EUROPEAN
COMMISSION

Brussels, 13.3.2017
SWD(2017) 111 final

COMMISSION STAFF WORKING DOCUMENT

Appropriateness of the Risk Adjustment Multiplier for the Calculation of Contributions to Resolution Financing Arrangements

EXECUTIVE SUMMARY

In Commission Delegated Regulation (EU) 2015/63 the Commission announced to assess, based on the experience gained with its application, the risk adjustment multiplier for the calculation of contributions to resolution financing arrangements.

National Resolution Authorities applied the Delegated Regulation for the first time in 2015 (and not all of them did, because of lack of BRRD transposition), while the first round of contributions to the Single Resolution Fund had to be notified to institutions by 1 May 2016. The Commission services collected data in June, July and August 2016. Thanks to the cooperation of Resolution Authorities, a dataset covering 26 Member States for at least 2016 contributions was compiled.

While it would be premature to draw firm conclusions at this stage, this Staff Working Document provides some first insights into the appropriateness of the risk adjustment multiplier. Larger institutions tend to get an upwards risk adjustment, while smaller institutions tend to get a downwards risk adjustment. For example, institutions representing the top 82% of total assets in the Euro area (the same percentage as the total assets of significant institutions) pay 88% of contributions calculated at Banking Union level. Widening the range of the risk adjustment multiplier does not alter the overall shape of the cumulative distribution of contributions. Furthermore, 52% of institutions in the EU pay lump sums, benefitting from an average reduction of 73% in the Euro area and of up to 97% outside the Euro area with respect to their *pro rata* contributions. When looking at risk adjustment overall, in practice the lump-sum system introduces for many contributing institutions much larger reductions with respect to a *pro rata* system than those implied by the lower end of the range of the multiplier (0.8). Finally, the risk adjustment multiplier seems to be positively and significantly correlated with market-perceived risk, which suggests that it should be capturing a sensible underlying construct of risk.

Even though they come very early into the application of the Delegated Regulation, these results provide some preliminary evidence that the risk adjustment multiplier works as intended.

As regards the construction of the risk adjustment multiplier, variation was experienced in the use of the different risk indicators. Some Resolution Authorities already used all indicators in the first year. The Single Resolution Board should be able to fully apply the methodology set out in the Delegated Regulation by 2019 at the latest. The denominator of the interbank indicator appears to be, from a technical point of view, redundant. In addition, stakeholders have frequently brought to the attention of the Commission services the duplication of reporting requirements. Finally, stakeholders and Resolution Authorities have flagged the complexity of the methodology. As the application of the Delegated Regulation continues and communication efforts by Resolution Authorities are enhanced both predictability and replicability of the results should be improved.

Contents

1. INTRODUCTION

In Recital 27 of its Delegated Regulation (EU) 2015/63 (the Delegated Regulation), the Commission announced to review the risk adjustment for the calculation of the annual contributions and, in particular, the appropriateness of the risk adjustment multiplier set out in this Regulation and the need for a possible increase of the upper limit the risk adjustment multiplier before 1 June 2016, in order to ensure that the risk adjustment continues to reflect developments in the banking sector and therefore meets the requirements of Directive 2014/59/EU on an ongoing basis, based on the experience gained with its application.

This Recital reflects the fact that at the time of the preparation of the Delegated Regulation the Commission services had to make use of assumptions and estimates in order to provide an analysis of how the proposed methodology would work (see Commission Staff Working Document SWD(2014) 327/2). In particular, the co-legislators considered that the actual performance of the 0.8-1.5 range for the risk adjustment multiplier needed to be assessed on the basis of observed data.

In order to inform their assessment with the necessary evidence on the 2015 and 2016 contributions, the Commission services requested data from Resolution Authorities in June 2016 and used it to analyze the risk adjustment multiplier. The results of these analyses are presented in this Commission Staff Working Document.

The deadline for this review came very early into the application of the Delegated Regulation. National Resolution Authorities applied it for the first time in late 2015 (some of them did not apply it in 2015 because a resolution financing arrangement under Directive 2014/59/EU had not been established in their Member State yet), with varying degrees of completeness. Basing the review on only one year of (partial) application could have been prone to errors. Furthermore, even though this first review does not concern the provisions of Council Implementing Regulation (EU) 2015/81 (the Council Implementing Act), it would seem appropriate for it to cover the Single Resolution Fund (SRF). The first round of contributions to the SRF only had to be notified by the Single Resolution Board to the contributing institutions by 1 May 2016. As a result, data for the review had to be collected in 2016 after this date. This also offered the opportunity to double the number of observations for the non-participating Member States (i.e. of observing both 2015 and 2016 calculations as opposed to 2015 only), because National Resolution Authorities also had a deadline of 1 May 2016 for notifying 2016 contributions to institutions. Section 2 of this Staff Working Document summarizes the data collection process and Section 3 describes the dataset obtained from it.

As indicated in Recital 27 of the Delegated Regulation, this Staff Working Document mainly focuses on the appropriateness of the risk adjustment multiplier. This is assessed by virtue of analyses of the sensitivity the results to the range of the risk adjustment multiplier (Section 4.1), of the distribution of contributions by institution size (Section 4.2) and of the correlation of the risk adjustment multiplier with an exogenous measure of risk (Section 4.3).

While strictly speaking the lump-sum system as provided for in Article 10 of the Delegated Regulation does not form part of the risk adjustment multiplier, it also pertains

to the risk adjustment (see Recital 16 of the Delegated Regulation). This Staff Working Document therefore also presents an assessment of its application (Section 4.4). Finally, the availability of the indicators that compose the risk adjustment multiplier is analyzed (Section 5) and the qualitative feedback spontaneously submitted by stakeholders is summarized and discussed (Section 6).

2. DATA COLLECTION

On 23 June 2016 the Commission services requested Resolution Authorities to submit data in electronic format on contribution periods[1] 2015 and 2016. The last data submission was received by the Commission services on 19 August 2016. Bilateral exchanges followed with a number of Resolution Authorities in order to clarify the content of their submissions, which led to the last edits to the data files being made on 8 November 2016.

The cooperation of Resolution Authorities was essential to ensure that the most accurate, complete and comparable information could be used. Data was received from the Single Resolution Board and from the Resolution Authorities of Austria, Bulgaria, Czech Republic, Germany, Denmark, Estonia, Greece, Spain, Finland, France, Croatia, Hungary, Ireland, Italy, Lithuania, Luxembourg, Latvia, Malta, Netherlands, Portugal, Romania, Sweden, Slovenia and Slovakia. The Resolution Authority of Belgium was not able to provide the data due to the duty of professional secrecy applicable under Belgian law, and the Resolution Authority of Hungary was able to provide only a small part of the required data due to the professional secrecy applicable under Hungarian law. The Resolution Authority of Poland communicated that the BRRD would be implemented into the Polish legal system by means of a new Act which would enter into force on 9 October 2016, while the provisions regarding contributions would enter into force on 1 January 2017.

All information provided by the Resolution Authorities under this data request was treated as confidential and processed in compliance with the security rules that apply to information classified as EU Restricted, and as such has not been shared beyond its intended addressees or used for other purposes than the task conferred to the European Commission by Recital 27 of Commission Delegated Regulation (EU) 2015/63. The Commission services guarantee professional secrecy at least equivalent to the professional secrecy obligations under Article 53 of Directive 2013/36/EU and are subject to the professional secrecy obligations laid down in Article 339 TFEU. In order to avoid the possibility that individual institutions are identified, all institutions with contribution base above EUR 400 bn were removed from the graphs presented in this Staff Working Document.

The data request contained three main sections, covering institutions' data, the set of signs and weights applied by Resolution Authorities to build the risk adjustment multiplier, and additional information on the data with reference to the relevant legislation. The data was to be provided at individual level, covering all institutions liable to pay contributions to the respective resolution financing arrangement, and to be reported exactly as it entered the Resolution Authorities' actual calculations, after all

[1] The contribution period is the calendar year in which contributions are raised. The contribution period is not to be confused with the reference date for the data which is used for the calculation, as defined in Article 14 of Commission Delegated Regulation (EU) 2015/63.

checks and cleaning steps. The purpose of the collection was to gather all the data points needed to compute the risk adjustment multiplier and contributions in accordance with the Delegated Regulation.

3. FINAL DATABASE

This section is devoted to describing the data received for this Staff Working Document and to explaining the steps and the checks performed to come up with a suitable final version of the database to compute the risk adjustment multiplier and the contributions at individual institution level according to the rules set out in the Delegated Regulation.

Table 1 presents the dataset collected from Resolution Authorities.[2] For each Member State, the number of institutions and the aggregate amount of total liabilities including own funds is presented. For non-Banking Union Member States, since data was provided in local currency, the exchange rates used for the conversion are the end-of-period rates provided by AMECO[3].

Table 1: Composition of the dataset provided by Resolution Authorities

MS	Contribution period 2015		Contribution period 2016	
	Number of institutions	Total Liabilities including Own Funds (bn€)	Number of institutions	Total Liabilities including Own Funds (bn€)
AT	605	819	604	795
BE	missing	missing	41	877
CY	missing	missing	14	67
DE	1,752	7,461	1,662	7,411
EE	11	14	9	16
ES	179	2,550#	116	2,501
FI	96	489	42	544
FR	481**	7,906**	464**	8,673**
GR	34*	321*	30*	310*
IE	41*	829*	40*	544*
IT	606	2,878	562	2,878
LT	9[4]	18	7	19
LU	102	583	102	592
LV	17	25	16	26
MT	21	27	26	26
NL	65	2,463	54	2,471
PT	61	416	56	367
SI	17	35	16	32
SK	13	54	13	54
Euro area	**4,093**	**26,863**	**3,874**	**28,203**
BG	24	38	23	40
CZ	missing	missing	46	157
DK	91	1,009	91	1,038
HR	37	52	34	52
HU	53	87	54	91
PL	missing	missing	missing	missing
RO	missing	missing	31	74
SE	missing	missing	179	1,274
UK	missing	missing	missing	missing

[2] Data for Euro area Member States have been provided by the Single Resolution Board (SRB) for the contribution period 2016.

[3] http://ec.europa.eu/economy_finance/ameco/user/serie/SelectSerie.cfm

[4] This includes one investment firm.

** The MS provided a separate dataset for investment firms*

*** France provided data for institutions operating in Monaco (or branches licensed in Monaco) and in overseas non-EU territories, and for French branches of an institution registered in a third country*

[#] Total liabilities of small institutions are not reported

Data provided by Resolution Authorities have been processed in order to remove all the institutions for which the risk adjustment multiplier and contributions were not provided and were impossible to compute.

The final dataset used for the analyses is presented in Table 2.

Table 2: Composition of the final database

MS	Contribution period 2016	
	Number of institutions	Total Liabilities including Own Funds (EUR bn)
AT	604	795
BE	41	877
CY	14	67
DE	1,662	7,411
EE	9	16
ES	116	2,501
FI	42	544
FR	373	8,562
GR	21	310
IE	28	536
IT	562	2,878
LT	7	19
LU	102	592
LV	16	26
MT	26	26
NL	54	2,471
PT	56	367
SI	16	32
SK	13	54
Euro area	**3,762**	**28,081**
BG	23	40
CZ	46	157
DK	91	1,038
HR	34	52
HU[5]	not included	not included
PL	missing	missing
RO	31	74
SE	179	1,274
UK	missing	missing

As for the 2015 contribution period, Resolution Authorities implemented the Delegated Regulation in heterogeneous ways that make it difficult to the compare the results. For a few Member States the analyses have been performed also on 2015 data, yielding results that are in line with the ones obtained for 2016. Therefore, in order to maximize the number of Member States included, the results presented in this Staff Working Document focus on the 2016 contribution period only.

[5] The Resolution Authority did not provide the target, the amount of covered deposits and the risk indicators used to calculate the risk adjustment multiplier due to the duty of professional secrecy applicable under Hungarian national law. For this reason, Hungary is excluded from the analysis.

4. ANALYSES

4.1. Sensitivity Analysis of the Upper Limit of the Multiplier

4.1.1. Methodological Considerations

According to the Annex 1, Step 6, paragraph 2 of the Delegated Regulation, the formula to compute contributions to resolution financing arrangements is the following:

$$c_n = Target * \frac{\frac{B_n}{\sum_p B_p} \cdot \tilde{R}_n}{\sum_p \left(\frac{B_p}{\sum_q B_q} \cdot \tilde{R}_p \right)}$$

where n, p and q index institutions and $Target$ is the annual target level determined in accordance with Article 4(2), minus the sum of the lump-sum contributions as per Article 10 and Article 20(5).

The ratio $\frac{B_n}{\sum_p B_p}$, multiplied by the Target, is the Basic Annual Contribution (BAC), i.e. the share of the target that would be paid by each institution under a mechanism purely based on the total liabilities excluding own funds minus covered deposits.[6] The BAC is multiplied by $\tilde{R}_n$, the Final Composite risk Indicator (FCI), rescaled into the pre-defined range ($Rmin$, $Rmax$) according to formula:

$$\tilde{R}_n = (Rmax - Rmin) * \frac{FCI_n \ - \min_n FCI_n}{\max_n FCI_n \ - \min_n FCI_n} + Rmin$$

According to the Delegated Regulation, $Rmin$ and $Rmax$ are set to 0.8 and 1.5 respectively.

The range of variation specifies the desired maximum penalization and maximum discount to be awarded to the most risky and least risky institutions in the sample. This implies that, before applying the denominator $\sum_p \left(\frac{B_p}{\sum_q B_q} \cdot \tilde{R}_p \right)$, the institution assessed as having the highest risk value in the system would see its BAC increase by 50% ($\frac{B_n}{\sum_p B_p} * 1.5$), while the least risky institution would see its BAC decrease by 20% ($\frac{B_n}{\sum_p B_p} * 0.8$).

[6] This BAC is computed as follows:

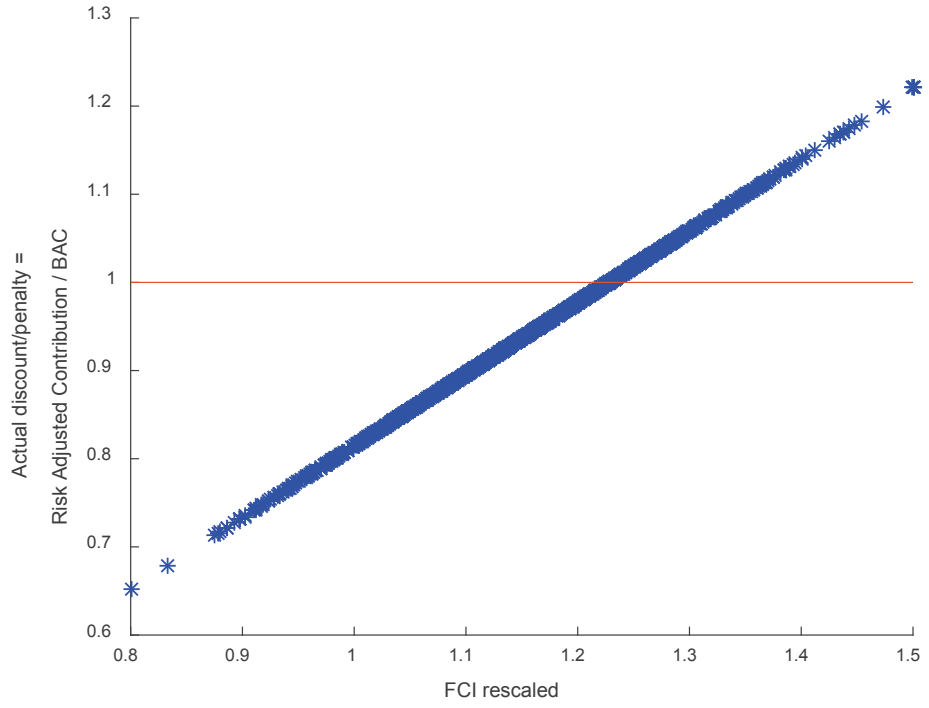
- B is the base with deductions as per Article 5 of the Delegated Regulation;
- The denominator is the sum of B over the institutions that fully or partially (i.e. falling in the scope of Article 20(5)) pay risk-adjusted contributions. For institutions falling in the scope of Article 20(5), EUR 300 million are deducted from the base.
- The target is the total target minus the total lump-sum payments.

This BAC is different from the BAC computed for the small institutions in Section 4.4.

However, in order not to result in any overshooting or undershooting of the annual target, the sum of all risk-adjusted contributions is constrained to yield exactly the total target. In other words, all risk-adjusted contributions are divided by a constant that assures that the target is met exactly. The denominator in the formula to compute the risk-adjusted contribution is a "normalization term".

This normalization transforms the final range of discounts and penalties. By way of example on Euro Area data, Figure 1 shows that rescaling the FCI yields a final range of ratios from around 0.65 to around 1.22 (or an implied maximum discount of about 35% and maximum penalization of about 22%). However, the ratio of the final maximum discount to the final maximum penalty will be exactly the same as the one imposed by the initial range: in other words: $\frac{1.21875}{0.65} = \frac{1.5}{0.8} = 1.875$. Therefore, per euro of contribution base, the riskiest institution pays 87.5% more than the least risky one.

Figure 1: Relationship between the range of the rescaled FCI and the actual discount/penalty with respect to a pro-rata contribution, Euro area institutions, 2016 contributions.



4.1.2. Results

In this Section the distribution of the risk-adjusted contributions is compared against two alternative distributions that would result by applying (i) (0.8-2) and (ii) (0.5-2) as alternative ranges to rescale the final composite risk indicator. The two chosen ranges increase the ratio of the largest indicator over the smallest one up to 2.5 $\left(\frac{2}{0.8}\right)$ and 4 $\left(\frac{2}{0.5}\right)$ respectively.

This analysis includes all institutions that have to pay on a risk-adjusted basis in full or in part (i.e. according to Article 20(5)).

Calculations have been run under two different frameworks. In the first case, called BRRD environment, the target is set at national level, i.e. it is a percentage of the sum of covered deposits in each Member State, and the ranking of each institution's riskiness is obtained on a national basis. The BRRD environment has been applied to all Euro area (EA) Member States plus Bulgaria, Czech Republic, Denmark, Croatia, Romania and Sweden. In the second case, called SRM environment, the overall target is set at Euro area level and the FCI is computed and rescaled on a Banking Union basis.

Figure 2 and Figure 3 disclose the two series of contributions obtained by applying the current multiplier (blue) versus the alternative one obtained by rescaling the risk indicator from 0.8 to 2 (purple), for the BRRD environment and the SMR environment respectively. The same is shown in Figure 4 and Figure 5 for the (0.5-2) range.

In all the above-mentioned charts, the x-axis reports the contribution base (i.e. total liabilities excluding own funds minus covered deposits and the exclusions allowed in accordance with Article 5 of the Delegated Regulation).

Zoomed-in charts for different categories of institutions' size are reported in Annex I: Zoomed-in Charts on the Sensitivity Analysis of the Upper Limit of the Multiplier.

Moreover, the relative changes in contributions following the implementation of the alternative range for the risk multiplier have been computed. Changes when moving from (0.8-1.5) to (0.8-2) are reported in Figure 6 and Figure 7 for the BRRD and the SRM environments, respectively, while changes when moving from (0.8-1.5) to (0.5-2) are reported Figure 8 in and Figure 9.

Key results are as follows:

- The overall shape of the distribution of risk-adjusted contributions does not change. This result holds for both stretched ranges, and for both the BRRD and the SRM environments.
- The direction of change (increase or decrease) of contributions following the stretching of the range does not depend on the size of the institution. Upwards and downwards variations are visible both on the right end of the chart (where the largest institutions are) and on the left one (where the smallest institutions are).
- The biggest (positive or negative) relative changes in contributions are experienced by the smallest institutions paying risk-adjusted contributions. This effect is not reflected by a relative change of the same magnitude in the contributions of the largest institutions. This is because the overall amount of money that institutions have to contribute on aggregate does not change (the target is a constraint). By stretching the range of the risk adjustment multiplier, the constraint of the total target is quickly hit because the contribution base of the largest institutions is very much bigger compared to the others' (in the SRM environment, the largest total liabilities excluding own funds minus covered deposits are around 5000 larger than the smallest ones which do not fall under Article 10 or 20(5) of the Delegated Regulation): this results in a limit to the upward shifts in contributions that can be applied to the largest institutions.
  This effect is amplified when considering the widest risk-multiplier range (0.5-2).

Figure 2: Risk-adjusted contribution under 0.8-1.5 range (blue) and under 0.8-2 range (purple). BRRD environment, EA Member States plus BG, CZ, DK, HR, RO, SE

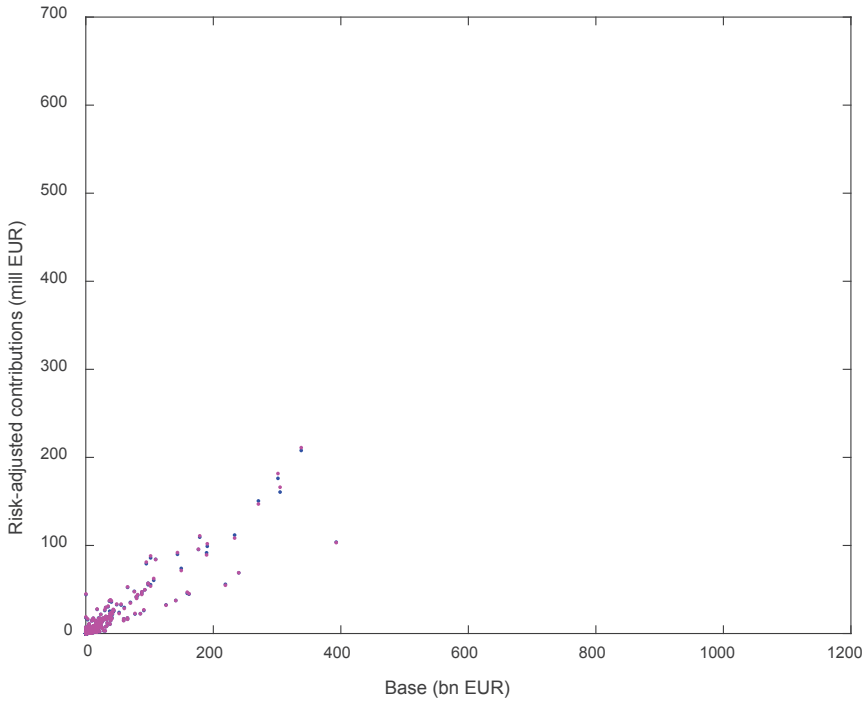


Figure 3: Risk-adjusted contribution under 0.8-1.5 range (blue) and under 0.8-2 range (purple). SRM environment, EA Member States

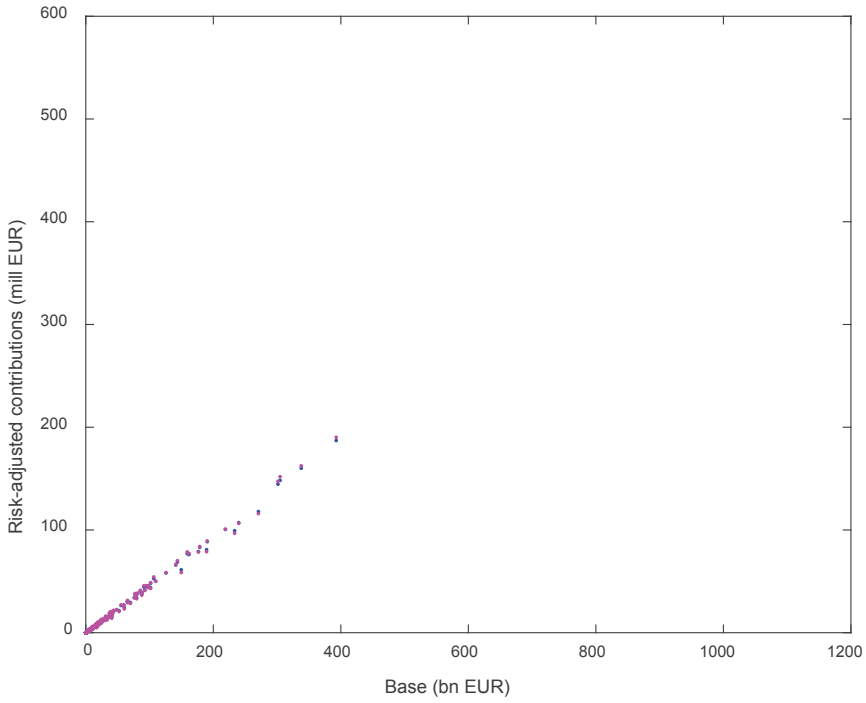


Figure 4: Risk-adjusted contributions under 0.8-1.5 range (blue), and under 0.5-2.0 range (purple), BRRD environment, EA Member States plus BG, CZ, DK, HR, RO, SE

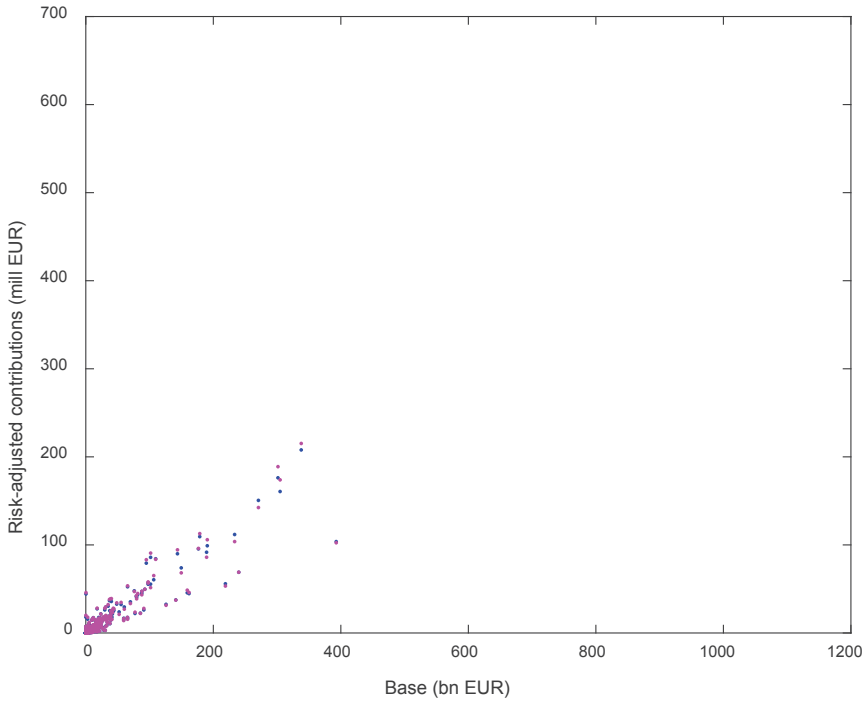


Figure 5: Risk-adjusted contribution under 0.8-1.5 range (blue) and under 0.8-2 range (purple). SRM environment, EA Member States

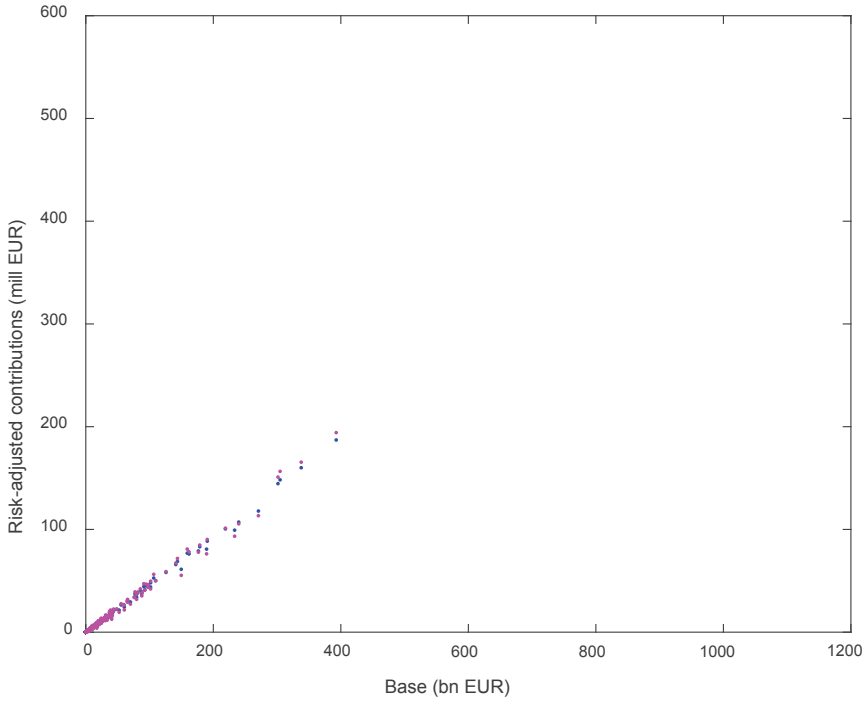


Figure 6: Changes in risk-adjusted contributions when moving from (0.8-1.5) to (0.8-2). BRRD environment, EA Member States plus BG, CZ, DK, HR, RO, SE

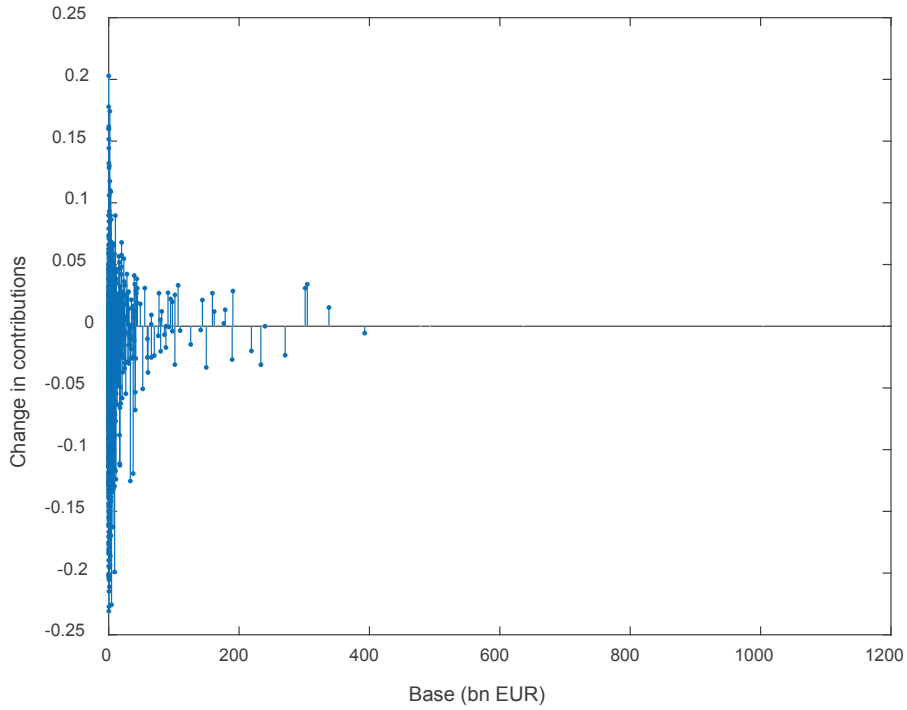


Figure 7: Changes in risk-adjusted contributions when moving from (0.8-1.5) to (0.8-2). SRM environment, EA Member States

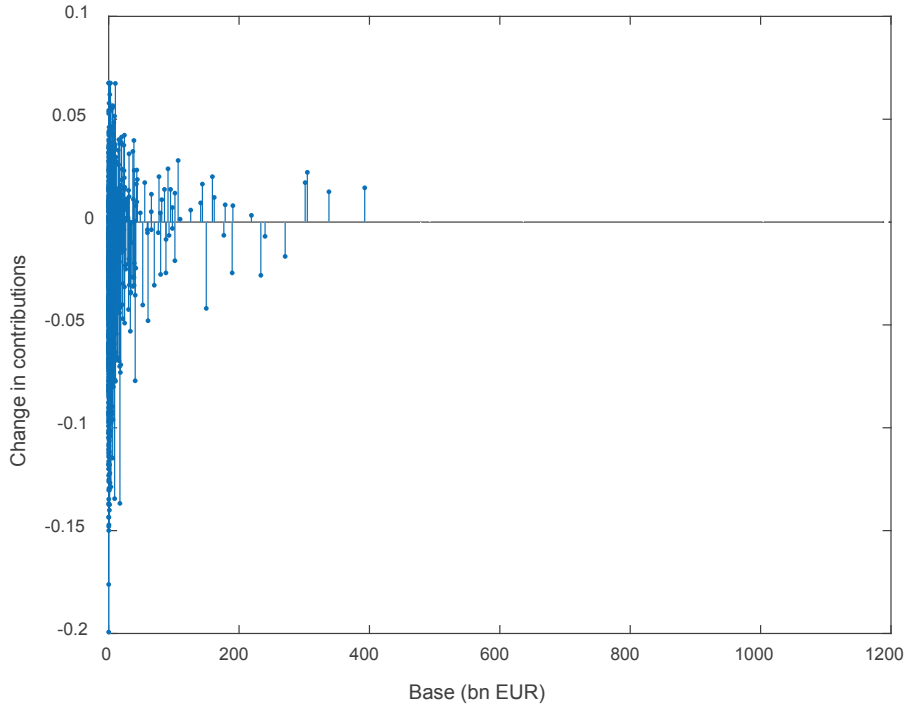


Figure 8: Changes in risk-adjusted contributions when moving from (0.8-1.5) to (0.5-2). BRRD environment, EA Member States plus BG, CZ, DK, HR, RO, SE

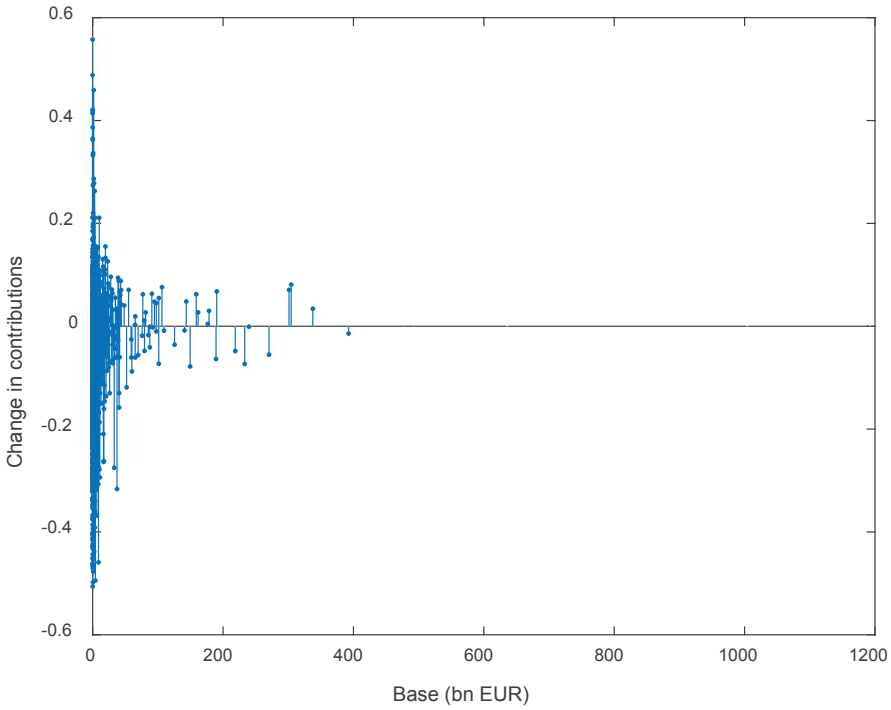
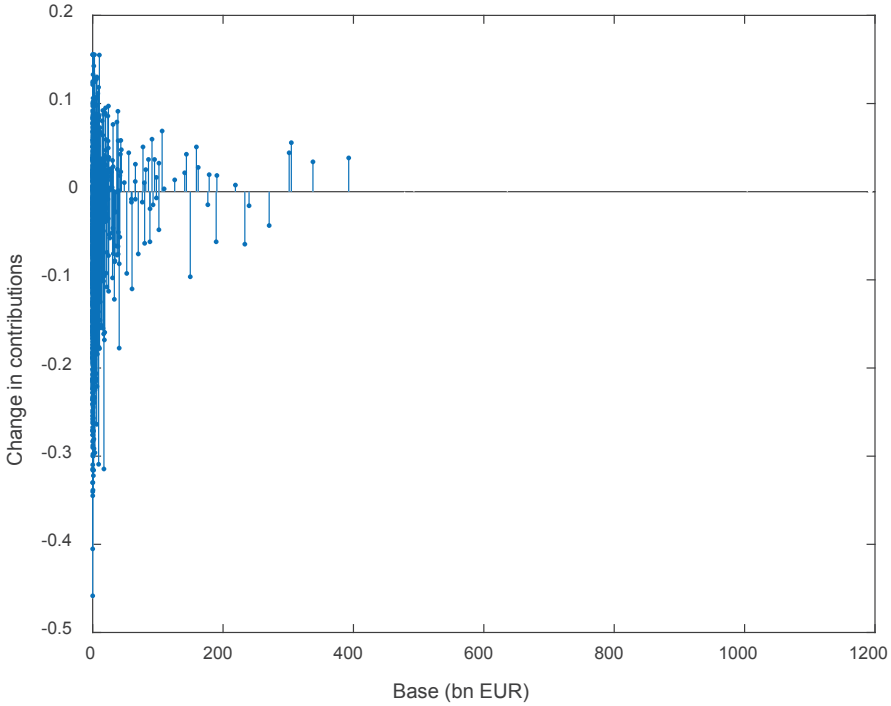


Figure 9: Changes in risk-adjusted contributions when moving from (0.8-1.5) to (0.5-2). SRM environment, EA Member States



4.2. Distribution of contributions by institutions' size

The appropriateness of the risk adjustment multiplier can also be assessed by its ability to reflect the *a priori* higher expectations that the largest institutions enter into resolution when they are failing or likely to fail, by levying them more than proportionally with respect to a *pro-rata* system (i.e. the BAC).

For the purpose of this analysis, only the sub-sample of the largest institutions making up 85% of aggregate total assets[7] is considered. These institutions pay 88% of the total contributions under the BRRD environment[8] and 90% under the SRM environment. This confirms that the risk adjustment results in a more than proportional burden on the largest institutions and is consistent with the idea, enshrined in Recital 15 of the Delegated Regulation, that "small institutions […] are often less systemically risky compared to large institutions, and, in many cases, the impact of their failure on the wider economy is lower than that of large institutions".

Figure 10 is a scatter plot reporting the BAC on the x-axis and the risk-adjusted contribution on the y-axis. Each purple star in the chart corresponds to a different institution. The 45-degree line is also reported in order to easily visualize who, because of the risk adjustment, pays more (above the black line) or less (below the black line) than proportionally to total liabilities excluding own funds minus covered deposits and the applicable exclusions. Figure 11 reports the same under the SRM environment.

It can be noticed that in general the largest institutions covering 85% of aggregate total assets in the system pay more than proportionally to their dimension. However, this is of course not always the case for each such institution since the risk multiplier is a measure of riskiness that is not necessarily correlated to the dimension of the institution, and there can be cases of large institutions with a relatively low composite risk indicator.

[7] Total assets is calculated using the variable "total liabilities including own funds". The largest institution corresponding to the cumulative 85% of total assets in the sample holds 10 billion of total assets under the BRRD environment and 11 billion under the SRM one.

[8] "BRRD environment" means that contributions are calculated for national resolution funds both for Banking Union Member States, as if the SRF did not exist, and for the other Member States in the sample. When looking at non-participating Member States only, the value is 89%.

Figure 10: Risk-adjusted contribution of the largest institutions making up 85% of total assets in the system, as a function of the BAC. BRRD environment, EA Member States plus BG, CZ, DK, HR, RO, SE

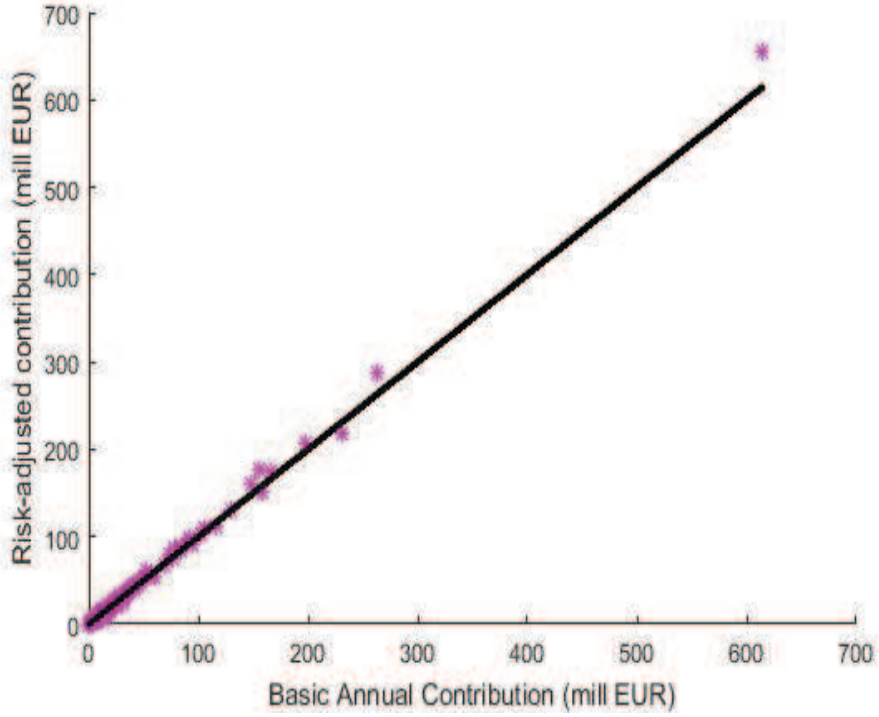
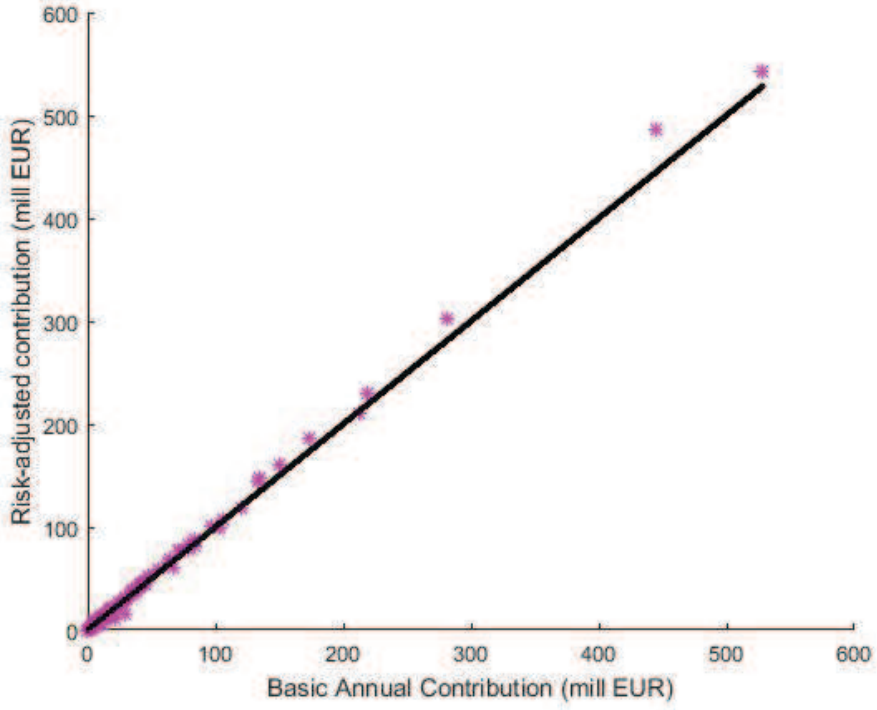


Figure 11: Risk-adjusted contribution of the largest institutions making up 85% of total assets in the system, as a function of the BAC. SRM environment, EA Member States



The same results hold when looking at the 82% cutoff[9]. The largest institutions making up 82% of total assets[10] pay 86% under the BRRD environment[11] and 88% under the SRM environment.

4.3. Distribution of Contributions by an Exogenous Risk Measure

Another possible way of evaluating the appropriateness of the risk adjustment multiplier is examining to what extent it reflects the riskiness of the corresponding institutions according to an exogenous (i.e. not determined by the calculation method of the Delegated Regulation) measure, such as a market-based one.

In order to do so, this Section compares the final composite risk indicator of some institutions to an exogenous measure of default risk for the same institutions. The chosen exogenous measure is the most commonly applied market-based risk indicator, the credit default swap (CDS) spreads. The comparison is performed by way of a simple linear regression.

4.3.1. Data

CDS data on the 5-year senior bonds issued by institutions is used for this analysis, as these CDSs have the most liquid market. The CDS data for the year 2013 are from CMA Datavision, a subsidiary of Standard & Poor's.[12] This series of CDS data is updated from Bloomberg for the year 2014. Altogether, for this analysis daily CDS data for 134 European financial companies for the year 2013 (to be matched to the data for the 2015 contribution period) and 123 European financial companies for the year 2014 (to be matched to the data for the 2016 contribution period) are used. In order to filter out the noise in the daily data and to obtain a robust measure on the annual market-perceived default risk of institutions, the yearly average of the daily observations is calculated.

Given that some of the financial companies with CDS data are not commercial or investment banks (but insurance companies, or in some cases central banks), only a fraction of the CDS data could be used. As explained below, the sample size decreases even further due to the anonymized fashion in which data was received from Resolution Authorities for most of the institutions.

In order to compare the two alternative measures for the riskiness of institutions, data from Resolution Authorities needs to be matched with data on CDS spreads. Since data

[9] Significant institutions in the Euro area currently represent almost 82% of banking assets (see https://www.bankingsupervision.europa.eu/about/thessm/html/index.en.html - last accessed: 17 November 2016)

[10] The institution corresponding to the cumulative 82% of total assets in the sample holds around 14 billion of total assets both under the BRRD environment and the SRM one.

[11] When looking at non-participating Member States only, the value is also 86%.

[12] For a detailed description of the data on CDS, see: W. Heynderickx and J. Cariboni and W. Schoutens and B. Smits (2016)," The relationship between risk-neutral and actual default probabilities: the credit risk premium", Applied Economics, 48(42), p. 4066-4081.

from Resolution Authorities is in most cases[13] anonymized, data from the Bankscope database was used according to the following steps:

(1) Matching the total assets and own funds of anonymized institutions with the corresponding data in Bankscope.

(2) Assigning the institution's identifier in Bankscope to the institutions in the dataset provided by the resolution authorities.

(3) Assigning the same identifiers to the institutions for which the CDS data are available.

(4) Assigning the CDS spreads to the matched institutions.

The main limitations of this matching algorithm are that Bankscope does not cover all the institutions for which Resolution Authorities provided data and that the level of reporting to Bankscope often differs from the ones applied by Resolution Authorities, mainly due to different consolidation levels and different rules and waivers for the purposes of financial and prudential reporting. Due to these issues, the final sample only contains 25 institutions for the 2015 contribution period and 14 institutions for the 2016 contribution period.

Another issue that emerges when directly comparing the CDS spreads and the rescaled final composite risk indicators is that while the CDS data capture the riskiness of bank groups, the reporting for the purposes of contributions to resolution financing arrangements is often at the individual institution level. An attempt to tackle this issue is made by running separate regressions on the sub-sample of institutions that partially report to Resolution Authorities at the group level.[14] To be precise, for the purpose of this analysis this subset of institutions includes those for which the reporting level of the CET1 ratio risk indicator was reported to be either the "consolidated level" or the "EU sub-consolidated level" or the "EU consolidated level" by the Resolution Authority.[15] This sub-sample covers 9 and 5 institutions for the contribution periods 2015 and 2016, respectively. Table 3 describes the samples.

[13] The prior consent of Resolution Authorities that did not provide data in an anonymized fashion was obtained in order to include the relevant institutions in this analysis.

[14] These are the institutions making use of a waiver for the individual reporting of some indicators, which are allowed to be reported at the sub-consolidated or consolidated level in accordance with Article 8 of the Delegated Regulation.

[15] As there is no difference between the reported "reporting level of the CET1 ratio risk indicator" and the reported "reporting level of the leverage ratio risk indicator" for the institutions in the sample for which information on both of these indicators is available, the sub-sample of banks that report at consolidated level is the same no matter which criteria on reporting is used to select the banks into the sub-sample.

Table 3: Descriptive statistics of the samples used for the regression analyses

Contribution year	2015		2016	
Method	BRRD		BRRD	
Sample	All banks with matched data	Sub-sample of banks	All banks with matched data	Sub-sample of banks
num. obs.	25	9	14	5
total liabilities including own funds (in bn €)	3,572	1,124	5,577	4,082
average total liabilities including own funds (in bn €)	143	125	398	816
total contributions (in million €)	1,133	544	1,768	1,257
average contribution (in million €)	45	60	126	251

Note: The sub-samples of banks cover only those financial institutions which calculate their contributions to the resolution funds with some data at consolidated level.

Although the samples used for the regressions cover only a small fraction of institutions, these represent a high share of the banking sector in terms of total liabilities and total contributions. For instance, for the contribution year 2016 data was used only on 14 institutions, but the total liabilities of these banks correspond to 13% of the total liabilities of all the institutions paying into the SRF. In terms of total contributions, the significance of these banks is even higher as they paid almost one quarter of all the contributions to the SRF in 2016.

4.3.2. Results

The main result of the linear regressions is that there is a generally statistically significant positive relationship between the rescaled final composite indicator and the CDS spreads (see Table 4). The R^2 statistics range from 33% to 52% for the regressions where both the external (CDS spreads) and the internal (rescaled final composite indicator) risk measure account for the riskiness of the group. Given that the estimates are obtained on cross-sectional data, the goodness of fit can be considered to be reasonably good.

Table 4 also shows that this positive relationship is robust to:

- the vintage of the data, i.e. using the composite risk indicator for the 2015 or 2016 contribution periods;
- whether the composite risk indicator is computed on a national (BRRD) or Banking Union (SRM) basis;
- the choice of the sample, i.e. using a sample covering all the institutions with matched data, or the subsample of institutions providing the composite indicator based on some indicators reported at consolidated level.

By comparing the R^2 statistics of regressions run on the full sample of 25 (14) institutions with their counterparts obtained on the sub-sample of 9 (5) institutions for the year 2015 (2016), we find that the fit is better in the latter set of regressions. This finding is not surprising, given that the dependent variable is measured with a larger error in the first set of regressions due to not calculating the composite risk indicator with some data at consolidated level for all the institutions.

Given the very low sample size due to the difficulties in matching data points and in comparing consolidation levels, the estimated relationship should be treated with extreme caution (see for example the large changes in the estimated slope coefficients across samples).

Notwithstanding all the above-mentioned limitations, these results seem to offer some confidence regarding the presence of a positive relationship between the final rescaled composite risk indicator and the external risk indicator (CDS spreads), and thus regarding the appropriateness of the risk adjustment multiplier in terms of sensibility with respect to a market-based measure of risk. In other words, the risk adjustment multiplier tends to flag as more risky the institutions that the market also considers to be so.

Table 4: Regression results from a two-variable linear model on institution data. Dependent variable: rescaled final composite indicator; explanatory variable: CDS spreads.

Contribution year	2015		2016			
Method for calculating the risk indicator	BRRD		BRRD		SRM	
Sample	All institutions with matched data	Sub-sample of institutions	All institutions with matched data	Sub-sample of institutions	All institutions with matched data	Sub-sample of institutions
Intercept	0.97	0.83	1.19	0.88	1.22	1.13
Slope	8.71	11.4	5.53	40.96	4.02	16.16
(t-stat)	(3.00)	(2.48)	(1.27)	(1.80)	(1.52)	(4.29)
num. obs.	25	9	14	5	14	5
R^2	0.28	0.47	0.12	0.52	0.16	0.33
correlation	0.53	0.68	0.34	0.72	0.40	0.57

Notes: For the contribution period 2015 (2016), the reference period for the CDS data is 2013 (2014). The CDS spreads are on the 5-year senior bonds issued by institutions. The annual CDS spreads are the averages of the daily spreads for the years 2013 and 2014. The sub-sample of institutions covers only those financial institutions which calculate their contributions to the resolution funds with some data at consolidated level.

4.4. Functioning of the Lump-sum System

According to Article 10 of the Delegated Regulation, small institutions make a lump-sum payment to resolution financing arrangements[16]. While strictly speaking the lump-sum system does not form part of the risk adjustment multiplier, it also pertains to the risk adjustment (see Recital 16 of the Delegated Regulation).

The appropriateness of the lump-sum system can be assessed by quantifying the size of the actual discount (with respect to a *pro-rata* payment based on total liabilities

[16] According to the lump-sum system small institutions are split into different buckets depending on the dimension of their contribution base. A different fixed payment (the lump-sum) is associated to each bucket.

excluding own funds minus covered deposits of the institution) that small institutions receive via the lump-sum system.

Table 5 reports the overall contributions that small institutions would pay if the BAC[17] was applied and the overall actual amount paid under the lump-sum system. Results are reported both in Euro amounts and as a share of the total annual target. The last column presents the overall discount that small institutions receive because of paying a lump-sum amount instead of a pro-rata contribution.

The overall reduction in contributions for small institutions across Banking Union Member States is 73%, while in non-participating Member States it ranges from 27% in Denmark to 70% in Sweden to 96% and 97% in Czech Republic and Bulgaria, respectively. In other words, the risk adjustment applied to small institutions goes well beyond the discount implied by the range of the risk adjustment multiplier for the less risky institutions.

This is all the more significant taking into account that 52% of institutions are classified as small and paid a lump sum according to Article 10 of the Delegated Regulation. This proportion is the same in the Banking Union (1945 out of 3762) and in the EU as a whole (2060 out of 3987).

Figure 12 shows the distribution of lump sums (green), BAC (purple), risk-adjusted (black) and Article 20(5) contributions (red) for institutions with a contribution base from 0 to 500 million. All lump-sums and most of the risk-adjusted (in full or partially) contributions are lower than the BAC. Rules set out in the Delegated Regulation make the smallest institutions pay less than proportionally to their size.

Table 5: Small institutions annual contributions under BAC and Lump-sum system.

MS	Small institutions - Overall Lump Sum		Small institutions - Overall BAC		Reduction when moving from the BAC to the lump sum
	th €	as % of annual target	th €	as % of annual target	
Euro area	16,313	0.23%	61,243	0.87%	-73%
BG	1	0.002%	32	0.066%	-97%
CZ	42	0.04%	978	0.91%	-96%
DK	235	0.24%	320	0.33%	-27%
HR	68	0.29%	1,291	5.58%	-95%
RO	120	0.48%	973	3.88%	-88%
SE	806	0.22%	2,644	0.73%	-70%

[17] This BAC is computed as total liabilities excluding own funds, less covered deposits, divided by the overall total liabilities excluding own funds, less covered deposits in the selected country and multiplied by the target.

Figure 12: Risk-adjusted contributions (black), Lump-Sum contributions (green), BAC (purple), Article 20(5) contributions (red) (EA, SRM environment)[18]

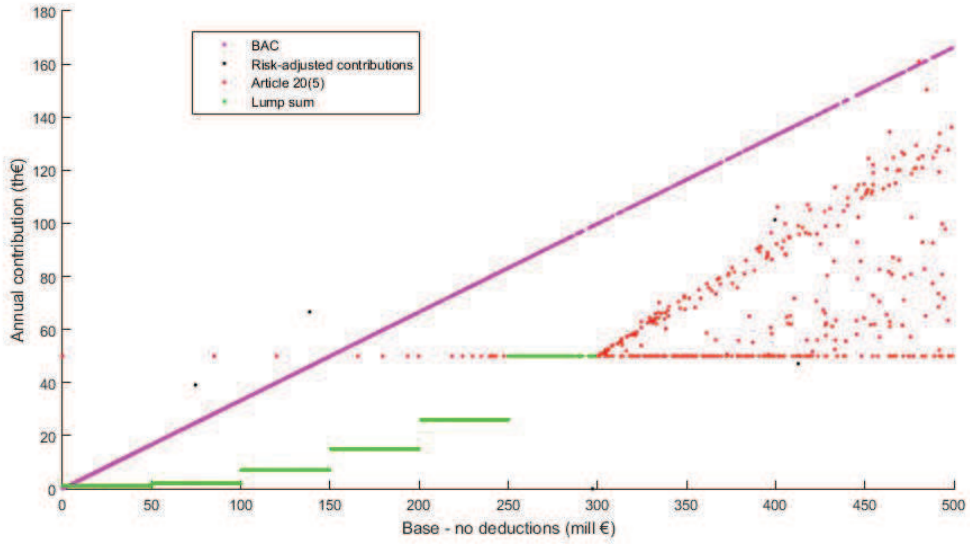


Figure 12 includes some cases in which the simplification introduced by the lump-sum system becomes a limitation:

- In some cases, institutions that do not qualify for Article 10 or Article 20(5) of the Delegated Regulation pay less than institutions qualifying for those Articles. For example, one institution with a base below EUR 300 million but total assets above EUR 3 billion pays zero once it applies the deductions of Article 5.

- On the other hand, Article 20(5) of the Delegated Regulation introduces a floor of EUR 50 thousand for institutions qualifying for it, even for those with a base below EUR 300 million.

5. AVAILABILITY OF INDICATORS

The functioning of the risk adjustment multiplier also depends on the extent to which the risk indicators provided for in the Delegated Regulation are included in the calculation.

The Commission services note significant variation in the availability of data both across and within jurisdictions (competent authorities may require the reporting of certain indicators only from a subset of institutions). As a result, Resolution authorities have been applying the methodology with different degrees of completeness and it would seem very premature to draw definitive conclusions on the functioning of the risk adjustment multiplier before its components are fully applied.

Table 6 reports the percentage of Member States in which each indicator has been applied in contribution periods 2015 and 2016, out of 20 and 25 Member States, respectively, for which Resolution Authorities have reported data on this aspect.

[18] There are few institutions that pay a risk-adjusted contribution even if their base is below 300 million. These institutions are classified as small disproportionally risky institutions (Article 10(8)).

Table 6: Prevalence in the use of risk indicators

Risk Indicator	% MSs where it was applied	
	2015	2016
Own funds and eligible liabilities in excess of MREL; art 6(2)(a)	35%	16%
Leverage ratio; art 6(2)(b)	65%	100%
CET 1 ratio; art 6(2)(c)	85%	100%
TRE divided by TA; art 6(2)d)	85%	100%
NSFR; art 6(3)(a)	15%	12%
LCR; art 6(3)(b)	35%	16%
Share of interbank loans and deposits in the European Union, capturing the importance of the institution to the economy of the Member State of establishment; art. 6(4)	60%	24%
Trading activities, off-balance sheet exposures, derivatives, complexity and resolvability: art 6(5)(a)	85%	96%
Membership in an IPS; art 6(5)(b)	50%	92%
Extent of previous extraordinary public financial support; art 6(5)(c)	70%	96%

The indicator on own funds and eligible liabilities in excess of MREL is likely to become more widely applied as Resolution Authorities take MREL decisions. Similarly, the Commission services note that, within the indicator on trading activities, off-balance sheet exposures, derivatives and complexity and resolvability some Resolution Authorities did not include any measure of complexity and resolvability, which are also likely to become more populated as resolution planning activities advance.

In the case of the Single Resolution Fund, the NSFR, LCR and interbank indicators were not applied in 2016. As regards the NSFR indicator, Regulation (EU) 575/2013 introduced a reporting requirement for the NSFR without setting out more detailed requirements. Once such detailed requirements will enter into force, the indicator should be available for application in the Single Resolution Fund (with a 2-year lag, due to Article 14 of the Delegated Regulation). However, other Resolution Authorities explained that in their Member State institutions had to report NSFR already, in which case they used the indicator. As regards the LCR indicator, Commission Implementing Regulation (EU) 2016/322 of 10 February 2016 amending Implementing Regulation (EU) No 680/2014 laying down implementing technical standards with regard to supervisory reporting of institutions of the liquidity coverage requirement applies since 10 September 2016, therefore the indicator should be applied in the Single Resolution Fund starting in the 2018 contribution period. However, other Resolution Authorities explained that in their Member State institutions had to report LCR already, in which case they used the indicator. As regards the interbank indicator, significant institutions already report the required information to competent authorities, while less significant institutions will start doing so only in 2017. Therefore, this indicator should be available for contributions to the Single Resolution Fund by 2019 at the latest.

Finally, the Commission services note that the denominator of the interbank indicator, which is required to be reported according to Article 15 of the Delegated Regulation, appears to be, from a technical point of view, redundant, because the indicator is subsequently rescaled according to Annex I, Step 3. Therefore, the same rescaled indicator would be obtained by using the numerator only. Article 15 of the Delegated Regulation therefore introduces an unnecessary burden. Table 7 illustrates this: the rescaled indicators between 1 and 1000 (columns E, F and G, respectively) are the same irrespective of whether the numerator only (column B), the share of interbank divided

calculated with the denominator including the full sample (column C) the share of interbank calculated with a "reduced" denominator (column D) are used.

Table 7: Simplified example of the calculation of the interbank indicator

	A	B	C	D	E	F	G
MS	Institution	IB (€)	IB/IB total	IB/IB total excluding MS4	Column B --> 1-1000	Column C --> 1-1000	Column D --> 1-1000
MS1	1	1	0.0256	0.0345	1	1	1
MS1	2	3	0.0769	0.1034	223	223	223
MS2	3	6	0.1538	0.2069	556	556	556
MS2	4	5	0.1282	0.1724	445	445	445
MS2	5	8	0.2051	0.2759	778	778	778
MS3	6	6	0.1538	0.2069	556	556	556
MS4	7	10	0.2564	0.3448	1000	1000	1000

IB total	39
IB excluding MS4	29

6. QUALITATIVE FEEDBACK

6.1. Data Request

Some Resolution Authorities spontaneously submitted comments on the application of the Delegated Regulation together with the data, based on their concrete experience. These comments are summarized below.

6.1.1. Contributions of Investment Firms

A Resolution Authority in the Banking Union reported that only 12 investment firms were required to make contributions to its national resolution financing arrangement in 2016. Out of those, only 3 were subject to the risk adjustment. This created practical challenges with performing the calculation for 3 institutions only. Moreover, the Resolution Authority noted all those investment firms are relatively small ones and thus suggested considering the application of alternative metrics for determining the annual contributions of investment firms or for extending the application of the lump-sum approach to larger investment firms than currently provided for in the Delegated Regulation.

6.1.2. Complexity of the Methodology

A Resolution Authority considered that the risk adjustment might be too complex, leaving the calculation mechanism prone to operational risk. Together with another Resolution Authority, it also noted that size (measured as total liabilities excluding own funds minus covered deposits) tends to be correlated with the risk adjustment multiplier, making the latter somehow redundant in its view. Finally, it reported that entities complained about the lack of predictability of the current risk adjustment and thus, together with another resolution authority, suggested a mechanism with a very simple risk adjustment based only on two or three very well understood indicators. Predictability is discussed in more detail in Section 6.2.

6.1.3. Appropriateness of the Risk Adjustment Multiplier

A Resolution Authority reported that, since the banking sector in its Member State has a relatively limited number of institutions, they noticed that under the current risk adjustment multiplier large institutions ended up being "penalized" several times for their significance and concluded that the upper limit of the risk adjustment multiplier is already set at a rather high level and should not be further increased, while any need for more granular risk profiling could be channeled via particular risk pillars, their weighting and the potential alignment with the results of the Supervisory Review and Evaluation Process.

A Resolution Authority reported that institutions are sometimes struggling with the fact that the midpoint of the range of the risk adjustment multiplier is 1.15 and suggested using a range centered on the value 1.

6.1.4. Behavioral Response of Institutions

One Resolution Authority reported that using data as observed on one day in a year drives the institutions to change their balance sheet profile and behavior at that date (e.g. large deposits at institutions are expelled / charged with a negative rate, interbank market dries up).

6.2. Call for Evidence

In the context on the Call for Evidence on the EU regulatory framework for financial services that ran from 30 September 2015 to 31 January 2016, the Commission received 11 responses related to the Delegated Regulation.

3 Responses related to the role of institutions' size in the calculation. These stakeholders claimed that their contributions to the respective resolution financing arrangement are too high in proportion to their size and proposed solutions ranging from a full exemption of small-sized institutions from the payment to the extension of the lump-sum treatment.

3 Respondents complained about the duplication of reporting requirements for the purpose of the calculation of contributions with respect to already existing supervisory reporting requirements and asked that Competent Authorities automatically transmit those to Resolution Authorities. The Commission services note that such obligation is already provided for under Article 19(3) of the Delegated Regulation.

1 Respondent complained that the calculation methodology for contributions to resolution financing arrangements does not allow institutions to precisely estimate their future payments.

As regards predictability, the methodology set out in the Delegated Regulation provides for interdependency between contributions. This same feature can be found in the EBA's Guidelines on methods for calculating contributions to deposit guarantee schemes[19] and

[19] EBA/GL/2015/10: https://www.eba.europa.eu/documents/10180/1089322/EBA-GL-2015-10+GL+on+methods+for+calculating+contributions+to+DGS.pdf (last accessed: 22 November 2016)

in the ECB's supervisory fees[20]. The Commission services note that a distinction should be made between predictability (*ex-ante*) and replicability (*ex-post*).

Ex-ante, institutions paying risk-adjusted contributions will in any case face some uncertainty on the exact figure as long as the amount to be raised by the Resolution Authority in a given year is not known yet. Once that is communicated, institutions should be able to form a solid idea of their upcoming contribution since they should have an up-to-date understanding of how their size compares to others'. Anecdotal evidence suggests that larger institutions are also able to estimate their relative risk profile with relatively small margins of error. In any case, past contributions should from now on provide fairly accurate benchmarks for all institutions paying risk-adjusted contributions. In addition, IT tools could be developed based on the previous year's contributions to allow institutions to input their current data and obtain an estimate of their future contribution. Institutions qualifying for lump-sum payments, which are the majority, do not face such ex-ante uncertainty.

Ex-post, institutions paying risk-adjusted contributions would like to be able to replicate the calculation of their contribution. Resolution Authorities could provide information to individual institutions on all the calculation steps that don't involve the disclosure of individual-level data of other institutions. In fact institutions cannot replicate the calculation of the indicators of each and every institution without having access to the individual data of each and every institution (and might not have an interest in doing so). However, for each indicator they could receive the values of all the components of the formula determining the number of bins (the first one in Step 2(2) of the Delegated Regulation) and the minimum and maximum values of the raw indicators in each bin, so that, knowing the values of their own raw indicators, they would be able to correctly place themselves in a bin and continue the calculation until the end of Step 5. In order to complete Step 6(1) institutions could receive the minimum and maximum values of the final composite indicator. Finally, the aggregate denominators involved in the calculation and the appropriate target level could be disclosed to institutions so that they would be able to replicate their actual contribution under Step 6(2). All these values are the same for all institutions entering the calculation, and therefore are not variables, but parameters which institutions can take as given when replicating the calculation of their own contribution. Furthermore, they do not contain any information that would allow the identification of an individual institution; therefore it should be possible to disclose them. IT tools could also be developed for this purpose.

1 Respondent claimed that the geometric average used to aggregate the various risk pillars in order to calculate the composite risk indicator undoes the effect of the weights attached to each pillar, i.e. pillars with high weights are not as important as they should be. The stakeholder suggested changing to arithmetic averaging instead. The Commission services note the following with respect to this claim.

First, the “non-compensatory” nature of the geometric mean is “uni-directional”. In other words, either it does not allow particularly bad scores in an indicator, even with low weight, to be easily improved with average or good scores elsewhere, or it does not allow particularly bad scores in a single indicator, even with low weight, to worsen the whole composite indicator. The choice that was made in the Delegated Regulation is the first

[20] Regulation (EU) No 1163/2014 of the ECB of 22 October 2014 on supervisory fees (ECB/2014/41), OJ L 311, 31.10.2014, p. 23.

one (incidentally, it is this choice which introduces the need to build the indicator with low scores for high riskiness, and then invert it in Annex I, Step 5, paragraph 3 of the Delegated Regulation).

Second, the weight of the various parts of the indicator does not reflect “importance” in a lexicographic sense, but the strength of the penalization for low scores and the speed with which such penalization increases as the value of the indicator drops. In particular, under the geometric mean, reductions in the value of indicators with a high weight get penalized “early” at a rather constant rate, while reductions in the value of indicators with low weight get penalized “late”, but at an increasing rate. At the same time, however, the total penalty will always be higher, for any given reduction in value, for an indicator with a higher weight.

Taken together, these two characteristics make it well possible that a very low score (high risk) in a dimension even with low weight might not be fully compensated with a very good score in a dimension with higher weight. Annex I: Zoomed-in Charts on the Sensitivity Analysis of the Upper Limit of the Multiplier provides additional considerations and examples on the geometric mean.

1 Respondent claimed that the deduction of intragroup liabilities should be extended to its case, where there is no formal group, but central institutions manage the liquidity of the affiliated institutions, giving rise to a lot of "quasi-intragroup transactions". The stakeholder believes to be discriminated with respect to groups.

2 Responses relate to the tax treatment of contributions and therefore do not pertain to the subject matter of this Staff Working Document.

6.3. Additional Feedback from Stakeholders

Some stakeholders have bilaterally submitted feedback to the Commission on the application of the Delegated Regulation.

One association of credit institutions in a Member State considered that the weight assigned to risk pillar 1 is too high, and complained that using the geometric mean gives too much weight to those indicators where institutions do not perform well (see Section 6.2 and Annex I: Zoomed-in Charts on the Sensitivity Analysis of the Upper Limit of the Multiplier for an explanation of how the geometric mean works) and that IPS membership is underweighted. This stakeholder also reported that under the lump-sum approach situations could occur where institutions below EUR 3 billion of total assets pay more than institutions above, because the former have to pay EUR 50 thousand on the first EUR 300 million of total liabilities excluding own funds minus covered deposits, while the latter, by way of the exclusions under Article 5 of the Delegated Regulation, may end up with a lower contribution (see Section 4.4).

Another industry association argued that covered bonds should be excluded from the basis to calculate contributions. The Commission services note that the Delegated Regulation contains specific provisions on institutions which are already given recognition under Art. 45(3) BRRD, and that the characteristics of covered bonds (providing safety and sustainable access to funding) are given recognition via the inclusion of the liquidity coverage and net stable funding among the indicators used for the risk adjustment.

Finally, similarly to the case in Section 6.2, one credit institution claimed it should be allowed to deduct liabilities towards other members of the network of credit institutions which it heads, even if such network is not recognized as a group as defined in Article 5 of the Delegated Regulation, because its structure is comparable and provides for equivalent safeguards.

6.4. Litigation in the General Court

Several institutions have sought legal recourse against the raising of contributions to the Single Resolution Fund. In their lawsuits, some of these institutions are not only seeking the annulment of the individual contribution decision by the Single Resolution Board, but are also challenging the legality of the Delegated Regulation and of Council Implementing Regulation (EU) 2015/81.

7. CONCLUSIONS

At the time of the preparation of the Delegated Regulation, uncertainty surrounding the availability of data led the Commission and the co-legislators to consider it necessary to analyse the results of the application of the methodology already in 2016. This is reflected in Recital 27 of the Delegated Regulation.

Given the documented variation in the degrees of completeness to which the Delegated Regulation has been implemented (as documented in Sections 2 and 5) and the infancy of its application, the Commission services consider it premature to draw any firm conclusions at this stage. Nevertheless, some first insights into the appropriateness of the risk adjustment multiplier can be drawn with respect to a number of aspects.

The analyses presented in this Staff Working Document confirm that the results obtained in 2014, on the basis of older data and with the need for significant assumptions, hold when looking at the actual data used for the calculation of contributions to resolution financing arrangements in 2015 and 2016.

First, institutions representing the top 85% of total assets in the Euro area pay 90% of contributions calculated at Banking Union level. Institutions representing the top 82% of total assets in the Euro area[21] pay 88% of contributions calculated at Banking Union level. Incidentally, this is the same percentage that significant institutions currently pay in terms of ECB supervisory fees[22].

This suggests that larger institutions tend to get an upwards risk adjustment, while smaller institutions tend to get a downwards risk adjustment.

The application of the exclusion of certain liabilities and the treatment of derivatives provided for in Article 5, for which detailed and precise data were not available at the time of the preparation of the Delegated Regulation, did not alter these basic distributional outcomes of the methodology.

[21] Significant institutions in the Euro area currently represent almost 82% of banking assets (see https://www.bankingsupervision.europa.eu/about/thessm/html/index.en.html - last accessed: 17 November 2016).

[22] Decision (EU) 2016/661 of the ECB of 15 April 2016 on the total amount of annual supervisory fees for 2016 (ECB/2016/7), OJ L 114, 28.4.2016, p. 14.

Second, 52% of institutions in the EU pay lump sums, benefitting from an average reduction of 73% in the Euro area, and between 27% and 97% in non-participating Member States. While the risk adjustment multiplier does not apply to these institutions, the lump sum system introduces for many contributing institutions much larger reductions with respect to a *pro rata* system than those implied by the lower end of the range of the multiplier (0.8). As a result, the riskiest institutions pay much more than 1.875 (1.5/0.8) times the least risky ones per unit of contribution base.

Third, sensitivity analyses show that widening the range of the risk adjustment multiplier does not result in significant shifts in the cumulative distribution of contributions, but rather increases variation in the contributions of smaller institutions. When stretching the range of the risk adjustment the constraint of the total target is quickly hit, because the contribution base of the largest institutions (which tend to get an upwards risk adjustment) is very big compared to the others' (the largest contribution base in the sample, excluding institutions paying according to Articles 10 and 20(5) of the Delegated Regulation, is around 5000 times larger than the smallest one).

Fourth, the risk adjustment multiplier seems to be positively and significantly correlated with market-perceived risk. This suggests that the risk adjustment multiplier should be capturing a sensible underlying construct of risk.

While coming very early into the application of the Delegated Regulation, these results provide some preliminary evidence that the risk adjustment multiplier works as intended.

The information gathered for this Staff Working Document has also provided some initial understanding of the practical aspects related to the implementation of the Delegated Regulation. Some Resolution Authorities have not been able to include all risk indicators in the calculation yet, while others have done so already in the first year. In the case of the Single Resolution Fund, the outlook suggests that the Single Resolution Board should be able to fully apply the methodology set out in the Delegated Regulation by 2019 at the latest. The denominator of the interbank indicator has been assessed as redundant.

In addition, stakeholders have frequently brought to the attention of the Commission services the duplication of reporting requirements for the purposes of supervision and the calculation of contributions to resolution financing arrangements. The Commission services note that Article 19(3) of the Delegated Regulation contains an obligation for Competent Authorities to share relevant data with Resolution Authorities.

Finally, stakeholders have flagged the difficulty of institutions in predicting their future contributions. The Commission services note that, for the institutions concerned by it, predictability should improve over time as the application of the Delegated Regulation continues and that, while some limited margin of uncertainty around future payments will persist, if anything due to year-on-year changes in the amounts to be raised, institutions should already be able to derive an informed and accurate estimate of their upcoming contribution. On the other hand, communication efforts could be enhanced in order to maximize replicability of the calculations without the disclosure of individual-level data to other institutions. Both predictability and replicability could be significantly improved by the development of dedicated IT tools by Resolution Authorities.

ANNEX I: ZOOMED-IN CHARTS ON THE SENSITIVITY ANALYSIS OF THE UPPER LIMIT OF THE MULTIPLIER

Figure 13: Risk-adjusted contribution under 0.8-1.5 range (blue) and under 0.8-2 range (purple). BRRD environment, EA Member States plus BG, CZ, DK, HR, RO, SE – Zoom in 0-10 bn € base

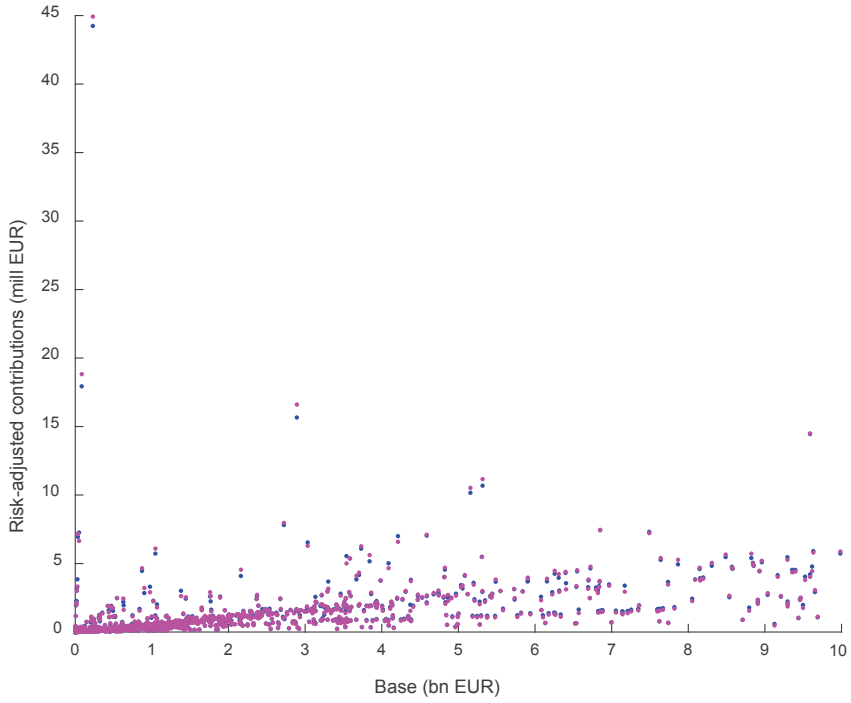


Figure 14: Risk-adjusted contribution under 0.8-1.5 range (blue) and under 0.8-2 range (purple). SRM environment, EA Member States – Zoom in 0-10 bn € base

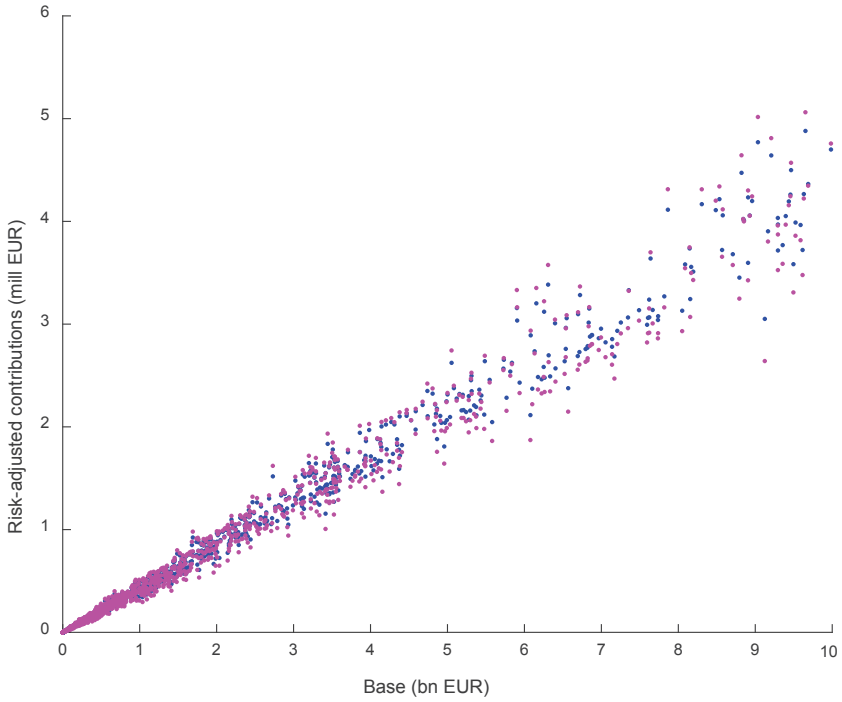


Figure 15: Risk-adjusted contribution under 0.8-1.5 range (blue) and under 0.8-2 range (purple). BRRD environment, EA Member States plus BG, CZ, DK, HR, RO, SE – Zoom in 10-100 bn € base

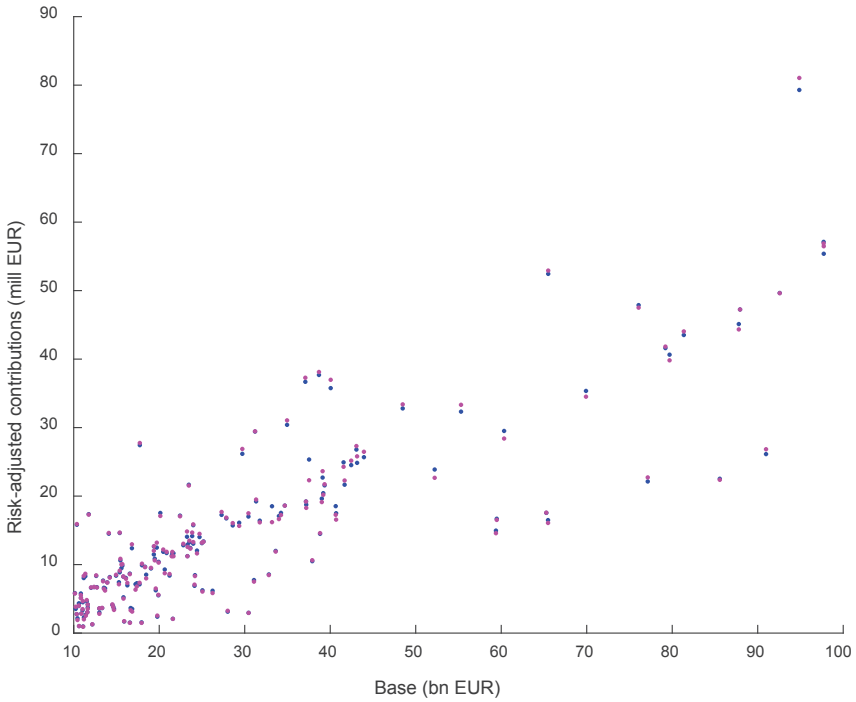


Figure 16: Risk-adjusted contribution under 0.8-1.5 range (blue) and under 0.8-2 range (purple). SRM environment, EA Member States– Zoom in 10-100 bn € base

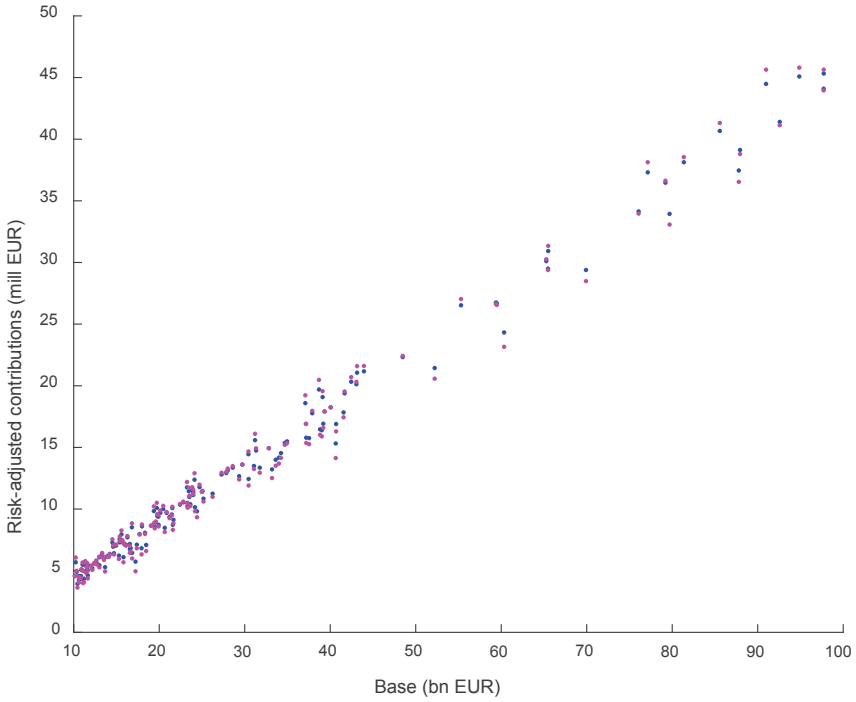

Risk-adjusted contributions (mill EUR)
0
5
10
15
20
25
30
35
40
45
50
10
20
30
40
50
60
70
80
90
100
Base (bn EUR)

Figure 17: Risk-adjusted contribution under 0.8-1.5 range (blue) and under 0.8-2 range (purple). BRRD environment, EA Member States plus BG, CZ, DK, HR, RO, SE – Zoom in 100-1200 bn € base

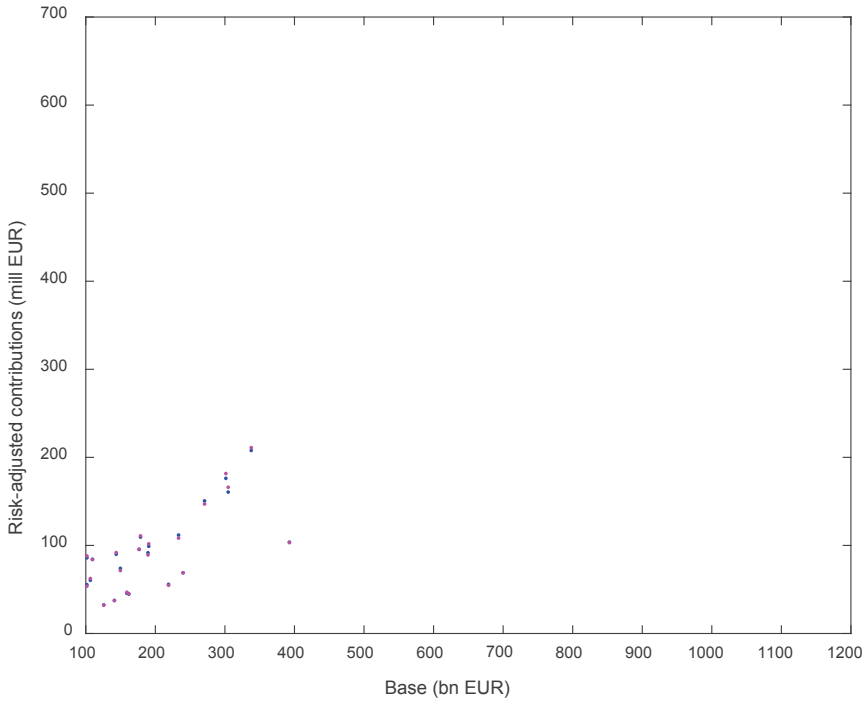


Figure 18: Risk-adjusted contribution under 0.8-1.5 range (blue) and under 0.8-2 range (purple). SRM environment, EA Member States – Zoom in 10-100 bn € base

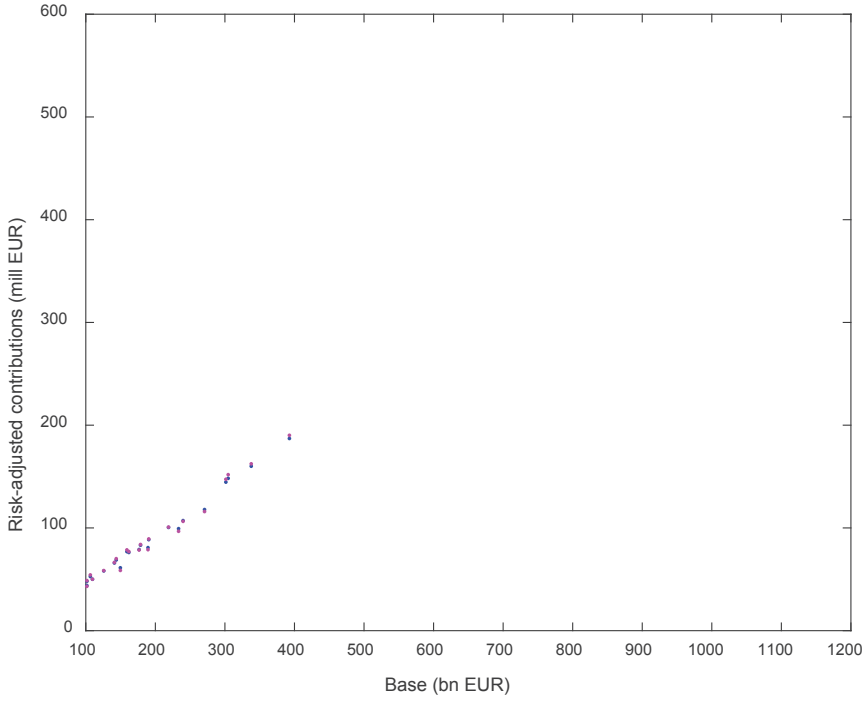


Figure 19: Risk-adjusted contributions under 0.8-1.5 range (blue), and under 0.5-2.0 range (purple), BRRD environment, EA Member States plus BG, CZ, DK, HR, RO, SE – Zoom in 0-10 bn € base

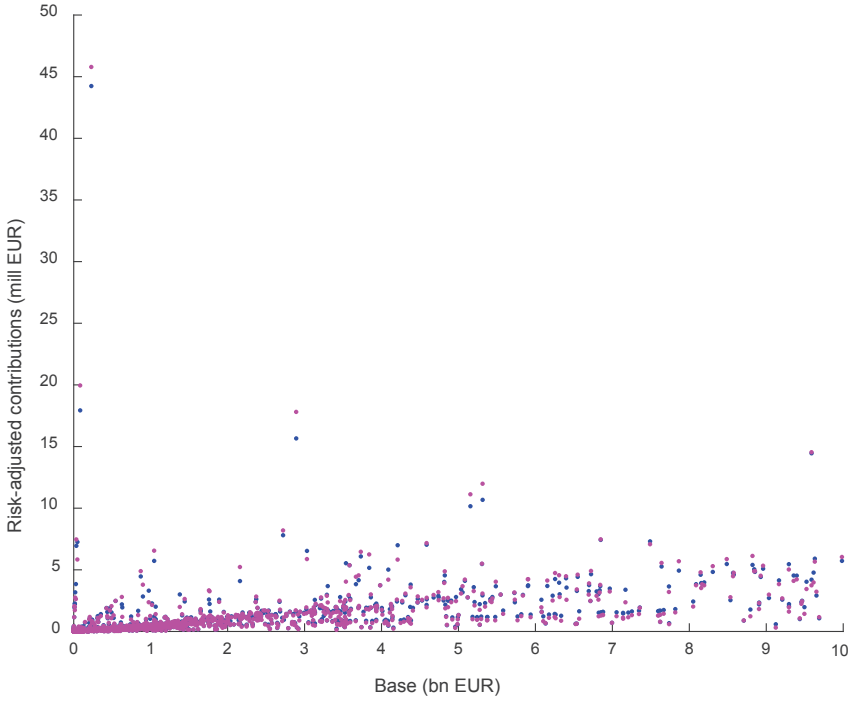


Figure 20: Risk-adjusted contribution under 0.8-1.5 range (blue) and under 0.8-2 range (purple). SRM environment, EA Member States – Zoom in 0-10 bn € base

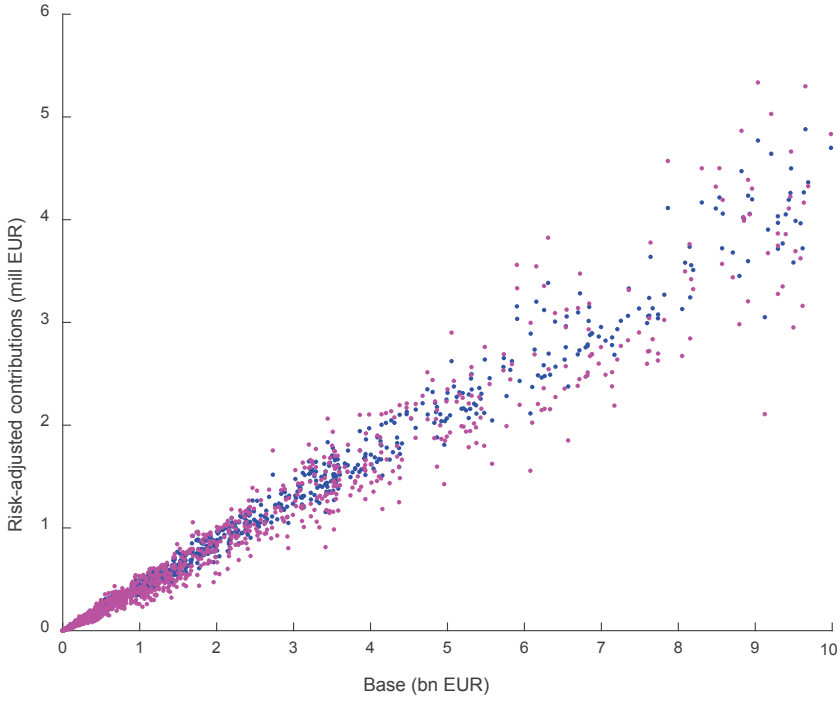


Figure 21: Risk-adjusted contributions under 0.8-1.5 range (blue), and under 0.5-2.0 range (purple), BRRD environment, EA Member States plus BG, CZ, DK, HR, RO, SE – Zoom in 10-100 bn € base

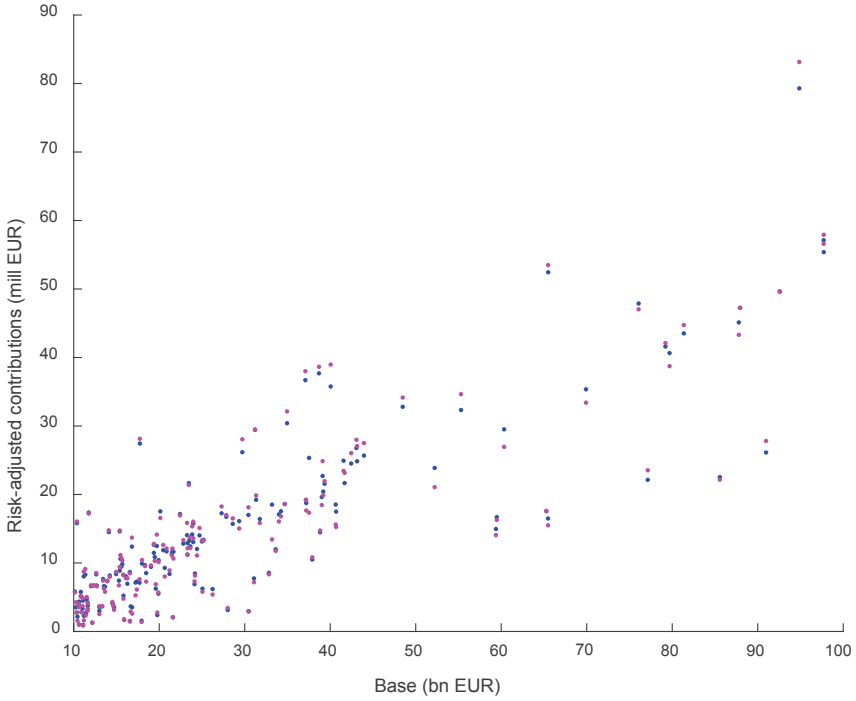


Figure 22: Risk-adjusted contribution under 0.8-1.5 range (blue) and under 0.8-2 range (purple). SRM environment, EA Member States – Zoom in 10-100 bn € base

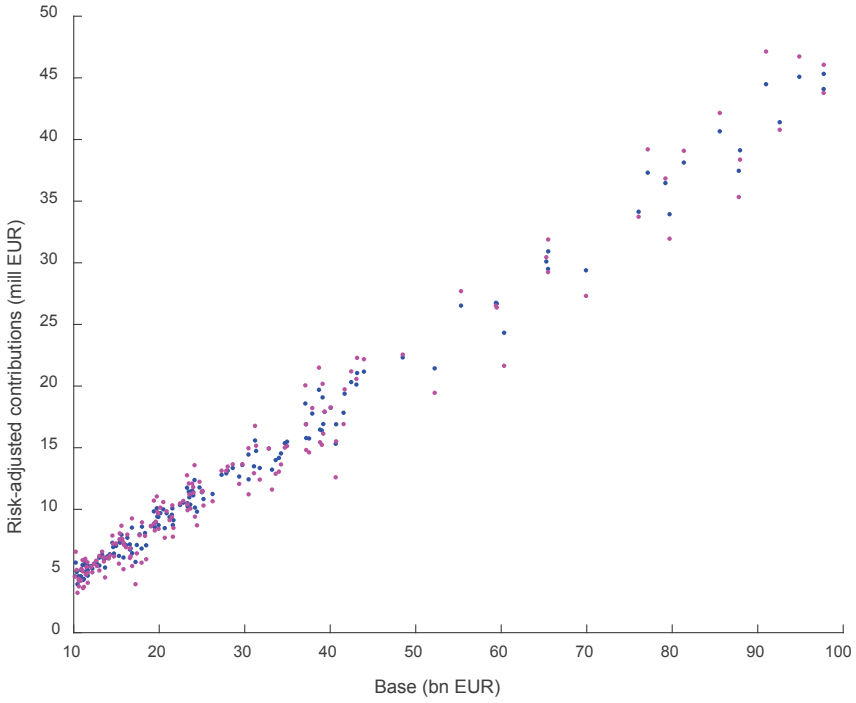


Figure 23: Risk-adjusted contributions under 0.8-1.5 range (blue), and under 0.5-2.0 range (purple), BRRD environment, EA Member States plus BG, CZ, DK, HR, RO, SE – Zoom in 100-1200 bn € base

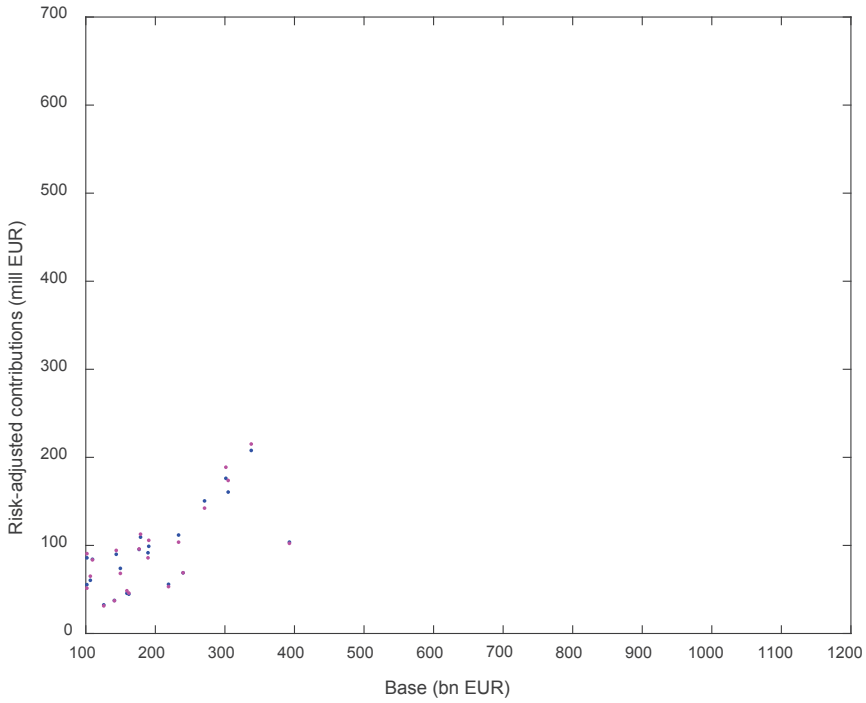


Figure 24: Risk-adjusted contribution under 0.8-1.5 range (blue) and under 0.8-2 range (purple). SRM environment, EA Member States – Zoom in 100-1200 bn € base

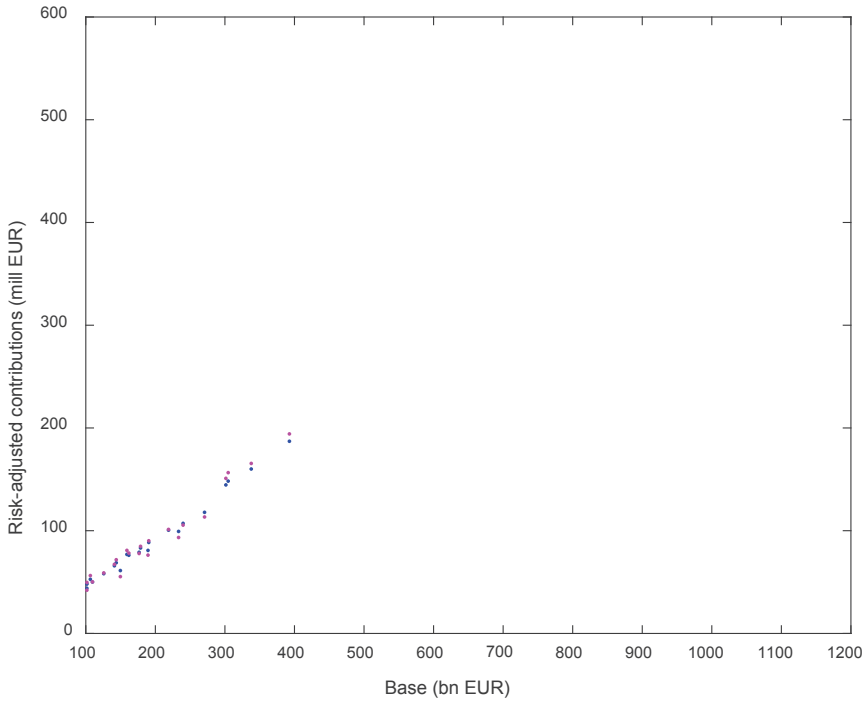


Figure 25: Changes in risk-adjusted contributions when moving from (0.8-1.5) to (0.8-2). BRRD environment, EA Member States plus BG, CZ, DK, HR, RO, SE – Zoom in 0-10 bn € base

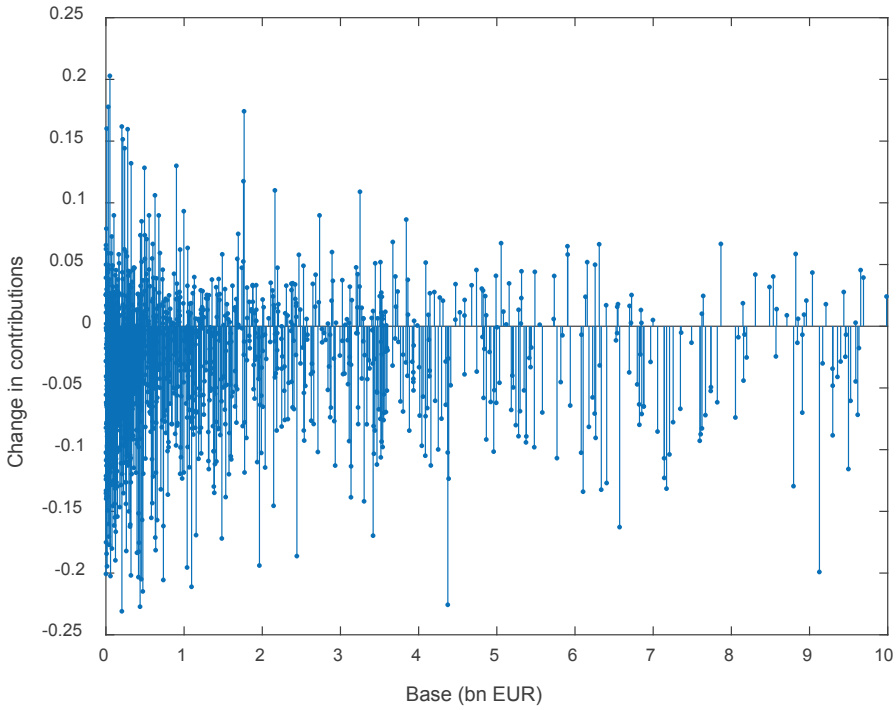


Figure 26: Changes in risk-adjusted contributions when moving from (0.8-1.5) to (0.8-2). SRM environment, EA Member States – Zoom in 0-10 bn € base

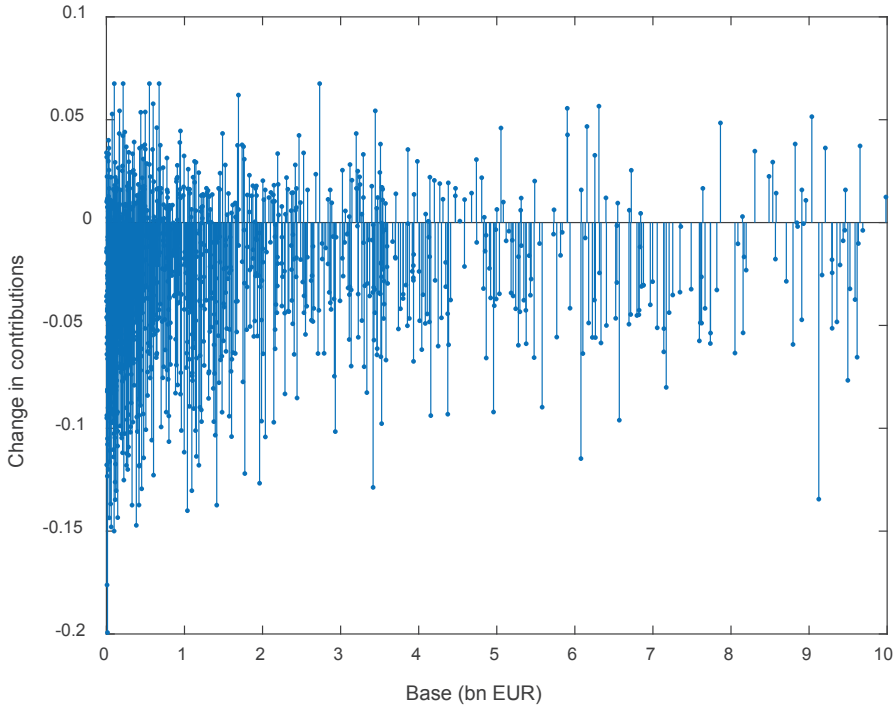


Figure 27: Changes in risk-adjusted contributions when moving from (0.8-1.5) to (0.8-2). BRRD environment, EA Member States plus BG, CZ, DK, HR, RO, SE – Zoom in 10-100 bn € base

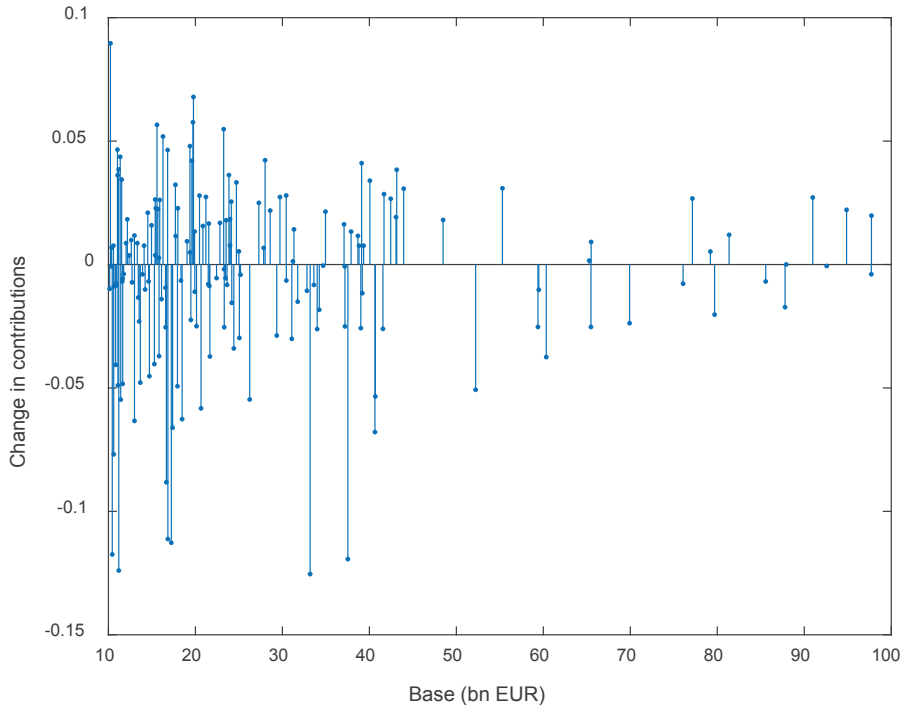


Figure 28: Changes in risk-adjusted contributions when moving from (0.8-1.5) to (0.8-2). SRM environment, EA Member States - Zoom in 10-100 bn € base

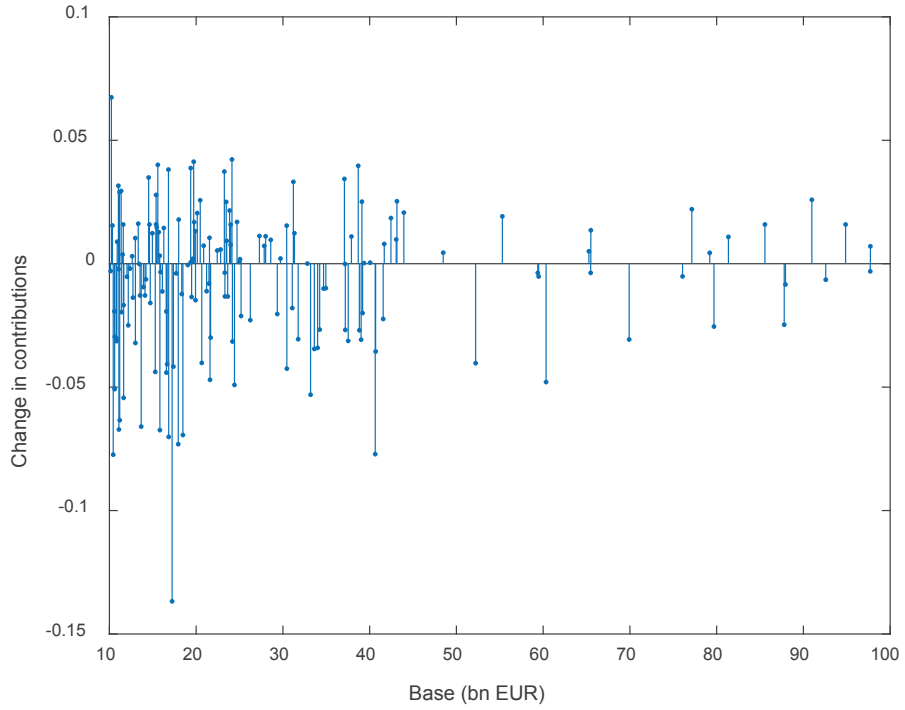


Figure 29: Changes in risk-adjusted contributions when moving from (0.8-1.5) to (0.8-2). BRRD environment, EA Member States plus BG, CZ, DK, HR, RO, SE - Zoom in 100-1200 bn € base

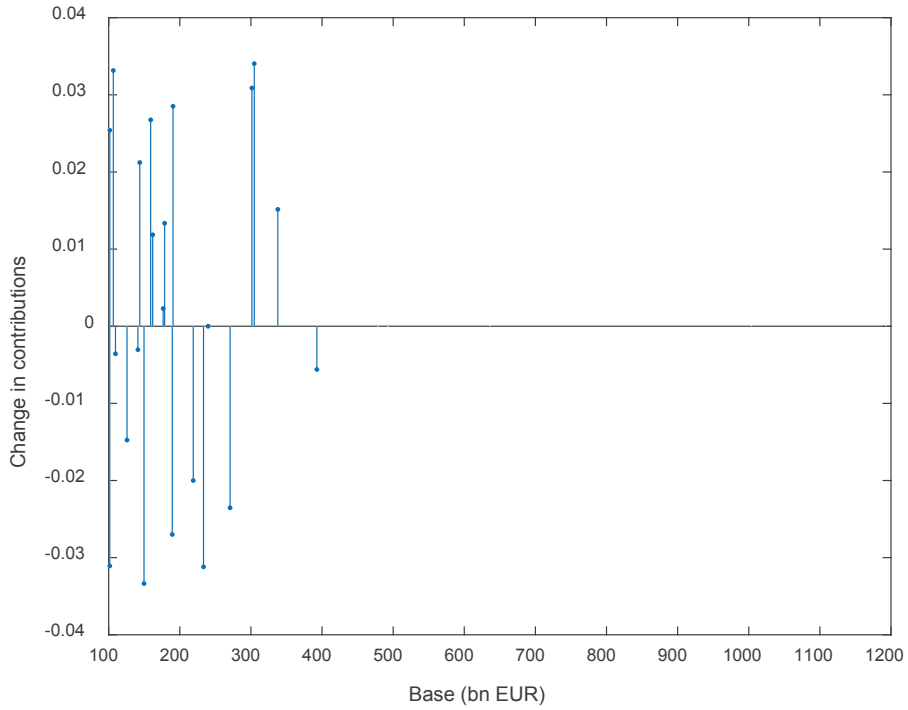


Figure 30: Changes in risk-adjusted contributions when moving from (0.8-1.5) to (0.8-2). SRM environment, EA Member States - Zoom in 100-1200 bn € base

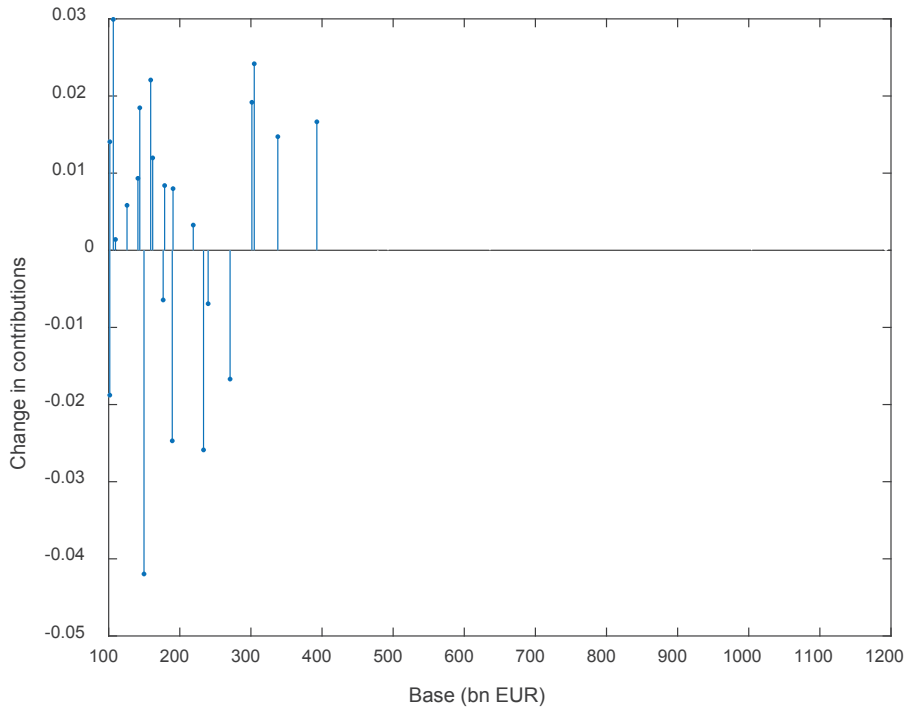


Figure 31: Changes in risk-adjusted contributions when moving from (0.8-1.5) to (0.5-2). BRRD environment, EA Member States plus BG, CZ, DK, HR, RO, SE – Zoom in 0-10 bn € base

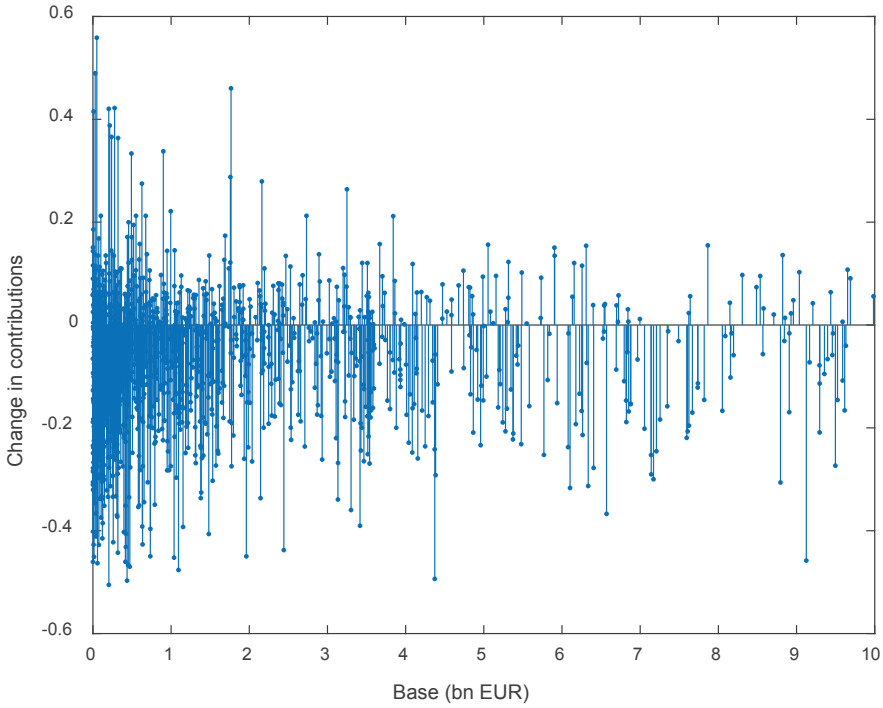


Figure 32: Changes in risk-adjusted contributions when moving from (0.8-1.5) to (0.8-2). SRM environment, EA Member States – Zoom in 0-10 bn € base

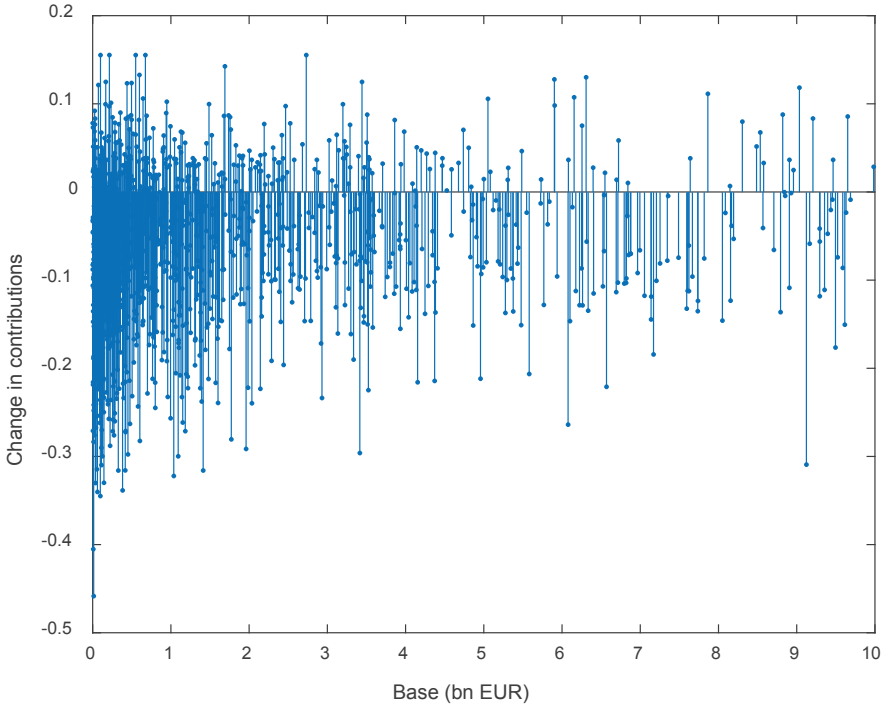


Figure 33: Changes in risk-adjusted contributions when moving from (0.8-1.5) to (0.5-2). BRRD environment, EA Member States plus BG, CZ, DK, HR, RO, SE - Zoom in 10-100 bn € base

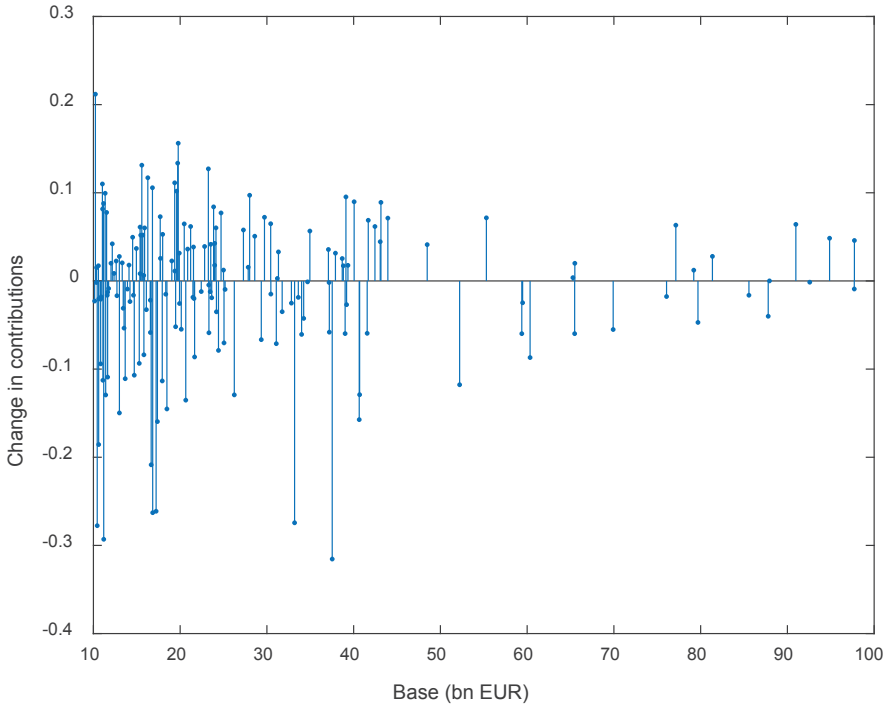


Figure 34: Changes in risk-adjusted contributions when moving from (0.8-1.5) to (0.8-2). SRM environment, EA Member States- Zoom in 10-100 bn € base

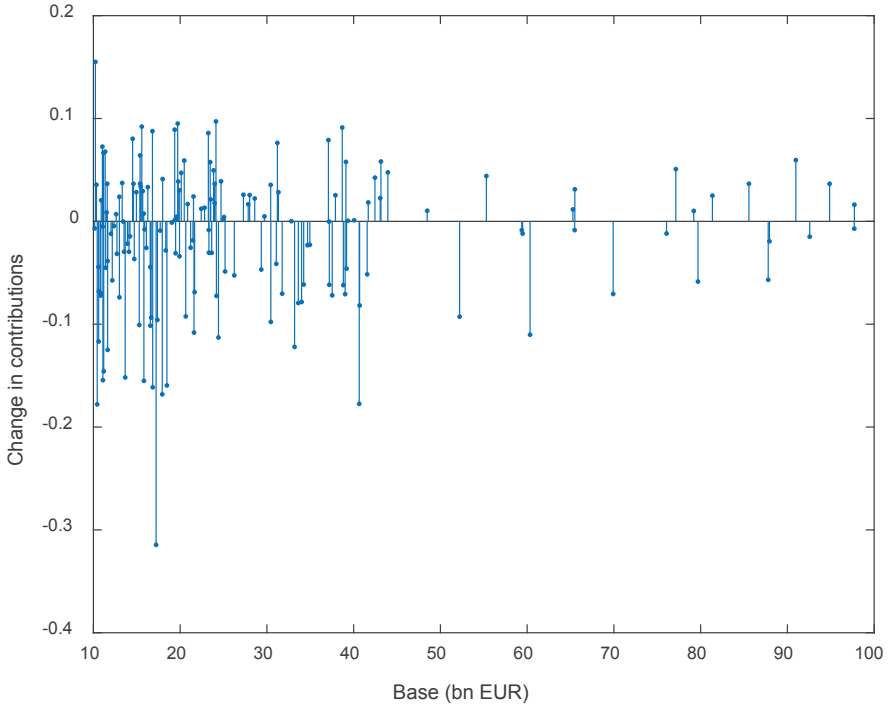


Figure 35: Changes in risk-adjusted contributions when moving from (0.8-1.5) to (0.5-2). BRRD environment, EA Member States plus BG, CZ, DK, HR, RO, SE - Zoom in 100-1200 bn € base

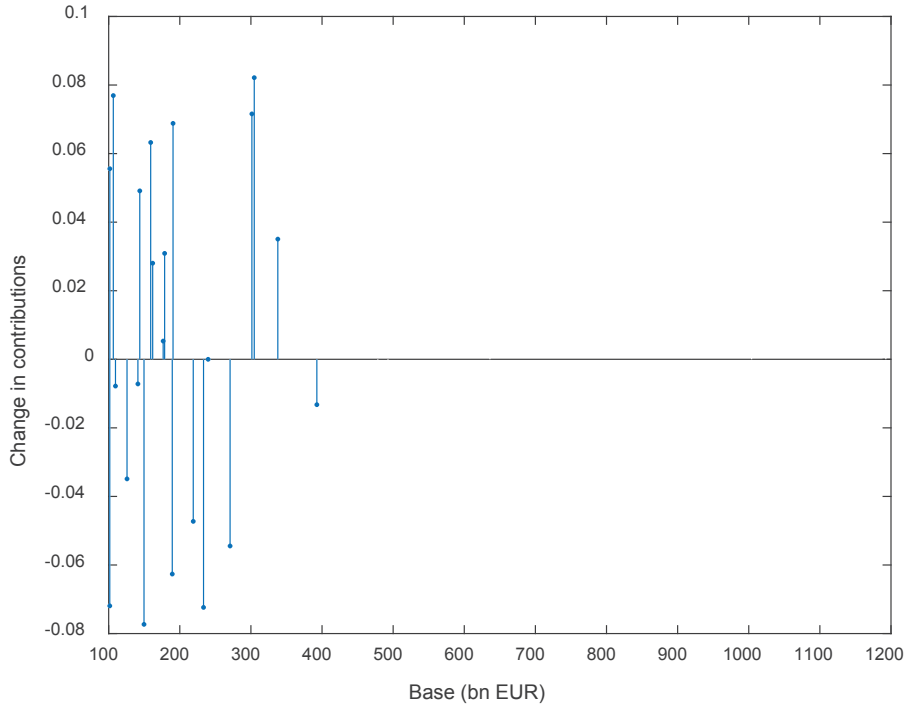
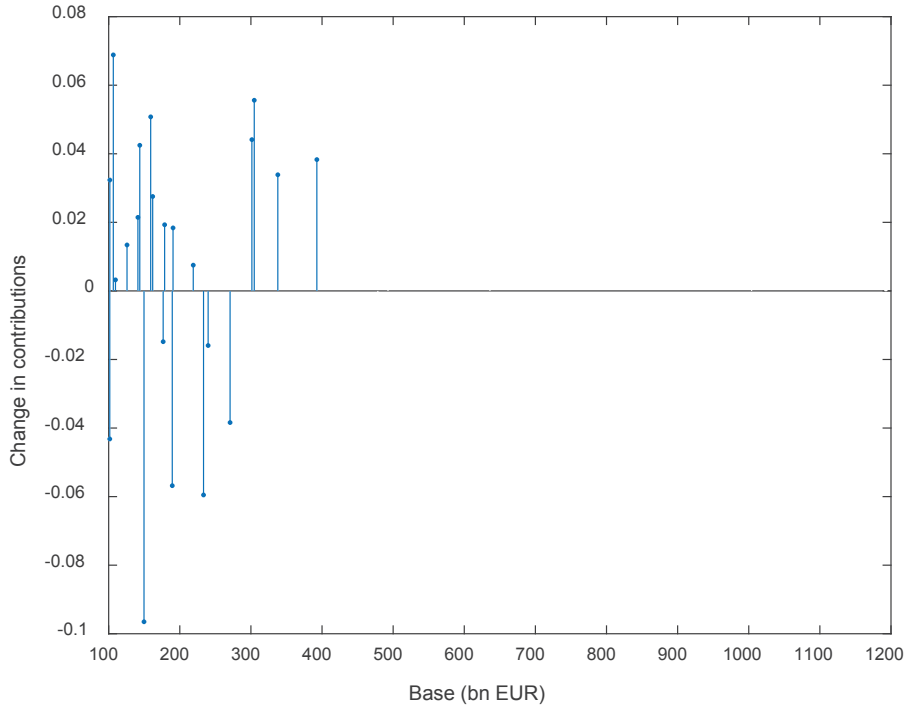


Figure 36: Changes in risk-adjusted contributions when moving from (0.8-1.5) to (0.8-2). SRM environment, EA Member States - Zoom in 100-1200 bn € base



ANNEX II - ADDITIONAL CONSIDERATIONS ON THE GEOMETRIC MEAN

The geometric average has the following general properties.

First, the geometric average does not suffer from compensability, i.e. poor performance in one dimension cannot be fully compensated by good performance in another.

Second, the geometric average rewards balance by penalizing uneven performance between dimensions.

Third, the geometric average encourages improvements in the weak dimensions.

A more detailed description of the main properties of the arithmetic versus geometric averages and some examples can be found in Annex A2 of JRC report EUR 27250[23].

The two examples in Table 8 illustrate the properties of the geometric average.

Table 8: Arithmetic and geometric averages

	Example 1		Example 2	
	Bank A	Bank B	Bank A	Bank B
Risk indicator 1 (weight = 50%)	1	500	100	599
Risk indicator 2 (weight = 20%)	500	1	500	1
Risk indicator 3 (weight = 10%)	500	1	500	1
Risk indicator 4 (weight = 20%)	500	1	500	1
Arithmetic average	250.5	250.5	300	300
Geometric average	22	22	224	24
FCI	978	978	776	976

Example 1 shows the case of two different sets of values of the risk indicators yielding the same arithmetic and geometric averages and thus also the same FCI. When improving the first risk indicator by the same absolute value (99), as shown in example 2, Bank A moves from a very bad situation (1) 1 to a slightly better one (100) and the corresponding reduction in its FCI is of around 21%. Bank B already starts from a middle score for its first risk indicator and moving from 500 to 599 corresponds to a much less pronounced reduction in its FCI (-0.2%).

[23] Available at http://publications.jrc.ec.europa.eu/repository/bitstream/JRC93669/lbna27250enn.pdf (last accessed: 11 November 2016).