The promptness of European Deposit Protection Schemes to face banking failures

Jessica Cariboni

born in 1976, graduated in Physics at University of Milan. She completed her PhD in financial modelling at the Katholieke Universiteit of Leuven. Since 2003, she is a researcher at the European Commission Joint Research Centre. Her main fields of research are financial modelling, uncertainty and sensitivity analysis, credit risk modelling and Lévy processes.

Elisabeth Joossens

received her PhD in Statistics in 2006 at the Katholieke Univesriteit Leuven. Since 2004, she is working as a statistician at the Econometrics and Applied Statistics Unit of the Joint Research Centre of the European Commission. Her main fields of research are extreme value statistics and modelling default risk in finance and insurance.

Adamo Uboldi

is currently a post-doctoral fellow at Parma University, Economics Department, and Contract Professor of Mathematical Finance at University 'Insubria' of Como-Varese, Italy. He received his PhD in Mathematics (University 'La Sapienza' of Rome) in 2004 and then he spent the following years doing research in Mathematical Finance with an (Italian) National Research Council grant, a (Swiss) National Science Foundation grant and a Joint Research Centre of the European Commission contract. His main research interests focus on option pricing, stochastic volatility modelling and interest rates theory.

Correspondence: Jessica Cariboni, European Commission, Joint Research Centre, TP361, 21020 Ispra, Varese, Italy

E-mail: jessica.cariboni@jrc.ec.europa.eu

ABSTRACT This article aims to investigate the efficiency of European Deposit Protection Schemes (DPSS) in providing adequate financial protection to depositors and enhancing the stability of the financial sector. Using data provided by European DPSS, the analysis focuses on different aspects of their operation. The intervention procedures in force across European Union (EU) countries are compared, the amount of available funds are analysed by means of different quantitative measures to assess the fund adequacy and the promptness of consumer repayments is investigated using data on historical payouts. It can be concluded that fairly heterogeneous procedures are currently in place in the EU Member States, thus posing the question of whether more harmonised rules are needed to enhance the effectiveness of the DPSS' role in the financial safety net. The analysis shows that, while under stable market situations, most of the European DPSS would be capable of facing the failure of a non-systemic bank, in a critical period, such as the one that prevailed at the end of 2008, they could encounter problems in adequately fulfilling their consumer protection role. With regard to the time period needed to repay depositors, results highlight that more stringent rules might be advisable from a consumer's perspective.

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INTRODUCTION

The stability of the banking sector is the cornerstone of a nation's economy. As banks are one of the most important actors in the

financial network, the management of their portfolios makes them vulnerable to illiquidity and insolvency, especially because deposits are highly leveraged. Insolvencies in the banking

sector can undermine the stability of the financial markets and the creditworthiness of the financial system as a whole. These risks were confirmed by the financial crisis of 2008, when European credit institutions suffered from the effects of investments on the US loan market.

Deposit Protection Schemes (DPSs), also known as Deposit Guarantee/Insurance Schemes, are funds set up with the goal of reimbursing depositors in the event of insolvency of their financial institution. By ensuring protection of small depositors, DPSs aim to avoid bank runs and thus enhance the stability of the financial sector; also, by ensuring the same level of protection within a country, they aim to avoid competition distortions within the banking system. DPSs are thus part of a country's financial safety net, which is composed of different key actors: the DPS, the prudential regulator and the supervisory authority, and the lender of last resort (for example, the State or the Central Bank).^{1,2}

For the safety net to serve its purpose, the tasks of the different actors need to be clearly defined and implemented. Moreover, these actors should cooperate effectively in order to deal with a systemic crisis.¹

Within the European Union (EU), DPSs are in force in all Member States pursuant to Directive 94/19/EC.³ Aimed at completing the single market, this Directive required minimum harmonisation of deposit protection rules across Member States, that is the establishment of a DPS in each Member State, the choice of a minimum level of protection for depositors (set in 1994 at €20 000) and some time constraints for depositors' repayment. At the same time, the Directive left Member States free to choose on a number of issues, as it is recognised that each country must consider what is the final goal of a DPS and what are the peculiar circumstances of the banking system in which the DPS is set up.^{4,5} For instance, each Member State can decide on the types of action the DPS can undertake (for example, optional preventive interventions

and/or statutory repayments of depositors in case of failure), on the intervention procedure, on the way DPS collects financial resources, and on the interaction between the DPS and other competent authorities such as the Central Bank or the Banking Supervisory Authority (BSA). As a result, DPSs across EU Member States have developed in quite heterogeneous ways.

In 2005–2006, Directive 94/19/EC underwent a first review process, the results of which were summarised in a European Commission (EC) Communication.⁶ The Communication identified a number of short-term improvements to the existing arrangements, to be adopted *via* self-regulatory agreements and without the need to make changes to the legislation implemented. EC also analysed the efficiency of EU DPSs to determine whether differences among procedures and rules for paying out to depositors might undermine fast and efficient banking crisis resolution.⁷

The global banking crisis of 2008 once more opened the debate on the effectiveness of the Directive, as, in most of the EU countries, bank insolvencies could only be addressed through capital injections into the system by the Government.⁸ This was the case for several banks within the EU, for example Northern Rock and Bradford & Bingley in the United Kingdom, Fortis in Belgium and the Netherlands, and Hypo Real Estate in Germany. A detailed chronological list of events can be found in two reports by the Bank of England.^{9,10} As a quick response to the 2008 financial crisis, the EC proposed some amendments to the Directive in force, aiming to restore confidence in and proper functioning of the financial sector.¹¹ The Amending Directive (Directive 2009/14/EC), adopted in Spring 2009, increases the minimum coverage level from €20 000 to €50 000 (and possibly to €100 000 by the end of 2010), reduces the payout period from 3 months to 20 working days and discontinues coinsurance.^{12,13}

In recent years, academics have also started to develop some research on the role and the

goals of DPSs. Analysis of DPSs around the world can be found, for instance, in the work of Garcia and Demirgüç-Kunt *et al.*^{14,15}

The role and consequences of explicit deposit protection have been the subject of debate in the literature.¹⁶ More specifically, whether setting up a DPS actually enhances financial stability is still discussed in the paper of Demirgüç-Kunt and Detragiache,¹⁷ whereas the positive impact of Government provisions regarding deposit insurance on the demand for liquidity is discussed in the paper of Diamond and Dybvig.¹⁸ Moreover, despite the fact that the International Monetary Fund has endorsed a limited form of deposit protection as a best practice,¹⁹ it is well known that the presence of a DPS could encourage risk-taking by the banks, thus introducing moral hazard.^{20,21}

As outlined in the work of Lee and Kwok, most of the existing literature on deposit insurance tend, in general, to be confined to a discussion of the reform proposals and risk-related premium assessment methodologies.^{22,23} The present article is more oriented to discussing practical issues arising from the procedures adopted by EU DPSs in facing banking difficulties, such as the procedures to be followed in case of intervention, the extent of resources available to EU DPSs and their potential capability to cope with banking failures of given sizes. Using quantitative and qualitative data collected among EU DPSs, it shows the low level of harmonisation in the procedures adopted, which might result in a reduction of their effectiveness. In particular, by analysing historical payouts, it highlights the issue of the capability of EU DPSs to handle situations of different types, ranging from the default of a bank of small/medium size to the resolution of failures of wider dimensions, for example failures that occurred during the 2008 crisis. To this end, the resources available to EU DPSs are investigated and compared with the costs incurred in coping with historical failures. In addition, where a repayment is made, the time needed to reimburse customers is also very relevant, in particular from a depositor's point

of view. The study investigates the time needed to repay depositors in past defaults by assessing the percentage of repayments performed within the time limits laid down by the Directive.

There are two main sources of data used in this article: the first one is the survey, which is analysed in the report on DPSs efficiency released by the EC; the second one is a survey by the EC conducted in response to the crisis, whose findings are currently unpublished.^{7,24}

The article is structured as follows. In the next section, an overview of the Directive is given. The section following this details the types of procedures adopted by EU DPSs in case of intervention and briefly comments on potential problems arising from the low level of harmonisation enforced by the Directive. The section after that focuses on the financial resources available to EU DPSs and introduces two measures to describe the size of their funds. The subsequent section discusses in quantitative terms the 10 biggest reimbursements of depositors that have occurred in each Member State after the adoption of the Directive. Appropriately rescaled costs are compared with available resources *via* the measures introduced to assess the capacity of current funds to cope with past reimbursements. The penultimate section discusses the issue of consumers' awareness and the promptness of payouts and the final section draws some conclusions.

EU SITUATION

Before starting to discuss in detail several specific features of EU DPSs, this section gives a brief overview of Directive 94/19/EC as it stood before Autumn 2008. More detailed information can be found, for example, in the paper by Cariboni *et al* or in the report by the Joint Research Centre.^{25,26} The last part of this section focuses on the consequences of the 2008 crisis for deposit protection, starting with actions taken at Member States level to face the lack of confidence in the banking systems and leading to the Amending Directive.

Directive 94/19/EC introduced only a few harmonised rules, for example:

- It requires EU Member States to ensure that one or more schemes exist on their territory.
- It enforces a minimum level of protection for depositors, set at €20 000.
- It introduces a 3-month limit for repayments with the possibility of extending it twice, up to a maximum of 9 months.

The lack of more standardised guidelines was because of historical reasons, mainly the fact that, although in many countries DPSs had been in place for several decades before the Directive, other Member States only set up a protection system in the transitional period following the EC Directive. For this reason, implementation of the rules was left to the Member States, which were free to choose how to finance their DPSs, how to invest their funds and how to refinance them in case of need. Furthermore, each Member State could decide on the type of action the DPS can undertake, allowing optional preventive interventions or limiting it to statutory payouts to depositors in case of failure. All these ‘degrees of freedom’ introduced wide heterogeneity among Member States, as discussed in the report by the Joint Research Centre.²⁶

For instance, the number of operating schemes varies from one country to another. Currently, there are 39 DPSs in the 27 Member States (see Table 1): in some countries, there are more than one DPS, dealing with specific sectors of the banking market (savings banks, public banks, cooperative banks and so on).²⁷ The Directive only requires there be a DPS in operation in each Member State, without specifying the way it should be financed, which is maybe one of the most discussed differences among EU DPSs. In EU, 16 countries have *ex ante* systems, where levies are collected on a regular basis in order to build a reserve fund, whereas six countries (Austria, Italy, Luxembourg, the Netherlands, Slovenia and the United Kingdom) collect contributions

from member banks only in case of interventions: these are described as *ex post* systems. In the remaining five Member States (Denmark, Cyprus, Malta, Poland and Romania), the DPSs’ funding is hybrid, that is it combines *ex ante* and *ex post* components.²⁸ As discussed in detail in the ‘Financial Resources’ section, the amount of resources set aside by *ex ante* DPSs also varies widely among countries, depending on historical payouts, on the structure of the banking system and especially on the role of the scheme in a country.

Another factor to be taken into consideration is the level of coverage of the deposit protection. Before the 2008 financial crisis, around half of the Member States opted to cover only up to the obligatory minimum amount of €20 000, whereas other Member States chose to cover different amounts, up to a maximum of around €103 000 in Italy. Member States also chose whether to cover certain types of deposits, explicitly mentioned in the Directive (see Article 7(2)), such as deposits by insurance undertakings, by the Government and by pension funds. Here too, extreme situations can be found, ranging from countries where no exclusions are in force (Finland) to countries implementing all possible types of exclusions (Belgium, Germany and Austria).²⁵ Another element of heterogeneity was the application of *coinsurance* (see Article 7(4)): in order to avoid moral hazards, DPSs could lower the level of coverage to 90 per cent, so that depositors would keep part of the risk in their own hands. This meant that, in certain Member States, the real level of guarantee was lower than the level of coverage.

The implementation, among Member States, of different coverage levels, different types of exclusions and different *coinsurance* rules introduced distortions within a banking system in which credit institutions from different Member States coexist. To avoid such competition problems, the Directive enforced the application of the *topping-up* principle, which imposes the same type of guarantee to depositors, irrespective of the origin of the credit institution.

Table 1: List of DPSs in the EU member states

	<i>Country</i>	<i>Name</i>
BE	Belgium	Deposit and financial instrument protection fund
BG	Bulgaria	Bulgarian Deposit Insurance Fund (BDIF)
CZ	Czech Republic	Deposit Insurance Fund
DK	Denmark	Guarantee Fund for Depositors and Investors
DE1	Germany 1	Compensatory fund of the Association of German Public Sector Banks
DE2	Germany 2	German Private Commercial Banks Compensation Scheme for Depositors and Investors
DE3	Germany 3	Protection Scheme of National Association of German Cooperative Banks
DE4	Germany 4	Haftungsverbund der Sparkassen-Finanzgruppe
EE	Estonia	Deposit Guarantee Sectoral Fund
IE	Ireland	Irish Deposit Protection Scheme
GR	Greece	Hellenic Deposit Guarantee Fund
ES1	Spain 1	Deposit Guarantee Funds for Banks Institutions
ES2	Spain 2	Deposit Guarantee Funds for Credit Cooperative Banks
ES3	Spain 3	Deposit Guarantee Funds for Savings Banks
FR	France	Deposit Guarantee Fund
IT1	Italy 1	Interbank Deposit Protection Fund
IT2	Italy 2	Deposit Guarantee Fund of Cooperative Credit Banks
CY1	Cyprus 1	Deposit Protection Scheme
CY2	Cyprus 2	Deposit Protection Scheme for Co-operative Societies
LV	Latvia	Deposit Guarantee Fund
LT	Lithuania	Deposit and Investment Insurance
LU	Luxembourg	Luxembourg Deposit Guarantee Association
HU	Hungary	National Deposit Insurance Fund of Hungary
MT	Malta	Depositor Compensation Scheme
NL	The Netherlands	Collective guarantee scheme of credit institutions for repayable funds and portfolio investments
AT1	Austria 1	Deposit Protection Company of the Austrian Commercial Banks Ltd
AT2	Austria 2	Österreichische Raiffeisen-Einlagensicherung reg.Gen.m.b.H. (ÖRE)
AT3	Austria 3	Sparkassen-Haftungs Aktiengesellschaft
AT4	Austria 4	Schulze-Delitzsch Haftungsgenossenschaft reg.Gen.m.b.H.
AT5	Austria 5	Hypo-Haftungs-Gesellschaft m.b.H.
PL	Poland	Bank Guarantee Fund
PT1	Portugal 1	Deposit Guarantee Fund
PT2	Portugal 2	Guarantee Fund of Mutual Agricultural Credit Institutions
RO	Romania	Deposit Guarantee Fund in the Banking System
SI	Slovenia	Deposit Guarantee Scheme
SK	Slovakia	Deposit Protection Fund
FI	Finland	Deposit Guarantee Fund
SE	Sweden	Swedish Deposit Guarantee Board
UK	UK	Financial Services Compensation Scheme

Finally, regarding the time taken to repay depositors in the event of a failure, the Directive introduced a clear deadline for the scheme to complete the procedure (see Article 10(1)), starting from the so-called trigger event, that is the moment in time when the competent authorities make the determination that deposits are unavailable. However, at the same time, the Directive remained vague about the period in which a depositor can

submit a claim and the time between the submission of the claim and the due repayment. This will be discussed in greater detail in the section ‘Consumer Confidence and Promptness of Repayments’.

As a reaction to the 2008 financial crisis, the Amending Directive was adopted in March 2009. With the aim of building more confidence in the market and meeting depositors’ needs more fully, the Amending Directive

Figure 1: Levels of coverage as of 1 January 2008 and 30 June 2009.
Note that for Slovenia, Slovakia and Austria the level of coverage in 2009 is unlimited (*).

increases the coverage level, initially to an intermediate level of €50 000 and later to €100 000 (see Figure 1 for a comparison of the levels of coverage as of 1 January 2008 and 30 June 2009). The Amending Directive also reduces the deadline for repaying depositors to 20 working days and allows extensions only under exceptional circumstances and after approval by the competent authorities. As a final issue, the new Directive terminates the possibility of coinsurance.

The Amending Directive represents the latest measures taken by the EC to improve deposit insurance regulation. However, it is expected that the EC will review the entire Directive in the years ahead. For instance, the EC is currently considering promoting *ex ante* schemes, as also stressed in the Report by the de Larosière Group, as ‘they are better to foster confidence and help avoiding procyclical effects resulting from banks having to

pay into the schemes at a time where they are already in difficulty’.⁸

PROCEDURES

This section describes aspects of DPSs’ activities across EU Member States: the types of action allowed, the institutions involved in the crisis management and the events triggering the DPS activation.

In many cases, DPSs have a multiple role. Not only do they have statutory obligations to repay depositors in the event of a failure (as laid down in Directive 94/19/EC), but around 40 per cent of the Member States’ national laws allow the schemes to perform other actions such as preventive interventions (see Table 2).

For preventive actions, the Board of DPS often acts on the basis of a monitoring system developed to assess the risk of the DPS

Table 2: Main characteristics of EU DPSs per member state, as of 30 June 2009

Ex ante	Preventive intervention	Borrowing allowed	Maximum limit on contributions	Extraordinary contributions	Possibility to access data a priori	2007 coverage ratio	2007 resource ratio	Target fund as % of 2007 eligible deposits	2007 fund (m€)	2007 eligible deposits (m€)	2007 level of coverage (€)	2009 level of coverage (€)
BE	Y	Y	N	Y	N	0.33%	0.37%	5.00%	765	234 000	20 000	100 000
BG	Y	Y	Y	Y	N	1.62%	3.12%	N	266	16 453	20 452	51 129
CZ	Y	N	N	Y	N	0.40%	0.57%	N	266	16 453	20 452	51 129
DK	Y ^a	N	Y	Y	N	0.25%	0.46%	0.22%	489	194 986 ^b	40 000	50 000
DE	Y	Y	n.a.	n.a.	Y	n.a.	n.a.	N	n.a.	2 371 145 ^b	22 222	50 000
EE	Y	Y	Y	Y	N	1.78%	2.28%	2.00%	116	6513	20 000	50 000
IE	Y	N	N	Y ^c	Y ^d	0.26%	0.33%	N	526	203 329 ^b	22 222	100 000
GR	Y	Y	Y	Y	N	0.58%	1.69%	N	942	162 625	20 000	100 000
ES	Y	Y	Y	Y	N	0.80%	1.00%	1.00%	6503	815 510	20 000	100 000
FR	Y	Y	N	Y ^e	N	0.09%	0.10%	0.08%	1624	1 765 520 ^b	70 000	70 000
IT	N	Y	—	—	N	—	0.56% ^f	N	0	574 377	103 291	103 291
CY	Y ^a	Y	Y	Y	N	0.01%	0.31%	N	8	59 114 ^b	22 222	100 000
LV	Y	N	N	N	Y	0.80%	1.00%	N	96	11 966	20 000	50 000
LT	Y	Y	N	N	N	2.32%	2.76%	4.00%	251	10 835	22 000	100 000
LU	N	Y	—	—	N	—	— ^g	N	0	103 970 ^b	20 000	100 000
HU	Y	Y	Y	Y	Y	0.56%	0.76%	0.79%	249	44 421	22 500	50 000
MT	Y ^a	N	Y	Y	Y	0.10%	0.40%	0.10%	7	6729	22 222	100 000
NL	N	N	—	—	N	—	— ^h	N	0	445 596 ^b	40 000	100 000
AT	N	Y	—	—	Y	—	— ⁱ	N	0	211 410 ^b	20 000	unlimited
PL	Y ^a	Y	Y	Y ^j	N	0.81%	0.81%	N	731	90 806	22 500	50 000
PT	Y	Y	Y	Y	Y	0.99%	1.40%	N	1377	138 604	25 000	100 000
RO	Y ^a	N	Y	Y	Y	0.81%	1.81%	1.48%	219	269 389	20 000	50 000
SI	N	N	—	Y ^k	N	—	1.43% ^l	N	0	15 430	22 000	unlimited
SK	Y	N	Y	Y	N	—0.13%	1.62%	N	—23	18 030	20 000	unlimited
FI	Y	Y	N	N	Y	0.58%	0.63%	N	549	94 086	25 000	50 000
SE	Y	Y	Y	Y	N	0.70%	0.74%	0.59%	1822	259 387	26 479	50 000
UK	N	Y	—	—	N	—	0.30% ^m	N	0	1 319 754	47 700	52 500

^aEx ante funds showing also an ex post component (hybrid systems).

^bEstimated values.

^cIn IE extraordinary contributions are foreseen but cannot be estimated.

^dAs the DPS is part of the CB.

^eIn FR extraordinary contributions are foreseen but cannot be estimated.

^fFor IT there is a maximum virtual fund.

^gFor LU there is a maximum virtual fund, but it cannot be estimated.

^hFor NL there is a maximum virtual fund, but it cannot be estimated.

ⁱFor AT there is a maximum virtual fund, but it cannot be estimated.

^jIn PL there is a maximum limit on contributions but cannot be estimated.

^kAs the DPS is part of the CB.

^lFor SI there is a maximum virtual fund.

^mFor UK there is a maximum amount of annual contribution. Note that the scheme in UK underwent a funding review, adopted in Spring 2008.

n.a. – not available.

members, and different types of risk measures are used. No common rules on starting a preventive procedure exist but very often 'the least cost principle' is applied. This means that a DPS will start an intervention preventively if the expected costs are lower than the costs of the failure itself. In this way, the institutions in charge try to ensure the stability of the financial system and the banking sector.

In most EU countries, DPS will not act on its own in the decision-making process and strategy development, although it would seem most effective to have a totally independent DPS.⁴ For instance, one or more of the following institutions can also be involved in the initiation of a payout by DPS or in the decision that DPS should perform a preventive intervention: the Central Bank, the BSA, a competent Court and/or the Economics/Finance Ministry.

Another important factor is the payout procedure in the event of a failure, where different actors might be involved (see Table 3). In general, the event triggering the activation of a DPS is the declaration of the unavailability of deposits by a competent authority. Directive 94/19/EC enforced a time limit of 21 days for the competent authority to determine that a credit institution is unable to repay deposits (Article 1(3)) and a 3-month period (possibly extended twice) for DPS to pay duly verified claims (Article 10(1) and (2)). The Amending Directive reduces these time limits to 5 and 20 working days, respectively. However, the current time frames and the steps to be followed in a failure resolution vary widely across Member States, depending not only on the interface between the authorities involved but also, for instance, on the overlap between bankruptcy law and DPS regulation.

More than one-third of the DPSs have complete powers in all steps of the payout procedure. For the remaining schemes, other entities are involved, such as the liquidator of the failing bank, the Central Bank, the Supervisory Authority or the failing bank itself. Their corresponding powers vary considerably from

one Member State to another. For instance, in some countries, the defaulting bank interacts with the DPS in order to handle the payout. In many cases, the defaulting bank is in charge of collecting/verifying claims/data or applying set-off rules. When another existing bank is involved, its role has mainly to do with the payout of depositors. For a few DPSs, the Central Bank is involved in some steps of the payout process. Note that no Member State is created for the purpose of the payout process. In only some Member States, the liquidator of the failing bank supports the DPS in some stages of the payout, especially related to the collection/verification of claims/data. Finally, the powers of the Supervisory Authority are usually restricted to data/claim collection/verification. Table 3 provides, for each country, the responsible authorities for each step of the intervention procedure.

Although the involvement of more than one actor could introduce delays and ambiguities, it appears in practice that the different parties in charge maintain a good balance of powers (see also data on payout times in the section 'Consumer Confidence and Promptness of Repayments'). The existence of such diverse procedures makes the actual role of DPSs in the financial safety net less evident. As a consequence, the question arises whether more harmonised rules, at the EU level, are needed to enhance the effectiveness of the DPSs' role in maintaining stability of the financial markets.

Some attention should be given to the possible involvement of the State in the event of big failures or systemic crises. Where no preventive actions are taken by DPS, the Government can still intervene as a last resort before a trigger event if, for instance, the bank plays a strategic role in the banking system or if the stability of the financial sector is undermined. However, the exact role of the State when intervening as a last resort remains vague in the Directive. During the 2008 turmoil, EU Governments often intervened to avoid banking failures and interventions

Table 3: Authorities responsible for each step of the payout process, as of 30 June 2009

Responsible authority for								
Unavailability of deposits declaration								
		Claims collection	Data collection	Amount calculation	Set-off application	Access to money	Access to contributions	Payout
BE	n.a.	DPS	DPS	DPS	DPS	DPS	DPS	DPS
BG	CB	Not mandatory	Conservator	Conservator	Conservator	DPS	n.a.	DPS + AEB
CZ	CB	Not mandatory	DB	DB	DB	DPS	DPS	DPS
DK	BSA	DPS	DPS	DPS	DPS	DPS	DPS	DPS
DE	BSA	DPS	DPS	DPS	Not applied	DPS	DPS	DPS
EE	Court + BSA	Trustee or liquidator	Trustee or liquidator	DPS	Trustee or liquidator	DPS	DPS	DPS
IE	Court or BSA	DPS	SA	DPS	DPS	CB	CB	CB + DPS
GR	CB or the judicial authorities	Not mandatory	DPS	DPS	DPS	DPS	DPS	DPS
ES	Court and/or the CB	Not mandatory	DPS + CB	DPS	Not applied	DPS	DPS	DPS
FR	BSA	Not mandatory	DPS	DPS	Not applied	Ex post	DPS	DPS
IT1	CB	Not mandatory	Liquidator	Liquidator	Liquidator	Ex post	DPS	DPS
IT2	Ministry of Economy, under proposal of CB	Not mandatory	DB	DB	DB	Ex post	DPS	AEB
CY1	CB	DPS + CB	DPS + CB	DPS	DPS + CB	DPS	DPS	DPS
CY2	Commissioner of the Authority for the Supervision and Development of Cooperative Societies	Not mandatory	DPS	DPS	DPS	DPS	DPS	DPS
LV	Court and the Financial and Capital Market Commission	Not mandatory	BSA	DB	DB	BSA	BSA	BSA
LT	Institution of bankruptcy or BSA	Not mandatory	DPS	DPS	DPS + DB	DPS	DPS	DPS
LU	Court and BSA	DPS	DPS + Sub	DPS	DPS + DB	DPS	DPS	DPS
	DPS + DB + Sub							
	DPS + DB + Sub	Ex post	DPS + Sub	DPS	DPS	DPS	DPS	DPS
HU	BSA	DPS	DPS	DPS	DPS	DPS	n.a.	DPS, DB, AEB
MT	BSA or Court	DPS	DPS + BSA	DPS	DPS + DB	DPS	DPS	DPS
NL	District Court	CB	DPS	DPS	DPS	Ex post	DPS	DPS
AT	Court upon application of the Financial Market Authority	DPS	DPS	DPS	DPS	Ex post	DPS	DPS
PL	BSA	Not mandatory	DB	DB	DB	n.a.	DPS	DPS + DB
PT1	CB	Not mandatory	DPS + DB	DPS + DB	Not applied	DPS	DPS	DB
PT2	CB	Not mandatory	Mutual Agricultural Credit CB	DPS	Not applied	DPS	DPS	DPS

Table 3 continued

Responsible authority for		Claims collection	Data collection	Amount calculation	Set-off application	Access to money	Access to contributions	Payout
Unavailability of deposits declaration								
RO	CB and Court	Not mandatory	DB	DPS	DPS	DPS	DPS	DPS + AEB
SI	CB	Not mandatory	DB + AEB					
	DPS + BSA + DB + AEB							
	DPS + BSA + DB + AEB	Ex post	DPS + BSA	AEB				
SK	CB	Not mandatory	DPS + DB	DPS	DPS	DPS	DPS	AEB
FI	BSA or District Court	Not mandatory	DPS	DPS	Not applied	DPS	DPS	DPS
SE	District Court	Not mandatory	DPS	DPS	Not applied	DPS	DPS	DPS
UK	BSA or a judicial authority	DPS						
	DPS + Insolvency practitioner	DPS	DPS	Ex post	DPS	DPS		

Abbreviations: CB=Central Bank; BSA=Banking Supervisory Authority; DB=defaulting bank; AEB=another existing bank; Sub=subcontractor. Note that for each country data of different DPS is merged if DPS statutes are equal within the country.

took two different forms: either the Government helped to solve the liquidity problem of the financial institution by providing a loan or, in really problematic cases, the Government even took over the bank and put it under state control. Examples of Capital injections are Fortis and KBC in Belgium and ING in the Netherlands, whereas Northern Rock in the United Kingdom and Hypo Real Estate in Germany are cases in which the banks were (temporarily) nationalised.

FINANCIAL RESOURCES

The choice of an adequate funding system is of crucial importance to ensure that a DPS functions effectively: if a scheme were not capable of coping with the reimbursement of claims because of insufficiency of funds, the safety net might lose credibility and the costs might increase significantly.^{4,29} In this section, the financial resources available to EU DPSs are investigated. As for ex post DPSs, funds collection is completely dependent on the occurrence of a bank default, this section will focus on the schemes showing complete/partial *ex ante* features.

As already outlined, the size of the funds accumulated by *ex ante* DPSs can vary widely among Member States (see also Table 2). Two measures are proposed in order to gain a picture of the readiness of a DPS to face potential interventions. A first measure, called *coverage ratio*, looks at the amount of resources put aside by *ex ante* DPSs rescaled by the amount of deposits protected by the scheme (which will be referred to as the amount of *eligible deposits* as in the paper by Cariboni et al.²⁵ This ratio will be discussed in the subsection 'Coverage ratio'.

Besides the size of the fund, other factors should be examined in order to gain a complete picture of the resources that each DPS can call on if necessary. Two other aspects that need to be taken into account are the possibility to raise additional contributions (up to

a certain pre-determined maximum), and to levy 'extraordinary' premiums. In more than 80 per cent of *ex ante* EU Member States (see Table 2), schemes can levy extraordinary contributions from members in case of need: this option can be particularly useful in order to cope with low-cost payouts, avoiding the financial burden of taking out a loan. At the same time, 70 per cent of EU *ex ante* Member States have, in their statutes/by-laws, an explicitly set maximum limit for annual contributions (see Table 2): the underlying reason is to keep the contribution level not too high for members, in order to avoid the contagion phenomena. This is because, it is believed that members who are already in financial difficulty would be put in a worse situation if they were asked to contribute to the solution of other members' failures. It should also be noted that, among the schemes that are funded *ex post*, there might be a 'virtual fund', earmarked or set aside by the members, but not explicitly collected by the DPS, which has to be made available in case of need. In order to account for all types of resources potentially obtained from DPS members, a second measure named *resource ratio* is introduced in the subsection 'Resource ratio'.

In addition to the resources that the DPS can obtain from its members, the possibility of borrowing money must also be taken into account. Only in six EU Member States do schemes have explicit rules in their statute, which prohibit them from borrowing either from institutional sources (Government, Central Bank) or on the free market, whereas all other schemes are allowed to ask for a loan (see Table 2). In particular, in most cases (around 80 per cent of DPSs that are allowed to ask for a loan) there are no explicit limitations on the amount of funds that can be borrowed, thus introducing a theoretically infinite capability to collect money. However, as this option seems unrealistic, in practice, a limit on borrowing must be considered as in force, despite the absence of an explicit limit in the legislation. For example, a ceiling on annual contributions

introduces a limit to the capability of repaying a loan.³⁰

Before detailing the two measures, it is worth noting that the debate on how much funds would be adequate for a DPS is still open. Some *ex ante* DPSs do actually set a target level for their funds (see Table 2). However, in practice, there is no recognised methodology to evaluate the adequacy of the amount of resources before a failure event. For instance, the target could be calculated as a fixed share of the amount of eligible deposits. Moreover, where this approach is applied, the shares used vary by an order of magnitude among EU countries (from 0.2 per cent to 5 per cent). Some authors put emphasis on the necessity to link the amount of funds to the DPS loss distribution.^{31,32}

Coverage ratio

The first ratio describes the resources owned by the DPS to face potential interventions. In order to compare data from different countries, the size of the market in which the DPS operates should be taken into account. For this reason, the fund is rescaled by the amount of eligible deposits:

$$\text{Coverage ratio} = \frac{\text{Size of fund}}{\text{Total amount of eligible deposits}}. \quad (1)$$

The ratio has been calculated for each *ex ante* DPS for the year 2007 and the results are presented in Figure 2.³³ The results show that, on average, *ex ante* EU DPSs could face the failure of a member covering approximately 0.73 per cent of the market of eligible deposits. Schemes in Eastern Europe show stronger *ex ante* features than EU-15 DPSs, the corresponding average ratios being, respectively, 0.92 per cent and 0.51 per cent. Coverage ratios might seem very low, all being below 2.5 per cent, probably reflecting the underlying assumption that the DPS would have to handle the failure of a single member of small size. This

assumption of isolated defaults clearly revealed its limitations during the 2008 crisis.

While discussing the financial resources available, the question of how they are managed or invested is also very relevant. Most of the funds (almost 90 per cent of cases) are directly managed by DPSs. Only in very few cases are funds provided by ring-fenced reserves or partially earmarked by members. With regard to the way *ex ante* DPSs manage their resources, in all cases but one (in which money is put on an account with the Central Bank), funds are invested. For the great majority, funds are invested in national and/or EU bonds or similar government securities and there are significant cases in which schemes resort to short-term deposits. Whenever more risky financial products are allowed, strict limitations (for example, a minimum rating for the instruments) are explicitly laid down in statutes/by-laws in order to limit the risk in the DPS' portfolio. This approach could be strengthened

by specifying common and harmonised investment rules and risk constraints.

Resource ratio

This second proposed ratio is quite similar to the coverage ratio. The difference lies in the fact that, in this case, the maximum amount that could be made available in case of need is considered, instead of limiting the analysis to the financial resources currently owned by DPS:

$$\text{Resource ratio} = \frac{\text{Maximum amount of available resources}}{\text{Total amount of eligible deposits}} \cdot (2)$$

The maximum amount of available resources includes the fund, the theoretical maximum amount of standard contributions and potential extraordinary contributions. Moreover, for *ex post* funded schemes, virtual funds are taken

Figure 2: 2007 coverage ratios in countries with *ex ante* funding. The missing countries are Italy, Luxembourg, the Netherlands, Austria, Slovenia and the United Kingdom, which have *ex post* schemes. Slovakia is not reported as the fund has a negative value because of a loan contracted in 2001, which has not yet been completely repaid. For Germany, the data are missing.

Figure 3: 2007 resource ratios and coverage ratios in EU countries. Luxembourg, the Netherlands, and Austria are not reported as they have ex post schemes without virtual funds or with non-estimable virtual funds. For Germany, the data are missing.

into account.³⁴ Note that, as already discussed, for the great majority of countries, there is no explicit limitation to the amount of money that may be borrowed. For this reason, borrowing is not included in this analysis, a notable difference with the approach taken in report from the Joint Research Centre.⁷

In order to produce an immediate comparison between current funds and potential resources, Figure 3 shows, for each Member State, the resource ratio and the corresponding coverage ratio for the year 2007.

The resource ratio clearly lies higher than the coverage ratio and the EU average even exceeds 1 per cent. It should be noted that, for this ratio, three additional ex post countries are included (Italy, Slovenia and the United Kingdom), as they were able to provide precise information on the size of their virtual funds.³⁴ Also the resource ratio of Slovakia is plotted.

Figure 3 shows that, for this ratio too, the situation is fairly heterogeneous from one country to another, ranging from cases in which the maximum amount of resources doubles the fund (for example Romania, Finland) to cases in which the additional collection is not significant (for example Belgium, Sweden).³⁵

Taking all these possible resources into account, the ratio clearly increases but current values still do not demonstrate that DPSs are adequately prepared to handle multiple failures.

HISTORICAL PAYOUTS

This section is based on data on the most significant DPS payouts that occurred in the EU over a 13-year period, from 1995 to 2008, including some of the failures that took place during the 2008 financial turmoil. The focus is on those cases in which DPSs intervened after a member's failure to repay depositors.

In order to compare and classify failures that occurred in different years and in different markets, the following measure, which will be referred to as the *intensity ratio*, is defined:

$$\text{Intensity ratio} = \frac{\text{Total cost of payout}}{\text{Total amount of eligible deposits}}, \quad (3)$$

where the total cost of each payout and the total amount of eligible deposits refer to the same year. This measure aims to describe the effects of the payout costs, as it is expected that interventions with low costs would have a lower impact and that bigger markets would be capable of handling a critical situation more effectively. Data show that failures of different impact have occurred in the EU, with intensity varying between 0.00005 per cent and 3.24 per cent.

Under the assumption that within EU all countries follow a similar pattern, the ratios obtained can be used to construct the distribution

of the intensities of the defaults. The distribution could then be used to forecast the size of a future failure or to check the readiness of a DPS to face a potential payout. The intensity ratio can, in fact, be directly compared with the coverage ratio and the resource ratio in order to investigate whether DPS' resources would be sufficient to tackle the effects of a failure.

Figure 4 presents the empirical cumulative distribution function for the intensity ratio based on the EC data set. For comparison, the figure contains also the EU average coverage and resource ratio. Using the results, it can be concluded that more than 85 per cent of all failures had an intensity ratio, falling below the average coverage ratio (and almost 90 per cent for the resource ratio). Even the fund with the smallest coverage ratio (0.01 per cent) would have been able to cover 35 per cent of the interventions that occurred.

It should be noted that information on DPS interventions during the financial turmoil is not complete because, at the time of data

Figure 4: Empirical cumulative distribution function for the intensity ratio, based on data from the EC survey. The vertical lines present the average EU coverage ratio (dotted) and resource ratio (dashed).

gathering, several payout procedures were still ongoing. In fact, only around 10 per cent of the failures, presented in Figure 4, occurred in 2008 and many of them relate to the failure of tiny credit unions in the United Kingdom. It has to be noted that in some cases, guarantee costs were only partially covered by DPS. For instance, in the case of the failure of Bradford & Bingley plc. (2008), where the UK DPS contributed £14 billion, the value of the intensity ratio is around 1.5 per cent. However, as almost one quarter of the total costs were covered by the State, which guaranteed the entire amount of retail deposits above the £35 000 limit in place at the time of failure and all whole sale deposits, the true value of the intensity ratio would be higher.³⁶ Finally, as already stressed before, it should be mentioned that, in many countries, banks in difficulty were rescued by state interventions, whose size is often comparable to several points of the GDP of a country.

CONSUMER CONFIDENCE AND PROMPTNESS OF REPAYMENTS

From a consumer's point of view, more than the choice of the level of coverage, key factors to avoid bank runs are the public awareness that deposits are protected by a DPS and the time required to effect the repayment. The guarantee of repayment alone is not sufficient, as many costumers need the money deposited for their everyday life. Clearly, if someone is not aware of the existence of a DPS, he/she cannot take it into account when deciding to keep money in a bank account. A recent study by the UK Financial Services Authority (FSA) states: 'One factor that may have contributed to the queues outside branches of Northern Rock in September 2007 was that many consumers were unaware of the existence of a financial compensation scheme and how it operated'.³⁷ The International Association of Deposit Insurers has developed guidance for effectively promoting public awareness of deposit insurance systems, recognising that the ultimate goal

of a public awareness programme is to enhance the effectiveness of the scheme.³⁸ Despite the fact that the issue of public awareness is receiving more and more attention, extremely few quantitative data have been collected so far. The UK FSA produced a report on public awareness of financial regulation reporting that around 44 per cent of the UK population was not aware of the existence of FSA as a financial regulator.^{39,40}

Besides the fact that consumers might or might not be aware that a DPS is guaranteeing their money, another critical issue is depositors' confidence that the repayment will be accomplished in a reasonable time. The payout delay issue received particular attention by EC both in the Directive review process started in 2005 and in the Amending Directive.

The 1994 Directive specified a maximum of 21 days for the competent authorities to determine that a bank is unable to conclude a requested payment (called a trigger event), starting from the moment a payment has not been performed (Article 1(3)). Next, the Directive set a 3-month limit within which a DPS had to pay depositors, starting from the trigger event (Article 10(1)). The Directive also gave DPSs the possibility to ask twice for an extension of a further 3 months, leading to a possible maximum payout deadline of 9 months from the trigger event (Article 10(2)). The Amending Directive reduces the 21 days to 5 days and the 3 months to 20 days and allows a single extension under specific circumstances.

Although these limits are very precise, the Directive and the Amending Directive do not say anything about the time given to submit a claim (when mandatory, see Table 2) and do not put any constraint on the period of time between the submission of the claim and the DPS repayment, which might be more significant from the consumer's point of view. Moreover, the Directive stated that the time of arrival of claims cannot be used to refuse repayment (Article 10(3)). Clearly, this rule conflicts with the maximum period set in the

Figure 5: Top amount of money repaid in 3–6–9 months as a percentage of the total amount of covered deposits. Bottom: number of deposits repaid in 3–6–9 months as a percentage of the total number of covered deposits.

Directive. Some Member States tackle this situation by putting a maximum time horizon for the submission of a claim, whereas other countries allow a very long, even unlimited, submission period.

On the basis of the results of the EC surveys, conclusions can be drawn on the payout times in past bank failures. The results are summarised in Figure 5, in which the amount (top plot) and number (bottom plot) of deposits

repaid after 3–6–9 months are plotted.⁴¹ On average, 72 per cent of the total number of deposits were repaid within 3 months, corresponding to an amount of around 93 per cent of the total amount covered. These amounts increase, after 9 months, to an average of 82 per cent of the total number of deposits with a total amount of around 97 per cent.

Although the percentage of the number of unrepaid deposits seems significant (18 per cent of the total), its importance can be minimised as it corresponds to only 3 per cent of the total amount of deposits. This confirms the assumption that many depositors with very little amounts of money on their bank accounts did not claim for reimbursement.

It has to be noted that these results only give a picture of how efficiently the Directive is working from the regulator's point of view, that is they measure the performance of the DPSs in repaying depositors within the time limit set by the legislation. From a consumer's point view, on the other hand, the problem arises not at the time of the trigger event but from the moment that the money is not accessible.

There could be a number of reasons for the scheme to request for an extension: IT problems, delays in accessing data, unavailability funds, appeals introduced by the shareholders and so on. Very little data on these issues are currently available. With regard to the delay in accessing data, DPSs in 10 out of 27 Member States can access data from their members periodically or on request, whereas in the remaining EU countries the schemes receive information only after the competent authorities declare that a failure has occurred (see Table 2). Another issue has to do with the quality of data received by the DPSs. The 2008 report commissioned from Ernst & Young by the UK FSA and the UK DPS proposed a number of methods (such as data cleansing, eligibility account flagging, creation of a single customer view, that is the identification of the complete position of each customer) to improve the quality of data and speed up the compensation procedure towards

a target of 7 days.⁴² Depending on the scenario chosen, the study shows that total estimated setup and maintenance costs for the industry are rather high, ranging from £0.5billion to £1billion.

CONCLUSIONS

This article has investigated the effectiveness of DPSs in EU countries more than 10 years after the introduction of specific legislation on guarantee funds. The main idea behind the EU Directive was to provide consumers with a safety net for their deposits, thus improving their trust in the financial system.

On the basis of the data collected among European DPSs, the analysis has shown that approaches are currently not harmonised across countries. The investigation has focused on three crucial aspects of the schemes' functioning, namely the procedures applied in case of intervention, the amount of available resources and the promptness of depositor repayment in case of a bank failure.

Concerning the procedures in case of intervention, data have revealed a range of very different practices adopted by the schemes, varying from countries where the system works only as a pay box in case of bankruptcy, to situations in which schemes are allowed to intervene in order to prevent banking failures. These very diverse approaches are probably not the most efficient, and they do not help in clarifying the actual role of DPSs in the overall European financial safety net. Moreover, although the responsibility of the Governments in handling banking crises remains ambiguous in the EU legislation, in several circumstances, their intervention proved to be the only way of resolving problematic situations. In this view, clarifying the relative functions of all the actors involved in the resolution of a banking crisis might improve and increase the stakeholders' confidence in a country's safety net.

With regard to funds available to the schemes, as the current legislation sets no specific rule, resources vary considerably from one

country to another, both in terms of the funding mechanism adopted and in terms of accessible resources. The analysis has introduced two quantitative measures in order to evaluate the adequacy of current and potentially available funds, and to compare them with the costs of historical reimbursements. Although the capability of ex post systems remains uncertain, for *ex ante* schemes, the results have demonstrated that, in the great majority of cases, funds are sufficient to face interventions of small size, for example the bankruptcy of a credit institution covering less than 1 per cent of the national market of deposits. In the event of multiple failures or interventions of wider dimension, like those that occurred in 2008, most of the schemes would be unable to handle alone the expenditures and thus to protect consumers.

Finally, regarding the issue of the DPSs' readiness to repay depositors, the data set has confirmed the capability of the schemes to cope with the 21-day and 3-month rules enforced at European level by Directive 94/19/EC. It remains an open question whether DPSs will be able to cope with the more stringent constraints introduced by the 2009 Amending Directive (5 and 20 working days) and whether this reduction will improve the confidence of consumers and thus help in controlling possible bank runs during critical periods.

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REFERENCES AND NOTES

- 1 Bank Committee on Banking Supervision and International Association of Deposit Insurers. (2009) Core principle for effective deposit insurance systems, <http://www.bis.org/publ/bcbs156.pdf?noframes=1>.
- 2 Schich proposes a fourth element to complete the safety net, namely the failure resolution. Schich, S. (2008) Financial turbulence: Some lessons regarding deposit insurance. *Financial Market Trends* 94: 55–79.
- 3 European Parliament and Council. (1994) Directive 94/19/EC of the European Parliament and of the Council of 30 May 1994 on deposit-guarantee schemes, <http://europa.eu.int/eur-lex/lex/LexUriServ/LexUriServ.do?uri=CELEX:31994L0019:EN:HTML>.
- 4 Blair, C.E., Carns, F. and Kushmeider, R.M. (2006) Instituting a deposit insurance system: Why? How? *Journal of Banking Regulation* 8: 4–19.
- 5 Financial Stability Forum (FSF). (2001) Guidance for developing effective deposit insurance systems. Basel, http://www.fsforum.org/publications/r_0109b.pdf?noframes=1.
- 6 European Commission. (2006) Communication from the European Commission to the European Parliament and the Council concerning the review of Directive 94/19/EC on deposit guarantee schemes, COM(2006) 729, <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2006:0729:FIN:EN:PDF>.
- 7 Joint Research Centre of the European Commission. (2008) Investigating the efficiency of EU deposit guarantee schemes, http://ec.europa.eu/internal_market/bank/guarantee/index_en.htm.
- 8 The de Larosière Group. (2009) Report of the High Level Group on Financial Supervision in the EU, http://ec.europa.eu/internal_market/finances/docs/de_larosiere_report_en.pdf.
- 9 Bank of England. (2008) Financial Stability Report, 24, <http://www.bankofengland.co.uk/publications/fsr/2008/fsrfull0810.pdf>.
- 10 Bank of England. (2009) Financial Stability Report, 25, <http://www.bankofengland.co.uk/publications/fsr/2009/fsrfull0906.pdf>.
- 11 European Commission. (2008) Proposal for a Directive of the European Parliament and of the Council amending Directive 94/19/EC on Deposit Guarantee Schemes with regard to the coverage level and the payout delay, COM (2008), http://ec.europa.eu/internal_market/bank/docs/guarantee/dgs_proposal_en.pdf.
- 12 European Parliament and Council. (2009) Amending Directive 94/19/EC on deposit-guarantee schemes with regard to the coverage level and the payout delay, <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:068:0003:0007:EN:PDF>.
- 13 Coinsurance gives Member States the opportunity to deduct a certain percentage (usually 10 per cent) from the amount to be reimbursed.
- 14 Garcia, G.G.H. (1999) Deposit Insurance: A Survey of Actual Best Practices. IMF Working Paper, WP/99/54.
- 15 Demirgüç-Kunt, A., Karacaovali, B. and Laeven, L. (2005) Deposit Insurance Around the World: A Comprehensive Database. World Bank Policy Research Working Paper, 3628.
- 16 For example see the work of Demirgüç-Kunt, A. and Kane, E.J. (2002) Deposit insurance around the globe: Where does it work? *The Journal of Economic Perspectives* 16(2): 175–195, and the work of Laeven, L. (2000). International evidence on the value of deposit insurance. *The Quarterly Review of Economics and Finance* 42: 721–732.
- 17 Demirgüç-Kunt, A. and Detragiache, E. (2002) Does deposit insurance increase banking system stability? An empirical investigation. *Journal of Monetary Economics* 49(7): 1373–1406.
- 18 Diamond, D.W. and Dybvig, P.H. (2000) Bank runs, deposits insurance, and liquidity. *Federal Reserve Bank of Minneapolis Quarterly Review* 24(1): 14–23.

- 19 Folkerts-Landau, D. and Lindgren, C.J. (1998) Toward a framework for financial stability. World Economic and Financial Surveys, International Monetary Fund, <http://www.imf.org/external/pubs/ft/wefs/toward/index.htm>.
- 20 Gropp, R. and Vesala, J. (2004) Deposit Insurance, Moral Hazard and Market Monitoring. European Central Bank Working Paper Series, 302.
- 21 Schich, S. (2008) Financial crisis: Deposit insurance and related financial safety net aspects. *Financial Market Trends* 2: 76–121.
- 22 Lee, W.S. and Kwok, C.C.Y. (2000) Domestic and international practice of deposit insurance: A survey. *Journal of Multinational Financial Management* 10: 29–62.
- 23 See also Kaufman, G.G. (2006) Using efficient bank insolvency resolution to solve the deposit insurance problem. *Journal of Banking Regulation* 8(1): 40–50, and Pennacchi, G. (2006). Deposit insurance, bank regulation, and financial system risks. *Journal of Monetary Economics* 53: 1–30.
- 24 These surveys do not report any quantitative data about the financial resources of the German DPSs.
- 25 Cariboni, J., Vanden Branden, K., Campolongo, F. and De Cesare, M. (2008) Deposit protection in the EU: State of play and future prospects. *Journal of Banking Regulation* 9(2): 82–101.
- 26 Joint Research Centre of the European Commission. (2007) Estimating the effects of changing the funding mechanisms of EU Deposit Guarantee Schemes, http://ec.europa.eu/internal_market/bank/guarantee/index_en.htm.
- 27 There are five DPSs in Austria, four in Germany, three in Spain and two in Italy, Cyprus and Portugal.
- 28 As hybrid schemes have an *ex ante* component, for the purpose of this article, they are grouped with *ex ante* schemes.
- 29 International Association of Deposit Insurers. (2009) Funding of deposit insurance systems guidance paper, http://www.iadi.org/docs/Funding%20Final%20Guidance%20Paper%206_May_2009.pdf.
- 30 For instance, DPS in Slovakia, whose fund is negative because of a loan contracted in 2001, is still collecting money to repay the debt.
- 31 Sironi, A. and Zazzara, C. (2004) Applying credit risk models to deposit insurance pricing: Empirical evidence from the Italian banking system. *Journal of International Banking Regulation* 6(1): 10–32.
- 32 De Lisa, R., Zedda, S., Vallascas, F., Campolongo, F. and Marchesi, M. (forthcoming) Modelling deposit insurance schemes' losses in a Basel 2 framework. *Journal of Financial Services Research*. Work in progress.
- 33 Where more than one DPS is in operation in a country, DPS funds are aggregated.
- 34 Virtual funds are estimated by applying the rules set out in the DPS' statutes.
  - For the two Italian DPSs, members have a commitment to make available to the Fund an amount of resources variable between 0.4 and 0.8 per cent of the total reimbursable funds as of the end of June of each year.
- In the Netherlands, there is an annual limit on contributions of 5 per cent of the member's own funds.
- For Austria, there is an annual maximum contribution of 0.93 per cent of the assessment basis for the solvency ratio. The assessment basis is defined using the weighted asset items, the off-balance sheet transactions and the special off-balance sheet financial transactions form.
- In Slovenia, all members have to invest a minimum of 2.5 per cent of guaranteed deposits in the financial instruments such as debt securities.
- Until 1 April 2008, the maximum amount that could be raised by the UK scheme with respect to protected deposits was 0.3 per cent. On 1 April 2008 new funding rules were adopted by the scheme, which are available on <http://www.fscs.org.uk/>. Given these rules, the maximum amount can be estimated only for Italy, Slovenia and the United Kingdom.
- 35 In Lithuania and Latvia, extraordinary contributions are not provided for; in France and Ireland, they are provided for but cannot be estimated; in Finland, there was a ceiling on the total amount of contributions (repealed in 2008), which could not be estimated; finally, in Poland, there is a maximum limit on contributions, which cannot be estimated.
- 36 See, for example, Financial Services Compensation Scheme. (2009) Annual Report and Accounts: 2008/09, <http://www.fscs.org.uk/Download.ashx?id=11402>.
- 37 Financial Services Authority (FSA). (2009) Consumer awareness of the financial services compensation scheme, <http://www.fsa.gov.uk/pubs/consumer-research/crpr75.pdf>.
- 38 International Association of Deposit Insurers. (2009) Public awareness of deposit insurance systems guidance paper, http://www.iadi.org/docs/Public%20Awareness%20Final%20Guidance%20Paper%206_May_2009.pdf.
- 39 Financial Services Authority. (2009) Consumer awareness of the FSA and financial regulation. Fieldwork conducted by TNS, <http://www.fsa.gov.uk/pubs/consumer-research/crpr80.pdf>.
- 40 This figure is based on a survey among people living in Great Britain aged 16 and over. The survey, carried out during February 2009, covered a sample of 1997 adults representative of the British population in terms of known population data on age, sex, social class and region.
- 41 All the payouts fall under the 3-month rule of Directive 94/19/EC, since the Amending Directive was adopted in 2009 and data refer to interventions that occurred earlier.
- 42 Ernst & Young LLP. (2008) Fast Payout Study – Final Report, http://www.fsa.gov.uk/pubs/other/fast_payout_report.pdf.

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