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ESTIMATES OF THE APPLICATION OF THE PROPOSED METHODOLOGY FOR THE CALCULATION OF CONTRIBUTIONS TO RESOLUTION FINANCING ARRANGEMENTS

Accompanying the document

Commission Delegated Regulation

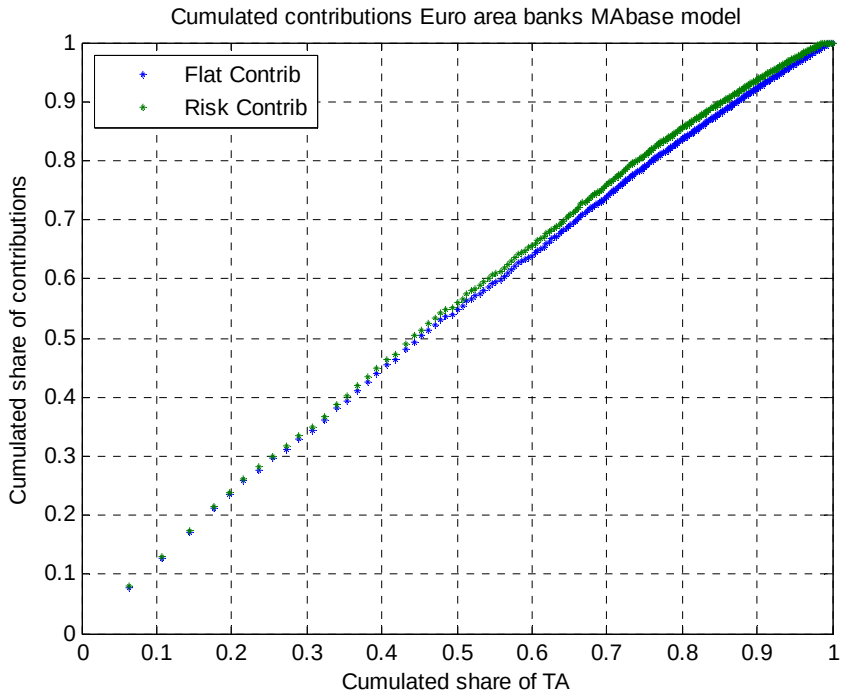
supplementing Directive 2014/59/EU of the European Parliament and the Council of 15 May 2014 with regard to ex ante contributions to resolution financing arrangements

{C(2014) 7674}

3) CUMULATIVE DISTRIBUTION OF CONTRIBUTIONS BY TOTAL ASSETS

In order to evaluate the ability of the proposed contribution system to produce a fair distribution of the burden, a possible reference point is represented by significant banks as defined by the SSM regulation. The ECB has communicated that these institutions represent around 85% of total banking assets in the Euro area[1]. In principle, the contribution system should attribute at least 85% of the total burden to these institutions. Furthermore, these institutions should tend to pay an additional risk premium (see below), as they tend to be more important for financial stability and the economy of the Member States and more engaged in trading activities and derivative contracts than the smaller players, and might be more complex and hence more difficult to resolve.

Figure 1: Cumulative distribution of contributions by total assets in the Euro Area



Source: JRC estimates

As Figure 1 shows, banks representing the largest 85% of total assets in the Euro area pay 90% of total contributions. For the very largest banks (starting from the left on the x-axis), the application of the flat basic risk contribution alone represents a significant premium in their share of total contributions with respect to their share of total assets, as their points always lie well above an imaginary 45-degree line crossing the graph. This shows that the calcualtion of the basic risk contribution includes already elements which are favorable to small banks.

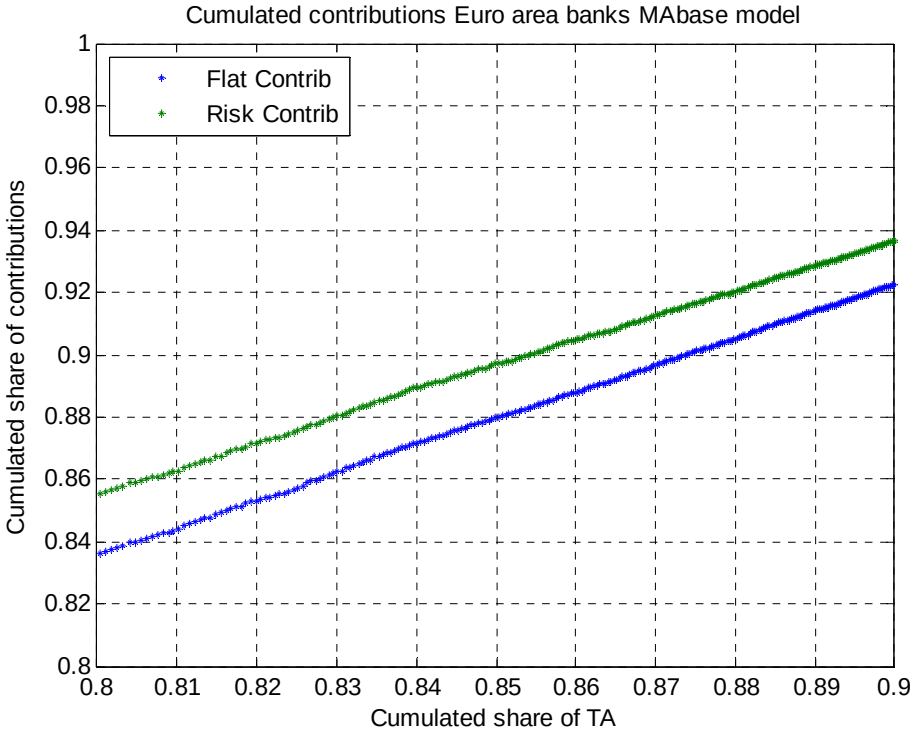
Banks representing the largest 85% of total assets in the Euro area also pay a risk premium with respect to their flat fees, as Figure 2 highlights with a zoom around 85% of the cumulative distribution of total assets. Similar results can be obtained for all non-participating Member States[2]. Figure 2 also offers a zoom on the reinforcing effect of the risk-based

[1] http://www.ecb.europa.eu/ssm/html/index.en.html as of 29 August 2014.

[2] Annex II presents the equivalent of Figure 1 for all non-participating Member States.

adjustment. Banks representing the largest 85% of total assets in the Euro area would pay 88% of total flat fees (+ 3 percentage points circa), and 90% of total contributions (+ 2 extra percentage points circa). This suggests that, at this very specific point of the cumulative distribution, the application of the risk-based adjustment nearly doubles the effect of the application of the BRRD base[3] (with respect to a situation in which contributions were to be calculated on the basis of size alone).

Figure 2: Cumulative distribution of contributions by total assets in the Euro Area – zoom around 85% of total assets



Source: JRC estimates

Figure 1 and Figure 2 report estimates on the basis of the first 3 pillars of risk factors only (risk exposure, stability and variety of the sources of funding, importance to the stability of the financial system or economy)[4], since it is proposed that the fourth pillar is left to the determination of the resolution authorities. However, the fourth pillar contains risk factors that will be especially prominent for the largest banks, such as trading activities, off-balance sheet exposures and derivatives, and complexity and resolvability (accounting for as much as 18% of the composite risk indicator). Therefore, the risk premium of the largest banks could be even more pronounced than represented in Figure 1 and Figure 2 above. An estimate of the effect of introducing the fourth pillar on the cumulative distribution of contributions is presented in Annex III: Cumulative Distribution of Contributions when Including the Fourth Pillar of the Composite Risk Indicator.

[3] Liabilities excluding own funds minus covered deposits.

[4] It should be noted that some indicators are not available: bail-in-able funds; liquidity coverage ratio and net stable funding ration (replaced by loan-to-deposit ratio), as described in Section 2.

Since the calculation of contributions will be done on a solo basis, it is not possible to have a direct estimation of the contributions of significant banks as defined under the SSM Regulation[5]. Significant banks are in fact defined on a consolidated basis, and even though the ECB has published the names of all the entities of the provisional list of significant groups[6], it is not possible to exactly identify these in the final database, since Member States have provided data on an anonymized basis. As a result, the best possible proxy is to consider individual banks that joinlty represent the largest 85% of total assets in the Euro area[7].

For each of the deciles in the distribution of total assets, Table 5 reports the corresponding number of banks whose cumulated total assets are below the corresponding percentage. For example, there are 10 banks whose aggregated total assets represent around 30% of the Euro area total assets.

Table 1: Sample cumulated counts of banks by decile of total assets in the Euro area

Cumulated share of TA	Cumulated number of banks
10%	1
20%	5
30%	10
40%	17
50%	27
60%	46
70%	82
80%	162
90%	420
100%	3943

Source: JRC estimates

4) SMALL BANKS

It is proposed that small banks are defined as those with a BRRD base (total liabilities excluding own funds minus covered deposits) below 300 million Euro and total assets below 1 billion Euro. Table 6 presents basic statistics that describe the application of this definition to the final database.

5 Council Regulation (EU) No 1024/2013 of 15 October 2013.

6 http://www.ecb.europa.eu/ssm/pdf/SSM-listofdirectlysupervisedinstitutions.en.pdf?6dfe13ea9224b4f2f313c8c9dd05bc96 last updated on 26 June 2014.

7 This group will include entities which are not part of the ECB's list of significant institutions but are larger than some of the smaller entities that are part of significant groups.

Table 2: Statistics on small banks

	Number of banks			Total Assets			BRRD base		
	All banks	Small banks	Small banks (as % of total number of banks)	All banks (TEUR)	Small banks (TEUR)	Small banks (as % of TA all banks)	All banks (TEUR)	Small banks (TEUR)	Small banks (as % of BRRD base all banks)
Euro area	3,943	2,194	56%	26,952,013,485	450,088,866	1.67%	20,155,820,108	205,776,356	1.02%
BG	24	10	42%	39,270,243	3,933,947	10.02%	15,865,362	1,637,241	10.32%
CZ	23	3	13%	166,882,156	1,240,178	0.74%	88,993,553	218,517	0.25%
DK	70	38	54%	566,547,859	7,964,072	1.41%	377,124,381	2,995,186	0.79%
HR	21	15	71%	7,012,864	2,563,948	36.56%	5,957,418	2,184,727	36.67%
HU	12	5	42%	39,384,364	828,420	2.10%	26,148,415	445,561	1.70%
LT	7	3	43%	16,878,730	660,783	3.91%	9,559,361	377,353	3.95%
PL	245	210	86%	289,793,612	11,329,352	3.91%	183,366,909	6,615,035	3.61%
RO	25	8	32%	65,695,654	1,402,626	2.14%	33,293,416	628,494	1.89%
SE	64	43	67%	836,497,962	14,341,859	1.71%	605,233,004	5,099,237	0.84%
UK	177	62	35%	8,364,505,719	14,211,076	0.17%	7,008,941,282	9,165,757`	0.13%

Source: JRC estimates

Under this proposed definition, small banks represent 56% of the banks, 1.7% of total assets and 1% of the BRRD base in the final database for the Euro area. Among non-participating Member States, some variation exists both in the prevalence and in the size of small banks, which represent as much as 85% of the total in Poland (as little as 13% in the Czech Republic), and as much as 37% of total assets and of the BRRD base in Croatia (as little as 0.17% and 0.13%, respectively, in the UK).

It is proposed that small banks are split into 6 buckets according to their BRRD base, setting a fixed payment (lump sum) for each bucket, as described in Table 7.

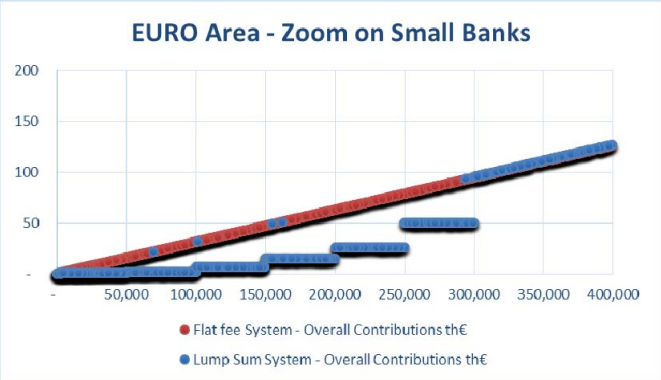
Table 3: The 6-bucket system: thresholds and lump sums, TEUR

Buckets	Lump sum
BUCKET 1: BRRD base <= 50.000 & TA <= 1,000,000	1
BUCKET 2: 50.000 < BRRD base <= 100.000 & TA <= 1,000,000	2
BUCKET 3: 100.000 < BRRD base <= 150.000 & TA <= 1,000,000	7
BUCKET 4: 150.000 < BRRD base <= 200.000 & TA <= 1,000,000	15
BUCKET 5: 200.000 < BRRD base <= 250.000 & TA <= 1,000,000	26
BUCKET 6: 250.000 < BRRD base <= 300.000 & TA <= 1,000,000	50

Source: JRC estimates

Figure 3 compares the flat fees (i.e. the contributions to the lump sums in proportion to the share of each bank in the total BRRD base) to the lump sums for banks in the Euro area.

Figure 3: 6-bucket system versus flat fee, Euro area, TEUR



Source: JRC estimates

It is worth noting that a *safeguard clause* would be introduced to guarantee that all small banks pay the minimum between the lump sum associated to the bucket in which they fall and the flat fee. This is to avoid that the very smallest banks could be penalized by the lump sum system.

Another important concern that may arise when comparing a bucketing system (discrete) with the flat fee (continuous) is the existence of a cliff effect between the highest lump sum and the flat fee that a bank right above the threshold of 300 million Euro of BRRD base would pay. As Figure 3 shows, the 6-bucket system sets an adequate progression over the BRRD base, effectively limiting the scope for a cliff effect in the Euro area.

Furthermore, it is important to analyse whether the proposed special regime effectively reduces the contributory burden of the smallest banks in view of their low risk profile. Table 8 below reports the overall contributions that would be paid by small banks under the flat fee and the 6-bucket system. Results are reported both in thousand Euros and as a share of the total annual target. The last column presents the overall risk-based reduction given to small banks when moving from the flat contribution to the 6-bucket system. For example, -71% is the percentage variation in small banks' aggregate contributions for the Euro area (i.e. (18,451-63,269)/ 63,269)).

Table 4: Annual contributions of small banks[8]

	Small banks - Overall Flat fee		Small banks - Overall lump sums		Reduction when moving from the flat fee to the lump sum
	TEUR	as % of annual target	TEUR	as % of annual target	
Euro area	**63,269**	**1.0287%**	**18,451**	**0.3000%**	**-71%**
BG	2,416	10.32%	199	0.85%	-92%
CZ	200	0.25%	10	0.01%	-95%
DK	1,445	0.79%	215	0.12%	-85%
HR	75	36.67%	74	36.21%	-1%
HU	200	1.70%	22	0.19%	-89%
LT	275	3.95%	24	0.34%	-91%
PL	3,453	3.61%	465	0.49%	-87%
RO	610	1.89%	31	0.10%	-95%
SE	1,722	0.84%	435	0.21%	-75%
UK	1,398	0.13%	939	0.09%	-33%

Source: JRC estimates

An equivalent result (70% overall reduction in the contribution of the smallest banks) would be obtained if applying to this group a risk adjustment of 0.3. As a result, the actual, effective ratio between the highest and lowest risk adjustment factors would be much higher than 1.875 (i.e. 1.5/0.8).

It must be noted that the overall reduction in the contributions of small banks is not the same across the Euro area and non-participating Member States. In particular, for Croatia the lump sums are too high when compared to the estimated flat fees of small banks, which triggers the safeguard clause in 12 out of 15 cases, thereby yielding an insignificant aggregate reduction in the contributions of small banks.

Finally, Table 9 shows that this sizeable risk-based reduction in the contributions of the smallest banks would only entail a minor additional burden for all the other banks: an increase

[8] A detailed breakdown by participating Member State is presented in Annex IV: Contributions of Small Banks in Participating Member States.

in contributions in the order of 0.7% in the Euro Area. A small additional burden for every other bank translates in a big overall reduction for the smallest banks.

Table 5: Annual additional payment (as a share of flat fee) by all other banks when introducing the special regime for small banks

Economic area	Additional burden for each other bank
Euro area	+ 0.72%
BG	+ 10.56%
CZ	+ 0.23%
DK	+ 0.68%
HR	+ 0.73%
HU	+ 1.54%
LT	+ 3.75%
PL	+ 3.24%
RO	+ 1.83%
SE	+ 0.64%
UK	+ 0.04%

Source: JRC estimates

Bulgaria stands out for the particularly high estimated additional burden that would be placed on all other banks when introducing the 6-bucket system. This is probably due to the fact that a sizeable estimated reduction in small banks' contributions (-92%) is distributed among other banks which are not very big (the biggest bank in Bulgaria has a BRRD base of Euro 3.5 billion only).

In order to maintain a levelled playing field in the internal market, it is not possible to tailor the lump sums to Member States individually. On the contrary, these estimates confirm that the application of the principle of proportionality holds in the EU as a whole, even though some variation across Member States exists[9].

5) ADDITIONAL RISK FACTORS AND THE CONTRIBUTIONS OF THE LARGEST BANKS

This Section shows results for the risk-adjusted contributions of the biggest banks in the EU when including the "Additional risk factors" pillar. Results are compared with those based upon the first three pillars only. The list of indicators is described in Table 10 below: since the indicators for trading activities, off-balance sheet exposures and derivatives, and complexity and resolvability, can weigh up to 18% of the total composite risk indicator, and since the indicators for IPS membership and extarordinary public financial support are not modelled, these four additional indicators are assigned a weight of 18%/98%.

[9] Figures comparing the flat fees to lump sums in non-participating Member States are presented in Annex V.

Table 6: Balance sheet ratios and *de facto* weights used when introducing the "Additional risk factors" pillar

Pillar / Indicator	**Effective weight**
Pillar: Risk exposure	51.02%
Indicator: RWA over Total Assets	*33.33%*
Indicator: Leverage ratio (Common equity over Total Assets)	*33.33%*
Indicator: Capital ratio (Total regulatory capital over RWA)	*33.33%*
Pillar: Stability and variety of the sources of funding and unencumbered highly liquid assets	20.41%
Indicator: Loan to Deposits (Customer loans over Customer deposits)	*100%*
Pillar: Importance of an institution to the stability of the financial system or economy	10.20%
Indicator: Share of interbank loans and deposits to the system (Interbank loans + interbank deposits)/sum(Interbank loans + interbank deposits) at EU level	*100%*
Pillar: Additional risk factors to be specified by the resolution authority based on the remaining elements covered by Article 103(7) of the BRRD.	18.37%
Indicator: Trading activities	*25%*
Indicator: Off-balance sheet exposures	*25%*
Indicator: Derivatives	*25%*
Indicator: Complexity and resolvability	*25%*

All indicators in the additional pillar enter the calculations with positive sign. As quantitative data on the additional pillar are not available, the Commission services artificially created the indicators, under the assumption that larger banks would tend to have higher values. Therefore, the maximum value was attributed to the largest banks in the EU and all the remaining institutions were assigned the average value of all the other indicators among themselves. The criterion to select the largest banks is the following: banks are sorted within each economic area from largest to smallest in terms of total assets, and the largest are selected up to those covering 65% of the total assets, provided that each selected bank holds more than 30 bn€. This approach is loosely in line with figures produced for the banking structural reform[10] and it leads to select the number of banks shown in Table 11.

[10] See Annex A8 of the Commission Staff Working Document Impact Assessment Accompanying the document Proposal for a Regulation of the European Parliament and of the Council on structural measures improving the resilience of EU Credit Institutions and the Proposal for a Regulation of the European Parliament and Council on reporting and transparency of securities financing transactions (http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52014SC0030&from=EN).

Table 7: Geographical distribution of the "riskiest" banks

Economic Area	Number of selected "riskiest" banks
Euro Area	61
CZ	2
DK	1
GB	5
PL	2
SE	2
TOTAL	**73**

Source: JRC estimates

As the values of the indicators for the additional pillar have been created *ad hoc*, results should be carefully read because they might change once actual data becomes available.

The 73 largest banks in the EU account for a very large part of the total population in most of the economic areas (Euro Area, Denmark, UK and Sweden, where they represent more than 50% of total assets and of BRRD base), while they are slightly less representative in the Czech Republic and Poland. Further details are reported in Table 12 below.

Table 8: Statistics on the very biggest banks

Economic area	Aggregated TA		Aggregated BRRD base	
	TEUR	as % of overall TA in the economic area	TEUR	as % of overall BRRD bases in the economic area
Euro Area	17,483,597,521	64.87%	13,871,841,749	68.82%
CZ	65,200,852	39.07%	31,507,056	35.40%
DK	315,957,333	55.77%	224,180,702	59.44%
GB	5,366,351,945	64.16%	4,544,375,612	64.84%
PL	83,504,251	28.82%	51,662,896	28.17%
SE	422,000,706	50.45%	318,640,260	52.65%

Source: JRC estimates

Table 13 shows some statistics on the percentage variation in contributions when moving from 3 pillars to 4 pillars. Results show that on average, banks contributions increase from a few percentage points to more than 20%.

Table 9: Statistics on the percentage variation in contributions of the largest banks when moving from 3 pillars to 4 pillars

	Statistics on the percentage variation in contributions					
	Euro Area	**CZ**	**DK**	**UK**	**PL**	**SE**
Average	2.4%	7.71%	1.15%	3.17%	21.84%	8.32%
Median	1.8%	7.71%	1.15%	3.52%	21.84%	8.32%
min	-3.8%	6.86%	1.15%	0.84%	13.26%	3.02%
max	23.4%	8.57%	1.15%	4.76%	30.43%	13.61%

Source: JRC estimates

The results for the Euro Area need a more in-depth analysis. Most of these banks increase their contributions, but there are 12 banks whose contributions decrease, though their composite indicators increase. This happens because of the following:

- the absolute risk (expressed via the risk indicator) increases, as expected, for all the selected banks, but final risk-adjusted contributions depend upon the relative share of risk;

- some of these banks significantly increase their absolute risk, while others do so to a smaller extent. When computing the risk-adjusted contributions, which reflect the relative riskiness of each bank, the former will face a sizeable increase in their contributions, while the latter will face a moderate increase in their contributions and in some cases they might even benefit from a reduction in their contributions.

In order to provide some additional statistics on this characteristic, Table 14 shows the percentage range of variation of the absolute risk indicator, the rescaled risk indicator and the final risk contributions for the selected banks in the Euro area facing an increase in their contributions and for those facing a reduction. The figures demonstrate that those benefiting from a reduction are those facing a slight increase in the risk indicator (in the range 2% - 11%), with respect to the other group (from 12% to 113%).

Table 10: Percentage ranges of variations for Euro area for banks increasing and decreasing their risk-adjusted contributions

	Range of % variation in the absolute CI	**Range of % variation in the CI rescaled over [0.8-1.5]**	**Range of % variation in risk contributions**
Banks increasing contributions	[12% 113%]	[6% 30%]	[0.1% 23%]
Banks reducing contributions	[2% 11%]	[1% 5%]	[-4% -0.1%]

Source: JRC estimates

Artificially increasing the pillar for selected banks also has an impact on the remaining big banks[11]: all those banks benefit from a reduction in their contributions (ranging on average from -1% to around -10%) when moving from three to four pillars. Selected statistics on this reduction can be found in Table 15.

Table 11: Statistics on the percentage variation in contributions of the "non-largest" big banks[12] when moving from 3 pillars to 4 pillars

	Statistics on the percentage variation in contributions					
	Euro Area	**CZ**	**DK**	**UK**	**PL**	**SE**
Average	-5.38%	-4.38%	-1.11%	-5.85%	-7.90%	-9.58%
Median	-5.29%	-4.20%	-1.00%	-5.75%	-7.87%	-9.67%
min	-7.50%	-7.66%	-2.55%	-7.50%	-8.60%	-11.06%
max	-4.80%	-1.58%	-0.41%	-5.05%	-7.04%	-8.21%

Source: JRC estimates

6) ESTIMATES BY SIZE GROUP

This Section presents estimates of the contributions by size group. While the contributions of small banks are calculated on the basis of lump sums as described in Section 4), all other banks (hereafter referred to as "big banks" for convenience), i.e. those banks with a BRRD base greater than 300 million Euro or Total assets greater than 1 billion Euro, will pay risk-adjusted contributions.

a) DESCRIPTION OF THE BIG BANKS

According to this definition, Table 16 reports some basic figures on big banks for each economic area. Table 18 summarize the distribution of the Total assets and the BRRD bases respectively. These distributions present huge variations. When considering total assets, the ratio of the maximum to the minimum is about 5,000 in the Euro area and in UK; when considering the BRRD base, this ratio peaks at 22,000 in the Euro area and reaches as high as 160,000 in Denmark. Also, the distributions present very long right tails (the mean is almost always above the median and for many economic areas it is even above the third quartile).

[11] The term "big banks" refers to all banks not classified as small as per Section 4).

[12] The term "big banks" refers to all banks not classified as small as per Section 4).

Table 12: Basic figures on big banks

Economic area	Number of banks			Total Assets			BRRD base		
	All banks	Big banks	Big banks (as % of total number of banks)	All banks (TEUR)	Big banks (TEUR)	Big banks (as % of TA all banks)	All banks (TEUR)	Big banks (TEUR)	Big banks (as % of BRRD base all banks)
Euro area	3,943	1,749	44%	26,952,013,485	26,501,924,619	98.3%	20,155,820,108	19,950,043,752	99.0%
BG	24	14	58%	39,270,243	35,336,297	90.0%	15,865,362	14,228,121	89.7%
CZ	23	20	87%	166,882,156	165,641,978	99.3%	88,993,553	88,775,036	99.8%
DK	70	32	46%	566,547,859	558,583,787	98.6%	377,124,381	374,129,194	99.2%
HR	21	6	29%	7,012,864	4,448,917	63.4%	5,957,418	3,772,691	63.3%
HU	12	7	58%	39,384,364	38,555,944	97.9%	26,148,415	25,702,854	98.3%
LT	7	4	57%	16,878,730	16,217,947	96.1%	9,559,361	9,182,009	96.1%
PL	245	35	14%	289,793,612	278,464,260	96.1%	183,366,909	176,751,874	96.4%
RO	25	17	68%	65,695,654	64,293,028	97.9%	33,293,416	32,664,921	98.1%
SE	64	21	33%	836,497,962	822,156,103	98.3%	605,233,004	600,133,767	99.2%
UK	177	115	65%	8,364,505,719	8,350,294,643	99.8%	7,008,941,282	6,999,775,525	99.9%

Source: JRC estimates

Table 13: Summary statistics on Big banks' total assets per economic area, TEUR

Economic area	Total assets					
	min	25th percentile	median	75th percentile	max	average
Euro area	348,859	929,401	1,787,141	5,009,897	1,723,459,000	15,152,616
BG	700,736	1,191,853	2,357,157	3,223,111	6,472,304	2,524,021
CZ	801,116	2,900,874	3,748,431	2,900,874	32,863,763	8,282,099
DK	705,669	1,078,465	2,065,650	1,078,465	315,957,333	17,455,743
HR	354,835	405,473	414,831	922,954	1,769,738	741,486
HU	926,211	1,411,918	1,886,513	5,070,745	22,777,895	5,507,992
LT	849,011	2,727,749	4,414,133	5,740,871	6,540,670	4,054,487
PL	525,695	1,373,279	4,127,224	10,278,079	47,224,675	7,956,122
RO	579,080	1,063,319	1,555,801	5,638,767	15,867,911	3,781,943
SE	662,285	1,466,041	5,836,870	18,879,969	221,025,879	39,150,291
UK	378,179	975,281	2,604,007	15,841,186	1,806,937,831	72,611,258

Source: JRC estimates

Table 14: Summary statistics on Big banks' BRRD base per economic area, TEUR

Economic area	BRRD base					
	min	25th percentile	median	75th percentile	max	average
Euro area	69,123	522,775	1,031,072	3,183,496	1,544,017,886	11,406,543
BG	167,177	566,219	836,181	1,206,797	3,402,258	1,016,294
CZ	126,099	526,637	2,023,126	5,194,030	18,173,681	4,438,752
DK	1,389	49,273	207,383	641,058	224,180,702	5,387,491
HR	309,278	340,800	362,474	764,983	1,505,738	628,782
HU	663,753	1,163,058	1,227,024	3,665,505	14,154,952	3,671,836
LT	712,829	1,767,393	2,323,220	2,851,330	3,822,739	2,295,502
PL	320,746	1,018,877	2,802,704	6,653,889	29,341,269	5,050,054
RO	319,134	667,613	918,643	2,344,824	7,947,751	1,921,466
SE	124,999	184,945	3,900,477	15,528,332	169,752,726	28,577,798
UK	307,052	629,950	1,794,660	12,387,981	1,573,086,254	60,867,613

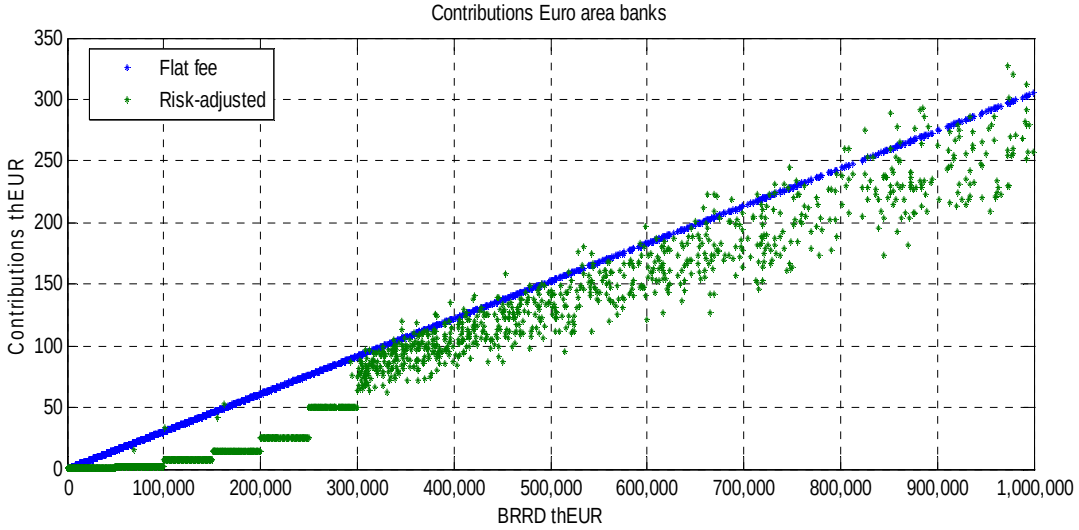
Source: JRC estimates

b) ESTIMATES OF CONTRIBUTIONS BY SIZE GROUP

For each size group, Figure 4 to Figure 7 are scatter plots of the contributions (the flat fee in blue and the risk-adjusted contribution in green) as a function of the BRRD base: each point in the plot represents a bank. Size groups are defined as a function of the BRRD base as follows:

- S: from the minimum BRRD base to 1 billion Euro;
- M: from 1 billion Euro to 25 billion Euro;
- L: from 25 billion Euro to 500 billion Euro;
- XL: from 500 billion Euro to the maximum BRRD base.

Figure 4: Zoom on S category (BRRD base up to 1 bill EUR), Euro area, TEUR



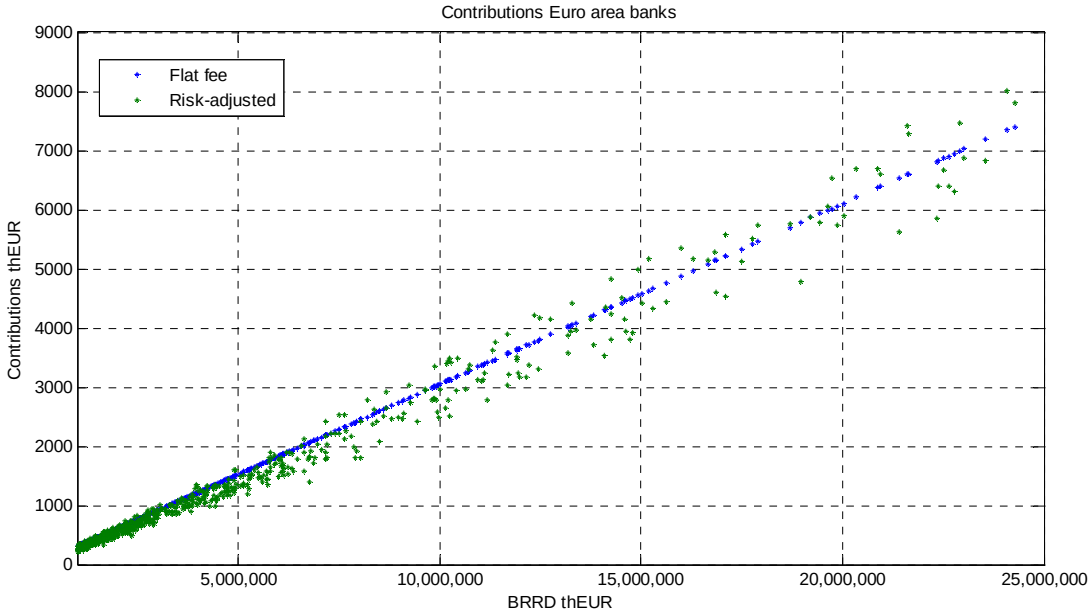
Source: JRC estimates

Figure 4 above shows that the vast majority of the “smallest big banks” gets a reward from the risk-adjustment, as almost always these banks pay less than the flat fee.

Furthermore, Figure 4 shows that by virtue of this trend the cliff effect between small and big banks almost disappears. Finally, it seems that the lump sums are calibrated in a proper way, as no risk-adjusted contribution falls below the lump sums: in other words, there is no negative cliff effect, i.e. no big bank pays less than any small bank.

Figure 5 below zooms in the "medium size" banks (BRRD base from 1 billion EUR to 25 billion EUR). It seems that the risk adjustment still tends to grant a reward, especially for the banks with a BRRD base up to 10 billion EUR.

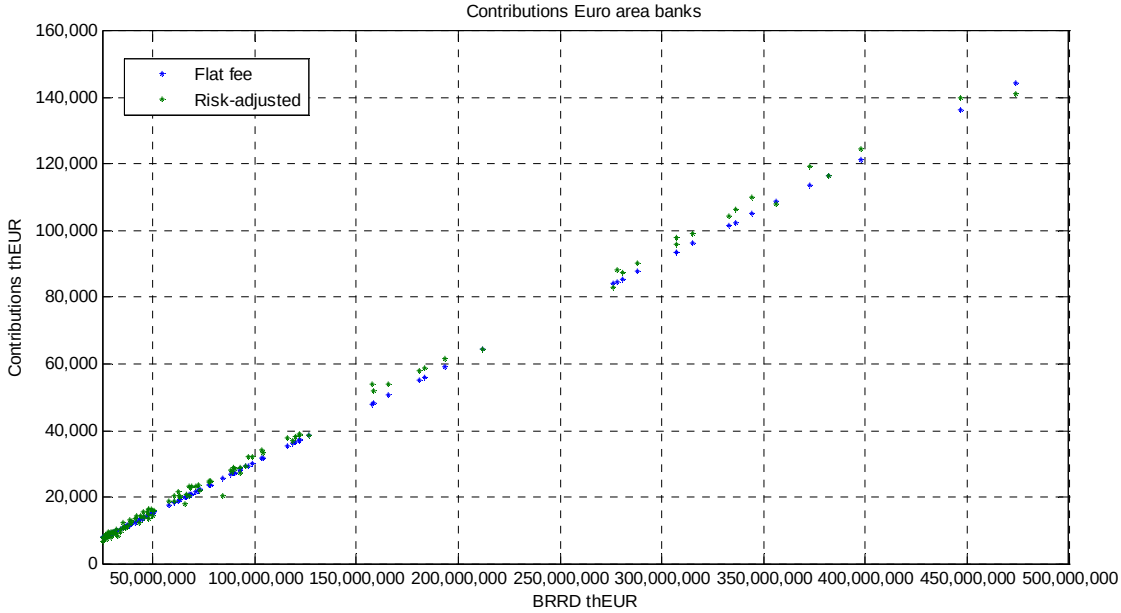
Figure 5: Zoom on M category (BRRD base from 1 bill EUR up to 25 bill EUR), Euro area, TEUR



Source: JRC estimates

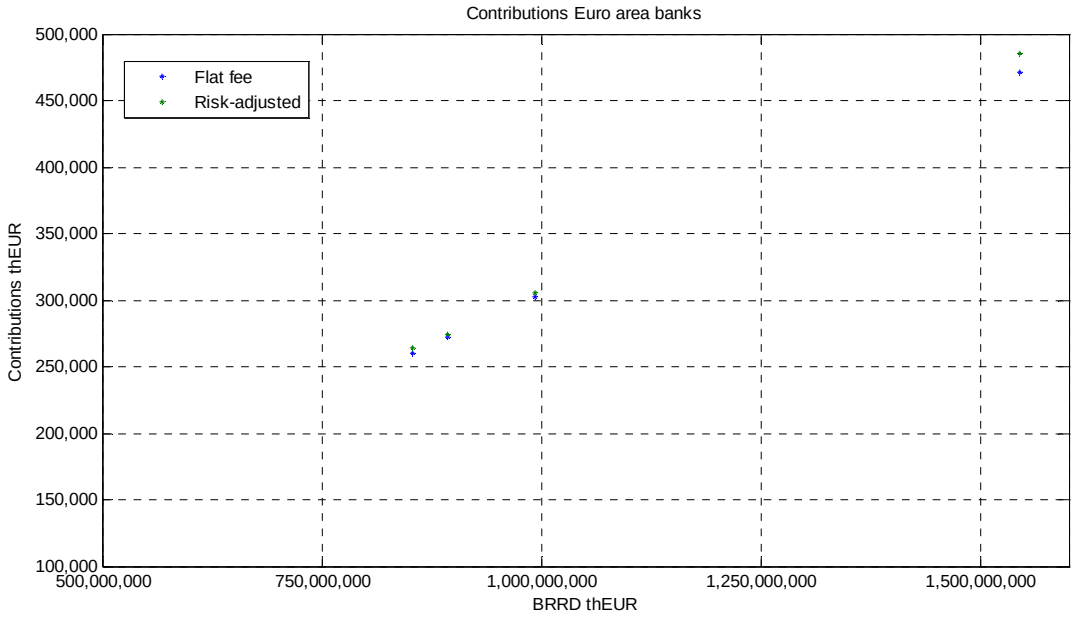
The large banks (BRRD base from 25 billion Euros up to 500 billion Euros) are represented in Figure 6 below. The graph shows that for this size category the risk adjustment generally works as a punishment. Moreover, this result holds true for the biggest banks depicted in Figure 7.

Figure 6: Zoom on L category (BRRD base from 25 bill EUR up to 500 bill EUR), Euro area, TEUR



Source: JRC estimates

Figure 7: Zoom on XL category (BRRD base from 500 bill EUR up to the maximum value), Euro area, TEUR



Source: JRC estimates

As a conclusion, Figure 4 to Figure 7 show that larger banks (in the L and XL categories) tend to consistently get an upwards risk adjustment, while smaller banks (in the S and M categories) tend to get a downwards risk adjustment. The magnitudes of the risk adjustment tend to be distributed in a more concentrated fashion among larger banks, while they display a wider variation among smaller banks.

7) EXAMPLE BANKS: HOW CONTRIBUTIONS WORK

This Section illustrates, by virtue of providing the estimated calculation of contributions of some banks based on actual data, the mechanics of how contributions will work. This is the result of the combination of three main elements: the BRRD base, the risk profile, and the Member State of the bank.

In order to show how the risk adjustment works, Table 19 below highlights, for each size category as defined in Section 6), the cases of some example banks with similar size and different riskiness.

Table 15: Example banks with similar size and different risk profile, by size category, Euro area, TEUR

Size category	BRRD base TEUR	Riskiness	Flat fee TEUR	Risk-adjusted Contribution TEUR	Variation (from the flat to the risk-based)
S	664,608	0.8248	204	127	-38%
	661,894	1.4466	203	222	+9%
M	14,727,777	1.1134	4,526	3,808	-16%
	15,178,094	1.4685	4,665	5,176	+11%
L	276,134,623	1.2975	84,868	83,206	-2%
	277,859,551	1.3695	85,399	88,374	+3%

Source: JRC estimates

Table 20 and Table 21 illustrate that similar banks, both in terms of size and riskiness, pay a similar fee if they contribute to the same resolution financing arrangement. On the contrary, contributions can significantly vary between banks with similar size and risk profile if they contribute to different resolution financing arrangements.

Table 16: Example banks with similar size and similar risk profile across different MS in the Euro area

Size category	Country	BRRD base TEUR	Riskiness	Risk-adjusted Contribution TEUR
S	Euro area MS 1	603,715	1.1391	159.70
	Euro area MS 2	605,105	1.1418	160.45
M	Euro area MS 1	16,292,099	1.3653	5,165.84
	Euro area MS 2	16,659,950	1.3284	5,139.63
L	Euro area MS 1	333,278,465	1.3481	104,340.34
	Euro area MS 2	336,207,073	1.3625	106,377.66

Source: JRC estimates

Table 17: Example banks with similar size and similar risk profile, one in the Euro area and other two in non-participating MS

Size category	Country	BRRD base TEUR	Riskiness	Risk-adjusted Contribution TEUR
S	Euro area MS 1	661,894	1.4466	222
	Non-Euro area MS 1	665,007	1.4490	109
	Non-Euro area MS 2	658,814	1.1569	261
M	Euro area MS 1	22,923,458	1.4042	7,476
	Non-Euro area MS 1	22,100,895	1.3163	3,304
	Non-Euro area MS 2	22,224,291	1.4545	11,082
L	Euro area MS 1	276,134,623	1.2975	83,206
	Non-Euro area MS 1	261,623,219	1.5000	44,570
	Non-Euro area MS 2	224,180,702	1.4738	113,267

Source: JRC estimates

8) TENTATIVE ESTIMATES OF INTRAGROUP LIABILITIES

As there is a need to assess the potential impact of intragroup liabilities in the calculation of the BRRD base, this Section provides a description of a tentative estimation procedure for intragroup liabilities at Member State level.

In the absence of bank-level data on intragroup liabilities, a first possibility is given by summary statistics on the distribution of interbank deposits, as they appear in the final database described in Section 2. This is an upper bound proxy for intragroup liabilities[13]. While as a proxy interbank deposits almost surely provide a large overestimation of intragroup liabilities, they should be very positively correlated to actual values (i.e. countries with much higher value of interbank deposits should also be those with high levels of intragroup linkages). While these statistics provide a sensible appreciation of the variation that could exist in intragroup linkages, in order to provide a better approximation of the orders of magnitude involved an alternative estimation methodology is applied based on aggregate statistics from the BIS and the ECB.

"Small banks" (BRRD base less than 300 m Euro) are excluded from this analysis. These banks are excluded as they are very numerous and are often not active in the interbank market (with some exceptions in some countries) so that including them would lead to a biased estimate of the mean and median, which would not be representative of the typical values of the banks which do participate in interbank/intragroup exchange activities.

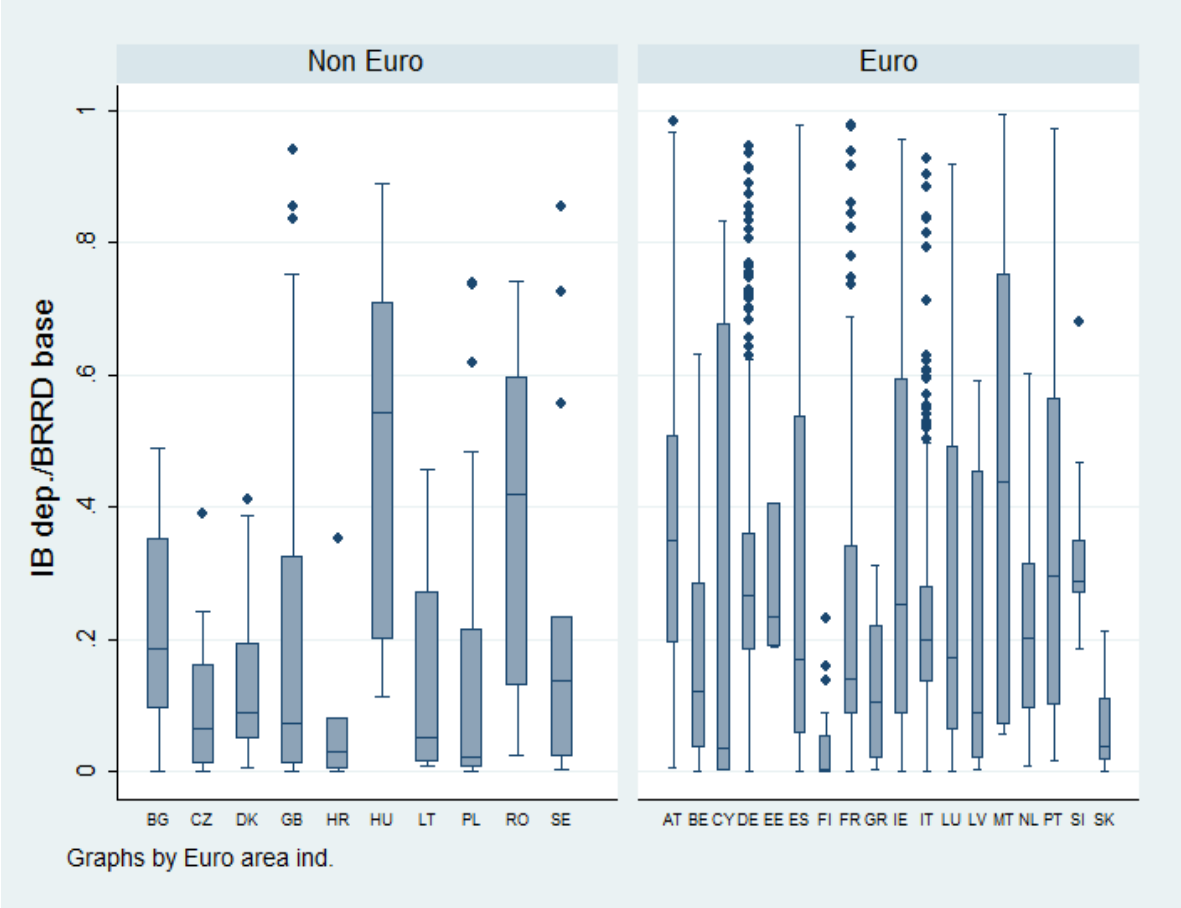
a) PROXYING INTRAGROUP VIA THE DISTRIBUTION OF MICRO-LEVEL INTERBANK DATA

The following graphs and tables present results in terms of BRRD base (defined as total assets excluding own funds minus covered deposits).

[13] Though not all intra-group liabilities take the form of interbank deposits, these should be the most common form.

Figure 8 is a box plot of the ratio of interbank liabilities to BRRD base for each Member State, grouped by membership in Euro area. In the graph, the lower and upper limits of the box identify the 1st and 3rd quartile (one fourth of all banks have a value of the ratio which is lower than the 1st quartile, and one quarter of all banks have a value of the ratio which is higher than the 3rd quartile), the line in the box denotes the median (the value which splits the sample in two identical parts: half of the banks have a value of the ratio which is lower than the median, and half of the banks have a value which is higher), and the limits of the lower and upper whiskers denote the lowest and highest points which can be considered "normal" given the shape of the distribution[14]. All individual points outside the whiskers are outliers: actual points which are "unexpected" given the shape of the rest of the distribution for that particular Member State. The biggest is the distance between the extremes of the box, the more spread-out is the distribution and the least the median and the mean can be considered "representative" of all other banks within the country which are not considered "outliers" (i.e. those banks represented as individual points).

Figure 8: Box plot of interbank deposits over BRRD base, excluding "small banks" (BRRD base<300m Eur)



[14] This depends on the assumptions on the general shapes of statistical distributions employed to assess it. Here we use the classical Tukey definition of the box plot: the end points of the whiskers coincide with the lowest and highest actual points which fall within 1.5 times the inter-quartile range from the 1st and 3rd quartiles. The inter-quartile range being the distance between the 1st and the 3rd quartile.

How to read the box-plot, an example: in BE about a quarter of all banks have a ratio of Interbank liabilities to BRRD which is lower than roughly 5% (3.47%, see table 1.1 under); half of all banks in the sample have a ratio which is lower than about 10% and about half of the banks have a ratio which is above it; about a quarter of all banks have a ratio which is above about 30% (i.e. three quarters of all banks lie below this value); the bank with the highest value which is "not unexpected" given the general shape of BE distribution has a ratio of about 65%, and there are no banks with higher values; the bank with the lowest value has a value of about zero, and there are no banks with a lower value.

Table 22 contains summary statistics for the interbank deposits to BRRD base ratio for all Euro area Member States. The table reports the average, the standard deviation (a measure of the "spread" of the distribution: the higher this value the less representative of the whole distribution the mean can be considered to be[15]) and four key measures of the boxplot graph shown above: the first quartile, the median, the third quartile and the interquartile range (i.e. the difference between the third and first quartiles, another measure of the spread of the distribution). The table also reports the minimum and maximum value for each country.

Table 19Table 23 reports the same information for non-Euro area MS.

Table 18: Summary statistics for interbank deposits over BRRD base, excluding "small banks" (BRRD base <300m) - Euro area

Country	mean	standard deviation	1st quartile	median	3rd quartile	Interquartile range	min	Max
AT	36.31%	22.94%	19.54%	35.09%	50.85%	31.31%	0.52%	98.37%
BE	18.16%	17.02%	3.47%	12.24%	28.64%	25.17%	0.01%	63.30%
CY	24.17%	35.63%	0.00%	3.68%	67.72%	67.72%	0.00%	83.30%
DE	28.26%	15.41%	18.25%	26.73%	35.99%	17.74%	0.00%	94.67%
EE	27.64%	11.48%	18.77%	23.54%	40.60%	21.83%	18.77%	40.60%
ES	29.88%	30.95%	5.65%	16.99%	53.89%	48.25%	0.00%	97.85%
FI	3.95%	6.62%	0.01%	0.12%	5.47%	5.46%	0.00%	23.21%
FR	24.24%	24.32%	8.81%	14.07%	34.16%	25.36%	0.00%	97.91%
GR	12.25%	11.21%	1.88%	10.48%	22.12%	20.25%	0.27%	31.19%
IE	35.93%	31.02%	8.77%	25.24%	59.34%	50.56%	0.03%	95.76%
IT	23.30%	16.25%	13.45%	20.05%	28.09%	14.63%	0.20%	92.86%
LU	28.11%	27.02%	6.23%	17.34%	49.37%	43.14%	0.00%	92.07%
LV	21.85%	23.93%	1.99%	8.93%	45.49%	43.50%	0.42%	59.22%
MT	42.20%	36.62%	6.99%	43.98%	75.39%	68.40%	5.81%	99.59%
NL	22.85%	16.88%	9.49%	20.26%	31.53%	22.04%	0.95%	60.24%
PT	36.55%	31.15%	9.95%	29.56%	56.41%	46.45%	1.79%	97.41%
SI	32.93%	13.61%	27.05%	28.96%	34.96%	7.91%	18.68%	68.15%
SK	6.92%	7.02%	1.63%	3.94%	11.03%	9.40%	0.00%	21.20%
Total	27.14%	19.38%	13.92%	23.64%	35.54%	21.62%	0.00%	99.59%

Source: JRC estimates

[15] Values of the same magnitude of the mean roughly imply that almost 20% of all banks would have a value at least double than the mean itself. This under the assumption that the distribution has a Normal Distribution (i.e. Gaussian) shape.

How to read the table, an example: in AT the average interbank liabilities over total assets is 36.3%; the distribution is relatively spread out. As with the boxplot: 25% of AT banks have a value of the ratio below roughly 19%, half of all banks have a value below 35% and three quarters of the banks have a value below 50.8%. The interquartile range is equal to 31%. The minimum value for all banks which are not “small” for our purposes (i.e with a BRRD base above 300 m EUR) is almost zero, while the biggest observed value is around 98%.

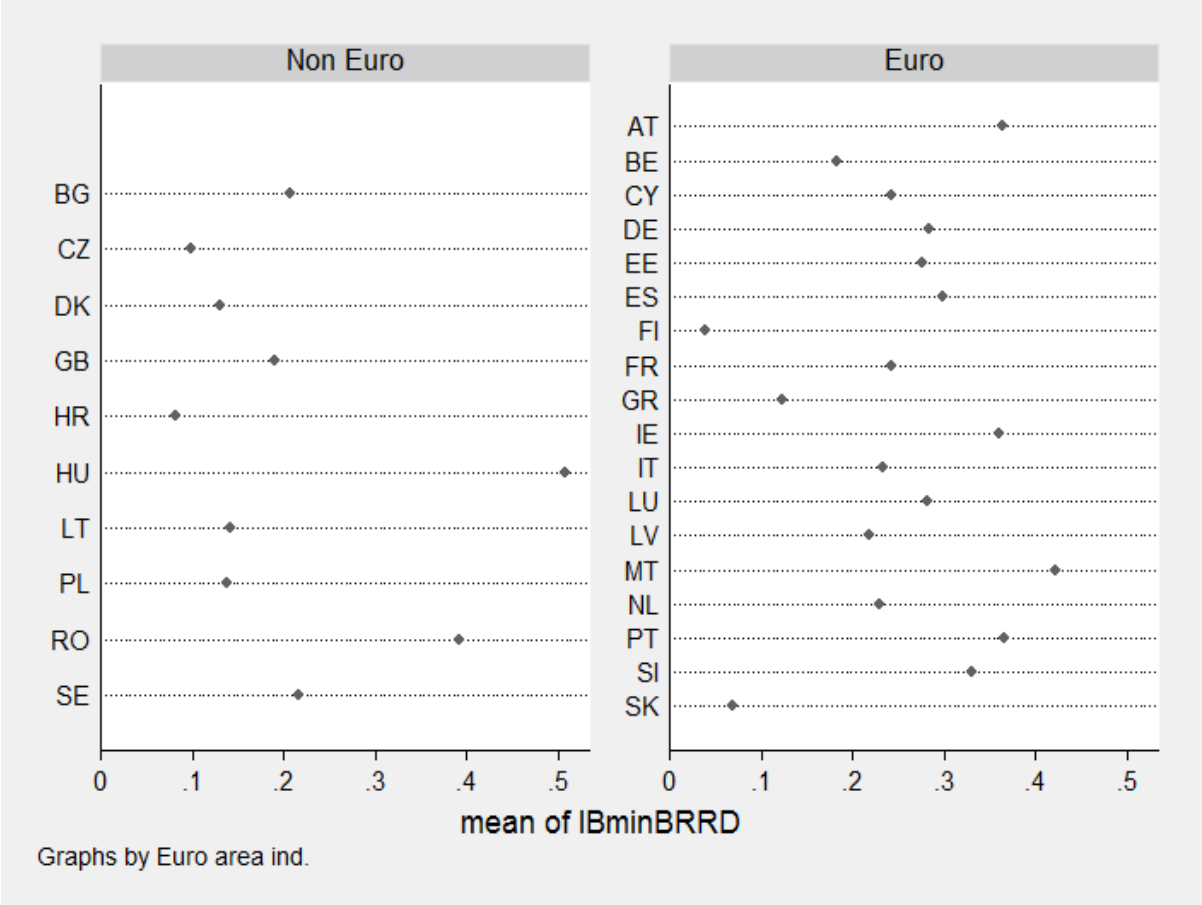
Table 19: Summary statistics for interbank deposits over BRRD base, excluding "small banks" (BRRD<300m) - Non-Euro area

Country	mean	standard deviation	1st quartile	median	3rd quartile	Interquartile range	min	Max
BG	20.70%	15.63%	9.52%	18.71%	35.35%	25.83%	0.20%	49.08%
CZ	9.92%	10.53%	1.13%	6.49%	16.12%	14.99%	0.00%	39.16%
DK	12.94%	10.90%	4.87%	8.94%	19.35%	14.48%	0.62%	41.20%
GB	18.93%	23.40%	1.06%	7.24%	32.64%	31.58%	0.00%	94.09%
HR	8.25%	13.57%	0.33%	2.93%	8.11%	7.78%	0.01%	35.17%
HU	50.70%	28.44%	20.04%	54.46%	70.88%	50.84%	11.41%	89.13%
LT	14.21%	21.24%	1.33%	5.19%	27.10%	25.77%	0.82%	45.66%
PL	13.84%	21.94%	0.72%	2.21%	21.68%	20.96%	0.00%	74.06%
RO	39.25%	24.50%	12.89%	42.10%	59.84%	46.95%	2.43%	74.25%
SE	21.70%	27.29%	2.23%	13.66%	23.56%	21.33%	0.25%	85.44%

Source: JRC estimates

Figure 9 offers a visual summary of the average values from the table above, for Euro area and non-Euro area Member States.

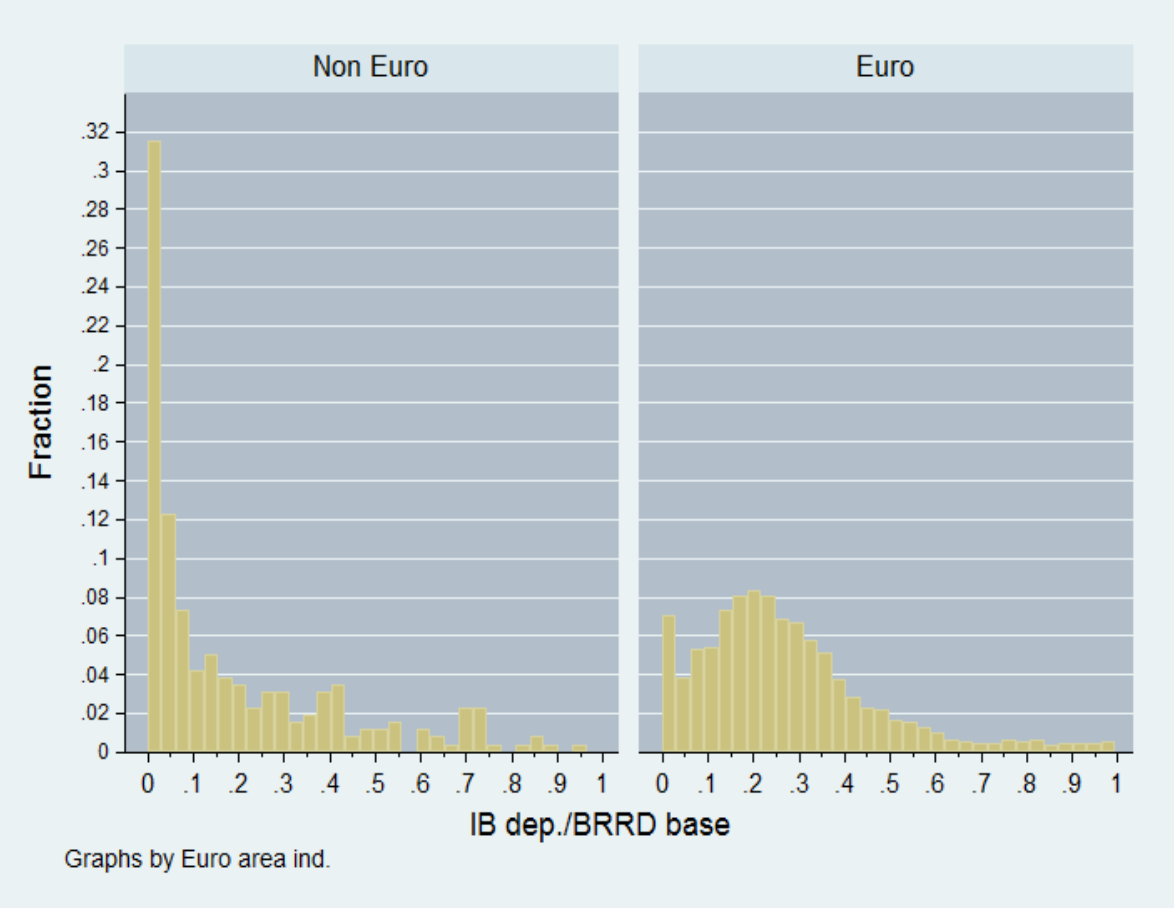
Figure 9: Means of interbank deposits over BRRD base by Member State, excluding "small banks" (BRRD<300m)



Source: JRC estimates

Figure 10 shows a histogram for the distribution of the value of the interbank deposits to BRRD base for the Euro area and non-Euro area. The height of each bar represents the share of all banks in each area possessing a value of the ratio comprised between those falling at the hedges of each bar.

Figure 10: Histogram of the distribution of values of interbank deposits over BRRD base, excluding "small" banks (BRRD>300m), for Euro area and non-Euro area

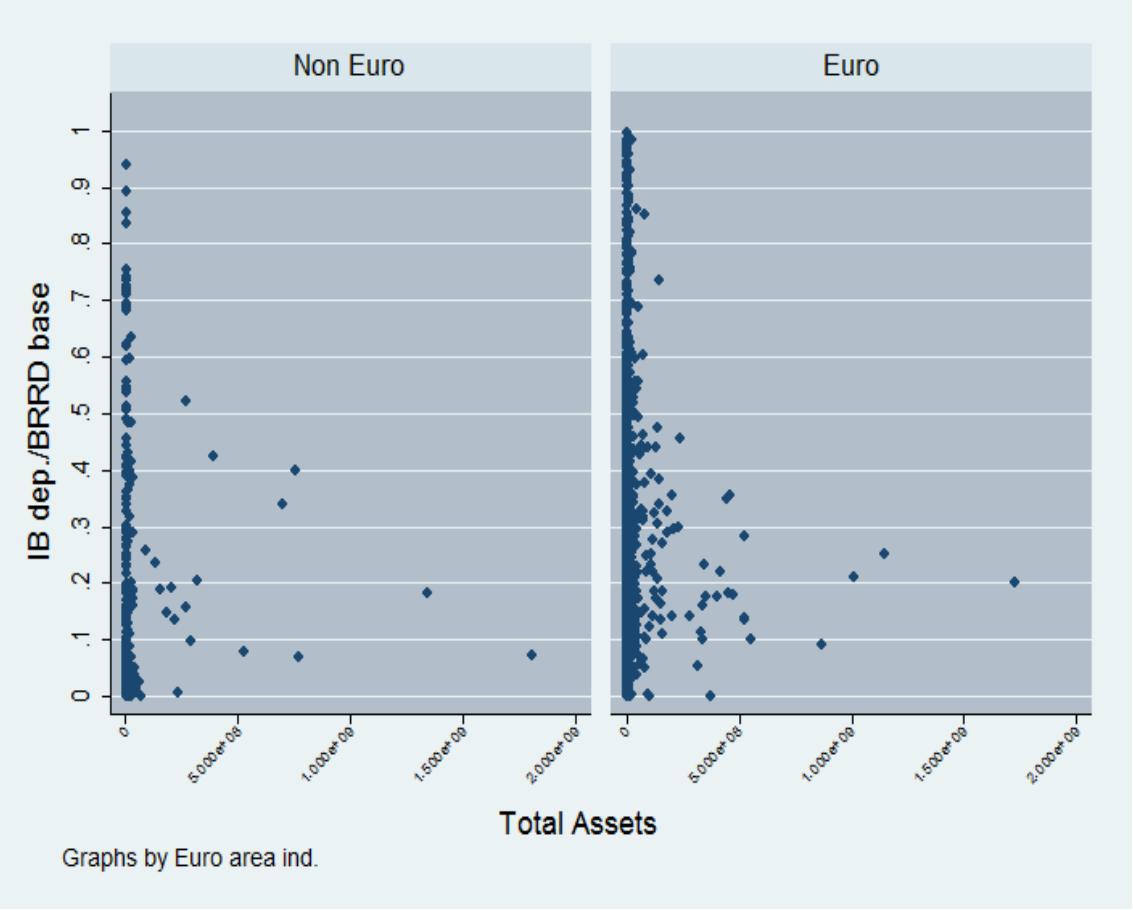


Source: JRC estimates

How to read the histogram, an example: in the Euro area roughly 8% of all banks have a value of the interbank deposits to total assets ratio which is between roughly 22% and 25%, and another 7% of all banks have a value of the ratio between 25% and roughly 28%. About 1% of all banks have a value of the ratio roughly between 75% and 81%.

Finally, Figure 11 illustrates the relationship between the interbank deposits to total assets ratio, and the size of institutions in terms of total assets. The horizontal axis reports total assets in thousands of Euro (i.e. a value of 5 followed by 8 zeros corresponds to 500 billion Euro, the biggest bank has total assets of roughly 1.5 trillion Euro). It is possible to see that the largest banks tend to have values of the ratio of interbank deposits over BRRD base which are relatively lower than the mass of other banks, but which can be non-negligible (i.e. about 25% for banks in the Euro area)

Figure 11: Scatterplot of values of interbank deposits over BRRD base vs. total assets, excluding "small" banks (BRRD>300m), for Euro area and non-Euro area



Source: JRC estimates

b) ESTIMATING INTRAGROUP LIABILITIES BY MEANS OF BIS AND ECB STATISTICS

Intragroup liabilities can also be estimated as a share of interbank deposits by using some ratios from BIS and ECB statistics on interbank to intragroup deposits[16]. This Section is an update with respect to the estimates presented in Working Document CEGBPI/BANK/67/2014. The update was performed on the basis of the final version of the database as described in Section 2, and of alternative methodological steps[17].

In its international banking statistics[18], the BIS provides a breakdown of international liabilities to foreign banks into liabilities to all foreign banks and liabilities to related foreign offices for 13 Member State (AT, BE, CY, DE, ES, FI, FR, GR, IE, IT, LU, NL, PT).

[16] All data is sourced as of Q1 2014. BIS data is converted from USD to EUR at the exchange rate of 1.33 USD/EUR (Source: AMECO, end 2013 data point).

[17] Previous estimates were computed for all Member States, while now they are presented only for Member States for which BIS data is available (13 Member States). Previously, other Member States were applied the average of those 13. Furthermore, previous estimates had been obtained by virtue of applying averages of intragroup to interbank to all banks' interbank individually, and subsequently re-averaging. In this update, estimates by Member State are also obtained by applying averages of intragroup to interbank to averages of interbank at the Member State level.

[18] http://www.bis.org/statistics/about_banking_stats.htm as of 5 September 2014.

In its MFI statistics[19], the ECB provides data on the amounts of deposit liabilities towards other MFIs for each Euro area Member State, breaking it down into liabilities towards Euro area MFIs, MFIs within the European Union but outside Euro area, MFIs in the rest of the world.

Ignoring the possibly major complication of the different statistical populations involved in the two exercises (credit institutions in the BIS exercise, MFIs including money market funds in the ECB exercise), it is therefore possible to obtain an estimate of intragroup to interbank liabilities by following these steps:

1. Estimate the total interbank for a Member State's banks by summing deposit liabilities of its MFIs to all MFIs within the Euro area, other EU Member States and other foreign countries;

2. Estimate the share of foreign interbank on this total by comparing it to international interbank liabilities obtained from BIS statistics;

3. Estimate the share of intragroup on foreign interbank deposits by comparing BIS data on total foreign interbank and foreign intragroup;

4. Obtain an estimate of the share of intragroup on domestic interbank by applying a "correction factor" to the estimate for the share of intra-group on foreign interbank obtained above. In this case the correction is 70%, based on the observation that domestic money market transactions are probably more likely to be conducted on the open interbank market, while foreign transactions are relatively more likely to be conducted with a related office;

5. Finally obtain the share of intragroup liabilities on interbank liabilities as the (weighted) average of the ratios obtained in points 3 and 4.

Table 24 shows the ratio of intra-group liabilities to the BRRD base by Member State. For each Member State, this is obtained by multiplying the ratio of intragroup liabilities to interbank liabilities as per step 5 above to the ratio of interbank liabilities to BRRD base obtained from the final database. This can be done alternatively by multiplying the two average ratios for each Member State (column 2 of Table 24), or by multiplying the average ratio of intragroup to interbank for each Member State to the individual bank-level ratio of interbank to BRRD base, and subsequently taking a BRRD-base-weighted average (column 3 of Table 24). This calculation is executed for the mean and the median. While it is not possible to obtain estimates for the range of variation of these estimates based on the data available, variation for interbank loans data estimated in Section a) could be a considered a proxy.

Based on a similar reasoning, the overall median of the mean could be a good proxy of the impact at Euro area level (based on comparisons of the median of the means and of the total Euro area level mean on interbank data used in Section a)).

[19] Statistics for credit institutions balance sheets do not provide the necessary breakdowns, thus leaving MFI statistics as the only possible choice: https://www.ecb.europa.eu/stats/money/aggregates/bsheets/html/index.en.html as of 5 September 2014.

Table 20: Ratio of intra-group liabilities to BRRD base by Member State

Member State	Intragroup as share of BRRD (product of averages)	Intragroup as share of BRRD (weighted average of products)
AT	3.4%	3.7%
BE	8.0%	13.5%
CY	3.4%	5.9%
DE	16.0%	15.0%
ES	10.0%	5.5%
FI	0.5%	2.0%
FR	12.8%	10.3%
GR	3.1%	4.4%
IE	19.3%	10.2%
IT	8.9%	11.3%
LU	3.5%	5.1%
NL(*)	14.5%	13.4%
PT	9.5%	4.9%
Overall median	8.9%	5.88%

(*) NOTE: For NL, the share of foreign IB would result larger than 100%. This estimate is therefore substituted with the second highest estimated value in the sample before proceeding with the calculations.

Source: JRC estimates

As in Section a), these estimates too suggest that there could be large variations between Member States, which could be further amplified by individual bank-level variation (which cannot be captured in the current analysis). Furthermore, the significant variation in estimates within Member States depending on which methodology is applied (i.e. between column 2 and column 3) indicates that these tentative estimates shall be read with extreme caution.

It should also be noted that these estimates are based on the definition of intragroup used by the BIS in compiling its statistics, and therefore differ from the options considered by the Commission Services along the following lines:

- They cannot capture specific conditions, such as bail-in-ability of the liabilities;
- They cannot distinguish between EU intragroup and non-EU intragroup.

c) ASSESSING INTRAGROUP LIABILITIES BY COMPARING ECB AGGREGATED AND CONSOLIDATED BANKING DATA

Another possible approach to assess the relative magnitude of intragroup links consists of comparing between aggregated and consolidated banking statistics produced by the ECB. This exercise is fraught with problems due to inconsistencies between definitions employed in the two sets of statistics, which are created and used for very different purposes.

This notwithstanding, a comparison is contained in ECB's occasional paper 140 of January 2013 by Borgioli, Gouveia and Labanca: "Financial stability analysis – insights gained from consolidated banking data from the EU"[20].

Tables 4 and 5 in section 3 of the paper in particular compare total interbank loans and deposits and are reported hereunder:

Table 4 from ECB occasional paper 140/2013. Total interbank loans under CBD and MFI statistics

Table 4 Total loans under MFI statistics and CBD, by country, end-2011

(EUR billion)

MFI data		CBD data				Difference	Percentage
Total (1)			Domestic	Foreign	Total (2)	(2) - (1)	difference 1)
BE	691	BE	350	335	685	-6	-1
DE	5,464	DE	4,438	291	4,729	-734	-13
EE	18	EE	0	15	15	-3	-16
IE	696	IE	250	258	508	-187	-27
GR	341	GR	250	71	320	-20	-6
ES	2,371	ES	2,442	246	2,688	316	13
FR	5,137	FR	3,539	88	3,627	-1,510	-29
IT	2,596	IT	1,753	179	1,932	-664	-26
CY	99	CY	63	30	94	-6	-6
LU	600	LU	36	508	543	-57	-9
MT	33	MT	6	27	33	-1	-2
NL	1,704	NL	1,753	166	1,919	215	13
AT	735	AT	592	222	815	79	11
PT	361	PT	290	92	382	21	6
SI	41	SI	28	12	40	-1	-2
SK	40	SK	3	35	39	-1	-3
FI	374	FI	96	131	226	-148	-39
Total EA	21,301	Total EA	15,890	2,705	18,595	-2,706	-13

Sources: ECB and ESCB.
Note: 1) Computed as [(CBD total / MFI total)-1]*100.

[20] http://www.ecb.europa.eu/pub/pdf/scpops/ecbocp140.pdf as of 19 September 2014.

Table 5 from ECB occasional paper 140/2013. Total interbank deposits under CBD and MFI statistics

Table 5 Total interbank deposits under MFI statistics and CBD, by country, end-2011

(EUR billion)

MFI data		CBD data					
Total (1)			Domestic	Foreign	Total (2)	Difference (2) - (1)	Percentage difference[1]
BE	290	BE	53	77	130	-160	-55
DE	1,833	DE	1,216	79	1,295	-537	-29
EE	4	EE	0	5	5	0	6
IE	472	IE	18	94	112	-360	-76
GR	121	GR	11	34	45	-77	-63
ES	687	ES	274	209	483	-203	-30
FR	2,693	FR	637	22	659	-2,034	-76
IT	916	IT	304	82	387	-530	-58
CY	41	CY	6	21	27	-14	-35
LU	375	LU	5	350	355	-20	-5
MT	21	MT	1	19	20	0	-1
NL	419	NL	137	136	273	-146	-35
AT	274	AT	152	55	208	-66	-24
PT	156	PT	23	52	75	-82	-52
SI	15	SI	7	7	14	-1	-4
SK	4	SK	0	2	2	-2	-50
FI	171	FI	7	125	132	-39	-23
Total EA	8,492	Total EA	2,851	1,370	4,221	-4,271	-50

Sources: ECB and ESCB.
Note: 1) Computed as [(CBD total / MFI total)-1]*100.

The ECB paper notes that: *"in Table 4, CBD figures are more than 10% lower than MFI data (in terms of total assets the euro area difference is 2%), highlighting the importance of intra-group loans (that are netted out in CBD). This effect is particularly relevant in the case of Finland, Italy, France and Ireland. In a few countries CBD data actually exceed MFI data, meaning that the intra-group loans effect just described is less present or compensated for by important cross-border branches/subsidiaries."* while *"Table 5 shows that there are very large differences between MFI and CBD interbank deposits figures both at euro area and at country level. CBD values are around 50% lower than MFI values for the euro area as a whole, ranging from -1% in Malta to -76% in Ireland and France. This highlights the role of the group, and in particular of interbank loans, in providing funding in the different countries. Estonia is the only country where values for CBD are higher than MFI values"*

These conclusions, at least in their qualitative part, are in line with those which can be taken by looking at interbank as a proxy for intragroup (Section a)): the distribution is very uneven between different Member States, and the size of intragroup can be relevant compared to other liabilities.

d) CONCLUSIONS

Based on the evidence presented in this Section it can be concluded that, although using interbank deposits as a proxy for intra-group liabilities is probably a rather large over-estimation, there could be specific cases in which the latter could represent a non-negligible amount: in fact, there exists significant variation in interbank deposits between Member States, and such variation is even stronger within Member States, i.e. at the bank level. As a result, the distribution of the impacts of their exclusion from the BRRD base would not be even between Member States and between banks, with some which could be affected sensibly more than others. However, the average prevalence of intragroup liabilities in the Euro area is

estimated to be relatively limited (median of 5.88% or 8.9% of the BRRD base, depending on the methodology used, in 13 Euro area Member States), and the largest banks tend to have lower interbank deposits. Due to their limitations, all the estimates presented in this Section should be read with extreme caution, while still providing some valuable insights.

9) ANNEX I: DETAILED DESCRIPTION OF THE DATA PREPARATION STEPS

Before closing the final database, some imputations are needed and some checks must be performed to delete banks with inconsistencies in the data. Two different treatments are applied to data coming from Bankscope and from the Member States.

a) BANKSCOPE

1. Step 1: RWA estimates from Total and Tier 1 capital and corresponding ratios.

   In Bankscope the following variables are available: Total regulatory capital, Tier 1 capital, Total regulatory capital ratio, Tier 1 capital ratio and RWA.

   Where not available, RWA are estimated (and referred to as RWA*) in one of the following ways:

$$RWA^* = \frac{Total\ Capital}{Total\ Capital\ Ratio} \quad or \quad RWA^* = \frac{Tier\ 1\ Capital}{Tier\ 1\ Capital\ ratio}.$$

2. Step 2: Capital estimates from RWA, RWA* and ratios.

   Matching original available data and RWA* capital is computed as follows:

$$Total\ Capital^* = Total\ Capital\ Ratio * RWA^* \quad or \quad Total\ Capital\ Ratio * RWA$$

$$Tier\ 1\ Capital^* = Tier\ 1\ Capital\ Ratio * RWA^* \quad or \quad Tier1\ Capital\ Ratio * RWA.$$

3. Step 3: Cleaning up the dataset.

   Banks are removed from the sample when they meet at least one of the following criteria:

   - Total assets not available;
   - Common equity not available;
   - Tier 1 capital greater than total assets;
   - Total capital greater than total assets;
   - Common equity greater than total assets;
   - Total capital plus customer deposits greater than total assets.

4. Step 4: Regression to estimate capital.

For every bank specialization[21], the following linear models are employed:

$$Tier\ 1\ Capital^{**} = \beta_0 + \beta_1 * Common\ equity$$

$$Total\ Capital^{**} = \gamma_0 + \gamma_1 * Common\ equity$$

Parameters are estimated by means of a linear regression (without considering outliers) and are applied to estimate capital from common equity.

5. Step 5: RWA estimates with new capital data.

   Using data on capital estimated via the above regressions the same computations as those described in Step 1 are performed.

6. Step 6: Total regulatory capital ratio estimates.

   For those banks without Total regulatory capital ratio, it is approximated with ECB solvency ratios at country level[22].

7. Step 7: RWA estimates with new ratios.

   The same computations as in step 1 are repeated to estimate RWA starting from ECB solvency ratios.

Covered deposits are estimated for all banks starting from deposits and applying the coverage ratio estimated based on DGS data as described in Section 2.

b) MEMBER STATES' DATA

Before proceeding with the checks and assumptions, all the banks with some missing data in at least one of the variables necessary to build the database are deleted.

Assumptions to estimate some missing data:

- Common Equity is approximated with the Common equity Tier 1 or, in case the latter is missing, with Tier 1 capital.
- Total capital is approximated with the sum of Tier 1 and Tier 2 capital.
- If data on covered deposits are missing, they are estimated from customer deposits by applying the average coverage ratio estimated at country level as described in Section 2.

The following checks are performed:

[21] Bankscope provides a classification of banks according to their specialization. For the purpose of the present analysis the following classifications are considered:
- Commercial banks: mainly active in a combination of Retail Banking (Individuals, SMEs), Wholesale Banking (large corporates) and Private banking (not belonging to groups of saving banks, co-operative banks).
- Cooperative banks: banks that have a cooperative ownership structure and are mainly active in Retail Banking (Individuals, SMEs).
- Saving banks: mainly active in Retail Banking (Individuals, SMEs) and usually belonging to a group of savings banks.
- Private banking & asset management companies: banks mainly active in private banking and asset management.
- Real estates and mortgage banks: mainly active in mortgage financing and project development.

[22] https://www.ecb.europa.eu/stats/money/consolidated/html/index.en.html as of 9 September 2014.

- Total assets >Total Capital.
- Total assets >Common equity.
- Total assets > Deposits + total capital (this is a conservative approach to check that the BRRD base is not negative).
- Deposits > Covered deposits.
- Deposits > 0 (otherwise the ratio of loans over deposits cannot be computed).
- Total Capital >0.

If a bank does not fulfil one of the above constraints, it is removed from the database.

c) INDIVIDUAL COMMENTS AND ASSUMPTION ON MEMBER STATES' DATA

AUSTRIA

The final database includes the Member State's data for Austria as the sample provided by the Member State covered all the data necessary to perform the exercise. Based on the feedback received from the Member State, customer deposits have been estimated as "deposits" minus "deposits to credit institutions".

BELGIUM

The final database includes Member State data for Belgium as the sample provided by the Member State covered all the data necessary to perform the exercise. Covered deposits were estimated starting from deposits and applying the coverage ratio estimated with DGS data as described in Section 2.

BULGARIA

The final database includes Member State data for Bulgaria as the sample provided by the Member State covered all the data necessary to perform the exercise.

CYPRUS

The final database includes 2013 data provided by Cyprus, as the Member State's representatives informed the Commission services that these data are more representative of the current situation than the 2012 ones, when major changes took place in the banking sector. As no data on covered deposits were provided, these were estimated starting from 2013 deposits and applying the 2012 coverage ratio estimated with DGS data as described in Section 2.

CZECH REPUBLIC

The final database includes data provided by the Czech Republic as the sample provided by the Member State covered all the data necessary to perform the exercise. Data on credit unions were not included in the database.

GERMANY

The final database includes Member State data for Germany as the sample provided by the Member State covered all the data necessary to perform the exercise. Covered deposits were estimated starting from deposits and applying the coverage ratio estimated with DGS data as described in Section 2.

DENMARK

The final database includes data provided by Denmark. Based on the feedback received from the Member State, the zeros for deposits and deposits to credit institutions were treated as missing data. Data on mortgage credit institutions were not included in the database. Covered deposits were estimated starting from deposits and applying the coverage ratio estimated with DGS data as described in Section 2.

ESTONIA

The final database includes data provided by Estonia as the sample provided by the Member State covered all the data necessary to perform the exercise.

SPAIN

The final database includes data provided by Spain as the sample provided by the Member State covered all the data necessary to perform the exercise.

FINLAND

The final database includes data provided by Finland as the sample provided by the Member State covered all the data necessary to perform the exercise.

FRANCE

The final database includes data provided by France as the sample provided by the Member State covered all the data necessary to perform the exercise.

UNITED KINGDOM

The final database includes data provided by the UK as the sample provided by the Member State covered all the data necessary to perform the exercise. 2012 covered deposits are estimated from 2012 deposits by applying the coverage ratio computed using 2013 deposits and covered deposits provided by the UK.

GREECE

The final database includes 2013 data provided by Greece, as the Member State's representatives informed the Commission services that these data are more representative of the current situation than the 2012 ones, when major changes took place in the banking sector. As no data on covered deposits were provided, we estimated them starting from 2013 deposits and applying the 2012 coverage ratio estimated with DGS data as described in Section 2.

CROATIA

The final database includes data provided by Croatia as the sample provided by the Member State covered all the data necessary to perform the exercise.

HUNGARY

The data provided by the Member State did not include data on loans and advances to banks and thus this sample could not be included in the final database.

IRELAND

The final database includes data from Ireland, though loans and advances include also those to credit institutions. Covered deposits were estimated starting from deposits and applying the coverage ratio estimated with DGS data as described in Section 2.

ITALY

The final database includes data provided by Italy as the sample provided by the Member State covered all the data necessary to perform the exercise.

LITHUANIA

The final database includes data provided by Lithuania as the sample provided by the Member State covered all the data necessary to perform the exercise.

LUXEMBOURG

The final database includes data from Luxembourg, though the item "deposits" includes also those to credit institutions.

LATVIA

The data provided by the Member State did not include data on loans and advances to banks and thus this sample could not be included in the final database.

MALTA

The final database includes data provided by Malta as the sample provided by the Member State covered all the data necessary to perform the exercise. 2012 covered deposits are estimated from 2012 deposits by applying the coverage ratio computed using 2013 deposits and covered deposits provided by Malta.

NETHERLANDS

As data provided by the Member State mixed different consolidation level (unconsolidated for some banks, consolidated for others), this dataset could not be included in the final one, which contains data at solo level only.

POLAND

All the data provided in the different sheets are unconsolidated data and thus they all could be used to build the final database. Covered deposits were estimated starting from deposits and applying the coverage ratio estimated with DGS data as described in Section 2.

PORTUGAL

The final database includes data provided by Portugal as the sample provided by the Member State covered all the data necessary to perform the exercise.

ROMANIA

The final database includes data provided by Romania as the sample provided by the Member State covered all the data necessary to perform the exercise. It is assumed that all the zeros for loans and advances to banks are true zeros.

SWEDEN

The final database includes data provided by Sweden as the sample provided by the MS covered all the data necessary to perform the exercise. Based on the feedback received, the zeros for deposit and deposits to credit institutions were considered as missing data. Where missing, covered deposits were estimated using the estimated coverage ratio as described in Section 2.

SLOVENIA

The final database includes data provided by Slovenia as the sample provided by the Member State covered all the data necessary to perform the exercise, though data are as of 2013 and the item "deposits" includes also banking sector deposits.

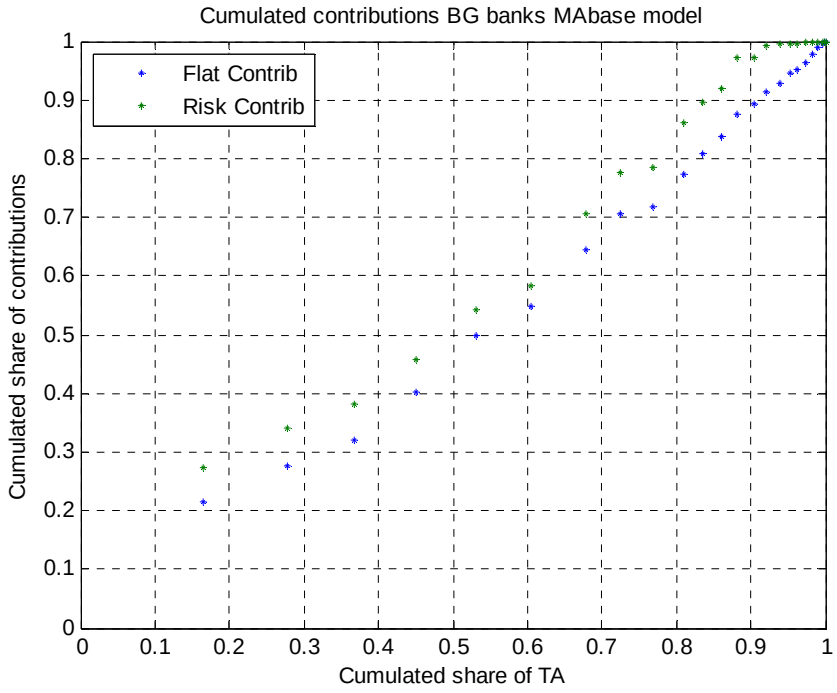
SLOVAK REPUBLIC

The final database includes data provided by the Slovak Republic as the sample provided by the Member State covered all the data necessary to perform the exercise

10) ANNEX II: CUMULATIVE DISTRIBUTION OF CONTRIBUTIONS IN NON-PARTICIPATING MEMBER STATES

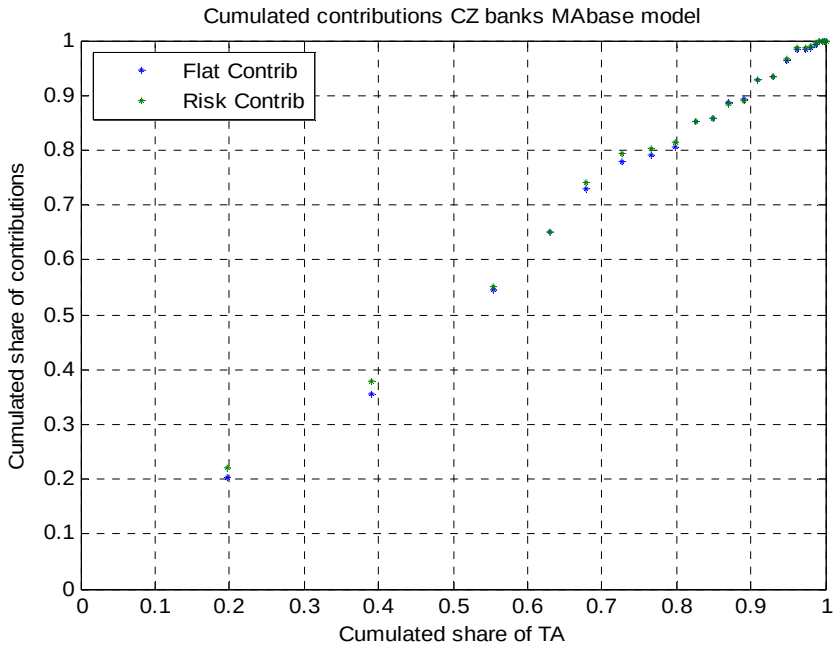
Figure 12 to Figure 21 show the cumulative distributions of contributions in non-participating Member States (as indicated in Section 3), no pillar 4 factors are included in these estimates).

Figure 12: Cumulative distribution of estimated contributions in Bulgaria



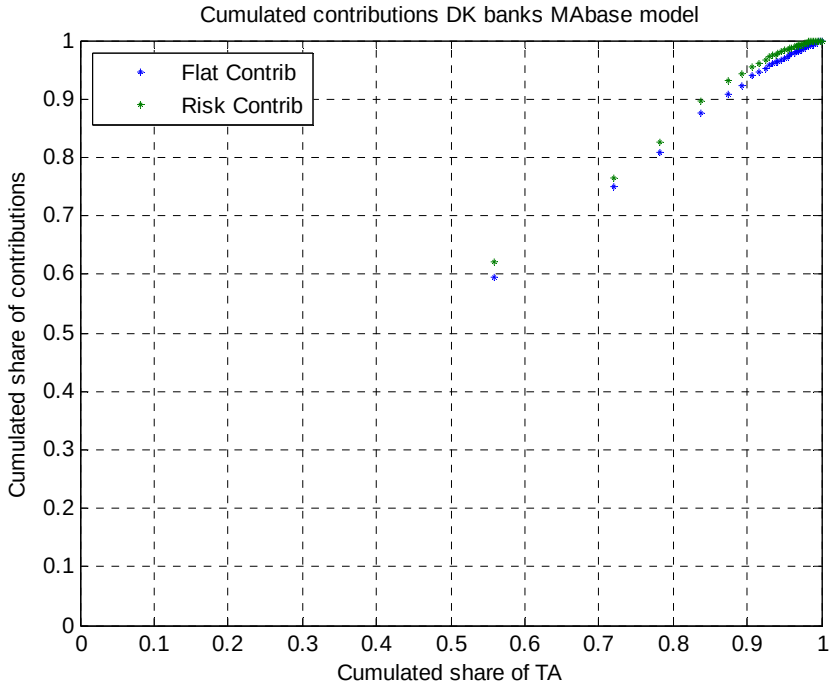
Source: JRC estimates

Figure 13: Cumulative distribution of estimated contributions in the Czech Republic



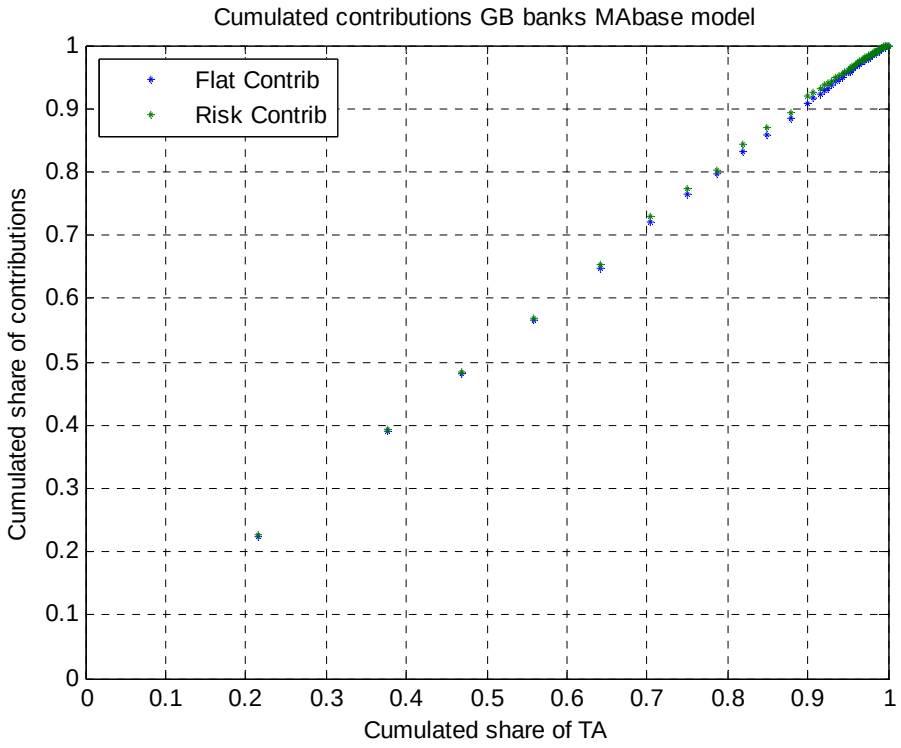
Source: JRC estimates

Figure 14: Cumulative distribution of estimated contributions in Denmark



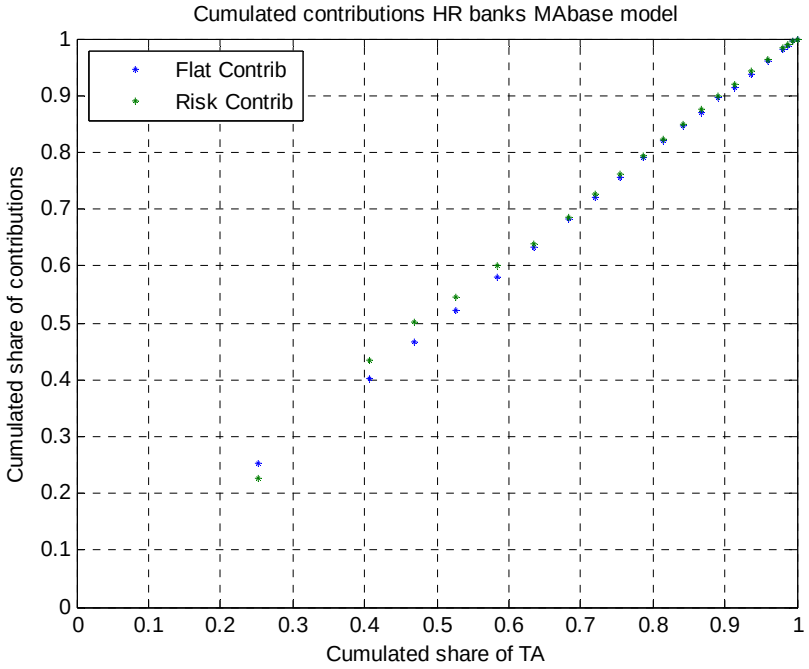
Source: JRC estimates

Figure 15: Cumulative distribution of estimated contributions in the UK



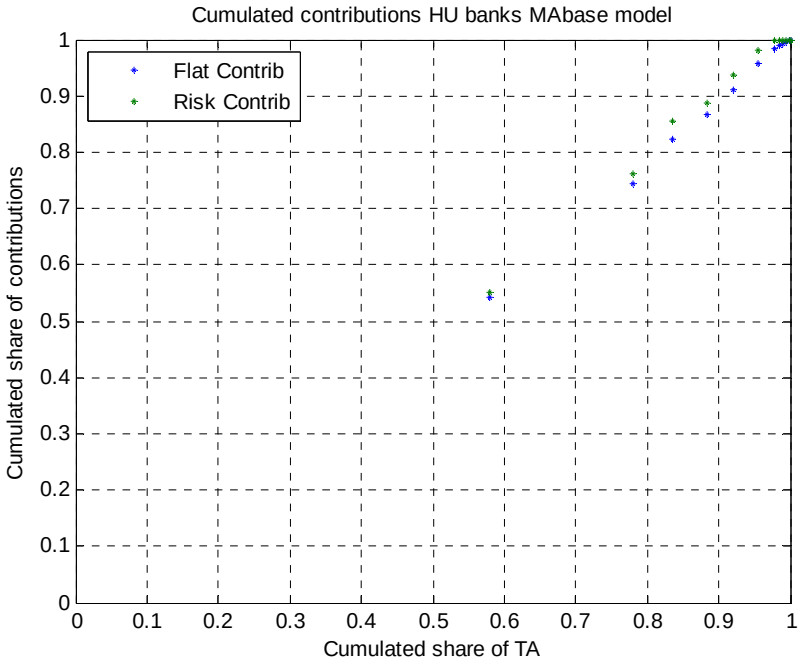
Source: JRC estimates

Figure 16: Cumulative distribution of estimated contributions in Croatia



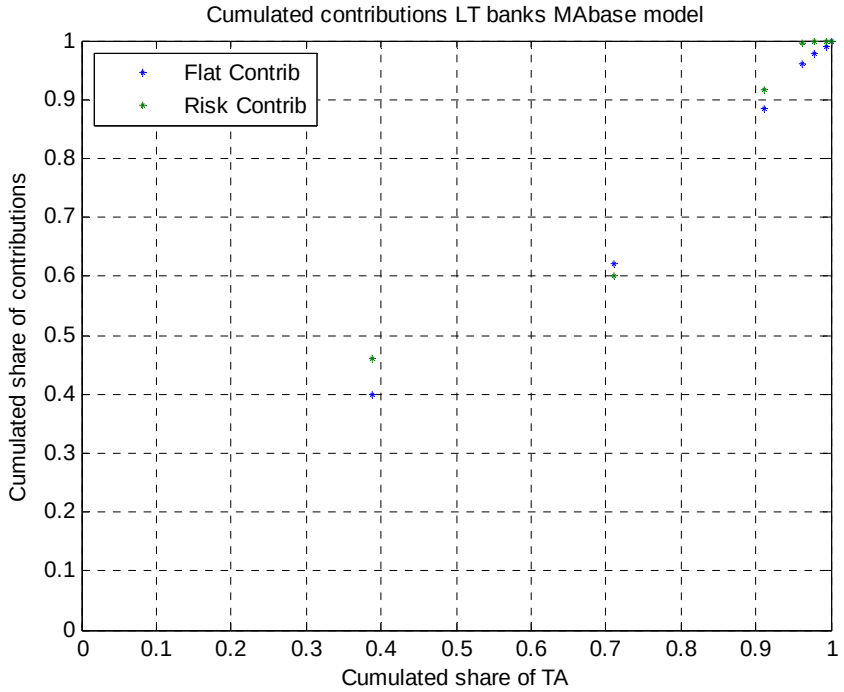
Source: JRC estimates

Figure 17: Cumulative distribution of estimated contributions in Hungary



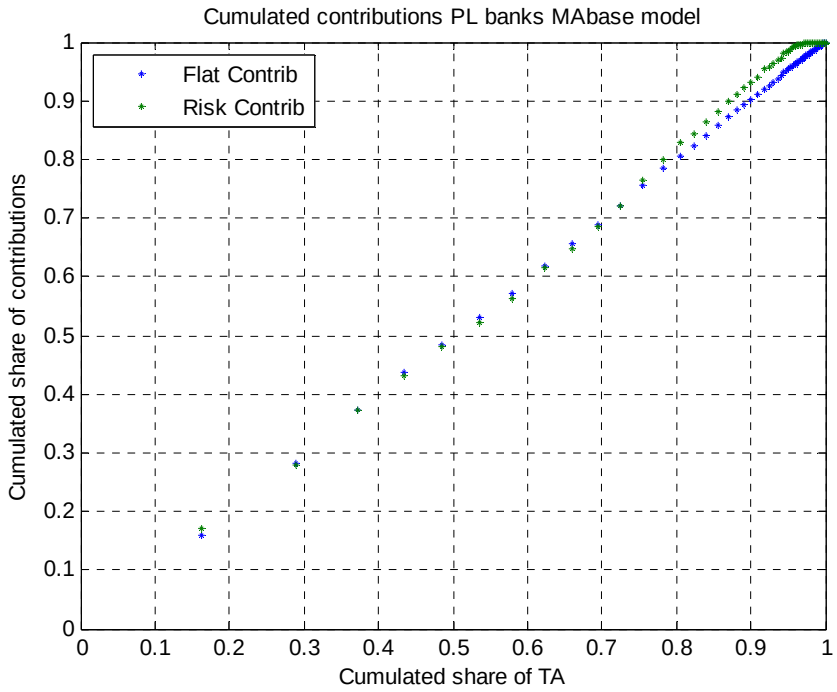
Source: JRC estimates

Figure 18: Cumulative distribution of estimated contributions in Lithuania



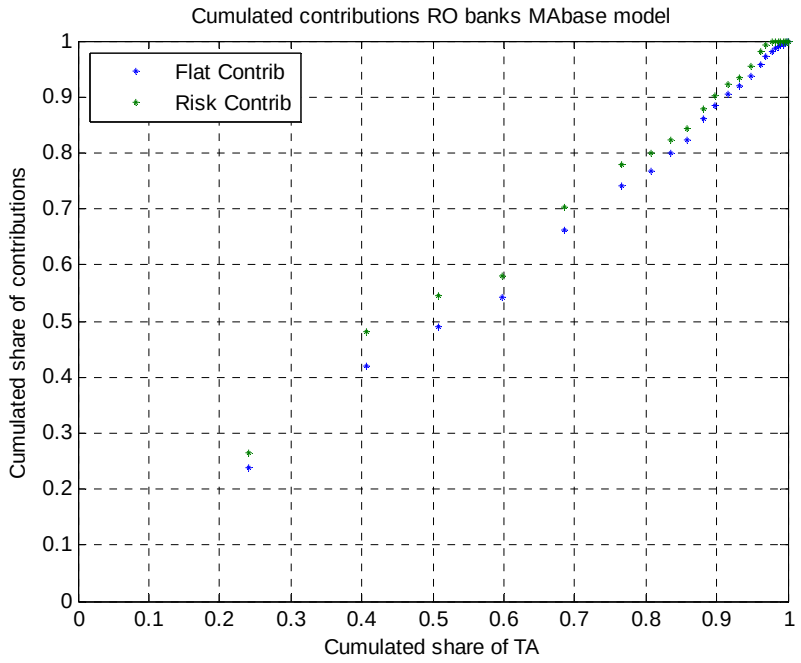
Source: JRC estimates

Figure 19: Cumulative distribution of estimated contributions in Poland



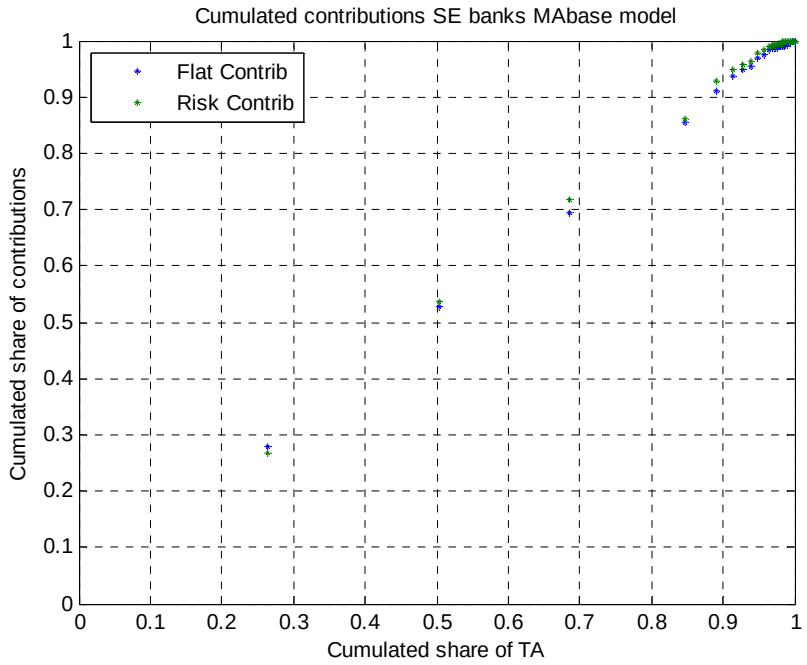
Source: JRC estimates

Figure 20: Cumulative distribution of estimated contributions in Romania



Source: JRC estimates

Figure 21: Cumulative distribution of estimated contributions in Sweden

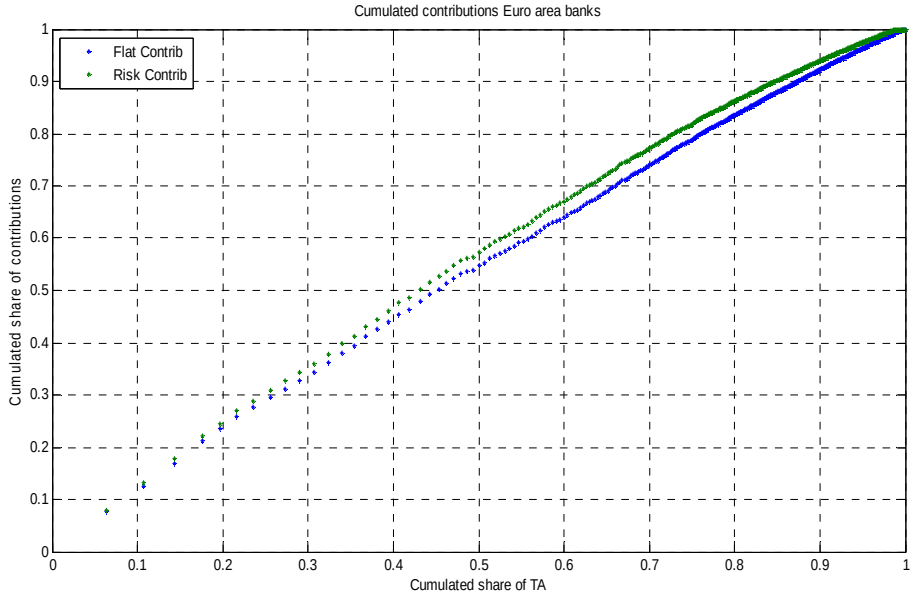


Source: JRC estimates

11) ANNEX III: CUMULATIVE DISTRIBUTION OF CONTRIBUTIONS WHEN INCLUDING THE FOURTH PILLAR OF THE COMPOSITE RISK INDICATOR

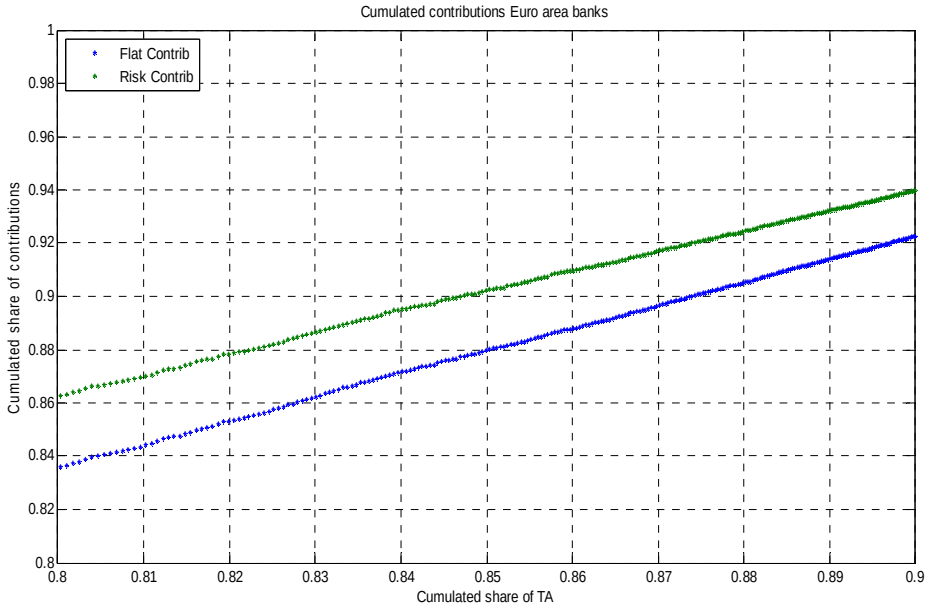
In order to have an estimate on the role of the fourth pillar in the calculation of contributions, the same assumptions sescribed in Section 5) are made. Figure 22 and Figure 23 show that indeed the inclusion of the fourth pillar could have the effect of further accentuating the risk premium paid by the largest institutions cumulatively in the Euro area. Similar results were obtained for the Cezch Republic, Denmark, Poland, Sweden and the UK. For other pariticpating Member States, the inclusion of the fourth pillar did not seem to affect the cumulative distribution; however, this result is driven by the selection of banks described in Section 5).

Figure 22: Cumulative distribution of contributions by total assets in the Euro Area, including selected pillar 4 risk factors



Source: JRC estimates

Figure 23: Cumulative distribution of contributions by total assets in the Euro Area, including selected pillar 4 risk factors – zoom around 85% of total assets



Source: JRC estimates

12) ANNEX IV: CONTRIBUTIONS OF SMALL BANKS IN PARTICIPATING MEMBER STATES

The following table contains a detailed breakdown of the estimates of the contributions of small banks in participating Member States.

Table 21: Estimated contributions of small banks in participating Member States

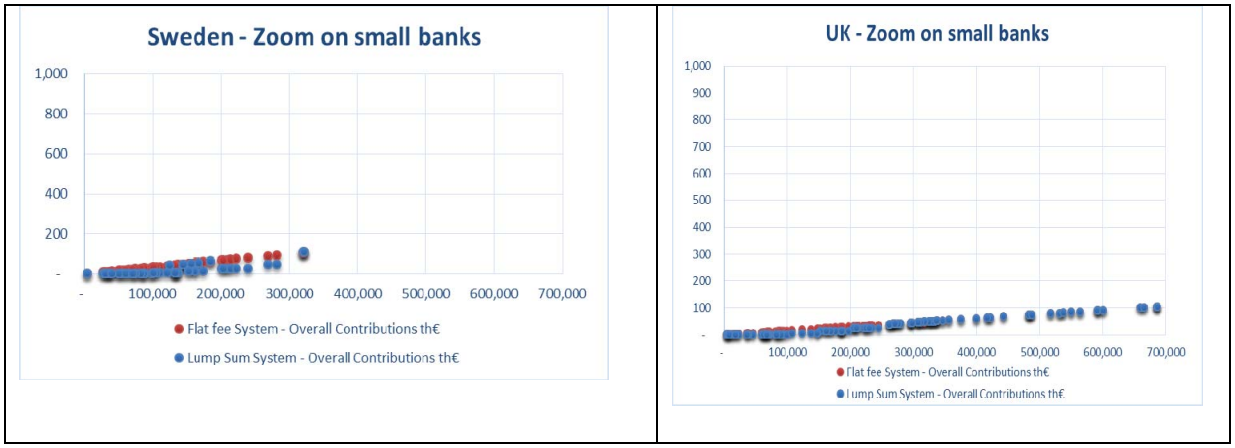
	Small banks - Overall Flat fee		Small banks - Overall lump sums		Reduction when moving from the flat fee to the lump sum
	TEUR	as % of annual target	TEUR	as % of annual target	
AT	10,674	0.1735%	2,501	0.0407%	-77%
BE	516	0.0084%	170	0.0028%	-67%
CY	82	0.0013%	50	0.0008%	-39%
DE	32,843	0.5340%	10,532	0.1712%	-68%
EE	71	0.0011%	10	0.0002%	-86%
ES	415	0.0067%	118	0.0019%	-72%
FI	2,735	0.0445%	552	0.0090%	-80%
FR	1,983	0.0322%	648	0.0105%	-67%
GR	79	0.0013%	10	0.0002%	-87%
IE	163	0.0027%	100	0.0016%	-39%
IT	10,450	0.1699%	3333	0.0542%	-68%
LU	893	0.0145%	365	0.0059%	-59%
LV	416	0.0068%	195	0.0032%	-53%
MT	99	0.0016%	19	0.0003%	-81%
NL	130	0.0021%	34	0.0006%	-74%
PT	996	0.0162%	229	0.0037%	-77%
SI	184	0.0030%	69	0.0011%	-63%
SK	62	0.0010%	16	0.0003%	-74%
Euro area	**63,269**	**1.0287%**	**18,451**	**0.3000%**	**-71%**

Source: JRC estimates

13) ANNEX V: CONTRIBUTIONS OF SMALL BANKS IN NON-PARTICIPATING MEMBER STATES

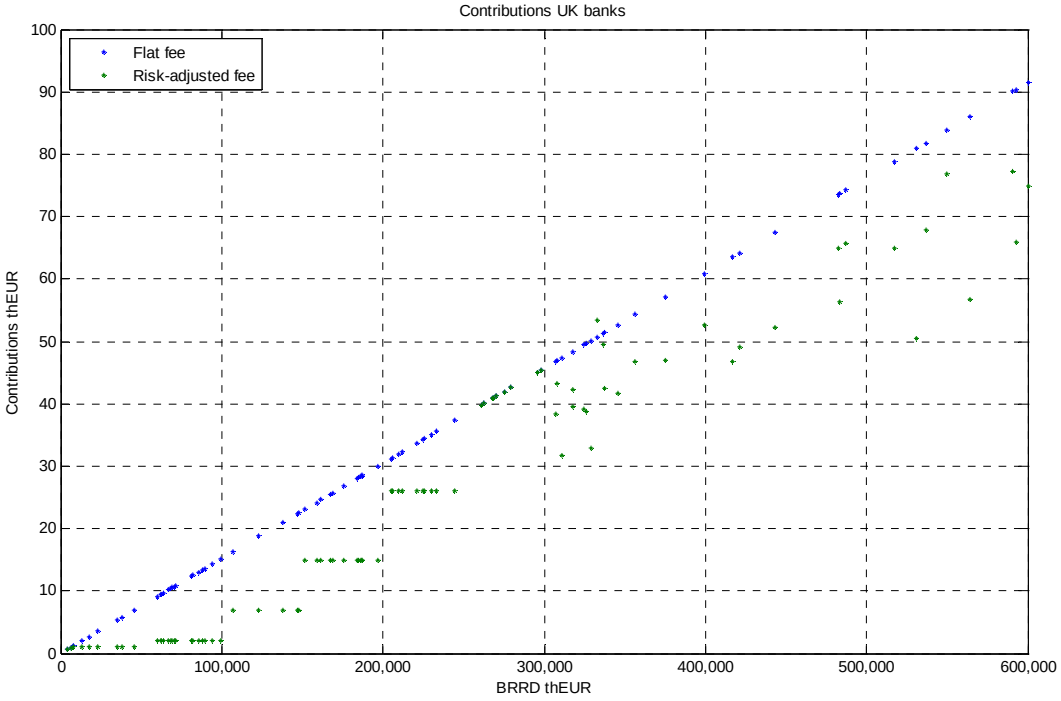
Figure 24 shows the 6-bucket system applied to Member State outside the Euro area. The horizontal axis measures the BRRD base in Euros and the vertical axis measures contributions in thousand Euros.

Figure 24: Estimated contributions of small banks in non-participating Member States



Source: JRC estimates

Figure 25: UK - Zoom on small banks



Source: JRC estimates

It is worth noting that in UK a negative cliff effect occurs, as represented in Figure 25. In fact, all banks falling into the 6th bucket have a flat fee lower than the lump sum (i.e. lower than EUR 50,000), and as a result of the safeguard clause they all pay the flat fee. Since the big banks just above the threshold pay less than the flat fee thanks to a favourable risk-adjustment, the small banks treatment is unfavourable to banks in the 6th bucket. This issue could be addressed by some additional safeguard clause establishing that no small bank shall pay more than the minimum risk-adjusted contribution, and any difference with the contributions they would have had to pay absent this safeguard shall be distributed among all "non-small" banks in proportion to their risk-adjusted contributions.

14) ANALYSIS OF THE IMPACT OF THE PROPOSED TREATMENT OF DERIVATIVES

This Section provides an analysis of the potential impact of excluding a part of the derivative liabilities from the BRRD base on the calculation of the contributions. The key messages of this Section may be summarized as follows:

- The proposed treatment of derivatives is estimated to results in an average reduction of 1% in the contributions of largest banks;
- All other banks except those paying lump sums are estimated to compensate with an increase of 2% in their contributions;
- The cumulative distribution is still such that banks representing the largest 85% of total assets in the Euro area pay around 90% of total contributions;
- The inclusion of additional risk factors for the largest banks will tend to compensate the already limited reductions in their contributions due to the proposed treatment of derivatives, and is estimated to keep the share of contributions paid by banks representing the largest 85% of total assets in the Euro area above 90%;
- The average estimated changes in the aggregate contributions by Member State are limited to a 1% increase.

Data on derivative liabilities

As data on derivative liabilities are not included in the final database, derivative liabilities were estimated by using the Bankscope sample. This dataset reports balance sheet data at solo level. The original Bankscope sample includes 3,710 entities in the EU 28 area, but data on derivatives are missing for a large part of the database. After excluding banks that do not report data on derivatives, the final subsample contains 809 banks corresponding to 24,265 billion EUR in terms of total assets. With respect to the final database, the Bankscope subsample including data on derivatives covers 18% of sample size (809 over 4,611 credit institutions) and 65% of the overall total assets. This might lead to conclude that the most part of the missing observations in the Bankscope subsample concerns small banks.

Table 26 below reports some descriptive statistics on the ratio of derivative liabilities to total assets. The median value is 0.2% while the mean is located on the right-hand part of the distribution at a value of 2.6%. This value is even greater than the 75th percentile, revealing the existence of a long right tail with few banks having extremely high values.

Table 22: Descriptive statistics on the ratio of derivative liabilities to total assets

Distribution	Derivative Liabilities (as share of TA)
Minimum	0.00%
25th percentile	0.02%
Median	0.21%
75th percentile	1.38%
Maximum	89.76%
Average	**2.55%**

Source: JRC estimates

In order to analyse the distribution of derivative liabilities per size category, the sample has been divided into a number of buckets according to total assets size. Table 27 reports descriptive statistics by size category. The biggest banks (banks with total assets greater than EUR 30 billion, grouped in bucket 5) report the highest average ratio of derivatives to total assets. However, when looking at the column reporting the maximum values, it appears that relatively quite large amounts of derivatives can be held also by smaller banks.

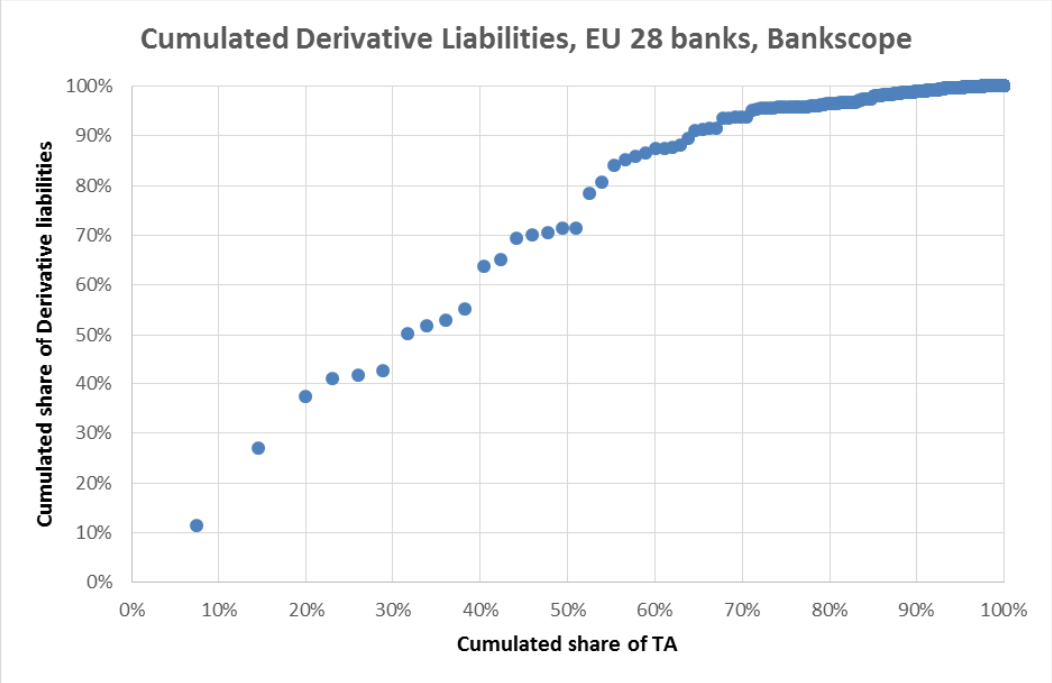
Table 23: Descriptive statistics on the ratio of derivative liabilities to total assets by size category

Bucket	Thresholds	Minimum	25th percentile	Median	75th percentile	Maximum	Average
Bucket 1	TA < 300 mill	0.00%	0.00%	0.01%	0.12%	12.39%	0.22%
Bucket 2	TA > 300 mill & < 1 bill	0.00%	0.00%	0.05%	0.22%	15.49%	0.43%
Bucket 3	TA > 1 bill & < 15 bill	0.00%	0.03%	0.29%	1.30%	44.91%	1.69%
Bucket 4	TA > 15 bill & < 30 bill	0.06%	0.46%	1.36%	4.15%	24.84%	3.58%
Bucket 5	TA > 30 bill	0.00%	1.36%	3.25%	12.24%	89.76%	10.67%

Source: JRC estimates

To verify whether limiting the scenario analysis to the biggest banks would be too restrictive an assumption, the cumulative distribution of derivative liabilities by total assets was computed. Banks with total assets greater than EUR 30 billion represent 89% of the overall total assets in the sample[23]. As can be seen in Figure 26, these banks account for almost all (i.e. 98.5%) derivative liabilities.

Figure 26: Cumulated derivative liabilities, EU 28 banks, Bankscope sample



Source: JRC estimates

[23] These banks represent a subsample of 110 entities.

Two main conclusions can be drawn from this analysis. On the one hand, the vast majority of the outstanding derivatives belong to the largest banks. On the other hand, the proportion of derivatives held in each institution can significantly vary both among banks in different size categories and among banks of similar size.

The proposed treatment of derivatives at work: a simplified example

The proposed treatment of derivatives in the calculation of the BRRD base envisages the application to derivative liabilities of the leverage ratio treatment as defined in Articles 429(6) and 429(7) of Regulation (EU) No 575/2013, with a 25% cap on the maximum reduction in the value of derivative liabilities with respect to their value resulting from the applicable accounting standards. This responds to the need of ensuring an harmonised treatment of derivatives in spite of the different accounting standards (IFRS or national GAAPs) applicable to banks in the EU.

Since IFRS accounting rules (which are generally applied by the largest banking groups) have more restrictive requirements for netting than the proposed treatment, and since largest banks tend to hold higher shares of derivative liabilities on their balance sheets, it might be expected that the effect of the application of the leverage ratio treatment would lead to significant reductions in the contributions of such banks, with a consequent shift of the contributory burden towards smaller banks. However, a reduction in the derivative liabilities implies first of all a reduction in the total BRRD base: as a result, the largest banks will continue to hold a very large share of such base, and therefore to pay a very large share of the total contributions.

The following example tries to illustrate this effect at work, together with the safeguard of the 25% cap. This oversimplified example should not be taken at face value for any of the figures, but rather only aims at providing an immediate illustration of the underlying mechanisms. It assumes that only two banks exist in the system, more or less as if in the Euro area all significant banks were one institution, and all other banks were another one.

Table 24: Changes in contributions

Bank	BRRD base (according to applicable accounting standard), EUR	Derivatives as a % of BRRD base	BRRD base (25% reduction in derivatives), EUR	Share of flat contributions under applicable accounting standards	Share of flat contributions under 25% reduction in derivatives
1	90	30%	83.25	90.00%	89.28%
2	10	0%	10	10.00%	10.72%
Total	100		93.25	100.00%	100.00%

Table 28 shows that, even if a bank accounting for 90% of the total BRRD base and having 30% of its base made of derivative liabilities (Bank 1) benefits from the entire capped reduction of 25%, the actual reduction in its share of flat contributions is only 0.72 percentage points. Therefore, a reduction of 7.5% in the base, (83.25-90)/90, will only lead to a reduction of 0.8% in the flat contribution, (89.28%-90%)/90%.

Assumptions for the empirical analysis of the impacts

The analysis that follows focuses on the estimated impact of the proposed treatment of derivative liabilities on the calculation of the contributions based on the final database. The following assumptions were made:

- Banks holding derivatives (in the remainder of this Section, "the largest banks") are the same entities selected for the analysis on the fourth pillar as described in Section 5). This selection was meant to identify banks with criteria broadly in line with those for the structural separation proposal, i.e. with total assets greater than EUR 30 billion and covering the largest 65% of total assets in the Euro area or each of the non-participating Member States.
- All other banks have no derivative liabilities. Banks holding derivatives will all benefit from a reduction of 25% in their derivative liabilities due to the application of the leverage ratio treatment. These assumptions will result in an overestimation of the impacts, since not all the largest banks will be bound by the cap and the vast majority of all other banks will have some derivative liabilities.
- All the largest banks hold 10.67% of derivative liabilities on their balance sheet, i.e. the average ratio of derivative liabilities to total assets for banks with total assets greater than EUR 30 billion in the Bankscope sample for the whole EU (bucket 5 in Table 27).

The reduction in contributions for the largest banks

Table 29 below presents summary statistics on the distributions of the percentage variations of the BRRD base and contributions (flat and risk-adjusted) for the largest banks in the Euro area. In this table the minimum values represent the maximum discount and vice versa.

Table 25: Scenario 1, percentage variations in the BRRD base, flat fee and risk-adjusted contributions for the largest banks, Euro area

	BRRD base	Flat fee	Risk-adjusted contribution
Average	-3.82%	-1.52%	-1.48%
Median	-3.44%	-1.13%	-1.09%
Minimum	-11.67%	-9.55%	-9.52%
Maximum	-2.72%	-0.39%	-0.35%

Source: JRC estimates

An average 4% reduction in the BRRD base translates into an average 1.5% reduction in the contributions.

The additional burden for all other banks

If a discount is granted to a specific category of banks and a certain target level has to be reached, it is important to quantify the additional burden imposed to the other entities.

The following formulas express the percentage increase in the burden for all other banks that do not hold derivatives. Of course, there will be no increase in the burden for banks classified as small and qualifying for the lump-sum treatment as described in Section 4).

- *Flat fee*

If no reduction is granted on the amount of derivatives, for each non-small bank not holding derivatives *i*, the flat fee would be:

$$flat_i = \frac{BRRD_i}{\sum_j BRRD_j}$$

where $BRRD_i = TL_i - K_i - CovDep_i$ and $j \in J$ represents an element in the group of non-small banks *J*.

If a percentage reduction α on the amount of derivatives is introduced, then the new flat fee would be:

$$\widetilde{flat_i} = \frac{BRRD_i}{\sum_j BRRD_j - \alpha \cdot \sum_k D_k}$$

where $k \in K$ is a generic one among the largest, derivatives-holding banks, with $K \subset J$, and *D* denotes derivative liabilities.

The percentage increase in the burden for all other banks that do not hold derivatives is:

$$\frac{(\widetilde{flat_i} - flat_i)}{flat_i} = \frac{\sum_j BRRD_j}{\sum_j BRRD_j - \alpha \cdot \sum_k D_k} - 1$$

Given a sample of banks, this increase is a constant for each bank. Table 30 reports the results assuming alpha equal to 25%.

Table 26: Annual additional payment for all other non-small banks, as share of flat fee, Euro area

Overall BRRD base of non-small banks $\sum_j BRRD_j$ (bill€)	Overall Derivative Liabilities $\sum_k D_k$ (bill€)	Percentage additional burden
19,950	1,865	+2.39%

Source: JRC estimates

- *Risk-adjusted contributions*

The same steps can be used to derive the formula for the additional burden in the risk based contributions system. In the percentage increase between contributions computed with ($\tilde{c}_i$) and without (c_i) the reduction in derivative liabilities is:

$$\frac{(\tilde{c}_i - c_i)}{c_i} = \frac{\sum_j BRRD_j \cdot R_j}{\sum_j BRRD_j \cdot R_j - \alpha \cdot \sum_k D_k \cdot R_k} - 1$$

where R_j is the risk adjustment. Table 31 reports the results assuming alpha equal to 25%.

Table 27: Annual additional payment for all other non-small banks, Euro area

Overall BRRD base times the risk factor of non-small banks	Overall Derivative Liabilities times the risk factor	Percentage additional burden

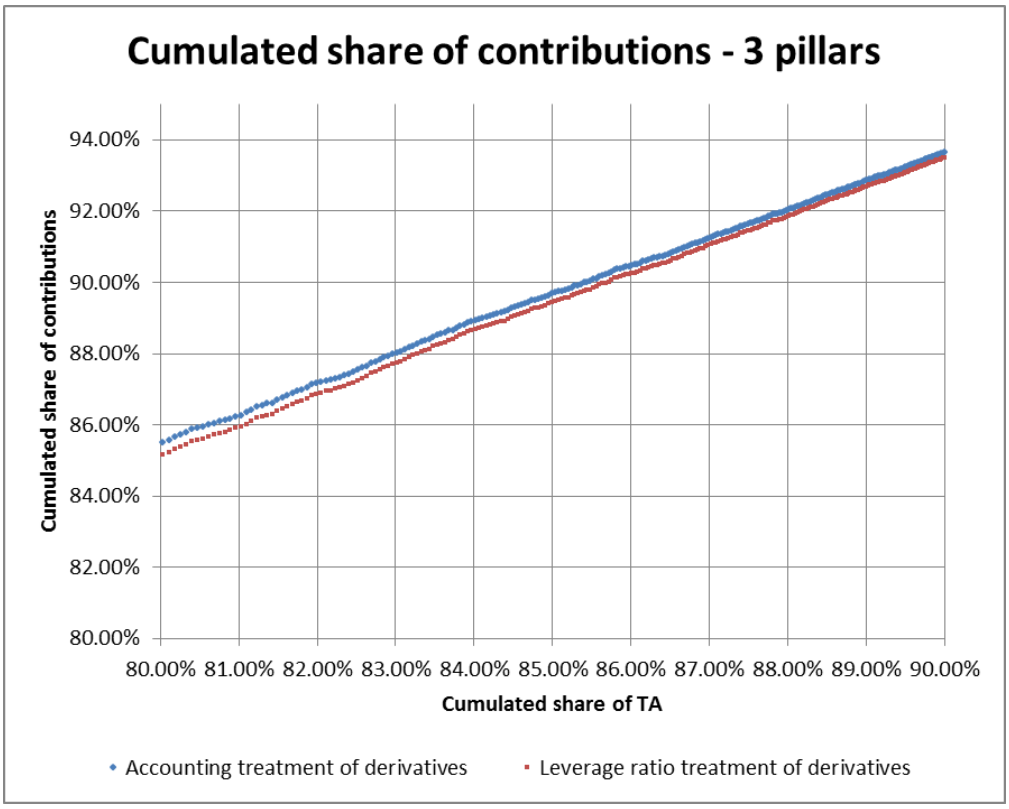
$\sum_j BRRD_j \cdot R_j$ (bill€)	$\sum_k D_k \cdot R_k$ (bill€)	
26,403	2,511	+2.44%

Source: JRC estimates

Cumulative distribution of contributions and additional risk factors

Besides the variation in the individual contributions of banks, an important indicator for the overall fairness of the system can be derived by looking at the cumulative distribution of contributions by total assets. In this respect, it is very important that the overall shape of this distribution presented in Section3), whereby banks representing the largest 85% of total assets in the Euro area would pay around 90% of total contributions, is not altered by the proposed treatment of derivatives. Figure 27 compares the cumulative distributions of risk-adjusted contributions by total assets under the baseline (i.e. the accounting treatment of derivatives - blue line) and the proposed treatment of derivatives (i.e. the leverage ratio treatment of derivatives with a 25% cap - red line).

Figure 27: Cumulative distributions of risk-adjusted contributions by total assets, Euro area: zoom around 85% of total assets



Source: JRC estimates

It is estimated that, under the proposed treatment of derivatives, banks representing the largest 85% of total assets in the Euro area would still pay around 90% of total contributions. More precisely, under the assumptions described in paragraph 0 their total contributions would only decrease from 89.74% to 89.49% (see Table 33).

It is important to recall that these same banks will tend to have an upward adjustment in their contributions due to additional risk indicators described in the respective section). This will tend to compensate the slight decrease portrayed in Figure 27. The estimates presented in this

Section so far do not include the additional risk indicators (i.e. the fourth pillar of the composite risk indicator). In order to estimate the effect of the interaction between the proposed treatment of derivatives and the additional risk indicators, it is assumed that the additional risk indicators have a weight of 18% and, alternatively:

- the largest banks are assigned the highest value on these indicators and all other banks are assigned the average of all other indicators among themselves (same assumptions as described in Section 5)): this scenario is referred to as "4 pillars - average";
- the largest banks are assigned the highest value on these indicators and all other banks are assigned the lowest: this scenario is referred to as "4 pillars - minmax" and represents the upper bound on the effect of the additional risk indicators.

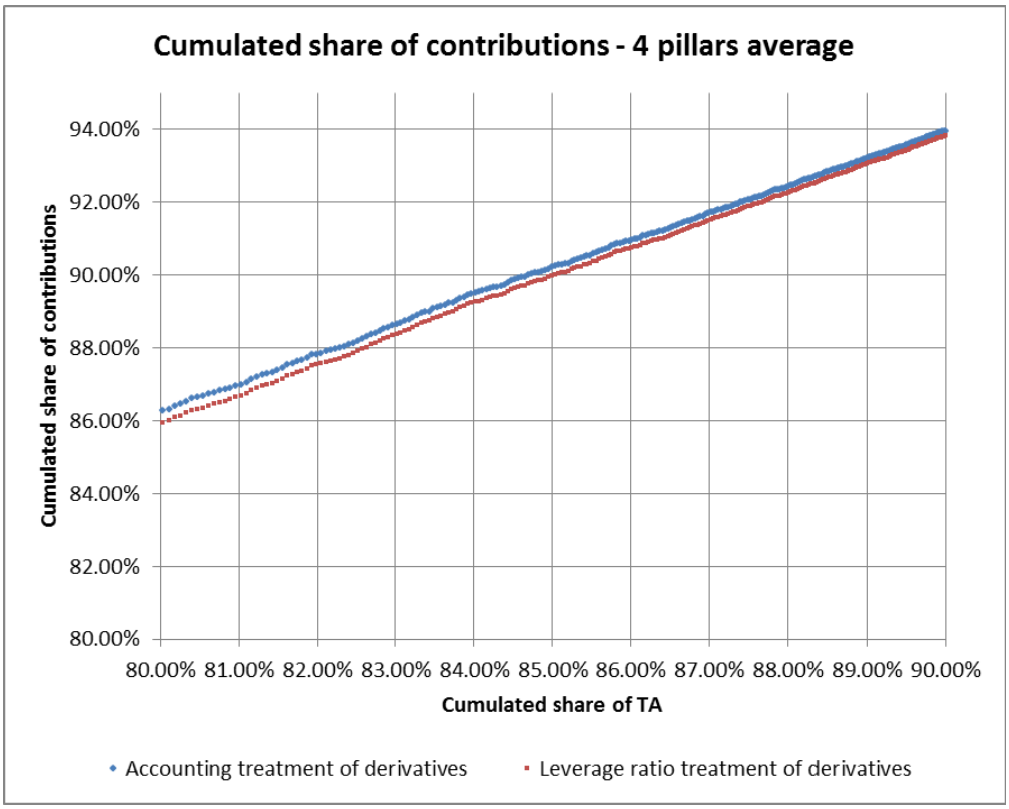
Table 32 and 33, and Figure 28 and 29 present the results of applying these assumptions. It is estimated that the inclusion of the additional risk factors would reduce the already limited decrease in contributions that the largest banks experience. As a result, the inclusion of the additional risk factors would maintain the total share of contributions of banks representing the largest 85% of total assets in the Euro area above 90%.

Table 28: Percentage variations in the BRRD base, flat fee and risk-adjusted contributions for largest banks, Euro area

	BRRD base	Flat fee	Risk-adjusted contribution 3 pillars	Risk-adjusted contributions 4 pillars average	Risk-adjusted contributions 4 pillars minmax
Average	-3.82%	-1.52%	-1.48%	-1.42%	-1.40%
Median	-3.44%	-1.13%	-1.09%	-1.03%	-1.01%
Minimum	-11.67%	-9.55%	-9.52%	-9.47%	-9.45%
Maximum	-2.72%	-0.39%	-0.35%	-0.29%	-0.27%

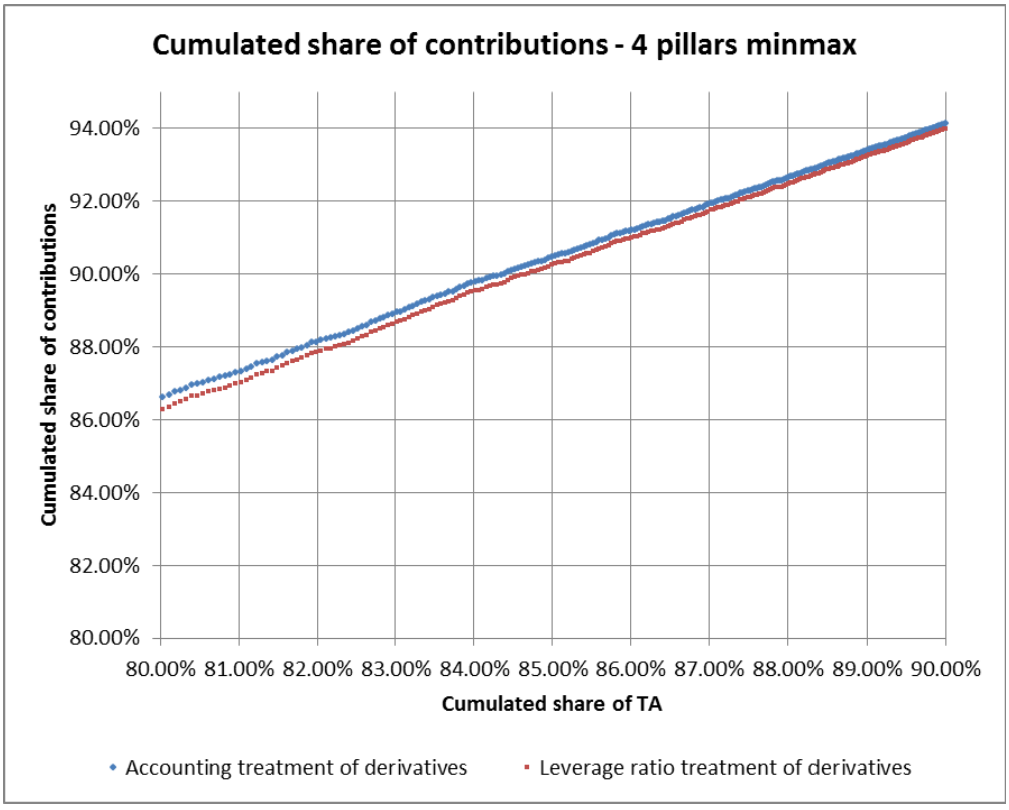
Source: JRC estimates

Figure **28: Cumulative distributions of risk-adjusted contributions by total assets, Euro area: zoom around 85% of total assets**



Source: JRC estimates

Figure 29: Cumulative distributions of risk-adjusted contributions by total assets, Euro area: zoom around 85% of total assets



Source: JRC estimates

Table 29: Share of contributions paid by Euro area banks accounting for 85% of total assets

	Baseline	Proposed treatment of derivatives
3 pillars	89.74%	89.49%
4 pillars - average	90.27%	90.03%
4 pillars - minmax	90.53%	90.29%

Source: JRC estimates

It should be noted that the 18% weight of the additional risk factors reflects an earlier stage of the preparatory work for the delegated act, in which the indicators for trading activities, off-balance sheet exposures and derivatives, and complexity and resolvability, could weigh up to 18% of the total composite risk indicator. The Commission services are currently considering such a 9% cap on such weight. Specific analyses are ongoing in order to update all the estimates affected from this specification.