9

A Technical Approach to Deposit Guarantee Schemes

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9.1 Introduction

Progress towards a common European financial framework has been a constant trend over the past forty years, with ongoing harmonization of national legislation and practices. The financial sector has played a key role in the integration of the European countries. Indeed, financial integration has been enhanced by the introduction of a single currency.

Despite the positive achievements in the integration of European financial markets and economies, the financial crisis confirms that closer coordination of prudential policies and safety nets is required. The European financial system has revealed more fragile than expected. The crisis meant a serious setback for financial integration and the possibility of the break-up of the single currency.

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As regards the European retail banking markets, the financial crisis illustrated once more how banks are susceptible to the risk of bank runs and the need of a coordinated supervision at European level.

Deposit guarantee schemes help preventing such risk, through the reimbursement of a limited amount of deposits to depositors whose bank has failed.

Directive 2014/49/EU set a uniform level of protection for depositors throughout the European Union (EU), thanks to a broadened and clarified scope of coverage, faster repayment periods, improved information and robust funding requirements. However, it did not establish the third pillar of the Banking Union, a European deposit insurance scheme (EDIS). In the first moment, it was decided to delay its creation and to opt instead for a harmonized network of national deposit guarantee schemes (DGSs).[1]

In 2015, progress towards the EDIS accelerated. The Five Presidents' Report (President of the European Commission, in close cooperation with the President of the Euro Summit, the President of the Eurogroup, the President of the European Central Bank and the President of the European Parliament) was published in July 2015 (Juncker et al., 2015). It sets out an ambitious programme of measures to underpin the economic and monetary Union, among which is the European Deposit Insurance Scheme (EDIS). It will be applied alongside the Single Supervisory Mechanism (SSM) and the Single Resolution Mechanism (SRM) and funded by risk-based contributions from banks operating in the Banking Union countries (FITD 2016).

In May 2015, in order to ensure consistent application of Directive 2014/49/EU and to provide incentives to banks to operate under a less risky business model, the European Banking Authority (EBA) issued guidelines to specify methods for calculating the contributions to DGS. In a context where many member states did not have pre-financed DGS, EBA set out principles for technically sound methods for calculating contributions to ensure that costs of deposit insurance are borne primarily by the banking sector (EBA 2015).

The European Commission, in fulfilling a commitment, published in November 2015 a proposal for legislation, which sets out a euro area-wide deposit insurance scheme for bank deposits and further

measures to reduce remaining risks in the banking sector in parallel (European Commission 2015a). The legislative proposal proceeds through three successive stages: a reinsurance scheme for participating national DGSs in the first period of 3 years, a co-insurance scheme for participating national DGSs in the second period of 4 years, and full insurance for participating national DGSs in the steady state, which starts in 2024 (European Commission 2015b).

Within this framework, EBA guidelines offer a basis on which to assess progress in the convergence of national practices in calculating contributions to DGSs.

In this chapter, we take advantage of the EBA guidelines and study whether Italian banks would be negatively affected by their implementation, fuelling systemic risk, as opined by some member countries. "Germany, the EU's biggest economy, does not want its depositors to be liable for payouts in the event of bank failures elsewhere. It insists the EU must first take steps to minimise risks before starting talks on shared responsibility. Berlin insisted that any reference to setting up such a deposit scheme be removed at the EU summit in October, and has succeeded in doing so again at the December meeting" (Reuters 2015).

Specifically, this chapter investigates the system of calculating risk-based contributions to DGS currently in use in the Italian banking system and compares this to the system promoted by EBA, using a sample of 172 out of 202 member banks, 85% of the population of the Fondo interbancario di tutela dei depositi (FITD). Using Bankscope data from 2012, when the single supervisory mechanism was established, to 2014, we examine the impact of the EBA system on the classification of Italian banks among risk categories and, subsequently, on the contributions banks have to pay to DGS.

We find that EBA proposal would increase the number of banks in the lower-risk classes, where contribution quota to the DGS would remain unchanged or would decrease.

This chapter contributes to the literature on banking supervision by investigating the third pillar of the Banking Union, that is, deposit guarantee schemes, a matter of which the use of information has been limited in order to prevent such use from affecting the stability of the banking system or depositor confidence (Directive 2014/49/EU art.16 c.5).[2] In particular, the main contribution lies in the comparison of the

two methodologies mentioned above and in the prediction of the EBA algorithm's effect on Italian banks contributions. The analysis may have significant policy implications, as it forecasts the future contributions of Italian banks providing an empirical evidence that should reassure about the possible Italian banks' moral hazard.

This investigation shows some caveats: in principle, the FITD uses semi-annual or quarterly data, whereas Bankscope reports annual data. Secondly, for some ratios, it is not possible to match data as described by the FITD documents to data in Bankscope.

However, uncertainty about the real exposure of depositors to bank failures impairs the relationship with clients and with other member states. Therefore, we believe that the FITD, which is the only institution with access to real data, should provide additional information on this relevant topic.

The rest of the chapter is organized as follows. Section 9.2 provides the framework for deposit guarantee schemes in Italy. Section 9.3 analyses the system of calculating risk-based contributions established by the FITD. Section 9.4 applies EBA guidelines to the same sample of domestic banks, using both core and additional ratios and the buckets method. Section 9.5 compares the two systems, and Sect. 9.6 concludes.

9.2 Deposit Guarantee Schemes in Italy

The Fondo interbancario di tutela dei depositi (Interbank Deposit Protection Fund) is a private-law consortium established in 1987 on a voluntary basis, which has since become a mandatory Fund (FITD 2016). Bank participation in a deposit guarantee scheme became mandatory in 1996 with the transposition of the first Directive on Deposit Guarantee Systems, 94/19/EEC, in the Italian legislation. The second DGS was created in Italy in 1997, the Fondo di garanzia dei depositanti del credito cooperativo, which covers mutual banks and replaced the Fondo centrale di garanzia, created in 1978 to guarantee deposits in rural and cooperative banks (Senato 2015). Thus, all Italian banks are members of the FITD, except for mutual banks and branches of non-EU banks authorized in Italy if they already participated in an

equivalent scheme in their home country. Italian branches of EU banks also may adhere to FITD, in certain cases, to top-up their home guarantee coverage.

FITD guarantees the deposits in the member banks, which provide the financial resources for FITD to accomplish its mission. The Fund conducts a variety of interventions in favour of member banks when they are under compulsory administrative liquidation, in resolution or in special administration. Pursuant to art. 96-ter of the Legislative Decree 385/1993 (Italian banking Law), the Bank of Italy exercises specific powers of oversight on the deposit guarantee systems.

Today, FITD is regulated by Directive 2014/49/EU and, as a result, it undergoes many changes. These include, among others: (1) the passage from an ex post to an ex ante system of payment of contributions to the scheme; (2) the investment of available financial resources; (3) the reduction to seven working days of the deposit payout time, presently established within 20 working days from the date the compulsory administrative liquidation takes effect, by the end of the year 2023; (4) calculation of banks' risk-based contributions, following EBA guidelines; and (5) use of the Fund's resources for a wide variety of measures, alternative to direct reimbursement (FITD 2016). In this context, the FITD began raising ex ante contributions in December 2015 to avoid an excessive burden in the following financial years given the obligation to reach the target level by the year 2024.

9.3 The FITD's Monitoring System of Bank Riskiness

9.3.1 Balance Sheet Indicators

The Fund has in place a monitoring system to measure and control member banks' riskiness. This system works through balance sheet indicators on four different risk profiles: asset quality, solvency, liquidity and profitability (FITD 2012). The reporting frequency is semi-annual or quarterly, depending on the specific source of data of the Bank of Italy.

Five ratios are computed to measure the four risk profiles: A1, P, L, D1 and D2.

According to FITD (2016), at the end of 2015, member banks were 202. Fourteen banks have been dropped since they do not report data on Bankscope, a Bureau Van Dijk database, and sixteen do not report enough data to compute any ratios over the 2012–2015 sample period. The final sample is, thus, formed by 172 member banks, 85% of the population of member banks to the FITD.[3] The sample period starts in 2012 when it was decided to establish a single supervisory mechanism (SSM) and ends in 2014, because of the paucity if data in 2015.

As previously mentioned, this analysis shows some caveats: in principle, the Fund uses semi-annual or quarterly data, whereas Bankscope reports annual data. Secondly, for some ratios, it is not possible to match data from the Bank of Italy to data in Bankscope. To avoid confusion, the rest of the chapter uses the ratio definitions provided by the Fund (FITD 2012).

The first ratio (A1) measures the capacity of a bank to absorb potential losses without risk of insolvency, and it is given by the ratio of bad debts to supervisory capital (FITD 2012). To compute the asset quality ratio A1, total impaired loans are used. According to Bankscope, total impaired loans are the total value of the loans that have a specific impairment against them. The Fund uses bad loans, that is, loans which will be never repaid, even if this status has not been proved yet in court (Bank of Italy 2016). The computed ratio is, therefore, higher, overestimating the risk of the bank.

P provides a measure of bank's capital: according to the Fund, it is the ratio of supervisory capital (including tier 3) minus total capital requirements to risk-weighted assets. The solvency ratio *P* is not computed since the FITD does not provide clear information on risk-weighted assets, preventing a match to Bankscope data.

The liquidity ratio L measures the structural liquidity of the bank dividing receivables from clients by an aggregate given by the sum of payables from clients, circulating bonds and structured payables from clients and bonds at fair value. The Fund does not specify whether receivables from clients include impairments or not, so both specifications have been computed. Furthermore, the denominator is an

aggregate, and it does not have a match in Bankscope; the Fund does not provide a list of the components and of their maturities. Therefore, two components have been used: (1) total deposits, money market and short-term funding which includes total customer deposits, deposits from banks and other deposits and short-term borrowings; (2) trading liabilities, that is, short positions, repos, short-term notes and other liabilities classified at fair value. The computed ratio could under- or overestimate the Fund ratio, which however cannot be estimated.

The fourth risk profile has two ratios: D1 is given by operating expenses to gross income, and it shows whether gross income covers the cost of core banking activity and/or the ability of the bank to meet extraordinary expenses. It does not show critical issues.

D2 measures loan losses on profit before tax. It is computed only if both numerator and denominator are positive; otherwise, it takes the value of zero or four (only if numerator is positive and denominator is negative) (FITD 2012). D2 is computed using total impaired loans and pre-tax profit; once more the estimate is larger than the value provided by the Fund, thus underestimating the true member bank's efficiency.

To better appreciate the pros and cons of the present analysis, the balance sheet ratios measured by the Fund are now compared to the estimated values for years 2012 and 2013 (FITD 2012). Differences can be explained by: (1) the use of proxies, since not all data used by the Fund is publicly available; (2) the frequency of data, semi-annual for the Fund measures, annual in the present estimation. As a consequence, the Fund ratios are the median values of three observations (June and December 2012, June 2013), while the present estimation uses year-end data.

Comparing June 2012 with June 2013, there was a slight worsening in A1 (+18%, from 18.01 to 21.18%), and in D2 (from 37.22 to 50.67%), similar to the change computed for A1 (+21%, from 93 to 119%) and for D2 (from −957 to 1002%), reported in Table 9.1.

Over the same period, there was a slight improvement in the median value of the liquidity ratio (−7.45% points, from 91.73 to 84.18%) and in the profitability ratio D1 (−1.64% points, from 68.17 to 66.53%) (FITD 2012). As for the liquidity ratio, Table 9.1 shows similar trends using both gross and net receivables, but net ratio is preferred since it provides closer estimates (from 92 to 83%, versus from 97 to 88%).

Table 9.1 Balance sheet ratio computed from Bankscope

	2012		2013		2014	
Ratio	# observations	Mean	# observations	Mean	# observations	Mean
A1	149	0.93	148	1.19	148	1.99
D1	165	0.66	164	0.70	161	0.43
D2	151	−9.57	152	10.02	155	29.69
L	167	0.97	164	0.88	162	0.90
Lnet	167	0.92	164	0.83	162	0.81

Source Own computation on Bankscope's data

D1 is the only ratio which is different from the Fund data, and it increases from 66 to 70% (Table 9.1).

9.3.2 Thresholds, Classes and Coefficients

To assess bank's risk, the Fund sets four thresholds per each ratio, which correspond to five classes. FITD assigns a coefficient to each class (Table 9.2).

According to the Fund, the sum of the coefficients of each ratio defines an aggregate indicator (AI) ranging from 0 to 24 (Table 9.3). Since this chapter does not compute P ratio, the aggregate indicator varies from 0 to 20. The aggregate indicator is grouped in clusters, and each cluster corresponds to a statutory position. If the AI is lower than 3.5, the corresponding statutory position for the bank is "low risk", that is the bank is classified as a low-risk bank according to the Fund rules. To avoid distortions due to the fact that AI ranges from 0 to 20 and not from 0 to 24 as stated by the Fund, in this chapter the scale of AI has been changed proportionally.

Figure 9.1 shows the distribution of the sample banks and of the coefficients for each ratio (A1, L, D1 and D2) over the 2012–2014 period. Looking at A1 and D2, 72 and 89.6% of banks, respectively, show the highest coefficient (which equals to eight for A1 and to four for D2) and thus belong to the riskiest class. Conversely, investigating L and D1, 0.72 and 8.32% of banks, respectively, belong to the riskiest class.

Table 9.2 Thresholds, classes and coefficients

	A1		L		D1		D2	
Risk classes	Thresholds (%)	Coefficients	Thresholds (%)	Coeff.	Thresholds	Coeff.	Thresholds (%)	Coeff.
Low risk	<10	0	<90	0	<60 o numerator = 0	0	0–20% o numerator <=0	0
Medium-low	10–20	1	90–100	0.5	60–70	0.5	20–40	0.5
Medium	20–30	2	100–130	1	70–80	1	40–50	1
Medium-high	30–50	4	130–200	2	80–90	2	50–60	2
High risk	>50	8	>200	4	>90 o denominator < 0	4	>60 o denominator < 0	4

Source FITD (2012)

Table 9.3 Statutory position, aggregate indicator and scaled aggregate indicator

Statutory position	Aggregate indicator (*)	Scaled aggregate indicator(**)
Low risk	0–3.5	0–2.9
Medium-low	3.5–6.5	2.9–5.4
Medium	6.5–8	5.4–6.7
Medium-high	8–10.5	6.7–8.8
High risk	10.5–14.5	8.8–12
Expulsion	>14.5	>12

Source FITD (2012)
Note (*) Upper bounds are included
(**) The aggregate indicator has been scaled to take into account that AI ranges from 0 to 20 rather than from 0 to 24

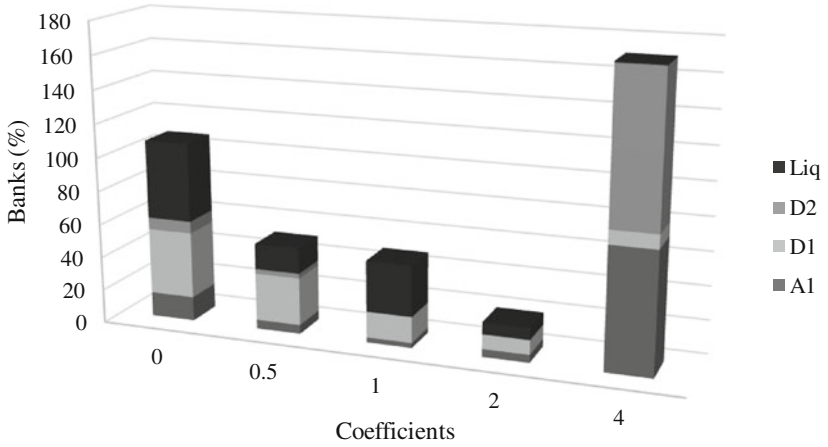

Fig. 9.1 Banks (%) and coefficients *Source* Own computation on Bankscope's data. *Note* As far as ratio A1 is concerned, coefficients are 0, 1, 2, 4 and 8

In fact, 47 and 39% of banks score a coefficient equal to zero, and the lowest risk. Sample banks seem less risky under the liquidity and profitability profiles.

The scaled aggregate indicator is computed summing up the coefficients for each of the four ratios. Then, according to Table 9.3, the statutory position is assigned to each bank of the sample in each year. Table 9.4 investigates the year-to-year statutory position, showing a migration of banks from the highest to the lowest risk position.

Table 9.4 Year-to-year statutory position

Year	2012		2013		2014		2012/2014 change (%)
Statutory position	# banks	%	# banks	%	# banks	%	
Low risk	13	8.9	14	9.46	15	10.2	
Medium-low	4	2.74	6	4.05	9	6.12	40
Medium	10	6.85	10	6.76	5	3.4	
Medium-high	10	6.85	9	6.08	8	5.44	−35
High risk	15	10.27	17	11.49	28	19.05	85
Expulsion	94	64.38	92	62.16	82	55.78	−13
Total	146	100	148	100	147	100	

Source Own computation on Bankscope's data

Over 2012–2014, banks classified in the low and medium-low statutory position increased by 40%; conversely, banks classified in the medium and medium-high risk decreased by 35%.[4] Likewise, banks belonging to the high-risk statutory position increased by 85%, whereas banks classified in the expulsion position decreased by 13%.

As previously mentioned, two caveats apply to the analysis: (1) the statutory position computed in this chapter does not include the P ratio and it is, therefore, incomplete; (2) some proxies have been used to compute the ratios, since actual data are not publicly available.

9.3.3 Contribution Quotas

After calculating the statutory position, the Fund computes the proportional quota of the contribution base which is given by the individual contribution base over the total reimbursable funds. Two correction methods, the regressive mechanism and the weighted average aggregate indicator (WAAI), that may increase or decrease the proportional quota, are then applied (FITD 2012).

The regressive correction method modifies the proportional quota according to the size of the bank: bigger banks get a reduction in the proportional quota, while the smaller ones get an increase.[5]

The second correction method is related to the value of the aggregate indicator, linking contributions to bank riskiness. The WAAI is

computed on the last three semi-annual ratios submitted by the bank to the Fund: each semi-annual ratio receives a weight, which is larger the closer in time the ratio is. The weight is four for the closest ratio, two for the middle one and one for the ratio, which refers to the earliest time.

The WAAI is given by the following formula:

$$\text{WAAI} = \sum_{t=1}^{3} \frac{\text{AI}_t * \text{weight}_t}{\sum \text{weight}} \tag{9.1}$$

where

t	1, 2 and 3; semi-annual reports
AI	semi-annual aggregate indicator
Weight	1, 2 and 4 if the AI refers to semester 1, 2 or 3, respectively

According to the Fund, when the WAAI is greater than 3.5, the bank's contribution quota shall be increased, proportionally to the WAAI value; when it is greater than zero and less than or equal to 3.5, the bank shall retain its contribution quota unchanged; if the WAAI is equal to zero, the bank shall benefit from a reduction in its contribution quota, linked to the total amount of increases. To account for the change of scale of AI, this chapter uses 2.9 rather than 3.5 as threshold.

9.3.4 The Weighted Average Aggregate Indicator and the Sample Banks

WAAI is computed applying (1) to the sample banks with the goal to determine any changes in the statutory position of banks due to risk. Since Bankscope reports annual data, only two observations are used. The weights are, therefore, equal to one, for the AI of the previous year, and to four for the most recent AI.

The denominator in (1) is equal to seven, given by the sum of the weights, whereas in (2) is equal to five, since the weights are now only two. As a consequence, in this investigation, the WAAI is given by:

$$\text{WAAI}_{\text{computed in } t} = \frac{1 * \text{AI}_{t-1} + 4 * \text{AI}_t}{5} \tag{9.2}$$

Table 9.5 part (a) shows banks with WAAI equal to zero, that would benefit from a reduction in contribution quota. Over 2012–2014 period, five banks would benefit from such reduction. One bank shows a WAAI equal to zero in two years and another one in one single year. Table 9.5 part (b) shows those banks with WAAI greater than zero and less than or equal to 2.9. Those banks would retain their contribution quota unchanged. Once more, the same banks recur over years: six banks belong to the group for 3 years out of three and one bank recurs twice.

When WAAI is greater than 2.9, banks' contribution quota shall be increased. Over 2012–2014, the number of sample banks with WAAI over the threshold remains almost stable (92%); within this group, the average WAAI decreases from 12 to 11.7, the minimum value of WAAI

Table 9.5 Weighted average aggregate indicator

Bank identification number\year	2012	2013	2014	Total
(a) Banks benefitting from a reduction in contribution quota				
1	1	1	1	3
50	1	1	0	2
152	0	0	1	1
155	1	1	1	3
166	1	1	1	3
Total	4	4	4	12
(b) Banks retaining contribution quota unchanged				
8	1	1	1	3
21	1	1	1	3
37	0	0	1	1
42	1	1	1	3
43	1	1	1	3
48	0	0	1	1
55	1	1	1	3
89	1	0	0	1
98	1	0	0	1
161	0	1	1	2
184	1	1	1	3
Total	8	7	9	24

Source Own computation on Bankscope's data

Table 9.6 Changes in statutory position after risk adjustment—all years

SP/RASP	*1*	*2*	*3*	*4*	*5*	*6*	Total
Low risk—1	24	1	0	0	0	0	25
Medium-low—2	0	12	1	0	0	0	13
Medium—3	0	1	13	1	0	0	15
Medium-high—4	0	0	0	13	1	0	14
High risk—5	0	0	0	2	24	18	44
Expulsion—6	0	0	0	0	2	167	169
Total	24	14	14	16	27	185	280
Changes SP—RASP	−1	1	−1	2	−17	16	

Source Own computation on Bankscope's data

remains stable at 4, and the maximum value decreases from 18 to 17 (−6%)[6]. Investigating the adjustment to bank riskiness, less banks would have their contribution quota increased, and the average increase in contribution quota would be lower, thus showing a safer risk profile for the banks under scrutiny.

Applying thresholds in Table 9.3 to the weighted average aggregate indicator, a risk-adjusted statutory position (RASP) can be computed. Table 9.6 investigates the changes in the statutory position when the risk adjustment is applied. Minor changes involve five banks. In particular, one bank moves from the low-risk statutory position (SP equal to one) to medium-low risk-adjusted scaled statutory position (RASP equal to two); one from SP equal to two to three when risk adjustment is applied; medium risk statutory position (SP equal to three) receives this bank but looses one bank which moves to RASP equal to four. The medium-high RASP is now formed by 16 rather than 14 banks. Major change involves the riskiest clusters: 16 banks move from high to expulsion RASP.

9.4 The EBA's Monitoring System of Bank Riskiness

9.4.1 Risk Indicators

This section is based on EBA guidelines on methods for calculating contributions to DGSs (EBA 2015). EBA defines core and additional

indicators, as they belong to one of the following risk categories: capital, liquidity and funding, asset quality, business model and management, potential losses for the DGS. This chapter describes only the indicators used in the empirical investigation and refers to EBA (2015) for further details on all risk categories and indicators.

EBA guidelines have been applied to a sample of 171 Italian banks, member of the FITD. From the initial 202 member banks, 14 banks have been dropped because of the lack of data on Bankscope, as we did in the previous analysis on the FITD system. In addition, the year 2015 has been dropped, because only 22 banks out of the remaining 188 (12% of the sample) report data to compute EBA indicators. Seventeen more banks have been excluded because they do not report enough data to compute any EBA indicator over the 2012–2014 sample period. Table 9.7 shows descriptive statistics on core and additional indicators for the final sample of 171 banks.

Table 9.7 Descriptive statistics—EBA core and additional indicators

Indicators	Number of observations	Mean	Standard deviation	Minimum	Maximum
Core					
Leverage ratio	413	0.09	0.07	0.01	0.95
CET1	470	0.19	0.18	0.01	2.98
Capital coverage ratio (%)	472	3.52	3.65	0.11	66.22
Liquidity ratio	494	0.17	0.19	0.00	0.97
NPL ratio	468	0.06	0.05	0.00	0.64
Return on asset (%)	318	0.01	1.25	−7.37	4.65
RWA to total asset	470	0.55	0.19	0.07	1.33
Additional					
Return on equity (%)	318	0.04	17.30	−115.48	49.34
Total asset growth	321	0.08	0.34	−0.89	3.80
Cost income (%)	482	65.78	44.26	9.05	895.25

Source Own computation on Bankscope's data

For the first risk category (capital), EBA proposes two core indicators: leverage ratio, defined as tier 1 capital to total asset ratio, and capital coverage ratio (actual to required CET1 ratio) or common equity tier 1 ratio (common equity tier 1 capital to risk-weighted assets). Capital indicators reflect the level of loss-absorbing capacity of the bank. Higher amounts of capital show that the bank has a better ability to absorb losses internally, thus decreasing its likelihood of failure. Therefore, banks with higher values of capital indicators should contribute less to the DGS (EBA 2015). In the sample, the leverage ratio is on average 9% and CET1 19%. Due to available information, the numerator of CET1 is tier 1 capital and not common equity tier 1 capital. Thus, the computed leverage ratio overestimates the EBA ratio, underestimating the level of risk.[7] Similar considerations can be drawn on the capital coverage ratio, which average is equal to 3.52%.[8]

For the liquidity and funding category, the two core indicators suggested by the authority (liquidity coverage ratio—LCR—and net stable funding ratio—NSFR) cannot be applied until their definition as determined in Regulation (EU) No 575/2013 is fully operational. As a transitional indicator, the liquidity ratio (LR) defined as liquid assets to total assets is computed. It measures the bank's ability to meet its short-term debt obligations as they become due. The higher the ratio, the larger the safety margin to meet obligations and unforeseen liquidity shortfalls. Indeed, low liquidity levels indicate the risk that the institution may be unable to meet its current and future, expected or unexpected, cash-flow obligations and collateral needs. Liquid assets cover 17% of total assets on average. In 6 banks, LR is close to zero indicating possible future liquidity tensions (LR below 0.010 for 1 bank in 2012, for 4 banks in 2013 and for 1 bank in 2014).

The asset quality category shows the extent to which the bank is likely to experience credit losses. Large credit losses may cause financial problems that increase the likelihood of failure, therefore justifying higher contributions to the DGSs. This category includes the non-performing loan (NPL) ratio, given by non-performing loans to total assets. It provides an indication of the type of lending the bank engages in. A high degree of credit losses in the loan portfolio indicates lending to high-risk customers. The NPL ratio is on average 6%. Twenty banks out of 171

(12% of the sample) show a ratio higher than 15% in one or more years (Two banks in 2012, four banks in 2013—of which one already over the threshold in 2012—and 15 banks in 2014). Among those banks, 1 bank has a NPL ratio larger than 50% in 2014 and another one larger than 50% in the same year. These two latter banks have a high degree of credit losses in the loan portfolio, which increases the likelihood of failure.

Business model and management takes into account the risk related to the bank's current business model and strategic plans, and reflects the quality of internal governance and controls. Business model indicators can, for instance, include indicators related to profitability, balance sheet development and exposure concentration. The first core indicator proposed by EBA is risk-weighted assets to total assets ratio, which indicates the kind of risky activities a bank engages in. A higher value indicates higher risk. The second core indicator is return on asset (ROA). A business model which is able to generate high and stable returns indicates lower risk. However, unsustainably high levels of ROA also indicate higher risk (EBA 2015). In the sample, RWA to total assets ratio is 55% on average, but it is larger than 100% for three banks in 2012 and in 2013, raising doubts about the sustainability of the business model. ROA is on average equal to 0.01%.[9] Fifty three banks have a negative value of ROA in 2013 and 54 banks in 2014 (about 32% of the sample). The maximum value of ROA in the sample is 4.65%, and it does not seem unsustainably high.

The last risk category is potential losses for the DGS. EBA (2015) suggests one core indicator (unencumbered assets to covered deposits) which measures the degree of expected recoveries from the bankruptcy estate of the bank, which was resolved or put into normal insolvency proceedings. A bank with a low ratio exposes the DGS to higher expected loss. However, the proposed definition of unencumbered asset does not allow to compute the ratio.[10]

In addition to the core risk indicators, DGSs may include additional risk indicators that are relevant for determining the risk profile of member banks. The additional risk indicators should be classified into the above-listed risk categories. EBA proposes indicators for the asset quality, business model and management and potential losses for the DGS categories. In this chapter, three additional indicators belonging to

the business model and management category are applied: (1) excessive balance sheet growth ratio (TAG) that measures the growth rate of the bank's balance sheet. Unsustainably, high growth might indicate higher risk; (2) return on equity (ROE), which measures the ability to generate profits to shareholders from the capital these have invested in the bank. A business model which is able to generate high and stable returns indicates reduced likelihood of failure. However, unsustainably, high levels of ROE indicate higher risk; (3) cost to income ratio (CI) which measures cost efficiency. An unusually high ratio may indicate that the institution's costs are out of control, especially if represented by the fixed costs (i.e. higher risk). A very low ratio may indicate that operating costs are too low for the institution to have the required risk and control functions in place, also indicating higher risk (EBA 2015).

The mean of the sample for total asset growth is 8%. However, 99 banks over 171 (58% of the sample) have a negative asset growth at least in 1 year (72 banks in 2012 and in 2013—of which 45 banks are common to both years); four banks have a TAG ratio larger than 100% (two banks in 2013 and in 2014). Among those four banks, one has a ratio larger than 200% in 2014 and one larger than 300% in 2013. These banks show an unsustainable high growth which indicates higher risk.

On average, ROE is equal to 0.04%, and it is negative for 53 and 54 banks in 2012 and 2013, respectively. EBA (2015) states that unsustainably high levels of profitability ratios also indicate higher risk. The maximum value of ROE in the sample is 49%, and the ratio is larger than 20% for 18 banks (10 banks in 2013 and 11 in 2014). This numbers may suggest some problems of the sustainability of the business model in the long term.

On the efficiency side, the average cost to income ratio is 66%. Nineteen banks have a ratio larger than 100% at least in one year: in particular 7 banks in 2012, 9 in 2013 and 8 in 2014; among them, two banks have a ratio larger than 200%. The unusually high ratio indicates that the bank's costs are out of control. A very low ratio may indicate that operating costs are too low for the bank to have the required risk and control functions in place, also indicating higher risk, but this is not the case for the sample under scrutiny since only seven banks have a CI ratio smaller than 20% (EBA 2015).

Overall, this chapter examines seven over nine core indicators and three over 13 additional indicators, which are enough to perform a significant analysis, in the author's point of view.

9.4.2 Individual Risk Score

As the FITD, also EBA proposes thresholds, classes and weights to compute individual bank risk scores (IRS). Unlike the Fund, however, EBA allows two methods to assign banks to risk classes: the bucket method and the sliding method. The first one uses a fixed number of buckets defined for each risk indicator by setting upper and lower boundaries for each bucket. The number of buckets for each risk indicator should be at least two. The buckets should reflect different levels of risk posed by the member banks (e.g. high, medium, low risk) assessed on the basis of particular indicators (EBA 2015).

Where the calculation method follows the sliding scale approach instead of a fixed number of risk classes, the upper and lower limits are set by the DGS on the basis of regulatory requirements or historical data on the particular indicator. Since the sliding method is based on information available only to the national DGS, this chapter uses the bucket method, which is also closer to the FITD system, thus allowing easier comparison between the two.

9.4.3 Bucket Method

In the bucket method, an individual risk score is assigned to each bucket. The buckets' boundaries should be determined either on a relative or absolute basis. When using the relative basis, the IRSs of banks depend on their relative risk position vis-à-vis other institutions; in this case, institutions are distributed evenly between risk buckets, meaning that institutions with similar risk profiles may end up in different buckets. In the absolute basis, the buckets' boundaries are determined to reflect the riskiness of a specific indicator; in this case, all banks may end up in the same bucket if they all have a similar level of riskiness.

Table 9.8 Buckets, boundaries and individual risk score

Buckets	Boundaries (%)	IRS
1	<2	0
2	=< 2–7 <	50
3	> = 7	100

Source EBA (2015)
Note Risk indicator for which higher values indicate higher risk (NPL ratio)

For each risk indicator, the IRSs assigned to buckets should range from 0 to 100, where zero indicates the lowest risk and 100 the highest risk.

Table 9.8 shows an example of bucket-scoring by type of risk indicator, where higher values of the risk indicator mean higher risk (for example, NPL ratio).

To compute the IRS of the sample banks, buckets and boundaries provided by EBA have been used for LR, NPL ratio, ROA, ROE and total asset growth. EBA does not provide specific examples for the leverage ratio, CET1, RWA/TA and cost to income ratio, thus relative boundaries, which correspond to the 20, 40 and 60th‰ of the sample banks distribution year to year, have been used for those indicators. The percentiles and corresponding IRS have been fixed according to EBA guidelines. Relative boundaries imply an even distribution of banks among risk buckets, and Table 9.9 shows an example of buckets, relative boundaries and individual risk scores.

Table 9.9 Buckets, relative boundaries and individual risk score

Bucket	Boundaries	IRS
1	>60° ‰	0
2	<40°–60° = <	33
3	<20°–40° = <	66
4	=< 20° ‰	100

Source own computation on EBA (2015)
Note Risk indicator for which higher values indicate lower risk (liquidity ratio)

9.4.4 Aggregate Risk Score

EBA (2015) multiplies each IRS by an indicator weight (IW) which should be the same for all banks and calibrated by using supervisory assessment and/or historical data on failures of institutions (EBA 2015).

The sum of weights assigned to all risk indicators is equal to 100%. When assigning weights to particular risk indicators, the minimum weights for the risk categories and core risk indicators, which sum up to 75%, should be preserved.

When only core indicators are computed and NSFR is not yet available, EBA (2015) states that the minimum IW assigned to NSFR is assigned to LR, which belongs to the same risk category. One of the possible allocation of weights suggested by EBA, when both core and additional indicators are computed, allows five additional indicators in four different categories. These indicators can be freely chosen by the DGS.

The aggregate risk score (ARS) is the weighted average of the IRS, according to the following formula:

$$\mathrm{ARS}_i = \sum_{j=1}^{n} \mathrm{IW}_j * \mathrm{IRS}_j \tag{9.3}$$

where: $\sum_{j=1}^{n} \mathrm{IW}_j = 100\%$ and $\mathrm{IRS}_j = \mathrm{IRS}_{x_j}$ when X in $\{A, B, \ldots, M\}$, that is the bucket corresponding to indicator A_j.

Following the guidelines, since NSFR is not computed during the transition period, the IW explained above is applied to core indicators. In addition, as previously mentioned, the ratio of unencumbered assets to covered deposits has not been computed because data on unencumbered assets for the sample banks were not available. Thus, the weight (17%) originally assigned by EBA to this ratio is equally allocated among all other computed indicators.

Consequently, when only core indicators are investigated, the ARS is computed according to:

$$\begin{aligned} \mathrm{ARS}_{\mathrm{core}} = {} & 0.15 * \text{leverage ratio} + 0.15 * \mathrm{CET}\,1 + 0.25 * \mathrm{LR} + 0.21 \\ & * \mathrm{NPL\ ratio} + 0.12 * \mathrm{RWA/TA} + 0.12 * \mathrm{ROA} \end{aligned} \tag{9.4}$$

When core and additional indicators are considered, weights are applied to each risk category, except for the business model and management. All three additional indicators belong to this category; thus, its weight is given by the sum of the weights of business model and management and of potential losses for the DGS.

$$\begin{aligned} \mathrm{ARS}_{\mathrm{core+additional}} = {} & 0.115 * \text{leverage ratio} + 0.115 * \mathrm{CET1} + 0.18 \\ & * \mathrm{LR} + 0.18 * \mathrm{NPL\ ratio} + 0.085 \\ & * \mathrm{RWA/TA} + 0.085 * \mathrm{ROA} + 0.08 \\ & * \mathrm{ROE} + 0.08 * \mathrm{TAG} + 0.08 * \mathrm{CI} \end{aligned} \tag{9.5}$$

Descriptive statistics of ARS are computed by applying formula (4) and (5) to the sample banks. Over 2012–2014, the averages of ARScore and ARScore + additional are almost the same, but ARScore + additional standard deviation is lower and the minimum higher than ARScore. This may suggest a lower volatility when additional indicators are taken into consideration.

According to EBA (2015), every ARS has a corresponding aggregate risk weight (ARW), which should be used to calculate the contribution of an individual member bank to the DGS (Table 9.10). When ARW is 75%, the member bank gets a discount on contribution to be paid because it is considered as a low-risk bank. When ARW is 100%, contribution does not change. When ARW is higher than 100% (either 125 or 150%), the member bank is considered as a high-risk bank and has to pay higher contributions.

The average ARS of the sample banks is about 60, which assigns the sample to the ARW of 125%. Overall, banks should pay higher contributions to the national DGS. Of course, ARS is assigned to each member bank year by year: additional information is reported in

Table 9.10 Aggregate risk weight

Risk classes	ARS boundaries	ARW (%)
1	<40	75
2	=< 40–55 <	100
3	=< 55–70<	125
4	> = 70	150

Source EBA (2015)

Table 9.11. Table 9.11 part (a) lists the number of banks in each risk class using only core indicators in the year 2013 and year 2014; part (b) shows the distribution of banks considering both core and additional indicators.

Looking at core indicators [Table 9.11 part (a)], from 2013 to 2014, the number of banks in risk class 1 decreases by 20%, whereas the number of banks in class 2 (ARW = 100%) increases by 45%. Changes in the other two risk classes are negligible. Thus, it seems that the sample banks became more risky in 1-year time, and their contributions to the

Table 9.11 Number of banks, risk classes, ARW_{core} and $ARW_{core+additional}$ (2013 and 2014)

		2013		2014		
Risk classes	ARW_{core} (%)	Number of banks	Percentage	Number of banks	Percentage	Change 2013–2014 (%)
(a)						
1	75	27	20	16	15.53	−20
2	100	27	20	29	28.16	45
3	125	39	28.89	28	27.18	−3
4	150	42	31.11	30	29.13	−4
	Total	135	100	103	100	
(b)						
1	75	18	13.53	13	12.62	−4
2	100	35	26.32	31	30.1	18
3	125	46	34.59	30	29.13	−13
4	150	34	25.56	29	28.16	13
	Total	133	100	103	100	

Source Own computation on Bankscope's data

Fund would not be further discounted. Table 9.11 part (b) confirms this scenario, applying core and additional indicators to sample banks in the year 2013 and year 2014. The number of banks in class 1 diminishes by 4%, and the number of banks in class 2 increases by 18%. The change in the number of banks in class 3 (−13%) is perfectly matched by the change in class 4.

9.5 Comparison Between FITD and EBA Monitoring System of Bank Riskiness

The comparison between the monitoring systems applied by the FITD and proposed by EBA is not straightforward for many motives. First, risk categories are different, for instance the FITD does not consider the potential losses for DGS. Second, within the same category, indicators are computed differently, as, for example, indicator A1 of the FITD and the NPL ratio proposed by EBA, or liquidity ratios, which have different numerator and denominator. Third, the number of indicators is significantly different between the two systems: five indicators for the Italian Fund versus nine core indicators proposed by EBA. Furthermore, EBA suggests to use thirteen additional indicators. Fourth, indicator weights are the same for all ratios except A1 in the case of the FITD, whereas many different scenarios are proposed by EBA, with the only prescription of minimum weights for core indicators. Last but not least, risk classes cannot be easily compared since EBA proposes four classes (75% lowest risk, 100% average risk, 125% risky and 150% most risky), whereas FITD assigns banks to six different classes.

However, notwithstanding all differences, the core of the two systems is the same, since both works on the assessment of member bank's risk and the result of the assessment increase or decrease contributions to be paid to the DGS. Assuming to modify the thresholds in Table 9.4 in order to fit the four risk classes proposed by EBA in Table 9.12, this chapter suggests the match among risk classes reported in Table 9.12.

The match reported in Table 9.12 is based on the level of contributions to be paid to the DGS according to FITD (2012): when WAAI is

Table 9.12 Risk classes (FITD versus EBA)

WAAI	ARW
0	75% lowest risk
0–2.9	100% average risk
2.9–8.8	125% risky
>8.8	150% most risky

Source Own computation on FITD (2012) and EBA (2015)

larger than 3.5, the bank's contribution quota shall be increased as it happens when ARW is greater than 100%; when WAAI is greater than zero and less than or equal to 3.5, the bank shall retain its contribution quota unchanged, as when ARW is equal to 100%; if the WAAI is equal to zero, the bank shall benefit from a reduction in its contribution quota, as it happens when ARW is 75%. The additional threshold (10.5) for WAAI has been identified on the basis of Table 9.3: when WAAI is above 10.5, the member bank is considered at high or expulsion risk. This category is matched with ARW equal to 150%, which means a substantial increase in contribution. Since in this chapter thresholds have been scaled to avoid distortions, the Funds 3.5 and 10.5 are scaled to 2.9 and 8.8.

Table 9.13 summarizes the changes in member banks' classification in 2013 and 2014 when EBA core indicators (panel a) or core and additional indicators (panel b) are applied instead of FITD indicators. When indicators proposed by EBA are applied to Italian banks, the distribution of those banks among risk classes improves.

Table 9.13 panel (a) shows the changes in risk classes when only core indicators are applied. The number of banks belonging to the low-risk class increases by 500% (20 banks) in 2013 and by 367% (11 banks) in 2014. Those banks experience a discount in contribution quota to the Fund. The number of banks in class 2, which retains their contribution quota unchanged, increases by 500% (+20 banks) in 2013 and by 700% (+21 banks) in 2014. Conversely, the number of banks in the highest risk class (class 4) decreases by 59% in 2013 and by 61% in 2014 (−58 and −46 banks, respectively).

When core and additional indicators are applied (Table 9.13 panel b), the number of banks in class 1 would increase by 275% (11 banks) in

Table 9.13 Changes in risk classes

Risk classes	EBA core	2013				*Changes in risk classes from FITD to EBA*	
FITD	0.75	1	1.25	1.5	Total	Number of banks	Percentage (%)
(a)							
1	4	0	0	0	4	20	500
2	3	0	1	0	4	20	500
3	12	7	1	1	21	18	86
4	5	17	37	40	99	−58	−59
Total	24	24	39	41	128		
2014							
	0.75	1	1.25	1.5	Total		
1	3	0	0	0	3	11	367
2	2	1	0	0	3	21	700
3	6	7	0	0	13	14	108
4	3	16	27	29	75	−46	−61
Total	14	24	27	29	94		
(b)							
1	3	1	0	0	4	11	275
2	1	2	1	0	4	28	700
3	8	10	1	1	20	26	130
4	3	19	44	32	98	−65	−66
Total	15	32	46	33	126		
2014							
	0.75	1	1.25	1.5	Total		
1	3	0	0	0	3	8	267
2	2	1	0	0	3	25	833
3	4	9	0	0	13	15	115
4	2	18	28	27	75	−48	−64
Total	11	28	28	27	94		

Source Own computation on Bankscope's data

2013 and by 267% (8 banks) in 2014. In class 2, the number increases by 700% (+28 banks) in 2013 and by 833% (+25 banks) in 2014, whereas the number of banks in class 4 decreases by 66% in 2013 (65 banks) and by 64% in 2014 (48 banks).

9.6 Conclusion

Deposit guarantee schemes are an essential element in the completion of the internal market and an indispensable complement to the system of supervision of banks.

The set-up of a European Deposit Insurance Scheme was mildly welcomed by some member states. They were concerned that sharing the responsibility of backstopping deposits without tackling the remaining risks in banking systems would increase moral hazard. This concern is based on the assumption that EDIS would increase the level of contributions banks of some member states have to pay according to their riskiness.

To test this hypothesis, this chapter analyses monitoring systems of bank riskiness currently applied by the FITD and proposed by EBA on a sample of Italian banks members of the FITD. The conclusion is twofold.

First, the change of indicators, thresholds, weights and risk classes is applied to years 2013 and 2014 and shows that EBA proposal would increase the number of banks in the lower-risk classes, where contribution quota to the DGS would remain unchanged or would decrease. This outcome points out that, on average, sample banks would pay less contributions to the DGS when EBA guidelines are applied. This should reassure member states concerned about Italian banks' moral hazard in the event of the set-up of a common backstop for deposits.

Unfortunately, the results in this chapter are approximate because of the lack of data and information. Since the issue is relevant, the FITD, which is the only one that has the full set of data and information, might consider disclosing the real situation. Uncertainty undermines bank-client relationship and obstacles a trustfully relationship with other member states.

Second, on the effectiveness of EBA implementation of Directive 2014/49/EU goals, this chapter suggests some caution. Carefully analysing the monitoring system proposed by the European regulator, it emerges that EBA proposes many indicators, which composition is not always clear, and allows national DGSs great flexibility in line with the principle of proportionality. The choices of how many and which

additional indicators to use, of the weights to assign to each risk category and, within each category, to each indicator, of the bucket or of the sliding method to fix boundaries, and, depending on the chosen method, of boundaries themselves to compute individual risk scores, are just some of the decisions EBA allows national DGSs to take. While it is clear that EBA guidelines will contribute to providing incentives to banks to operate under a less risky business model and to speed up the convergence process, it is not so clear whether such discretionary power allowed to national DGSs on many relevant features would benefit the system. The outcome of the risk assessment can vary strongly, depending on the choices made. This negatively affects the harmonization and comparability of the national schemes, fuelling, once again, concerns among member states about the true riskiness of other member states' banking systems. The goals of Directive 2014/49/EU seem postponed to the near future and rely on the adoption of EDIS.

Notes

1. Further information can be found in "Germany warns on eurozone bank deposit plan" (Financial Times 2015) and in the Deutsche Bundesbank's Monthly Report of December 2015, p. 58–60.
2. D. Lgs. 659/96, art. 2, c. 1, which transposes directive 94/19/CE, states that all information, news or data related to FITD are privileged communications.
3. Six banks out of 172 (3% of the sample) report data to compute only one ratio.
4. The year 2015 is not included in the analysis, since the number of observations is less than 50% compared to the previous years.
5. "This procedure consists of a set of steps made for determining the point of equilibrium quota" which could be only performed by the Fund (FITD 2012, p. 23).
6. Data are available upon request.
7. A higher CET1 indicates a better risk mitigation. Tier 1 capital is given by the sum of common equity tier 1 and of additional tier 1 (BIS 2012).
8. Required tier 1 ratio is 4.5% and 5.5% for the year 2013 and 2014, respectively (BIS 2012).

9. To avoid including one-off events and avoid pro-cyclicality in contributions, an average of 2 years data is used (EBA 2015).
10. EBA defines unencumbered and encumbered asset as the following: "an asset should be treated as encumbered if it has been pledged or it is subject to any form of arrangement to secure, collaterise or credit-enhance any on-balance sheet or off-balance sheet transaction from which it cannot be freely withdrawn (for instance, to be pledged for funding purposes)" (EBA 2015, p. 22).

Appendix

Table A.1 shows the test for equality of means between top- and bottom-performing banks in terms of return on equity (ROE) over 2012–2014. As far as asset quality is concerned, most profitable banks are significantly less risky (A1 equals 50% versus 178%, respectively). Top-performing banks are also less exposed to liquidity risk (L takes the value of 65 versus 97%). Top- and bottom-performing banks do not show any significant difference in means for profitability ratios D1 and D2.

Table A.2 shows the results of the test of the difference in means among banks belonging to the top and bottom quartile in terms of ROE. Top quartile banks have a smaller leverage ratio (66% vs. 96%), a higher liquidity ratio (27% vs. 14%), a higher quality of loan portfolio (NPL ratio equal to 4 and 8%, respectively), lower RWA to total assets

Table A.1 Test for difference in means—ROE

Ratio	Bottom quartile		Top quartile		Difference in means (p-value)
	# observations	Mean	# observations	Mean	
A1	87	1.78	78	0.5	0.0000***
D1	96	0.52	93	0.6	0.3941
D2	87	−16.95	84	−16.43	0.4927
L	96	0.97	94	0.65	0.0000***

Note Top-performing banks belong to the first quartile of yearly distribution, bottom-performing ones to the fourth quartile
Source Own computation on Bankscope's data

Table A.2 Top and bottom quartile—ROE

Indicators	Bottom quartile		Top quartile		Difference in means (p-value)
Core	Number of observations	Mean	Number of observations	Mean	
Leverage ratio	82	0.96	75	0.66	0.0134**
CET1	92	0.19	88	0.22	0.2391
Capital coverage ratio (%)	93	3.8	88	3.78	0.4871
Liquidity ratio	97	0.14	96	0.27	0.0001***
NPL ratio	91	0.08	86	0.04	0.0000***
Return on asset (%)	53	−0.84	55	0.94	0.0000***
RWA to total asset	92	0.59	88	0.43	0.0000***
Additional					
Total asset growth	57	0.1	55	0.12	0.3966
Cost income (%)	92	70.64	95	59.23	0.0021***

Source Own computation on Bankscope's data

(43 vs 59%) and lower CI (59 vs. 71%) than bottom quartile banks. All EBA indicators suggest that top-performing banks in terms of ROE have a lower risk than the worst-performing ones.

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