



SOSE WEST

Workshop Economico, Statistico e Tecnologico

DATA SCIENCE E RESPONSABILITÀ CIVICA

DATI APERTI AL SERVIZIO DI ENTI LOCALI E CITTADINI

THE DETERMINANTS OF THE FISCAL DISTRESS OF ITALIAN MUNICIPALITIES: HOW MUCH IS IT DUE TO INADEQUATE RESOURCES?

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The determinants of the fiscal distress of Italian municipalities: how much is it due to inadequate resources?

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Motivation

In the aftermath of the **2008 Great Recession** many sub-national (municipal and regional) governments experienced **severe financial difficulties**

This can be, inter alia, related to **fiscal consolidation strategies** carried out by central government: cuts in transfers to subnational governments and expenditure and/or deficit objectives to be met by sub-national authorities

There are many examples of large municipalities which filed for bankruptcy in the US (Stockton, San Bernardino 2012 and Detroit 2013). Also in Europe sub-national governments have run high budget deficits and accumulated a substantial amount of debt, which caused financial troubles. In **Italy** the number of cases of municipalities in financial distress **sharply increased** after 2008

Motivation

The aim of this paper is to empirically analyse the **main factors** affecting the probability of **financial distress** in Italian municipalities

In particular, the focus is on the role of **inadequacy in financial resources** in relation to their own needs in making some municipalities more financially vulnerable than others

The determinants of the inadequacy in financial resources are distinctively considered:

- **severe cuts in vertical transfers**
- **shortcomings in the current equalizing transfer system** which makes some municipalities to suffer from a level of resources lower than required to provide public services at standard levels

Literature review

Factors causing financial distress in local governments can be grouped into two categories:

- **non-structural** factors, which to some extent are under the control of local policy-makers and officials
- **structural** factors, which include socio-economic features generally beyond the direct control of local policy-makers

Literature review

Non-structural factors

- poor budgetary management and inefficiency
- interest group pressures
- political factors (timing of election, political orientation and strength of local government as well as its alignment with the party in power at central level)
- design of intergovernmental fiscal relationships, specifically concerning expectations for a local government bail-out by central authorities (soft budget constraint)

Structural factors

- declining population, fundamental changes in the economic base which can affect local tax capacity
- cuts in vertical transfers, especially when they disproportionately affect specific municipalities

Literature review

There is an **extensive literature** investigating these issues in the case of **US cities** whereas it is much more limited for European countries
No studies on the determinants of financial default specifically referred to the case of the **Italian municipalities**, except for Gregori et Marattin (2019), who, however, are more interested in detecting the budget indicators likely to lead to local distress

Institutional background: Procedures for sub-national financial crises

Four main elements of the Italian institutional background are relevant to this analysis

- 1) Three different procedures of resolution of subnational financial crises**, roughly differentiated according to the severity of the crisis
 - **‘structurally distressed’ local governments** (enti “strutturalmente deficitari”)
 - **local governments under ‘financial rebalance’** (enti in “procedura di riequilibrio finanziario” o “pre-dissesto”)
 - **‘financially destabilized’ local governments** (enti “in dissesto finanziario”)

These procedures usually include some intervention of debt restructuring, supplemented with fiscal adjustment plans, measures on management or judicial procedures for insolvency

Italian municipalities: financial distress cases 1993-2018

Year (municipal resolution)	Financially destabilized municipalities		Municipality under procedure of financial rebalance		Total municipalities in financial distress	
	no.	%	no.	%	no.	%
1993	1	0.50%	0	-	1	0.20%
2005	2	1.00%	0	-	2	0.40%
2006	3	1.50%	0	-	3	0.60%
2007	1	0.50%	0	-	1	0.20%
2008	6	3.00%	0	-	6	1.10%
2009	6	3.00%	0	-	6	1.10%
2010	5	2.50%	0	-	5	0.90%
2011	13	6.50%	0	-	13	2.40%
2012	15	7.50%	46	13.60%	61	11.30%
2013	19	9.50%	65	19.20%	84	15.60%
2014	21	10.50%	48	14.20%	69	12.80%
2015	18	9.00%	31	9.10%	49	9.10%
2016	32	16.00%	55	16.20%	87	16.10%
2017	28	14.00%	48	14.20%	76	14.10%
2018	29	14.50%	45	13.30%	74	13.70%
Total	200		339		539	

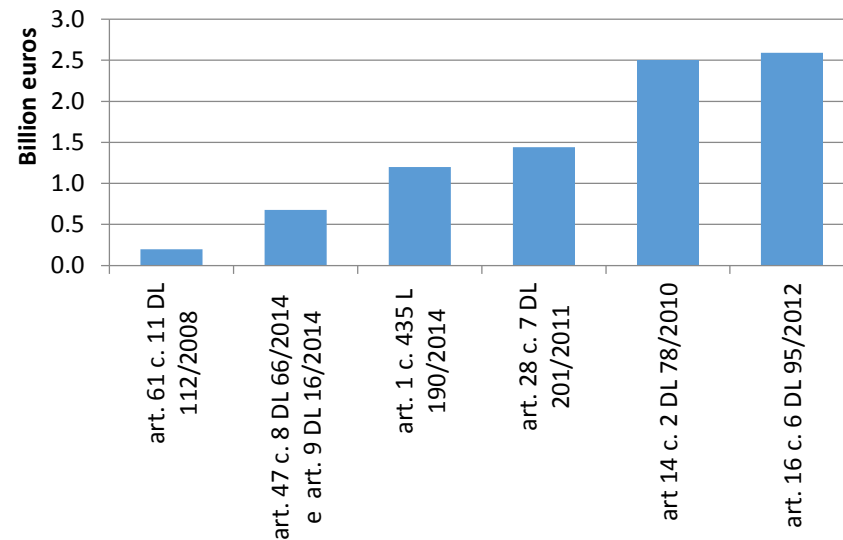
Source: Ca' Foscari Foundation

Institutional background: Transfer cuts as a measure of VFI

2) In 2009-15, as part of the **fiscal consolidation strategies** undertaken by central government, **severe cuts in vertical transfers** towards municipalities: 8.6 billion euros in total (18% and 33% of respectively current and capital expenditure in 2007)

The amount of transfer cuts burdened on each municipality gives a measure of how severe the **Vertical Fiscal Imbalance (VFI)** suffered by each municipality is:

$$VFI = \text{transfer cuts} / \text{historical current expenditure}$$



- 2009 → art. 61 c. 11 DL 112/2008 (0.2 billion)
- 2011 → art 14 c. 2 DL 78/2010 (2.5 billion exemption of municipalities < 5,000 inhabitants)
- 2012 → art. 28 c. 7 DL 201/2011 (1.4 billion)
- 2013 → art. 16 c. 6 DL 95/2012 (2.6 billion exemption municipalities affected by the 2009 and the 2012 earthquakes)
- 2014 → art. 47 c. 8 DL 66/2014 e art. 9 DL 16/2014 (0.7 billion)
- 2015 → art. 1 c. 435 DL 190/2014 (1.2 billion exemption municipalities affected by the 2009 and the 2012 earthquakes)

Source: Ministry of Home Affairs

Institutional background: Equalization grants as a measure of HFI

3) The recently reformed **equalizing transfer system** for Italian municipalities based on the estimate of **Standard Expenditure Needs indicators (SENs)** for the main expenditure programmes

- SENs measure the **financial resources to be assigned** to each municipality as **justified by differences in the socio-economic conditions** affecting production costs and demand for local public services
- Following a **top-down approach**, SENs (estimated in monetary terms) are then converted into **coefficients in order to apportion** the pre-determined total budget across municipalities according to the **Municipal Solidarity Fund (FSC)** formula → **standard expenditure**
- In the perspective of this paper, SENs are exploited to derive a measure of the **Horizontal Fiscal Imbalance (HFI)** suffered by each municipality as the difference between grants that each municipality should receive in case of **full implementation of the FSC** compared with the **historical grants**:

$$HFI = (\textit{standard expenditure} - \textit{fiscal capacity}) - \textit{historical grants}$$

Institutional background: Indicator of efficiency in services provision

4) Availability of **performance indicators** for each municipality as a **by-product** of the computation of FSC

Based on estimated SENs, **global indicators of the efficiency level** in the provision of services (**LQP Livelli Quantitativi delle Prestazioni**) can be derived for each municipality by combining:

- the percentage deviation of SENs from historical expenditure → **expenditure score**
- the percentage deviation of the level of services actually provided from the standard level (average value for population groups) → **output score**

	Historic (a)	Standard (b)	Difference (a-b)
Expenditure	\hat{y}	y	Δy
Level of Service	g	\hat{g}	Δg

Performance evaluation

- *Output score* = Δg (converted in 1-10 score)
- *Expenditure score* = Δy (converted in 1-10 score)
- *LQP score* = $(3/5\Delta g + 2/5\Delta y)$

Data

Source:

Ca' Foscari Foundation dataset: info on the **cases of fiscal distress in Italian municipalities**

2012-18

- Municipalities under 'multiyear financial rebalance': 339 cases
- 'Financially destabilized' municipalities: 163 cases

2012 latest reference point for the evaluation of the **historical resources**

Ministry of Home Affairs dataset: info about **grants** towards municipalities under the Municipal Solidarity Fund (FSC)

- grants under full implementation of FSC (simulated) vs historical grants (2012) → HFI
- grants cuts 2010-15 → VFI

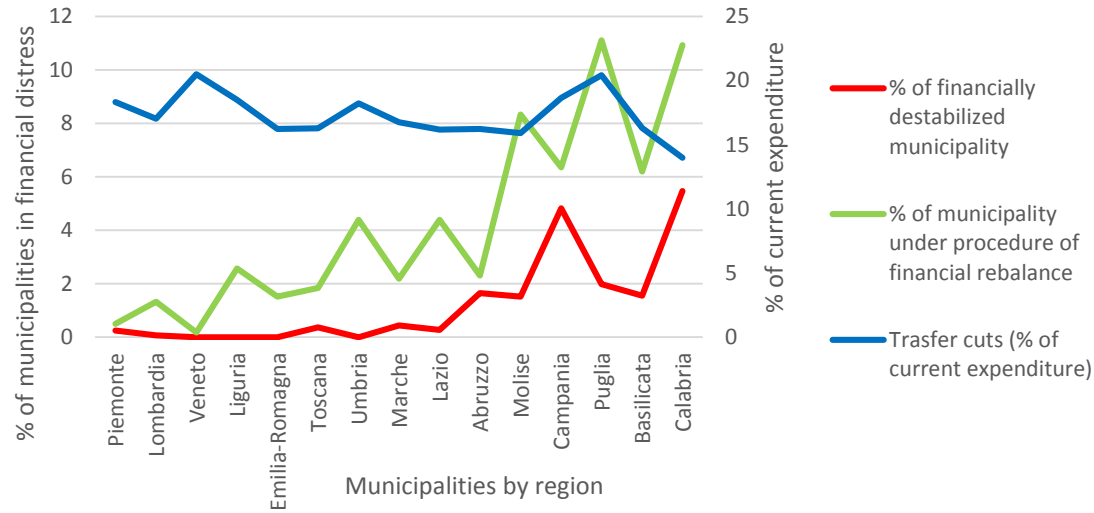
Opencivitas website: **LQP indicators** for each municipality in 2010 and 2013

Other sources: info on **electoral, census and morphological** characteristics

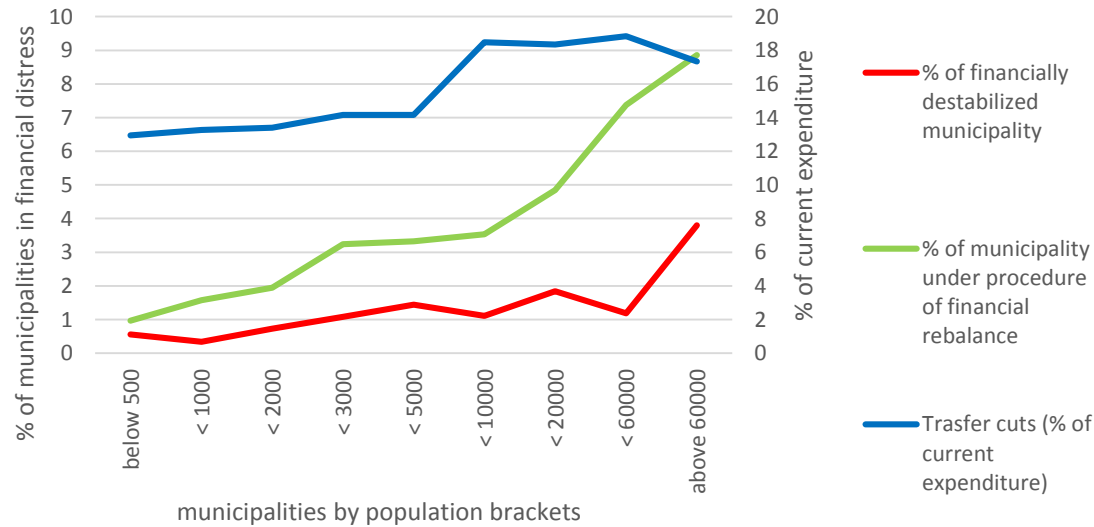
Structure:

Sectional micro-dataset on 6,605 Italian municipalities (excluding Special-Statute Regions) combining info on **cases of fiscal distress** occurred in **2013-18** with info on **time-invariant determinants** measured in **previous years**

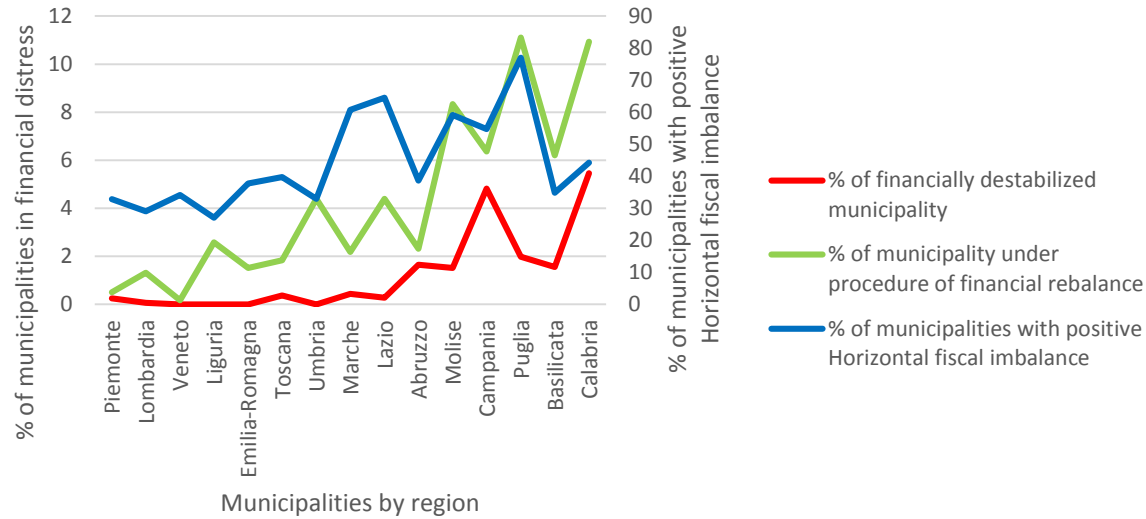
Financial distress vs VFI



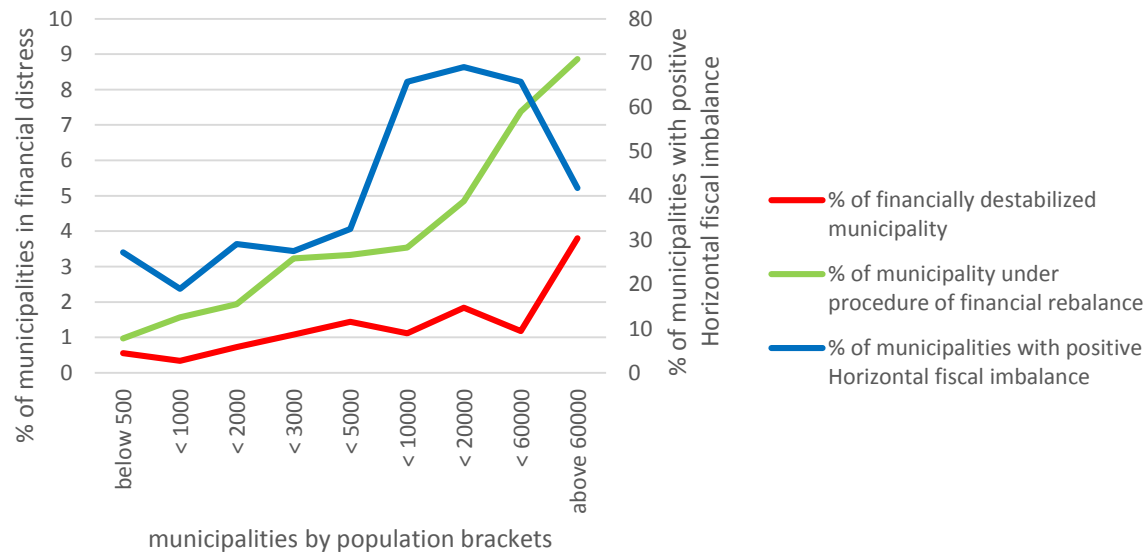
No sharp correlation between VFI and the percentage of municipalities in financial distress



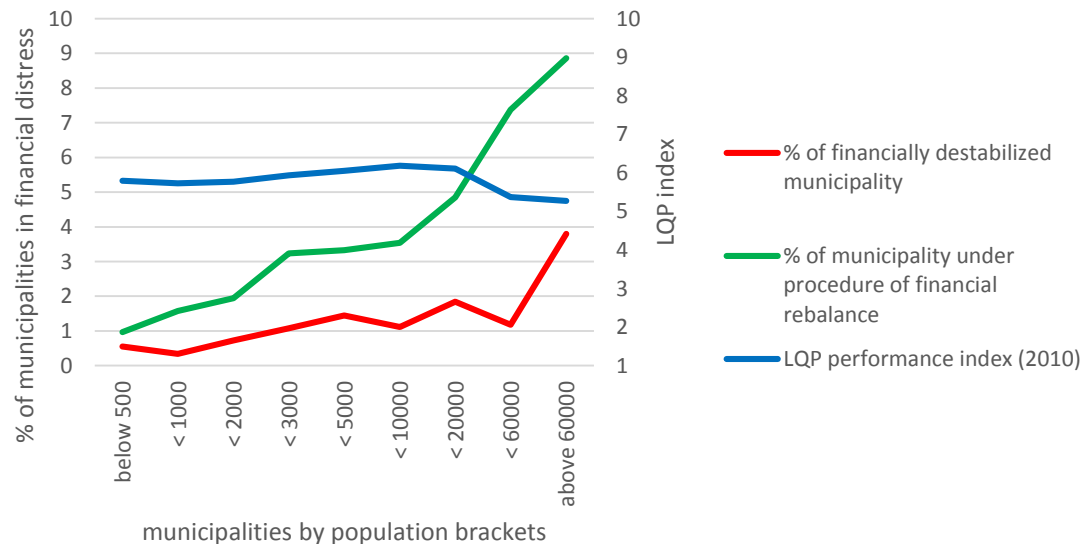
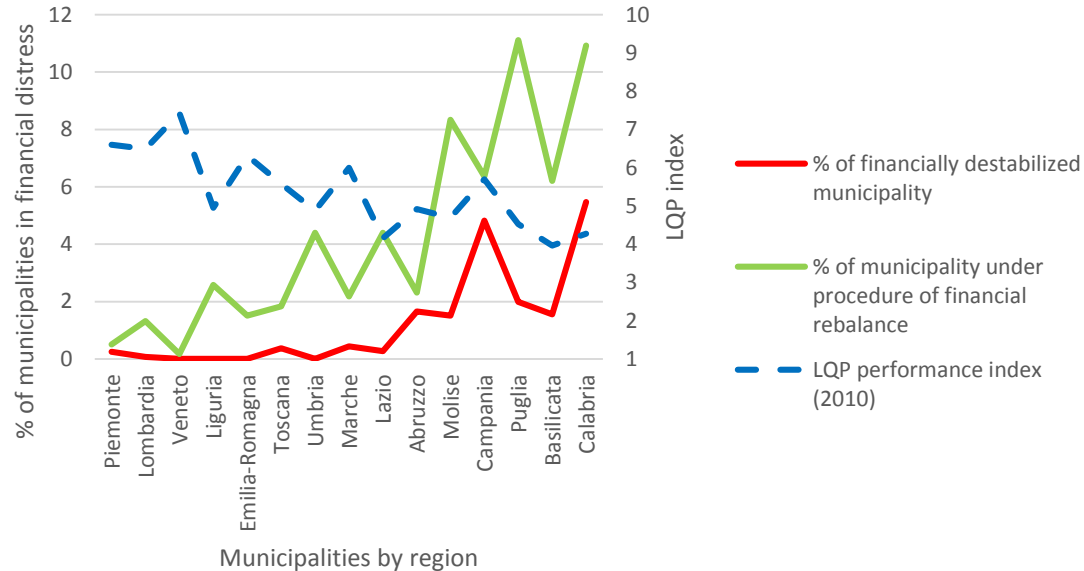
Financial distress vs HFI



Clear evidence of the positive correlation between the two variables: the higher the level of HFI the higher the percentage of municipalities in financial distress



Financial distress vs performance (LQP)



Clear evidence of inverse correlation between the two variables: the higher the level of efficiency the lower the percentage of municipality in financial distress

This correlation is particularly evident for municipalities in the Southern regions

Empirical strategy

$$Y_i = \beta_0 + \beta_1 D_i^{HFI} + \beta_2 D_i^{VFI} + \beta_3 LQP_i + \beta_4' \mathbf{Controls}_i + \epsilon_i$$

where:

- Y_i : dummy=1 in case of ‘financially destabilized’ municipality/ municipality under ‘financial rebalance’
- D_i^{HFI} : dummy=1 for municipality with **positive HFI** (poor equalization)
- D_i^{VFI} : dummy=1 for municipality which suffers from **severe VFI** (transfer cuts in percentage of historical current expenditure above national average)
- LQP_i : dummy=1 for municipality showing a level of **efficiency** (2010 LQP index) **above the average**
- $\mathbf{Controls}_i$: vector of controls including electoral, census and morphological variables

Since the dependent and the main explanatory variables are **discrete binary variables**, we estimate the **probability of financial distress** using a **Linear Probability Model (LPM)** where point estimates are got through OLS with robust standard errors

Summary statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Dummy = 1 if financially destabilized municipality	6,605	0.0233	0.1509	0	1
Dummy = 1 if municipality under procedure of financial rebalance	6,605	0.0368	0.1883	0	1
Dummy = 1 if municipality with positive HFI	6,605	0.4872	0.4999	0	1
HFI (euro per capita)	6,605	-3.63	64.29	-1137.43	637.59
Dummy = 1 if municipality with severe VFI	6,543	0.4721	0.4993	0	1
VFI (transfer cuts in % of current expenditure)	6,543	15.89	4.21	0.95	41.37
Dummy = 1 if performance index above average	6,538	0.4971	0.5	0	1
Dummy = 1 if per capita fiscal effort above average	6,605	0.2754	0.4467	0	1
Electoral cycle (years from election, 0 = electoral year)	6,521	2.29	1.17	0	4
Dummy = 1 if left-wing council majority	6,511	0.0938	0.2916	0	1
Dummy = 1 if right-wing council majority	6,511	0.0954	0.2938	0	1
Dummy = 1 if centre-wing council majority	6,511	0.0052	0.0721	0	1
Margin of victory of incumbent major (%)	6,137	19.98	17.27	0	98
Dummy = 1 term limit major	6,516	0.3838	0.4864	0	1
Seismic risk class	6,543	2.73	1.24	1	5
Rural municipality level	6,542	1.89	0.95	1	3
Altimetric zone	6,542	2.92	1.54	1	5
% of population below 2 years old	6,543	2.55	0.74	0	6.17
% of population 3-14 years old	6,543	10.55	2.19	0	17.84
% of population above 65 years old	6,543	22.85	5.83	5.71	62.64
Resident population	6,605	7,781	45,773	29	2,872,800

LPM estimation results: HFI, VFI, Performance Index

	(1)	(2)	(3)	(4)	(5)	(6)
	Financially destabilized municipalities			Municipalities under financial rebalance		
HFI	0.0118*** (0.00253)	0.0108*** (0.00253)	-5.34e-05 (0.00252)	0.0325*** (0.00429)	0.0296*** (0.00423)	0.00763* (0.00415)
Performance Index (2010)		-0.0095*** (0.00249)	-0.00425 (0.00289)		-0.0292*** (0.00417)	-0.0139*** (0.00440)
VFI			0.00592** (0.00296)			0.00990** (0.00485)
Constant	0.00447** * (0.00115)	0.00980** * (0.00209)	-0.0173 (0.0190)	0.0143*** (0.00205)	0.0307*** (0.00346)	0.0451 (0.0335)
Control variables	NO	NO	YES	NO	NO	YES
Observations	6,501	6,434	6,028	6,501	6,434	6,028
R-squared	0.03	0.06	0.38	0.09	0.16	0.45

*Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1*

LPM estimation results: control variables (1)

	(3) Financially destabilized municipalities		(6) Municipalities under financial rebalance	
Population	3.96e-05	(4.44e-05)	0.000255*	(0.000132)
Population (sq)	-1.56e-08	(1.69e-08)	-1.01e-07**	(4.82e-08)
Lombardia	-0.0102***	(0.00258)	-0.00602	(0.00506)
Veneto	-0.0139***	(0.00344)	-0.0222***	(0.00588)
Liguria	0.000559	(0.00318)	0.0250**	(0.0117)
Emilia-Romagna	-0.00806**	(0.00366)	-0.00385	(0.00998)
Toscana	0.00264	(0.00535)	-0.000171	(0.0104)
Umbria	-0.00562	(0.00498)	0.0117	(0.0213)
Marche	-0.00532	(0.00669)	-0.00117	(0.0134)
Lazio	-0.000980	(0.00422)	0.0214**	(0.0108)
Abruzzo	0.00984	(0.00871)	-0.00102	(0.0121)
Molise	0.0110	(0.0121)	0.0537**	(0.0241)
Campania	0.0347***	(0.0106)	0.0302**	(0.0137)
Puglia	0.00497	(0.00925)	0.0709***	(0.0205)
Basilicata	0.0115	(0.0121)	0.0281	(0.0238)
Calabria	0.0477***	(0.0139)	0.0779***	(0.0188)

*Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1*

LPM estimation results: control variables (2)

	(3) Financially destabilized municipalities		(6) Municipalities under financial rebalance	
Electoral cycle	-0.00119	(0.00129)	-0.00251	(0.00208)
Dummy = 1 if left wing council	-0.0122***	(0.00355)	0.00217	(0.00992)
Dummy = 1 if right wing council	0.00150	(0.00485)	0.0140*	(0.00842)
Dummy = 1 if centre council	0.00598	(0.0341)	-0.0179	(0.0328)
% of margin of victory	-0.000128**	(6.19e-05)	-3.54e-05	(0.000122)
Dummy = 1 term limit mayor	0.00549*	(0.00296)	-0.00700	(0.00442)
Seismic risk class	0.00235	(0.00175)	0.00580*	(0.00313)
Rural municipality level	-0.00441*	(0.00237)	-0.00835**	(0.00376)
Altimetric zone	-0.000282	(0.00133)	0.00309	(0.00229)
% of population below 2	0.00188	(0.00353)	-0.00376	(0.00332)
% of population 3-14	0.00209	(0.00132)	0.000568	(0.00161)
% of population above 65	0.000134	(0.000387)	-0.00118*	(0.000670)
Dummy = 1 if fiscal effort above mean	0.00554*	(0.00325)	0.00163	(0.00522)
Observations	6,028		6,028	
R-squared	0.38		0.45	

*Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1*

Conclusions

Are financial distress conditions recently experienced by Italian municipalities due to **inadequate resources** in relation to their needs?

- The estimation results show that the municipalities which suffer from a level of **resources lower** than required to provide **public services at standard levels** (as measured by SENs) are, ceteris paribus, **more prone to running into financial distress**
- Similarly, **severe cuts in central government transfers** seem to exert a statistically significant effect on the probability of municipality to incur a situation of default

Further research

Derive a **more informative measure of financial distress** by drawing on the definition of '**structurally distressed**' municipalities which are identified on the basis of a set of specific financial indicators

By computing these **indicators on the basis of budget data** for each municipality/year, we can derive a summary **quantitative measure** of public finance situation to be used as the dependent variable

First step to building a yearly panel dataset including **time-variant explanatory variables**

New measures of financial distress

- **Module 50 of municipal balance sheets** => definition of '**structurally distressed**' authorities (*DM 28 December 2018*), the institutions with at least half of the parameters not in line with the thresholds are considered structurally distressed (TUEL article 242)

Incidence of rigid expenses (threshold = greater than 48%)

Incidence of own revenue collections on total revenues (threshold = less than 22%)

Financial anticipations processed only for accounting purposes (threshold = greater than 0)

Debt sustainability (threshold = greater than 16%)

Deficit Sustainability (threshold = greater than 1.20%)

Certified and financed debts (threshold = greater than 1%)

Debts under certification + Certified and financed debts (threshold = greater than 0.60%)

Revenue collection capacity (threshold = less than 47%)

Variables under construction (2009 – 2018):

- 1) **Value of each indicator** (problem => some indicators can not be consistently measured across years, moreover we need to generate a composite indicator)
- 2) **% of indicators not in line with the threshold** (problem => the structure of module 50 was updated every three years, reduced variability within municipalities)

Thank you!