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Discussion Paper Series

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Discussion paper n. 41/2025

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May 30th, 2024

Abstract

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1 Introduction

Due to the deterioration of their public finance position, during and after the 2008 Great Recession many local governments experienced severe financial difficulties and sometimes were compelled to declare financial insolvency. The US experience offers several outstanding cases of large municipalities which filed for bankruptcy, such as Stockton and San Bernardino in 2012 and Detroit in 2013 (Gorina et al., 2017; Beckett-Camarata & Grizzle, 2014). Even In Europe, where bailout procedures are much more common (Allers & de Natris, 2021), cases of financial distress of subnational authorities have been frequent. The most relevant episode was that of the Catalonia government in 2012, whose financial crisis can be traced back to a combination of cuts in central transfers, local economy recession and effects of real estate speculation (Díaz Mendoza et al., 2015; De La Fuente, 2022), but other significant cases have occurred elsewhere, such as in Portugal (Lobo et al., 2011).

Italy, which together with Austria, Hungary and Switzerland, applies a stricter insolvency regime (Person, 2021), was no exception. It was severely hit by the 2008 Great recession and local governments, which are responsible for about one third of total public spending, had to deal with harsh direct and indirect consequences (Ambrosanio et al. 2016). Cuts in central transfers to subnational governments have been accompanied by a strengthening of local fiscal autonomy and a tightening of rules on budget discipline. All these financial tensions brought to a drop in local investments and to a rapid increase in the number of municipalities in budget difficulties. If in the twelve-year period before the Italian sovereign debt crisis between 1998 and 2010, 71 local governments experienced fiscal distress, in the following twelve years (2011-2022) as many as 291 local governments were involved in one procedure of legal default.[1] All in all, local governments located in Southern Italy were more affected by financial difficulties (Banca d'Italia, 2022).

Starting from this evidence, the aim of this paper is to empirically investigate whether the cases of financial distress recently experienced by several Italian municipalities can be at least partially imputed to the inadequacy of the financial resources they suffer compared to the needs of their populations and their territories. To explore this issue, we exploit the variability across municipalities revealed by two recent occurrences involving the intergovernmental fiscal relations in Italy. On the one hand, we make reference to the large cuts in vertical transfers carried out by the central government as part of the fiscal consolidation strategy in the period 2014-2015 which affected the revenues of single municipalities to varying degrees. On the other hand, the introduction in 2015 of a new mechanism of equalization transfers at local level, based on municipal expenditures needs indicators estimated on the basis of structural characteristics of each local entity, has made it possible to get a measure, exogenous from the effects on the budget of local policy decisions, of the gap between available financial resources to local needs in each municipality. To corroborate our exogeneity assumption, it should be noted that municipalities did not receive any information on the structural equalization gap and could not anticipate its impact on their budget policy. Moreover, the full implementation of the new equalization system involves a very long transitionary period, up to 2030.

By exploiting these two sources of variability across local authorities, the estimation results show first of all that the Italian municipalities which suffer a level of resources lower than what would be necessary to provide public services at a standard level, as measured by the estimated expenditures needs indicators, are, ceteris paribus, more likely to run into financial

[1] Among the main municipalities, Naples entered into legal financial distress in 2012, while Rome established a sort of "bad company" to manage bad debt as of April 2008.

difficulties. By the same token, large cuts in central government transfers have a statistically significant effect on financial vulnerability at municipal level.

The structure of the paper is as follows. Section 2 provides a review of the literature about the determinants of financial distress in subnational governments and how our paper is placed within this framework. In Section 3 we discuss the legal cases of financial crisis at local level in the Italian institutional setting and the broader, multidimensional definition of financial distress we adopt in this analysis. Section 4 deals with the two measures of inadequacy of financial resources we define starting from two relevant occurrences in the recent developments of the intergovernmental financial relations in Italy that is, as mentioned before, the cuts in transfers for central government to municipal level and the estimation of expenditures needs indicators as a part of the newly introduced mechanism of municipal equalization as a standardized measure of financial needs of each local authority. In Sections 5 we present the data. Section 6 describes the empirical model to estimate the role of inadequacy of financial resources in affecting the probability of financial distress. Section 7 presents the main empirical results and some relevant robustness checks. Section 8 offers some concluding remarks.

2 Factors causing financial distress in municipalities

Financial distress

Financial distress represents the negative side of financial health in municipalities, opposite to financial sustainability, which implies a stable, positive financial condition (Gardini & Grossi, 2018). Financial distress occurs when a government struggles to meet its financial obligations and is often referred to as fiscal health, financial position, fiscal stress, or fiscal crisis (Cabaleiro et al., 2013). Definitions vary: some describe it simply as the inability to meet obligations, while others include criteria like acceptable taxation levels, service provision, and both short-term and long-term financial perspectives (Carmeli & Cohen, 2001; Kloha et al., 2005; Wang et al., 2007; Jones & Walker, 2007; Zafra-Gomez et al., 2009).

In this study, financial distress is defined as the inability to balance the budget and provide services and meet future obligations (Pagano & Moore, 1985). Four dimensions of municipal financial distress are widely acknowledged (Groves et al., 2003; Hendrik, 2011; Jacob & Hendrick, 2012): (1) Cash solvency: Assesses liquidity and cash management, focusing on meeting immediate liabilities like payroll and supplier payments. Poor cash management leads to payment delays and service disruptions. (2) Budget solvency: Determines if annual revenues cover expenditures without resorting to borrowing or reserves. Deficits indicate financial distress. (3) Long-run Solvency: Considers long-term obligations' impact on future resources, assessing financial sustainability. Absence of long-term solvency burdens future generations. (4) Service-level solvency: Measures the ability to deliver required public services, impacting service quality and quantity. Cutting services to improve finances risks dissatisfaction and falling below service standards.

Structural, socio-economic factors

Literature has focused on the conditions of financial distress in municipalities, categorized into structural (external) and non-structural (internal) factors (Pammer, 1990; Gardini & Grossi, 2018). Structural factors are exogenous constraints beyond local politicians' control but significantly impact financial distress. Non-structural factors are within the control of local policymakers and reflect their choices. Structural factors include socio-economic and institutional design elements.

One structural factor is declining population: as the population decreases, so does the tax base, leading to a mismatch between service expenses and revenue, exacerbated by "cost-stickiness," where service expenditures remain unchanged despite population decrease, leading to financial distress (Choen, 2008, 2017; Cabaleiro et al., 2012; Capalbo & Grossi, 2014; Rodriguez-Bolivar et al., 2016).

Another structural factor is local economic shocks, which negatively impact the tax base, reduce government revenue, and increase welfare program demands (Garcia-Sanchez et al., 2012b, 2014; Ashworth et al., 2005; Capalbo & Grossi, 2014; Rodriguez-Bolivar et al., 2016). During crises like the pandemic, higher financial vulnerability in local governments can be mitigated by central state emergency policies (Padovani et al., 2021, 2022).

Structural, institutional design factors

Literature identifies four institutional design factors affecting financial distress: fiscal rules, central government mandates, local tax autonomy, and inadequacy in financial resources. Fiscal rules, including bail-in versus bail-out procedures, debt ceilings, and spending review policies, influence local financial stability. However, their impact is unclear due to opportunistic behavior by policymakers expecting central government support in financial crises (soft budget constraint) (Raffer & Ponce, 2021; Ter-Minassian, 2007).

Central government mandates can also significantly impact local financial stability by making it difficult to reduce expenditures when revenues decrease, leading to imbalances (Ahrens & Ferry, 2020; Nemec & Spacek, 2020).

Financial autonomy, or the decentralization of income and expenditure decisions, can enhance local government efficiency and effectiveness (Ladner et al., 2016; Oates, 1972). While debated, there is consensus that increased financial autonomy reduces financial vulnerability (, -Galera et al., 2017; Ahrens & Ferry, 2020).

Finally, inadequacy in financial resources can contribute to financial distress in local governments. This inadequacy arises when the revenue capacity of local governments does not match their expenditure needs, making it difficult to generate sufficient revenue to meet financial obligations and fund essential public services. Kloha et al. (2005) highlight how revenue constraints can limit the ability of local governments to effectively manage their budgets. Similarly, Pagano & Moore (1985) discuss the challenges faced by local governments when their fiscal capacity is insufficient to address the demands for public services and infrastructure. Inman (1995) further elaborates on the structural financial imbalances that can lead to persistent fiscal stress, emphasizing the need for adequate fiscal policies and intergovernmental transfers to bridge the gap between revenue and expenditure requirements.

Non-structural, non-financial factors

Non-structural factors can be categorized as non-financial and financial. Non-financial factors include political aspects, mismanagement, and outsourcing and decentralization strategies. Political factors impacting financial distress include the local government's ideological leaning (Brusca et al., 2015; Garcia-Sanchez et al., 2014; McDonald III, 2015) and the strength of the political majority (Ashworth et al., 2005; Solé-Ollé, 2006). These factors influence policies and financial health. Election timing can disrupt financial planning (Ashworth et al., 2005; Garcia-Sanchez et al., 2014), and alignment with the central government affects support and funding (Ahrend et al., 2013).

Mismanagement, such as long-term personnel stability or inadequate training, leads to inefficiencies, higher expenses, lower revenues, increased debt, and tax collection issues (Carmeli & Choen, 2001; Wallsted et al., 2014).

Outsourcing and decentralization strategies can both improve efficiency and reduce costs but also reduce control and accountability, complicating coordination across government levels (Zafra-Gomez et al., 2013; Cuadrado-Ballesteros et al., 2013).

Non-structural, financial factors

Financial non-structural factors include low revenue autonomy and diversification, expenditure rigidities, opacity of accounting information, and low-quality budgetary processes. Low revenue autonomy means local governments rely on limited revenue sources, making them vulnerable to economic shocks and changes (Mikesell, 2013). Limited revenue-generating capacity negatively impacts financial health and sustainability (Jones & Walker, 2007; Martell, 2008; Trussel & Patrick, 2012; Lara-Rubio et al., 2017). Chapman (1988) noted that local governments face more risk when funding decisions are made by others, leading to financial vulnerability (Cabaleiro et al., 2012).

Expenditure rigidities, like personnel expenses and debt service payments, hinder local governments' ability to adjust expenditures during revenue reductions, causing imbalances and financial distress (Jacob & Hendrick, 2012; Cohen et al., 2017). As discussed in previous literature (Padovani et al., 2021), this factor and the low revenue autonomy are interconnected with institutional factors. Specifically, decisions regarding revenue diversification and expenditure rigidities at the municipal level are often influenced by the country's fiscal rules, central government mandates, and the level of financial autonomy. In essence, while decisions are made locally, they are constrained by national-level boundaries and regulations.

Opacity in accounting information prevents stakeholders from accurately assessing financial health, complicating efforts to address financial issues (Benito & Bastida, 2009; Rodriguez-Bolivar et al., 2014; Padovani & Rescigno, 2018).

A low-quality budgetary process, including poor planning and resource use, contributes to financial distress by weakening financial management (Carmeli, 2008; Kimhi, 2008; Tang et al., 2014). A synopsis of the main factors causing financial distress is portrayed in Table 1.

Levine et al. (2013) and Maher et al. (2023) extensively explore factors contributing to financial distress in US cities. In the European context, Spain has received significant attention, with studies by Cohen (2008), Cabaleiro & Buch (2011), Cuadrado-Ballestreros et al. (2014), and Brusca et al. (2015). Fewer studies focus on Italian municipalities (Capalbo & Grossi, 2014; Brusca et al., 2015; Bisogno et al., 2019; Cuadrado-Ballesteros et al., 2019; Gregori & Marattin, 2019). The imbalance between revenue capacity and spending needs, termed inadequacy of financial resources, is identified as a key factor by Kloha et al. (2005), Pagano & Moore (1985), and Inman (1995). However, empirical tests to measure its effects are lacking, presenting a research gap we aim to fill in this study.

Table 1 – Factors causing financial distress in local governments

3 Financial distress in Italian municipalities: institutional setting

The Italian the legal framework provides for three different cases of financial distress and of the related financial recovery procedures for local authorities, which impose an increasingly greater restriction on their autonomy: structural deficit, intermediate pre-default and financial default.

Local authorities that are structurally in deficit – a condition that is established on the basis of a series of predetermined parameters – are subjected to central government controls relating to staff and the costs of certain services. Local authorities incurring a situation of structural deficit, that can evolve into financial default, can autonomously decide to launch the intermediate pre-default procedure. This procedure leaves financial management in the hands of the elective local policy-makers instead of transferring all powers to a commissioner, even if the local body is subjected to intensive controls aimed at preventing a possible future bankruptcy. Lastly, financial default occurs if a local authority is no longer able to carry out its functions and to deliver essential services, or is unable to meet its financial obligations. The recovery process is managed both by the local government, as regards ordinary management, and by a special liquidation authority, which deals with debt management.[2]

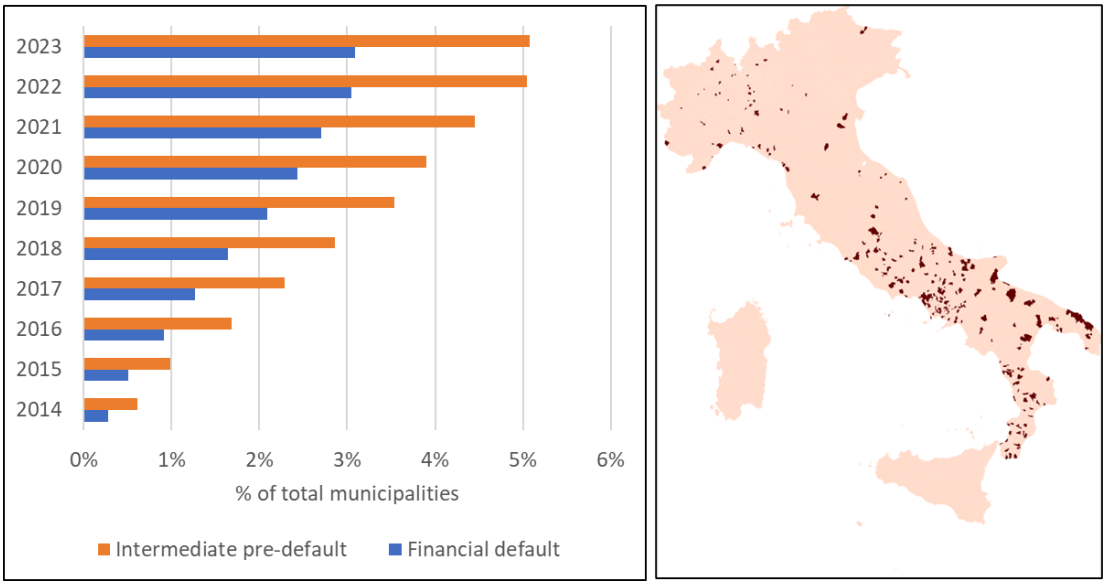
Our analysis of the determinants of financial distress in the Italian municipalities could, as a consequence, be based directly on cases of legal default and of the other instances of financial crisis that can be derived from public records. However, referring to these legal insolvency regimes suffers from a number of drawbacks. First, in the recent experience of the Italian municipalities, a strong propensity of local authorities to postpone as much as possible the official declaration of financial distress clearly emerges (Ambrosanio et al., 2016; Person, 2021). Second, several municipalities avoided falling into insolvency thanks to massive cash advances provided by banks (Raffer & Padovani, 2019). Finally, Italian municipalities show a long record of bail-out carried out by the central government through huge transfers to avoid bankruptcy (Raffer & Padovani, 2019).

As a result, only the tip of the iceberg of the financial distress experienced by the Italian municipalities is actually captured by the legal cases: Figure 1 shows that in the entire period from 2014 to 2023 only 3% and 5% of municipalities located in ordinary regions were involved in legal procedures of financial default and intermediate pre-default respectively (244 and 401 municipalities in total). Moreover, most of these cases occurred in municipalities located in Southern Italy.[3]

[2] A reform of the different procedures of financial distress above illustrated is currently under discussion in Italy. The main elements of the proposed reform include unifying the multi-year financial rebalancing procedure and the default one, excluding municipalities in financial difficulty from the fiscal consolidation measures implemented by the central government, and assigning financial support to those local entities which incur financial distress outside the direct responsibility of local policy makers.

[3] Table A2 in the Appendix reports all official cases of intermediate pre-default and financial default from 1989 to 2023.

Figure 1 – Municipalities involved in legal insolvency procedures (ordinary regions, cumulative 2014-2023)



We sought to overcome these shortcomings by relying on a more multi-dimensional measure of financial distress at the municipal level. In the case of the Italian municipalities, AIDA-PA database provides a financial distress scoring system for individual institutional bodies, named *Rating Finanziario*, which can prove useful in this perspective.[4] In particular, a set of ten elementary financial indicators/ratios are derived from the budgetary modified-accrual accounting reports (*rendiconti finanziari*) of each municipality. These elementary financial ratios are able to capture the three most relevant dimensions of financial conditions at municipal level mentioned in Section 2: cash solvency, budget solvency and long-run solvency.[5] Moreover, a Financial Rating Index is derived as a summary indicator of overall financial health by combining the elementary financial ratios (Financial Rating Index is normalized in the range 0-10).

Within the array of the indexes set out by AIDA-PA database, we selected, in addition to the overall Financial Rating Index, two elementary indexes which we consider particularly relevant to catch the different dimensions of financial health or, on the contrary, of the financial distress at local level:

1) the Structural Current Equilibrium Index (R4) is defined as the ratio of current revenues (deducted of bad debt) to current expenditures plus loans repayment, and provides a summary measure of budget solvency. This measure captures the capacity of a municipality to cover ordinary expenditures, namely those for goods and services for current activities including the debt service, with similar revenues, that is taxes, fees and current grants;
2) the Use of Cash Advances index (R8) is defined as the ratio of cash advances to current revenues, and provides a summary measure of the cash solvency. Cash advances are short term cash facilities used by municipalities in case they run out of cash. A high level, or a

[4] This scoring system is used by the Italian Court of auditors (Corte dei conti, 2021) and several public and private institutions to assess financial risk of municipalities.

[5] Service solvency is not measured since standard levels of public services provision at municipal level have not yet been established.

frequent use, of cash advances is symptomatic of ineffective cash management, usually caused by incapacity to collect own revenues (Corte dei conti, 2022).

We did not select any specific index to capture long-run solvency since this dimension seems not to be relevant for the Italian sub-national governments for three different reasons. First, the public debt of local governments in 2023 accounts for only 1.27% of the total public debt and this share is constantly decreasing over time (from 2017 and 2022 the consolidated long-term debt in municipalities fell by 18 p.p.). Moreover, cash advances have sometimes been used by local authorities as improper long-term debt instruments, especially in municipalities in Southern Italy. Lastly, the index R4 inherently considers in the denominator the debt burden, which include loans repayment. Therefore, the two selected indexes already absorb the financial distress dimension related to long-run solvency.

4 The measurement of financial resources inadequacy and performance

As mentioned above, the focus of this paper is on the role of the inadequacy in financial resources in determining its financial distress of single municipalities.

In the recent evolution of public finances in Italy the issue of the inadequacy of financial resources of local governments compared to what would be necessary for the fulfillment of their public functions has been raised in connection with at least two important occurrences that involved the municipal level of government.

The first concerns the large cuts in vertical transfers to municipalities carried out by the central government as part of the fiscal consolidation strategy in the period 2014-2015. These cuts (about 2 billion euros in total) were burdened on all municipalities roughly in proportion of their receipts (with the exemption of municipalities hit by the 2009 and the 2012 earthquakes). Given that the funding of municipal expenditures largely still depends on intergovernmental grants (vertical fiscal imbalance) in addition to decentralized taxes, the decision of the central government to shift part of the fiscal adjustments to local governments through cuts in intergovernmental transfers may have pushed municipalities to run into financial difficulties.

Therefore, in the empirical exercise developed below we defined a Transfer Cuts Effect (TCE) measured for each municipality as the total cut in intergovernmental transfers recorded in the period 2014-2015 and we assessed whether it could be significant in determining the financial distress of municipalities.

The second occurrence relevant for the issue of assessing the inadequacy in financial resources at municipal level was the introduction in 2015 of a new mechanism of equalization transfers for Italian municipalities, the so-called Municipal Solidarity Fund – MSF (Arachi et al., 2023). This reform provides for a progressive implementation of a system of equalization of expenditure needs which aims to fill the gap in each municipality between its estimated expenditure needs and its standard tax capacities. In particular, the estimate of Standard Expenditure Needs indicators (SENs) for the main local expenditure programs provides a measure for each municipality of the standard resources deemed necessary to carry out main municipal public functions on the basis of the structural socio-economic conditions affecting production costs and the demand for local public services, regardless of the discretionary choices of local policy-makers. Here we take advantage of the implementation of the new equalization mechanism to derive a measure of the inadequacy/excess in the financial resources possibly suffered/benefited by each municipality by comparing the resources actually available in 2013 (the baseline year for the implementation of the equalization mechanism, that since 2013 is kept constant) to what it should have in the case of full

achievement of SENs, which will actually occur in 2030 at the end of a long transition period. Given that the evaluation of the gap in the availability of financial resources is derived with reference to a level – the full financing of estimated expenditure needs in 2030 as calculated in 2013 – which is not influenced by the policy choices actually implemented by local policy-makers in the period we analyze (2016-2019), the strategy applied here can provide an exogenous measure of the possible inadequacy in the financial resources at municipal level. To corroborate our exogeneity assumption, it should be noted that municipalities did not receive any information on the structural equalization gap and could not anticipate its impact on their budget policy.

In particular, in the empirical exercise we defined an Equalization Gap Effect (EGE) measured for each municipality as the difference between the full financing of SENs and the resources available in 2013 and we assessed whether it could be significant in determining the financial distress of municipalities.

The meaning of these two different components – TCE and EGE – of the overall inadequacy in financial resources can be better understood by taking three different Italian municipalities as an example (Table 2A): Giuliano in Campania, Perugia and Salerno. These three municipalities have almost the same size in terms of population but are affected very differently by the two effects, TCE and EGE, defined above. In particular, in perspective the new equalization transfer mechanism recognizes Giuliano in Campania 89 euros per capita more than the level of resources actually available in 2013 (as mentioned above, the baseline year for the implementation of the equalization) meaning that Giuliano in Campania suffers from a strong inadequacy of resources compared to its SENs. Moreover, the financial resources of Giuliano in Campania were reduced by 23 euros per capita due to vertical transfers cuts carried out in 2014-2015. The case of Perugia is quite different. The new equalization transfers mechanism does not show any resources gap compared to the full financing of its SENs (only 1 euro per capita). However, even Perugia suffered from a cut in vertical transfers by 32 euros per capita. Finally, the case of Salerno is even more favorable. The new equalization mechanism evaluates that the resources available in the baseline year largely exceed what is justified by its SENs, by 172 euros. However, Salerno was also hit by vertical transfers cuts by 50 euros per capita in 2014 and 2015.

Table 2A – Transfer Cuts Effect and Equalization Gap Effect in an illustrative sample of municipalities

As pointed out in Section 2, poor management by local policy-makers and officials can be a relevant determinant on the financial distress at municipal level. As a part of the process of estimation of SESs, an extensive data collection was performed via questionnaire sent to all Italian municipalities. The questionnaire asked about expenditure and service levels for several categories of services provided at municipal level. In addition to the evaluation of SENs, the data collected through the questionnaires were used to build a simple system of performance indicators, providing basic information on how each municipality uses available resources for the provision of essential services.[6]

In particular, performance is measured using two specifically calculated indicators. The first is computed for each municipal service as the percentage difference between actual expenditure and the estimated SEN. The elementary indicators for each category of service are then combined into a summary indicator derived as a weighted average across services with weights given by the share of the corresponding expenditure to total expenditure and dividing by municipal population. In what follows we refer to this as the Expenditure Gap (EG). Therefore, a positive (negative) value of EG indicates that the municipality spends more (less) than its standard.

The second performance indicator is computed as the percentage difference between the actual level of services actually delivered (which combines quantity and quality dimensions of the provision) and the estimated standard level of provision consistent with SENs. For example, for waste disposal the quality indicator is the percentage of waste recycled. Also in this case, a summary indicator for all municipal services is derived as a weighted average across services with weights given by the share of the corresponding expenditure to total expenditure and then dividing by municipal population. In what follows we call this as the Output Gap (OG). Therefore, a positive (negative) value of OG points out the ability of the municipality to produce more (less) services than its standard.

However, to provide an adequate measure of the performance at municipal level these two indicators – EG and OG – have to be considered together. Otherwise, for example, a municipality showing a positive EG, that is an expenditure below its standard, could be considered efficient but this is incorrect if it also shows a negative OG, that is a service provision below its standard. Accordingly, for each municipality we defined an overall index of municipal performance simply as the average between OG and EG, following the same approach adopted by the Italian government. This summary index is referred to as Efficiency Index (EI). The higher the value of EI, the higher the municipal performance, that is the ability to produce more services with less expenditure This summary index is included in our empirical model to evaluate the impact of performance of local policy makers and officials on the municipality's probability of incurring financial distress.

For the same sample of municipalities considered as an example to show different combinations of TCE and EGE, Table 2B reports the corresponding values of the EG, OG and EI indices. In particular, even if both Giuliano in Campania and Perugia how a per capita expenditure below the respective standard, only the latter provides an overall level of services higher than the estimated standard and, as a consequence, a positive overall performance (EI > 0), whereas in the former low expenditure is associated with poor services for the citizens. Finally, in Salerno the overall performance is undoubtedly negative because, even if spending exceeds its standard, the provision of services is decidedly below its standard.

[6] The performance indicators for each municipality are available at: https://www.opencivitas.it/. For more details about the formulation of performance indicators, see Porcelli et al. 2016.

Table 2B – Expenditure Gap, Output Gap and Efficiency Indices in an illustrative sample of municipalities

5 Data and methods

To implement the empirical analysis, we collected an original cross-sectional dataset on all Italian municipalities (6,565 excluding those in Special-Statute Regions), combining information on financial distress indicators in 2016-2019 with information on time-invariant determinants measured at or before 2015. In addition to AIDA-PA, we resorted to different sources of municipal data: the Ministry of Home Affairs dataset as for equalizing transfers under full implementation of the Municipal Solidarity Fund (simulated at the end of the transitional period in 2030) and about transfer cuts implemented in 2014-2015; the Ministry of Economy and Finance (Opencivitas web page) as for the performance indicators measured concerning 2015; the Ministry of Interior and the National Institute of Statistics (ISTAT) as for information on fiscal, electoral, census and morphological characteristics of each municipality as referred to 2015.

Table A1 in the Appendix provides a general overview of the descriptive statistics, grouping the variables into three sets: Outcome variables, Main independent variables, and Control variables. As reported in Section 3, among Outcome variables the most important indicator is the Financial Rating Index that assigns to each municipality an alphanumeric score over eleven categories from A to E (A, B1, B2, C1, C2, C3, C4, C5, D1, D2, E) that we converted in a numerical score from zero (E) to ten (A). On average between 2016 and 2019 municipalities achieved a score of 4.8. Other Outcome variables are the already defined Structural Current Equilibrium index, Use of Cash Advances index, and a dummy variable that indicates if the municipality has been subject to legal financial default or intermediate pre-default procedure after 2015. The Main independent variables include the indicators we use as main determinants of financial distress regarding financial resources inadequacy and municipal performance. Among the Control variables, we list fiscal variables such as fiscal effort and expenditure rigidity, political variables that measure the political orientation of the council and the margin of victory of the incumbent mayor in the municipal election, the population dimension and structure by age brackets, morphological characteristics such as the mountain degree and seismic risk. Finally, we also identify if the municipality experienced a council

dissolution due to mafia infiltration between 1991 and 2023, information that we used as a proxy for the local level of criminal activity.[7]

As mentioned in Section 4, inadequacy of financial resources is measured through the EGE and TCE in the percentage of historical resources. EGE indicates how much the historical resources will change after implementing the equalization period 2030. Therefore, the indicator ranges from negative to positive values; negative values indicate a surplus of resources, and positive values indicate a lack of resources. TCE indicates the amount of grant cuts each municipality has suffered since 2015 (about 10% on average). Municipal performance is measured through OG, EG and EI indices ad in Section 4. As mentioned above, the larger the EI, the higher the municipal efficiency, i.e., its ability to produce more services by using less resources.

Table 3 reports the correlation matrix among the main explanatory variables. As expected, the correlation between EGE and TCE is positive and statistically significant. However, the magnitude is 0.31, much below the critical value of 0.7, usually identified as a signal of multicollinearity. Similarly, EGE is also (negatively) correlated, as expected, with EG and OG; however, the magnitude of the correlation (0.14) is very low. Finally, EI, obtained through the combination of EG and OG, is not correlated with EGE (-0.0047 with a p-value of 0.72) and TCE (-0.0215 with a p-value of 0.62).

Table 3 – Correlation matrix among main explanatory variables

Figure 3 gives a preliminary picture of the distributions of the municipal financial distress indexes across Italian municipalities. What is evident is a strong concentration of high values of the Financial Rating Index and the Structural Current Equilibrium Index in Northern Italy (remember that high values of these indexes correspond to low financial distress conditions). In contrast, the same occurs in Southern Italy when the Use of Cash Advance Index is considered (remember that high values of this index correspond to high financial vulnerability).

To get some initial evidence about the relationship among variables, Figure 4 reports the correlation plots between fiscal distress indicators and the main determinants we focus on. As for the two measures of inadequacy of financial resources (EGE plus TCE), it is apparent the negative slope of correlation lines (here, the opposite of Use of Cash Advances is considered). So, when EGE and TCE are high, the quality of the municipal budget is low.

[7] We have decided to keep the entire the whole record of this event since it indicates a higher probability of having organized crime activities going on at the local level independently on the specific year (see, among the others, Ministero dell'interno, 2017).

The same happens when the two measures of municipal performance are considered (EG and OG). Given the definitions of these indexes, high values of EG are associated with high inefficiency in managing the municipal budget, whereas high values of OG are associated with high efficiency. In brief, the lower the performance indexes, the greater the vulnerability of the municipal budget and the more severe the risk of financial distress

Based on this dataset, the strategy we followed, as illustrated in Figure 5, is to analyze the effects of the inadequacy in financial resources (EGE and TCE) and of mismanagement (EG, OG and EI), all measured at or before 2015. We aim to provide insights into the financial distress that occurred in Italian municipalities in the immediately following period (average 2016-1019), primarily measured by the Financial Rating Index. For robustness, we also consider the Structural Current Equilibrium Index, the Use of Cash Advances Index, and the legal financial default procedures according to Italian Law.

Figure 5 – Timing and identification strategy

Figure 3 – Financial distress indicators (average 2016-2019)

Figure 4 – Correlations between fiscal distress indicators and main determinants

6 The empirical strategy

The empirical model specified for the estimation of the impact of the lack of resources on financial distress, conditional on the level of efficiency in the provision of services and other controls, is reported in Equation (1):

$$Y_i = \beta_0 + \beta_1 EGE_i + \beta_2 TCE_i + \beta_3 EI_i + \beta_4' Controls_i + \epsilon_i \quad (1)$$

where:

- Y_i indicates different measures of financial distress (Financial Rating Index, Structural Current Equilibrium, Use of Cash Advances, legal financial default or intermediate pre-default);
- EGE_i indicates the EGE (% of 2013 financial resources);
- TCE_i indicates the TCE (% of 2013 financial resources);
- EI_i: indicates the Efficiency index (% referend to 2015) obtained from the weighted average of EG_i and OG_i;
- $Controls_i$ is the vector of controls including electoral, census, morphological variables and regional dummies;
- ϵ_i: error component clustered in all specifications at the provincial level.

Given the structure of the dependent variables (some are continuous, and some are discrete), we estimated model (1) by different estimators. In the baseline estimation procedure, we used OLS for all variables except for the dummy that identifies the default or intermediate pre-default; in this case, we estimated a probit model (baseline results are reported in Table 4). Moreover, given the discontinuous structure of the Financial Rating Index, which takes discrete values from 0 to 10, we also estimated a nonlinear model for robustness (results are reported in Table 5). We reclassified the Financial Rating into five categories[8] and estimated an Ordered logit model typically used when the actual values taken on by the dependent variable are irrelevant, except that larger values are assumed to correspond to "higher" outcomes as in our case.

We implemented a heterogeneity analysis to investigate how the main determinants triggering financial distress interact with different municipal characteristics, splitting the sample according to three different municipal features. First, the sample was split between municipalities in Northern and Southern Italy respectively, then between larger and smaller municipalities (above and below 10,000 inhabitants respectively), and finally according to the efficiency level (above and below the median value). We decided not to explore the heterogeneity coming from other factors, such as the political orientation of the local government, given the difficulties in identifying a clear political orientation in small municipals where the mayors are usually representative of local lists.

7 Results

As an initial step, we conducted a detailed analysis of how key variables affect the likelihood of legal financial default or intermediate pre-default procedures. These variables include the

[8] Score A, B1, and B2 have been classified in the best Category 5; scores C1, C2, and C3 in Category 4; scores C4 and C5 in Category 3; scores D1 and D2 in Category 2, and the worst score E in Category 1.

inadequacy of financial resources (measured by EGE and TCE) and mismanagement (measured by EI). We also included the Financial Rating Index among the regressors to assess whether it effectively predicts defaults when considered alongside other variables. The preliminary findings are presented in Table A3 of the Appendix. Here, we evaluate the impact on the default likelihood using the following variables, either individually or collectively: Financial Rating Index, EGE, TCE, and EI. The results, as expected, reveal that the Financial Rating Index significantly reduces the default probability. Specifically, an increase in the rating by one unit lowers the default probability by 1.59%, as indicated by the marginal effects in column six of Table A3. When all four variables are analyzed together, the results remain consistent, suggesting that these factors capture different dimensions of financial stress without overlapping.

Table 4 reports the results of the OLS estimation of equation (1) considering the three indexes of financial distress separately as dependent variables and, for each of them, excluding or including controls and regional dummies among the covariates (Financial Rating Index in columns (1) and (2); Structural Current Equilibrium in columns (3) and (4); (opposite of) Use of Cash Advance in columns (5) and (6)). The results for the explanatory variables of interest are quite sharp. The estimated coefficients of the indexes of inadequacy of financial resources, EGE and TCE, are statistically significant and show the expected sign for all three financial distress dimensions (particularly when controls and regional dummies are included in the estimated model, as shown in columns (2), (4) and (6)). This means that when the inadequacy of financial resources becomes more severe, the indexes considered here signal a worsening of financial difficulties. The same goes for the mismanagement variable: when mismanagement is high, meaning a low EI (which corresponds to a high EG and low OG), financial distress indexes are high too.

According to our estimates, a one percent increase in the EGE corresponds to a drop of 0.01 points in the Financial Rating Index. Instead, a one percent increase in the TCE corresponds to a more significant reduction of 0.05 points in the Financial Rating Index. Also, taking into account that the average EGE is 20% of the historical resources (considering only municipalities with positive equalization gap) and TCE on average is 10% of the historical resources, we still observe that the impact of transfer cuts can be more than twice larger compared to the effects of the equalization gap. This piece of evidence leads us to the critical and intuitive conclusion that a cut in the historical budget, i.e. resources that municipalities were used to spend (also financing inefficient projects), may produce more severe consequences on the financial stability compared to a lack of future funds, i.e. resources that the municipalities should receive but that never were part of the budget.

For completeness, we have also estimated the same model reported in (1) using as a dependent variable a dummy that takes value one if the municipality was subject to financial default or intermediate pre-default in order to estimate the probability of being subject to a legal financial insolvency procedure. The probit coefficient point estimates reported in columns (7) and (8) of Table 4 broadly confirm previous results.

Given our cross-section data, multicollinearity among the main explanatory variables can be an issue. To verify the robustness of our estimate, we computed the Variance Inflation Factor (VIF) indicator that quantifies how much the variance of an estimated regression coefficient increases if your predictors are correlated. A rule of thumb is that if VIF is greater than 10 (some use a lower threshold like 5), multicollinearity is likely a problem, suggesting that the variable is highly correlated with other variables. The VIF of the main explanatory variables is always below 2. Therefore, we think that multicollinearity is not an issue in our model.

As a robustness check, Table 5 reports the coefficient point estimates of the model in equation (1), considering the Financial Rating Index reclassified into over five categories as a dependent variable and using the Order logit estimator to see if the discrete structure of the data affects the results obtained using OLS. In Table 5, we show the coefficient point estimates on the main variables of interest (EGE, TCE, and EI) considering three alternative identifications of the dependent variable over the 2016-2019 period: the average, the minimum, and the maximum values. For each hypothesis, we specify the model with and without control variables. In total, Table 5 has six columns and, in general, largely confirms the OLS results reported in Table 4. The probability of improving the Financial Rating Index is lower the higher the EGE and the TCE and is higher the higher the E). To visualize the marginal effects on the probability of improving the Financial Rating Index, we have produced Figure 5, which reports the marginal effects of the three main variables of interest (EGE, TCE and EI) in connection with the three different specifications of the financial index adopted as the dependent variable. Independently on the configuration of the financial index, the probability of being in category five (the highest in terms of financial health) is always negative when EGE and TCE increase by 1%. In line with our original OLS results, TCE has a larger impact than EGE: a 1% increase in TCE reduces the probability of being in category five by roughly 1%. Instead, a 1% increase in the EGE reduces the probability of being in category five only by 0.1%. As expected, the probability of being in category five is always above zero (between 0.5% and 1%) when the EI increases by 1%.

Regarding the heterogeneous effects, the results are reported in Table 6, where we show the OLS point estimates of our three main variables of interest (EGE, TCE, and EI). In particular, columns 1 and 2 show the geographical dimension splitting the sample between municipalities in Northern and Southern Italy, columns 3 and 4 show the sample split between larger and smaller municipalities (above and below 10,000 inhabitants), and finally, columns 5 and 6 split the sample according to the level of efficiency (above and below the median value). The results of Tabel 6 (confirmed in Table A6 of the Appendix, where we specify a non-linear model and report order logit point estimates) show that inadequacy of financial resources matters, especially in Southern and/or smaller municipalities; on the other hand, efficiency is important as a determinant of financial distress in Northern and/or larger municipalities. Finally, as expected, increasing efficiency may reduce financial distress mainly if a municipality shows an efficiency index below the median.

For the control variables, a few point estimates (see Table A4 of the Appendix for the OLS estimates and Table A5 for Order logit estimates) are statistically significant apart from regional dummies. It is worth noting that the fiscal effort index and the expenditure rigidity of the municipal budget (computed as the ratio of expenditures for personnel to total current revenues) are both statistically significant and show the expected sign: the lower the tax effort and the higher the budgetary rigidity, the higher the financial distress as measured by (almost) all dimensions considered. Results on municipalities dissolved for mafia infiltration show point estimates always with the correct sign, but in rare cases, we observe statistical significance below a p-value of 0.10. Lastly, the dummies referred to the Italian regions where municipalities are located are almost all significant for each index of financial distress. The magnitude of the estimated coefficients (nearly always negative given the exclusion of the municipality of region Piemonte) shows a clear divide between the municipalities of Northern and Central Italy (Lombardia, Veneto, Liguria, Emilia-Romagna, Toscana, Umbria, Marche, Lazio, Abruzzo) and Southern Italy (Molise, Campania, Puglia, Basilicata, Calabria): ceteris paribus, financial vulnerability generally increases when moving from Northern to Southern Italy.

Table 4 – OLS point estimates of the municipal financial health, general results

*Notes: Point estimates with robust standard errors clustered at the provincial level, p-values in brackets * = p<0.10, ** = p<0.05 * = p<0.001. Control variables include Fiscal effort, Expenditure rigidity, Electoral Cycle, Mayor's political orientation, The margin of victory of the incumbent mayor, the indication of municipalities dissolved due to mafia infiltration, Seismic risk, Mountain degree, Altimetric zone, Resident population, Structure of the population by age brackets.*

Table 5 – Point estimates of the municipal financial health, rating 0-5, order logit estimator

*Notes: Point estimates with robust standard errors clustered at the provincial level, p-values in brackets * = p<0.10, ** = p<0.05 * = p<0.001. Control variables include Fiscal effort, Expenditure rigidity, Electoral Cycle, Mayor's political orientation, The margin of victory of the incumbent mayor, the indication of municipalities dissolved due to mafia infiltration, Seismic risk, Mountain degree, Altimetric zone, Resident population, Structure of the population by age brackets.*

Figure 5 – Average marginal effects with 95% confidence interval, determinants (in rows), and Financial Rating index configurations (in columns).

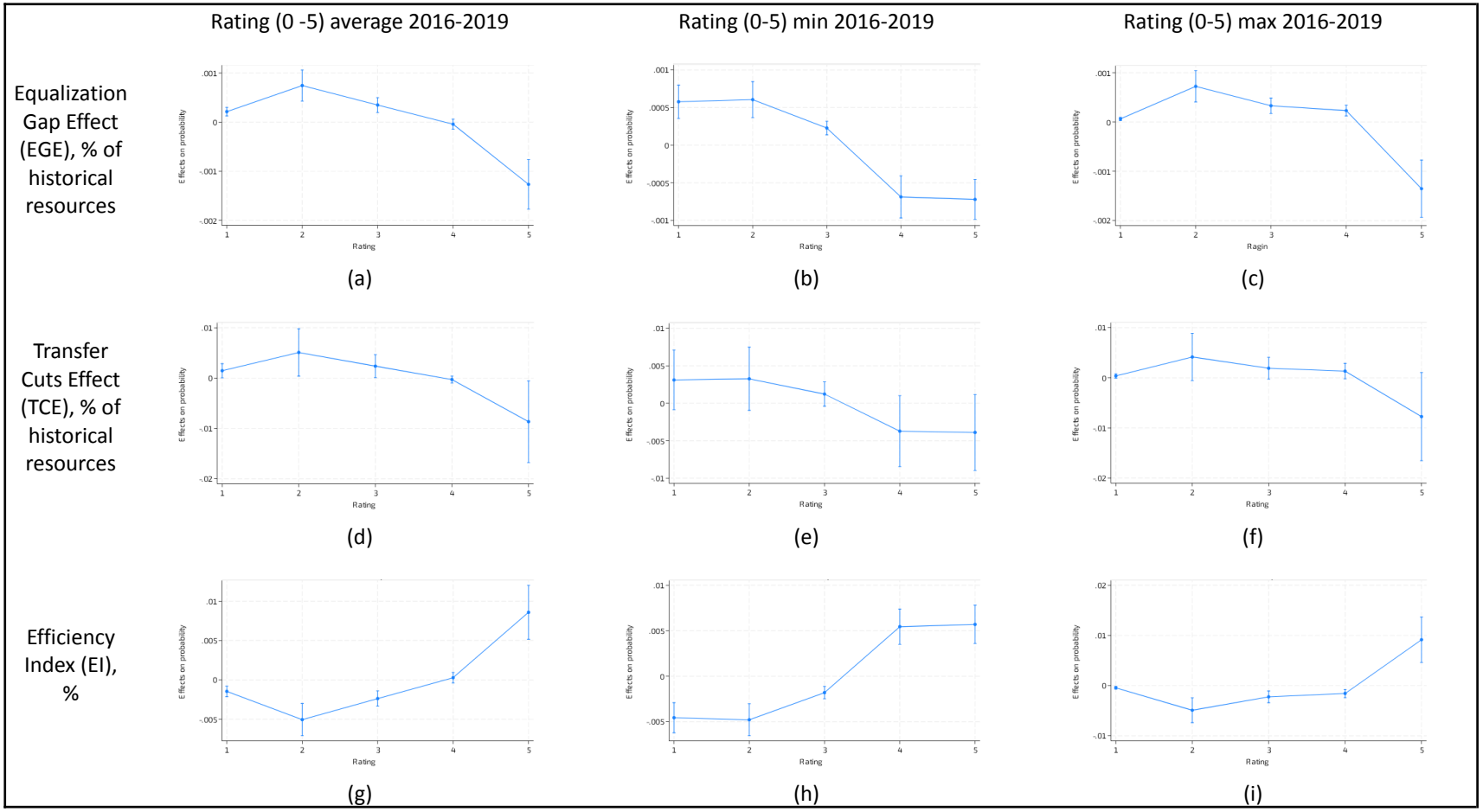


Table 6 – OLS point estimates of the municipal financial health, heterogeneity analysis, rating 0-10, OLS estimator

*Notes: Point estimates with robust standard errors clustered at the provincial level, p-values in brackets * = p<0.10, ** = p<0.05 * = p<0.001. Control variables include Fiscal effort, Expenditure rigidity, Electoral Cycle, Mayor's political orientation, The margin of victory of the incumbent mayor, the indication of municipalities dissolved due to mafia infiltration, Seismic risk, Mountain degree, Altimetric zone, Resident population, Structure of the population by age brackets.*

8 Conclusions

The key question of this paper is whether the conditions of financial distress recently experienced by Italian municipalities can be partially attributed to the inadequacy of financial resources some municipalities suffer compared to the needs of their populations and territories and the mismanagement of local policy-makers and officials and the.

In our investigation, we leverage the novel equalization transfers mechanism, a recent addition to Italy's municipal level. This mechanism offers an exogenous measure of the resource gap that each municipality might be facing, compared to its needs evaluated on a standardized basis (SENs).

The estimation results show that the Italian municipalities suffering from a level of resources below what is necessary to provide public services at standard levels (as measured by a positive Equalization Gap Effect) are ceteris paribus more prone to financial difficulties. By the same token, large cuts in central government transfers (as measured by the Transfer Cuts Effect) have a statistically significant effect on financial vulnerability at the municipal level.

These results, which are based on a multidimensional definition of financial distress, including budget solvency and short-term solvency, confirm and reinforce the evidence we obtained in the case when financial destabilizations of Italian municipalities are detected solely based on the official cases of insolvency regimes envisaged by Italian legislation (structural deficit, intermediate pre-default and financial default). It should be stressed that the budgetary indexes we used in the paper provide a much more informative measure of the financial distress of municipalities than the legal cases of insolvency actually occurred, which can be registered only in qualitative terms (binary variable).

Our findings suggest that financial distress is not only a consequence of economic pressures or administrative mismanagement but is significantly exacerbated by structural imbalances in the allocation of financial resources. The empirical results highlight the dual pressures of drastic cuts in central government transfers and discrepancies in the distribution of funds via new equalization mechanisms. These factors collectively contribute to a scenario where municipalities endowed with insufficient financial resources relative to their service provision standards are predisposed to experience fiscal difficulties. This is compounded by fiscal consolidation strategies that unevenly affect municipalities, exacerbating the fiscal challenges.

From a policy perspective, this analysis underlines the necessity for legislative and fiscal reforms to rectify the structural deficiencies in financial resource allocation. First, it is critical to revisit and refine the criteria and mechanisms for intergovernmental transfers to ensure they are equitable and reflective of the actual expenditure needs as determined by standardized financial health indicators of municipalities. Enhancing the fiscal autonomy of municipalities to allow more localized decision-making regarding revenue and expenditure could also mitigate reliance on central transfers, fostering more sustainable fiscal management.

Furthermore, the study underscores the need for a robust fiscal equalization mechanism that effectively bridges the resource gap between economically diverse municipalities. This approach should adjust the amounts transferred and refine the criteria used to determine these transfers to be more responsive to changing economic conditions and fiscal needs.

Additionally, implementing targeted financial support programs for municipalities most at risk of fiscal distress could prevent financial crises. Such initiatives are particularly crucial for regions with historically lower economic performance and higher public service demands. Strengthening financial accountability and management capacities through training and

regulatory oversight is also vital in curtailing risks associated with mismanagement and inefficiency, which are significant contributors to financial distress.

Lastly, it is essential to ensure that national fiscal consolidation efforts are well-coordinated with local government financial planning. Such coordination can help avert situations where local fiscal health is compromised by broader economic policies.

Several possible extensions of the analysis presented in this paper can be outlined. First, it should be more thoroughly investigate the relationship between the legal cases of insolvency and the indexes of financial distress (or a larger array of them) based on municipal budgets. Second, the effects on the financial conditions of the municipality carried out by the two different components of the overall inadequacy of resources we considered – transfer cuts and the equalization gap – should be more adequately explored to understand better the way they enter the budgetary decision-making process at the municipal level. In fact, while the cuts to transfers have actually been implemented, the gap in resources highlighted by the equalization mechanism is only virtual. This can produce different effects on the municipal budget through cost stickiness.

A – Appendix

Table A1 – Descriptive statistics, municipalities in Ordinary Statute Regions (n = 6,565)

Table A2 – Italian municipalities in financial distress 1989-2023

Source: Ca’ Foscari Foundation

Table A3 – Probit point estimates of determinants of financial default or intermediate pre-default 2014-2023 (column 6 reports marginal effects)

*Notes: Point estimates with robust standard errors clustered at the provincial level, p-values in brackets * = p<0.10, ** = p<0.05 * = p<0.001. Control variables include Fiscal effort, Expenditure rigidity, Electoral Cycle, Mayor's political orientation, The margin of victory of the incumbent mayor, the indication of municipalities dissolved due to mafia infiltration, Seismic risk, Mountain degree, Altimetric zone, Resident population, Structure of the population by age brackets.*

Table A4 – OLS point estimates of the municipal financial health, control variables

Table A5 – Point estimates of the municipal financial health, Control variables, Order Logit estimator

Table A6 – Point estimates of the municipal financial health, heterogeneity analysis, rating 0-5, order logit estimator

*Notes: Point estimates with robust standard errors clustered at the provincial level, p-values in brackets * = p<0.10, ** = p<0.05 * = p<0.001. Control variables include Fiscal effort, Expenditure rigidity, Electoral Cycle, Mayor's political orientation, The margin of victory of the incumbent mayor, the indication of municipalities dissolved due to mafia infiltration, Seismic risk, Mountain degree, Altimetric zone, Resident population, Structure of the population by age brackets.*

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