Problems and Opinions

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The impact of deposit guarantee schemes on bank stability – the experience of periods of systemic instability

Abstract

Deposit insurance is a key component of the financial safety net that stabilizes the banking system. The March 2023 episode of systemic instability in the US triggered a crisis of confidence as to whether the existing deposit guarantee frameworks adequately protects banks' resilience to panics and shocks. The article analyses and tests some of the assumptions of the ongoing debate on reforming the EU Crisis Management and Deposit Insurance (CMDI) framework. The main conclusions from the literature review and the empirical study are that fundamental features such as adequate capitalization and profitability of banks are crucial to maintain stability, while some of the proposals for the new CMDI framework are legitimate and will enhance the stability of the EU banking system. The empirical part of the paper confirms the main conclusions of the CMDI debate that bank runs and panics depend not only

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on the extent and level of deposit guarantee under national guarantee schemes, and that the volume of unguaranteed deposits in EU countries does not pose a major threat to banking sector stability as an isolated factor.

Keywords: DGS, CMDI directive, financial stability, systemic crisis 2023, unguaranteed deposits

JEL Codes: G21, G28, G32, K23

Wpływ systemów gwarancji depozytów na stabilność banków – doświadczenia okresów niestabilności systemowej

Streszczenie

Gwarantowanie depozytów jest kluczowym elementem sieci bezpieczeństwa finansowego, która stabilizuje system bankowy. Epizod niestabilności systemowej w USA w marcu 2023 r. wywołał kryzys zaufania, czy istniejące ramy gwarantowania depozytów odpowiednio chronią odporność banków na panikę i wstrząsy. Artykuł analizuje i testuje niektóre założenia toczącej się obecnie debaty na temat reformy unijnego pakietu zarządzania kryzysowego i gwarantowania depozytów (CMDI). Podstawowe wnioski płynące z przeglądu literatury i z badania empirycznego stanowią, że cechy fundamentalne, takie jak właściwa kapitalizacja i rentowność banków mają kluczowe znaczenie dla utrzymania stabilności, natomiast niektóre propozycje nowej dyrektywy CMDI są zasadne i zwiększą stabilność unijnego systemu bankowego. Przeprowadzone badanie empiryczne potwierdza główne wnioski z debaty, że runy i paniki bankowe zależą nie tylko od zakresu i poziomu gwarantowania depozytów w ramach krajowych systemów gwarancyjnych, oraz że wolumen niegwarantowanych depozytów hurtowych w krajach UE nie stanowi głównego zagrożenia dla stabilności sektora bankowego, jako czynnik izolowany.

Słowa kluczowe: systemy gwarantowania depozytów, dyrektywa CMDI, stabilność finansowa, kryzys systemowy 2023 roku, niegwarantowane depozyty

Kody JEL: G21, G28, G32, K23

1. Introduction – research problems and objectives

Deposit insurance is a part of the banking safety net and a key component of the financial market infrastructure. Deposit Guarantee Schemes (DGS) contribute to maintain confidence in the banking system and to reduce systemic risk. However, deposit guarantee can create moral hazard on the part of both depositors and banks. Therefore, the design of DGS must consider both the benefits to financial stability and the negative consequences for risk-taking in the banking system. Hence, most DGS strive for a defined balance point between risk and stability (Beck et al. 2024). The systemic instability episode of the US West Coast banks in March 2023 showed that not only systemically important banks, but also mid-sized regional banks can be subject to a run that results in the need for public intervention. This experience called for a reflection on the need to reform deposit guarantee schemes and develop

a modified crisis management framework in both the US and the EU (Acharya et al. 2023). Bank failures in March-May 2023 in the US: Silicon Valley Bank (SVB), Signature Bank (SBNY) and First Republic Bank (FRB) have also highlighted the structural risks posed by wholesale deposit funding of banking assets (in excess of guaranteed level) and the role of social media in the spread of panic (Restoy 2023). Although the European banking system has proven resilient to the shocks of the pandemic and events in the US in 2023, the European Commission has embarked on a review of the existing crisis management and deposit insurance framework in the EU, preparing a proposal for a new CMDI (Crisis Management and Deposit Insurance) directive, focusing on enhancing stability for medium and small banks (Enria 2023).

The purpose of the article is to analyze some of the issues discussed in the ongoing debate on changes to deposit guarantee schemes in the new CMDI directive. The article characterizes the DGS in the EU, with a particular focus on the level of guaranteed deposits. In the empirical part it examines the role of selected DGS features for safeguarding stability of the banking sector. Specifically, two hypotheses were tested: (1) whether the events of 2023 affected the risk aversion of debt funding providers in the EU, and (2) whether the variation in the capital endowment of DGS institutions and the share of guaranteed deposits affected the stability of the banking sectors of EU countries, based on a panel data model. The article concludes with a presentation of key findings.

2. Characteristics of deposit guarantee schemes in the EU in the context of the level of guaranteed deposits

Deposit guarantee schemes typically perform three main functions: protect depositors, reduce the possibility of systemic bank failure and minimize the cost to taxpayers during a bank failure (CEPR 2019). DGS in the EU countries vary significantly in terms of their funding model, capital endowment relative to guaranteed deposits and the target level of this ratio, as well as the availability of additional forms of funding in the form of lines of credit from the central bank or the government (Tables 1 and 2). Significant variation is also observed in the share of guaranteed deposits in the total deposits in each banking sector.

Table 1. Selected characteristics of DGS in the EU countries at the end of 2023

Country	Short form	The target level for DGS funds (% of covered deposits)	Model	Credit line (or similar) from the central bank	Credit line (or similar) from the government
Austria	AT	0.80	Ex post	No	No
Belgium	BE	1.80	Ex ante	No	Yes
Bulgaria	BG	1.00	Ex ante	No	No
Cyprus	CY	0.80	Ex ante	No	No
Czechia	CZ	0.80	Ex ante	No	No
Germany	DE	0.80	Ex ante	No	No
Denmark	DK	0.80	Ex ante	No	No
Estonia	EE	1.66	Ex ante	No	No
Spain	ES	0.80	Ex ante	No	No
Finland	FI	0.80	Ex ante	No	No
France	FR	0.50	Ex ante	No	No
Greece	GR	0.80	Ex ante	No	No
Croatia	HR	2.50	Ex ante	No	No
Hungary	HU	0.80	Ex ante	Yes	No
Ireland	IE	0.80	Other	Yes	Yes
Italy	IT	0.80	Ex post	No	No
Lithuania	LT	0.80	Ex ante	No	No
Luxembourg	LU	1.60	Ex post	No	No
Latvia	LV	0.80	Ex ante	No	Yes
Malta	MT	1.30	Ex ante	No	No
Netherlands	NL	0.80	Ex post	No	No
Poland	PL	1.60	Other	Yes	Yes
Portugal	PT	0.80	Ex ante	No	No
Romania	RO	2.71	Ex ante	No	Yes
Sweden	SE	0.80	Ex ante	No	Yes
Slovenia	SI	0.80	Ex post	No	Yes
Slovakia	SK	0.80	Ex ante	No	No

Source: own study based on EBA DGS data, https://www.eba.europa.eu/sites/default/files/2024-05/a289903c-11c1-4732-a51f-a49e056585b9/Aggregated%20DGSD%20data%202023.xlsx (accessed 10.03.2025).

Table 2. DGS funds as % of covered deposits in 2015–2023 period (in %)

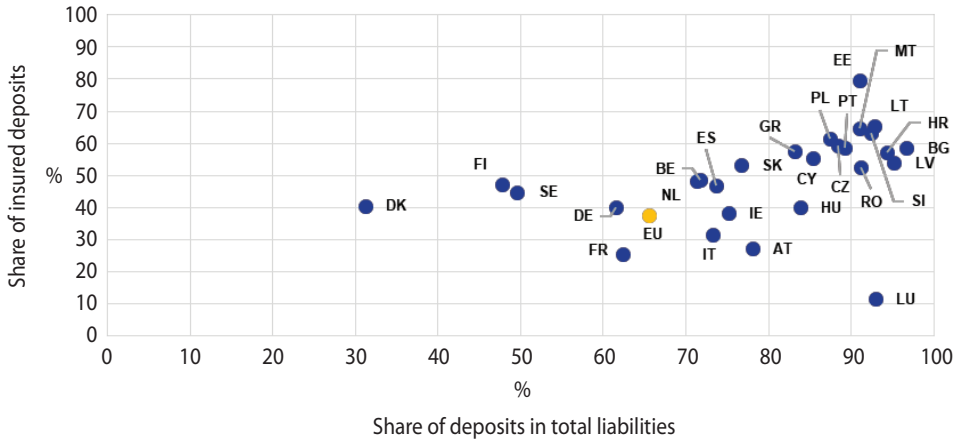
Country	2015	2016	2017	2018	2019	2020	2021	2022	2023	2015–2023
Austria	0.024	0.068	0.117	0.161	0.082	0.104	0.257	0.361	0.468	0.171
Belgium	1.005	1.076	1.168	1.249	1.307	1.356	1.388	1.455	1.597	1.301
Bulgaria	0.786	0.762	0.958	1.180	1.168	1.770	2.029	1.881	1.781	1.454
Cyprus	0.844	0.551	0.390	0.253	0.250	0.293	0.641	0.693	0.756	0.509
Czechia	1.434	1.301	1.336	1.290	1.305	1.206	1.171	0.422	0.397	1.024
Germany	0.240	0.307	0.383	0.456	0.516	0.561	0.557	0.631	0.676	0.500
Denmark	1.278	1.229	1.345	1.273	1.207	1.111	1.113	0.995	1.013	1.163
Estonia	3.196	3.020	2.638	2.365	1.696	1.571	1.451	1.437	1.524	1.847
Spain	0.144	0.218	0.266	0.281	0.407	0.509	0.615	0.747	0.915	0.480
Finland	1.383	1.341	2.100	0.886	0.903	0.875	0.894	0.934	0.991	1.036
France	0.299	0.317	0.328	0.347	0.370	0.387	0.412	0.455	0.506	0.388
Greece	1.367	1.392	1.447	1.429	1.400	1.329	3.134	1.255	1.248	1.574
Croatia	2.527	2.253	2.505	2.879	3.006	2.618	2.443	1.000	1.000	2.163
Hungary	0.226	0.319	0.351	0.201	0.540	0.605	0.587	0.778	1.065	0.547
Ireland	0.000	0.099	0.156	0.298	0.398	0.460	0.552	0.644	0.642	0.396
Italy	0.033	0.093	0.163	0.239	0.243	0.237	0.376	0.452	0.645	0.294
Lithuania	-0.753	0.196	0.422	0.431	0.810	0.806	0.811	1.064	1.047	0.673
Luxembourg	0.000	0.260	0.507	0.763	0.847	0.894	1.057	1.194	1.384	0.810
Latvia	1.347	1.721	1.826	2.143	0.302	1.300	1.615	1.663	2.124	1.579
Malta	1.168	1.186	1.007	0.974	0.931	0.948	0.996	0.825	1.148	1.012
Netherlands	0.000	0.071	0.165	0.227	0.355	0.393	0.559	0.616	0.767	0.372
Poland	1.586	1.650	1.711	1.797	1.792	1.805	1.829	1.766	1.636	1.735
Portugal	1.335	1.299	1.286	1.254	1.215	1.039	0.979	0.941	0.978	1.132
Romania	3.280	3.396	3.169	3.014	2.959	2.714	2.596	2.682	2.542	2.870
Sweden	2.264	2.264	1.758	2.567	2.555	2.422	2.250	1.981	2.082	2.211
Slovenia	0.000	0.094	0.184	0.277	0.365	0.430	0.500	0.585	0.743	0.390
Slovakia	0.673	0.659	0.634	0.606	0.578	0.679	0.718	0.806	0.825	0.693
Total EU	0.470	0.510	0.559	0.600	0.657	0.675	0.770	0.761	0.857	0.665

Source: own study based on EBA data (DGS data), https://www.eba.europa.eu/sites/default/files/2024-05/a289903c-11c1-4732-a51f-a49e056585b9/Aggregated%20DGSD%20data%202023.xlsx (accessed 10.03.2025).

From 2022 to 2023, an upward trend in the average coverage of guaranteed deposits by DGS funds was observed (after a one-time reversal of the trend in 2022). The coverage level increased by almost 0.1 pp. – from 0.761 to 0.857. The highest coverage ratio, exceeding 2% at the end of 2023, was observed in Romania, Latvia and Sweden (ex ante funding model). The lowest rate, below 0.5%, was observed in the Czech Republic (ex ante model) and Austria (ex post model). Both countries also lack direct financial support mechanisms in the form of a credit line from the central bank or government.

Deposits are the main source of funding for European banks, although their importance varies across member states. In 2022, the average share of deposits in total liabilities of banks in the EU was 65% – in some countries, such as Bulgaria, Croatia, Latvia and Slovenia, banks rely almost exclusively on deposit financing with a share of around 90%, while in the Nordic countries (Denmark, Finland, Sweden and Norway) the share of deposits ranged from 32% to 49% of total liabilities, while bond financing accounted for more than 30% of total liabilities (Beck et al. 2024) (Figure 1).

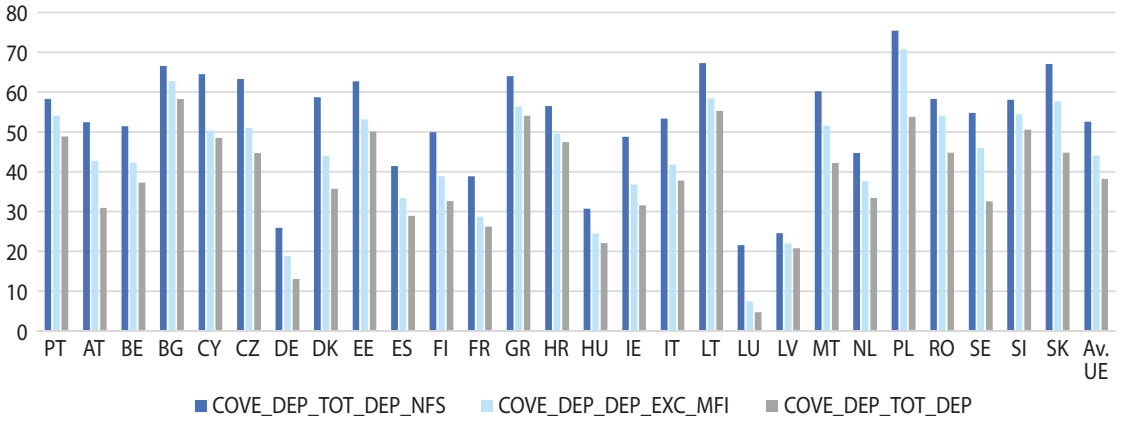
Figure 1. Share of insured deposits and the role of deposits in bank financing in the EU member states, end of 2022 (%)



Source: Beck et al. (2024), p. 11.

As shown in Figure 2, the variation in guaranteed deposits is significant across EU member states, with a spread of more than 50 pp. At the end of 2023, the lowest level of all analyzed indicators was observed in Luxembourg, where DGS-guaranteed deposits accounted for 4.7% of total deposits and 21.54% of non-financial sector deposits, respectively. In contrast, the highest share of guaranteed deposits in household and corporate deposits was observed in Poland, with a value exceeding 75% at the end of 2023 (with a weighted average for the EU of 42.9% and an arithmetic average of 52.9%).

Figure 2. The share of guaranteed deposits in total deposits with/without some subsections, at the end of 2023 (in %)



Note:
COVE_DEP_TOT_DEP – share of guaranteed deposits in total deposits of the financial and non-financial sector
COVE_DEP_DEP_EXC_MFI – share of guaranteed deposits in total dep. excluding monetary financial institutions
COVE_DEP_TOT_DEP_NFS – share of guaranteed deposits in deposits of the non-financial sector.

Source: own study based on EBA data (Deposit Guarantee Schemes data) and ECB Consolidated Banking Data https://www.eba.europa.eu/sites/default/files/2024-05/a289903c-11c1-4732-a51f-a49e056585b9/Aggregated%20DGSD%20data%202023.xlsx; https://data.ecb.europa.eu/data/data-categories/supervisory-and-prudential-statistics/consolidated-banking-data/ (accessed 12.03.2025).

In the eurozone, in 2023 there were 261 banks that could individually deprive domestic DGS funds with a single full payout of guaranteed deposits – hence, for them, the crisis management strategy involves resolution rather than deposit payouts. However, 132 less systemically important institutions also have guaranteed deposits in excess of the DGS target funds, although these systems may benefit from ex-post collection and a possibly of other protection mechanisms (ECB 2023). The same is true for Poland, as illustrated by data for the BFG (Table 3).

Table 3. Selected characteristics of the Bank Guarantee Fund in the context of the implementation of the guarantee function (banks)

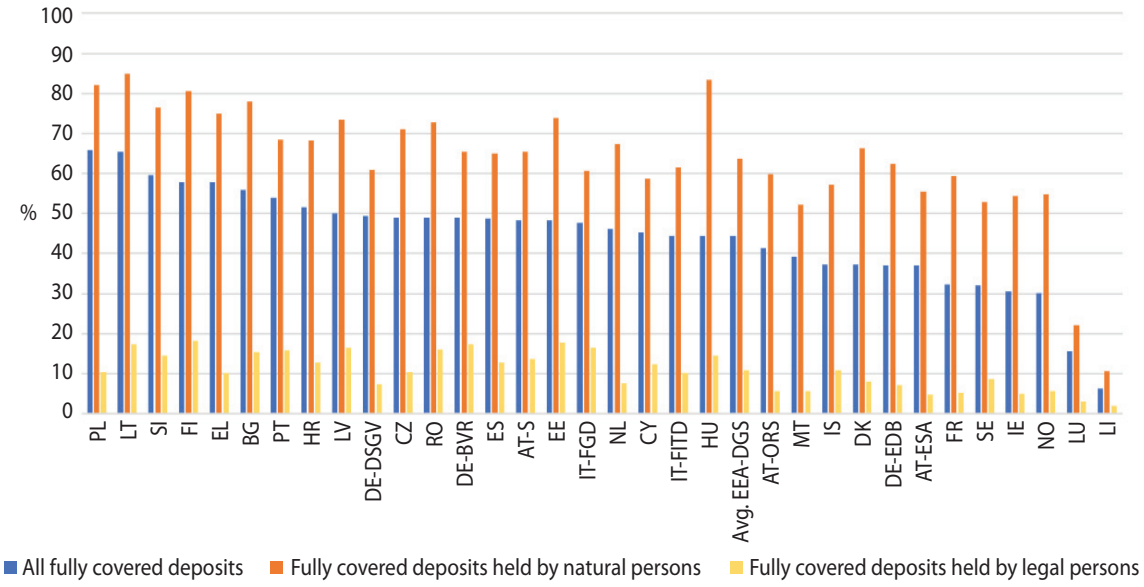
	31.12.23	31.12.22	31.12.21	31.12.20
Covered deposits (PLN '000's)	1 172 161 976	1 068 117 961	1 022 618 756	963 538 120
Covered deposits (€ '000s)	19 172 727	18 868 203	18 706 640	17 391 980
Available financial means (PLN '000's)	270 114 524	228 191 326	222 337 426	214 291 020
Available financial means (€ '000s)	4 418 188	4 030 978	4 067 191	3 867 980

DGS additional data
– current target level for DGS – 1,6%
– alternative financing arrangements in place: credit line from central bank and government.

Source: https://www.eba.europa.eu/activities/single-rulebook/regulatory-activities/depositor-protection/deposit-guarantee-schemes-data

In the global market, non-guaranteed deposits account for 41% of total deposit volume, including more than 50% for G7 and G20 countries (IADI 2023). However, some reports indicate that an increase in the level of guarantees will not contribute significantly to reducing systemic risk. Also, the Japanese experience of previous crises shows that any change in the structure of the guarantee system causes offsetting changes in the structure of the deposit base (Nakaso 2001). One of the most important assessments was formulated by the European Banking Authority (EBA 2023). The report, based on data collected from 28 EEA countries between January 2022 and August 2023, showed that increasing the current level of deposit guarantees would have a limited impact on financial stability and depositor protection, while it would be costly and have a negative impact on moral hazard (EBA 2023). As a result, the EBA sustained its previous opinion that no changes to the DGSD appear necessary (EBA 2019). The report highlighted that in EEA countries, 96% of depositors are fully covered, and a potential increase in the level of coverage would not affect the vast majority of depositors. The remaining 4% of depositors are mainly companies, but they hold more than half of the deposits in the EEA. The average deposit held by individuals ranges from €1,309 to €148,987, with an EU average of €18,693. Poland is among the countries with the lowest average deposit value. The average deposit held by legal entities ranges from €34,208 to €775,926, with the average for deposit guarantee schemes at €152,977 (Poland is below this level). As shown in Figure 3, the share of fully guaranteed deposits ranges from 6.3% in Liechtenstein to 65.8% in Poland. The percentage of fully guaranteed deposits held by individuals ranges from 10.6% to 85%, and for legal entities from 2% to 18.2%, so the risk of a bank run by legal entities is much higher than for individuals.

Figure 3. Fully covered deposits over total covered deposits by DGS and type of depositor (in %)



Source: EBA 2023, p. 14.

According to EBA, the incentive to withdraw funds in a crisis, and thus contribute to a bank run, does not depend only on the coverage level, but also on other factors, including behavioral ones. However, the EBA proposed to amend the DGSD by extending DGS coverage to the public authorities, whose deposits are currently out of the scope of protection. In the event of failure of a credit institution and public authorities losing their funds, there might be an impact on financial stability, particularly given the weak position that ineligible deposits have in the creditor hierarchy.

3. DGS resilience during periods of systemic instability

The experience of the 2007–2009 global financial crisis resulted in a series of regulations to strengthen banks' capital and the functioning of regulatory and supervisory authorities. The EU has also responded by enhancing the legal protection available to depositors, mostly thanks to the introduction of a powerful depositor preference rule throughout the EU (Lenihan 2014). Since the 2008 financial crisis, substantial work has been undertaken in the EU to strengthen the ability to respond to distress in the financial system. Member States are required to raise funds from the banking industry equaling to at least 0.8% of covered deposits. Member States must also ensure that DGSs have adequate alternative funding arrangements in place to enable them to meet any claims against them.

The March 2023 crisis, however, have illustrated a different face of instability affecting bank liquidity and deposit safety – wholesale deposits run. The US authorities decided to take advantage of the FDIC's Systemic Risk Exception (SRE) – a tool introduced in 1991 that allows the Federal Deposit Insurance Corporation (FDIC) to provide emergency assistance to banks when deemed necessary to maintain financial stability. As a result, all SVB and SBNY depositors received full protection. In addition, the Federal Reserve launched an emergency bank lending program, which provided US banks with emergency access to liquidity on favorable terms (FDIC 2023). In the US, the level of deposit protection is one of the highest in the world ($250,000 per depositor at a given bank), covering 99% of bank accounts. However, uninsured large deposits in 2022 accounted for about 45% of the value of the deposit base (FDIC 2023). At SVB, in 2 days 85% of total deposit were withdrawn, forcing the closure of the bank (BIS 2023). The FDIC estimated that the total cost of SVB and SBNY insolvencies by the end of 2023 was $23.6 billion, of which $20.4 billion was the cost of covering non-guaranteed deposits under the SRE (FDIC 2025). The FDIC recovered $20.4 billion by imposing a special fee on depository institutions. The remaining amount represented the second highest annual loss in FDIC history after 2009. However, the FDIC's response, including the use of SREs, helped calming the panic, with no immediate negative side effects. This event has also illustrated that technological changes occurring at an accelerated pace increase the risk of bank runs, through the speed at which information or misinformation is disseminated and the speed at which depositors can withdraw funds. The ease of use of digital banking applications enables depositors to withdraw significant funds in a matter of hours (Reuters 2023).

Bank failures in 2023 triggered a broader crisis of confidence in the resilience of banks, banking systems and financial markets and reopened the debate – both in the U.S. and the EU – on the effectiveness of crisis management frameworks, including the potentially destabilizing role of non-guaranteed deposits, given the risk of increased speed of payouts due to technological advances (Trapanese et al. 2024). Thus the first research question was the potential impact of events in 2023 on the behavior of depositors in EU countries. Analyzing the changes in the value of bank deposit portfolios in 2023, there is no ground for confirming the hypothesis of a significant impact of the 2023 events on the risk aversion exhibited by debt capital providers (Table 4). Reversely, an increase in the average value of banks' deposit liabilities to all groups of borrowers was observed, with the highest growth in deposits in relative terms in the interbank market (17.85%) and the government sector (11.09%), while a markedly lower growth in funds placed by non-monetary financial institutions (5.42%) and the non-financial sector (households 2.27 and non-financial corporations 1.81%).

Table 4. Change in the value of the deposit portfolio (by type of depositor) held in banks at the end of December 2023 compared to December 2022 in the EU countries (in %)

Country	Category of depositors					
	Excluded from DGS protection			Covered by partial/full DGS protection		
	Interbank market	Non-monetary financial institutions	Government	Non-financial sector in total	Non-financial enterprises	Households
AT	8.457	6.702	9.622	0.121	-2.197	1.180
BE	51.522	-6.926	13.365	-0.931	1.375	-1.817
BG	31.773	-14.008	-5.576	9.616	7.173	11.020
CY	-3.105	-8.611	51.678	-0.081	-1.414	0.430
CZ	34.499	30.820	93.335	5.207	5.685	5.014
DE	19.554	4.753	-5.620	3.953	3.722	4.058
DK	15.497	11.397	-19.126	-2.866	-8.385	1.439
EE	33.810	-4.874	9.532	6.827	1.257	11.123
ES	35.589	19.598	6.153	1.280	1.292	1.275
FI	46.143	-6.184	-18.582	-2.555	-6.623	0.308
FR	17.375	7.604	63.973	2.750	3.141	2.482
GR	19.513	-3.091	-9.377	2.239	0.176	3.006
HR	-23.704	-12.899	26.090	4.278	9.410	2.141
HU	4.621	0.131	39.481	13.019	14.448	11.799
IE	-23.644	35.330	18.842	2.148	-1.622	5.817

Table 4 (continued)

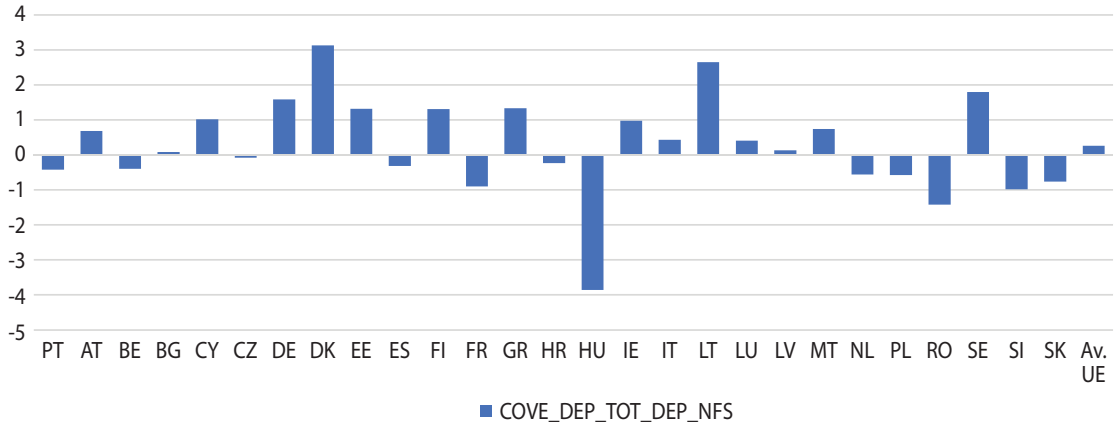
Country	Category of depositors					
	Excluded from DGS protection			Covered by partial/full DGS protection		
	Interbank market	Non-monetary financial institutions	Government	Non-financial sector in total	Non-financial enterprises	Households
IT	20.687	15.581	11.715	-2.841	0.254	-4.369
LT	48.090	14.798	9.564	9.367	3.374	12.041
LU	8.504	-7.794	-5.564	-4.120	-7.255	-1.950
LV	89.648	-4.456	-5.869	1.778	-0.009	2.768
MT	-1.765	-0.294	0.000	3.206	-6.029	5.764
NL	-2.261	-5.754	6.960	2.773	0.463	3.740
PL	21.186	58.635	2.684	19.282	19.769	19.078
PT	16.136	17.254	-16.228	-0.565	-4.906	1.144
RO	-11.199	-2.055	1.946	14.495	19.082	11.478
SE	32.523	-7.972	-2.460	0.554	-4.006	3.909
SI	-1.786	-14.037	-7.735	5.214	10.289	3.511
SK	-26.524	1.936	-13.645	3.874	7.805	2.187
Total UE	17.853	5.416	11.085	2.114	1.812	2.270

Source: own calculations based on ECB Consolidated Banking Data: https://data.ecb.europa.eu/data/data-categories/supervisory-and-prudential-statistics/consolidated-banking-data/ (accessed 12.03.2025).

At the same time, the assessment of changes in the ratio of covered deposits in deposits from households and non-financial corporations indicates that some entities have taken measures to optimize protection. In 2023, the share of the value of covered deposits in most EU countries (16) and in the EU banking sector as a whole increased on average (0.3 p.p.) relative to 2022. A reverse trend of quite strong magnitude was observed for Hungary (-3.9 p.p.) and Romania (-1.4 p.p.).

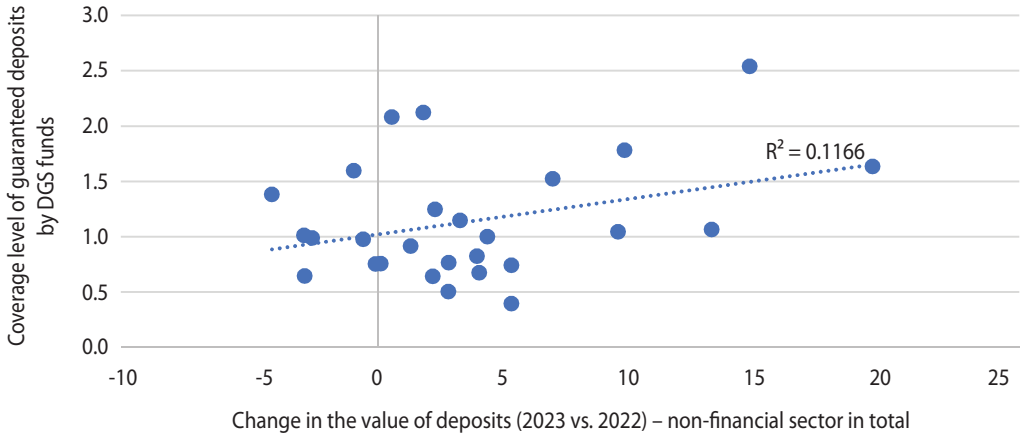
An analysis of the correlation between the annual change (2023 vs. 2022) in deposits made by non-financial sector customers and the level of deposit coverage by DGS funds (Figure 5) and the share of deposits guaranteed in the EU (Figure 6) does not allow, at a high level of confidence, to confirm the hypothesis of a strong effect of DGS capital equipment and the proportion of cover deposits on the propensity of non-financial sector customers to increase deposit exposure under conditions of financial market turmoil.

Figure 4. Change in the value of the ratio of guaranteed deposits to total deposits of non-financial corporations and households in 2023 relative to 2022 in the EU (in %)



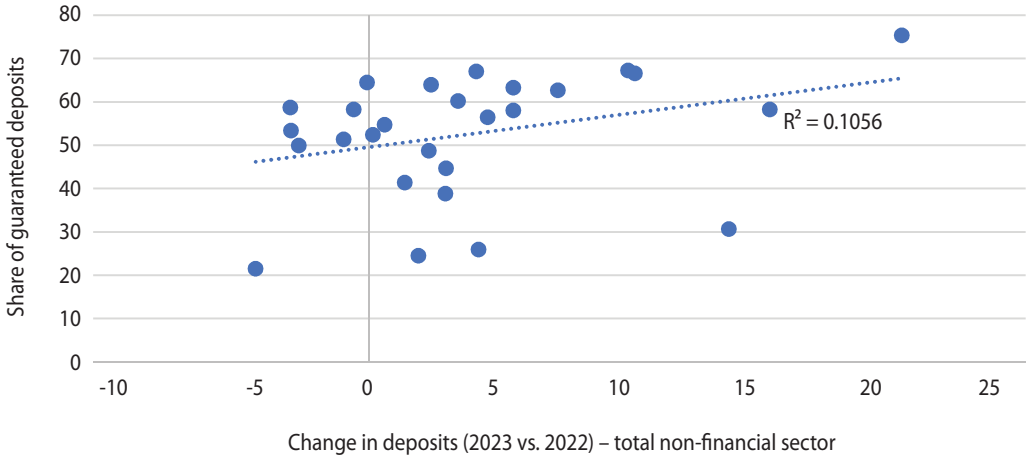
Source: own study based on EBA data (DGS data) and ECB Consolidated Banking Data, https://www.eba.europa.eu/sites/default/files/2024-05/a289903c-11c1-4732-a51f-a49e056585b9/Aggregated%20DGSD%20data%202023.xlsx; https://data.ecb.europa.eu/data/data-categories/supervisory-and-prudential-statistics/consolidated-banking-data/ (accessed 12.03.2025).

Figure 5. Change in the value of deposits (2023 vs. 2022) in the non-financial sector and coverage level of guaranteed deposits by DGS funds in the EU



Source: own study based on EBA data (Deposit Guarantee Schemes data) and ECB Consolidated Banking Data https://www.eba.europa.eu/sites/default/files/2024-05/a289903c-11c1-4732-a51f-a49e056585b9/Aggregated%20DGSD%20data%202023.xlsx; https://data.ecb.europa.eu/data/data-categories/supervisory-and-prudential-statistics/consolidated-banking-data/ (accessed 12.03.2025).

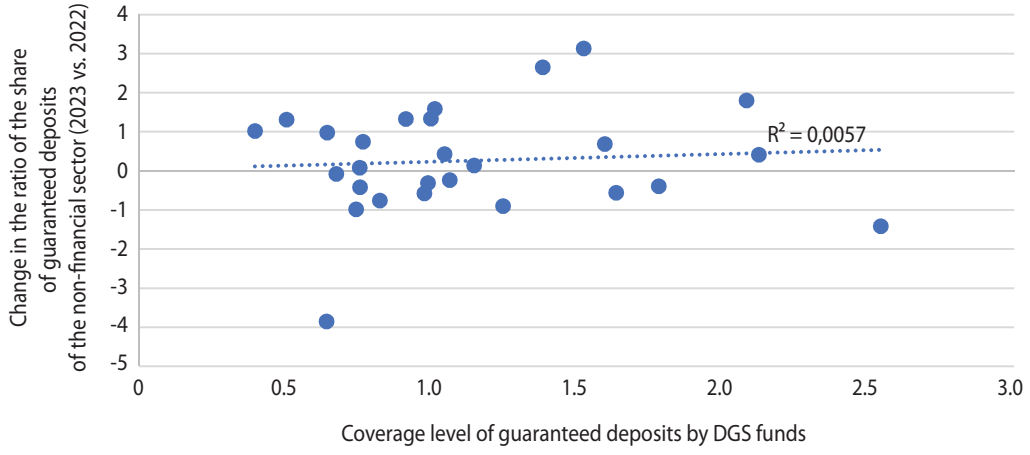
Figure 6. Change in deposits (2023 vs. 2022) in the non-financial sector and share of guaranteed deposits in the EU



Source: Own study based on EBA data (Deposit Guarantee Schemes data) and ECB Consolidated Banking Data https://www.eba.europa.eu/sites/default/files/2024-05/a289903c-11c1-4732-a51f-a49e056585b9/Aggregated%20DGSD%20data%202023.xlsx; https://data.ecb.europa.eu/data/data-categories/supervisory-and-prudential-statistics/consolidated-banking-data/ (accessed 12.03.2025).

There is also no clear sign of a relationship between the level of capital equipment of guarantee schemes and the change in the share of guaranteed deposits of the non-financial sector in 2022–2023 (Figure 7).

Figure 7. Change in the ratio of the share of guaranteed deposits of the non-financial sector (2023 vs. 2022) and coverage level of guaranteed deposits by DGS funds in the EU



Source: own study based on EBA data (Deposit Guarantee Schemes data) and ECB Consolidated Banking Data https://www.eba.europa.eu/sites/default/files/2024-05/a289903c-11c1-4732-a51f-a49e056585b9/Aggregated%20DGSD%20data%202023.xlsx; https://data.ecb.europa.eu/data/data-categories/supervisory-and-prudential-statistics/consolidated-banking-data/ (accessed 12.03.2025).

4. The role of selected DGS parameters in shaping banking sector stability – panel data model

In this section, the research question was whether the variation in the capital endowment of DGS institutions and the share of guaranteed deposits have an impact on the stability of the banking sectors of EU countries. Banking stability was approximated by the follow variables: TCR, T1R, CET1R, CAR and by the Z-Score index. Based on the literature review, a set of control variables was selected and experimental variables related to the deposit guarantee model resulting from the capitalization of DGS, the share of insured deposits and the funding model were used. The characteristics of the variables are presented in Table 5. The data related to banking sector characteristics were obtained from the ECB Consolidated Banking Data database, the variables related to macroeconomic characteristics were obtained from the Eurostat database, while the experimental variables are based on own calculations created using EBA data (DGS database) and the ECB Consolidated Banking Data database. The period of analysis was 2015–2023 and was determined by data availability.

Table 5. Characteristics of the set of variables used in the model

Variable	Definition	Area of analysis
Explained variables		
ZSC	Z-score = ROA+CAR/standard deviation of ROA	Banking sector stability
TCR	Total equity / RWA	
T1R	Tier 1 capital / RWA	
CET1R	Common Equity Tier 1 capital / RWA	
CAR	Total equity / Total assets	
Experimental variables – characteristics of deposit protection parameters		
DGSF_COV_DEP	Available financial means DGS Guarantee Fund / Covered deposits	The level of coverage of guaranteed deposits by the funds accumulated by the DGS as a measure of the DGS's ability to fulfill its guarantee function
COVE_DEP_TOT_DEP	Insured deposits / Total deposits of financial and non-financial institutions in a given country	The share of guaranteed deposits in the total deposit portfolio (various categories of entities)
COVE_DEP_TOT_DEP_NFS	Insured deposits / Total deposits of the non-financial sector (households and non-financial enterprises)	

Table 5 (continued)

Variable	Definition	Area of analysis
DEP_MFI_TA	Deposits from the interbank market / Total assets	The scale of uninsured financing from the wholesale interbank market
EX_ANTE	Binary variable: 1 – if the DGS operates under the Ex ante funding model, 0 otherwise	DGS funding model
EX_POST	Binary variable: 1 – if the DGS operates under the Ex post funding model, 0 otherwise	
Control variables – sectoral characteristics		
LN_ASS	Natural logarithm of total banking sector assets	Banking sector size
LOANS_ASS	Total loans granted / Total assets	Scale of banking credit activity
ROE	Net income / Average equity	Sector profitability
NPL	Share of impaired loans in total loans	Sector asset quality
NET_FEE_COM_INC_ASS	Net fee and commission income relative to total assets	Diversification of banking sector income sources
C_I	Costs / Revenues	Cost efficiency
CUR_DEP_TOT_DEP_NFS	Current deposits / Total deposits of the non-financial sector	Stability of funding sources
HHI	Herfindahl-Hirschman Index	Sector concentration
Control variables – macroeconomic characteristics		
GDP	Change in the country's GDP	Macroeconomic environment – economic growth
INF	HICP index – harmonized measure of inflation in the EU	Macroeconomic environment – inflation
PU_DT_GDP	Public finance sector debt / GDP	Macroeconomic environment – public debt

Source: own study.

Due to the occurrence of extreme events in the analyzed period: COVID-19 (2020) and the US West Coast banks failures (2023), binary variables characterizing these factors were also introduced into the model (COVID, WESTCOAST_BC, respectively). Based on the analysis of the correlation coefficients and their significance (correlation matrix in the appendix), it was decided to alternatively include some experimental variables in the model, creating model 1 (among the correlated

variables EX_ANTE; COVE_DEP_TOT_DEP_NFS were included) and model 2 (among the correlated variables EX_POST; COVE_DEP_TOT_DEP). Based on the nature of the data and their abundance, and considering the statistical tests (Hansen, AR 1, AR 2), it was decided to choose dynamic panel data models (Generalized Method of Moment version of GMM-SYS, Blundell and Bond, 1998) to determine the parameters of the linear regression equation. The use of such models (using instrumental variables) allows a departure from the standard assumption of strict exogeneity of the regressors. It allows the inclusion of lagged values of the dependent variable, which is not feasible for statistical panel models (with fixed effects and individual random effects) (Kozlowski 2016). GMM-based methods are therefore particularly useful for models that include endogenous or predetermined explanatory variables (Dańska-Borsiak 2009). A factor conditioning the use of the GMM-SYS model is the limited study sample (181–191 observations) – the GMM-SYS estimator may give more reliable and accurate results in similar cases (Baltagi 2005). Statistical inference on the significance of the model parameters was carried out based on a 1-step estimation. The final shape of the estimated dynamic regression models is determined by equation 1.

$$\begin{aligned} FIN.STAB.BSEC_{(it)} &= const + a_{(1)}FIN.STAB.BSEC_{i,t-1} + a_2EXP.DGS_{i,t} + \\ &+ a_3CONTR.VAR.SEC_{i,t} + a_4CONTR.VAR.MAC_{i,t} + a_5EXTR.PHEN_{i,t} + V_{it} \end{aligned} \quad (1)$$

where:

FIN.STAB.BSEC – selected variable characterizing the level of financial stability of the banking sector of individual EU countries;

EXP.DGS – vector of experimental variables, characteristics of deposit guarantee schemes and their implications in the context of banks' deposit portfolios in individual EU countries;

CONTR.VAR. SEC – vector of control variables characterizing selected banking market parameters of individual EU countries;

CONTR.VAR.MAC – vector of macroeconomic control variables for EU countries;

EXTR.PHEN – vector of binary variables on the occurrence of extreme events – COVID pandemic or West Coast banking crisis.

The results for model 1 are presented in Table 6 and for model 2 in Table 7.

Table 6. Results of parameter estimation in model 1 for bank stability indicators

Variable	ZSC	TCR	T1R	CET1R	CAR
DEP.VAR(-1)	1.006*** (0.023)	0.702*** (0.055)	0.676*** (0.064)	0.687*** (0.065)	0.893*** (0.043)
CONST	-15.792* (8.331)	9.463*** (3.67)	10.82** (4.342)	12.104*** (4.395)	0.923 (2.121)
DGSF_COV_DEP	0.457 (0.401)	0.223 (0.205)	0.198 (0.216)	0.245 (0.215)	0.124 (0.161)
DEP_MFI_TA	0.080 (0.061)	0.002 (0.025)	0.005 (0.025)	0.007 (0.025)	0.02 (0.026)
EX_ANTE	-0.248 (0.769)	-0.118 (0.304)	0.013 (0.32)	-0.028 (0.308)	-0.249 (0.174)
COVE_DEP_TOT_DEP_NFS	0.005 (0.023)	-0.002 (0.010)	-0.005 (0.010)	-0.007 (0.010)	0.001 (0.005)
LN_ASS	0.773** (0.329)	-0.075 (0.139)	-0.175 (0.164)	-0.250 (0.168)	0.028 (0.063)
LOANS_ASS	-0.027 (0.025)	-0.049** (0.022)	-0.035 (0.024)	-0.034 (0.025)	-0.009 (0.007)
ROE	0.123* (0.067)	0.091*** (0.026)	0.074** (0.033)	0.072** (0.031)	0.043*** (0.015)
NPL	0.053 (0.035)	-0.008 (0.013)	0.002 (0.017)	0.012 (0.018)	-0.018** (0.008)
C_I	-0.036 (0.042)	0.023 (0.021)	0.024 (0.023)	0.02 (0.024)	-0.009 (0.01)
NET_FEE_COM_INC_ASS	2.738 ** (1.388)	1.425** (0.703)	1.492* (0.843)	-1.229 (0.777)	0.657* (0.366)
CUR_DEP_TOT_DEP_NFS	-0.019 (0.016)	0.01 (0.008)	0.011 (0.009)	0.01 (0.01)	-0.006 (0.005)
HHI	11.331 *** (4.237)	3.545* (1.866)	2.021 (1.697)	0.465 (1.74)	0.81 (1.282)
GDP	0.118* (0.067)	0.065*** (0.025)	0.063*** (0.022)	0.069*** (0.022)	0.007 (0.012)
INF	-0.017 (0.051)	-0.084*** (0.023)	-0.076*** (0.025)	-0.073*** (0.025)	-0.014 (0.017)
PU_DT_GDP	-0.002 (0.010)	-0.007* (0.003)	-0.009* (0.005)	-0.01** (0.005)	-0.001 (0.002)

Table 6 (continued)

Variable	ZSC	TCR	T1R	CET1R	CAR
WESTCOAST_BC	3.240*** (0.701)	0.859*** (0.241)	0.83*** (0.24)	0.818*** (0.243)	0.451*** (0.123)
COVID	-1.07 (0.948)	1.817*** (0.269)	1.671*** (0.267)	1.745*** (0.271)	-0.169 (0.168)
No. of observations	188	188	188	188	188
No. of instr.	53	53	53	53	53
AR 1 Test	-3.31892 [0.0009]	-2.36703 [0.0179]	-2.09636 [0.0361]	-2.09672 [0.0360]	-2.69569 [0.0070]
AR 2 Test	-0.648828 [0.5164]	1.51078 [0.1308]	1.44658 [0.1480]	1.32813 [0.1841]	-0.867661 [0.3856]
Hansen Test	6.5302 [1.0000]	8.63321 [1.0000]	10.3567 [1.0000]	10.8012 [0.9999]	6.41815 [1.0000]

Notes: AR (1) – 1st order autocorrelation test. AR (2) – 2nd order autocorrelation test. Robust standard errors in parentheses and p-values in brackets. Time effects are included but not reported. System GMM (1 lag used as instrument).

Source: own study.

Table 7. Results of parameter estimation in model 2 for bank stability indicators

Variable	ZSC	TCR	T1R	CET1R	CAR
DEP.VAR(-1)	0.999*** (0.027)	0.688*** (0.053)	0.648*** (0.068)	0.642*** (0.067)	0.908*** (0.041)
CONST	-14.201* (7.478)	9.97*** (3.475)	11.629*** (4.021)	13.455*** (4.225)	0.167 (1.87)
DGSF_COV_DEP	0.392 (0.416)	0.255 (0.194)	0.247 (0.21)	0.305 (0.218)	0.089 (0.164)
DEP_MFI_TA	0.072 (0.045)	0.002 (0.026)	0.005 (0.026)	0.007 (0.027)	0.022 (0.026)
EX_POST	0.490 (0.630)	0.195 (0.292)	0.031 (0.297)	0.014 (0.291)	0.127 (0.142)
COVE_DEP_TOT_DEP	-0.002 (0.031)	-0.001 (0.012)	-0.007 (0.012)	-0.011 (0.011)	0.001 (0.006)
LN_ASS	0.789*** (0.301)	-0.098 (0.14)	-0.22 (0.155)	-0.323 (0.36)	0.066 (0.057)

Table 7 (continued)

Variable	ZSC	TCR	T1R	CET1R	CAR
LOANS_ASS	-0.041 (0.027)	-0.048** (0.019)	-0.029 (0.021)	-0.024 (0.022)	-0.014* (0.008)
ROE	0.136** (0.068)	0.087*** (0.027)	0.074** (0.033)	0.07** (0.031)	0.041*** (0.014)
NPL	0.059 (0.041)	-0.009 (0.014)	-0.001 (0.018)	0.01 (0.021)	-0.021** (0.009)
C_I	-0.041 (0.040)	0.026 (0.021)	0.028 (0.024)	0.023 (0.024)	-0.009 (0.01)
NET_FEE_COM_INC_ASS	2.299* (1.397)	1.526** (0.671)	1.621* (0.833)	1.342* (0.796)	0.704** (0.356)
CUR_DEP_TOT_DEP_NFS	-0.015 (0.021	0.009 (0.008)	0.009 (0.01)	0.01 (0.011)	-0.004 (0.005)
HHI	10.968** (4.345)	3.338 (2.117)	1.94 (1.885)	0.157 (2.001)	0.949 (1.225)
GDP	0.127* (0.066)	0.065*** (0.025)	0.062*** (0.022)	0.073*** (0.021)	0.010 (0.013)
INF	-0.022 (0.053)	-0.079*** (0.025)	-0.069** (0.028)	-0.064** (0.027)	-0.013 (0.017)
PU_DT_GDP	-0.005 (0.010)	-0.007* (0.004)	-0.009* (0.005)	-0.009** (0.004)	-0.003 (0.002)
WESTCOAST_BC	3.140*** (0.649)	0.916*** (0.237)	0.876*** (0.228)	0.885*** (0.233)	0.476*** (0.131)
COVID	-0.808 (0.902)	1.743*** (0.276)	1.629*** (0.273)	1.765*** (0.266)	-0.112 (0.167)
No. of observations	191	191	191	191	191
No. of instr.	53	53	53	53	53
AR 1 Test	-3.39377 [0.0007]	-2.45529 [0.0141]	-2.13776 [0.0325]	-2.12426 [0.0336]	-2.77311 [0.0056]
AR 2 Test	-0.303465 [0.7615]	1.60862 [0.1077]	1.50848 [0.1314]	1.37723 [0.1684]	-0.756817 [0.4492]
Hansen Test	4.48252 [1.0000]	7.93105 [1.0000]	11.8531 [0.9998]	11.6775 [0.9999]	4.76238 [1.0000]

Notes: AR (1) – 1st order autocorrelation test. AR (2) – 2nd order autocorrelation test. Robust standard errors in parentheses and p-values in brackets. Time effects are included but not reported. System GMM (1 lag used as instrument).

Source: own study.

The estimated models allow to formulate the following conclusions:

- No grounds were found to confirm the hypothesis of a direct impact of the capitalization level and the funding model of DGS on the level of financial stability of the banking sectors in the EU. The values of the directional coefficients of the regression equations for the variables DGSF_COV_DEP, EX_ANTE and EX_POST do not show statistical significance even at the significance level of 10%.
- There is also no evidence to directly support the hypothesis that the share of guaranteed deposits in total deposits raised by banks and in deposits of the non-financial sector affects the level of financial stability of the banking sectors. For both the COVE_DEP_TOT_DEP_NFS and COVE_DEP_TOT_DEP variables, the directional coefficients are statistically insignificant for all the measures of financial stability of banking sectors used in the study.
- The scale of dependence of bank funding on the interbank market (variable DEP_MFI_TA) did not have a statistically significant impact on the level of financial stability, regardless of the type of measure used.

The results obtained from the estimated models illustrate that the significant determinants of banking sector stability in the EU countries over the period 2015–2023 were:

- the level of stability in the previous year (lagged explanatory variable);
- bank-based or macroeconomic variables such as ROE, NET_FEE_COM_INC_ASS, GDP, INF, PU_DT_GDP in all or most models;
- NPL, HHI, LN_ASS, LOANS_ASS for some measures of financial stability.

Another important finding is the positive correlation of experimental variables denoting the occurrence systemic event (the West Coast banking crisis – WEST-COAST_BC) – significant for all measures of stability and the COVID-19 variable, significant for all measures of capital adequacy, with the level of financial stability. In this context, it should be pointed out that for the EU banking sectors, the extreme events occurring in recent years have provided room for growth in the capital base and reduction in risk exposures. Given the above, the conclusions of the analyses are not surprising, indicating high confidence level of both the financial and non-financial sectors in their readiness to increase the value of funds entrusted to the banking sectors in 2023, despite the systemic problem in the US.

5. Conclusions and summary of key findings

The reports and research papers analyzed in the article highlighted that the EU crisis management and deposit insurance framework put in place after the 2008 crisis has proven effective and has brought benefits in the form of improved crisis management, increased market discipline, more resilient banks and improved depositor protection. However, there are still significant gaps that need to be modified in the planned CMDI directive. The European Commission's 2023 proposal

did not change the target level of available funds to be held by deposit guarantee schemes (0.8% of guaranteed deposits) or resolution funding mechanisms (1% of guaranteed deposits). However, more flexible conditions were proposed for the precautionary use of funds from DGS (Clifford Chance 2023).

The empirical analysis, including the conducted panel studies for EU countries, did not confirm the hypothesis that the level of capitalization and the funding model of deposit guarantee schemes have a direct impact on the level of stability of the banking sectors of EU countries. The hypothesis that the share of guaranteed deposits in total deposits directly affects the level of stability of banking sectors was also not confirmed. Similarly, the scale of the dependence of the financing of the activities of the banking sectors on the interbank market did not turn out to have a statistically significant effect on the level of stability. These findings support some of the conclusions and recommendations for CMDI reforms made by stakeholders, particularly in the EBA report (2023).

Another important finding of the empirical analysis is the positive association of variables describing the occurrence of extreme financial and social events – i.e., the West Coast banking crisis and the aftermath of the COVID-19 pandemic – with the level of financial stability. For the European Union's banking sectors, the extreme events occurring in recent years have been a stimulus to increase the capital base and reduce risk exposures. The analysis of deposit portfolio changes also indicated a high conviction in both the financial and non-financial sectors that they are ready to increase the value of funds entrusted to the banking sector in 2023. Thus, both the theoretical analysis and the empirical model used confirm the main conclusions of the debate on the new CMDI directive, also contained in the EBA's 2023 report, that bank runs and panics depend on many factors, not only on the scope and scale of deposit guarantees in DGS schemes, and that unguaranteed corporate deposits do not pose a serious threat to the stability of the banking sector as an isolated factor.

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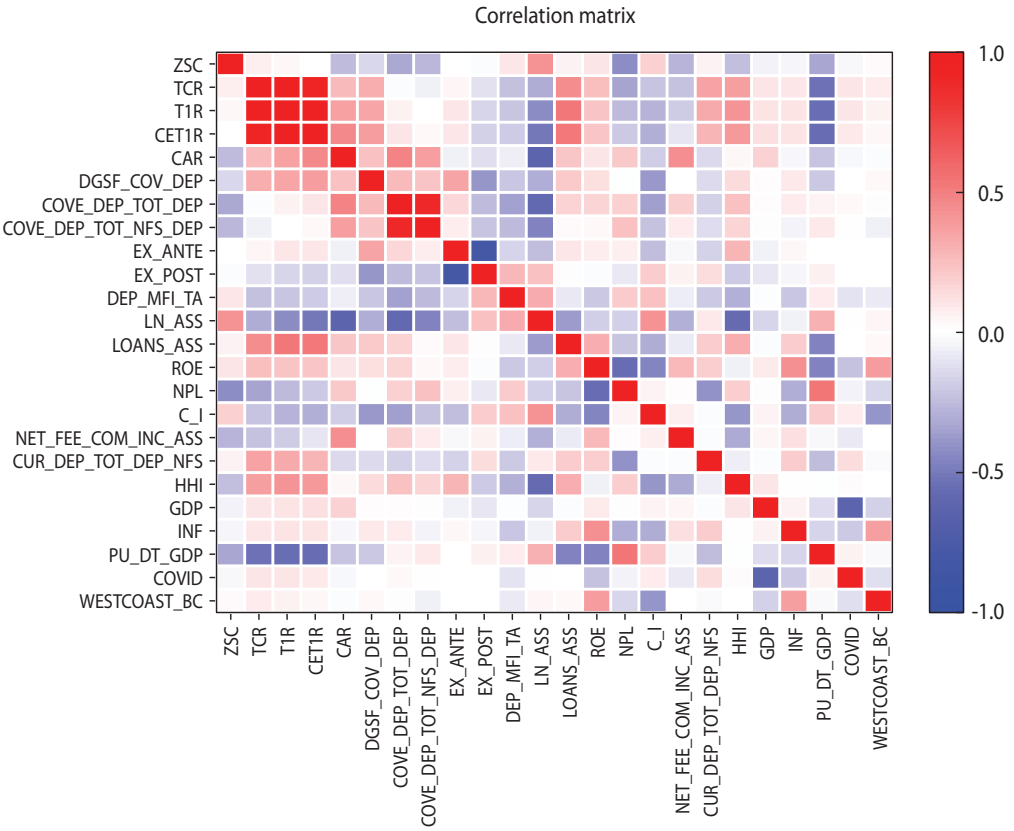
Appendix 1. Correlation matrix



Appendix 2. Main descriptive statistics of the variables used in the construction of the model

Variable	Mean	Median	St. Dev.	Min	Max
ZSC	38.3	36.5	22.5	3.73	96.9
TCR	20.4	19.8	3.27	12.3	35.4
T1R	18.6	18.2	3.42	11.5	34.9
CET1R	17.9	17.4	3.49	10.9	34.8
CAR	8.74	8.23	2.38	5.25	15.1
DGSF_COV_DEP	1.06	0.931	0.784	-0.753	3.40
COVE_DEP_TOT_DEP	37.7	36.5	13.1	4.55	62.7
COVE_DEP_TOT_NFS_DEP	55.2	58.2	13.8	21.1	88.6
EX_ANTE	0.741	1.00	0.439	0.000	1.00
EX_POST	0.185	0.000	0.389	0.000	1.00
DEP_MFI_TA	4.55	3.29	3.92	0.000	24.0
LN_ASS	19.7	19.8	1.70	16.9	23.0
LOANS_ASS	75.6	75.3	8.06	54.1	96.5
ROE	7.55	8.14	5.62	-24.2	21.8
NPL	5.42	2.99	7.59	0.565	46.8
C_I	55.6	55.4	8.90	32.8	83.9
NET_FEE_COM_INC_ASS	0.702	0.680	0.267	0.283	1.70
CUR_DEP_TOT_DEP_NFS	70.6	72.4	14.2	25.8	95.6
HHI	0.137	0.113	0.0752	0.00950	0.356
GDP	2.66	2.60	3.97	-11.2	24.5
INF	2.95	1.70	3.85	-1.50	19.4
PU_DT_GDP	68.7	61.9	38.8	8.20	207.
COVID	0.111	0.000	0.315	0.000	1.00
WESTCOAST_BC	0.111	0.000	0.315	0.000	1.00