SCORING THE DEFAULT RISK OF LOCAL AUTHORITY

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Abstract: *In the Nineties, almost all public administrations were affected by a change that made municipalities more responsible in using public resources. More recently, the global crisis and the gradual cuts in funding from the State led to significant repercussions on the budgets of local authorities with an increasing number of defaults. The Italian government introduced the procedure of "financial default" to rescue local authorities in financial difficulties from 1989. However, to date, a methodology to constantly monitor the local authorities' "health" and to prevent financial defaults has not yet been formalized. As previous studies highlighted a close link between financial condition and service delivered to citizens, the study aims to construct a set of specific indicators to judge the default risk of Italian LAs in order to prevent defaults. In this research we use a deductive method. The research was carried out in eight different steps according to a logical process of identifying the risk indicators and the consequent risk ranges. The results are significant as they clarify the situation leading potentially to default and they propose a set of specific risk indicators to evaluate and to prevent the risk of default. This logical process could easily be adopted at an international level, with the necessary modifications for specific accounting regimes.*
Keywords: *local authorities' defaults, default risk ranges, default prevention, default indicators*.

1. INTRODUCTION

In the Nineties, almost all public administrations were affected by changes making local authorities (LAs) more responsible in the use of public resources and in meeting the Maastricht Treaty's objectives (Council of Europe, 2007). These reforms were inspired by the New Public Management theory (Pollitt & Bouchkaert, 2011).

Financial health is a necessary condition under which governments must operate as there is a close link between financial condition and service delivered (Jones & Walker, 2007). At international level, literature concerning financial health in LAs is quite limited in number and, with few exceptions, is restricted to the Australian, Canadian and U.S. context (Holian & Joffe, 2013). Moreover, local governments are not self-contained entities existing by themselves; consequently, each governmental level affects the others (Coe, 2007: 68). Timely identification of early symptoms of difficulty is an extremely complex issue - and a very pertinent one nowadays.

This exploratory study aims to make a contribution to two different audiences - the scientific community and the institutions. It is our intention to pursue the debate within the scientific community by using a means of analysis derived from the literature, integrated with solutions made necessary by specific problems of the sector. From an institutional point-of-view, our system of indicators allows an institution to easily "take the pulse" of Italian LAs by classifying them within a risk default range (no risk, low risk, high risk) and using data that can be extracted from the Ministry of the Interior database. This information has the advantage of being certified and comes from a reliable source. LAs can be compared by the scientific community and by external institutions and more detailed enquiries instituted, should results suggest early signs of financial difficulties. Regular analysis can highlight potential financial problems and provide information necessary for timely corrective action, in order to guarantee public services to citizens.

Our aim is to construct a system of specific indicators with which to judge the default risk of Italian LAs. Timely identification of early signs of problems in local authorities would meet requirements both of higher government levels and of the scientific community. In other words, we propose a proactive approach in order to predict future defaults and, consequently, to prevent them (Cahill & James, 1992). To achieve this aim, in this article we shall:

- examine the trends for Italian LAs declared to have defaulted;
- formulate, based on the theoretical framework, on Italian practices and the course of these difficulties, a system of specific indicators that identify early symptoms of instability;
- describe the results of empiric research into Italian LAs that defaulted, aimed at testing the system of indicators;
- determine the risk range according to the results of empiric research;
- highlight both the limits and possible future developments of the research in some concluding observations.

2. THE LITERATURE REVIEW

Scholars in Italy and abroad have written a great deal about businesses in crisis, but studies on LAs in crisis are relatively rare and frequently address the issue from a political economy viewpoint (Kloha *et al.*, 2005). The first problem to solve is the definition of financial health or what is sometimes called, highlighting its negative side, fiscal stress, default conditions. Unfortunately, this definition is not unique (Levine *et al.*, 2013). This variety of definitions inevitably leads to a diversity of operational measures adopted when attempting to measure or predict LAs financial distress (Downing, 1991). However, the main challenge is to determine how to measure financial health, or from the opposite viewpoint, how to measure the default risk. Within the literature there are four generally agreed upon measures: cash solvency, budget solvency, long run solvency and service solvency (ICMA, 2003). Cash solvency measures a local authority's liquidity and effective cash management, and its ability to pay current liabilities. Budgetary solvency refers to the ability of the LA to generate sufficient revenues to find its current or desired

service levels. Long run solvency refers to the impact of existing long term obligations on future resources. Service level solvency refers to the ability of the government to provide and sustain a service level that citizens require and desire.

In general, the measures range from basic approaches, such as accounting information and financial reporting analysis (Kleine *et al.*, 2003) to more sophisticated statistical modelling approaches (Murray & Dollery, 2005). An important aspect of the default risk is the proxy used in order to discriminate financially unhealthy local governments from the healthy ones. Several variables have been proposed such as ratio indicators (ICMA, 2003) or the quantity, quality and cost of service delivery (Zafra-Gomez *et al.*, 2009).

Given the negative impact produced by the financial crisis of a single LA within the nation, some countries have introduced specific procedures to rescue public bodies in financial difficulties (Högye, 2002: 593-616). The Italian government introduced a procedure of "financial default" for LAs in serious financial difficulties (Decree Law 66/1989).

Obviously a system of indicators is needed, able to identify the causes of the financial difficulties and, consequently, to understand whether the state of crisis derives from improper conduct by the LA or not. At the same time, such a system would enable prompt intervention before the financial difficulties are transformed into an irreversible crisis. A common element, however, in the literature examined and, above all, in practice developed in European countries is that there is no such shared system of indicators or tracking that can be used as a "warning signal" for potentially endangered authorities (Council of Europe, 2002: 36-37).

Numerous instruments have been put forward for timely identification of crisis. These fall into three groups - intuition-based, founded on analysis of indices or on models.

The first signs of decline are manifested in objective elements of imbalance that may be found in the static or dynamic indices commonly used in financial analysis (Tektas *et al.*, 2005). Hence the usefulness of setting up an executive dashboard of indicators aimed at picking up even minimal signs to enable timely intervention in corporate crises (Altman, 1968; Beaver, 1966). Other studies chose to concentrate on the predictive capacity of financial statement analysis in identifying potential corporate instability (Beaver *et al.*, 1968; Wilcox, 1971). These methods can also be used to investigate the state of health of LAs. Previous research highlighted the possibility of measuring the fiscal health of local governments by analysing their balance sheets together with other variables (Hendrick, 2004), as LAs have the same issues connected with finding and managing balance as have private bodies. Some studies focussed on quantitative variables able to monitor – and so to evaluate – the trend of per capita revenue, with specific attention to own source revenues, to the ratio between debt and amount of revenue (debt limit), to temporal and quantitative differences between ability to collect revenues and to realize expenses, to an operating deficit and to the ability to generate liquidity (Maher & Deller, 2013).

The review of the literature has shown that there is a need to prevent financial default of LAs. It has also been shown that the state of health of a local authority can be judged, based on its balance sheet.

Given all this, we believe it possible to build a dashboard of indicators capable of identifying authorities in financial difficulty and determining the risk default ranges.
Yet from a practical point-of-view, there are many issues to be resolved in identifying a suitable system of indicators. Once it has been built, the system must then be tested for effectiveness in timely signalling of critical financial situations in LAs.

3. IDENTIFYING SYMPTOMS OF DEFAULT IN ITALY

From the point-of-view of territorial organisation and workings, in Italy there are 4 levels of government. The base or primary level of Italian public administration is made up of 8,093 municipalities. 70.3% of municipalities have a population of less than 5,000 inhabitants. On the second level, Italy has provinces (110) whose function it is to coordinate and mediate within local administrations (municipalities). On the third level, there are 20 regions, through which central political and administrative power is channelled. Finally, there is central government.

Each municipality has a mayor, a municipal executive board, a city council and a professional bureaucracy. The executive structure of Italian local government is similar to the U.S.A. model of mayor-council government in that the mayor and city council are separate offices.

Municipalities are allowed to raise local taxes and charge fees for the services that they provide, but a significant percentage of their revenues is still accounted for by transfers from higher levels of government, especially in low-income areas of the country.

From an accounting viewpoint, municipalities still rely predominantly on cash and commitment-based budgetary accounting, although they are technically expected to also publish an accrual-based financial statement (Anessi-Pessina & Steccolini, 2007). The budget, which is commitment-based, must be approved by the council and is required to balance. Budgeted revenues can include borrowing, which, however, can only be used to cover capital spending. Past-year surplus may be added to budgeted revenues, while past-year deficits must be covered by adding them to budgeted expenditures. The fiscal year coincides with the calendar year. Revenues are classified by kind, into several large groups ("titoli"). Expenditures are classified by kind and purpose, once again into several large groups ("titoli").

The Italian government introduced a procedure of "financial default" for LAs in financial difficulties under Decree Law 66 of 1989. In Italy, the recognition of instability is therefore relatively recent and now permits municipalities and provinces to instigate a recovery process if their financial conditions are preventing them from discharging primary functions and services.

The default procedure aims to balance the budget. It permits Italian local authorities whose financial conditions do not allow them to guarantee primary functions and services, or who are in conditions of insolvency, to start a recovery process.

Once the local authority has declared financial default and approved the ruling, a clear division is made between the previous administration and ordinary activities. The Ministry of the Interior appoints an OSL (Extraordinary Liquidation Body) that draws up a recovery plan, then arranges payment of previously incurred debts and balances the situation. The council that declared default remains in office, but only to carry out ordinary activities.

Since the law was introduced in 1989 up to our data extraction on December 31st 2011, 459 authorities had declared financial instability, of which just one province, that of Naples, in 1993. All things considered, the phenomenon is not very widespread, considering that it involves 5.51% of the 8,093 Italian municipalities and only a minimal percentage of the country's 56 million inhabitants. It has been noted, however, that this number is probably not representative of the total number of local bodies actually in financial difficulties.

The early years of introduction of the procedure were characterized by a high number of defaults but later on this phenomenon diminished, probably as a result of the changes in recovery procedure, which, since Constitutional Law 3/2001 came into force, decreed that the state could no longer give financial aid.

This resulted in a fresh increase in the number of financial defaults (Ifel, 2011a: 58-61), which then focussed the attention of media and scholars on LA financial crises (Mazzara & Nigro, 2009: 7).

The question of LA default has produced a new accounting practice that attempts to fill the void created by the lack of legal instruments available for identifying LA crisis in its early stages. This lack has frequently been underlined by the Ministry of Economy and Finance (2008: 52; 2009a: 63 and 70-71; 2009b: 36) and by the Italian Court of Auditors (2011).

Yet despite interest shown by the institutions (Ministry of the Interior and Italian Court of Auditors), to date, a methodology for constantly monitoring LA "health" and preventing defaults has not yet been formalised.

4. RESEARCH METHOD

The deductive method was used in this explorative research, as being the only one possible, considering the special characteristics of bodies examined and of their balance sheets.

Firstly, we identified the LAs - municipalities and provinces - declared to have defaulted since the law was introduced in 1989 up to our data extraction on December 31st 2011. It should be noted that this information is the exclusive property of the Ministry of the Interior and that, at time of writing, it is unavailable through any database either to institutions or to the public.

Next, given its complexity, the research was broken down into the following steps:

1. for those LAs that had defaulted, we collected data available in their final accounts from the Ministry of the Interior website for the year of default and the two previous years;

2. taking into account both the literature and accounting practice acquired in dealing with their balance sheets, we built a dashboard of indicators for use in preventing LA crisis;
3. we ran the calculation using indicators for the LAs chosen;
4. we constructed a sample of the same number of healthy LAs, with similar geographic location and demographic dimensions as those declared to have defaulted;
5. we gathered data and ran the calculation using indicators for the above mentioned healthy LAs;
6. we verified the effectiveness of indicators for both distressed and healthy LAs, in the year when default was officially registered and the two previous years;
7. we gathered data and ran the calculation using indicators for Italian local authorities belonging to each demographic category;
8. according to the results of the previous step, we determined the risk ranges.

Before beginning to collect data, it was necessary to choose which defaulting authorities should be examined.

Although there were many more cases of financial distress in the period 1989-1996, we only calculated indicators for authorities in financial distress after 8th November 2001 – for two kinds of reason. First, the recovery process brought into being by the constitutional reform of 8th November 2001 was quite different from the previous one and laid down that recovery costs should be borne by the local community and not by the State. Then, the managerial and accounting systems of local authorities underwent profound reform in compliance with Legislative Decree 267/2000 (still in force), so comparison with results from preceding years is in effect impossible (Italian Court of Auditors, 2011: 412).

Next, we gathered the main accounting data contained in the final accounts. This information, readily available on the Ministry of the Interior website, is both official, inasmuch as authenticated by the Head of Financial Affairs and the Secretary, and standardised, since all LAs must compile and submit their final accounts to the Ministry.

The subsequent phase was to build a system of risk indicators, made up of quantitative and qualitative indices and able to predict early warning symptoms of financial distress in order to identify them before more serious problems occur (Kloha *et al.*, 2005). A "system" is needed, because the indices, if used separately, would give only an incomplete picture of the phenomenon being studied and would not capture the connections between the numerous aspects analysed (Puntillo, 2007: 50).

5. THE PROPOSED INDICATORS

For our purposes, the choice of indicators was based on knowledge from academic sources, obtained through analysis of Italian and international literature, as well as from the field, thanks to the publication of manuals and reports by institutions. We decided not to consider the indicators used by credit rating agencies as in Italy the rating is not mandatory and it mainly concerns the large municipalities (Manes Rossi, 2009). Also, given the aim of our analysis, we should remember not only that about 93% of Italian municipalities have less than 20,000 inhabitants, but also that 93.46% of local

authorities in financial distress had a population under that level. Moreover, previous studies agreed that model ratings cannot be considered as proxy default probability (Holian & Joffe, 2013).

Our investigation was naturally an analysis conducted from the outside. We therefore used an historical perspective, using historical ratios, and a spatial one, comparing results from authorities with similar territories. This enabled us to evaluate trends in phenomena.

Previous research highlighted the presence of many proposals for capturing early warning signs of local financial emergencies; however the problem is that these methods are mainly focused on a short time period, are not systematic and are very different (Weikart, 2013). Moreover, other authors underline that indicators for providing information on local situations are not always useful, as there are too many variables to monitor without any clear indication of which ones are the most important; they do not consider the specific economic and social characteristics of the locality; the use of averages can be misleading and data are frequently unavailable (Kloha *et al.*, 2005; Sohl *et al.*, 2009).

In general previous research pointed out that there is no single measure that fully captures the financial condition of a local authority. Financial condition is affected by a combination of environmental, fiscal and organizational factors, including decisions and actions of the governing board (Wang *et al.*, 2007). In particular, Zafra-Gomez *et al.* (2009), hold that financial condition can be measured by means of a series of indicators related to solvency, sustainability, flexibility and vulnerability. According to the previous proposition and as mentioned in our literature review, the International City/County Management Association (ICMA, 2003) identifies three dimensions of local authority solvency: cash solvency, budgetary solvency and service level solvency.

In order to determine indicators for preventing default, we decided not to consider the risk indicators of LAs with more than 20,000 inhabitants, as their meagre number did not allow us the statistical generalisation of results. Within the range from 0 to 20,000 inhabitants we divided them into two groups: one with less than 5,000 inhabitants and the other over 5,000 up to 20,000, as 5,000 is the threshold for identifying a small LA (Ifel, 2011b). In this regard, the Italian Court of Auditors (2013) identifies an association between population size and the performance they use to analyse their balances.

Although external forces, mostly socioeconomic, could heavily affect LA default, we consider as healthy those LAs that are able to meet their payroll, pay their current liabilities, meet their debts service and undertake service obligations (Downing, 1991). In particular, we focused on financial conditions by evaluating revenues, expenditures, operating results, debt limit and Off Balance Sheet (OBS) debts (Zafra-Goméz *et al.*, 2009).

We believe that the creation of a system of indicators for monitoring the health of LAs cannot ignore indications from the institutions. The Italian Court of Auditors (2006; 2008; 2009; 2010; 2011) identified, on several publications, the causes of default.

Previous studies (Gori & Fissi, 2012) highlighted that the default does not depend on a single cause but it is the result of mix of factors. However, some causes are more common and have a higher importance for the risk level. In this sense, Hou (2006)

identifies three kinds of budget deficit: structural, cyclical, and managerial. A structural deficit reflects a long-term shortfall between recurring revenues and recurring expenditure. Moreover, a cash flow deficit can become a structural deficit if the recurring revenue becomes inadequate to maintain recurring expenditure over the cycle (cyclical deficit). Lastly, managerial deficits result from poor financial management or deliberate spending in excess of revenue. So, while cyclical and managerial deficit can be easily remedied by using stabilisation funds or a policy of reducing expenditure respectively (Grizzle, 2010), a structural deficit is decidedly worse. Consequently, we decided not to weight the indicators, but to divide them into three types, according to how much the information was able to highlight the first symptom of financial distress. Moreover, we decided to run indicators for the year of default and for the two previous years (Figure 1).
The first group contains key indicators for analysis of financial condition that, in the case of a positive result (low or high risk), highlight the presence of a default probability (Indicators 1, 2 and 3). These indicators check the short-run solvency and service level solvency. If one of these parameters is positive it is necessary to closely monitor the municipality. The first indicator measures the difference between the speed of revenue collection (tax and non-tax) and that of payment of current expenses. This indicator measures the structural surplus or deficit, expressed in terms of cash-flow, due to management.

Figure 1. The form used to calculate risk indicators for each defaulted LAs.

Municipality _____ D efault year "n"

Demographic class ≤5,000 ☐ 5,001≤x≤20,000 ☐

	Year n	Year n-1	Year n-2
Group 1			
1. Difference between speed of collection of own revenue and speed of collection of current expenditure (%)			
2. Ratio between cash advances not refunded and current revenue (%)			
3. Ratio between current positive residuals and current revenues (%)			
Group 2			
4. Quality of management result			
5. Per capita operating result			
6. Debt limit			
7. Ratio between current negative residuals and current expenditures (%)			
Risk multiplier			
8. Ratio between OBS debts and current revenues (%)			

The second indicator in the first group monitors the risk associated with cash advances by measuring the ratio between un-recouped cash advances (bank overdrafts that are not reimbursed) at year-end and total current revenues. Compared with the previous indicator, this one represents a step up the risk ladder and the higher the ratio, the more serious the risk.

Lastly, the third indicator in the first group measures the ratio between the amount of receivables on own-source revenue and total own-source revenue, thereby highlighting their ability to collect.

Indicators 4, 5, 6 and 7 are in the second group and they track flexibility, local authority independence and long run sustainability. These indicators are less important and reveal a default risk only if two of them are positive. The fourth indicator measures the part of the administration's results made up of receivables from own-source revenues (active residuals). In other words, the management of residuals affects the quality of administration results. And the more the budget surplus depended on active residuals, the more uncertain are the effective results and the worse its quality, since we do not know when and how much will be collected.

The fifth indicator measures the financial results per capita (or the result minus effects of active residuals). The sixth indicator measures the debt limit, given by the ratio between passive interest and current revenues. It shows the part of current revenue destined to cover the authority's costs for payment of passive interest. The seventh indicator of the second group measures the ratio between residuals and current expenses and shows the incidence of debt from previous years on expenses for the current year.

Finally, indicator eight must be considered a risk multiplier as this cause of default is common to all the authorities in default. This indicator often shows positive because of OBS debts deriving from bad results of municipal-owned corporations (Italian Court of Auditors, 2013). OBS debts should represent an exceptional event for a LA. If positive, this indicator, regardless of value, has a multiplier effect on the risk of default. The eighth indicator, the risk multiplier, shows "exceptional" debt situations – for example, the need to cover the deficit of subsidiaries or the existence of rulings condemning the municipality to pay damages – and their "weight" with respect to the ordinary activity of the authority (current revenues)

The aim of the selected indicators is to monitor authorities' default risk, comparing them with the performance of similar geographic locations and of similar demographic groups. This enables us to identify any discrepancies - positive or negative - between the performance of the authority under examination and that of entities with similar dimensions and geographical locations.

From an operational point-of-view, the risk indicators described were calculated for the year when default was filed and the preceding two years, using for each authority the form shown in Figure 1.

The indicators selected for defaulted authorities are then calculated for the same number of "healthy" authorities.

6. TESTING THE INDICATORS

The system of indicators created was then tested for effectiveness. For this, we used the "logical process" employed by Altman (1968) for testing his Z-Score.

In our research, the test was carried out on accounting data from final accounts of LAs in default over the period 8th November 2001-31st December 2011, and of the same number of financially "healthy" municipalities. Here, there were two problems to be solved:

1. deciding when a LA may be defined as "healthy";
2. defining the method for building the sample of healthy authorities.

A concise way of defining an authority as healthy had to be found. We therefore turned our attention to the final accounts.

According to Italian Court of Auditors reports (2009, 2010a and 2011: XV) healthy authorities are those with a positive operating result, as this result is not affected by the influence of residuals that are the most manipulative elements of financial statements.

The second issue was how to build a sample of healthy authorities for testing the indicators. This was important both from a statistical point-of-view and from an organisational-economic one. In doing this, we adopted a statistical sample with a previous theoretical sampling that minimises differences between the elements (Patton, 2003). We identified the healthy authorities among neighbouring municipalities in the same demographic class, thereby taking into account fundamental aspects of comparison. Firstly, "nearby" local authorities share similar socio-economic characteristics (Hammer & Green, 1996). Choosing a statistical sample, rather than a theoretical one, would have seriously affected the level of comparability between local authorities. Indeed, earlier studies (Wang *et al.*, 2007) have shown the importance of considering socio-economic conditions of the geographical area, when analysing the financial state of a local authority.

The choice of neighbouring municipalities did not undermine results. Unlike in the USA, in Italy the demand for local public services does not concern neighbouring municipalities as citizens can only use services where they are resident. In other words, horizontal intergovernmental relationships have scarce consequences for the fiscal health, condition, and wellbeing of local governments (Honadle, 2003). Having identified the "healthy" authorities, we collected the data submitted in their final accounts and built a system of indicators taking into account information from the year the authority in difficulty filed for default, plus two preceding years (Winn, 1993), using the same form (Figure 1) as for defaulting municipalities. The same form was used to determine average national indicators.

7. THE RESULTS OF RISK INDICATORS

The phenomenon of default in LAs is not widespread in Italy. Data from the Ministry of the Interior shows only 459 authorities declaring default from 1989 to 31st December 2011.

Before calculating the indicators, we identified authorities in default in the period between 8th November 2001 (when Constitutional Law 3/2001 came into force) and 31st December 2011. There were a total of 45 municipalities, however, at present final accounts are available for only 39 of these. Next, for each municipality, a corresponding healthy authority, with similar dimensions and location, was identified. Table 1 shows the authorities in default and their corresponding healthy authority.

Next, for both types of authority and for each of the three years analysed, we identified risk indicators for the bankrupt authority and the corresponding average levels in their area, then we calculated the indicators.

The analysis of risk indicators shows that authorities in default generally produce worse-than-average results. Often, however, healthy authorities, despite performing better, achieve results below the average registered in their geographical area. This probably depends on two kinds of factors. On the one hand, the local socio-economic situation affects all municipalities in the area and, on the other hand, the demographic group of the authorities examined tends to level out some of the results produced in the territory. Of the municipalities in default, 70% were small, with a population of less than 5,000 inhabitants, and presumably suffer more than larger authorities from the reduction in available resources (Ifel, 2011b: 105-108)

Table 1. The 39 defaulted municipalities and the corresponding healthy authorities.

No.	Defaulted Municipality	Province	Inhabitants	Healthy municipality	Province	Inhabitants
1	Borgorose	RI	4,785	Contigliano	RI	4,428
2	Umbriatico	KR	1,114	Laino Castello	CS	970
3	Pontelandolfo	BN	3,028	San Lorenzello	BN	2,314
4	Maltignano	AP	2,392	Venarotta	AP	2,279
5	Gallodoro	ME	406	Savoca	ME	1,668
6	Ramacca	CT	10,568	Motta Sant'Anastasia	CT	10,705
7	Enna	EN	28,476	Giarre	CT	26,827
8	Moschiano	AV	1,711	Taurano	AV	3,570
9	Paternopoli	AV	2,645	Pietradefusi	AV	2,491
10	Pignataro Interamna	FR	2,521	San Vittore del Lazio	FR	2,707
11	Arpaia	BN	1,943	Bonea	BN	1,536
12	Lungro	CS	2,950	Sant'Agata di Esaro	CS	2,061
13	Mentana	RM	19,245	Bracciano	RM	27,772
14	San Procopio	RC	582	Terranova Sappo Minulio	RC	547
15	Soriano Calabro	VV	2,886	Acquaro	VV	2,664
16	Capistrello	AQ	5,397	Luco dei Marsi	AQ	5,879
17	Rocca Priora	RM	11,490	Lanuvio	RM	12,894
18	Apice	BN	5,808	Guardia Sanframondi	BN	5,367
19	Camini	RC	743	Pazzano	RC	686
20	Casabona	KR	2,904	Belvedere di Spinello	KR	2,351
21	Filignano	IS	729	Scapoli	IS	783
22	Lauro	AV	3,636	Sirignano	AV	2,982
23	Montecalvo Irpino	AV	4,013	Flumeri	AV	3,225
24	Rionero Sannitico	IS	1,177	Colli a Volturno	IS	1,387
25	Roccabernarda	KR	3,616	Cropani	CZ	4,015

26	San Giorgio a Liri	FR	3,170	Esperia	FR	4,012
27	Velletri	RM	52,647	Nettuno	RM	44,444
28	Baia e Latina	CE	2,349	Sant'Angelo d'Alife	CE	2,334
29	Barni	CO	628	Magreglio	CO	666
30	Briatico	VV	4,084	Cessanti	VV	3,483
31	Caserta	CE	79,231	Benevento	BN	62,035
32	Castel Volturno	CE	24,307	Mondragone	CE	27,619
33	Fuscaldo	CS	8,383	San Marco Argentano	CS	7,634
34	Roccamonfina	CE	3,688	Mignano Monte Lungo	CE	3,290
35	San Gregorio Matese	CE	991	Castello del Matese	CE	1,538
36	Volturara Irpina	AV	4,103	Montefalcione	AV	3,461
37	Casal di Principe	CE	56,000	Trentola Ducenta	CE	17,673
38	Castiglion Fiorentino	AR	13,685	Foiano della Chiana	AR	9,622
39	Riomaggiore	SP	1,740	Calice al Cornoviglio	SP	1,177

The analysis of trends in the speed of collection of current revenue and current expenditure is particularly interesting. There are significant differences between the two values for defaulting authorities, while the gap is less marked for the healthy municipalities. Both indicators are connected with the rate of acquiring residuals: the lower the ability to collect revenues, the higher the rate of formation of positive residuals. The same reasoning may be applied to current expenditure and formation of negative residuals. These indicators give information about the cash flow and the ability of LA to face its debts.

In the year when default is filed, the gap between ability to collect revenue and that of expenditure is reduced, reaching levels close both to the general average and to the performance of healthy authorities, which we might consequently describe as "normal".
The analysis of indicators highlights that, under "Quality of management results"(ratio between own current positive residuals and management result), an authority in difficulty usually has a lower indicator than a healthy one, that is to say, has a better result. When default is imminent, in fact, the authority's residuals - particularly the positive residuals - are revised and frequently reduced. The same logic may be applied to the "Ratio between current positive residuals and current revenues". Receivables that have become irrecoverable are likewise usually written off.

As far as "Operating results" are concerned, we have already mentioned the extreme difficulty of identifying healthy LAs, similar in dimensions and location to those in difficulty, that register positive results over the three years examined. Although their indicators are better than those of defaulting municipalities, they still register worse-than-average performance for their geographical zone.

The "debt limit" is similar for healthy authorities and those in default and values registered are generally quite low. Control of this aspect is facilitated by the requirement to draw up a multi-annual budget which of necessity means projecting debt exposure both for capital share and for passive interest over the next three years.

According to opinions in periodical reports from the Italian Court of Auditors and the Ministry of Economy and Finance, cash advances and OBS debts are frequent. The

use of off-balance-sheet debt and cash advances is more frequent in defaulted authorities than in healthy ones. If we consider that the defaulted municipalities on average have low performance indices, the risks associated with cash advances become even clearer. Their maximum amount is tied to the total of determined revenues, but if we consider that generally the speed of revenue collection slows as the year of default approaches, the amount that can be advanced presumably decreases over time. This mechanism may then provoke a dangerous spiral that, by reducing liquidity, makes the authority incapable of paying expenditure deriving from basic functions and consequently leads it to default.

8. THE RISK RANGES

Application of the indicators has shown differences between groups (authorities in difficulty, healthy authorities and national average), but also similar performance within groups. We believe a link may be found between the trend of the system of indicators and the authority's financial condition. In particular, we determined the default risk ranges by comparing the average performance indicators of the defaulted LAs and of the healthy ones together with the national average results of risk indicators of the LAs of the same demographic group (Table 2 and 3). The three levels of risk correspond to three separate general financial conditions of the local authority. Hou (2006) observes that there are three different types of balance deficit that can be at three different levels of risk, because of the seriousness of the financial situation.

Table 2. The average indicators for LAs up to 5,000 inhabitants (Demographic group 1).

Indicators	Average of defaulted authorities	Average of healthy authorities	National average
Group 1			
Difference between speed of collection of own revenue and speed of collection of current expenditure (%)	-30,50	-31,04	-13,16
Ratio between cash advances not refunded and current revenue (%)	4,34	1,96	1,17
Ratio between current positive residuals and current revenues (%)	57,60	46,21	17,50
Group 2			
Quality of management result	141,21	59,80	1,00
Per capita operating result	-640,61	1.322,17	-21,77
Debt limit	0,07	0,05	0,05
Ratio between current negative residuals and current expenditures (%)	35,58	33,66	14,04
Risk multiplier			
Ratio between OBS debts and current revenues (%)	1,54	0,21	0,48

Table 3. The average indicators for LAs from 5,000 to 20,000 inhabitants (Demographic group 2).

Indicators	Average of defaulted	Average of healthy	National average

	authorities	authorities	
Group 1			
Difference between speed of collection of own revenue and speed of collection of current expenditure (%)	-18,25	-14,05	-7,87
Ratio between cash advances not refunded and current revenue (%)	6,05	6,23	1,25
Ratio between current positive residuals and current revenues (%)	48,13	29,28	20,88
Group 2			
Quality of management result	78,74	12,73	1,61
Per capita operating result	33,36	-6,99	-11,27
Debt limit	0,0614	0,0576	0,0477
Ratio between current negative residuals and current expenditures (%)	25,16	17,08	14,61
Risk multiplier			
Ratio between OBS debts and current revenues (%)	0,17	0,42	0,96

To run the average risk range, we considered only the second year before the default in order to identify the early symptoms of financial difficulty. We identified, for each indicator and for both demographics groups, three different risk levels of defaulting: no risk, low risk and high risk. In particular, we considered that the average national result and the average of defaulted authorities have to be placed, respectively, in the no risk area and in the high risk one, since the majority of Italian authorities is not in default and must be considered healthy, therefore in the "no risk area", while the defaulting administrations must be placed in the "high risk area" – also for the years before default. Including authorities that later defaulted and the low risk group within the national average did not significantly skew results, as the percentage of defaulted and healthy authorities is statistically insignificant (Levine *et al.*, 2002). As far as the "healthy" local authorities are concerned, previous studies (Gori & Fissi, 2012: 105-115) have shown their performance to be regularly below national average, since they are affected by the socio-economic conditions of their territory. So on an ideal scale, they can be considered more at risk and, therefore, placed in the low risk range.

For each indicator the difference between the average national result and the average of defaulting authorities represents the distance between two extreme positions used to calculate the proportion between the three risk areas. The average result of healthy authorities is used to calculate the threshold for low risk because previous studies have shown that these entities, despite having features that allow one to call them "healthy", have performance on average higher than those in financial difficulty but below the national average (Gori & Fissi, 2012). Table 4 and 5 show the risk range for each indicator and for both demographic groups.

Table 4. The risk range for LAs up to 5,000 inhabitants (Demographic group 1).

Indicators	Risk range		
	No risk	Low risk	High risk
Group 1			

Difference between speed of collection of own revenue and speed of collection of current expenditure (%)	-13,16; -19,47	-19,48; -25,25	-25,26; -∞
Ratio between cash advances not refunded and current revenue (%)	1,17;1,75	1,76; 2,15	2,16; ∞
Ratio between current positive residuals and current revenues (%)	17,50; 25,64	25,65; 54,35	54,36; ∞
Group 2			
Quality of management result	0,00; 35,13	35,14; 84,46 -0,01; -35,13	84,46; 141,21 -35,14;- ∞
Per capita operating result	1.322,17; -43,53	-43,54; -249,81	-249,82; ∞
Debt limit	0,0478; 0,0520	0,0521; 0,0544	0,0545; ∞
Ratio between current negative residuals and current expenditures (%)	14,04; 16,02	16,03; 35,64	35,65; ∞
Risk multiplier			
Ratio between OBS debts and current revenues (%)	0,00; 0,95	0,96; 1,30	1,31; ∞

Table 5. The risk range for LAs from 5,000 to 20,000 inhabitants (Demographic group 2).

Indicators	**Risk range**		
	No risk	**Low risk**	**High risk**
Group 1			
Difference between speed of collection of own revenue and speed of collection of current expenditure (%)	-7,87; 10,36	-10,37; 17,72	-17,73; -∞
Ratio between cash advances not refunded and current revenue (%)	1,25; 3,02	3,03; 4,62	4,63; ∞
Ratio between current positive residuals and current revenues (%)	20,88; 26,68	26,69; 31,86	31,87; ∞
Group 2			
Quality of management result	0,00; 11,12	11,13; 14,32 -0,01; -11,12	14,33; ∞ -11,13; -∞
Per capita operating result	n.d.	n.d.	n.d.
Debt limit	0,0477; 0,0503	0,0504; 0,0602	0,0603; ∞
Ratio between current negative residuals and current expenditures (%)	14,61;16,49	16,50;17,65	17,66; ∞
Risk multiplier			
Ratio between OBS debts and current revenues (%)	n.d.	n.d.	n.d.

9. CONCLUSIONS

When constitutional reform in 2001 required defaulting bodies to organise their own recovery without government aid, a downward turn in defaults occurred. This change in legislation led many local administrations, which were in serious debt, not to declare default (Italian Court of Auditors, 2013). It is therefore important that the

organism in charge of public finance monitor the state of health of LAs, intervening promptly in critical situations that might lead, if unchecked, to default.

Routine analysis is fundamental to better management of public resources: regular check-ups and early detection and treatment are key components of good financial health. The first hypothesis was confirmed: the system of indicators can be considered as an "early warning system" in order to recognize symptoms of financial distress before they become a real emergency (Kloha *et al.*, 2005). The results of our exploratory investigation are significant in that they have clarified the causes, or rather, situations leading potentially to default.

Application of the indicators to authorities in different financial conditions (authorities in difficulty, healthy authorities and national average) has shown similar performances within groups, enabling us to determine a range of risk.

Our set of specific risk indicators, while not overcoming every obstacle in assessing LA accounts, allows us to express a judgement, albeit not definitive, about the risk of default of a LA in Italy. Although state-local relationships differ across the countries, this logical process could easily be adopted at an international level, with the necessary modifications for specific accounting regimes.

Our research is an external analysis and the quality of results would improve notably for research carried out internally, with access to information unavailable to those without direct contact with the LA. However it allows us to evaluate the default risk by using official data available on the website of the Ministry of Interior. This ranking system should help external bodies such as the Italian Court of Auditors and Ministry of the Interior in controlling LAs in order to prevent defaults and to highlight bad practices in managing public resources. The indicators calculated could be a significant initial report for a database, allowing fact-based judgement of potentially dangerous financial situations and this may offer valid input in activating controls by the Court of Auditors.
Moreover, the non-systemic calculation of indicators currently used by the Ministry of the Interior and the Italian Court of Auditors to identify potentially critical situations is limited. Compared with this, our proposal can place authorities in specific risk categories where, depending on the seriousness of the situation, appropriate instruments of control and monitoring may be used, before an irreversible default occurs.

Finally, the methodology proposed uncovers all those situations of financial difficulty that, for mostly political reasons, are not openly declared but actually procrastinated by local authorities.

Seen from the perspective of scientific enquiry, by calculation of specific risk indicators, we see that the causes frequently indicated by the institutions (Italian Court of Auditors and Ministry of the Interior) and technical experts (Ifel) give fundamental information to control and prevent defaults. The results from the scientific viewpoint could potentially interest and enrich the institutional outlook. The analysis demonstrates that it is possible to individuate the early symptom of default and that the main problem to be tackled, certainly from a legislative point-of-view, is the management of residuals, particularly positive residuals. The data shows an anomalous trend in residuals in the period immediately preceding default and in the year of default. As declaration of default

approaches, in fact, the quantity of positive and negative residuals dwindles, clearly showing how both categories had been artificially "inflated" previously.

Moreover, alteration of positive residuals affects the cash situation and, vice versa, chronic recourse to cash advances may derive from lack of positive residuals. The latter, in fact, go to form the management surplus and, when this is spent, determine a cash flow that cannot be "reconstructed" by collecting positive residuals.

Further developments would be needed at least in two directions. First, we may hypothesise testing the proposed indicators and the risk threshold by applying the risk ranges to a sample of local authorities. Second, additional analysis is needed in order to develop a set of specific tools to control entities that are in a state of low or high default risk.

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NOTE: Although this work represents a joint study by the authors, sections "Introduction", "The literature review", "Identifying symptoms of default in Italy", "Research Method", and "The proposed indicators" can be attributed to Silvia Fissi; "Testing the indicators", "The results of risk indicators", "The risk range", and "Conclusions" to Elena Gori.