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What Drives the Systemic-Importance Scores of Large EU Banks? Scale, Market Activity and the Banking Union

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Research Article

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Abstract

The Basel G-SIB framework ranks banks by a weighted score built from thirteen indicators, and the resulting bucket sets a capital surcharge. Using the European Banking Authority's public end-2024 disclosure for the 32 EU banks with leverage exposures above EUR 200 billion, together with the Basel Committee's global denominators, we replicate the official scores and match the FSB's 2025 bucket allocation for all seven EU G-SIBs once the Banking Union adjustment (ASTRA) is applied. We then ask what drives the scores. Three results stand out. First, cross-jurisdictional activity and complexity account for 31% and 27% of the cross-sectional variance in scores, against 14% for size. Second, the score is close to proportional to size, which alone explains 83% of the variation in log scores; a single scale-free dimension of market-activity intensity raises the explained share to 98%. Third, the Banking Union adjustment lowers scores by a median of 5.7% across euro-area banks but by 24% for ING and 16% for UniCredit, and it is decisive for BNP Paribas's bucket. New monthly memorandum data show no year-end effect on total scores, but intra-financial-system and cross-jurisdictional liabilities are reported significantly below their in-year averages. Rankings are highly robust to the choice of weights, whereas identification near the 130-basis-point threshold is not. A 2013–2024 panel shows very stable relative positions. The findings inform the debate on score design, the treatment of the Banking Union and the averaging of indicators.

JEL classification: G21, G28, E58

1. Introduction

Since 2011, the largest banks in the world have been subject to a capital surcharge that rises with their systemic importance. The Basel Committee on Banking Supervision (BCBS) measures systemic importance with an indicator-based score: thirteen indicators grouped into five equally weighted categories (size, interconnectedness, substitutability, complexity and cross-jurisdictional activity) are scaled by global sample totals and combined into a single number in basis points (BCBS, 2013, 2018). Banks scoring above 130 basis points are designated global systemically important banks (G-SIBs) and are allocated to buckets that carry higher loss-absorbency requirements of 1.0% to 3.5% of risk-weighted assets. In the European Union the same methodology is embedded in the Capital Requirements Directive, and the European Banking Authority (EBA) publishes the underlying indicators every year for all EU institutions whose leverage-ratio exposure exceeds EUR 200 billion.

Because the score drives a binding capital requirement, its construction matters. A score that mostly reflects balance-sheet size would add little to simpler measures and would encourage banks to manage the indicators rather than the risks behind them (Benoit et al., 2019; Passmore and von Hafften, 2019). A score measured at a single date invites year-end window dressing (Behn et al., 2019; Garcia et al., 2021; Pliszka and Schlam, 2025), which led the BCBS to consult on averaging in 2024 (BCBS, 2024). And in Europe a specific design question has been debated for a decade: whether exposures within the Banking Union should count as cross-border. In 2022 the BCBS agreed that a parallel score recognising 66% of the reduction from treating intra-Banking-Union exposures as domestic may be used to lower the buckets of euro-area G-SIBs (BCBS, 2022; ECB, 2022).

Despite the availability of granular public data, empirical evidence on what actually determines the scores of European banks is thin. The official scores of individual banks are published only for designated G-SIBs, the denominators are published separately, and most of the literature has focused on market reactions to designation (Moenninghoff et al., 2015; Bongini et al., 2015), on lending effects of surcharges (Favara et al., 2021) or on market-based systemic-risk measures (Acharya et al., 2017; Adrian and Brunnermeier, 2016; Brownlees and Engle, 2017). This paper fills the gap for the EU by asking three questions:

RQ1. Which categories and indicators account for the differences in systemic-importance scores across large EU banks, and how much of these differences is explained by scale rather than by business-model mix?

RQ2. How much do the Banking Union adjustment and its calibration change the scores and buckets of EU banks?

RQ3. How robust are the scores and rankings to the choice of weights and to point-in-time measurement, and how stable have relative positions been over 2013–2024?

To answer them we rebuild the full BCBS score for the 32 banks in the EBA's end-2024 sample from the published indicators and the BCBS denominators. The replication is validated against the official FSB lists: with end-2024 data it reproduces the bucket of all seven EU G-SIBs once the Banking Union adjustment is applied, and with end-2023 data it reproduces six of seven buckets. We then decompose the scores, relate them to scale and to a principal-component measure of business-model mix, compute the Banking Union parallel score for every euro-area bank in the sample, compare year-end indicators with the averages of month-end values that the EBA disclosure now contains, and assess robustness with alternative and randomised weights and with a twelve-year panel.

The results can be summarised in four points. First, the dispersion of scores is driven mainly by cross-jurisdictional activity (31% of cross-sectional variance) and complexity (27%); size accounts for 14% and substitutability for 13%. EU banks account for 23% of the global total-exposure denominator but for 42% of global cross-jurisdictional claims and 47% of global Level 3 assets, so the categories in which they are over-represented are also those that separate them from each other. Second, the score is almost proportional to size: the elasticity of the score with respect to total exposures is 1.12 on its own and 0.94 once business-model mix is controlled for, and size alone explains 83% of the variation in log scores. A single scale-free dimension, which we label market-activity intensity, explains most of the remainder (adjusted R^2 of 0.98); a one-standard-deviation increase in this dimension raises the score by about 43% at a given size. Third, the Banking Union parallel score lowers euro-area scores by a median of 5.7%, but the effect ranges from 1.5% to 24% and is decisive for the bucket of BNP Paribas. Fourth, total scores are not lower at year-end than on average, but two liabilities-side indicators are, and identification near the 130-basis-point threshold is sensitive to weights even though the overall ranking is extremely robust.

The paper contributes to three strands of work. It adds to the literature on the design of systemic-importance scores (Benoit et al., 2017, 2019; Passmore and von Hafften, 2019) by providing a validated, fully reproducible decomposition for the EU and by showing that one business-model dimension carries most of the information beyond size. It adds to the window-dressing literature (Behn et al., 2019; Garcia et al., 2021; Pliszka and Schlam, 2025) with evidence from the averaged indicators now disclosed by EU banks. And it provides, to our knowledge, the first bank-level quantification on public data of the Banking Union adjustment across the whole EU sample, including banks that are not currently G-SIBs.

The rest of the paper is organised as follows. Section 2 describes the institutional framework. Section 3 reviews the literature and states our expectations. Section 4 presents the data and methods. Section 5 reports the results, Section 6 discusses policy implications and limitations, and Section 7 concludes.

2. Institutional framework

2.1 The BCBS assessment methodology

The BCBS methodology, introduced in 2011 and revised in 2013 and 2018, measures a bank's systemic importance as its share of the global activity captured by each indicator (BCBS, 2011, 2013, 2018). For bank i and indicator k with value x_{ik}, the score in basis points is

$$S_i = \Sigma_k \, w_k \times (x_{ik} / D_k) \times 10{,}000$$

where D_k is the BCBS denominator, the sum of indicator k across the global assessment sample of roughly 75 large banks, and w_k is the indicator weight. Each of the five categories receives 20%. Size is measured by total exposures as

defined for the leverage ratio; interconnectedness by intra-financial-system assets, intra-financial-system liabilities and securities outstanding; substitutability by payments activity, assets under custody, underwriting activity and, since the 2018 revision, trading volume; complexity by the notional amount of over-the-counter (OTC) derivatives, trading and available-for-sale (AFS) securities and Level 3 assets; and cross-jurisdictional activity by cross-jurisdictional claims and liabilities. The substitutability category score is capped at 500 basis points. Table 1 lists the indicators, their weights and the end-2024 denominators.

Banks with a score of at least 130 basis points are designated G-SIBs. Buckets are 100 basis points wide: scores of 130–229 map to bucket 1 (1.0% higher loss absorbency), 230–329 to bucket 2 (1.5%), 330–429 to bucket 3 (2.0%), 430–529 to bucket 4 (2.5%) and 530 or more to bucket 5 (3.5%). Supervisors may override the quantitative result with supervisory judgement. The FSB publishes the resulting list each November; the 2025 list, based on end-2024 data, contains seven EU banks: BNP Paribas and Groupe Crédit Agricole in bucket 2, and Deutsche Bank, Groupe BPCE, ING, Santander and Société Générale in bucket 1 (FSB, 2025).

2.2 The EU framework and the EBA disclosure

In the EU the methodology is transposed into Article 131 of the Capital Requirements Directive and specified in Commission Delegated Regulation (EU) No 1222/2014, amended by Delegated Regulation (EU) 2021/539, which added an EU methodology for allocating G-SII buffer rates. All EU institutions whose leverage-ratio exposure exceeds EUR 200 billion report the full BCBS template, and the EBA publishes the indicators each year. For end-2024 the sample comprises 32 institutions from eleven EU and EEA countries, including JP Morgan SE, the Frankfurt-based EU subsidiary of JPMorgan Chase. Inclusion in this sample does not imply designation: only seven of the 32 are G-SIBs, while most of the others are designated as other systemically important institutions (O-SIIs) under a separate national framework.

Two features of the EU disclosure are important for this paper. First, it contains memorandum items that report cross-jurisdictional claims and liabilities with exposures to other Banking Union countries treated as domestic. Second, the end-2024 template includes the twelve month-end values (and their averages) of the stock indicators, which allows year-end values to be compared with in-year averages.

2.3 The Banking Union adjustment

Under the standard methodology, a claim of a French bank on a German counterparty is cross-jurisdictional, even though both countries share a single supervisor and a single resolution mechanism. European authorities argued that this overstates the systemic footprint of euro-area banks. In May 2022 the BCBS agreed to recognise progress in the European Banking Union through a parallel set of scores for G-SIBs headquartered in the Banking Union (BCBS, 2022). In the ECB's implementation, labelled ASTRA (Adjustment for STructural Regional Arrangements), the score is first recomputed with intra-Banking-Union exposures treated as domestic in the two cross-jurisdictional indicators; the parallel score then recognises 66% of the resulting reduction (ECB, 2022):

$$S_i^{EBU} = S_i - 0.66 \times (S_i - S_i^{dom})$$

where S_i^{dom} is the score with intra-Banking-Union exposures treated as domestic. The parallel score may lower a bank's bucket by at most one, cannot remove a bank from the G-SIB list and does not affect banks headquartered outside the Banking Union. The 66% factor reflects the view that elements of the Banking Union, notably a common deposit insurance scheme, remain incomplete.

3. Literature and expectations

3.1 Measuring systemic importance

Systemic risk can be measured either from market prices or from balance-sheet indicators (Benoit et al., 2017). Market-based measures such as CoVaR (Adrian and Brunnermeier, 2016), marginal expected shortfall (Acharya et al., 2017) and SRISK (Brownlees and Engle, 2017) estimate the contribution of a firm to system-wide distress, while network-based measures capture connectedness (Billio et al., 2012; Diebold and Yılmaz, 2014; Acemoglu et al., 2015; Glasserman and Young, 2016). The BCBS deliberately chose an indicator-based approach because it is transparent, applies to unlisted banks and reflects the loss-given-default of a bank's failure rather than its probability of default (BCBS, 2011).

The theoretical justification for the surcharge is the expected-impact approach: if the failure of a systemically important bank causes greater damage than that of a reference bank, its probability of failure should be lowered, through more capital, until the expected impacts are equalised (BCBS, 2011). The surcharge also aims to offset the funding advantage that too-big-to-fail status confers, an advantage documented in the reaction of bank stock and bond prices to G-SIB designation (Moenninghoff et al., 2015; Bongini et al., 2015). Whether the current calibration achieves equal expected impact is disputed; Passmore and von Hafften (2019) argue that the surcharges are too small.

3.2 Critiques of the indicator-based score

Benoit et al. (2019) show that the score has two structural weaknesses. Because each indicator is scaled by its global total and the indicators are highly correlated with size, the score behaves largely as a size measure, and because the denominators are dominated by a few very large banks, some indicators contribute almost nothing to the scores of most banks while the score is very sensitive to them for the few banks that dominate them. These properties lead us to expect that (E1) scores are close to proportional to size, but that (E2) the categories in which activity is concentrated, rather than size itself, account for most of the differences between banks.

3.3 Window dressing and point-in-time measurement

A score measured at year-end creates an incentive to reduce indicators temporarily around the reference date. Behn et al. (2019) find that banks participating in the assessment reduce score-relevant activities at year-end, especially when close to a bucket threshold and when repo activity is large. Garcia et al. (2021) show that year-end adjustments by EU G-SIBs, mostly in intra-financial-system positions and derivatives, can be large enough to lower surcharges, and Pliszka and Schlam (2025) find that G-SIBs reduce their exposures at year-end about twice as much as other internationally active banks. We therefore expect (E3) year-end values to fall below in-year averages mainly for indicators that can be adjusted cheaply at short notice, such as intra-financial-system liabilities.

3.4 The Banking Union

The cross-jurisdictional category treats a highly integrated monetary and supervisory union as a set of separate jurisdictions. Because EU banks hold a large share of global cross-jurisdictional activity, we expect (E4) this category to weigh more heavily in EU scores than its 20% weight, and the Banking Union adjustment to have heterogeneous effects that depend on the share of a bank's cross-border activity that takes place inside the Banking Union.

4. Data and methodology

4.1 Data

The data come from the EBA's G-SII data disclosure tool, which contains the full template for the end-2024 exercise and the headline indicators for each year since end-2013 (EBA, 2025). All amounts are converted into euro using the EBA's exchange rates for the Danish, Norwegian and Swedish banks. The summary sheets of the tool are labelled "thousand EUR", but the figures are in EUR million (for example, BNP Paribas's total exposures of 2,753,841 correspond to EUR 2.75 trillion); we use EUR million throughout. The BCBS denominators for end-2024 and end-2023 are taken from the BCBS website (BCBS, 2025) and are expressed in EUR billion.

The cross-section consists of the 32 banks in the end-2024 sample. For the panel analysis we use a constant sample of the 27 banks that report in every year from 2013 to 2024, excluding UK banks, which left the EU sample after Brexit.

4.2 Score replication and validation

We compute indicator, category and total scores with the formula of Section 2.1, the BCBS weights and the end-2024 denominators, apply the substitutability cap and allocate buckets. For the banks headquartered in the Banking Union we compute the ASTRA parallel score from the memorandum items that report cross-jurisdictional claims (items 1280 and 1281) and liabilities (item 1282) with intra-Banking-Union exposures treated as domestic, keeping the BCBS denominators, and apply the one-bucket and no-removal rules. To validate the procedure, we compare the resulting buckets with the FSB's 2025 list and repeat the exercise with end-2023 data and the FSB's 2024 list.

4.3 Decomposition

We decompose scores in three ways. First, we report each category's share of the aggregate score of the 32 banks. Second, because the total score is the sum of its category scores, the cross-sectional variance can be decomposed exactly as

$Var(S) = \Sigma_c Cov(S_c, S)$, so that the share of category c is $Cov(S_c, S) / Var(S)$.

This measures how much each category contributes to the differences between banks, as opposed to their average level, and we compute the same decomposition for individual indicators. Third, we compare average category shares for the seven G-SIBs and for the other banks.

4.4 Scale and business-model mix

To separate scale from business-model mix we express each of the thirteen non-size indicators relative to total exposures, take logarithms (adding 5% of the sample median to accommodate the zeros reported by some banks), standardise them and extract principal components. The components are therefore free of scale and describe how a bank's activity is distributed, given its size. We then estimate, by ordinary least squares with heteroskedasticity-robust (HC3) standard errors,

$$\ln S_i = \alpha + \beta \ln TE_i + \gamma PC1_i + \delta PC2_i + \varepsilon_i$$

where TE_i denotes total exposures. Because the score is constructed from the indicators, these regressions are an accounting decomposition rather than a causal model: they show how much of the variation in scores is associated with scale and how much with a bank's activity mix. As a complement we apply Ward hierarchical clustering to the standardised intensities.

4.5 Year-end versus in-year averages

For the ten stock indicators the end-2024 template reports the twelve month-end values and their average. We compute, for each bank and indicator, the ratio of the year-end value to the average and test with a one-sided Wilcoxon signed-rank test whether the year-end value is lower. We also recompute the total score with averages in place of year-end values. Four banks (BPCE, Crédit Agricole, Crédit Mutuel and Société Générale) do not report the averages and are excluded from these tests; ABN AMRO reports the averages in a different unit, which we correct by a power of 1,000. Because averages of month-end values cannot capture adjustments made at every month-end, the comparison is a lower bound on window dressing.

4.6 Robustness and panel analysis

We assess the sensitivity of rankings to the weighting scheme by recomputing scores (i) without the size category, (ii) with equal weights for the fourteen indicator series, (iii) without the substitutability cap and (iv) under 10,000 sets of

random category weights drawn from a flat Dirichlet distribution. For each bank we report the median and the 5th and 95th percentiles of its rank and the probability that its score exceeds 130 basis points.

Because the denominators are not available to us for every year and the methodology changed in 2018 (applied from end-2021 data), the panel analysis uses relative scores: each indicator is scaled by its total in the constant 27-bank sample and the twelve indicators common to all years are combined with the BCBS weights. Relative scores sum to 10,000 basis points in every year and are comparable over time. We report year-on-year rank correlations, Herfindahl–Hirschman indices (HHI) by indicator and changes in relative scores between 2014 and 2024.

5. Results

5.1 Replication and validation

Table 2 reports the scores for all 32 banks. Seven banks score above 130 basis points: BNP Paribas (344), Crédit Agricole (257), Deutsche Bank (218), Santander (203), Société Générale (202), BPCE (151) and ING (147). These are exactly the seven EU G-SIBs on the FSB's 2025 list. With the standard methodology the computed bucket matches the official one for six banks. The exception is BNP Paribas, whose standard score of 344 falls in bucket 3 but whose ASTRA parallel score of 306 falls in bucket 2, the official allocation. With the Banking Union adjustment, therefore, the replication reproduces the official buckets of all seven EU G-SIBs. Repeating the exercise with end-2023 data and the FSB's 2024 list gives the same seven banks and six matching buckets; the exception is again BNP Paribas (computed score 335). This close agreement indicates that the published EBA data and BCBS denominators are sufficient to reconstruct the official assessment with high accuracy.

The next highest scores belong to JP Morgan SE (122), UniCredit (108), Intesa Sanpaolo (93) and DZ Bank (91). The aggregate score of the 32 banks is 2,820 basis points, and the seven G-SIBs account for 54% of it.

Table 1
Indicators, weights, denominators and concentration in the EU sample (end-2024)

Indicator	Category	Weight (%)	BCBS denominator (EUR bn)	EU sample share of denominator	HHI (EU sample)	Top-5 share (EU sample)
Total exposures	Size	20.00	111,282	23.1%	518	40.7%
Intra-financial system assets	Interconn.	6.67	11,305	33.5%	596	44.9%
Intra-financial system liabilities	Interconn.	6.67	11,117	25.9%	569	42.4%
Securities outstanding	Interconn.	6.67	20,204	24.7%	455	35.8%
Payments activity	Substit.	6.67	3,448,906	20.2%	877	56.0%
Assets under custody	Substit.	6.67	227,864	13.5%	1,163	70.6%
Underwriting activity	Substit.	3.33	9,105	17.7%	926	58.0%
Trading volume - fixed income	Substit.	1.67	242,670	9.2%	711	50.1%
Trading volume - equities & other	Substit.	1.67	250,876	18.7%	4,471	88.3%
OTC derivatives	Complexity	6.67	715,872	34.7%	892	58.8%
Trading and AFS securities	Complexity	6.67	4,445	18.2%	801	54.4%
Level 3 assets	Complexity	6.67	756	46.7%	705	49.0%
Cross-jurisdictional claims	Cross-jurisd.	10.00	26,525	41.5%	657	48.3%
Cross-jurisdictional liabilities	Cross-jurisd.	10.00	21,778	38.9%	721	50.8%

Notes: Weights and denominators from BCBS (2018, 2025). Underwriting has a weight of 3.33% and each trading-volume sub-indicator 1.67%. The EU sample share is the sum of the indicator across the 32 EBA sample banks divided by the BCBS global denominator. HHI and top-5 shares are computed within the EU sample.

Table 2
Replicated systemic-importance scores, end-2024 (basis points)

Bank	Size	Inter-conn.	Substit.	Complex.	Cross-jurisd.	Score	Bucket	ASTRA score	ASTRA bucket	FSB 2025 bucket
BNP Paribas	49.5	56.0	46.2	79.7	112.8	344.1	3	306.1	2	2
Credit Agricole	46.4	53.9	30.0	70.4	56.1	256.9	2	243.0	2	2
Deutsche Bank	23.9	22.7	51.9	69.2	50.4	218.1	1	209.4	1	1
Santander	34.6	29.6	10.3	29.9	98.6	203.0	1	189.4	1	1
Societe Generale	29.0	41.7	23.2	57.1	50.9	202.0	1	190.0	1	1
BPCE	27.9	28.5	9.7	61.8	23.5	151.4	1	145.9	1	1
ING	20.4	23.6	6.8	20.5	75.9	147.0	1	111.2	1	1
JP Morgan SE	7.1	16.8	30.2	40.5	27.4	122.0	–	115.8	–	–
Unicredit	15.9	29.8	6.9	16.1	39.7	108.4	–	90.6	–	–
Intesa Sanpaolo	18.1	28.5	5.7	20.7	19.8	92.8	–	86.0	–	–
DZ Bank	10.0	35.3	5.5	32.1	7.6	90.5	–	89.0	–	–
BBVA	15.4	17.3	5.5	12.6	34.4	85.2	–	81.0	–	–
Nordea	10.8	14.5	10.0	17.9	27.8	80.9	–	79.7	–	–
Credit Mutuel	20.7	16.4	4.8	26.5	9.6	78.1	–	74.0	–	–
Commerzbank	11.4	10.5	11.8	12.6	28.2	74.4	–	68.0	–	–
Danske Bank	9.5	10.8	3.8	15.6	16.0	55.7	–	n.a.	–	–
ABN Amro	7.6	10.9	23.0	4.2	6.2	51.9	–	49.9	–	–
Rabobank	12.1	8.6	5.3	9.1	16.0	51.2	–	49.1	–	–
Banque Postale	12.1	13.0	0.1	22.2	1.8	49.3	–	48.2	–	–
SEB	6.5	8.8	11.7	8.0	12.7	47.8	–	n.a.	–	–
LBBW	7.0	15.4	3.8	10.4	5.9	42.5	–	41.1	–	–
Erste Group	6.8	6.8	3.6	3.1	15.3	35.6	–	32.4	–	–
KBC	7.1	6.7	2.9	3.8	13.8	34.4	–	31.0	–	–
DNB	5.9	6.0	3.6	6.2	11.3	33.0	–	n.a.	–	–
Caixabank	12.1	6.2	1.4	2.4	7.4	29.6	–	26.0	–	–
RBI	4.2	5.6	2.5	1.2	11.6	25.2	–	22.4	–	–

Notes: Scores computed with BCBS (2018) weights and end-2024 BCBS denominators from EBA (2025) data. ASTRA score: Banking Union parallel score recognising 66% of the reduction from treating intra-Banking-Union cross-jurisdictional exposures as domestic (ECB, 2022); n.a. for banks headquartered outside the Banking Union. ASTRA bucket applies the one-bucket and no-removal rules. Validation with end-2023 data: the same seven banks exceed 130 bps and six of seven buckets match the FSB (2024) list.

Bank	Size	Inter-conn.	Substit.	Complex.	Cross-jurisd.	Score	Bucket	ASTRA score	ASTRA bucket	FSB 2025 bucket
Handelsbanken	5.9	6.7	3.1	0.6	6.8	23.1	–	n.a.	–	–
Bayern LB	5.3	10.2	2.3	1.6	1.9	21.2	–	20.6	–	–
Swedbank	5.0	5.2	2.0	2.7	4.6	19.7	–	n.a.	–	–
Banco BPM	4.0	4.5	1.8	3.0	2.5	15.8	–	14.5	–	–
Nykredit	4.5	7.7	0.4	1.3	1.1	15.1	–	n.a.	–	–
Sabadell	4.3	2.2	0.4	0.5	7.1	14.5	–	13.4	–	–

Notes: Scores computed with BCBS (2018) weights and end-2024 BCBS denominators from EBA (2025) data. ASTRA score: Banking Union parallel score recognising 66% of the reduction from treating intra-Banking-Union cross-jurisdictional exposures as domestic (ECB, 2022); n.a. for banks headquartered outside the Banking Union. ASTRA bucket applies the one-bucket and no-removal rules. Validation with end-2023 data: the same seven banks exceed 130 bps and six of seven buckets match the FSB (2024) list.

Source: Authors' calculations based on EBA (2025*) and* BCBS (2025*).*

5.2 What drives the scores? (RQ1)

Figure 1 decomposes each bank's score, and Table 3 summarises the contributions. Cross-jurisdictional activity is the largest category in the aggregate EU score (28.5%), followed by complexity (23.5%), interconnectedness (19.9%), size (16.4%) and substitutability (11.7%). With equal category weights of 20%, these shares reveal that EU banks' activity is concentrated in the cross-jurisdictional and complexity indicators relative to the global sample. Table 1 confirms this: the 32 EU banks account for 23% of the global total-exposure denominator but for 42% of cross-jurisdictional claims, 39% of cross-jurisdictional liabilities, 35% of OTC derivatives and 47% of Level 3 assets, and for only 9% to 20% of the substitutability indicators.

The variance decomposition gives a sharper answer to RQ1. Cross-jurisdictional activity accounts for 30.8% of the cross-sectional variance of scores and complexity for 26.5%, while interconnectedness (15.8%), size (13.9%) and substitutability (13.0%) contribute less. At the indicator level, cross-jurisdictional liabilities (15.6%), cross-jurisdictional claims (15.2%) and total exposures (13.9%) are the largest contributors, followed by Level 3 assets (10.6%) and OTC derivatives (10.5%); the two trading-volume sub-indicators together contribute less than 1%. The differences between the G-SIBs and the other banks lie in the same categories: on average, complexity accounts for 25.7% of a G-SIB's score but 17.6% of other banks' scores, and cross-jurisdictional activity for 31.2% against 26.1%, whereas size and interconnectedness weigh relatively more for the smaller banks.

Concentration differs widely across indicators (Table 1). Total exposures and securities outstanding are the least concentrated (HHI of 518 and 455, equivalent to 19 and 22 equal-sized banks), whereas assets under custody (HHI 1,163; top-five share 71%) and especially equity trading volume (HHI 4,471; top-five share 88%) are dominated by a handful of banks. This is why bank-specific profiles emerge clearly in Fig. 1: Deutsche Bank's score relies heavily on substitutability (52 basis points, more than half of it from payments) and complexity; JP Morgan SE scores 122 basis points despite total exposures of only EUR 395 billion because of its payments, custody and derivatives activity; Santander and ING draw about half of their scores from cross-jurisdictional activity; and DZ Bank stands out in interconnectedness as the central institution of a cooperative banking group.

Table 3
Contribution of the five categories to EU scores (end-2024)

Category	Share of aggregate score	Share of cross-sectional variance	Mean share, G-SIBs (n = 7)	Mean share, other banks (n = 25)
Size	16.4%	13.9%	15.3%	20.4%
Interconnectedness	19.9%	15.8%	16.8%	24.8%
Substitutability	11.7%	13.0%	10.9%	11.0%
Complexity	23.5%	26.5%	25.7%	17.6%
Cross-jurisdictional	28.5%	30.8%	31.2%	26.1%
Total	100.0%	100.0%	100.0%	100.0%

Notes: The variance share of category c is $\mathrm{Cov}(S_c, S)/\mathrm{Var}(S)$, where S is the total score; shares sum to one. Each category carries a 20% weight in the methodology.

5.3 Scale versus business-model mix

The decomposition does not mean that size is unimportant. Size enters every category: the Spearman correlation between the size score and the sum of the four non-size categories is 0.87. Table 4 and Fig. 2 quantify the role of scale. On its own, the log of total exposures explains 83% of the variation in log scores, with an elasticity of 1.12; the score is therefore close to proportional to size, consistent with E1 and with Benoit et al. (2019).

The first principal component of the scale-free activity intensities explains 40% of their variance (Appendix Table A1). All loadings are positive except that of securities outstanding, and the largest are those of OTC derivatives, underwriting, intra-financial-system liabilities, payments, trading and AFS securities, custody and cross-jurisdictional positions. We interpret this component as market-activity intensity: how much capital-market, payment and international activity a bank conducts per euro of balance sheet. It ranges from domestic retail and mortgage lenders (Nykredit, CaixaBank, Banque Postale, Sabadell) to capital-market and infrastructure banks (JP Morgan SE, Deutsche Bank, BNP Paribas, Société Générale). The second component (15%) contrasts domestic wholesale and network activity (intra-financial-system assets and Level 3 assets, typical of DZ Bank, Banque Postale and the German Landesbanken) with cross-border activity.

Adding the first component to the size regression raises the adjusted R^2 from 0.83 to 0.98 (Table 4, column 3). At a given size, a one-standard-deviation increase in market-activity intensity raises the score by about 43% ($\exp(0.157 \times 2.30) - 1$). The size elasticity falls to 0.94 (standard error 0.035), which is close to unity, and the second component is not significant. In short, the EU scores can be described almost completely by two numbers: how large a bank is and how market-intensive its activity is. The hierarchical clustering confirms that business models form a continuum rather than distinct groups: the best partition (two clusters, separating domestic lenders from the rest) has a silhouette coefficient of only 0.25.

Table 4
Scale and business-model mix: OLS regressions of the log score

ln Total exposures	**(1)**	**(2)**	**(3)**	**(4)**
	1.124* **		**0.940*** **	**0.929*** **
	(0.069)		(0.035)	(0.038)
PC1: market-activity intensity		0.265***	0.157***	0.159***
		(0.066)	(0.017)	(0.016)
PC2: domestic wholesale vs cross-border		0.109		0.027
		(0.079)		(0.033)
Constant	-3.108***	4.106***	-1.924***	-1.855***
	(0.470)	(0.121)	(0.227)	(0.257)
Adjusted R^2	0.831	0.472	0.979	0.981
Observations	32	32	32	32

Notes: Dependent variable: log of the end-2024 score. PC1 and PC2 are the first two principal components of the thirteen non-size indicators expressed relative to total exposures (log, standardised); PC1 has a standard deviation of 2.30. HC3 robust standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1. The score is constructed from the indicators, so the regressions are an accounting decomposition, not a causal model.

Source: Authors' calculations based on EBA (2025*) and* BCBS (2025*).*

5.4 The Banking Union adjustment (RQ2)

Figure 3 and Table 2 report the ASTRA parallel scores. Across the 26 banks headquartered in the Banking Union, the parallel score is a median 5.7% below the standard score (mean 7.1%). The effect is highly heterogeneous. It is largest for ING (− 24%, from 147 to 111 basis points), UniCredit (− 16%) and BNP Paribas (− 11%), all of which conduct a large share of their cross-border business in other Banking Union countries, and smallest for banks whose foreign activity lies mainly outside the Banking Union, such as DZ Bank (− 1.7%) and Deutsche Bank (− 4.0%), or whose activity is largely domestic.

The adjustment changes one bucket in the current sample: BNP Paribas moves from bucket 3 to bucket 2, lowering its surcharge by 0.5 percentage points of risk-weighted assets. ING's parallel score falls below 130 basis points, but under the ASTRA rules this cannot remove a bank from the G-SIB list, so ING remains in bucket 1. The calibration matters. If intra-Banking-Union exposures were treated as fully domestic (100% recognition), BNP Paribas's score would fall to 287, ING's to 93 and UniCredit's to 81; with no recognition, BNP Paribas would remain in bucket 3. The 66% factor is therefore a consequential policy parameter, consistent with E4.

Source: Authors' calculations based on EBA (2025*) and* BCBS (2025*).*

5.5 Year-end versus in-year averages (RQ3)

Table 5 and Fig. 4 compare year-end values with the averages of month-end values for the 28 banks that report them. For most indicators the median ratio is close to or above one: total exposures (0.997), cross-jurisdictional claims (0.997), securities outstanding (1.019), assets under custody (1.019) and the three complexity indicators (1.03 to 1.07). Two indicators show the pattern predicted by E3. Intra-financial-system liabilities are lower at year-end than on average for 18 of 28 banks, with a median ratio of 0.924 (Wilcoxon p = 0.004); the largest reductions are observed for Handelsbanken (ratio 0.50), SEB (0.61), ABN AMRO (0.63) and DNB (0.64). Cross-jurisdictional liabilities are lower at year-end for 16 of 26 banks (median 0.974, p = 0.010).

These effects are too small to change total scores. Recomputing the scores with averages changes them by a median of + 0.3% (Wilcoxon p = 0.41), and no bank changes bucket. We find no difference between G-SIBs and other banks (Mann–Whitney p = 0.49), although this test has little power because three of the seven G-SIBs do not report the averages. The evidence is thus consistent with the view that window dressing concentrates in short-term funding and interbank positions (Behn et al., 2019; Garcia et al., 2021), but suggests that, at least for end-2024 and for month-end averages, its effect on EU scores was modest.

Table 5
Year-end values versus averages of month-end values, end-2024

Indicator	N	Median ratio (year-end / average)	Banks with year-end below average	Wilcoxon p (one-sided)
Intra-financial system liabilities	28	0.924	18 / 28	0.004
Cross-jurisdictional liabilities	26	0.974	16 / 26	0.010
Total exposures	26	0.997	14 / 26	0.392
Cross-jurisdictional claims	26	0.997	14 / 26	0.197
Securities outstanding	28	1.019	9 / 28	0.987
Assets under custody	28	1.019	11 / 28	0.877
Intra-financial system assets	28	1.024	9 / 28	0.915
OTC derivatives	28	1.033	4 / 28	1.000
Level 3 assets	25	1.056	5 / 25	0.998
Trading and AFS securities	29	1.071	8 / 29	0.945
Total score (averages vs year-end)	28	0.997	–	0.407

Notes: Averages of the twelve month-end values reported in the EBA (2025) memorandum items. BPCE, Crédit Agricole, Crédit Mutuel and Société Générale do not report averages; N varies with missing items. The one-sided test is for a year-end value below the average. For the total score, the ratio is the median of year-end score / score computed with averages; the test is for the average-based score exceeding the year-end score.

Source: Authors' calculations based on EBA (2025*) and* BCBS (2025*).*

5.6 Robustness to weights

The ranking of banks is highly robust to the weighting scheme (Table 6 and Fig. 5). Excluding the size category entirely leaves the rank correlation with the baseline at 0.997; equal indicator weights give 0.985; and the substitutability cap does not bind for any bank. Under 10,000 random category weights, the median Spearman correlation with the baseline ranking is 0.979 (5th percentile 0.948), BNP Paribas ranks first in 99.9% of draws, and Crédit Agricole ranks second or third in 96%.

Identification at the threshold is much less robust. The set of the seven highest-ranked banks is unchanged in only 44% of the draws. BNP Paribas, Crédit Agricole, Deutsche Bank and Société Générale exceed the threshold under all weights and Santander in 92% of draws, but BPCE does so in 72%, ING in 55%, JP Morgan SE in 38% and UniCredit in 19%. Designation of the banks closest to the threshold therefore depends on the equal-weighting convention far more than the ranking does.

Table 6
Robustness of rankings to the weighting scheme (top 12 banks)

Bank	Baseline rank	Rank, size excluded	Rank, equal indicator weights	Random weights: median rank [5th–95th pct]	P(score ≥ 130 bps), random weights
BNP Paribas	1	1	1	1 [1–1]	100.0%
Credit Agricole	2	2	2	2 [2–3]	100.0%
Deutsche Bank	3	3	3	3 [2–6]	99.8%
Santander	4	5	5	4 [2–7]	92.4%
Societe Generale	5	4	4	4 [3–6]	99.9%
BPCE	6	7	6	6 [5–9]	71.5%
ING	7	6	8	7 [4–10]	54.9%
JP Morgan SE	8	8	7	8 [5–12]	38.5%
Unicredit	9	9	10	9 [7–12]	19.1%
Intesa Sanpaolo	10	11	12	11 [9–13]	0.3%
DZ Bank	11	10	11	11 [7–17]	8.2%
BBVA	12	13	14	12 [9–16]	2.5%
Spearman correlation with baseline	1.000	0.997	0.985	0.979 (median)	

Notes: Random weights: 10,000 draws of the five category weights from a flat Dirichlet distribution, scaled to the baseline mean. Equal indicator weights assign 1/14 to each of the fourteen indicator series. The substitutability cap does not bind for any bank.

Source: Authors' calculations based on EBA (2025*) and* BCBS (2025*).*

5.7 Developments over 2013–2024

Relative positions are very stable (Fig. 6). The year-on-year Spearman correlation of relative scores in the constant 27-bank sample never falls below 0.97, and the seven highest-scoring banks account for 58–59% of the sample total in every year. Concentration of the relative score barely changed (HHI of 689 in 2014 and 654 in 2024). At the indicator level, OTC derivatives (HHI from 1,482 to 985) and payments (from 1,225 to 989) have become less concentrated, whereas intra-financial-system assets have become more concentrated (from 545 to 660).

The largest changes concern individual banks. Deutsche Bank's relative score fell from 1,320 basis points in 2014 to 925 in 2024, reflecting the reduction of its capital-market activities, while Crédit Agricole's rose from 665 to 1,009, so that it overtook Deutsche Bank in 2023. Banque Postale's relative score tripled (from 55 to 162), consistent with the consolidation of its insurance activities. In aggregate, the constant sample's cross-jurisdictional claims grew by 49% in nominal terms between 2014 and 2024, compared with 20% for total exposures. The recorded doubling of Level 3 assets coincides with the methodological revision that took effect with end-2021 data and should not be read as an economic change.

Source: Authors' calculations based on EBA (2025*) and* BCBS (2025*).*

6. Discussion

6.1 Policy implications

The results have four implications for the design and use of systemic-importance scores.

First, the scores of large EU banks are essentially a function of two quantities: size and market-activity intensity. The equal-weighted, thirteen-indicator structure produces rankings that are almost identical to those of much simpler schemes, including one that ignores size altogether. This does not make the indicators redundant, since they determine how a bank's score responds to changes in its business, but it suggests that the framework's apparent multidimensionality is limited. Policymakers reviewing the methodology could consider whether a more parsimonious or orthogonalised set of indicators would deliver the same information with less scope for indicator management.

Second, the cross-jurisdictional category weighs disproportionately in the scores of EU banks, because intra-EU activity is counted as cross-border. The ASTRA adjustment corrects part of this, but its effect is concentrated in a few banks, and its calibration (66%) decides the bucket of the largest EU bank. Since the parallel score applies only to designated G-SIBs, it does not affect UniCredit or Intesa Sanpaolo, whose standard scores would fall by 16% and 7%; this matters for any future designation decisions. A transparent link between the recognition factor and observable progress in completing the Banking Union, such as a common deposit insurance scheme, would make the parameter less discretionary.

Third, the finding that intra-financial-system and cross-jurisdictional liabilities are reported below their in-year averages supports the BCBS's 2024 proposal to base stock indicators on averages. Because the effect on total scores was small for EU banks at end-2024, averaging would mainly protect the framework against future incentives, especially for banks close to a threshold. Daily rather than month-end averages would also capture adjustments made at quarter-ends.

Fourth, designation near the 130-basis-point threshold is sensitive to the weighting convention. For banks such as BPCE, ING and JP Morgan SE, supervisory judgement and the interaction with O-SII buffers deserve more weight than the precise quantitative score, and disclosures should present scores with an indication of their sensitivity.

6.2 Limitations and further research

The analysis has several limitations. The main cross-section covers one year and 32 banks, and the regressions are an accounting decomposition of a constructed score, not a causal model of risk. Our replication uses the BCBS's published denominators but not its exchange rates, and the ASTRA computation keeps the standard denominators; both may introduce small differences from the official calculation. The averages needed for the window-dressing tests are missing for four large French banks and capture month-end rather than daily behaviour. The panel relies on relative scores and spans a methodological revision. Finally, the score is a regulatory construct: whether it ranks banks in the same way as market-based measures of systemic risk is an open question. Comparing the EU scores with SRISK or ΔCoVaR for the listed banks in the sample, and extending the window-dressing analysis as more years of averaged data become available, are natural next steps.

7. Conclusion

This paper has examined what drives the systemic-importance scores of the 32 largest EU banks. Using public EBA data and the BCBS denominators, we reproduce the official assessment closely enough to match the FSB's buckets for all seven EU G-SIBs once the Banking Union adjustment is applied. The differences between banks are driven mainly by cross-jurisdictional activity and complexity, categories in which EU banks are heavily over-represented in global terms. The score is close to proportional to size, and a single dimension of market-activity intensity explains almost all of the remaining variation. The Banking Union adjustment lowers euro-area scores by a median of 6%, with large differences between banks, and decides BNP Paribas's bucket. Year-end reporting reduces some liabilities-side indicators but leaves total scores unchanged. Rankings are robust to the weighting scheme, while designation at the threshold is not, and

relative positions have been very stable over the past decade. Together these findings suggest that the debate on the G-SIB framework in Europe should focus less on the number of indicators and more on three parameters that demonstrably matter: the treatment of the Banking Union, the measurement date and the handling of banks near the designation threshold.

Declarations

Author Contribution

The Introduction, Institutional Framework, Literature and Expectations sections were written by Research Assistant Dr. Yağmur Rençber.The Data and Methodology and Results sections were written by Assoc. Prof. Dr. Yavuz Selim Balcıoğlu.

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Figures

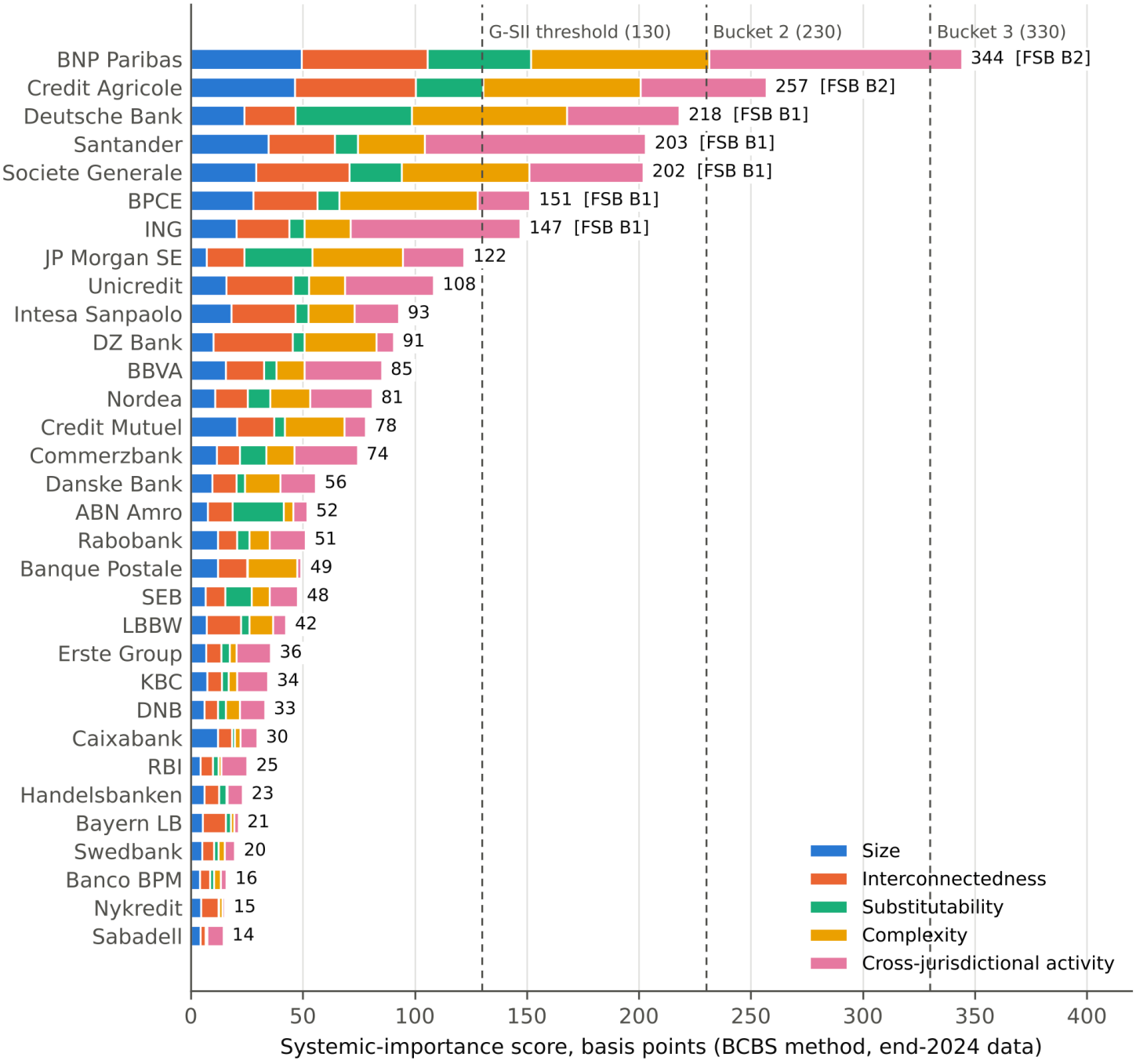

Figure 1

Decomposition of end-2024 systemic-importance scores by category (basis points). Dashed lines mark the G-SIB threshold and bucket boundaries; FSB 2025 buckets in brackets.

Source: Authors' calculations based on EBA (2025) and BCBS (2025).

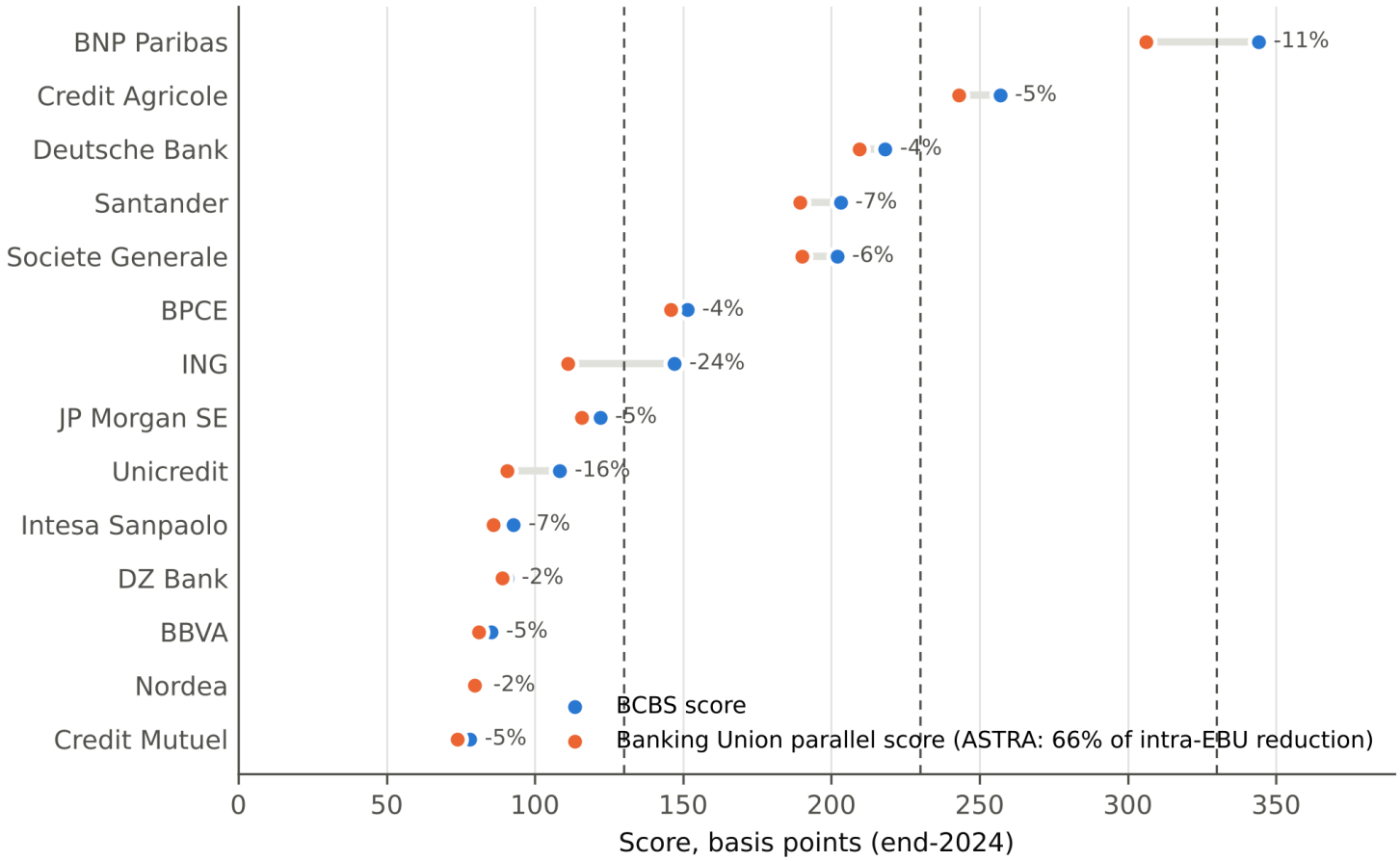

Figure 3

Standard BCBS scores and Banking Union (ASTRA) parallel scores for the 14 highest-scoring euro-area banks; labels show the percentage change.

Source: Authors' calculations based on EBA (2025) and BCBS (2025).

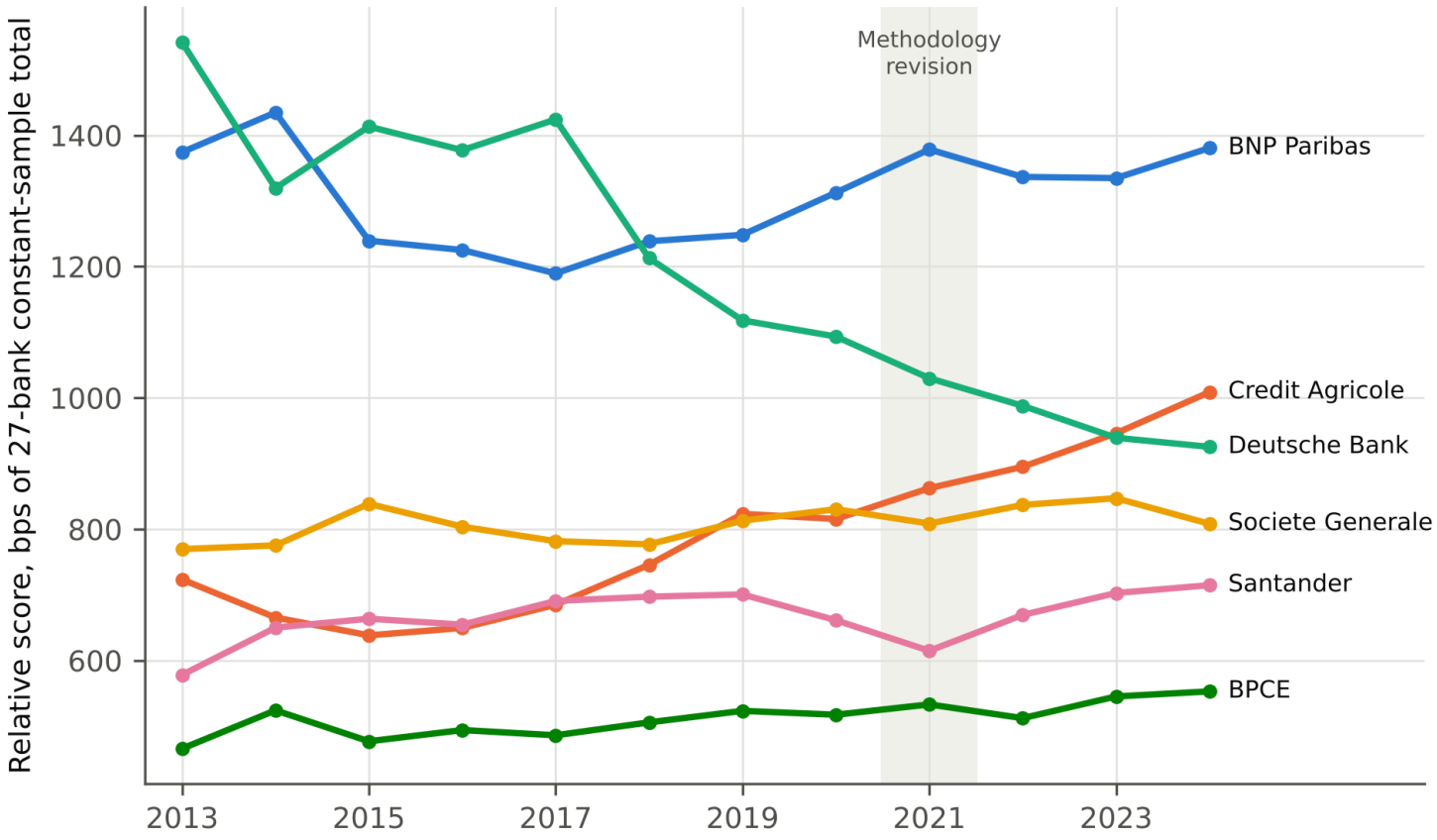

Figure 6

Relative systemic-importance scores of the six highest-scoring banks, 2013–2024 (constant 27-bank sample; basis points of the sample total). The shaded year marks the methodological revision.

Source: Authors' calculations based on EBA (2025) and BCBS (2025).

Supplementary Files

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- Appendix.docx