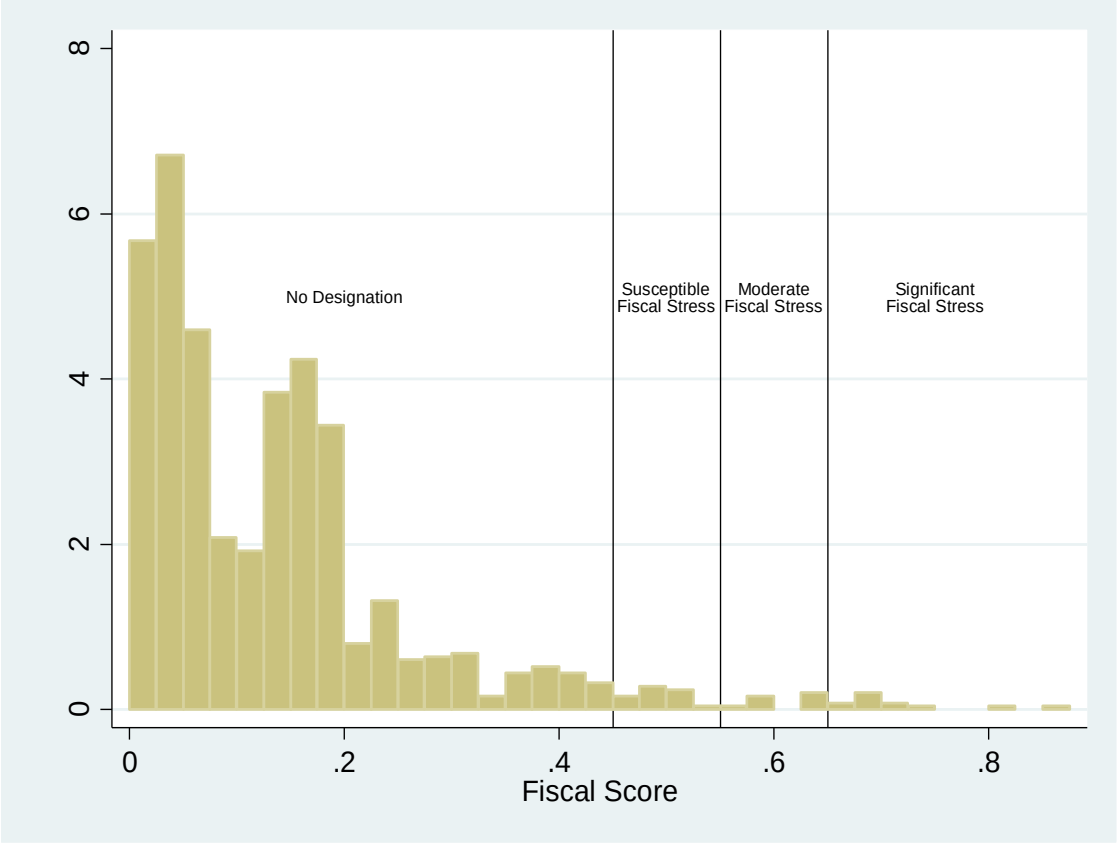
Internal validity checks

- Main assumption of a Regression Discontinuity Design
  - local governments have imprecise control over fiscal score

- Two approaches to check internal validity
  - Displaying the density of observations in each measured fiscal score within the bandwidth
  - McCrary Test
  - Regression analysis based on pretreatment covariates as dependent variables

Internal Validity Checks: Density of assigning variable





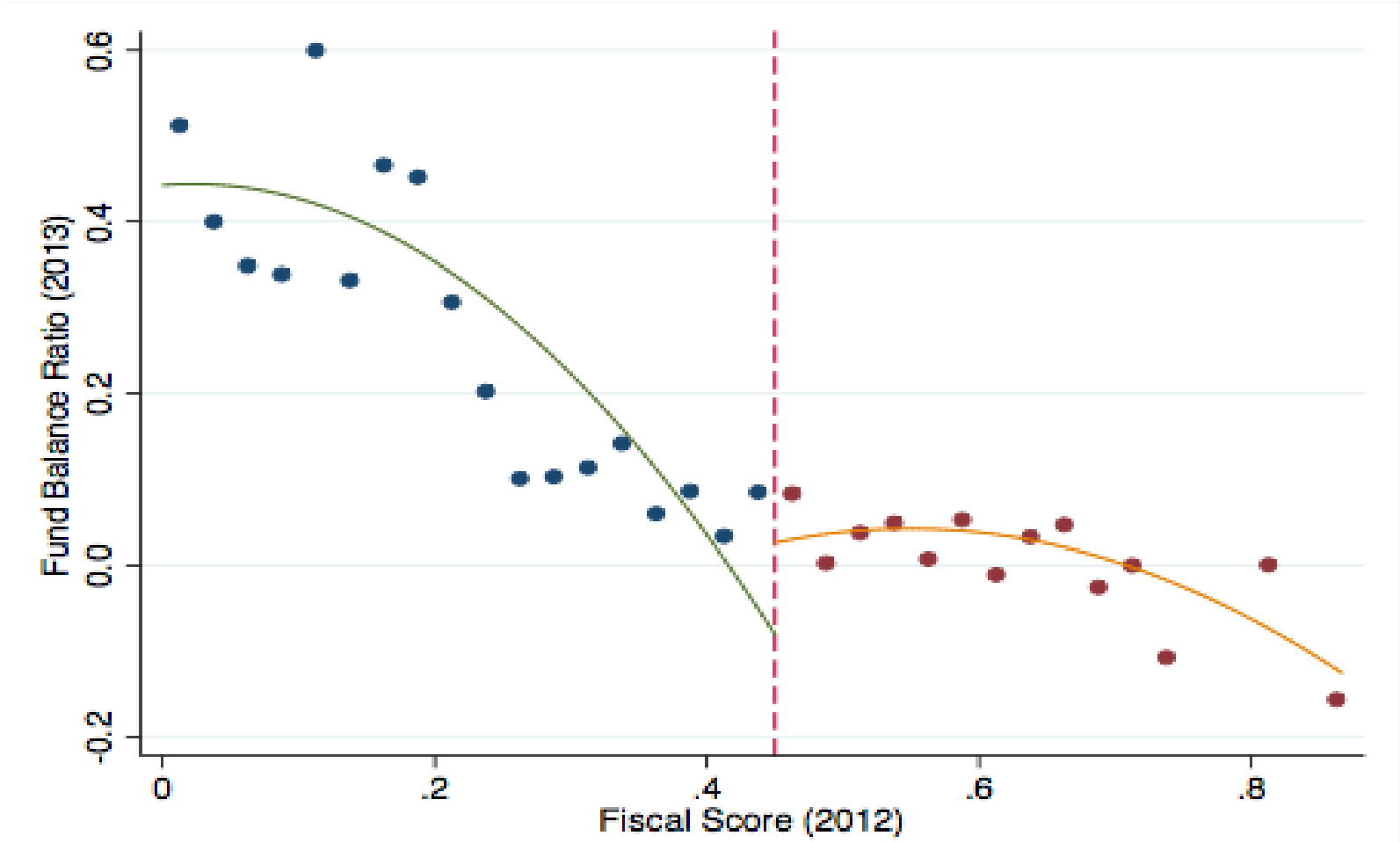
Internal Validity Check

Table 5. Test of Discontinuity in Pretreatment Covariates from Pooled Model

Dependent Variable				
	(1)	(2)	(3)	(4)
Median Age (2010)	3.676	0.182	1.947	3.536
	(3.15)	(4.905)	(3.06)	(5.412)
N	52	52	44	44
Poverty Rate (2010)	-0.042	0.105	0.017	-0.004
	(0.07)	(0.098)	(0.069)	(0.105)
N	52	52	44	44
Property Value Per Capita (2012)	99,889	-103,149	51,621	-33,556
	(62396)	(98770)	(56221)	(116463)
N	52	52	44	44
Population Change (2010)	-0.019	-0.012	-0.017	0.006
	(0.03)	(0.044)	(0.027)	(0.045)
N	52	52	44	44
Polynomial Specification	Linear	Quadratic	Linear	Quadratic
Neighborhood (p)	5	5	4	4

Note: OLS estimations with cluster standard error at bin width (cluster is constructed when bin width is 0.0125). Reported coefficients indicate the effect of cutoff (β) in each model with different dependent variables based on equation (3). Neighborhood (p) is distance from the cutoff (C), which allows us to focus on the sample around the cutoff with the different range.

Figure 4. Regression Discontinuity Estimates:
Fund Balance Ratio (2013) as an Outcome Variable



Note: The bin width is 0.025, which is suggested by the comparison of F-statistics across models. The F-statistics comparison and AIC procedures suggest that the quadratic specification is appropriate in the models.

Table 6. Regression Discontinuity Estimates: Fund Balance Ratio (2013) as an Outcome Variable

	(1)	(2)	(3)
Cutoff 1: Susceptible Fiscal Stress	0.06	0.284***	0.281***
	(0.077)	(0.009)	(0.008)
R-Squared	0.11	0.47	0.43
N	34	27	26
Cutoff 2: Moderate Fiscal Stress	-0.141*	-0.125***	-0.04
	(0.05)	(0.016)	-
R-Squared	0.66	0.65	1
N	10	9	5
Cutoff 3: Significant Fiscal Stress	0.028	-0.14	-0.108**
	(0.087)	(0.124)	(0.031)
R-Squared	0.08	0.47	0.64
N	13	11	10
Polynomial Specification	Quadratic	Quadratic	Quadratic
Neighborhood (p)	6	5	4

Note: OLS estimations with cluster standard error at the bin width (cluster is constructed when bin width is 0.0125). Reported coefficients indicate the effect of each cutoff (β) in the empirical models based on equation (3). Neighborhood (p) is distance from the cutoff (C), which allows us to focus on the sample around the cutoff with the different range.

Table 7. Regression Discontinuity Estimates: Fund Balance Ratio (2014) as an Outcome Variable

	(1)	(2)	(3)
Cutoff 1: Susceptible Fiscal Stress	0.016	0.398***	0.422***
	(0.131)	(0.039)	(0.024)
R-Squared	0.11	0.46	0.47
N	34	27	26
Cutoff 2: Moderate Fiscal Stress	-0.098	-0.105	0.163
	(0.106)	(0.067)	-
R-Squared	0.51	0.38	1
N	11	10	5
Cutoff 3: Significant Fiscal Stress	0.037	-0.165	-0.129**
	(0.083)	(0.14)	(0.03)
R-Squared	0.11	0.38	0.85
N	15	11	10
Polynomial Specification	Quadratic	Quadratic	Quadratic
Neighborhood (p)	6	5	4

Note: OLS estimations with cluster standard error at the bin width (cluster is constructed when bin width is 0.0125). Reported coefficients indicate the effect of each cutoff (β) in the empirical models based on equation (3). Neighborhood (p) is distance from the cutoff (C), which allows us to focus on the sample around the cutoff with the different range.

Table A.7. Robustness Check: Regression Discontinuity Estimates with Fund Balance Ratio (2013) with Randomization Inference

	(1)	(2)	(3)
Cutoff 1: Susceptible Fiscal Stress	0.06*	0.284***	0.281***
	(0.077)	(0.001)	(0.001)
Cutoff 2: Moderate Fiscal Stress	-0.141**	-0.125**	-0.04
	(0.03)	(0.0152)	(0.355)
Cutoff 3: Significant Fiscal Stress	0.028	-0.14	-0.108*
	(0.755)	(0.162)	(0.099)
Polynomial Specification	Quadratic	Quadratic	Quadratic
Neighborhood (p)	6	5	4

Note: OLS estimations with randomization inference p-value. Iteration is based on 1,000 times. Reported coefficients indicate the effect of each cutoff (β) in the empirical models based on equation (3). Neighborhood (p) is distance from the cutoff (C), which allows us to focus on the sample around the cutoff with the different range.

Discussion and Conclusion

- ‘Naming and Shaming’ works in public finance
- Heterogeneous policy effects
  - Greater responsiveness of less stressed localities
  - More stressed localities have fewer option
  - ‘Capacity to adapt’ matters (Elmore 2007)

Discussion and Conclusion

- Labelling at a relatively modest level of stress is effective
- More direct intervention may be required when stress reaches a higher level
- Application to Korean Case

- Future work
  - Understanding the black box for local governments' decision making process
  - When fiscal information is used

Q & A