European Banking Authority

EBA REPORT RESULTS FROM THE 2024 MARKET RISK BENCHMARKING EXERCISE – PART 1 - IMA

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Abbreviations

APR	all price risk
CA	competent authority
CDS	credit default swap
CO	commodities
CRD	Capital Requirements Directive
CRR	Capital Requirements Regulation
CS	credit spread
CS01	credit spread value of 1 basis point changes
CTP	correlation trading portfolio
CV	coefficient of variation
EBA	European Banking Authority
EQ	equity
ES	expected shortfall
EU	European Union
FRTB	fundamental review of the trading book
FX	foreign exchange
HPE	hypothetical portfolio exercise
HS	historical simulation
IMV	initial market valuation
IQD	interquartile dispersion
IR	interest rates
IRC	incremental risk charge
IT	information technology
ITS	implementing technical standards
LGD	loss given default
MC	Monte Carlo
MR	market risk
MRWA	market-risk-weighted asset
OFR	Own Funds Requirements
P&L	profit and loss
PD	probability of default
Q&A	question and answer
RTS	regulatory technical standards
RWA	risk-weighted asset
sVaR	stressed value at risk
SBM	Sensitivities Based Method
VaR	value at risk

1. Executive summary

1. This report presents the results of the 2024 supervisory benchmarking exercise pursuant to Article 78 of the Capital Requirements Directive (CRD) and the related regulatory and implementing technical standards (RTS and ITS) that define the scope, procedures and portfolios for benchmarking internal models for market risk (MR).

2. The report summarises the conclusions drawn from a hypothetical portfolio exercise (HPE) conducted by the EBA during 2023/24. The primary objective of the exercise is to assess the level of variability observed in risk-weighted assets (RWA) for market risk produced by banks' internal models.

3. The exercise was performed on a sample of 43 European banks from 13 jurisdictions. The relevant institutions submitted data for 105 instruments recombined into 77 market portfolios across all major asset classes, i.e., equity (EQ), interest rates (IR), foreign exchange (FX), commodities (CO) and credit spreads (CS), as well as five correlation trading instruments recombined into four portfolios (CTPs), for a total of 82 benchmark portfolios. Thus, the exercise covers the entire population of EU banks with internal models for MR at the highest level of consolidation.

4. As summarised in this report, the analytical part of the exercise delivered by the EBA provided the competent authorities (CAs) with a list of outliers to be examined in detail. The banks with the most significant number of outliers were also highlighted to their CAs, which addressed the issues reported bilaterally with their banks. CAs and the EBA also collected feedback on improving forthcoming benchmarking exercises where possible.

5. Finally, considering the benchmarking exercise's results, CAs were asked to provide the EBA with responses to a questionnaire on the actions they plan to take regarding each participating bank's internal model.

1.1 Main findings of the benchmarking analysis

6. The report measures variability in terms of the interquartile dispersion (IQD)[1] and the coefficient of variation (CV)[2] observed within each benchmark portfolio. The IQD is more robust than the CV when the sample is drawn from an unknown, fat-tailed distribution. As far as the market-risk-weighted asset (MRWA) variability, the IQD metric suggests a level of dispersion for all the risk measures provided by banks that need to be monitored.

7. The primary considerations are that the 2024 results show an increase in the dispersion of the initial market valuation (IMV) versus the 2023 exercise concerning all assets classes asset class; see, for instance, Table 2. Equity and Interest Rate and CS remains relatively low (4%, 4% and 5% respectively, compared to 2%, 2% and 3% respectively in 2023). Nonetheless, the FX average IQD increased significantly to 19% (it was 8% in 2023 and 3% in 2022). The reason for this is that FX FD instruments (301, 302, 310 and 311) present an IMV quite dispersed (especially instrument 301 with 1766% IQD). Instrument 301 (Fx FWD) is not a new instrument in the sample, with a low IMV, but also there are banks that report IMV of similar magnitude but opposite sign, which means that there are still some issues linked to the common understanding of the booking for this instrument. A clarification on the booking of the FX Fwd should improve the consistency of the Fx asset class booking in the future exercise. CO remains a substantially high IQD (16%, vs 14% in 2023 and vs 24% in 2022) asset class, which is driven by two instruments (401 and 402), over a total of 5 CO instruments (which is very limited), as well as the total number of submissions, with a negative effect on the average IQD of this asset class.

8. Therefore, even if the average IQD of the IMV has increased, this is due to a very restricted sample of instruments with substantially high IQD (the mentioned 301, but 223, 221, and 121). The rest of the instruments have comparable low dispersion with respect the previous exercise. Therefore, based on this year's observations, we can conclude that the quality of the data submitted did not decreased. The quality of the data is extremely important for the benchmarking exercise, and the banks should pay great attention when submitting these data. It should be stressed that to substantially increase the data quality, several rounds of iteration with submitters would be required, which is not feasible within the short time frame of the exercise. The continuous improvement and clarification of the details for the instruments is also an objective that the EBA is always pursuing.

9. Dispersions have been examined and most of them have been justified by the banks and CAs. A minority of the outlier observations remain unexplained and are expected to be part of the ongoing activities of supervisors, who are expected to monitor and investigate the situation (see Chapter 5 of this report).

[1] IQD is defined as the absolute value of the ratio of the interquartile range (Q3 – Q1) divided by the sum of the quartiles (Q3 + Q1). The higher the IQD is, the higher the dispersion in the data.

[2] CV is computed as the ratio of the standard deviation to the mean.

10. From a risk factor perspective, FX portfolios exhibit a lower level of dispersion than the other asset classes. In general, variability is substantially lower than in the previous exercise. This is likely due to an improvement in the data submission, which impacted the dispersion of the risk measures, decreasing the dispersion in general (see Table 5: Interquartile dispersion for IMV, risk metrics and SBM OFR by risk factor).

11. Regarding the single risk measures, the overall variability for value at risk (VaR) is lower than the observed variability for stressed VaR (sVaR) (14% and 21%, compared to 16% and 21% in 2023, compared to 21% and 28% in the 2022 exercise, with 27% and 31% in 2021 and with 18% and 29% in 2020).[3] More complex measures, such as the incremental risk charge (IRC), show a higher level of dispersion (44%, it was 42% in 2023 exercise, 45% in the 2022, 43% in 2021 and 49% in 2020).

12. The variability of risk measures, especially the VaR, is marginally lower than the previous exercise and overall, this exercise mark the lowest level of dispersion of the risk measures since the exercise has started, as shown in the table below.

Table 1: Average IQD by asset class - VaR

Average Interquartile dispersion by asset class - VAR

	Interquartile range 2024 exercise	*Interquartile range 2023 exercise*	*Interquartile range 2022 exercise*	*Interquartile range 2021 exercise*	*Interquartile range 2020 exercise*	*Interquartile range 2019 exercise*	*Interquartile range 2018 exercise*	*Interquartile range 2017 exercise*
Equity	16%	17%	25%	24%	18%	14%	23%	22%
IR	15%	16%	21%	19%	13%	16%	9%	19%
FX	9%	12%	11%	27%	12%	22%	17%	41%
Commodity	14%	17%	18%	19%	20%	24%	21%	13%
Credit spreads	16%	18%	28%	37%	23%	28%	26%	27%
CTP								

13. As for the past exercise, to deepen the analysis of VaR and further investigate the variability drivers, different VaR metrics were computed and compared with the banks' reported VaR, in particular:

- an alternative estimation of VaR, called profit and loss (P&L) VaR, computed by the EBA using the 1-year daily P&L series submitted by banks using a historical simulation (HS) approach; and

- a comparable VaR, called HS VaR, corresponds to the regulatory VaR reported by those banks that use an historical simulation (HS) approach (only).

14. When comparing the variability between the regulatory VaR and these alternative risk measures, a decrease in the IQD when considering a more homogeneous sample is confirmed (i.e., HS banks only). In fact, for all the risk types, the dispersion observed for the P&L VaR tends to be lower but is still not negligible. This finding suggests that the modelling approach is not the only driver of the observed VaR variability. Other drivers, such as risks not captured in the

[3] These values are derived as a simple average of the IQD across all non-correlation trading portfolios.

model or the choice of absolute versus relative returns, offer further explanations for the results' variability (see Table 5: Interquartile dispersion for IMV, risk metrics and SBM OFR by risk factor).

15. Even so, within the subset of banks using an HS approach, modelling choices (see Table 7: Coefficient of variation for regulatory VaR (controlling for HS) by modelling choice) seem to make a noticeable difference. Modelling configurations produce mixed results depending on the different asset classes. The same can be said in terms of conservativeness, where different calibrations have different effects depending on the asset class (see Table 8: Average regulatory VaR by modelling choice). But this analysis is extremely sensitive to the different portfolios used to produce the statistic, the low number of subjects available, and the passage of time from one exercise to another. Different model settings impact differently the dispersion; therefore, this report will refrain from trying to generalise the results and define a 'less dispersed' and 'more conservative' configuration of modelling choices.

16. As mentioned above, the dispersion in sVaR figures is generally higher than the dispersion observed for regulatory VaR (see Table 21 and Table 22). The stressed period used was the one applied by the bank for capital purposes, so it was not harmonised in the sample. Different choices for the stressed period are permitted by the Capital Requirements Regulation (CRR), and these choices are considered and questioned as part of the regulatory approval process. While allowing banks to use their own individual stress periods reduces the comparability of the sVaR results across the sample, doing so facilitates the estimation of implied capital needs from the HPE. Nonetheless, banks in the exercise are asked to report the stressed period applied. As a result, the EBA selected a subset of homogeneous time windows applied and ran the benchmark for this subsample. It appears clear that when a homogeneous stress window is applied, the sVaR figures tend to be less dispersed (see Table 41: Stress VaR statistics (2008-2009 stress period only)).

17. Moreover, to carry out these analyses, the EBA conducted a comparison across banks of the ratio between sVaR and VaR for each of the hypothetical portfolios included in the benchmarking exercise (see Table 6: sVaR–VaR ratio by range (number of banks as a percentage of the total)). The ratio generally varies significantly between the portfolios (from 0.09 to 34.5), with values that cannot be explained except by errors. However, on average, the ratio comes in at around 2.25 (see Table 25: sVaR/VaR statistics).

18. As expected, for the larger banks with significant trading activities, the benchmarking portfolios are generally relevant to their actual trading book. For smaller banks, this is less the case, and this is why the EBA included simpler and more plain vanilla instruments starting from the 2019 exercise. The challenge remains to design a benchmarking exercise that can fit banks that have a specialised business model. Overall, the portfolios are, however, reflective of the risk factors experienced by most banks. In the 2024 exercise, it is noticeable a further decrease in the VaR dispersion (14% from the 16% of 2023), still that in some cases (16 over 77 single portfolios - see Table 21: VaR statistics). The aggregate portfolios also feature notably low levels of IQDs.

19. Regarding the IRC, the average variability (as measured by the average IQD for this category of portfolios) is higher than that observed for all other metrics considered in the report (44%). This high variability is slightly higher than in the previous exercise – the IQD was 42% on average in the 2023 exercise (45% in 2022, 43% in 2021) (see Table 14: IRC statistics and cluster analysis). The understanding of the IRC dispersion was further analysed by disaggregating various modelling choices (see Table 15, Table 43, Table 44, Table 45 and Table 46). While the number of risk factors and applying market conventions to the source of LGD seems to have a different impact, depending on the asset classes applied. These results are not consistent with what was observed in the previous exercises, so it looks like even for the IRC, the modelling choices influence the dispersion, but the effect cannot be generalised, and it looks very time dependent.

20. An additional metric considered as part of the analysis was the diversification benefits observed for VaR, sVaR and IRC in the aggregated portfolios (see Table 16: Diversification benefit statistics). As expected, there is evidence that larger aggregated portfolios exhibited greater diversification benefits than smaller ones. In general, the level of dispersion observed in diversification benefits tends to be lower than that in the corresponding metrics at the level of the individual portfolios.

21. As for previous exercises, an assessment was also carried out on the variability of the empirical estimates of the expected shortfall (ES) at a 97.5% confidence level. The results indicate that the dispersion in this metric across risk factors is like that found for VaR and P&L VaR (see Table 24).

Dispersion in the capital outcome

22. Alongside the variability analysis, the EBA also conducted the usual assessment regarding possible underestimations of capital requirements (see Table 17: Interquartile dispersion for capital proxy). As the analysis is based on hypothetical portfolios and the capital requirements were defined using a proxy, the results should be interpreted as approximations of potential capital underestimations. The proxy for the implied capital requirements was defined as the sum of VaR and sVaR across all portfolios. For purposes of comparison, the proxy was computed three times. In one case, the VaR and sVaR figures were multiplied by the banks' total multiplication factor and, in the other, by the regulatory minimum of three only, i.e., ignoring the banks' individual addend(s) set by the CAs. Finally, a subset of banks applying the same stress period was also considered for capital dispersion. This metric enables a comparison of banks and an assessment of their variability in this regard.

23. The average variability across the sample as measured by the IQD is significant (around 18%), especially for the most complex portfolios in the credit spread asset class. This dispersion very slightly decreases when considering a more homogenous capital proxy (15% applying three as the multiplier and 14% for banks with the same stress period).

Additional analysis of Risk measures

24. As introduced in the previous exercises, the EBA extended the analysis to other drivers of variation (see Section 4.2.5), such as the size of the bank, the business model of the bank, the

level of approval granted by the CAs and the already mentioned stressed period applied in the sVaR calibration. The size and business model analyses were further provided as they were run in the 2020-2023 reports.

25. In a nutshell, based on this additional analysis, we observe that the size (in terms of RWA for market risk) of the bank has an impact on the figures since small and medium-sized banks tend to produce slightly more dispersed results than larger banks (see Table 9: Asset class comparison for VaR in terms of banks' size). Consistently, when considering the size in terms of the trading book (as a ratio of total assets), the bigger a bank is in terms of its trading book, the (slightly) smaller the dispersion (on average).

26. Concerning the business model, the EBA applied the internal classification of banks as a criterion, under which many of them are classified as cross-border universal banks (see Table 10: Asset class comparison for VaR within the same business model (cross-border universal bank)). Applying this definition of the business model, a smaller decrease in the IQD was identified due to a more homogenous sample. The business model analysis was further extended by considering the 'Level 3' assets and liabilities in the bank's books as a proxy for a more sophisticated business model linked to more exotic products (see Table 34, Table 35 and Table 36). This further specification did not prove conclusive since the dispersion did not change substantially depending on the 'Level 3' assets and liabilities ratio in the bank's trading book.

27. The subsample analysis based on the level of approval delivered interesting results. A priori, it was expected that having banks with different levels of approval would have increased the dispersion of the results of the risk measures. In line with this assumption, the IQD results seem to fluctuate among the subsamples of different approval levels. This is because more homogeneous subsamples tend to produce slightly smaller dispersions, but this positive effect is counterbalanced by the smaller number of firms in the sample. Basically, the benchmark provided and the 25th and 75th quantiles of the distribution tend to be less dispersed with respect to the whole set of banks. This implies that the different level of approval does indeed have an impact on the dispersion of the benchmarking results (see Table 11: Asset class comparison for VaR in terms of level of approval).

28. Finally, as already mentioned above, and in line with previous findings, sVaR figures are less dispersed when the benchmark is computed for a homogeneous subsample of firms that applied a similar time period for the stress window used for calibrating the sVaR (see Table 12: Asset class comparison for sVaR in terms of the time window applied).

29. As introduced in the 2020 Report, PV statistics are reported (see Table 42). The PVs reported generally have quite low IQDs, and they were useful in distinguishing true outliers and outliers due to mispricing of the portfolios.

SBM and ASA OFR analysis

30. The 2024 benchmarking exercise is the third year of collecting SBM sensitivities and OFR data. It is also the first year of collecting DRC and RRAO data, as well as the application of ASA

Validation portfolios. The amount of data concerning solely the FRTB-ASA methodology has grown with time, and it is now more appropriate to separate this part of the exercise in an independent report.

1.2 CAs' assessments based on supervisory benchmarks

31. CAs shared the outcomes of their assessments at the bank level with the EBA (see Figure 16: CAs' own assessments of the levels of MR own funds requirements). The CAs' assessments confirmed the existence of some areas that require follow-up actions on the part of specific institutions whose internal models were flagged as outliers in this benchmarking exercise.

32. Overall, CAs' assessment of the over- and underestimation of RWA was encouraging in the sense that CAs were aware of and able to explain the causes of almost all deviations. Although most of the causes were identified and actions put in place in order to reduce the unwanted variability of the RWA, the effectiveness of these actions can be evaluated only by CAs via constant monitoring of the benchmarking results.

33. The CAs are expected to pay the utmost attention to the minority of cases in which the over- and underestimations were unexplained, to closely monitor these institutions and to put in place additional efforts to reduce these gaps in future exercises.

1.3 Past exercises and future expected changes

34. The 2019 exercise represented a significant change from the 2016-2018 exercises in terms of the simplification of the portfolios. This simplification had a positive effect in obtaining less dispersed results than with the previous portfolios. Furthermore, it improved the significant data quality issues relating to some portfolios while focusing on the model risk elements.

35. In the 2020 exercise, the data submitted further improved in quality thanks to the clarification of the legal text description of some instruments and to the further practice that the banks have gained in conducting the present exercise. This had a positive effect in terms of dispersion in the data provided. Improvements in terms of less dispersed results have also stemmed from the change in the methodology to detect outliers for the risk measures.

36. In the 2021 exercise, the data quality of the submissions was acceptable. That said, the variabilities of the risk measures (VaR, PL VaR and ES) were substantially higher than in the previous year. This seems to be linked to the increased volatility of the markets in 2021 due to the Covid outbreak, as captured by the market model, which generally provided higher figures for the risk measures. These higher figures, in absolute terms, seem to exacerbate the differences in modelling outputs, producing higher IQD metrics. As a result, this higher dispersion does not seem to be the outcome of a decrease in the quality of the market model.

37. For the 2022 exercise, the set of instruments remained mainly similar to the previous exercise, so the EBA reports a similar level in terms of the data quality of the submissions, aside from the mistake in the EQ instruction. The analysis that the EBA ran for the 2022 exercise was the first

in which banks reported sensitivities and OFR figures relating to the sensitivities-based method of the alternative standardised approach (ASA) introduced with the FRTB. The SBM submission was of good quality overall, especially considering the tendency to improve with time.

38. For the 2023 exercise the data collection was extended to allow the collection of new instruments and portfolios, in particular as regards the instruments and portfolios that have lately been applied by the industry. These new instruments are also accompanied by a rationalisation of the references of the instruments in Annex V. The result showed that the overall dispersion was significantly reduced by the adjustment to the instruction, while some new instruments present a quite significant dispersion, due of course to their novelty. The exercise did not change substantially, so the EBA and CAs focused on the analysis of the SBM data submitted. It is clear that there was an improvement in sensitivities submission, with respect to the previous exercise, but also during the exercise due to the many resubmissions and CAs control of the data submitted. While the analysis did not detect any major issues in the SBM data submission, it is clear that at the single-bank level and instrument, minor issues can be detected, and overall compliance with SBM requirements could be improved.

39. For 2024, the EBA extended the SBM data collection to the other ASA components (DRC and RRAO) to have a complete picture of the standardised approach and also adopted a series of validation instruments for the SBM approach, which was already applied by part of the industry, that should significantly enhance the compliance with the SBM requirements.

40. For 2025, the exercise was expected to be reshaped based on the AIMA-FRTB implementation. But during before the ITS 2025 finalisation the European Commission manifested the intention to postpone the FRTB implementation. Therefore, it was decided to maintain the data collection to the format applied in 2024 (for scope and content). The new of the delayed implementation of the FRTB had the indirect impact of postponing the usual timeline of the Market Risk exercise from the usual September-March to January-June, in order to give to banks time to react to the FRTB postponement and to prepare for the exercise.

41. At the moment this report is drafted, the exercise 2026 is under planning, i.e. the ITS is in its final phase before consultation. The new benchmarking ITS will see the introduction of the new templates for the FRTB Alternative Internal Model Approach, which were expected in 2025, but also the extension to the data collection of the ASA methodology to all the banks that apply it, subject a proportionality threshold of 500 million.

42. On a medium-term horizon, the EBA will consider reshaping the instruments and the portfolios in the exercise in a way that still keeps the instruments simple to ensure clarity regarding the instruments. Nonetheless, further enrichment of the variety of the instruments monitored could be beneficial. The effect of the AIMA and ASA implementation will have a significant impact on future design of the exercise.

2. Introduction of the 2024 market risk benchmarking exercise

43. Based on the EBA benchmarking ITS, the MR benchmarking exercise is carried out by following three main steps. First, the EBA defines the hypothetical instruments and portfolios, which are the same for all banks, in order to achieve a homogeneous and comparable outcome across the sample. Second, banks are asked to submit the data accordingly. Third, and finally, the EBA processes and analyses the data, providing feedback to CAs. During the process, the EBA supports CAs' work by providing benchmarking tools to assess banks' results and detect anomalies in their submissions.

2.1 Definition of the market risk hypothetical portfolios

44. The MR portfolios have been defined as hypothetical portfolios composed of both non-CTPs and CTPs, as set out in Annex V of the benchmarking ITS. The exercise includes 95 instruments recombined into 84 portfolios (77 individual and 7 aggregated), capitalised under the VaR, sVaR and IRC models, comprising mainly plain vanilla and some complex financial products in all major asset classes: EQ (21 instruments and 16 individual portfolios), IR (24 instruments and 23 individual portfolios), FX (11 instruments and seven individual portfolios), CO (five instruments and four individual portfolios) and CS (34 instruments and 27 individual portfolios). The EBA also designed aggregated portfolios, obtained by combining individual ones, to consider diversification effects. Each aggregated portfolio has a particular composition: the first (portfolio 10000) encompasses all asset classes; the second (portfolio 11000) is made up of only EQ portfolios; the third (portfolio 12000) is made up of only IR portfolios; the fourth (portfolio 13000) is made up of only FX portfolios; the fifth (portfolio 14000) is made up of only CO portfolios; and the sixth (portfolio 15000) is made up of only CS portfolios.

45. In addition, the set of portfolios includes ten instruments, and six portfolios (five individual and one aggregated) used for correlation trading activities, capitalised under the VaR, sVaR and APR models. These portfolios contain positions in index tranches referencing the iTraxx Europe index on-the-run series. The portfolios are constructed by hedging each index tranche with the iTraxx Europe index on-the-run 5-year series to achieve a zero-credit spread value of 1 basis point (CS01) as at the initial valuation date (spread hedged). No further re-hedging is required.

46. A more detailed explanation of the portfolios can be found in the benchmarking ITS on the EBA website.[4]

2.2 Data collection process

47. The data for the supervisory benchmarking exercise were submitted by banks to their respective CAs using the supervisory reporting infrastructure. Banks submitted the specified templates provided in the ITS, where applicable.

2.2.1 IMV

48. The reference date for IMV was 21 September 2023, 5.30 p.m. CET. Banks entered all positions on 14 September 2023 ('reset or booking date'), and, once positions had been entered, each instrument aged for the duration of the exercise. Furthermore, banks did not take any action to manage the instruments in any way during the entire exercise period.

49. The IMV figure to be reported by the banks for each hypothetical instrument was defined as the mark to market of the instrument on the booking date plus the profit and loss from the booking until the valuation date and time. Therefore, it was the mark to market of the instrument on 21 September 2022, 5:30 p.m. CET.

2.2.2 Risk measures

50. Pursuant to the common instructions provided, banks were required to calculate the risks of the positions without considering the funding costs associated with the portfolios (i.e., no assumptions were admitted with regard to the means of funding the portfolios). Moreover, banks were required to exclude, as far as possible, counterparty credit risk when valuing the risks of the portfolios.

51. Banks were required to calculate the regulatory 10-day 99% VaR on a daily basis. sVaR and IRC could be calculated on a weekly basis. In such cases, sVaR and IRC had to be based on end-of-day prices for each Friday in the time window of the exercise. For the six CTPs (6001-6005 and 16000), APR was also requested.

52. For each portfolio, banks were asked to provide results in the base currency, as indicated in Annex V of the benchmarking ITS. The choice of base currency for each trade was made to avoid polluting results with cross-dependencies on risk factors.

[4] ITS package for benchmarking exercises | European Banking Authority (europa.eu). Please also refer to Commission Implementing Regulation EU 2016/2070 of 14 September 2016 and Commission Implementing Regulation 2019/439 of 15 February 2019, laying down ITS in accordance with Article 78(2) of Directive 2013/36/EU (Implementing regulation - 2024/348 - EN - EUR-Lex).

53. All collected data underwent a preliminary analysis to spot possible misinterpretations of the common instructions set out in the ITS/RTS on benchmarking and outliers, as defined hereafter.

2.3 Participating banks

54. A total of 43 banks representing 13 EU countries participated in the exercise (see Table 18 in the annex). All EU banks with MR internal models approved by CAs were asked to submit data at all levels where own funds requirements are calculated. The EBA collected the results only at the highest level of consolidation.

55. CAs are in charge of conducting similar benchmarking investigations for results at a 'solo' level within their own jurisdictions for eligible banks.

2.4 Data quality

56. The data collection process aims to ensure the reliability and validity of the data obtained. In this regard, it is obvious that an unwanted driver of variability (which would pollute the results) could be misunderstandings vis-à-vis the portfolios and the specific instruments included in them.

57. IMV results reached the EBA in November/December 2023, after which the EBA carried out a preliminary IMV analysis and provided CAs with a tool to help them spot likely anomalies or misunderstandings regarding the interpretation of each portfolio. This was done to enhance the quality of all risk measures so that they would be provided in accordance with a correct interpretation of the portfolios. This step was conducted before the computation of the risk measures by the banks. Where the price of an instrument fell outside a certain range,[5] more investigation had to be undertaken by the CA, which could – if necessary – ask the banks in its jurisdiction for a repricing and subsequent resubmission. The same process was carried out for the risk measure submission.

58. The issue experienced in the previous exercises linked to the aggregated portfolio figures no longer seems to be a major issue. It is worth noting that some banks reported the IMVs and risk measures for the aggregated portfolios without including all the relevant components.[6] The reason was that the 2018 (and previous) ITS required banks to report the value of aggregated portfolios even if not all individual portfolios are modelled for the benchmarking exercise. As a result, the submissions were not comparable with those valued in full. This issue was addressed in the 2019 exercise, and since then banks have reported the results for the aggregated

[5] The range means the interval between the first and third quartiles. These quartiles were considered and subsequently updated when resubmissions were received.

[6] Some banks reported values for aggregated portfolios, considering only those components for which they had permission to use an internal model. This is clearly not a data quality issue, and it is correct that banks report results only where they have permission to do so for regulatory purposes.

portfolios only if the results of all components have been submitted.[7] The structure of the 2019-2020 exercise, i.e. a plurality of instruments that are recombined into a plurality of individual portfolios, which are themselves the components of the aggregated portfolios, produced a similar error, i.e. the absence of some instrument components within some of the individual portfolios. Nonetheless, banks should not provide any (aggregated or individual) portfolios where any instrument is missing in order not to distort the risk measures analysis. This specification was further clarified in the ITS 2022, so the possibility that some individual portfolios could have been submitted even when some specific instruments were missing cannot be ruled out. On the other hand, the data submission seems compatible with the correct interpretation of the rule, at least for many submitters.

59. It should be recalled that the 2024 exercise is the third exercise where EBA is collection information concerning the sensitivities linked to the SBM and the OFR linked to the SBM from the banks participating in the benchmarking exercise. The complete representation of the sensitivities collected is provided at the moment due to the very granular nature of the data collected. Nonetheless, some issues were detected, mainly linked to the volatility reported (inconsistent representation). All in all, the quality of the submitted sensitivities was appropriate.

60. The 2024 exercise also marks the first year where the validation instruments/portfolio for the SBM methodology were introduced by the new Annex 10 of the benchmarking ITS. ITS should be noted that only a small number of banks complained with this new set of requirements.

61. In the data analysis, it looks like no major errors in the reporting of any asset class were present. A complete list of the errors in the submitted data is beyond the scope of this report, but the most common and easily avoided mistakes worth mentioning are as follows:

- Equity asset class: in the past it was usually detected cases of use of the wrong notional in the equity positions. In the 2023 Annex, the instruction was corrected, reporting now the exact amount of share (or point of index) that the option or the future should report. This has enhanced the quality of the submission of this asset class substantially. The only issue remained in the Equity Asset class seems to be linked to the instrument 121 (VIX option), where a noticeable dispersion in the IMV is still present.

- Interest rates: confirmed the very good results were obtained in the previous exercise, especially where the international securities identification number was available. The cross-currency swap (instrument 220, now included on IR instruments) finally present a very low IQD (1%) indicating a consistent booking practice of this instrument, with only a couple of exceptions. The 223 (inflation swap) exabits some relevant dispersion (309% IQD) due to a low market value of the instrument, but also to some inconsistency in the booking practice.

[7] Annex 5, Market risk 2024 BM, Section 1 (Common instructions), letter (ee)

- FX: this asset class shows generally low IQD, with a few of noticeable exceptions in instrument 301, 302 and instrument 310-311, all forward contracts. In this case, the dispersion is attributed to mix of error in booking, and some inconsistent interpretation of the instruction. Luckly this kind of error, does not impact negatively the risk measures provided in the exercise. Nonetheless, the instructions were amended in the 2025, which hopefully should provide additional clarity in the booking phase of the exercise.

- Commodity: high IQD for instruments 401 and 401. This is also not easily explained since the instruments should be well known by the banks.

- Credit spread: very good results in terms of CV and IQD, with very sporadic mistakes entailing possible wrong bookings, and no long position instead of a short, or vice versa.

62. Although these mistakes were detected thanks to the EBA and Competent Authorities data analysis and corrected by resubmission/cleansing of the data from the banks, unnoticed errors in data submissions could still be present in the dataset analysed, and this can potentially drive and pollute the results.

63. Nonetheless, data quality for the 2024 exercise has been generally good. Ensuring data quality is a fundamental step for the benchmarking exercise. However, reporting errors might still occur in future exercises, and the process will allow both regulators and participating banks to learn from it.

3. Market risk benchmarking framework

64. The benchmarking exercise aims to assess the variability in banks' MR models and to identify the drivers that account for it. Variability in banks' models can come from three types of drivers.

65. First, variability can stem from banks' modelling choices that are explicitly envisaged in the regulation. For example, when modelling VaR institutions can choose to use a lookback period longer than the minimum (i.e., the previous year), use a weighting scheme for the data series, calculate the 10-day VaR directly or, alternatively, obtain a 1-day VaR and rescale it using the square root of time approximation. Likewise, when modelling IRC, banks can choose from several sources of the probability of default (PD) and have a certain degree of freedom when choosing the transition matrices applied, or when deciding on the liquidity horizon applied to a particular instrument. It should be highlighted that all these possibilities are, in principle, acceptable under the current regulatory framework (the CRR), provided that they have been agreed on with the CA during the approval process. Therefore, given the wide range of approaches that each institution using internal models can choose to implement, some degree of variability is expected.

66. Second, there are other modelling choices that are not explicitly envisaged in the regulations, which may cause variability. Examples include differences in simulation engines; differences in pricing model assumptions; the modelling of returns, volatility, correlations and other indirect parameter estimates; additional risk factors considered in the models; different approaches to P&L computation and attribution; and a stochastic framework for the simulated shocks.

67. Finally, another source of potential variability originates from supervisory practices. In particular, the use of regulatory add-ons in the form of both VaR and sVaR multipliers and additional capital charges (e.g. to encompass risk not in VaR issues, any information technology (IT) and organisational weaknesses, independent pricing valuations or detected flaws) and, quite significantly, the application of limits to the diversification benefits applied by banks (i.e. not allowing a single calculation at consolidated level and, instead, requesting an aggregation of the capital results at sub-consolidated and/or subsidiary levels) are likely to increase the observed variability in capital. In most cases, these supervisory actions have been established to address known flaws or model limitations, or to add an additional layer of prudence. Therefore, they typically result in higher capital requirements than would otherwise be the case. However, they can also increase the variation in market own funds requirements between banks, particularly across jurisdictions. Although the effects on capital levels of these supervisory actions can be substantial, a benchmarking portfolio exercise is not suitable for assessing some of these supervisory actions. In particular, any constraints on diversification benefits and direct capital add-ons cannot be properly assessed, since these effects are entirely portfolio dependent. To assess these effects, it would be necessary to use a much more realistic (hypothetical) portfolio,

comprising thousands of instruments and including partial model approval. Nevertheless, some supervisory actions can be assessed and the effects of regulatory add-ons on the VaR and sVaR multipliers will be analysed as part of this assessment.

68. Possible additional drivers of variation include:

- misunderstandings regarding the positions or risk factors involved that could not be resolved during the preliminary assessment (see Section 2.2);
- non-uniform market conventions and practices adopted in the hypothetical portfolio booking;
- incompletely implemented models (e.g., because a pricing module is being tested, or an additional risk factor is being taken into consideration);
- missing risk factors not incorporated into the model;
- differences in calibration or data series used in the modelling simulation;
- additional risk factors incorporated into the model;
- alternative model assumptions applied; and
- differences attributable to the methodology used (i.e. Monte Carlo (MC) versus HS or parametric).

3.1 Outlier analysis

69. After the data quality assurance process, the EBA performed an ‘extreme value’ analysis with the aim of excluding from the computation of the benchmarks those values for which the IMV and risk measures (RMs: VaR, SVaR, P&L VaR and ES) were found to lie outside a certain tolerance range due to misinterpretation of the trade or mistyping of bookings by the banks.

70. The presence of clear outliers in the data used to assess variability is deemed inappropriate, since these data points are likely to weigh heavily on the results, distorting the actual level of variability observed.

71. Extreme IMVs and RMs are defined as values outside the range of two truncated standard deviations[8] from the median. Since some results exhibited empirical distributions that had fatter tails than expected, outliers were defined as values differing by twice the truncated standard deviation or more from the median.

[8] The truncated standard deviation is computed by excluding the values below the 5th and above the 95th percentile of the data series.

72. If a bank's IMV or RM are found to be an extreme value for a particular instrument, then this observation is removed from the computation of the final benchmark statistics. The empirical evidence indicates that excluding the RMs based solely on IMV submissions, as in the previous exercise, implied that some extreme RM submissions are wrongly reflected in the benchmarking computation, while some good observations are removed. Changing this methodology did not influence the benchmarking data point, i.e., the median result. In addition, the overall dispersion of the portfolio was only marginally affected (slightly improved). The significant enhancement is in the communication to the CAs of the significant outliers to be examined with the bank. This approach, which was first adopted for the 2020 market risk benchmarking exercise, increased the overall quality of the benchmark data, providing more consistency for the benchmarks of these metrics.

73. The dispersion across the contributions is summarised by the IQD coefficient, which is more robust than the coefficient of variation (CV) for data derived from fat-tailed distributions. The higher the IQD, the more dispersed the data. IQD is defined as:

$$IQD = abs[(Q_{75th} - Q_{25th})/(Q_{75th} + Q_{25th})],$$

where Q_{75th} and Q_{25th} denote the 75th and 25th percentiles, respectively.

74. Another metric used in the variability studies is the CV, which is defined as the ratio between the standard deviation[9] and the mean (in absolute values):

$$CV = abs[StD/Mean].$$

75. The analysis reports both metrics because they jointly allow detection of the highest peaks of variability.

[9] The standard deviation was considered to gain a sense of the entire variability and a harmonised approach across the HPE. Obviously, a truncated standard deviation may appear more consistent for some highly dispersed trades.

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Table 2: IMV statistics and extreme values

EU Statistics for IMV by instrument

		Main statistics								Percentiles			
	Instr. ID	Min	Max	Ave.	STDev	STDev_trunc[1]	MAD (median absolute deviation)	Coefficient of variation (STDev/Mean)	Num obs.[2]	25th	50th	75th	IQD
Equity	101	4,200,428	4,233,786	4,222,974	6,080	23,579	966	0%	32	4,222,034	4,223,000	4,224,845	0%
	102	477,403	478,200	477,716	174	278	0	0%	29	477,700	477,700	477,706	0%
	103	-477,719	-473,000	-475,098	1,072	6,157	692	0%	25	-475,435	-475,391	-474,503	0%
	104	-184,604	-171,790	-176,538	2,800	4,123	1,422	2%	27	-178,173	-176,601	-174,454	1%
	105	-2,289,009	-2,235,786	-2,273,078	9,861	19,421	2,762	0%	29	-2,274,411	-2,273,714	-2,270,424	0%
	106	-16,190	-15,745	-15,908	121	168	50	1%	25	-15,929	-15,866	-15,863	0%
	107	-101,550	-100,325	-100,847	321	383	166	0%	28	-100,931	-100,833	-100,649	0%
	108	-114,728	-111,901	-113,096	742	808	727	1%	29	-113,473	-113,197	-112,463	0%
	109	34,194	38,066	36,934	848	1,615	393	2%	26	36,677	37,190	37,441	1%
	110	-52,717	-46,527	-49,431	1,349	2,176	688	3%	26	-50,076	-49,418	-48,582	2%
	111	9,617	12,379	11,066	800	893	451	7%	24	10,222	11,353	11,584	6%
	112	13,933	17,590	15,518	1,072	1,257	506	7%	23	14,776	15,391	16,657	6%
	113	28,928	32,234	30,230	873	1,414	470	3%	26	29,703	30,164	30,608	2%
	114	-20,032	-15,499	-17,877	1,080	1,328	430	6%	28	-18,533	-18,138	-17,514	3%
	115	1,717	3,095	2,038	275	878	121	14%	26	1,871	1,976	2,145	7%
	116	1,592	2,475	1,986	180	333	76	9%	23	1,903	2,040	2,059	4%
	117	-645,600,000	-634,999,914	-639,925,356	3,100,627	4,439,684	1,550,000	1%	26	-642,200,000	-641,086,514	-617,557,451	0%
	118	846,294	1,121,764	974,578	43,543	196,069	5,185	5%	22	967,017	971,771	980,000	1%
	119	186,604	210,982	196,898	5,166	7,085	1,802	3%	29	194,542	197,181	198,065	1%
	120	152,319	230,017	186,710	16,256	24,876	5,816	9%	25	179,178	185,636	189,668	3%
	121	40,115	724,770	472,955	229,483	229,483	218,247	49%	13	303,535	482,260	700,507	40%
Interest Rate	201	-63,776	-48,984	-56,593	3,646	4,558	1,372	6%	35	-58,618	-57,072	-53,428	5%
	202	-269,000	-204,277	-217,693	10,007	31,678	2,495	9%	32	-214,216	-212,517	-209,427	1%
	203	-11,043	-8,355	-9,694	692	845	262	7%	35	-10,043	-9,912	-9,000	5%
	204	15,670	25,472	20,996	2,677	2,677	1,371	13%	39	19,080	20,294	24,024	11%
	205	939,344	1,032,043	995,124	28,327	68,099	15,122	3%	35	977,537	990,187	1,026,849	2%
	206	1,157,991	1,208,441	1,162,202	8,262	42,074	521	1%	34	1,160,568	1,160,958	1,161,510	0%
	207	-835,908	-834,730	-835,453	330	389	257	0%	35	-835,731	-835,493	-835,170	0%
	208	1,145,040	1,158,683	1,155,297	2,028	51,052	263	0%	32	1,155,141	1,155,605	1,155,891	0%
	209	953,201	956,131	953,777	475	2,497	174	0%	37	953,521	953,615	953,910	0%
	210	906,877	908,677	908,104	360	700	206	0%	36	907,911	908,089	908,114	0%
	211	-897,497	-894,021	-895,259	546	1,419	286	0%	37	-895,547	-895,161	-894,944	0%
	212	-1,226,702	-1,222,241	-1,223,575	810	10,667	410	0%	37	-1,223,795	-1,223,428	-1,223,018	0%
	213	1,014,605	1,019,252	1,016,147	1,038	2,983	665	0%	36	1,015,359	1,015,863	1,016,848	0%
	214	939,461	942,770	940,447	580	1,239	257	0%	36	940,151	940,348	940,601	0%
	215	-784,654	-783,380	-784,090	417	807	273	0%	33	-784,421	-784,026	-783,891	0%
	216	967,908	972,850	971,077	1,342	2,173	609	0%	25	970,449	971,210	972,095	0%
	217	923,955	933,000	929,078	2,118	3,324	1,552	0%	29	927,526	928,948	930,718	0%
	218	107,273	129,378	119,077	5,201	7,418	1,934	4%	35	117,996	119,148	122,407	2%
	219	5,000	6,297	5,653	332	397	151	6%	37	5,476	5,703	5,843	3%
	220	-127,000	-95,254	-119,092	4,554	18,433	888	4%	36	-120,209	-119,427	-118,435	1%
	221	-4,821	342	-2,279	1,265	1,340	893	56%	37	-3,006	-2,219	-1,330	39%
	222	1,077,969	1,099,711	1,080,152	3,636	49,486	437	0%	32	1,079,180	1,079,574	1,079,994	0%
	223	-34,229	5,686	-4,439	10,971	25,058	2,982	247%	31	-4,278	-1,679	2,188	309%
	224	-203,328	-80,235	-110,436	20,847	67,541	2,136	19%	37	-113,787	-112,535	-109,642	2%
FX	301	-64,608	65,453	6,682	31,841	35,322	13,414	477%	34	-15,504	552	13,842	1760%
	302	80,952	203,804	154,283	39,954	44,430	9,016	26%	33	120,434	169,513	181,147	20%
	303	9,194,805	9,523,810	9,379,052	44,733	112,787	2,696	1%	34	9,379,100	9,380,863	9,390,102	0%
	304	32,991	38,247	35,037	1,038	1,600	602	3%	33	34,453	35,161	35,575	2%
	305	1,067,718	1,096,015	1,083,014	7,230	20,678	4,460	1%	31	1,078,666	1,085,261	1,088,434	0%
	306	-336,053	-309,225	-320,493	5,785	10,561	2,425	2%	33	-324,052	-322,873	-317,612	1%
	307	-63,058	-51,924	-57,761	2,469	3,400	1,247	4%	33	-58,023	-57,786	-56,105	2%
	308	1,457,000	1,508,630	1,488,396	12,177	16,173	8,401	1%	34	1,480,485	1,487,181	1,499,193	1%
	309	-1,015,403	-985,038	-1,002,580	7,806	14,125	4,453	1%	33	-1,008,687	-1,000,729	-998,617	1%
	310	-44,388	-4,923	-19,323	10,451	10,191	1,358	54%	33	-26,007	-25,232	-7,156	57%
	311	-68,557	281,996	130,589	120,449	130,738	68,643	92%	25	47,401	173,718	239,075	67%
Commodities	401	16,627	32,877	26,331	5,476	8,406	4,369	21%	15	21,738	28,827	31,705	19%
	402	-51,084	-22,141	-31,633	7,904	1,619,157	5,181	25%	15	-36,504	-32,145	-23,961	21%
	403	163,642	334,634	252,223	35,100	46,675	3,953	14%	14	250,049	252,633	257,955	2%
	404	-182,847	-130,882	-157,936	14,170	41,347	4,576	9%	14	-165,474	-161,847	-154,934	3%
	405	670,389	721,580	687,460	15,715	21,102	11,381	2%	12	674,141	680,420	696,134	2%
Credit Spread	501	-23,838	-23,562	-23,722	88	133	51	0%	22	-23,798	-23,748	-23,638	0%
	502	-1,861	-1,185	-1,575	177	313	105	11%	23	-1,649	-1,601	-1,411	8%
	503	22,152	22,842	22,553	144	246	56	1%	23	22,475	22,559	22,611	0%
	504	10,940	11,447	11,229	141	167	108	1%	20	11,142	11,238	11,339	1%
	505	36,894	37,935	37,559	273	955	130	1%	21	37,377	37,716	37,747	0%
	506	-33,127	-31,674	-32,578	349	517	252	1%	22	-32,851	-32,541	-32,347	1%
	507	4,033	4,471	4,309	115	141	42	3%	24	4,280	4,313	4,387	1%
	508	-15,186	-14,212	-14,811	256	401	62	2%	23	-14,963	-14,946	-14,687	1%
	509	10,409	11,516	10,803	231	354	49	2%	24	10,757	10,846	10,873	1%
	510	-15,181	-14,075	-14,512	194	576	24	1%	25	-14,519	-14,496	-14,475	0%
	511	9,518	10,561	10,175	216	365	42	2%	22	10,037	10,230	10,264	1%
	512	15,433	15,673	15,582	57	135	27	0%	21	15,566	15,592	15,610	0%
	513	28,176	29,995	29,486	433	707	223	2%	21	29,330	29,463	29,863	1%
	514	33,040	35,168	33,974	450	1,326	196	1%	24	33,804	33,994	34,168	1%
	515	-28,509	-27,553	-28,120	214	358	43	1%	24	-28,207	-28,161	-28,087	0%
	516	17,096	18,443	17,713	322	451	177	2%	25	17,504	17,557	17,922	1%
	517	992,174	999,489	996,011	1,812	7,394	583	0%	24	995,309	996,455	997,052	0%
	518	118,447	122,855	119,619	1,199	2,996	696	1%	22	118,653	119,325	120,024	1%
	519	929,524	935,069	931,597	1,145	2,942	411	0%	26	931,306	931,676	932,128	0%
	520	841,666	852,577	846,383	4,341	4,323	1,920	1%	29	842,792	844,041	851,627	1%
	521	-858,344	-848,891	-853,314	2,206	3,170	691	0%	26	-853,615	-852,822	-852,232	0%
	522	760,964	822,247	792,102	17,426	43,345	8,386	2%	28	783,685	787,123	806,730	1%
	523	1,088,937	1,094,415	1,091,444	1,150	5,544	657	0%	27	1,090,800	1,091,444	1,092,197	0%
	524	-89,041	-83,162	-86,532	1,526	1,633	1,387	2%	23	-87,916	-86,359	-85,138	2%
	525	665,960	670,751	668,390	1,185	1,259	805	0%	27	667,845	668,391	669,335	0%
	526	-109,208	-98,450	-104,162	2,778	3,764	1,491	3%	22	-106,050	-103,601	-102,787	2%
	527	659,551	663,979	661,650	1,161	1,313	756	0%	27	660,937	661,641	662,399	0%
	528	-111,789	-93,749	-102,765	4,007	5,030	2,035	4%	20	-104,450	-102,682	-100,363	2%
	529	-127,174	-122,967	-124,978	1,202	1,641	577	1%	21	-126,158	-124,511	-124,305	1%
	530	-66,482	-39,676	-55,233	7,917	11,572	2,451	14%	14	-59,044	-58,225	-55,652	3%
	531	908,961	912,342	910,838	800	2,291	261	0%	22	910,590	911,116	911,244	0%
	532	879,900	892,995	885,549	2,783	4,074	740	0%	20	883,898	885,533	886,381	0%
	533	833,534	837,951	835,410	1,008	2,241	575	0%	23	834,930	835,203	835,957	0%
	534	911,171	914,573	912,821	718	1,578	420	0%	23	912,379	912,840	913,143	0%
CTP	601	-390,217	-291,771	-332,275	52,530	52,530	3,711	16%	5	-389,381	-295,481	-294,525	14%
	602	-304,258	-237,802	-278,002	28,695	28,695	15,100	10%	5	-300,130	-289,158	-258,663	7%
	603	291,771	390,217	332,275	52,530	52,530	3,711	16%	5	294,525	295,481	389,381	14%
	604	237,802	304,258	278,002	28,695	28,695	15,100	10%	5	258,661	289,158	300,130	7%
	605	143,457	150,907	146,454	3,631	3,631	855	3%	5	143,708	144,312	149,888	2%
	606	-43,806	-35,354	-39,747	3,203	3,203	1,789	8%	5	-41,531	-39,742	-38,304	4%
	607	-150,907	-143,457	-146,454	3,631	3,631	855	3%	5	-149,888	-144,312	-143,708	2%
	608	35,354	43,806	39,747	3,203	3,203	1,789	8%	5	38,304	39,742	41,531	4%
	609	-473,627	-291,771	-381,545	88,345	88,345	86,789	23%	5	-466,817	-380,028	-295,481	22%
	610	-337,010	-237,802	-285,378	38,775	38,775	30,497	14%	5	-304,258	-289,158	-258,663	8%

[1] *STDev trunc* is the standard deviation computed excluding values below the *5th* and above the *95th* percentile

[2] Refers to the number of banks included in the computation of the statistics

Table 3: Average IMVs' interquartile dispersion by asset class

Average Interquartile dispersion by asset class - IMV

	Interquartile range 2024 exercise	*Interquartile range 2023 exercise*	*Interquartile range 2022 exercise*	*Interquartile range 2021 exercise*	*Interquartile range 2020 exercise*	*Interquartile range 2019 exercise*	*Interquartile range 2018 exercise*
Equity	4%	2%	21%	2%	1%	2%	2%
IR	4%	2%	16%	19%	2%	3%	8%
FX	19%	8%	3%	4%	16%	15%	6%
Commodity	16%	14%	24%	4%	10%	6%	8%
Credit spreads	5%	3%	1%	1%	1%	3%	6%
CTP	4%				5%	8%	103%

76. Table 2 and Table 3 show the results at the level of both each individual instrument and each risk type. As shown, the highest dispersion at the level of the individual instruments is detected for Fx instrument 301 (Fx forward) (IQD 1766%). It appears that the variety of interpretation of the instruction make it particularly difficult for banks to book it consistently. Same issue with the instruction could be the cause of the high IQD of instrument 302, 310 and 311 (all Fx forwards). Overall, excluding these four instruments with high dispersion, it would lead to an average IQD of 1% for the Fx asset class i.e., comparable or lower with respect the previous exercises.

77. On the IR asset class, it should be highlighted instrument 223, with 309% of IQD. This significant dispersion, beside probably some inconsistencies in the booking of the instrument, is also due to the 'low value' of the instruments. In terms of its construction the IQD is a ratio of two absolute measures (difference of the 25^{th} and 75^{th} quantiles, divided by the sum of the two). Therefore, a difference of a few hundred euros in the IMV generates very high IQD statistics, which is the case for some derivative instruments that exhibit an IMV of close to zero at inception, since they are entered at market rates. The same differences in the case of instruments that are much more valuable generate IQDs close to zero.

78. The Cmd instruments 401 and 402 also show moderately high IQDs (19% and 21%). This is likely due to a combination of the low IMVs value, which exacerbate the IQDs, and different market practise linked to these instruments, since the instruments are not changed with respect the previous exercise, so such worsening of the IMVs submission would not be explained otherwise.

79. The EQ instrument 121 is the only one with medium-high IQDs (40%). These high IQD is likely due to the underling (Vix) which makes the instruments slightly more exotic with respect to the rest of the EQ instruments.

80. Overall, the IQD of the IMVs by asset class for the instruments of the 2024 exercise is slightly decreased when comparable to the past exercises for all asset classes. The worsening of the dispersion is driven by specific instruments (e.g., instrument 121, 223, 301, 401 and 401). This

means that some specific clarification and amendment to the instructions could still be beneficial (this was done in the ITS 2025).

81. Comparing the 2024 instruments with the 2023 instruments purely on the basis of the IQD, once the few instruments with abnormal IQD have been excluded, it would appear that the quality of the data submission is acceptable, and comparable with the previous exercise.

82. From an aggregated risk-type perspective, as in the past, Fx and CO instruments show the highest dispersion.

83. A cluster analysis (see Table 4 and Figure 1, Figure 2, Figure 18) was performed to strengthen and deepen the aforementioned descriptive insights. It shows the dispersion of the IMVs by instrument and helps in identifying clusters in the instruments' pricing that could explain the scattering of IMVs for some trades. The results of this analysis suggest that the clusters are observable for instruments121, 223, 301, 302, 310, 311 (i.e. also instruments with higher IQD).

Table 4: IMV cluster analysis – number of banks by range

2024 IMV cluster analysis by instrument: number of banks by range

(X = ratio with the median)

100 *Range containing more than 15% of the total obs for that particular portfolio*

	Instr. ID	300% < X	300% ≥ X >200%	200% ≥ X >150%	150% ≥ X >100%	100% ≥ X >50%	50% ≥ X >0	0 ≥ X > -100%	-100% ≥ X > -200%	Num obs.
Equity	101				14	22				36
	102				11	22				33
	103				16	16				32
	104				16	16				32
	105				16	16				32
	106				14	16				30
	107				12	20				32
	108				16	16				32
	109				15	16				31
	110				15	16				31
	111				13	14				27
	112				13	14				27
	113				15	16				31
	114				15	16				31
	115	2		1	11	14				28
	116	1			13	14				28
	117				15	16				31
	118				12	10	2			24
	119				17	17				34
	120			2	11	14				27
	121			2	4	5	2			13
Interest Rate	201				21	21	1			43
	202				20	21				41
	203		1		20	20	1			42
	204				21	21	1			43
	205				9	9				18
	206				19	19				38
	207				21	21				42
	208				18	18				36
	209				21	21				42
	210				21	21				42
	211				21	21				42
	212				18	24				42
	213				20	21				41
	214				20	21				41
	215				20	20				40
	216				14	15				29
	217				14	17				31
	218				21	22				43
	219				21	22				43
	220				19	17	2			38
	221	1	2	6	12	13	2	5		41
	222				18	18				36
	223	9	1	3	3	1	1	3	6	29
	224	3	1	1	15	21				41
FX	301	19								19
	302				19	12	7			38
	303				17	20				37
	304				18	19				37
	305				18	19				37
	306				19	18				37
	307	1			17	19				37
	308				18	19				37
	309				18	19				37
	310			1	18	2	16	1		38
	311	1		1	12	2	5	8		29
Commodities	401			1	7	8				16
	402	1		1	6	8				16
	403				7	8				15
	404			1	6	8				15
	405				6	7				13
Credit Spread	501				13	13				26
	502	1			12	11	1	1		26
	503				13	13				26
	504				11	12				23
	505				11	12				23
	506				12	12		1		25
	507				12	15				27
	508				13	14				27
	509				13	14				27
	510				13	14				27
	511				13	14				27
	512				13	14				27
	513				12	13				25
	514				13	14				27
	515				12	15				27
	516				13	14				27
	517				13	13				26
	518				12	12				24
	519				15	15				30
	520				15	15				30
	521				15	15				30
	522				15	15				30
	523				14	16				30
	524				13	13				26
	525				15	15				30
	526				12	12	1			25
	527				15	15				30
	528				12	12				24
	529				12	12				24
	530				7	7	1			15
	531				12	13				25
	532				12	12				24
	533				13	13				26
	534				13	13				26
CTP	601				2	3				5
	602				2	3				5
	603				2	3				5
	604				2	3				5
	605				2	3				5
	606				2	3				5
	607				2	3				5
	608				2	3				5
	609				2	3				5
	610				2	3				5

84. In particular, as shown in Table 3 and Figure 2:

- Instrument 121 (EQ) reports few submissions (13) – with some extreme value, and two clusters (around 300k and 700K of IMV);
- 223 exhibits extreme outliers in terms IMVs and in its IQD, which imply some residual issue in term of correct booking from banks.
- Instruments 301, 302, 310 and 311 (FX): generally high IQD (47%), with substantial clustering – highlight issue in the interpretation of the instructions.

85. Some of these extreme outlier banks were classified as a high priority for the CAs (see also Chapter 5), so they were followed with greater attention during the exercise in order to specifically define the reason for the extreme result.

86. Despite many recommendations, some minor misalignments in the IMV have been detected due to the reporting of the 'clean price' (i.e., the price of a trade excluding the accrued interest) instead of the 'dirty price' (i.e., the price of a trade including any interest), which is what was intended for the mark to market valuation. This has been detected especially in the bond price, as in instruments 517-527. This problem was more frequent in the past, but it is evident that not all the banks follow the instructions in this regard. On the other hand, this mistake does not significantly prejudice the provision of the risk measures.

87. In addition, the EBA recommends that banks make better use of the Q&A tool by submitting questions before the start of the exercise to avoid misinterpretations in the future. Banks are kindly invited to provide, using the Q&A tool, their best practice and market standard conventions when further specifications of the hypothetical trades are needed.

88. Evidence from a large majority of the banks is that IMV comes from front office systems. This is acknowledged as the best practice for alignment with real market-trading activities.

89. Figure 1 and Figure 2 report the clusters found in the IMV results for a sample of low IQD instruments (0% IQD or close to zero) and high IQD (the highest in the asset class) instruments. All the instruments' IMV distributions are available in the annex in Figure 18.

Figure 1: IMV scatter plots – low-IQD instruments

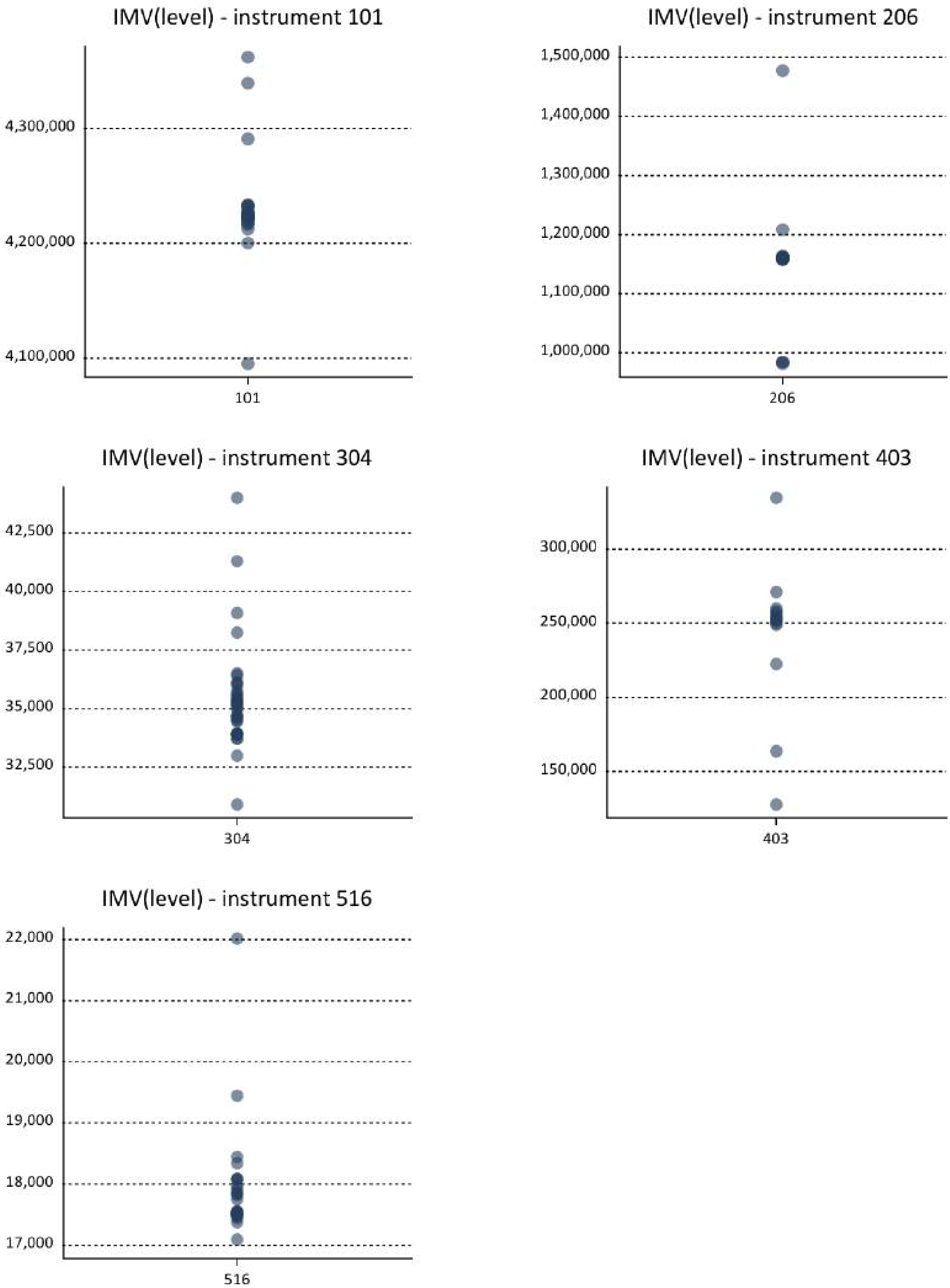
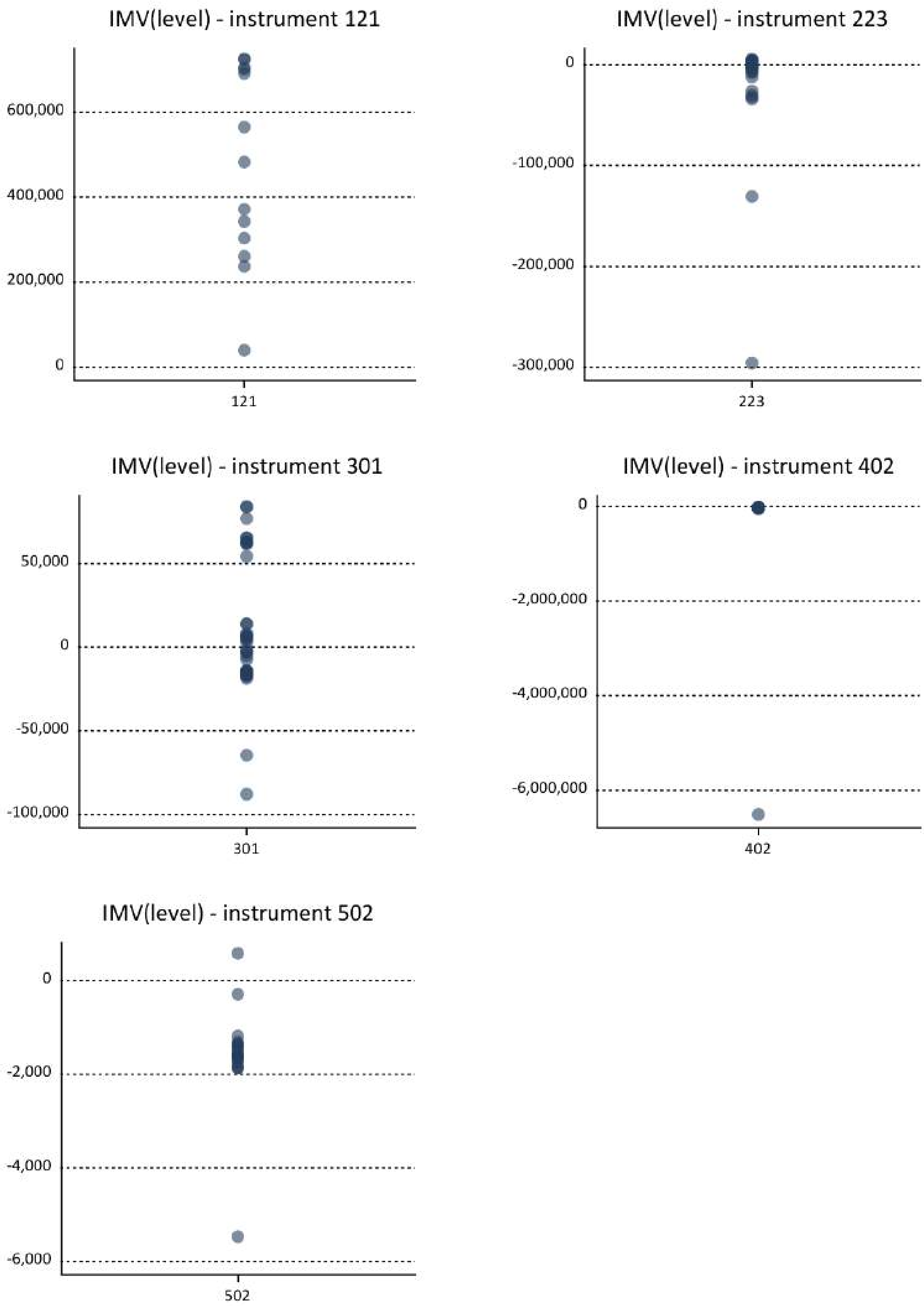


Figure 2: IMV scatter plots – high-IQD instruments



90. The 'concentration index' as per the percentage of values between 50% and 150% of the median value in Table 4 shows that, overall, 95% of the observations lie between those ranges.

91. This result is similar to what reported last year's MR benchmarking exercise, demonstrating a consistent level in terms of submissions quality.

92. Given the EBA's experience of past benchmarking exercises, values lying in this range might be considered acceptable on the basis of fine-tuning as successive benchmarking exercises are run.

93. For many hypothetical instruments, the IMV variability is explained by the divergence in terms of both fixings and market practice assumptions by the participating banks. Therefore, the interpretation of the deals and market practices substantially explains the observed variability.

3.2 Risk and stressed measures assessment

94. For VaR and sVaR, variability was assessed by using the banks' reported VaR and sVaR over a 2-week period (from 15 January 2024 to 26 January 2024). Banks submitted weekly or daily observations, depending on their models, and the final risk measures by portfolio were obtained by averaging the observations over the 2 weeks.

95. In the sample, 14 out of 43 banks calculated weekly sVaR measures. The remaining 29 banks computed daily sVaR measures.

96. Moreover, a P&L VaR measure produced by the EBA using the P&L data provided by banks via an HS approach was analysed. The relevant banks delivered a yearly 1-day P&L vector for each of the individual and aggregated portfolios modelled. These were used to compute the P&L VaR.

97. The additional P&L information for non-APR portfolios allowed the EBA to compute the alternative measure for VaR previously defined, and to check the variability of the results across banks by calculating VaR using a 1-year lookback period.

98. Additional checks were carried out for the available P&L vectors, such as the 1-day P&L versus the 10-day P&L (either overlapped or not), where applicable. Furthermore, the time series with the wrong time window were dropped. P&L vectors provided by banks with no HS model were also dropped. A final consistency checks across the HS banks entailed computing the ratio between P&L VaR and the regulatory VaR provided, which can be expected to be close to 1.[10]

99. Clearly, the P&L VaR assessment is possible only for banks applying an HS approach, and with at least 185 days of results submitted. Accordingly, banks applying an MC or parametric approach, or another approach other than HS, cannot be subject to this assessment, and have been dropped from the sample (see also Section 2.4, 'Data quality issues').

[10] It should be noted that this expectation depends on the lookback period for VaR.

100. The P&L VaR was computed as the absolute value of the empirical first percentile of the P&L vector rescaled to 10 days by applying the square root of time approximation, without applying any data-weighting scheme:[11]

$$VaR_{99\%}^{10day} = \sqrt{10} \ * VaR_{99\%}^{1day}$$

101. The P&L vector is used to assess the degree of P&L correlation across banks, as well as the level of volatility shown in each bank's vector. This analysis provides useful insights into the degree of market consensus on the relevant risk factors in terms of both market dynamics and volatility levels. Obviously, this analysis, like most of those discussed here, relies on sufficient data points and portfolios being modelled by banks to ensure robustness and consistency.

102. The IRC analysis cannot be deepened in this way for VaR because of the higher level of confidence (99.9%) and longer capital horizon (1 year) applied in these metrics. Nevertheless, a variability analysis was performed. In the paragraph concerning IRC, particular emphasis is reserved for missing, zero or unrealistically low results, which suggest that key underlying risk factors are not efficiently captured by the IRC internal model.

103. In the sample, 15 out of 27 banks computed weekly IRC measures.

104. It is apparent that more complex risk measures, such as IRC, are computed at a less frequent pace (i.e., a weekly basis instead of a daily basis).

105. For APR, only a small number of contributions were submitted because of the scarcity of approved internal models on CTPs and because most institutions consider the CTP business to be declining significantly as a result of the recent financial crisis. Therefore, the sample is quite limited.

106. The ES, as an alternative risk metric to VaR, has been estimated from the daily P&L series by averaging the P&L observations below the 2.5th percentile converted by the square root of time approximation and taking the absolute value:

$$ES_{97.5\%}^{10day} = \sqrt{10} \ * ES_{97.5\%}^{1day} = \sqrt{10}\ \frac{1}{n}\ \sum_{i=1}^{n} P\&L_{t_i}$$

where *n* = number of days describing the 2.5th quantile rounded to the highest decimal.

107. For the aggregated portfolios, diversification effects were checked with regard to the VaR, sVaR and IRC metrics, regardless of whether they were provided or estimated.

[11] Some banks apply data weightings at a risk factor level, and these will be present in the P&L vectors. This is an implicit source of variability that cannot be controlled.

108. For the most inclusive portfolios – i.e., the aggregate portfolios – the implied capital charges were also computed, and their variability analysed. Where possible, the idiosyncratic factors that drive variability and the impact of regulatory add-ons (e.g., multipliers) were analysed.

109. It is worth noting that, although the effects on capital levels of these supervisory actions can be substantial, an HPE is not suitable for assessing such differences. This is especially the case for diversification benefits since these effects are entirely portfolio dependent. More on this is included in the following subsection entitled 'Limitations'.

110. Finally, to make the analysis more comprehensive, CAs were asked to complete a questionnaire about the takeaways from this benchmarking analysis and the actions they plan to take to overcome potential weaknesses in the banks' MR models (see Section 5 of this report). Thanks to the interview process, the EBA had the opportunity to discuss directly some issues raised by CAs when challenging the models in the ongoing assessment process.

3.2.1 Limitations

111. The design of the benchmarking portfolio exercise described in the ITS aims to ensure the quality of the data used in the report to be produced by the EBA and, more importantly, to identify the banks and portfolios that need specific attention on the part of the responsible CAs. Nevertheless, any conclusions regarding the total levels of capital derived from the hypothetical data should be treated with due caution. The hypothetical portfolios are very different from real portfolios in terms of size and structure. What is more, the data cannot reflect all the actions taken by supervisors.

112. From a methodological perspective, the sVaR metric variability observed could originate either from differences in modelling or from the different data periods used for sVaR computation. Further variability stems from banks' different stress periods because there is no common benchmarking stress period. To allow more specific analysis of this aspect, since the 2019-2020 benchmarking exercise more information about the stressed VaR time window has been requested from banks by expanding the relative template envisaged in Annex VI of the benchmarking ITS (in this regard, see subsection 4.2.5.d, 'Common stress period considered' below).

113. Another limitation that was tackled in this analysis is that of producing a segregated analysis for institutions with partial model approval (e.g., general risk only) in order to split the result for portfolios with specific risk to filter the additional unwarranted dispersion of VaR figures. The benchmark analysis was run by splitting banks with full approval for equity and IR from those with partial approval to filter out the variability of the risk measure introduced by the partially approved banks.

114. Banks with partial model approval provided insights into how they approached the benchmarking exercise. It has been found that the differences reported by the banks in respect of the EBA's benchmark measure are almost entirely explained by considering the internal

measure of risk, which is not approved for capital purposes but is more complete in terms of risk factor coverage.

115. In summary, the reporting of partial use approval results should be continued for the purpose of the exercise. However, it should be considered within the specific sample in order to assess any bias these partial use approval results could introduce into the results for the rest of the sample observed.

4. Overview of the results obtained

4.1 Analysis of VaR and sVaR metrics

116. The dataset used to perform the assessment of risk measures for the 2024 exercise was determined based on the actual dispersion of the risk measures analysed. The outcome of the IMV extreme value analysis was used as an early indication of the potential problems to be reported to banks by their CAs. As explained in Section 3.1, banks' data were taken into account only for portfolios for which the RM is between the benchmark (50th percentile) +/- two times the truncated standard deviation in the portfolio analysed. The rest was classified as an outlier. As shown in Figure 27, we can see that this methodology, contrary to what was used until the 2019 exercise, does not exclude RMs that are clearly consistent with the benchmark.

117. To check if submissions (by portfolio) were at least approximately symmetrically distributed around the mean and/or the median, the EBA checked for any significant differences between the mean and median values for the truncated sample. Table 20 in the annex reports the banks' VaR results in relation to the median, aggregated into six buckets, to enable the detection of unexpected clusters.

118. As Table 20 and Table 21 show, the variability of the VaR (on average 15% in IQD vs an average variability of 17% in 2023 and 23% in 2022) has improved compared to the previous year, where basically all asset classes report some decrease in the IQDs. The analysis also identifies clusters for portfolios 1016 (EQ), portfolio 2008 and 2019 (IR), and 5009, 5012, 5014 and 5024 (credit spread). This improvement is likely due to a substantial amount of resubmission which improved the quality of Risk Measure dispersion, as long as the fixing and clarification of some instructions.

119. As in the previous exercise, the VaR values for CTPs (portfolios 6001 to 6005) are not reported because of insufficient numbers of these data submission to guarantee the significance of the statistics provided and the anonymity of the submissions.

120. The cluster analysis presented above is superior to a simple outlier analysis that flags submissions more than a designated number of standard deviations from the mean, as this method cannot easily be used for clustered or strongly asymmetric portfolios.

Interquartile dispersion

121. Figure 3 and Table 5 summarise the variability of the results, measured via the IQD and coefficient of variation, for the IMV as well as all three VaR measures (i.e. VaR, VaR for HS banks only and VaR calculated from the 1-year P&L series submitted by HS banks). IQD and CV for IMV, PV, VaR and stress VaR, divided by risk factors, are reported at the bottom of Figure 3. Table 5 also includes the VaR results for MC simulation banks and the expected shortfall.

122. In terms of risks across different assets classes, the IQDs for VaR for all asset classes are decreased, and they are all well below 20%. The asset class with the lower level of IQD is FX, with just 9% (it was 12% in 2023). The asset class with the highest IQD remain the CS (16%, it was 18% in 2023, 28% in 2022; and it was 37% in 2021) and EQ (16%). Overall, the IQD is lower (14%) than in the previous exercises (in 2021 exercise there was an average dispersion of the VaR of 25%, whereas this decrease to 21% in the 2022 exercise, and 16% in 2023), and it is now lower of the 17% before Covid pandemic in 2020. This decrease in the IQD of the VaR is likely to have stemmed from a stable decrease in the market volatility, but also to a good refinement of the instructions and submission of the data.

123. As expected, the IQD for sVaR is higher than for VaR (see the bottom panels of Figure 3), with an average IQD of 21% (22% in 2023, 28% in 2022, 29% in 2021 and 25% in 2020). The CS asset class features a higher dispersion once again (29% as it was in 2023, and 35% in 2022; in 2020 and in 2021 it was 34%). Higher sVaR dispersion is likely to be due to the differences between banks in their choice of the 1-year stress period used, which is chosen based on each participating bank's actual portfolio. It might therefore be the case that the sVaR is not calculated with respect to the 1-year period that maximises VaR for the given hypothetical portfolio.

Figure 3: Interquartile dispersion and coefficient of variation for IMV and risk metrics by portfolio

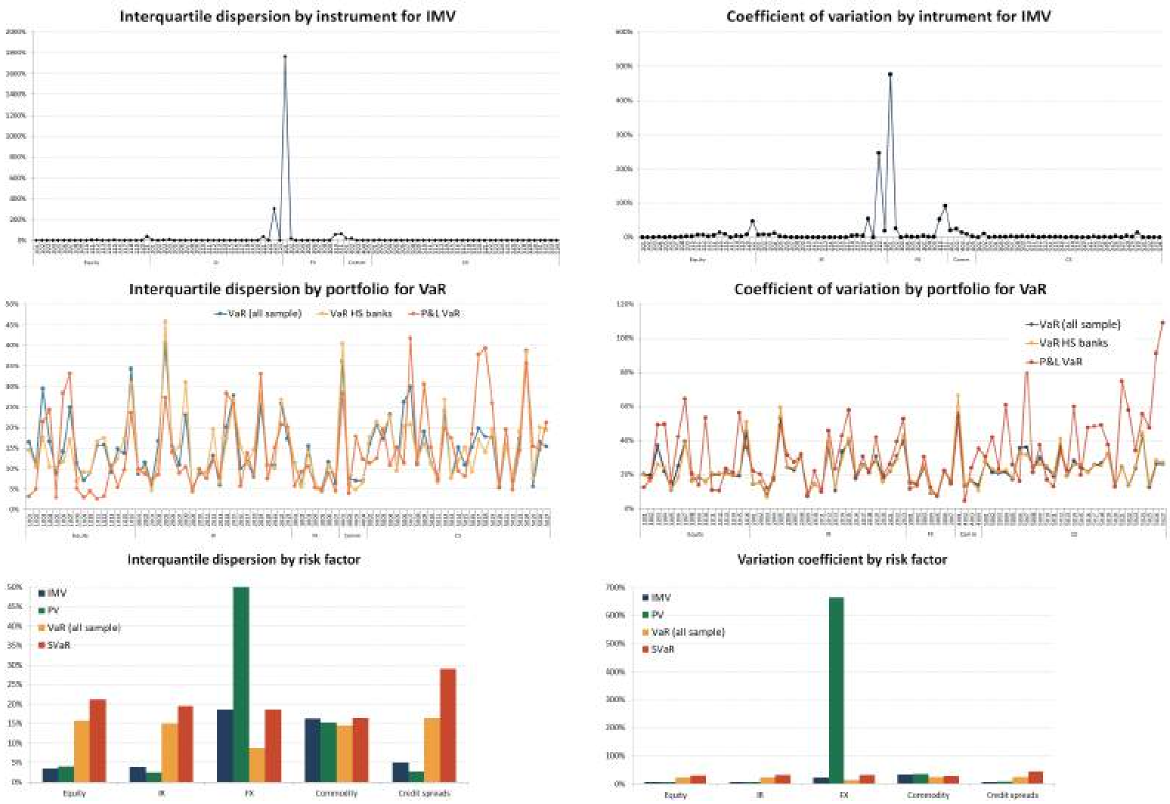


Table 5: Interquartile dispersion for IMV, risk metrics and SBM OFR by risk factor

Average Interquartile dispersion by risk factor

	IMV	VaR (all sample)	SVaR	P&L VaR	VaR HS banks	VaR MC banks	Exp shortfall	SBM OFR
Equity	4%	16%	21%	12%	12%	10%	11%	12%
IR	4%	15%	20%	14%	16%	8%	13%	8%
FX	19%	9%	19%	7%	8%	5%	8%	2%
Commodity	16%	14%	16%	16%	13%	5%	17%	20%
Credit spr.	5%	16%	29%	18%	14%	13%	18%	14%

124. Table 5 confirms that when a homogeneous subset of banks is considered (i.e., HS or MC banks), the VaR results show less dispersion than the total sample (average 13% vs. 14%). Regarding the P&L VaR, the dispersion is also 13% (on average among different assert classes) is slightly lower with respect to the all-sample VaR for almost all the asset classes (not for CS). This is consistent with the assumption that fewer differences in the methodology would imply less dispersion among the risk measures.

125. When comparing variability for HS VaR and MC VaR, also this year's result tells us that the MC VaR values are less dispersed than those of the HS VaR, as it was in the past exercise. Nonetheless, the analysis needs to take account of the fact that the sample of MC banks is quite small compared with that of HS banks (i.e., 7 MC banks versus 30 HS banks). As far as parametric banks are concerned, a similar analysis is not informative as the total number of parametric banks is very small (i.e., two banks in the sample – the remaining three apply a combination of methods, and one failed to report).

126. The ratio between sVaR and VaR was also analysed across the sample (see Table 25 in the annex). Some banks have ratios below 1 for many portfolios, while other banks have extremely high ratios for some portfolios. While it is generally expected that the sVaR is greater than the VaR, the clear disparity between these values is usually a natural indication that something is wrong with the data submitted, and the EBA and CAs must pay attention to these observations.

127. Table 6 shows the distribution of the sVaR–VaR ratio classified into three buckets (i.e., below 1, between 1 and 3, and above 3) for each portfolio. It is worth noting that a significant number of portfolios for EQ, and IR have a significant proportion of ratios below 1.

Table 6: sVaR–VaR ratio by range (number of banks as a percentage of the total)

Distribution of sVaR / Var ratio over portfolios

(X = ratio with the median)

	Port. ID	$X > 3$	$1 < X \leq 3$	$X \leq 1$
Equity	1001	17.9%	78.6%	3.6%
	1002	86.4%	13.6%	0.0%
	1003	17.4%	78.3%	4.3%
	1004	19.0%	71.4%	9.5%
	1005	33.3%	66.7%	0.0%
	1006	12.5%	83.3%	4.2%
	1007	55.0%	40.0%	5.0%
	1008	9.1%	86.4%	4.5%
	1009	8.0%	92.0%	0.0%
	1010	88.0%	12.0%	0.0%
	1011	11.1%	88.9%	0.0%
	1012	14.8%	85.2%	0.0%
	1013	10.3%	62.1%	27.6%
	1014	14.3%	85.7%	0.0%
	1015	10.5%	89.5%	0.0%
	1016	27.3%	63.6%	9.1%
Interest Rate	2001	0.0%	82.4%	17.6%
	2002	0.0%	52.6%	47.4%
	2003	0.0%	75.8%	24.2%
	2004	2.8%	36.1%	61.1%
	2005	21.4%	64.3%	14.3%
	2006	0.0%	88.9%	11.1%
	2007	0.0%	76.7%	23.3%
	2008	3.7%	85.2%	11.1%
	2009	0.0%	89.2%	10.8%
	2010	0.0%	72.7%	27.3%
	2011	0.0%	68.4%	31.6%
	2012	0.0%	78.8%	21.2%
	2013	2.7%	59.5%	37.8%
	2014	40.0%	52.0%	8.0%
	2015	28.6%	60.0%	11.4%
	2016	0.0%	57.1%	42.9%
	2017	86.2%	10.3%	3.4%
	2018	0.0%	68.6%	31.4%
	2019	14.7%	73.5%	11.8%
	2020	50.0%	39.5%	10.5%
	2021	3.2%	71.0%	25.8%
	2022	0.0%	82.8%	17.2%
	2023	0.0%	81.1%	18.9%
FX	3001	6.3%	90.6%	3.1%
	3002	0.0%	93.3%	6.7%
	3003	10.7%	89.3%	0.0%
	3004	6.7%	90.0%	3.3%
	3005	54.5%	45.5%	0.0%
	3006	19.4%	66.7%	13.9%
	3007	35.7%	64.3%	0.0%
Commodities	4001	20.0%	73.3%	6.7%
	4002	7.7%	92.3%	0.0%
	4003	18.2%	81.8%	0.0%
	4004	0.0%	100.0%	0.0%
Credit Spread	5001	18.2%	81.8%	0.0%
	5002	62.5%	37.5%	0.0%
	5003	30.4%	69.6%	0.0%
	5004	52.6%	47.4%	0.0%
	5005	68.2%	31.8%	0.0%
	5006	47.8%	52.2%	0.0%
	5007	18.2%	68.2%	13.6%
	5008	4.2%	70.8%	25.0%
	5009	3.8%	80.8%	15.4%
	5010	4.3%	78.3%	17.4%
	5011	8.3%	70.8%	20.8%
	5012	57.1%	33.3%	9.5%
	5013	22.7%	77.3%	0.0%
	5014	50.0%	40.9%	9.1%
	5015	0.0%	90.9%	9.1%
	5016	21.1%	78.9%	0.0%
	5017	26.3%	73.7%	0.0%
	5018	21.1%	78.9%	0.0%
	5019	13.6%	81.8%	4.5%
	5020	0.0%	77.8%	22.2%
	5021	52.4%	47.6%	0.0%
	5022	0.0%	89.5%	10.5%
	5023	15.4%	84.6%	0.0%
	5024	15.8%	84.2%	0.0%
	5025	8.7%	91.3%	0.0%
	5026	0.0%	92.0%	8.0%
	5027	0.0%	84.0%	16.0%
CTP	6001	75.0%	25.0%	0.0%
	6002	50.0%	50.0%	0.0%
	6003	0.0%	100.0%	0.0%
	6004	0.0%	100.0%	0.0%
	6005	50.0%	50.0%	0.0%
ALL-IN no-CTP	10000	9.1%	90.9%	0.0%
Equity Cumulative	11000	31.8%	68.2%	0.0%
IR Cumulative	12000	0.0%	77.4%	22.6%
FX Cumulative	13000	8.8%	91.2%	0.0%
Commodity Cumulative	14000	15.4%	84.6%	0.0%
CS Cumulative	15000	0.0%	95.7%	4.3%
CTP Cumulative	16000	0.0%	50.0%	50.0%

4.2 A closer look at the VaR and sVaR results

128. Figure 4 and Figure 5 give an overview of the VaR and sVaR results for portfolios 1001 to 6005, i.e. they do not include the aggregated portfolios, where fewer observations were available for the reasons explained above (see Section 2.4).

129. Broken down by portfolio, the figures show the average VaR and sVaR over the 10-day submission period for each bank, normalised by the median[12] of the given portfolio.[13]

130. Comparing Figure 4 and Figure 5, it shows the dispersion for sVaR than for VaR (sVaR 21% IQD versus 14% VaR IQD on average). Differences in dispersion between VaR and sVaR seem steady but are more marked for the CS portfolios, in which sVaR shows a higher level of dispersion than in the other asset classes (29%).

131. FX and CO are the asset classes with the lowest levels of dispersion for VaR (9% and 14%), as they are for sVaR (19% and 16%).

[12] The portfolio median is the median of the average VaR and sVaR over the submission period.

[13] Note that the figures are restricted to VaR–median and sVaR–median ratios below 450%.

Figure 4: VaR submissions normalised by the median of each portfolio

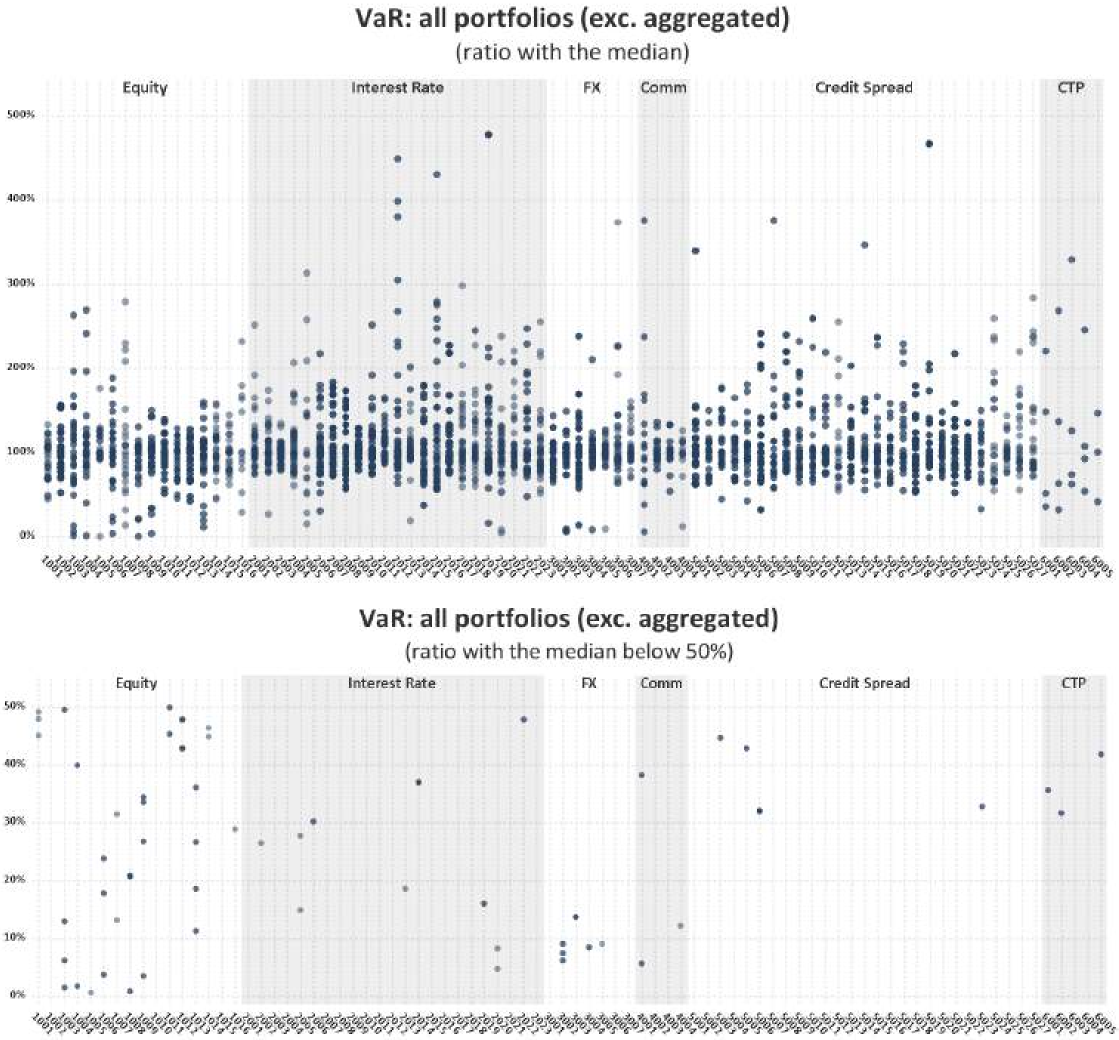
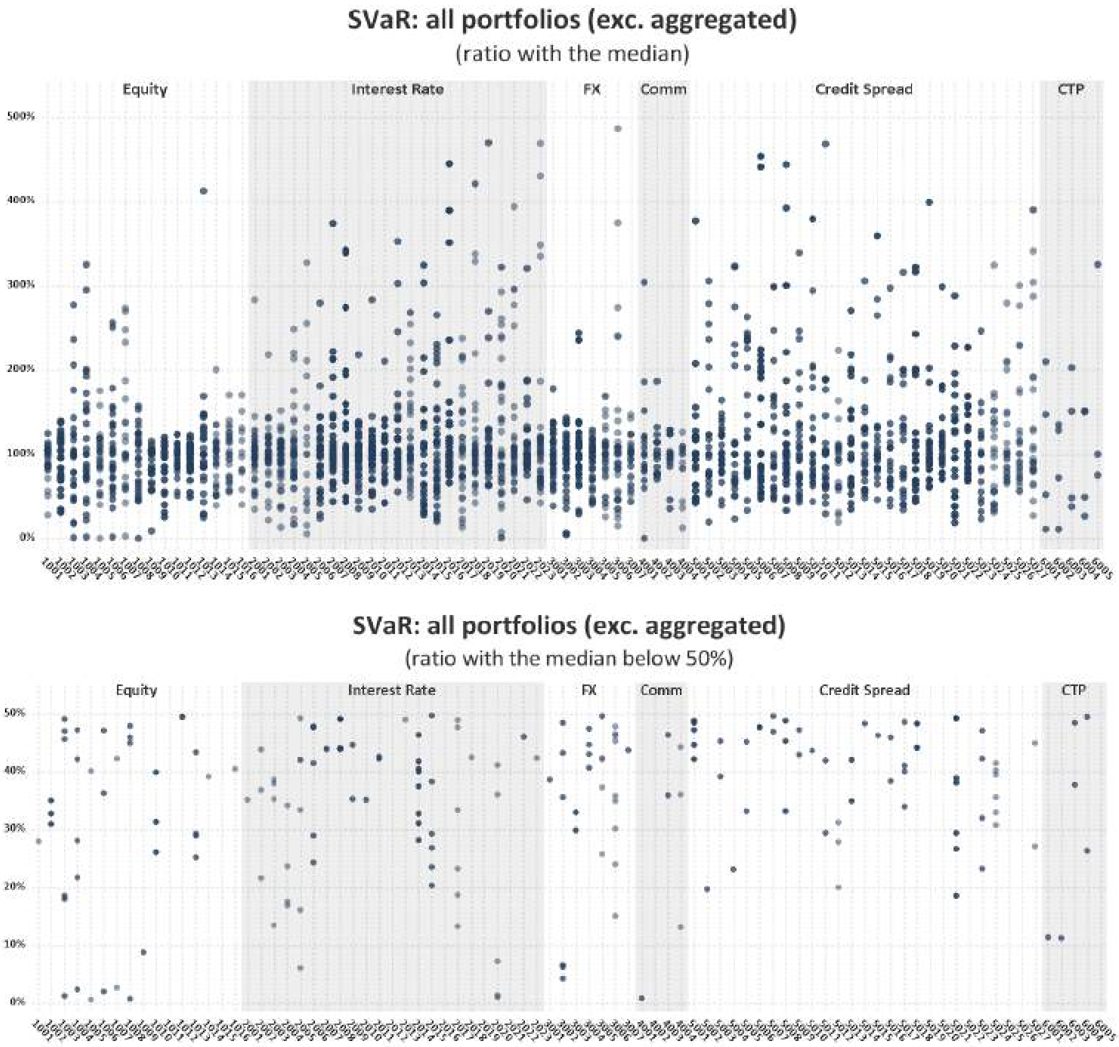


Figure 5: sVaR submissions normalised by the median of each portfolio



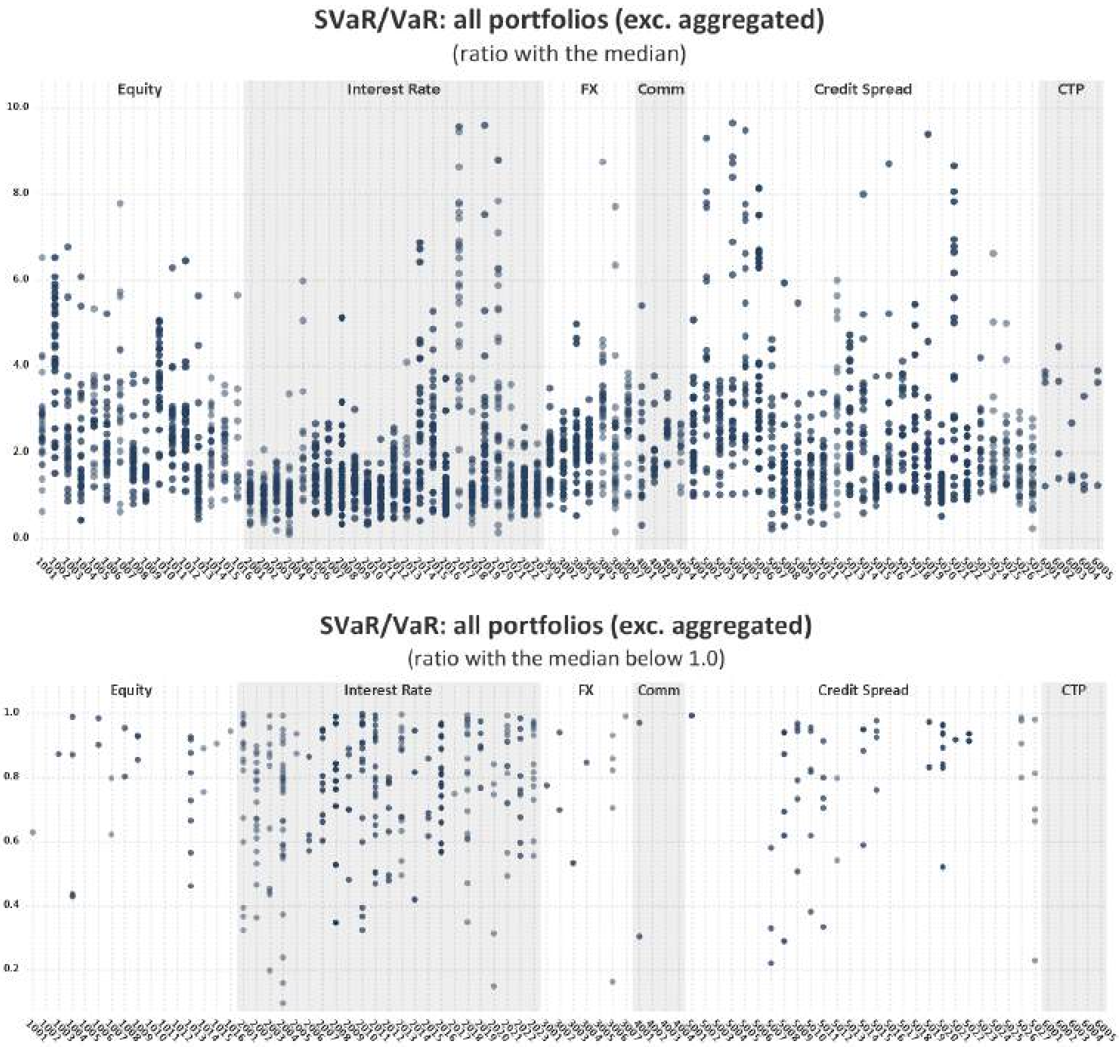
132. Table 21 and Table 22 in the annex report all the VaR and sVaR statistics along with EU benchmarks for all HPE portfolios.

4.2.1 Comparison of sVaR and VaR ratios

133. Banks were assessed in relation to the full sample not only by their VaR and sVaR values, but also by their sVaR–VaR ratios (Table 25). In general, it should be expected that sVaR would be at least as high as VaR, as sVaR is calibrated to a 1-year period of significant stress. This is verified in 88% of cases. This was 71% in 2023, 89% in 2022 and 73% in 2021.

134. Figure 6 shows the ratio of the average sVaR to the average VaR for each bank. The sVaR–VaR ratio varies significantly across the portfolios. Excluding outliers, the average sVaR–VaR ratio per portfolio varies between 0.09 and 34.50 and averages 2.25.

Figure 6: sVaR–VaR ratio for the average VaR and sVaR by portfolio



135. A few banks have a high sVaR–VaR ratio for portfolios in certain asset classes only. This suggests that these asset classes dominate the banks' real trading portfolios and, for that reason, drive the calibration of the sVaR window.

4.2.2 Drivers of variation

136. Based on the qualitative information provided by banks (Figure 7 to Figure 11), the most common methodological approach used by banks to model MR is HS (71%). Although most banks use the same methodological approach, the dispersion of VaR remains substantial because other modelling choices play a key role in producing variability of the risk measures (e.g., differences in time scaling and/or weighting scheme choices, absolute versus relative returns for different asset classes).

Figure 7: Qualitative data: VaR methodological approaches

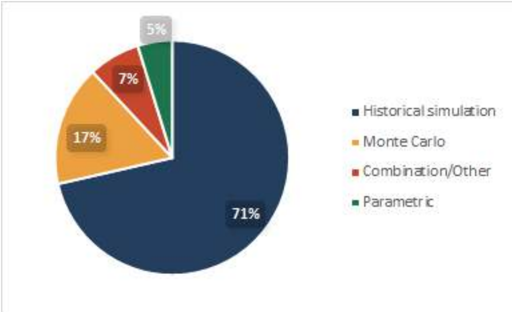
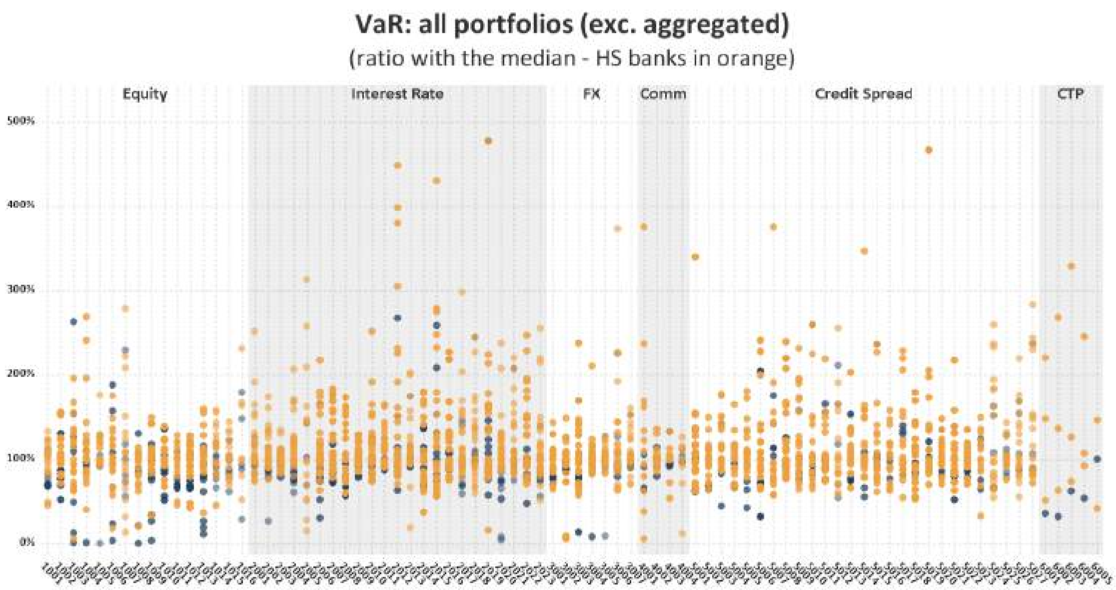
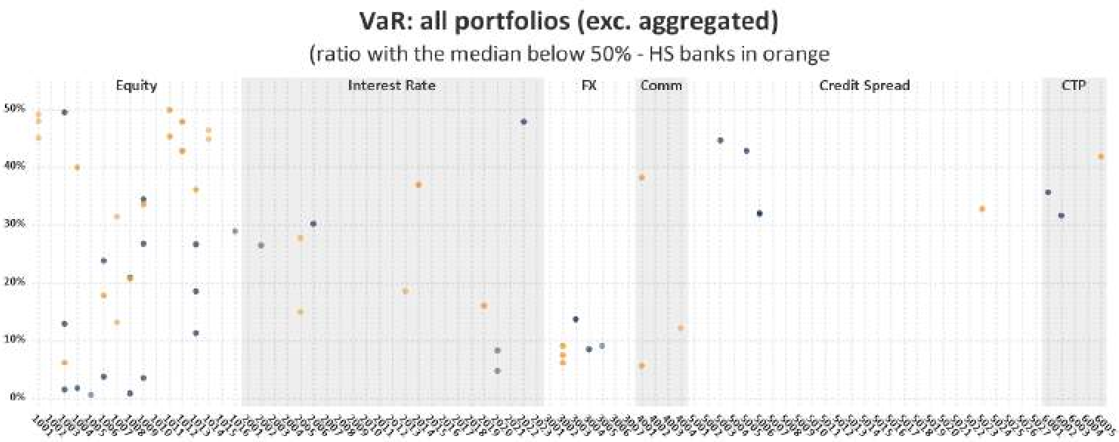


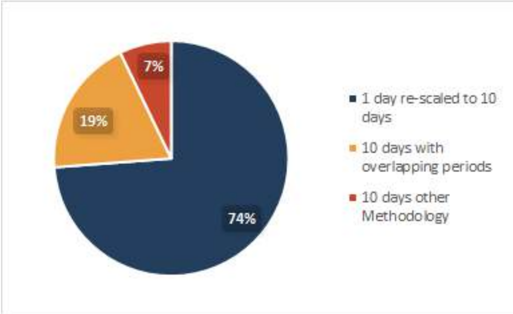
Figure 8: VaR submissions normalised by the median of each portfolio (by methodological approach)





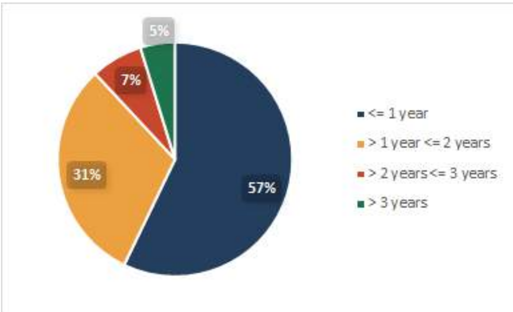
137. Regarding the regulatory 10-day VaR computation, by far the preferred method is rescaling the 1-day VaR to the 10-day VaR using the square root of time approximation.

Figure 9: Qualitative data: VaR time-scaling techniques



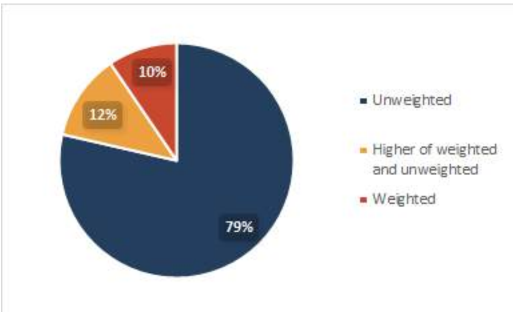
138. Regarding the historical lookback period used to calibrate banks’ VaR models, 57% of the banks use the minimum period of one year and applying a period longer than 2 years is very unusual.

Figure 10: Qualitative data – length of VaR lookback period



139. As for the possible use of a data-weighting scheme, the great majority of banks’ models use unweighted data in the regulatory VaR computation (79% of respondents).

Figure 11: Qualitative data – VaR weighting choices



140. Finally, regarding supervisory actions on regulatory add-ons, 72% of the banks in the sample have a total multiplication factor greater than the minimum of 3, which includes the addend resulting from the number of over-shootings (Table 1 in Article 366 of the CRR) and any supervisory extra charge(s). The average total multiplication factor in this sample is equal to 3.56, with a maximum of 5.63. As a result, quite a few banks either must correct for excessive over-shootings or are subject to supervisory measures. In addition, some banks have been assigned other kinds of added penalties that encompass risk 'not in VaR' and additional charges for IRC and APR. This was apparent from the additional and related information provided by some CAs about their supervised banks, and from discussions with some banks during the interviews.

141. These responses suggest that the observed variation may be due to a few different drivers. The EBA chooses to present the analysis using the following broad headings:

- supervisory actions;
- modelling differences; and
- other drivers of variation.

4.2.3 Supervisory actions

142. Supervisory actions can take different forms and are therefore difficult to capture fully in the analysis. However, the effects of some types of supervisory charges can be approximated. The effect of a higher VaR or sVaR multiplier imposed by a CA because of model weaknesses, for example, can be studied using the following proxy:

$$\text{Capital proxy} = m_{vaR} * VaR + m_{sVaR} * sVaR$$

where m_{vaR} and m_{sVaR} are the total regulatory multipliers given by 3 plus any add-on resulting from excessive backtesting exceptions and other prudential extra charges imposed by the regulator (where appropriate).

143. Including the multipliers in the analysis did not significantly change the results in terms of variability across the sample; that is, the positioning across the sample changed, but, on average, the extent of the dispersion did not.

144. Other supervisory measures, such as capital add-ons, cannot be easily captured. They are normally calculated at an aggregate level based on the banks' actual portfolios and cannot therefore be readily computed for the hypothetical portfolios used for benchmarking. Moreover, it tends to be the case that these add-ons are intended to capture difficulties in modelling risks associated with more exotic trades not represented well in the HPE.

4.2.4 Modelling differences

145. As outlined in Chapter 3, the CRR permits banks to tailor their VaR models to their specific requirements by making different modelling choices. To test the impact of different modelling choices in a controlled manner, four portfolios were selected based on low IQD. Obviously, the average sample size in this analysis is limited.

146. The portfolios – portfolios 1010, 2010, 3004 and 5020 – cover the main asset classes (i.e., EQ, IR, FX and CS) and were chosen due to the relative low variability of the submissions received for them. Six subsets of banks were defined within (and hence controlling for) the sample of banks using historical simulation, distinguishing the following modelling choices:

- 1-day scaled versus 10-day overlapping returns[14];
- the length of the historical lookback period (1 year versus > 1 year)[15]; and
- keeping constant the 1-day and unweighted modelling choices and varying the length of the lookback period (1 year versus > 1 year).[16]

147. As shown in Table 7 and Table 8, there seems to be evidence that the modelling choices have an impact on dispersion and the conservativeness of the VaR. For instance, for the EQ portfolio the 1-day calibration, more than 1 year and unweighted choices produce less dispersed results. On the contrary, for IR, FX and CS portfolios, 10-days calibration produces less dispersion.

148. In terms of conservativeness, for all portfolios selected, 1-day and 'more than 1 year' calibration produces more conservative results.

149. Columns 5 and 6 of Table 7 and Table 8 illustrate the effect of increasing the lookback period (1-year compared to 'more than 1 year') when we keep the other factors (1-day & unweighted shocks) the same. No clear path appears on the modelling choice that would produce less dispersed and more conservative results across assets classes.

150. Considering the evolution of the evidence in the years, these results depend on the portfolios' selection but also on the period applied for this analysis. Therefore, based on this analysis, it is difficult to conclude that one specific model choice will lead to consistently more conservative and less dispersed risk measures, at least on a stable basis.

[14] 31 banks adopted 1-day returns, while 10 banks adopted 10-day returns.

[15] 24 banks adopted 1-year, while 17 banks adopted > 1 year.

[16] 16 banks adopted 1-day, unweighted & 1-year, while 9 banks adopted 1-day, unweighted & >1 year.

Table 7: Coefficient of variation for regulatory VaR (controlling for HS) by modelling choice (%)

	Coefficient of Variation for regulatory VaR (controlling for HS)					
Port.	1-day	10-day	1y	>1y	1d, 1y, unw	1d, >1y, unw
EQ 1010	15.6%	17.7%	16.5%	12.8%	18.9%	8.5%
IR 2010	15.8%	11.3%	14.5%	14.7%	15.8%	18.8%
FX 3004	9.5%	9.1%	9.2%	9.7%	10.0%	10.7%
CS 5020	14.2%	8.3%	12.2%	14.9%	13.6%	18.7%
mean	13.8%	11.6%	13.1%	13.0%	14.6%	14.2%

Table 8: Average regulatory VaR by modelling choice

	Average VaR subsamples					
	1-day	10-day	1y	>1y	1d, 1y, unw	1d, >1y, unw
EQ 1010	33,126	32,314	31,028	35,280	31,386	36,523
IR 2010	181,120	172,366	174,304	183,361	179,953	186,906
FX 3004	454,580	451,234	451,244	456,798	448,837	459,960
CS 5020	168,137	157,925	165,041	165,861	165,279	170,110

4.2.5 Other drivers of variation

151. In addition to the drivers of variation discussed in the preceding two subsections, there may be other drivers of variation. In the section 4.2.4 ‘Modelling differences’, for instance, only results obtained with HS VaR were discussed, although the methodological aspects considered are expected to be important for other model types (e.g., MC simulation) as well.

152. Another driver of variation are the risks not captured in a model. Due to the simplification of the exercise compared to initial benchmarking exercises (2016-2018), most of the most exotic instruments were deleted, so most of the possible risk factors not in the models are no longer present in the exercise. Moreover, banks that are not able to model specific trades are allowed by the Benchmarking RTS not to submit the risk measure. This is shown, for example, in instrument 205 (IR ‘Cap and Floor’ on 10-year note), where only 13 observations (across 43 banks, where the average number of submissions is 33 for IR asset class) are available. Nonetheless, for this non-vanilla product the IQD is 41% for the VaR (portfolio 2005, it was only 2% the IQD of the 205 IMV), which is considerably higher with respect to other IR portfolios (average IQD for the asset class is 16%), therefore it is likely that few risks not in VaR were present.

153. The use of proxies probably leads to spurious variability in some of the hypothetical portfolios characterised by less liquid risk factors, for example some credit spreads. This consideration also applies to the sVaR.

154. As in the previous exercise, four additional drivers of variation will therefore be tested in the following areas: (a) size of the bank, (b) business model, (c) level of approval of model (e.g., general interest risk versus general and specific interest risk approval, or general equity risk versus general and specific equity risk approval) and (d) time window selected for the calibration of the stressed VaR. As for the previous exercise (2020-2023), the EBA also tested different definitions of size and business models.

a. Size of the bank

155. The size of the bank could influence the internal model. Larger banks could have more resources to invest into internal modelling, and this could have an impact on the quality of the model and the results submitted. The same can be said of banks that invest more in market activities in terms of their whole bank activity. The composition of the bank's trading portfolio could also have some influence on the design and performance of the internal model. Nonetheless, size is not a uniquely definable variable.

156. For the scope of the analysis, the size of the banks was selected based on banks' common reporting results concerning the RWA for market risk. The market risk RWA was preferred in selecting the size because a bigger bank in terms of total RWA can have a smaller market risk trading book in relative terms. The market risk RWA variable was therefore preferred. It should be noted that market risk RWA also incorporates the standardised measure but classifying the bank by the internal model market risk RWA did not change the composition of the sample substantially.

157. The banks were divided into three subsamples: large (above the 75th quantile), medium (between the 75th and 25th quantiles) and small (lower than the 25th quantile). Detailed VaR tables are presented in the annex (see Table 27, Table 28 and Table 29).

158. Table 9 summarises the effect of the bank's size. Because of the decreased number of submitters, the 'small banks' sample lost a little of its significance. Fewer banks imply fewer submissions, and the smaller banks usually report less information. Therefore, it is more interesting to look at the difference in dispersion among medium and large banks. Almost for all asset classes, it seems that dispersion sightly decreases with the size of the banks. This implies that the banks' size has some influence and that variability in size increases the dispersion of the general results submitted.

159. Further analysis of this aspect can be carried out in terms of the factors selected to define the size. If we run the same analysis using the size of the trading book[17] instead of the size of the bank (defined by RWA for market risk), we can see that dispersion varies again across different asset classes and different sizes of banks. The results are reported in Table 30, Table

[17] The size of the trading book was defined as: (assets held for trading + liabilities held for trading) / (total assets × 2). Data source: FINREP data)

31 and Table 32. Looking solely at the trading book size, we obtain different results. The average IQD ratio decrease with the size of the trading book. The average IQD is 13% for small TB banks (very few portfolios submission need to be considered as a factor here), 12% for medium TB and 11% for large TB banks.

Table 9: Asset class comparison for VaR in terms of banks' size

	VaR - Avg. Interquartile Range			
	All Banks	*Small Banks*	*Medium Banks*	*Large Banks*
Equity	16%	11%	13%	12%
Interest Rate	15%	14%	13%	14%
FX	9%	8%	10%	7%
Commodities	14%	21%	10%	10%
Credit Spread	16%	11%	14%	13%
CTP				33%
All-in	10%	5%	11%	11%

b. Business model

160. The business model of the banks in the sample was selected based on a previous analysis run by the EBA (EBA – LCR Report[18]). In the sample of 43 banks, 23 were classified as cross-border universal banks, which is by far the most numerous business model in the sample. The remaining banks were either not classified or had different business models (e.g., local universal banks), but they were too few to use as a subsample for this kind of analysis. As a result, the cross-border universal bank business model was selected.

161. Specific VaR results for banks classified as cross-border universal banks are shown in Table 33 of the annex. Table 10 summarises the impact of the business model on different asset classes. The business model selected is so predominant in the sample that it does not allow for proper discrimination among the whole sample; therefore, the dispersion of the banks belonging to the same business model is very close to the dispersion of the whole sample for the banks. Judging from the results, there is some weak evidence that the variety business model has some effect in increasing the dispersion of the VaR submission.

162. Further analysis of the business model can be carried out in terms of factors selected to define the business model. If we run the analysis based on the amount of 'Level 3 assets and liabilities' in relation to the size of the trading book[19] (FINREP data), the results are reported in Table 34, Table 35 and Table 36. The average IQD is 10% for the low level of Level 3 A&L banks, 13% for the medium level and 12% for the high level of Level 3 A&L banks. Therefore, it seems

[18] https://www.eba.europa.eu/regulation-and-policy/liquidity-risk

[19] (Level 3 assets held for trading + level 3 liabilities held for trading) / (assets held for trading+ liabilities held for trading)

that a more exotic composition of the bank's trading book does not affect the variability of the results.

Table 10: Asset class comparison for VaR within the same business model (cross-border universal bank)

	VaR - Avg. Interquartile Range	
	All Banks	*Cross-border Universal bank*
Equity	16%	14%
Interest Rate	15%	13%
FX	9%	8%
Commodities	14%	12%
Credit Spread	16%	13%
CTP		30%
All-in	10%	12%

c. Level of approval

163. Banks have different levels of approval for equity and interest rate risks. To be more specific, banks can apply to obtain approval for the general equity or interest rate risk or they can apply for approval of the specific equity or interest rate risk as well. See also the discussion in Section 3.2 on this point. In general, having approval for both the general and the specific parts of the equity and interest rate risks allows banks to fully model the instruments in the equity and credit spread sections of the exercise. Nonetheless, banks with only general approval are required to report these instruments as well, but this has been known to generate additional dispersion in the risk measures submitted. For this reason, in this exercise the EBA filtered all the results submitted and produced IQD statistics for the banks belonging to the sample of banks with different levels of approval.

164. Among the banks that submitted results for interest rate risk, 23 banks in the report have general and specific approval (see Table 37) and 17 banks have only general approval (see Table 38). Among the banks that submitted results for equity asset risk, 26 banks in the report have general and specific approval (see Table 39) and 8 banks have only general approval (see Table 40).

165. Table 11 summarises the result of the analysis when the filter for the level of approval is applied. The presence of banks with different levels of approval tends to moderately impact the benchmarking results.

166. Looking at Table 11, we see that the EQ asset class IQD is marginally smaller when considering only the subsample of firms with the full level of approval with respect to the full sample. The CS asset class also decreases, if only general risk is considered, but it should be considered that almost no banks without specific IR approval submitted any CS results. Finally, for the IR asset class splitting the sample between banks with general and specific approval and banks with only general approval produces some marginal changes in the benchmark for this asset class, confirming that the submissions from banks with partial approval tends to increase the IQD of the submissions.

Table 11: Asset class comparison for VaR in terms of level of approval

	VaR - Avg. Interquartile Range			
	All Banks	*IR Gen + Specific*	*IR Gen only*	*Eq Gen + Specific*
Equity	16%			15%
Interest Rate	15%	15%	13%	
Credit Spread	16%	16%	9%	

d. Common stress period considered

167. The stress window applied by the participating banks has always been understood as one of the main sources of the greater dispersion of the sVaR compared to the VaR, but this hypothesis was tested only from the 2019 exercise onwards due to a lack of information regarding the time window applied by the banks to calibrate the sVaR. This information was collected for the 2020-2023 exercises as well and applied to test the impact of the stress time window selected to calibrate the sVaR.

168. In their time window for the sVaR the banks select periods that include either 2008-2009 or 2011 in order to calibrate their sVaR, with a preference for 2008-2009. Because of the higher number of banks selecting 2008-2009, the EBA filtered the sample of the banks that applied a 2008–2009-time window for sVaR calibration, obtaining a subsample of 26 banks. The benchmark and the related statistics for this subsample of banks are available in Table 41 in the annex, and they are easily comparable with the full sample sVaR statistics in Table 22.

169. Table 12 summarises this stress period filtering analysis. It seems clear that the different time window selected for the bank has a significant impact on sVaR statistics. This means that the subsample with the same stress period generally exhibits smaller dispersion results for sVaR than the whole sample.

Table 12: Asset class comparison for sVaR in terms of the time window applied

	SVaR - Avg. Interquartile Range	
	All Banks	*Stressed Period*
Equity	21%	17%
Interest Rate	20%	17%
FX	19%	13%
Commodities	16%	10%
Credit Spread	29%	26%
CTP		50%
All-in	17%	15%

4.2.6 Portfolio comparison

170. Selective comparison of VaR results across portfolios can be informative in instances where the riskiness of those portfolios may be ranked in a model-independent way. For example, all else being equal, it is expected that a more diversified and hedged portfolio would lead to a lower VaR than a more concentrated and unhedged portfolio.

171. This hypothesis can be tested with several portfolios in the 2024 exercise. Use of the following portfolios is suggested:

- portfolio 2006, which is composed of instruments 206 (long 1 million German bond – 10 years) and 207 (short 1 million German bond – 5 years);
- portfolio 2007, which is composed of instruments 206 (long 1 million German bond – 10 years), 207 (short 1 million German bond – 5 years) and 208 (long 1 million Italian bond – 10 years), so it is equal to portfolio 2006 plus instrument 208.

172. Both portfolios comprise sovereign bond instruments, yet portfolio 2006 is concentrated on only one issuer and is partially hedged (long and short positions). Portfolio 2007 adds a second issuer to this portfolio without any hedge. Against this backdrop and in view of the specific portfolio definitions, we would expect the following result:

$$VaR_{Portfolio\ 2007}. > 200\% \times VaR_{Portfolio\ 2006}$$

173. Table 13 reports when this hypothesis holds true.

Table 13: Portfolio comparison for VaR, sVaR and IRC

	VaR(P2007) > VaR(P2006)	*sVaR(P2007) > sVaR(P2006)*	*IRC(P2007) > IRC(P2006)*
Num of banks	**35 out of 35**	**35 out of 35**	**26 out of 26**
	*VaR(P2007) > 1.5*VaR(P2006)*	*sVaR(P2007) > 1.5*sVaR(P2006)*	*IRC(P2007) > 1.5*IRC(P2006)*
Num of banks	**35 out of 35**	**35 out of 35**	**26 out of 26**
	*VaR(P2007) > 1.75*VaR(P2006)*	*sVaR(P2007) > 1.75*sVaR(P2006)*	*IRC(P2007) > 1.75*IRC(P2006)*
Num of banks	**35 out of 35**	**34 out of 35**	**26 out of 26**
	*VaR(P2007) > 2*VaR(P2006)*	*sVaR(P2007) > 2*sVaR(P2006)*	*IRC(P2007) > 2*IRC(P2006)*
Num of banks	**34 out of 35**	**32 out of 35**	**26 out of 26**

174. The comparison between the two portfolios with respect to regulatory VaR shows that only 1 out of 35 banks do not meet the initial expectation. The same comparison based on sVaR yields 3 banks that are not in line with this expectation. Regarding the IRC model, no bank does not meet the a priori expectation.

4.3 Analysis of IRC and APR

175. Banks with an approved IRC model constitute a subsample of those with an approved VaR model; only banks using internal models for specific risks of debt instruments are permitted to use IRC models (Article 372 of the CRR).

176. The full set of submissions for IRC results for each trade, after the data-cleaning process has been run as previously described, is reported in Table 14.

177. In the context of the HP exercise, only a subset of banks made submissions for IRC, and a number of those banks submitted very low figures. This suggests that important risk factors (in the context of the HPE) have not been modelled. While the submission of low figures may be linked to risk factors not modelled, this should not be taken to mean that banks with higher IRC figures included all risk factors from a given portfolio in their model.

178. The number of submissions is limited for some of the all-in portfolios. Statistical inferences for these portfolios are thus not appropriate. A prerequisite for consideration of banks' submissions for the all-in portfolios is that a bank needs to be able to model all the corresponding underlying portfolios.

179. As in the case of VaR, a selective comparison of IRC results across portfolios can be informative in instances where the riskiness of those portfolios may be ranked in a model-independent way. As shown in subsection 4.2.6, the expected diversification relationship holds true for all but one of the banks that submitted such results.

180. It is recommended that CAs assess the extent to which these missing risk factors are important in the context of banks' overall risk, and whether they need to be added to the model.

181. CAs should give particular attention to portfolios 2006, 2018-2019, 5001, 5004, 5010, 5014-5017, 5019-5020, 5022 and 5027, i.e., where IRC shows a higher level of dispersion (above 50%) above the average.

182. As is the case for VaR and sVaR, banks can choose from a range of permitted modelling approaches for IRC. For example, banks need to choose:

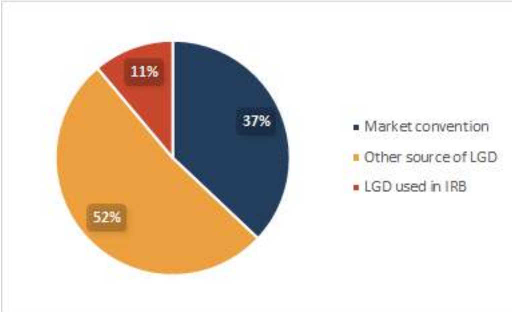
- a source of credit risk estimates such as PD and loss given default (LGD).
- the number of systemic factors used to model the co-movement among obligors in their portfolios.
- the size and granularity of credit spread shocks to apply to positions with an obligor following a rating transition; and
- the liquidity horizons to assign to positions with a particular obligor.

183. The responses to the qualitative questionnaire relating to the IRC methodological aspects suggest that the use of market LGD is highly applied among respondents (Figure 12), with 10 out of 27 banks using market convention as the source of LGD. A minority of banks – 3 out of 27 –

use their own IRB models as the source of LGD. The majority – 14 banks – use various other sources to obtain the LGD.

184. The PDs are provided by rating agencies in 64% of cases, by the IRB in 21% and by other sources in %. The transition matrices are mostly taken from rating agencies (20 respondents out of 26), and the rest of the banks use their IRB, 'market implied transition matrices and various other sources.

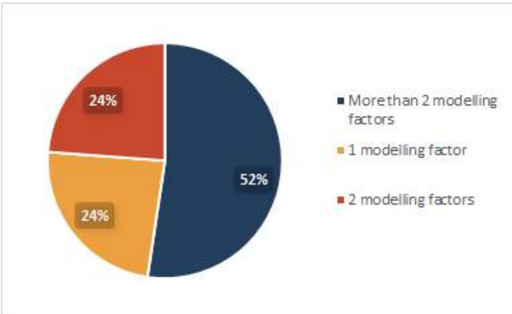
Figure 12: Qualitative data: source of LGD for IRC modelling



185. Moreover, many respondents stated that they use more than two systemic modelling factors at the overall IRC model level (Figure 13).

186. The liquidity horizon applied at the portfolio level for the IRC model is predominantly between nine and 12 months (70% of the responses).

Figure 13: Qualitative data – number of modelling factors for IRC



187. Hence, in the context of IRC the modelling practices across the sample of banks participating in the benchmarking exercise seem to be consistent.

Table 14: IRC statistics and cluster analysis

EU Statistics for IRC

		Main statistics								Percentiles			
	Port. ID	Min	Max	Ave.	STDev	STDev_trunc[1]	MAD (median absolute deviation)	Coefficient of variation (STDev/Mean)	Num obs.[2]	25th	50th	75th	IQD
Interest Rate	2005	20,889	425,631	212,008	132,131	145,652	91,152	62%	14	126,035	182,208	271,298	37%
	2006	2,085	56,173	25,410	17,065	28,847	12,633	67%	21	10,392	25,794	43,314	61%
	2007	98,981	874,866	490,358	250,168	234,388	192,517	51%	26	313,440	524,463	642,674	34%
	2008	147,137	1,579,283	872,641	457,314	427,464	330,773	52%	26	460,881	973,364	1,259,739	46%
	2013	9,762	197,073	59,243	50,823	84,353	25,474	86%	21	24,790	53,964	64,031	44%
	2014	197,368	983,179	672,235	231,013	282,084	184,811	34%	19	515,657	752,801	854,905	25%
	2016	152,347	1,763,730	950,131	487,809	449,663	378,497	51%	26	602,957	1,004,202	1,376,721	39%
	2018	35,999	717,199	354,984	230,908	219,209	211,936	65%	27	98,489	376,064	572,887	71%
	2019	35,999	717,199	334,877	227,998	214,454	202,774	68%	25	98,489	343,209	490,296	67%
	2022												
Credit Spread	5001	10,359	392,390	96,624	116,827	174,514	19,517	121%	21	26,144	58,248	109,359	61%
	5002	40,542	116,646	69,775	24,519	29,015	17,390	35%	19	49,921	67,279	82,704	25%
	5003	22,335	115,485	67,822	24,758	27,043	15,822	37%	21	52,239	69,146	80,465	21%
	5004	16,266	412,563	136,727	127,261	180,245	37,741	109%	18	26,099	69,584	207,585	78%
	5005	12	93,569	42,699	24,025	68,752	14,311	56%	24	34,627	43,524	58,312	25%
	5006	350,193	833,886	632,211	140,281	184,571	95,671	22%	22	554,810	620,034	791,178	18%
	5007	34,720	256,434	120,062	53,594	89,646	25,414	45%	21	99,509	120,295	143,814	18%
	5008	387,435	856,002	599,729	133,112	142,206	111,848	22%	24	505,297	586,232	728,160	18%
	5009	2,052	24,974	8,726	6,933	16,892	2,371	79%	25	4,095	7,026	8,801	36%
	5010	3,559	143,846	55,628	47,928	57,573	28,529	86%	23	12,695	41,265	91,556	76%
	5011	18,369	252,246	110,032	65,311	76,688	36,556	59%	24	63,074	108,170	124,312	33%
	5012	29,231	185,315	103,328	38,501	67,934	31,262	37%	21	76,964	102,381	132,877	27%
	5013	3,329	47,523	19,759	11,549	13,636	7,508	58%	24	9,584	22,885	25,907	46%
	5014	11,070	447,899	115,263	133,047	181,374	38,884	115%	20	21,843	92,157	167,332	77%
	5015	115	119,015	36,224	35,400	59,511	16,043	98%	23	7,768	28,230	67,256	79%
	5016	24,107	263,065	116,961	78,972	92,544	42,991	68%	19	51,419	106,868	196,140	58%
	5017	199	74,886	29,113	26,028	39,017	15,153	89%	19	10,362	26,139	44,399	62%
	5018	40,591	266,616	99,001	65,719	106,926	23,417	66%	18	60,298	82,677	116,814	32%
	5019	115	85,803	28,997	27,258	45,156	15,388	94%	21	7,768	25,609	39,031	67%
	5020	35,883	580,264	241,279	160,658	205,810	138,306	67%	24	113,704	231,596	367,375	53%
	5021	15,774	106,754	46,744	25,709	43,848	13,000	55%	18	29,838	48,256	55,838	30%
	5022	2,563	330,539	90,994	92,104	128,458	48,802	101%	21	23,996	79,509	135,052	65%
	5023	9,209	92,772	42,702	24,319	63,882	8,613	57%	15	25,929	34,346	69,175	45%
	5024	82,452	572,097	276,802	160,404	184,395	104,026	58%	21	158,671	228,399	393,024	42%
	5025	459,874	676,401	559,804	62,333	88,961	36,869	11%	18	522,002	567,587	574,974	5%
	5026	276,989	604,547	432,951	81,054	88,453	45,129	19%	21	403,493	445,631	454,837	6%
	5027	28,788	740,403	349,920	207,835	187,423	159,013	59%	24	154,920	383,505	516,275	54%
ALL-IN ex-CTP **	10009	645,623	1,435,718	981,547	278,750	378,427	268,502	28%	14	695,228	1,045,730	1,144,995	24%
CS Cumulative **	15009	492,813	1,021,210	754,661	151,343	135,786	116,951	20%	24	641,570	761,851	869,513	15%

[1] STDev trunc is the standard deviation computed excluding values below the 5th and above the 95th percentile

[2] Refers to the number of banks included in the computation of the statistics

** For the aggregated portfolios (60 to 66), banks that reported at least a missing portfolio IMV among the ones composing the aggregate are not included in the computation of the benchmarks for that particular aggregate portfolio.

188. Table 14 shows that the average variability of IRC is higher than that observed for VaR. This table presents a summary of the descriptive statistics concerning the IRC values submitted, along with the median, first and third quartiles used to select out-of-range values to be discussed with the banks during the interviews. EBA received on average 21 submissions for IRC in relation to the IR and CS hypothetical trades. We can observe that, even if the IQD for the single portfolios is sometimes quite significant, at lea at the aggregate level, the IQD is approximately 20%.

189. The EBA also provided a disaggregated analysis of sources of LGD and numbers of modelling factors. It is possible to split the sample between market convention and non-market convention (IRB and other sources) and the number of modelling factors (1-2 vs. more than 2). In Table 15 below, the average interquartile is reported. The full set of results is also reported in Table 43, Table 44, Table 45 and Table 46.

190. The IQD dispersion of the subsample is very stable for IR and CS portfolios among different model choices.

Table 15: Coefficient of variation for regulatory IRC by modelling choice (%)

	VaR - Avg. Interquartile Range				
	All Banks	Source of LGDss		No. modelling factors	
		Market Convention	Non-market Convention	1-2 factors	>2 factors
Interest Rate	49%	58%	41%	49%	49%
Credit Spread	43%	35%	42%	39%	40%
All-in	13%	17%	10%	18%	17%

191. This report is no longer reporting the summary of the responses to the qualitative questionnaire relating to the APR methodological aspects, since only 4 responses are available at the overall CTP model level, so no disclosure is possible without disclosing some specific information on the submitters.

192. The average variability of the APR charge is also no longer reported, since the limited data available do not allow a meaningful computation of the IQD of each CTP.

4.4 P&L analysis

193. The P&L analysis is complementary to the outcome of the assessment of variability based on VaR modelling. For each individual portfolio, the P&L vectors provided by banks using HS were compared, and a benchmark analysis is provided in the annex (see Table 23).

194. A graphic exemplification of low and high IQD portfolios is presented below in Figure 14 and Figure 15. Even though the P&L vectors available are much longer, only 3 months (1 November 2023 to 1 February 2024) are reported to simplify the representation. Additional examples of low and high IQD portfolios can be found in the annex in Figure 25 and Figure 26. P&L vector series that perform better tend to be closer to the benchmark. On the other hand, the low absolute value of the P&L, as per the risk measures, tends to provide misleading information if we consider the IQD figures alone.

Figure 14: P&L chart example of low IQD

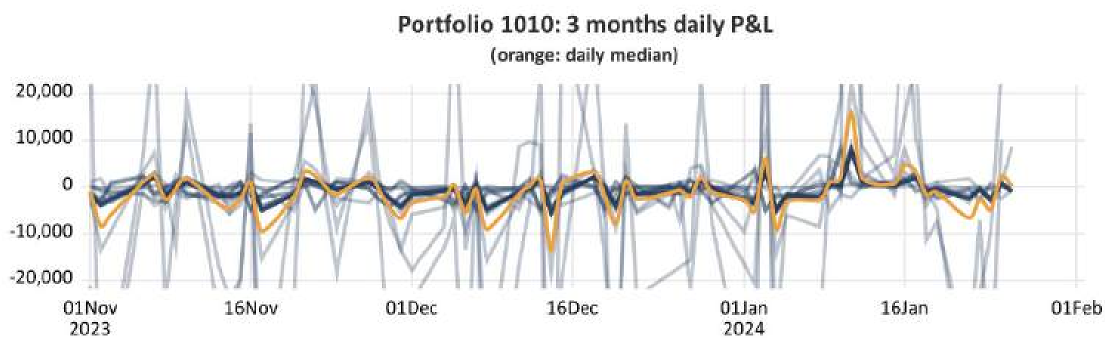
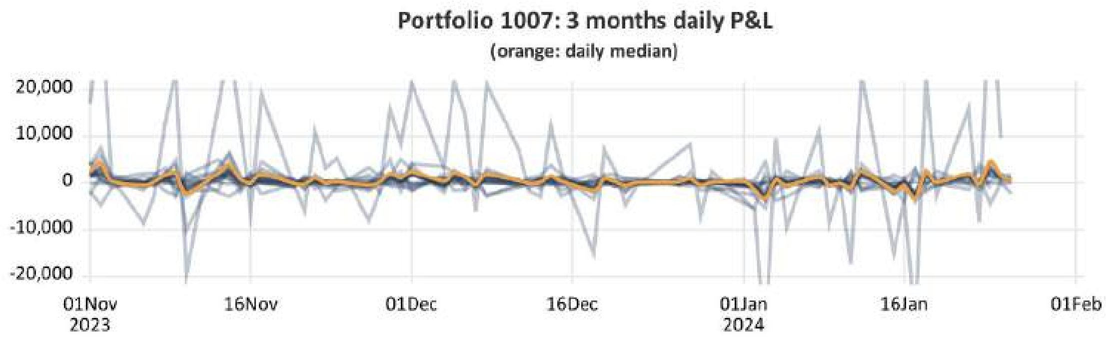


Figure 15: P&L chart example of high IQD



195. Another useful check for the P&L results submitted was a comparison of the ratio between the P&L VaR computed by the EBA (see Section 3.2 and Table 26) and the regulatory VaR submitted by the participating banks. A significant deviation of this ratio from 1 indicates an incoherent submission by the bank (see Table 26 in the annex). Moreover, it allows the tightness or the width of the realised P&L distribution for each bank to be checked at each hypothetical trade position. This can be done by referring to the standard deviation of the P&L series.

196. Another metric computed by the EBA from the P&L series provided by HS banks is the empirical ES (see Table 24 in the annex). The empirical ES results have approximately the same level of dispersion as the P&L VaR (see Table 5 in Section 5.1).

4.5 Diversification benefit

197. An additional metric considered as part of the analysis was the diversification benefit observed for VaR, sVaR and IRC in the aggregated portfolios.

198. The diversification benefit of a given metric (e.g., VaR) is computed as the absolute benefit, i.e., the difference between the sum of the single results for each individual position and the result for the aggregated portfolio, divided by the sum of the single results from each individual portfolio. Table 16 summarises the results of the analysis.

199. As expected, there is evidence that larger aggregated portfolios exhibited greater diversification benefits than smaller ones. The diversification benefit for all-in portfolio 10000 (all-in no-CTP portfolio), for instance, clearly exceeds the benefit for the other risk types, whose all-in portfolios are based on fewer individual instruments. Regarding the dispersion shown by the diversification benefits, it is possible to observe a significantly higher IQD for some portfolios than for others, and – in some cases – a quite comparable dispersion across VaR, sVaR and IRC (e.g., interest rate and commodity risk categories).

Table 16: Diversification benefit statistics

Diversification benefit statistics

Diversification benefit = (Sum of single portfolios VaR - Aggregated Port. VaR)/Sum of single portfolios VaR

VaR

		Other statistics			Percentiles			
	Port.	Ave.	STDev	Num obs. [3]	25th	50th	75th	Interquartile dispersion
ALL-IN no-CTP	10000	77%	3%	9	75%	76%	78%	2%
Equity Cumulative	11000	67%	6%	23	63%	67%	72%	7%
IR Cumulative	12000	61%	7%	34	57%	59%	61%	4%
FX Cumulative	13000	41%	9%	33	36%	43%	47%	12%
Commodity Cumulative	14000	7%	4%	13	5%	6%	9%	30%
Credit spread Cumulative	15000	9%	4%	22	7%	9%	12%	27%

sVaR

		Other statistics			Percentiles			
	Port.	Ave.	STDev	Num obs. [3]	25th	50th	75th	Interquartile dispersion
ALL-IN no-CTP	10000	36%	5%	9	35%	35%	37%	3%
Equity Cumulative	11000	23%	10%	23	18%	21%	24%	14%
IR Cumulative	12000	59%	17%	34	49%	53%	65%	14%
FX Cumulative	13000	22%	9%	33	17%	20%	26%	20%
Commodity Cumulative	14000	4%	3%	13	2%	3%	4%	25%
Credit spread Cumulative	15000	6%	3%	22	4%	5%	9%	36%

IRC

		Other statistics			Percentiles			
	Port.	Ave.	STDev	Num obs. [3]	25th	50th	75th	Interquartile dispersion
Credit spread (36 to 53)**	27	2%	1%	22	1%	2%	3%	39%

4.6 Dispersion in capital outcome

200. As a final means of comparison, for each individual position a variable equating to the sum of the regulatory VaR and sVaR was computed. This variable was used in two ways: using the banks' total multiplication factor, and using only the regulatory multiplication factor, i.e., ignoring the banks' individual addend(s) set by the CAs. The results were averaged across a given risk type, thus arriving at a proxy for the implied capital outcome.

201. Moreover, the exercise also attempted to isolate the effect of the time windows selected as the stress period. Therefore, the same statistics were reported for banks applying the 2008-9 stress period.

Table 17: Interquartile dispersion for capital proxy

Interquartile dispersion for capital proxy

	Capital proxy (banks own mult)	*Capital proxy (fixed mult, =3)*	*Capital proxy Stressed period (fixed mult, =3)*
Equity	17%	15%	13%
IR	18%	15%	14%
FX	16%	13%	10%
Commodity	16%	13%	12%
Credit spreads	23%	20%	18%
CTP			

202. Table 17 suggests that variability is slightly exacerbated by regulatory add-ons. The ranges of capital value dispersion remain broadly aligned whether the banks' actual multiplication factors are used. On the other side, filtering for banks with the same stress window seems to have a marginal impact in decreasing the variability. However, we need to take into consideration the fact that the sample of banks decreases in number when analysing the subsample of banks with the same stress period, which – other things being equal – tends to increase the IQD.

4.7 Present value

203. The 2020 exercise introduced the PV as a statistic to be provided by the banks. The full set of statistics is provided in Table 42 for this year's exercise as well.

204. The average IQD of the PV among the single portfolios is quite significant and not comparable to the low IQD of the previous years (it was 5% in 2023, it was 4% in 2022 and 11% in 2021). This IQD would be much comparable (3%) with the past if portfolios with a relatively high IQD (Portfolios 1016, 3006, and 3007) were excluded. By asset class, the IQD is distributed as follows: EQ (4%- or 2% if portfolio 1016 is excluded), IR (4%), FX (1% when 3006 and 3007 are excluded), CO (15%) and CS (3%).

205. PV measures are useful to CAs to verify the RM values. The ratio of RM over PV helps the CAs to quickly verify if the RM outlier comes from a simple mispricing of the portfolio or if it is indeed a true outlier with respect to the RM benchmark.

5. Competent authorities' assessment

206. For each participating institution, the CAs provided individual assessments of any potential underestimation of the capital requirement as required by Article 78(4) of the CRD and Articles 9 and 10 of the draft RTS on supervisory benchmarking. This chapter highlights some key information derived from these assessments.

207. The EBA designed a questionnaire about this assessment, which asked CAs to provide detailed information concerning the level of priority, based on both judgemental and qualitative/quantitative examination results, the overall assessment concerning the MR capital requirements of the internal models and, finally, the CAs' ongoing monitoring activities.

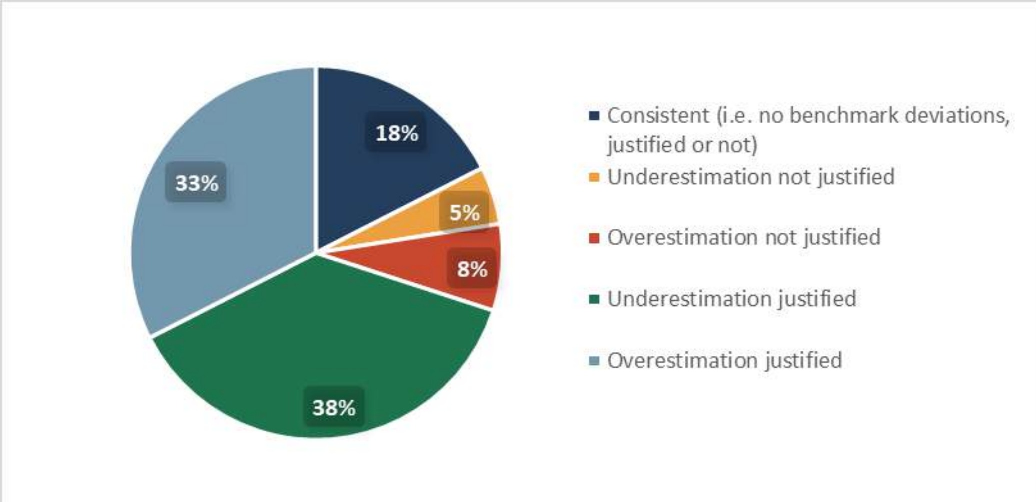
208. A total of 40 questionnaires from 12 jurisdictions, provided by the CAs, have been considered in this assessment of the MR benchmarking exercise.

209. Regarding the level of priority of the assessments, 4 banks were reported to be a high priority for intervention by CAs. The CAs gave high priority because of the valuable comparison coming from the benchmarking exercise for that jurisdiction and for specific focus given to the SBM implementation.

210. Figure 16 reports the CAs' own overall assessments of the levels of own funds requirements. When it comes to benchmark deviations, justified or not, 33 banks were reported by CAs as under or overestimating MR own funds requirements, of which 28 provided justifications for this. Obviously, 'not justified' implies that further and targeted CA investigation is required. Finally, 7 banks had consistent results (i.e., no benchmark deviations).

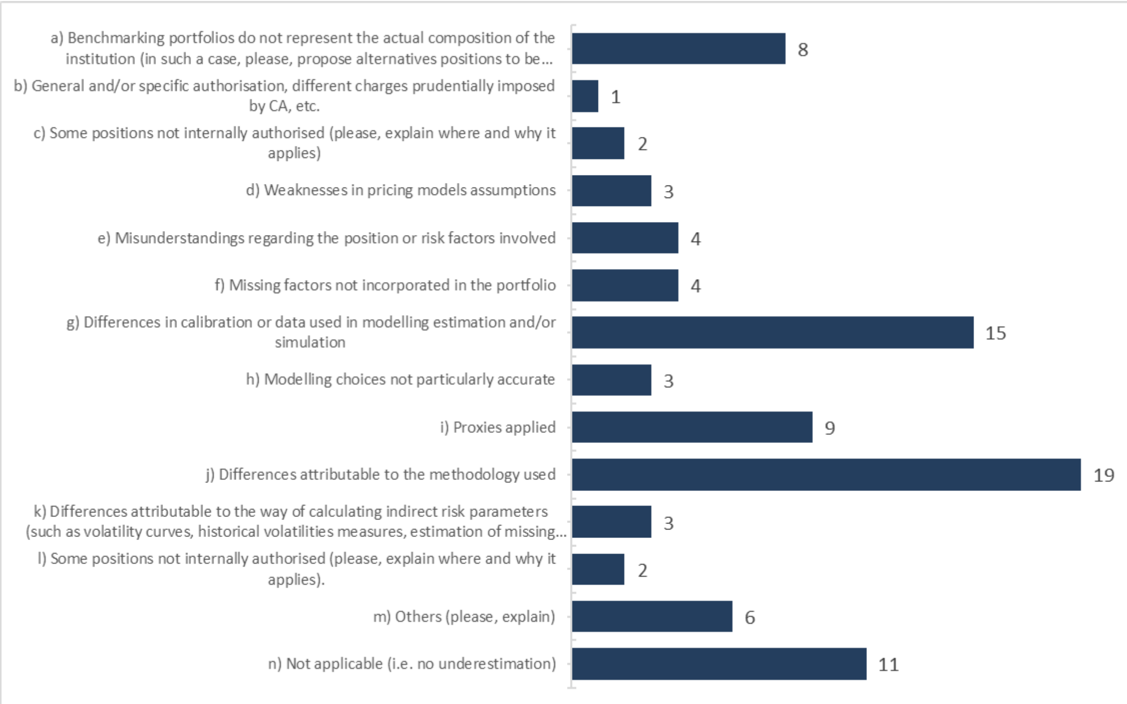
211. CAs' assessments acknowledge two cases out of 40 of unjustified underestimation and 3 of 40 of overestimation of internal model market capital requirements that require further in-depth analysis. Obviously, CAs – and the joint supervisory teams, where applicable – pay close attention to the potential cases of underestimation and overestimation, both across the portfolio and across the risk categories. 4 out of 5 of these cases were classified as low priority by their supervisors.

Figure 16: CAs' own assessments of the levels of MR own funds requirements (BM exercise 2023)



212. The main (see Figure 17) factors and reasons that may explain possible underestimations are as follows: benchmarking portfolios that do not represent the actual composition of the real trading portfolios of the institutions (8/90); differences in calibration or data used in modelling estimation and/or simulation (15/90); proxies applied (9/90); and differences attributable to the methodology used (19/90). These explanations, and very often a combination of these explanations, were offered by a large majority of the applicable respondents.

Figure 17: CAs' reported reasons for over-underestimation of MR own funds requirements (BM exercise 2023)



213. One bank identified as underestimating without justification partially motivated the underestimation to its CAs with issues on the input data which are at the base of the modelling computation. The second bank identified as underestimating without justification assessed that the waiting scheme of the model, the limited scope of approval, and some additional simplification could have generated the differences reported. Nonetheless no full explanation was provided for these cases found by the bank of the competent authority.

214. Overall, CAs planned or reported action in respect of 8 banks, such as:

a. reviewing the banks' internal VaR and IRC models;

b. extra supervisory charges;

c. additional resubmission, not included in the EBA benchmarking;

d. continue to monitor the data quality and pricing model modules in the annual validation;

e. further internal model investigations.

215. Currently, three banks have a due date for making improvements to their MR internal models, as already requested by CAs.

216. EBA reported 8 cases of substantial presence of outliers to CAs (5 on Var, 2 on SVAR and one on IRC). CAs, together with banks, assigned "low priority" to the cases highlighted, based on a plurality of explanations: low impact of portfolios highlighted as outliers, overestimation justified by the methodology applied for VaR (e.g. 500 days in place of 250, which would have had a closer result to the benchmarking) and SVaR methodology, and based on the facts overestimation are caused by model limitation known by the supervisor and on model that are on their way to be decommissioned.

6. Conclusion

217. This report has presented an analysis of the observed variability across results provided by EU banks that have been granted permission to adopt internal models for MR own funds requirements.

218. It must be remembered and emphasised that, as the quantitative analysis is based on hypothetical portfolios, this report focuses solely on potential rather than actual variations. The analysis shows the extent of the variability in these hypothetical portfolios, but this cannot automatically lead to conclusions regarding real under- or overestimations for the MR capital charge.

219. However, the analysis should help in determining possible supervisory activities to address uniformity and harmonisation across the Member States and in promoting in-depth future cross-investigations of this matter.

220. The objective of the benchmarking exercise was not to reach a definitive assessment of all key drivers of variation and the calculation of the implied capital charges but to provide supervisors with insights into how to increase comparability and reduce the variability between banks that is attributable to non-risk-driven behaviours.

221. In particular, the report provides inputs for CAs on areas that may require further investigation, such as IMV variability for some credit spread products. Supervisors should pay attention to the materiality of risk factors not in VaR and not encompassed in the IRC models.

222. Moreover, the conclusions reached in regular supervisory model monitoring activities will consider the outcome of the supervisory benchmarking exercises to achieve greater alignment between CAs' targeted internal model reviews and the EU's benchmarking analysis.

223. Overall, this exercise exhibits a slight increase in the IMV variability for IR and EQ asset class. CO IQDs remain subtidal, and marginally higher than 2023; for FX a significant increase of IQD in IMV may be due to a misunderstanding in the instruction that was not uniformly interpreted by the institutions; it should be highlighted that a high IQD is limited to a few instruments, slightly less vanilla compared to the average instruments required, had the effect to increase the average IQD. All considered, with the exception of a few cases, the booking of the instruments for the 2024 exercise was good in general.

224. The variability of risk measures, especially the VaR, is marginally lower than the previous exercise and overall, this exercise mark the lowest level of dispersion of the risk measures since the exercise has started. This reduction of the risk measure is due to a combination of factors, such as the improvement of the instruction, the relative stability of the set of portfolios, the good job done by competent authorities and banks in terms of resubmission during the exercise. The variability of the VaR aggregated portfolios is limited: the 'all-in portfolio' IQD is 10% (it was

18% in 2023, 11% in 2022, and 16% in 2021). Aggregated by asset class, the portfolio IQD of the others is 9% (vs 12% in 2023, 9% in 2022 and 15% in 2021) on average and never above 12%. The standard analysis carried out in the 2019-2023 exercise – relating to the considerations of the level of approval, size of banks, business model adopted and stress period – was repeated in the 2024 exercise as consolidated sample of information in the benchmarking report. The 2024 Market Risk benchmarking report also provides an analysis of the ASA OFR. Th SBM OFRs see an improvement overall in terms of data quality and exhibit, as expected, a lower level of dispersion with respect to the IMA Risk measures (Table 5). The granularity of the sensitivities data submitted, and their representation shed some light on where potential problems of ASA implementation could be at the bank-specific level, with focus on some problematic to treat the FX component of the ASA.

225. Hopefully, this report provides a framework that can be useful for the purpose of future benchmarking exercises under Article 78 of the CRD. The type of analysis conducted (i.e., the statistical tools provided to CAs, the graphs and tables created, and the methodology defined, etc.) offers a clear direction for future investigations into and activities relating to the benchmarking exercise.

7. Annex 1 – Additional tables

Table 18: Banks participating in the 2024 EBA MR benchmarking exercise

Country	Bank name
AT	Erste Group Bank AG
AT	Raiffeisen Bank International AG
BE	Belfius Bank
BE	KBC Groep
DE	COMMERZBANK Aktiengesellschaft
DE	Citigroup Global Markets Europe AG
DE	DEUTSCHE BANK AKTIENGESELLSCHAFT
DE	DZ BANK AG Deutsche Zentral-Genossenschaftsbank, Frankfurt am Main
DE	DekaBank Deutsche Girozentrale
DE	Goldman Sachs Bank Europe SE
DE	Landesbank Baden-Württemberg
DE	Landesbank Hessen-Thüringen Girozentrale
DE	Morgan Stanley Europe Holding SE
DE	Nomura Financial Products Europe GmbH
DE	Norddeutsche Landesbank - Girozentrale -
DK	Danske Bank A/S
DK	Nykredit Realkredit A/S
ES	Banco Bilbao Vizcaya Argentaria, S.A.
ES	Banco Santander, S.A.
ES	CaixaBank, S.A.
FI	Nordea Bank Abp
FR	BNP Paribas
FR	BofA Securities Europe SA
FR	Groupe BPCE
FR	Groupe Crédit Agricole
FR	HSBC Continental Europe
FR	Société générale S.A.
GR	ALPHA SERVICES AND HOLDINGS S.A.
GR	Eurobank Ergasias Services and Holdings S.A.
GR	National Bank of Greece, S.A.
IE	Barclays Bank Ireland plc
IE	Citibank Europe plc
IT	BANCO BPM SOCIETA' PER AZIONI
IT	Intesa Sanpaolo S.p.A.
IT	UNICREDIT, SOCIETA' PER AZIONI
NL	ABN AMRO Bank N.V.
NL	Coöperatieve Rabobank U.A.
NL	ING Groep N.V.
NL	NIBC Holding N.V.
NL	RBS Holdings N.V.
PT	Banco Comercial Português, SA
SE	Skandinaviska Enskilda Banken - gruppen
SE	Swedbank - Grupp

Country	AT	BE	DE	DK	ES	FI	FR	GR	IE	IT	NL	PT	SE
N.banks	*2*	*2*	*11*	*2*	*3*	*1*	*6*	*3*	*2*	*3*	*5*	*1*	*2*

Table 19: Instruments/portfolios underlying the HPE

Section 2: Instruments

EQUITY

101. Long EURO STOXX 50 index (Ticker: SX5E) Futures.

Notional: equivalent to the value of the index times 1 000 EUR

Exchange: Eurex

Expiry date: June Year T

Base currency: EUR

102. Long 10 000 BAYER (Ticker: BAYN GR) shares.

Exchange: Xetra

Base currency: EUR

103. Short Futures BAYER (Ticker: BAYN GR).

Notional: equivalent to the value of 10 000 shares of the underlying asset

Exchange: Eurex

Expiry date: June Year T

Base currency: EUR

104. Short Futures, STELLANTIS (Ticker: STLA FP).

Notional: equivalent to the value of 10 000 shares of the underlying asset

Exchange: Euronext

Expiry date: June Year T

Base currency: EUR

105. Short Futures, ALLIANZ (Ticker: ALV GR).

Notional: equivalent to the value of 10 000 shares of the underlying asset

Exchange: Eurex

Expiry date: June Year T

Base currency: EUR

106. Short Futures BARCLAYS (Ticker: BARC LN).

Notional: equivalent to the value of 10 000 shares of the underlying asset

Exchange: Eurex

Expiry date: June Year T

Base currency: GBP

107. Short Futures DEUTSCHE BANK (Ticker: DBK GR).

Notional: equivalent to the value of 10 000 shares of the underlying asset

Exchange: Eurex

Expiry date: June Year T

Base currency: EUR

108. Short Futures CRÉDIT AGRICOLE (Ticker: ACA FP).
Notional: equivalent to the value of 10 000 shares of the underlying asset
Exchange: Euronext
Expiry date: June Year T
Base currency: EUR

109. Long Call Options. Underlying BAYER (Ticker: BAYN GR), ATM (1 contract = 100 shares).
Notional: equivalent to the value of 10 000 shares of the underlying asset
Expiry date: June Year T
Base currency: EUR

110. Short Call Options. Underlying BAYER (Ticker: BAYN GR), ATM (1 contract = 100 shares).
Notional: equivalent to the value of 10 000 shares of the underlying asset
Expiry date: December Year T
Base currency: EUR

111. Long Call Options. Underlying PFIZER (Ticker PFE US) 10% OTM, (1 contract = 100 shares).
Notional: equivalent to the value of 10 000 shares of the underlying asset
Expiry date: June Year T
Base currency: USD

112. Long Put Options. Underlying PFIZER (Ticker PFE US) 10% OTM, (1 contract = 100 shares).
Notional: equivalent to value of 10 000 shares of the underlying asset
Expiry date: June Year T
Base currency: USD

113. Long Call Options. Underlying BAYER (Ticker: BAYN GR), 10% OTM (1 contract = 100 shares).
Notional: equivalent to the value of 10 000 shares of the underlying asset
Expiry date: December Year T
Base currency: EUR

114. Short Call Options. Underlying BAYER (Ticker: BAYN GR), 10% OTM (1 contract = 100 shares).
Notional: equivalent to the value of 10 000 shares of the underlying asset
Expiry date: June Year T
Base currency: EUR

115. Long Call Options. Underlying AVIVA (Ticker: AV/LN), 10% OTM (1 contract = 100 shares).
Notional: equivalent to the value of 10 000 shares of the underlying asset
Expiry date: December Year T
Base currency: GBP

116. Long Put Options. Underlying AVIVA (Ticker: AV/LN), 10% OTM (1 contract = 100 shares).
Notional: equivalent to the value of 10 000 shares of the underlying asset
Expiry date: December Year T
Base currency: GBP

117. Short Futures NIKKEI 225 (Ticker NKY).
Notional: equivalent to the value of the index times 20 000 JPY
Exchange: CME
Expiry date: 8 June Year T
Base currency: JPY

118. Auto-callable Equity product.
Long position
Booking on 'Booking date'
Notional amount ('Capital'): EUR 1 000 000
Underlying: Index EURO STOXX 50 (Ticker: SX5E)
Base currency: EUR
Maturity: 5 years
Annual Pay-out and annual observation ('Booking date + 1 year', 'Booking date + 2 years', 'Booking date + 3 years', 'Booking date + 4 years', 'Booking date + 5 years'). Pay-out occurs 10 days after reference date.
Coupon: 6%
Autocall level ('Initial value'): End of day Booking date + 1 month
Barrier coupon payment 60% of autocall level
Protection barrier: 55% of autocall level
additional details in the original ITS 2023)

119. Long Call Options. Underlying EURO STOXX 50 index (Ticker: SX5E), ATM.
Notional: equivalent to the value of the index times 1 000 EUR
Expiry date: June Year T
Base currency: EUR

120. Long Call Options. Underlying EURO STOXX 600 index (Ticker: SXXP), ATM.
Notional: equivalent to the value of the index times 10 000 EUR
Expiry date: June Year T
Base currency: EUR

121. Long Call Options. Underlying VIX (CBOE), ATM.
Notional: equivalent to the value of the index times 100 000 USD
Expiry date: June Year T
Base currency: USD

IR
201. 5-year IRS EUR – Receive fixed rate and pay floating rate.
Fixed leg: receive annually
Floating rate: 3-month EURIBOR, pay quarterly
Notional: EUR 10 000 000
Roll convention and calendar: standard
Effective date as booking date (i.e. the rates to be used shall be those at the market close as of the booking date)

Maturity: September Year T+4.

Base currency: EUR

202. Two-year EUR swaption on 5-year IRS EUR – pay fixed rate and receive floating rate.

Notional: EUR 10 000 000.
The institution is the seller of the option on the swap. The counterparty of the institution buys the right to enter a swap with the institution; if the counterparty exercises its right, the counterparty shall receive the fixed rate while the institution shall receive the floating rate.
Swaption with maturity of two years (Booking date + 2 years) on IRS defined as follow:
Fixed leg - pay annually; Floating rate: 3-month EURIBOR, receive quarterly;
Notional: EUR 10 000 000; Roll convention and calendar: standard;
Effective date as booking date (i.e. the rates to be used shall be those at the market close as of the booking date)

Maturity of the underlying swap: Booking date + 7 years

Premium paid at the booking date (Booking date). Cash settled

The strike price is based on the IRS defined within this instrument

Base currency: EUR

203. 5-year IRS USD. Receive fixed rate and pay floating rate.

Fixed rate: receive annually

Floating rate: 3-month USD LIBOR rate, pay quarterly

Notional: USD 1 000 000

Roll convention and calendar: standard

Effective date as booking date (i.e. the rates to be used shall be those at the market close as of the booking date)

Maturity date: September Year T+4.

Base currency: USD

204. 2-year IRS GBP. Receive fixed rate and pay floating rate.

Fixed rate: receive annually

Floating rate: 3-month SONIA rate compounded and paid annually

Notional: GBP 10 000 000

Roll convention and calendar: standard

Effective date as booking date (i.e. the rates to be used shall be those at the market close as of the booking date)

Maturity: Booking date + 2 years

Base currency GBP

205. Collared 10y floating rate note sold by UBS.

Notional (Principal) Amount: USD 1 000 000.

Floating Rate Notes (the 'Notes') are senior unsecured obligations of UBS AG ('UBS').

Base currency USD

Interest Payment Amount

Trade and Settlement Date

Interest Payment Dates

Maturity Date

Currency

Daycount Basis

Business Day Convention

Coupon Determination

Date

206. Long GERMANY GOVT EUR 1 000 000 (ISIN DE0001030583).
Maturity: 15 April 2033
Base currency: EUR

207. Short GERMANY GOVT EUR 1 000 000 (ISIN DE0001135044).
Maturity: 4 July 2027
Base currency: EUR

208. Long ITALY GOVT EUR 1 000 000 (ISIN IT0005138828).
Maturity: 15 September 2032
Base currency: EUR

209. Long ITALY GOVT EUR 1 000 000 (ISIN IT0005210650).
Maturity: 1 December 2026
Base currency: EUR

210. Long SPAIN GOVT EUR 1 000 000 (ISIN ES00000127A2).
Maturity: 30 July 2030
Base currency: EUR

211. Short FRANCE GOVT EUR 1 000 000 (ISIN FR0012993103).
Maturity: 25 May 2031
Base currency: EUR

212. Short GERMANY GOVT EUR 1 000 000 (ISIN DE0001135176).
Maturity: 4 January 2031
Base currency: EUR

213. Long UNITED KINGDOM GOVT GBP 1 000 000 (ISIN GB0004893086).
Maturity: 7 June 2032
Base currency: GBP

214. Long PORTUGAL GOVT EUR 1 000 000 (ISIN PTOTEXOE0024).
Maturity: 15 June 2029
Base currency: EUR

215. Short UNITED STATES GOVT USD 1 000 000 (ISIN US9128283F58).
Maturity: 15 November 2027
Base currency USD

216. Long BRAZIL GOVT 1 000 000 USD (ISIN US105756BZ27).
Maturity: 13 January 2028
Base currency: USD

217. Long MEXICO GOVT 1 000 000 USD (ISIN US91087BAC46).
Maturity: 28 March 2027
Base currency USD

218. 10-year IRS EURO – Receive floating rate and pay fixed rate.
Fixed leg: pay annually
Floating rate: 3-month EURIBOR, receive quarterly
Notional: EUR 10 000 000
Roll convention and calendar: standard
Effective date as the booking date (i.e. rates to be used are those at the market close on booking date)
Maturity: Booking date + 10 years
Base currency: EUR

219. 5-year IRS EURO – Receive floating rate and pay fixed rate.
Fixed leg: pay annually
Floating rate: 6-month EURIBOR, receive every 6 months
Notional: EUR 1 000 000
Roll convention and calendar: standard
Effective date as the booking date (i.e. rates to be used are those at the market close on booking date)
Maturity: Booking date + 5 years
Base currency: EUR

220. 5-year Mark to Market (MtM) Cross Currency EUR/USD SWAP. Receive USD and pay EUR.
EUR: 3-month ESTER, pay quarterly compounded with a payment lag of 2 days
USD: 3-month SOFR , receive quarterly compounded with a payment lag of 2 days
Leg 1 – USD: Notional EUR 10 000 000 equivalent adjusted on a quarterly basis
Leg 2 – EUR: Notional EUR 10 000 000
Roll convention and calendar: standard
Effective date as booking date + 6 months
Maturity: Booking date + 5,5 years
Base currency: EUR
See also Section 5 of this Annex – Instrument additional specifications

221. 10-year IRS EURO – Receive ESTER and pay EURIBOR.
ESTER leg: receive annually
EURIBOR leg: 3-month EURIBOR + Basis, pay quarterly
Notional: EUR 10 000 000
Roll convention and calendar: standard
Effective date as booking date (i.e. the rates to be used shall be those at the market close as of the booking date)
Maturity: September Year T + 9 years
Base currency: EUR

222. Long ITALY GOVT EUR 1 000 000 (ISIN IT0005387052).
Maturity: 15 May 2030
Base currency: EUR

223. 5-year Zero Coupon Inflation swap EUR – Receive Inflation indexed return and pay fixed rate (r).

Inflation Index: CPI (HICPxT)

Fixed leg (Pay fixed): $[(1+r)^5 - 1]$

Rec Inflation indexed return: $[(\frac{CPI \text{ at the end (maturity) date}}{CPI \text{ at the start date}}) - 1]$

Notional: EUR 10 000 000

Base fixing date: August Year T

Final Fixing: August Year T+4

Maturity: September Year T+4

Base currency: EUR

224. Two-year EUR swaption on 5-year IRS EUR – receive fixed rate and pay floating rate.

Notional: EUR 10 000 000.

The institution is the seller of the option on the swap. The counterparty of the institution buys the right to enter a swap with the institution; if the counterparty exercises its right, the counterparty shall receive the fixed rate while the institution shall receive the floating rate.

Swaption with maturity of two years (Booking date + 2 years) on IRS defined as follow: Fixed leg- receive annually; Floating rate: 6-month EURIBOR, pay every 6 months; Notional: EUR 10 000 000; Roll convention and calendar: standard; Effective date as the booking date (i.e. rates to be used are those at the market close on booking date)

Maturity of the underlying swap: Booking date + 7 years

Premium paid at the booking date (Booking date). Cash settled

The strike price is based on the IRS defined within this instrument+ 100 bps

Base currency: EUR

FX

301. 6-month USD/EUR forward contract. Cash settled. Long USD – Short EUR; Notional USD 10 000 000; EUR/USD ECB reference spot rate as of end of the booking date.

Base currency: EUR

302. 6-month EUR/GBP forward contract. Cash settled. Long EUR – Short GBP; Notional 10 000 000 GBP; EUR/GBP ECB reference spot rate as of end of the booking date.

Base currency: EUR

303. Long 10 000 000 USD Cash.

Cash position

Base currency: EUR

304. Long Call option. EUR 10 000 000. Equivalent amount based on EUR/USD ECB reference spot rate as of end of the booking date.

Strike price: 110% of EUR/USD ECB reference rate as of end of the booking date

Expiry date: Booking date + 1 year

Base currency: EUR

305. Long Call option. EUR 10 000 000. Equivalent amount based on EUR/USD ECB reference spot rate as of end of the booking date.

Strike price: 90% of EUR/USD ECB reference rate as of end of the booking date
Expiry date: Booking date + 1 year
Base currency: EUR

306. Short Call option. EUR 10 000 000. Equivalent amount based on EUR/USD ECB reference spot rate as of end of the booking date.
Strike price: 100% of EUR/USD ECB reference rate as of end of the booking date
Expiry date: Booking date + 1 year
Base currency: EUR

307. Short Call option. EUR 10 000 000. Equivalent amount based on EUR/GBP ECB reference spot rate as of end of the booking date.
Strike price: 110% of EUR/GBP ECB reference rate as of end of the booking date
Expiry date: Booking date + 1 year
Base currency: EUR

308. Long Put option. EUR 10 000 000. Equivalent amount based on EUR/JPY ECB reference spot rate as of end of the booking date.
Strike price: 110% of EUR/JPY ECB reference rate as of end of the booking date
Expiry date: Booking date + 1 year
Base currency: EUR

309. Short Put option. EUR 10 000 000. Equivalent amount based on EUR/AUD ECB reference spot rate as of end of the booking date.
Strike price: 110% of EUR/AUD ECB reference rate as of end of the booking date
Expiry date: Booking date + 1 year
Base currency: EUR

310. 6-month EUR/DKK forward contract. Cash settled. Long EUR – Short DKK; Notional EUR 10 000 000; EUR/DKK ECB reference spot rate as of end of the booking date.
Base currency: EUR

311. 6-month EUR/BRL Non deliverable forward contract. Long EUR – Short BRL; Notional EUR 10 000 000; EUR/BRL ECB reference spot rate as of end of the booking date.
Base currency: EUR

COMMODITIES

401. Long 3 500 000 6-month ATM London Gold Forwards contracts (1 contract = 0.001 troy ounces, notional: 3 500 troy ounces).
Cash Settlement
Base currency: USD

402. Short 3 500 000 12-month ATM London Gold Forwards contracts (1 contract = 0.001 troy ounces, notional: 3 500 troy ounces).
Cash Settlement
Base currency: USD

403. Long 30 contracts of 6-month WTI Crude Oil Call option with strike equals 12-month end-of-day forward price on the booking date (1 contract = 1 000 barrels. Total notional 30 000 barrels).

Cash Settlement

Base currency USD

404. Short 30 contracts of 6-month WTI Crude Oil Put option with strike equals 12-month end-of-day forward price on the booking date (1 contract = 1 000 barrels. Total notional 30 000 barrels).

Cash Settlement

Base currency USD

405. Long Call option. 5 000 0zt of London Gold.

Strike price: ATM as of end of the booking date

Expiry date: Booking date + 18 months

Cash Settlement

Base currency: USD

CREDIT SPREAD

501. Long (i.e. Buy protection) USD 1 000 000 CDS on PORTUGAL.

Restructuring clause: FULL

Base currency: USD

502. Long (i.e. Buy protection) USD 1 000 000 CDS on ITALY.

Restructuring clause: FULL

Base currency: USD

503. Short (i.e. Sell protection) USD 1 000 000 CDS on SPAIN.

Restructuring clause: FULL

Base currency: USD

504. Long (i.e. Buy protection) USD 1 000 000 CDS on MEXICO.

Restructuring clause: FULL

Base currency: USD

505. Long (i.e. Buy protection) USD 1 000 000 CDS on BRAZIL.

Restructuring clause: FULL

Base currency: USD

506. Long (i.e. Buy protection) USD 1 000 000 CDS on UK.

Restructuring clause: FULL

Base currency: USD

507. Short (i.e. Sell protection) EUR 1 000 000 CDS on Telefonica (Ticker TEF SM).

Base currency: EUR

508. Long (i.e. Buy protection) EUR 1 000 000 CDS on Telefonica (Ticker TEF SM).

Maturity: December Year T+2

Base currency: EUR

509. Short (i.e. Sell protection) EUR 1 000 000 CDS on Aviva (Ticker AV LN).
ISDA Definitions year 2003
Base currency: EUR

510. Long (i.e. Buy protection) EUR 1 000 000 CDS on Aviva (Ticker AV LN).
ISDA Definitions year 2003
Maturity: December Year T+2
Base currency: EUR

511. Short (i.e. Sell protection) EUR 1 000 000 CDS on Vodafone (Ticker VOD LN).
Base currency: EUR

512. Short (i.e. Sell protection) EUR 1 000 000 CDS on ENI SpA (Ticker ENI IM).
Base currency: EUR

513. Short (i.e. Sell protection) USD 1 000 000 CDS on Eli Lilly (Ticker LLY US).
Restructuring clause: No restructuring (XR14)
Base currency: USD

514. Short (i.e. Sell protection) EUR 1 000 000 CDS on Unilever (Ticker UNA NA).
Base currency: EUR

515. Long (i.e. Buy protection) EUR 1 000 000 CDS on Total SA (Ticker FP FP).
Base currency: EUR

516. Long (i.e. Buy protection) EUR 1 000 000 CDS on Volkswagen Group (Ticker VOW GR).
Base currency: EUR

517. Long position on TURKEY Govt. notes USD 1 000 000 (ISIN US900123CT57).
Maturity: 26 April 2029
Base currency: USD

518. Long (i.e. Buy protection) USD 1 000 000 CDS on TURKEY. Effective date as booking date.
Restructuring clause: FULL
Base currency: USD

519. Long position on Telefonica notes EUR 1 000 000 (ISIN XS1681521081).
Maturity: 12 January 2028
Base currency: EUR

520. Long position on Volkswagen Group notes EUR 1 000 000 (ISIN XS1944390597).
Maturity: 31 July 2026
Base currency: EUR

521. Short position Volkswagen Group notes EUR 1 000 000 (ISIN XS1944390241).

Maturity: 31 January 2024
Base currency: EUR

522. Long position on Total SA notes EUR 1 000 000 (ISIN XS1048519679).
Maturity: 25 March 2026
Base currency: EUR

523. Long AUSTRIA GOVT EUR 1 000 000 (ISIN AT0000A04967).
Maturity: 15 March 2037
Base currency: EUR

524. Long (i.e. Buy protection) USD 1 000 000 CDS on AUSTRIA.
Maturity: June Year T+15
Base currency: USD

525. Long NETHERLANDS GOVT EUR 1 000 000 (ISIN NL0013552060).
Maturity: 15 January 2040
Base currency: EUR

526. Long (i.e. Buy protection) USD 1 000 000 CDS on NETHERLANDS.
Maturity: June Year T+20
Base currency: USD

527. Long BELGIUM GOVT EUR 1 000 000 (ISIN BE0000348574).
Maturity: 22 June 2050
Base currency: EUR

528. Long (i.e. Buy protection) USD 1 000 000 CDS on BELGIUM.
Maturity: June Year T+30
Base currency: USD

529. Long (Buy protection) EUR 10 000 000 CDS on iTraxx Europe index on-the-run series.
Maturity: June Year T+5
Base currency: EUR

530. Short Put option. EUR 10 000 000. Underlying iTraxx Europe index on-the-run series (same instrument of 529).
Strike price: ATM
Expiry date: Booking date + 1 year
Base currency: EUR

531. Long AXA SA (callable) EUR 1 000 000 (ISIN XS1799611642).
Maturity: 28 May 2049
Base currency: EUR

532. Long AT&T Bond (callable) USD 1 000 000 (ISIN US00206RFW79).
Maturity: 15 August 2037

Base currency: USD

533. Long BAYER AG (callable) EUR 1 000 000 (ISIN XS2199266268).
Maturity: 06 January 2030
Base currency: EUR

534. Long AT&T Bond (callable) EUR 1 000 000 (ISIN XS0993148856).
Maturity: 17 December 2025
Base currency: EUR

CTP

601. Short (i.e. Sell protection) position in iTraxx Europe index on-the-run series.
Attachment point: 3%
Detachment point: 6%
Notional: EUR 5 000 000
Maturity: 5 years
Base currency: EUR

602. Long (i.e. Buy protection) EUR 5 000 000 CDS on iTraxx Europe index most recent on-the-run series.
Maturity: June Year T+5
Base currency: EUR
Notional adj. to fully hedge CS01 of 601 with no re-hedging required

603. Long (i.e. Buy protection) position in iTraxx Europe index on-the-run series.
Attachment point: 3%
Detachment point: 6%
Notional: EUR 5 000 000
Maturity: 5 years
Base currency: EUR

604. Short (i.e. Sell protection) EUR 5 000 000 CDS on iTraxx Europe index most recent on-the-run series.
Maturity: June Year T+5
Base currency: EUR
Notional adj. to fully hedge CS01 of 603 with no re-hedging required

605. Short (i.e. Sell protection) position in iTraxx Europe index on-the-run series.
Attachment point: 12%
Detachment point: 100%
Notional: EUR 5 000 000
Maturity: 5 years
Base currency: EUR

606. Long (i.e. Buy protection) EUR 5 000 000 CDS on iTraxx Europe index most recent on-the-run series.
Maturity: June Year T+5

Base currency: EUR
Notional adj. to fully hedge CS01 of 605 with no re-hedging required

607. Long (i.e. Buy protection) position in iTraxx Europe index on-the-run series.
Attachment point: 12%
Detachment point: 100%
Notional: EUR 5 000 000
Maturity: 5 years
Base currency: EUR

608. Short (i.e. Sell protection) EUR 5 000 000 CDS on iTraxx Europe index most recent on-the-run series.
Maturity: June Year T+5
Base currency: EUR
Notional adj. to fully hedge CS01 of 607 with no re-hedging required

609. Short (i.e. Sell protection) position in iTraxx Europe index on-the-run series.
Attachment point: 3%
Detachment point: 6%
Notional: EUR 5 000 000
Maturity: 5 years
Base currency: EUR
Recovery rate: 40% fixed.

610. Long (i.e. Buy protection) EUR 5 000 000 CDS on iTraxx Europe index most recent on-the-run series.
Maturity: June Year T+5
Base currency: EUR
Notional adj. to fully hedge CS01 of 609 with no re-hedging required

Portfolio	Combination of instruments:	Currency	Portfolio	Combination of instruments:	Currency
1001	101 – 1 instrument	EUR	4001	401 – 1 instrument	USD
1002	103 – 1 instrument	EUR		402 – 1 instrument	
	104 – 1 instrument		4002	403 – 1 instrument	USD
	105 – 1 instrument			404 – 1 instrument	
1003	113 – 1 instrument	EUR	4003	401 – 1 instrument	USD
	110 – 1 instrument			404 – 1 instrument	
1004	115 – 1 instrument	GBP	4004	405 – 1 instrument	EUR
	116 – 1 instrument		5001	501 – 1 instrument	USD
1005	117 – 1 instrument	JPY		502 – 1 instrument	
1006	109 – 1 instrument	EUR		503 – 1 instrument	
	110 – 1 instrument		5002	504 – 1 instrument	USD
1007	118 – 1 instrument	EUR		505 – 1 instrument	
1008	111 – 1 instrument	USD	5003	507 – 1 instrument	EUR

	112 – 1 instrument	
1009	102 – 1 instrument	EUR
	114 – 1 instrument	
1010	106 – 1 instrument	EUR
	107 – 1 instrument	
	108 – 1 instrument	
1011	101 – 1 instrument	EUR
	103 – 1 instrument	
1012	101 – 1 instrument	EUR
	103 – 1 instrument	
	104 – 1 instrument	
1013	102– 1 instrument	EUR
	104 – 1 instrument	
1014	119 – 1 instrument	EUR
1015	120 – 1 instrument	EUR
1016	121 – 1 instrument	EUR
2001	201 – 1 instrument	EUR
2002	202 – 1 instrument	EUR
2003	203 – 1 instrument	USD
2004	204 – 1 instrument	GBP
2005	205 – 1 instrument	USD
2006	206 – 1 instrument	EUR
	207 – 1 instrument	
2007	206 – 1 instrument	EUR
	207 – 1 instrument	
	208 – 1 instrument	
2008	206 – 1 instrument	EUR
	207 – 1 instrument	
	208 – 1 instrument	
	209 – 1 instrument	
	210 – 1 instrument	
	211 – 1 instrument	
	212 – 1 instrument	
2009	201 – 1 instrument	EUR
	218 – 1 instrument	
2010	201 – 1 instrument	EUR
	219 – 1 instrument	
2011	218 – 1 instrument	EUR
	219 – 1 instrument	
2012	201 – 1 instrument	EUR
	202 – 1 instrument	
2013	213 – 1 instrument	GBP
2014	215 – 1 instrument	USD
	216 – 1 instrument	

	508 – 1 instrument	
5004	503 – 1 instrument	USD
	504 – 1 instrument	
5005	509 – 1 instrument	EUR
	510 – 1 instrument	
5006	511 – 1 instrument	EUR
	512 – 1 instrument	
	514 – 1 instrument	
	515 – 1 instrument	
	516 – 1 instrument	
5007	517 – 1 instrument	USD
	518 – 1 instrument	
5008	519 – 1 instrument	EUR
	520 – 1 instrument	
	522 – 1 instrument	
5009	520 – 1 instrument	EUR
	521 – 1 instrument	
5010	519 – 1 instrument	EUR
	508 – 1 instrument	
5011	515 – 1 instrument	EUR
	522 – 1 instrument	
5012	513 – 1 instrument	USD
5013	520 – 1 instrument	EUR
	521 – 1 instrument	
	516 – 1 instrument	
5014	506 – 1 instrument	USD
	503 – 1 instrument	
5015	502 – 1 instrument	EUR
	209 – 1 instrument	
5016	504 – 1 instrument	USD
	217 – 1 instrument	
5017	505 – 1 instrument	USD
	216 – 1 instrument	
5018	504 – 1 instrument	USD
	217 – 1 instrument	
	505 – 1 instrument	
	216 – 1 instrument	
5019	502 – 1 instrument	EUR
	209 – 1 instrument	
	219 – 1 instrument	
5020	523 – 1 instrument	EUR
	525 – 1 instrument	
	527 – 1 instrument	
5021	524 – 1 instrument	USD

	217 – 1 instrument			526 – 1 instrument	
2015	203 – 1 instrument	USD		528 – 1 instrument	
	215 – 1 instrument		5022	523 – 1 instrument	EUR
2016	208 – 1 instrument	EUR		524 – 1 instrument	
	209 – 1 instrument			525 – 1 instrument	
	210 – 1 instrument			526 – 1 instrument	
	214 – 1 instrument			527 – 1 instrument	
2017	220 – 1 instrument	EUR		528 – 1 instrument	
2018	209 – 1 instrument	EUR	5023	529 – 1 instrument	EUR
				530 – 1 instrument	
2019	209 – 1 instrument	EUR	5024	531 – 1 instrument	EUR
	219 – 1 instrument		5025	532 – 1 instrument	USD
2020	221 – 1 instrument	EUR	5026	533 – 1 instrument	EUR
2021	222 – 1 instrument	EUR	5027	534 – 1 instrument	EUR
2022	201 – 1 instrument	EUR	6001	601 – 1 instrument	EUR
	223 – 1 instrument			602 – 1 instrument	
2023	224 – 1 instrument	EUR	6002	603 – 1 instrument	EUR
3001	301 – 1 instrument	EUR		604 – 1 instrument	
	302 – 1 instrument		6003	605 – 1 instrument	EUR
3002	303 – 1 instrument	EUR		606 – 1 instrument	
	304 – 1 instrument		6004	607 – 1 instrument	EUR
3003	304 – 1 instrument	EUR		608 – 1 instrument	
	305 – 1 instrument		6005	609 – 1 instrument	EUR
	306 – 1 instrument			610 – 1 instrument	
3004	307 – 1 instrument	EUR			
	308 – 1 instrument				
3005	309 – 1 instrument	EUR			
3006	310 – 1 instrument	EUR			
3007	311 – 1 instrument	EUR			

Aggreg. Portfolio	Description	Combination of Individual Portfolios (individual portfolios as stated by their numbers as referred to in Section 3 of this Annex)	Base Currency
10000	ALL-IN no-CTP	1001, 1002, 1006, 1007, 1009, 2001, 2002, 2008, 2011, 3001, 3002, 3003, 3004, 4001, 4002, 5003, 5006, 5008, 5022	EUR
11000	EQUITY Cumulative	1001, 1002, 1006, 1007, 1009	EUR
12000	IR Cumulative	2001, 2002, 2008, 2011	EUR

13000	FX Cumulative	3001, 3002, 3003, 3004	EUR
14000	Commodity Cumulative	4001, 4002	USD
15000	Credit Spread cumulative	5003, 5006, 5008, 5022	EUR
16000	CTP cumulative EUR	6001, 6002	EUR

For a detailed description of the portfolios, please refer to the EBA website:

https://www.eba.europa.eu/activities/single-rulebook/regulatory-activities/supervisory-benchmarking-exercises/its-package-benchmarking-exercises

Adopted as consolidated text: Commission Implementing Regulation (EU) 2016/2070 of 14 September 2016 laying down implementing technical standards for templates, definitions and IT-solutions to be used by institutions when reporting to the European Banking Authority and to competent authorities in accordance with Article 78(2) of Directive 2013/36/EU of the European Parliament and of the Council (Text with EEA relevance)Text with EEA relevance

https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02016R2070-20240328

Table 20: VaR cluster analysis – number of banks by range

2024 VaR cluster analysis: number of banks by range

(X = ratio with the median)

100

	Port. ID	300% < X	300% ≥ X >200%	200% ≥ X >150%	150% ≥ X >100%	100% ≥ X >50%	50% ≥ X >0	Num obs.
Equity	1001				17	13		30
	1002				10	15		25
	1003			3	9	11	2	25
	1004				10	12	1	23
	1005				11	14		25
	1006			1	11	12		24
	1007			1	6	10	2	19
	1008				13	10		23
	1009				14	11		25
	1010				12	13		25
	1011				15	13		28
	1012				15	13		28
	1013			2	13	11		26
	1014				13	14		27
	1015				10	12		22
	1016			3	2	5	1	11
Interest Rate	2001				16	21		37
	2002				16	19		35
	2003				19	16		35
	2004				16	21		37
	2005		1	1	5	7	2	16
	2006			2	11	18		31
	2007			2	10	18		30
	2008			6	9	18		33
	2009				16	20		36
	2010				16	21		37
	2011				16	21		37
	2012		2	4	9	20		35
	2013				14	19		33
	2014			2	9	14	1	26
	2015		1	4	8	19		32
	2016				13	18		31
	2017			3	11	18		32
	2018			1	13	21		35
	2019			8	8	19		35
	2020				18	16		34
	2021			2	11	18		31
	2022			3	9	16	1	29
	2023		3		14	20		37
FX	3001				18	16		34
	3002				17	14		31
	3003				14	17		31
	3004				16	16		32
	3005				12	17		29
	3006				14	18		32
	3007				10	15		25
Commodities	4001		1	2	4	6	2	15
	4002				6	7		13
	4003				6	6		12
	4004				6	6		12
Credit Spread	5001			2	10	13		25
	5002				10	12		22
	5003			1	10	13		24
	5004				10	12		22
	5005				10	13		23
	5006		1		8	13	1	23
	5007			3	6	12		21
	5008			3	7	15		25
	5009			4	6	15		25
	5010			1	9	14		24
	5011				9	14		23
	5012			4	5	13		22
	5013				11	14		25
	5014			4	6	13		23
	5015			1	8	14		23
	5016				9	11		20
	5017			2	6	11		19
	5018				9	11		20
	5019		1	2	7	14		24
	5020				11	15		26
	5021				10	12		22
	5022				9	13		22
	5023				8	8		16
	5024			7	2	12		21
	5025				8	12		20
	5026			2	6	13		21
	5027			2	5	13		20
CTP	6001							0
	6002							0
	6003							0
	6004							0
	6005							0
ALL-IN no-CTP	10000				6	7		13
Equity Cumulative	11000				8	12		20
IR Cumulative	12000				15	15		30
FX Cumulative	13000				14	17		31
Commodity Cumulative	14000				6	7		13
CS Cumulative	15000			1	7	12		20
CTP Cumulative	16000							0

Table 21: VaR statistics

EU Statistics for VaR

		Main statistics								Percentiles			
	Port. ID	Min	Max	Ave.	STDev	STDev_trunc[1]	MAD (median absolute deviation)	Coefficient of variation (STDev/Mean)	Num obs.[2]	25th	50th	75th	IQD
Equity	1001	276,609	545,084	395,993	79,853	87,495	66,977	20%	31	316,826	410,091	441,747	16%
	1002	138,749	343,002	247,770	48,737	67,607	29,808	20%	25	217,397	263,110	269,615	11%
	1003	204	2,636	1,577	584	697	467	37%	25	1,080	1,573	1,981	29%
	1004	512	1,840	1,280	282	508	179	22%	23	1,088	1,282	1,518	17%
	1005	51,728,788	70,540,542	58,577,127	6,390,309	7,394,419	2,672,361	11%	25	53,644,457	56,263,042	63,946,467	9%
	1006	1,633	4,445	2,914	732	1,022	434	25%	24	2,551	2,830	3,395	14%
	1007	2,132	24,389	14,181	5,582	8,685	2,975	39%	19	10,573	16,139	17,579	25%
	1008	12,507	26,168	19,451	3,229	5,081	948	17%	23	17,056	20,009	21,444	11%
	1009	42,816	84,955	59,022	10,765	15,628	5,272	18%	25	53,385	56,865	61,566	7%
	1010	21,826	43,968	32,899	5,229	6,262	3,336	16%	25	29,838	32,312	35,781	9%
	1011	257,866	506,663	374,044	74,667	77,199	59,472	20%	28	305,491	394,348	418,596	16%
	1012	246,258	481,566	356,928	71,991	75,097	57,343	20%	28	290,998	377,678	400,200	16%
	1013	36,106	93,216	61,557	13,176	17,880	5,646	21%	26	54,713	58,528	65,686	9%
	1014	142,739	311,626	223,953	42,781	51,745	36,227	19%	28	189,453	216,583	255,446	15%
	1015	125,828	245,197	177,032	33,844	33,844	28,489	19%	23	145,710	181,898	192,413	14%
	1016	51,102	316,474	192,757	86,748	103,704	81,936	45%	11	141,491	176,545	288,828	34%
Interest Rate	2001	144,168	258,202	198,038	28,857	38,700	12,358	15%	38	182,640	195,897	217,941	9%
	2002	136,316	239,967	179,482	27,770	30,522	20,310	16%	36	158,452	179,177	199,643	12%
	2003	23,181	31,062	27,497	2,223	2,448	1,622	8%	36	25,981	27,607	29,097	6%
	2004	67,975	142,257	110,750	20,225	26,439	17,800	18%	38	92,761	111,677	129,790	17%
	2005	4,629	64,885	31,360	16,661	24,422	14,105	53%	16	18,968	31,061	44,863	41%
	2006	15,587	48,230	29,380	7,135	9,718	4,466	24%	31	24,578	29,807	33,592	15%
	2007	57,406	126,190	80,900	18,201	24,994	8,900	23%	30	68,516	79,315	85,425	11%
	2008	46,268	131,950	82,643	26,217	28,419	16,160	32%	33	63,192	81,113	101,139	23%
	2009	160,752	240,874	199,217	17,284	20,895	10,477	9%	37	189,454	199,430	210,735	5%
	2010	129,752	232,375	178,356	26,118	34,902	11,135	15%	38	164,384	176,307	196,147	9%
	2011	352,525	508,469	418,449	47,411	57,813	31,978	11%	38	382,835	404,835	459,107	9%
	2012	49,735	181,999	86,564	31,030	54,394	8,651	36%	36	67,688	78,474	88,255	13%
	2013	28,039	53,227	42,167	4,526	9,175	1,933	11%	34	39,580	42,063	44,608	6%
	2014	15,534	71,063	42,068	14,062	15,362	9,004	33%	26	31,693	41,982	47,778	20%
	2015	6,199	23,132	11,137	4,364	7,296	2,841	39%	33	7,627	11,100	13,535	28%
	2016	89,996	179,909	123,109	21,520	40,617	9,366	18%	31	109,387	120,093	133,919	10%
	2017	17,062	45,864	30,108	7,723	9,235	4,007	26%	33	25,898	28,913	32,799	12%
	2018	14,378	37,897	24,717	5,449	7,696	1,916	22%	36	22,291	24,116	26,146	8%
	2019	6,079	18,782	11,835	3,628	4,287	1,871	31%	36	8,876	10,555	14,944	25%
	2020	28,149	56,843	43,374	7,602	9,406	4,897	18%	35	38,800	42,957	48,331	11%
	2021	28,455	63,040	39,473	8,687	13,360	4,198	22%	31	33,274	37,977	41,477	11%
	2022	98,104	372,082	223,290	69,089	85,977	37,867	31%	29	167,745	204,938	284,771	26%
	2023	19,646	97,586	41,193	16,481	31,334	6,364	40%	38	31,643	38,209	44,785	17%
FX	3001	342,985	690,918	467,686	72,246	74,729	47,806	15%	35	430,135	485,590	515,245	11%
	3002	239,141	488,006	332,304	48,617	82,435	20,082	15%	32	306,991	327,204	347,693	6%
	3003	74,228	190,625	127,398	31,167	37,359	20,624	25%	32	102,206	129,489	139,624	15%
	3004	374,887	539,803	453,769	42,040	45,697	27,234	9%	33	428,173	457,805	477,163	5%
	3005	310,237	439,428	371,960	30,474	42,318	18,312	8%	30	354,633	374,564	393,262	5%
	3006	10,359	23,789	16,546	3,719	7,041	2,290	23%	33	14,446	16,489	18,262	12%
	3007	371,186	727,498	531,754	85,281	111,233	38,810	16%	25	492,564	529,779	560,675	6%
Commodities	4001	1,319	55,740	24,162	13,520	20,710	7,350	56%	15	14,774	23,530	31,507	36%
	4002	293,232	479,620	367,485	49,025	58,472	25,128	13%	13	334,002	366,008	388,837	8%
	4003	382,949	709,464	549,841	90,591	113,229	31,293	17%	12	502,594	532,285	579,480	7%
	4004	233,817	412,229	337,501	45,535	93,386	31,070	14%	12	318,144	327,202	366,425	7%
Credit Spread	5001	4,259	10,678	6,981	1,944	1,899	1,334	28%	25	5,892	6,902	8,150	16%
	5002	14,807	31,316	22,090	4,701	4,520	3,058	21%	22	16,819	23,123	25,698	21%
	5003	3,278	5,976	4,265	891	1,022	530	21%	24	3,512	3,947	4,974	17%
	5004	6,917	14,052	9,975	2,159	2,099	1,839	22%	22	7,403	10,447	11,885	23%
	5005	2,902	6,121	4,515	780	1,077	480	17%	23	4,090	4,531	4,946	9%
	5006	2,322	14,490	7,018	2,488	3,724	1,694	36%	23	5,074	7,245	8,671	26%
	5007	21,691	71,614	39,851	14,395	44,820	7,160	36%	21	28,818	37,586	53,435	30%
	5008	54,021	117,512	74,035	17,954	29,766	10,543	24%	25	63,232	70,334	79,112	11%
	5009	4,987	13,360	8,063	2,412	3,101	1,203	30%	25	6,245	7,707	9,182	19%
	5010	12,977	30,295	19,530	4,705	10,692	2,065	24%	24	16,459	20,035	20,711	11%
	5011	26,110	52,921	35,217	6,644	9,166	2,532	19%	23	31,463	35,412	36,543	7%
	5012	1,654	5,763	3,054	1,145	1,571	592	38%	22	2,171	3,014	3,554	24%
	5013	10,066	21,007	15,413	2,939	3,125	1,488	19%	25	14,324	15,232	16,673	8%
	5014	2,231	6,357	4,255	1,202	1,212	604	28%	23	3,518	4,006	4,775	15%
	5015	14,571	39,379	23,679	5,719	11,547	2,431	24%	23	20,439	23,656	25,444	11%
	5016	26,641	59,810	40,697	8,846	9,445	6,359	22%	20	34,684	42,368	47,115	15%
	5017	12,754	36,677	24,570	6,397	9,392	3,357	26%	19	20,341	23,368	30,454	20%
	5018	32,985	89,229	59,765	15,894	17,586	11,552	27%	20	49,071	61,911	70,268	18%
	5019	7,123	20,848	11,372	3,646	10,522	1,082	32%	24	9,077	10,154	12,975	18%
	5020	118,540	207,875	165,388	21,787	25,024	10,322	13%	26	158,743	167,813	176,509	5%
	5021	12,325	32,470	22,822	5,642	5,905	3,572	25%	22	19,247	23,395	26,536	16%
	5022	114,514	192,895	157,134	21,230	25,383	11,362	14%	22	147,528	161,982	170,251	7%
	5023	40,813	94,343	66,203	15,646	18,751	11,175	24%	16	54,742	62,965	77,294	17%
	5024	19,679	69,802	39,257	16,883	20,543	10,970	43%	21	24,082	35,890	54,613	39%
	5025	39,838	66,740	50,939	6,419	7,673	2,810	13%	20	48,229	52,466	54,019	6%
	5026	15,580	43,473	28,877	7,673	9,295	3,542	27%	21	24,228	28,097	33,787	16%
	5027	14,311	30,822	20,165	5,355	11,597	2,058	27%	20	16,406	20,098	22,362	15%
CTP	6001								4				
	6002								4				
	6003								4				
	6004								4				
	6005								3				
ALL-IN no-CTP **	10000	509,460	1,125,408	792,591	159,483	159,483	72,353	20%	13	696,529	815,993	857,171	10%
Equity Cumulative **	11000	157,349	311,963	226,262	42,562	51,761	18,512	19%	20	203,385	215,708	258,481	12%
IR Cumulative **	12000	280,584	447,514	365,772	43,860	59,576	22,519	12%	30	338,774	361,800	383,811	6%
FX Cumulative **	13000	552,348	929,263	760,653	80,840	108,524	45,511	11%	31	707,402	756,418	827,610	8%
Commodity Cumulative **	14000	291,100	502,693	378,215	71,323	71,323	51,190	19%	13	330,492	371,080	422,271	12%
CS Cumulative **	15000	157,424	338,003	220,839	42,702	59,477	20,198	19%	20	190,555	221,537	229,335	9%
CTP Cumulative **	16000								2				

[1] STDev trunc is the standard deviation computed excluding values below the 5th and above the 95th percentile

[2] Refers to the number of banks included in the computation of the statistics

** For the aggregated portfolios (60 to 66), banks that reported at least a missing portfolio IMV among the ones composing the aggregate are not included in the computation of the benchmarks for that particular aggregate portfolio.

Table 22: sVaR statistics

EU Statistics for SVaR

	Port. ID	Main statistics: Min	Max	Ave.	STDev	STDev_trunc[1]	MAD (median absolute deviation)	Coefficient of variation (STDev/Mean)	Num obs.[2]	Percentiles: 25th	50th	75th	IQD
Equity	1001	695,666	1,210,174	959,535	123,037	154,228	85,378	13%	31	848,555	970,161	1,033,447	10%
	1002	628,195	1,739,419	1,238,490	312,500	358,056	233,929	25%	27	921,476	1,241,435	1,477,855	23%
	1003	45	6,175	3,033	1,424	1,765	856	47%	20	2,197	3,500	3,661	25%
	1004	56	4,645	2,371	1,299	1,489	951	55%	25	1,678	2,318	3,511	35%
	1005	85,198,895	207,722,826	159,777,985	37,266,629	44,937,914	24,518,591	23%	26	143,983,465	168,617,643	192,416,426	14%
	1006	2,034	10,006	5,543	2,117	2,641	1,739	38%	26	4,005	5,593	7,406	30%
	1007	1,328	92,329	46,910	21,647	31,876	16,518	46%	19	30,204	49,131	59,594	33%
	1008	14,801	51,770	32,102	11,501	10,978	8,001	36%	25	21,460	32,927	40,933	31%
	1009	56,819	98,092	81,198	11,124	14,722	3,376	14%	24	69,722	84,708	88,885	12%
	1010	70,135	157,766	126,833	23,381	31,025	13,220	18%	25	112,776	131,434	142,914	12%
	1011	724,334	1,130,107	909,934	105,791	128,401	70,515	12%	27	817,430	913,823	961,886	8%
	1012	699,121	1,079,333	874,683	105,676	128,833	83,287	12%	27	770,054	879,604	947,613	10%
	1013	20,752	120,621	72,425	26,001	26,001	18,007	36%	28	60,621	71,607	92,282	21%
	1014	247,745	663,630	453,718	126,926	126,926	67,974	28%	30	318,478	490,483	548,392	27%
	1015	204,266	522,090	362,825	101,617	97,994	95,079	28%	24	265,612	370,768	448,338	26%
	1016	143,776	604,922	365,648	134,946	134,946	86,229	37%	12	283,473	354,874	458,336	24%
Interest Rate	2001	153,539	282,141	222,611	30,269	40,134	17,630	14%	36	206,788	218,910	240,813	8%
	2002	108,963	225,270	172,853	27,247	35,167	15,169	16%	34	160,889	171,569	192,551	9%
	2003	18,949	64,997	33,273	6,442	7,560	3,937	19%	37	29,868	33,675	37,888	12%
	2004	35,363	162,913	99,099	25,691	36,259	17,564	26%	36	80,758	103,333	112,287	16%
	2005	4,342	181,397	70,964	50,738	62,184	39,691	72%	17	29,862	70,917	99,152	51%
	2006	19,197	67,301	44,526	13,239	15,461	9,385	30%	33	36,009	46,270	53,503	20%
	2007	42,207	161,832	95,977	26,740	41,790	12,276	28%	30	82,802	95,955	107,416	13%
	2008	42,708	193,909	102,830	38,837	60,068	15,425	38%	32	80,005	97,241	116,899	19%
	2009	173,380	370,636	275,605	46,831	52,862	24,009	17%	37	252,273	269,721	300,302	9%
	2010	138,186	253,927	200,493	27,260	36,160	15,837	14%	36	186,113	197,043	216,731	8%
	2011	289,116	584,888	438,841	77,011	81,206	50,919	18%	38	407,869	437,008	505,218	11%
	2012	62,747	178,529	114,518	29,154	39,702	16,743	26%	37	93,837	113,000	133,394	17%
	2013	21,582	83,274	45,426	14,626	21,276	7,197	32%	35	35,860	43,954	52,351	19%
	2014	35,443	269,420	115,249	65,266	81,001	56,283	57%	27	52,527	125,622	166,380	52%
	2015	5,952	62,222	28,090	14,545	17,064	9,819	52%	35	17,492	29,169	36,179	35%
	2016	78,030	279,995	125,478	39,014	100,662	18,368	31%	31	101,896	118,655	136,946	15%
	2017	24,098	326,623	166,317	77,939	95,193	45,033	47%	32	128,043	181,774	212,886	25%
	2018	11,041	56,933	25,905	8,225	15,656	2,992	32%	37	22,102	25,936	27,610	11%
	2019	12,450	47,897	20,607	6,503	14,495	2,545	32%	37	17,299	20,081	21,780	11%
	2020	1,117	276,819	121,125	74,403	87,397	46,538	61%	38	71,527	106,071	177,831	43%
	2021	26,118	71,746	43,755	10,306	29,528	5,828	24%	30	36,812	45,867	48,965	14%
	2022	119,610	346,475	255,004	45,817	76,432	22,250	18%	28	231,996	259,911	281,070	10%
	2023	21,115	93,293	46,176	14,170	31,116	11,051	31%	37	34,271	49,839	56,643	25%
FX	3001	502,324	1,217,111	891,408	209,471	209,471	147,003	24%	36	756,591	878,919	1,059,365	17%
	3002	229,091	926,123	636,376	185,588	225,332	118,888	29%	32	534,500	645,179	757,803	17%
	3003	80,700	374,845	262,009	70,927	107,681	38,620	27%	33	228,071	270,117	305,200	14%
	3004	578,384	1,315,742	1,001,136	179,238	224,982	70,324	18%	32	933,088	1,017,050	1,099,835	8%
	3005	431,049	1,758,842	1,097,593	330,017	378,690	155,380	30%	32	940,072	1,153,731	1,279,062	15%
	3006	6,093	150,389	41,689	30,301	61,739	13,326	73%	35	19,183	40,116	43,952	39%
	3007	861,037	2,423,672	1,587,526	414,941	412,335	233,770	26%	27	1,220,055	1,647,393	1,811,889	20%
Commodities	4001	400	85,809	44,975	19,322	30,189	8,990	43%	15	36,546	46,034	54,931	20%
	4002	480,389	917,919	677,575	137,895	212,563	104,943	20%	13	543,367	693,577	792,558	19%
	4003	651,717	1,814,706	1,433,187	327,181	405,446	165,307	23%	12	1,306,062	1,403,230	1,738,413	14%
	4004	280,617	979,275	708,785	207,325	260,174	74,708	29%	12	647,035	777,385	837,207	13%
Credit Spread	5001	7,016	25,856	15,392	5,633	6,573	4,121	37%	24	10,039	16,630	19,890	33%
	5002	15,426	159,284	73,631	33,594	53,255	16,025	46%	19	53,627	78,110	91,961	26%
	5003	6,933	15,363	10,922	2,426	2,681	2,223	22%	24	9,062	10,388	12,838	17%
	5004	7,676	76,513	32,903	18,808	26,265	6,863	57%	20	21,797	33,159	37,133	26%
	5005	4,646	32,798	15,516	7,600	9,401	2,463	49%	22	10,982	13,999	17,999	24%
	5006	11,239	52,753	28,119	14,538	20,599	7,341	52%	25	16,592	23,542	44,845	46%
	5007	36,902	194,212	87,902	43,950	58,805	29,363	50%	22	48,536	78,587	123,756	44%
	5008	33,171	221,144	100,030	42,676	84,089	18,091	43%	25	77,615	100,021	111,324	18%
	5009	5,058	27,894	12,133	5,750	8,168	3,613	47%	26	7,638	11,768	15,210	33%
	5010	11,566	54,369	28,469	12,246	23,890	6,507	43%	24	19,753	26,474	33,279	26%
	5011	16,553	106,101	54,739	26,223	48,314	12,292	48%	25	35,473	56,132	59,257	25%
	5012	1,723	19,285	8,041	3,876	8,673	1,582	48%	23	5,253	8,623	9,491	29%
	5013	12,372	71,170	36,882	17,135	18,144	10,998	47%	25	23,735	35,363	50,260	36%
	5014	5,014	19,522	10,412	3,880	5,725	3,667	37%	23	7,084	10,355	13,461	31%
	5015	13,479	76,958	30,413	11,902	24,737	4,645	39%	23	24,305	29,094	33,663	16%
	5016	34,070	169,297	84,855	37,430	46,626	18,505	44%	19	59,279	88,694	101,052	26%
	5017	21,369	126,118	66,511	35,003	34,309	26,504	53%	21	36,433	63,888	84,227	40%
	5018	53,137	242,254	123,085	58,483	85,657	29,561	48%	19	78,748	120,192	138,828	28%
	5019	12,747	42,568	21,693	7,260	26,443	2,875	34%	23	17,318	21,081	23,833	16%
	5020	129,809	264,353	182,475	34,400	56,683	29,279	19%	25	160,472	184,122	205,161	12%
	5021	17,600	185,369	92,187	52,059	55,634	44,168	57%	22	46,604	94,659	133,580	48%
	5022	144,339	335,507	218,847	64,987	69,112	39,768	30%	22	164,528	211,771	272,715	25%
	5023	33,865	235,521	129,124	60,956	81,235	47,853	47%	16	74,872	145,952	176,328	40%
	5024	27,952	156,446	85,161	44,193	43,394	38,320	52%	23	37,722	90,850	125,293	54%
	5025	63,073	145,107	92,324	25,030	44,072	15,914	27%	19	70,162	96,328	101,335	18%
	5026	24,467	76,948	42,202	14,587	25,815	9,456	35%	21	31,220	43,386	50,191	23%
	5027	7,077	79,227	30,812	18,611	28,032	5,734	60%	22	20,803	26,073	34,018	24%
CTP	6001								4				
	6002								4				
	6003								4				
	6004								4				
	6005								3				
ALL-IN no-CTP **	10000	796,321	2,353,012	1,716,828	493,185	612,233	459,194	29%	12	1,341,118	1,755,777	2,179,731	24%
Equity Cumulative **	11000	416,966	865,476	653,427	124,888	143,818	76,227	19%	20	573,599	644,473	735,569	12%
IR Cumulative **	12000	253,857	599,569	433,139	89,806	97,384	54,900	21%	31	388,170	425,567	501,757	13%
FX Cumulative **	13000	977,213	2,572,732	1,789,906	398,606	511,134	267,087	22%	29	1,473,708	1,883,385	2,015,043	16%
Commodity Cumulative **	14000	487,420	919,882	688,548	138,478	216,320	114,996	20%	12	574,628	697,765	805,999	17%
CS Cumulative **	15000	180,948	551,835	300,847	93,394	127,783	52,850	31%	20	247,244	296,584	381,991	21%
CTP Cumulative **	16000								2				

[1] STDev trunc is the standard deviation computed excluding values below the 5th and above the 95th percentile

[2] Refers to the number of banks included in the computation of the statistics

** *For the aggregated portfolios (60 to 66), banks that reported at least a missing portfolio IMV among the ones composing the aggregate are not included in the computation of the benchmarks for that particular aggregate portfolio.*

Table 23: P&L VaR statistics

EU Statistics for PnL VaR

	Part. ID	Main statistics: Min	Max	Ave.	STDev	STDev_trunc [1]	MAD (median absolute deviation)	Coefficient of variation (STDev/Mean)	Num obs. [2]	Percentiles: 25th	50th	75th	IQD
Equity	1001	288,150	509,838	417,502	52,589	246,455	11,979	13%	22	408,341	431,130	436,514	3%
	1002	209,700	387,499	276,788	49,916	145,193	11,297	18%	19	250,805	263,756	278,041	5%
	1003	47	2,769	1,221	604	1,520	217	50%	18	927	1,099	1,433	21%
	1004	899	4,155	1,984	986	6,793	299	50%	19	1,415	1,655	2,323	24%
	1005	47,520,760	86,321,641	57,760,952	8,953,682	21,678,301	1,329,871	16%	18	53,576,849	54,454,847	56,973,065	3%
	1006	480	4,962	2,414	1,020	2,074	667	42%	18	1,630	2,606	2,925	28%
	1007	1,798	44,009	17,642	11,351	36,291	5,452	64%	16	11,199	14,985	22,275	33%
	1008	4,446	22,100	19,214	3,950	11,784	933	21%	18	18,928	20,550	21,008	5%
	1009	21,366	53,394	45,829	6,342	25,863	1,266	14%	19	45,741	47,017	48,618	3%
	1010	24,622	115,303	36,504	19,450	66,474	1,561	53%	19	29,881	32,250	32,691	4%
	1011	308,502	479,773	394,092	42,832	254,339	11,659	11%	19	378,593	396,184	400,088	3%
	1012	295,915	450,046	379,725	40,528	243,418	11,191	11%	19	367,833	383,746	392,683	3%
	1013	21,783	81,537	51,594	12,211	26,956	2,903	24%	19	45,898	56,336	56,865	11%
	1014	147,174	405,442	288,497	60,605	175,552	17,596	21%	21	282,077	302,313	314,972	6%
	1015	139,038	784,833	253,782	143,016	770,309	26,728	56%	17	208,234	226,556	252,968	10%
	1016	149,699	395,710	240,494	85,551	85,551	58,294	36%	7	171,325	235,160	277,683	24%
Interest Rate	2001	157,056	367,398	199,812	44,240	125,230	13,651	22%	27	175,225	185,757	213,575	10%
	2002	126,235	257,209	178,168	35,935	105,610	15,583	20%	27	157,756	171,383	188,041	9%
	2003	23,150	37,394	27,529	3,293	13,810	1,699	12%	27	25,054	27,539	28,932	7%
	2004	75,733	176,885	122,288	20,803	54,907	9,044	17%	27	111,610	127,473	132,333	8%
	2005	8,801	58,963	32,462	15,926	20,842	11,327	49%	13	24,252	28,158	42,480	27%
	2006	14,531	50,854	29,082	9,148	24,043	3,482	32%	23	23,407	27,538	31,112	14%
	2007	54,056	143,726	79,149	21,659	72,138	5,548	27%	23	67,491	73,321	80,726	9%
	2008	50,025	130,920	72,087	23,048	71,122	7,687	32%	23	57,416	65,702	70,876	10%
	2009	173,781	234,840	196,042	14,321	20,632	8,705	7%	25	186,366	196,336	203,995	5%
	2010	141,348	330,659	179,883	39,850	112,704	12,286	22%	27	157,703	167,182	192,261	10%
	2011	355,710	539,434	406,014	40,878	74,198	20,736	10%	24	376,455	402,210	438,442	8%
	2012	54,198	232,891	81,856	37,497	91,886	5,424	46%	24	64,768	70,815	83,034	12%
	2013	7,008	60,966	42,335	9,926	22,859	3,261	23%	26	39,061	42,846	45,583	8%
	2014	16,184	100,964	47,233	20,260	111,750	11,961	43%	18	33,486	43,198	60,096	28%
	2015	6,118	30,627	12,535	7,263	10,960	2,454	58%	23	7,570	10,639	12,828	26%
	2016	96,378	194,551	119,094	22,424	78,079	7,135	19%	23	106,683	112,054	119,729	6%
	2017	21,500	61,069	31,270	9,607	17,754	2,024	31%	23	26,266	28,135	34,702	14%
	2018	14,707	35,920	23,459	4,925	7,516	1,743	21%	24	20,871	22,668	24,608	8%
	2019	1,662	22,569	11,181	4,703	8,888	1,713	42%	26	8,029	9,520	15,960	33%
	2020	35,290	77,159	44,352	8,773	24,484	3,823	20%	25	39,550	43,652	45,957	7%
	2021	27,502	65,785	37,636	9,949	32,212	5,136	26%	23	30,308	34,896	41,092	15%
	2022	48,146	456,412	218,453	86,065	189,127	20,641	39%	22	174,908	197,195	267,311	21%
	2023	16,719	112,715	35,638	18,791	45,708	6,531	53%	26	25,988	30,604	39,187	20%
FX	3001	393,956	628,881	484,757	57,048	236,560	24,220	12%	26	453,271	487,208	509,367	6%
	3002	248,748	436,023	327,945	44,722	70,112	32,750	14%	23	294,479	320,647	354,652	9%
	3003	91,167	286,334	127,644	39,025	88,936	13,114	31%	25	110,739	120,995	137,058	11%
	3004	389,276	677,711	453,035	56,527	214,555	26,930	13%	25	422,114	442,010	469,822	5%
	3005	311,753	431,914	365,260	26,373	171,171	15,498	7%	24	347,362	367,703	381,890	5%
	3006	12,351	29,004	17,505	3,883	13,060	1,613	22%	25	15,136	17,081	18,074	9%
	3007	475,012	751,698	552,168	81,531	440,436	24,082	15%	18	502,704	532,590	550,375	5%
Commodities	4001	849	51,229	27,480	14,786	19,642	7,764	54%	11	19,846	29,929	35,652	28%
	4002	340,868	388,737	372,622	18,074	382,423	5,764	5%	9	355,095	382,530	385,651	4%
	4003	285,143	576,004	446,689	107,621	552,649	68,289	24%	8	367,866	477,334	528,303	18%
	4004	59,189	390,409	297,967	104,926	299,205	35,604	35%	8	288,609	311,345	369,387	12%
Credit Spread	5001	3,647	12,341	6,093	1,866	4,617	688	31%	18	5,375	5,933	6,751	11%
	5002	15,150	58,109	23,838	10,030	88,373	2,469	42%	16	18,711	22,581	24,102	13%
	5003	2,697	6,011	4,206	974	1,096	675	23%	19	3,361	4,228	4,982	19%
	5004	6,308	33,837	10,810	6,566	34,052	987	61%	16	8,207	9,376	10,191	11%
	5005	2,006	5,839	3,978	1,039	1,528	770	26%	18	3,531	3,934	4,798	15%
	5006	4,108	7,114	5,240	838	3,964	611	16%	18	4,571	5,470	5,747	11%
	5007	21,162	191,050	60,766	51,337	99,972	6,432	88%	17	27,260	33,471	66,344	42%
	5008	51,045	112,607	71,880	15,405	86,132	7,850	21%	20	61,712	71,344	77,706	11%
	5009	5,074	14,574	8,254	3,082	4,490	1,450	37%	19	5,951	7,685	11,213	31%
	5010	13,852	23,880	17,957	3,030	3,886	2,095	17%	19	15,179	17,637	20,605	15%
	5011	26,380	45,310	34,598	4,568	5,039	2,953	13%	19	31,472	35,478	36,373	7%
	5012	1,824	5,236	2,882	980	4,750	437	34%	18	2,170	2,565	3,240	20%
	5013	8,914	19,622	13,916	3,129	4,324	2,307	23%	19	11,354	13,788	16,166	17%
	5014	3,074	15,564	4,687	2,809	12,261	418	60%	18	3,706	3,901	4,476	9%
	5015	18,746	35,299	24,023	4,720	6,541	1,563	20%	18	20,932	22,621	24,622	8%
	5016	25,991	116,010	45,771	21,926	137,901	6,719	48%	15	32,887	43,325	47,795	18%
	5017	12,894	64,976	32,087	15,542	74,080	5,053	48%	15	22,662	25,823	50,204	38%
	5018	34,297	167,523	71,851	35,429	198,781	15,515	49%	15	44,484	61,278	102,236	39%
	5019	7,835	22,653	11,009	4,122	11,108	743	37%	18	8,447	9,409	14,360	26%
	5020	148,736	247,006	167,831	21,574	102,177	7,531	13%	20	155,936	161,167	174,577	6%
	5021	13,479	112,293	29,369	21,957	91,849	3,367	75%	18	19,980	23,347	29,710	20%
	5022	139,187	598,394	180,904	104,587	547,903	7,702	58%	18	150,067	159,039	165,471	5%
	5023	14,951	107,682	63,479	21,615	34,294	9,178	34%	12	54,333	63,899	72,644	14%
	5024	22,104	82,906	39,627	22,063	57,884	5,862	56%	16	24,517	30,316	51,664	36%
	5025	39,056	150,343	56,830	27,047	168,423	5,691	48%	15	43,101	49,174	58,832	15%
	5026	19,473	155,811	33,996	31,080	87,579	2,946	91%	18	22,506	25,105	30,219	15%
	5027	14,313	146,195	29,126	31,855	66,517	2,679	109%	17	16,285	18,037	25,056	21%
CTP	6001								3				
	6002								3				
	6003								3				
	6004								3				
	6005								2				
ALL-IN no-CTP **	10000	529,808	947,858	781,116	131,157	509,918	74,740	17%	8	722,466	818,644	878,824	10%
Equity Cumulative **	11000	182,824	1,138,282	284,727	231,181	709,330	14,245	81%	16	203,126	214,879	260,230	12%
IR Cumulative **	12000	112,182	485,427	350,224	91,079	159,669	30,849	26%	22	329,679	361,183	391,378	9%
FX Cumulative **	13000	545,250	1,158,574	791,808	128,602	250,570	52,008	16%	25	729,153	806,721	832,510	7%
Commodity Cumulative **	14000	330,477	397,631	364,768	19,534	386,228	12,060	5%	9	355,056	366,994	377,376	3%
CS Cumulative **	15000	185,313	262,044	219,660	18,180	154,724	10,795	8%	17	208,246	219,471	230,011	5%
CTP Cumulative **	16000												

Dev trunc is the standard deviation computed excluding values below the 5th and above the 95th percentile

ifers to the number of banks included in the computation of the statistics

** *For the aggregated portfolios (60 to 66), banks that reported at least a missing portfolio IMV among the ones composing the aggregate are not included in the computation of the benchmarks for that particular aggregate portfolio.*

Table 24: Empirical expected shortfall statistics

EU Statistics for empirical expected shortfall

		Main statistics								Percentiles			
	Port. ID	Min	Max	Ave.	STDev	STDev_trunc[1]	MAD (median absolute deviation)	Coefficient of variation (STDev/Mean)	Num obs.[2]	25th	50th	75th	IQD
Equity	1001	274,074	497,137	365,475	54,093	247,195	8,700	15%	22	343,408	354,986	360,869	2%
	1002	211,746	376,242	253,323	53,304	167,736	12,062	21%	19	222,307	236,261	243,810	5%
	1003	45	2,793	1,292	571	1,501	214	44%	18	988	1,238	1,567	23%
	1004	883	3,931	1,916	908	5,706	404	47%	19	1,262	1,738	2,389	31%
	1005	46,304,325	84,596,628	56,258,961	9,252,938	21,304,291	1,083,407	16%	18	51,603,958	51,774,579	58,814,372	7%
	1006	461	4,704	2,517	948	2,123	636	38%	18	1,905	2,607	2,973	22%
	1007	1,698	45,266	17,167	11,046	38,173	4,500	64%	16	11,566	14,107	20,225	27%
	1008	4,326	21,182	19,010	3,840	12,102	1,013	20%	18	18,968	20,290	21,027	5%
	1009	18,853	72,091	61,982	11,017	25,380	1,626	18%	19	62,099	64,975	66,385	3%
	1010	23,122	118,943	35,961	20,628	57,883	794	57%	19	29,706	30,518	31,099	2%
	1011	294,335	472,358	351,783	51,783	254,821	8,592	15%	19	327,645	336,707	345,466	3%
	1012	279,343	443,167	333,110	48,119	240,223	7,668	14%	19	308,646	320,920	326,544	3%
	1013	20,614	104,304	64,212	15,959	29,299	2,846	25%	19	63,002	68,549	68,815	4%
	1014	130,799	381,094	255,172	56,430	174,499	10,545	22%	21	240,514	250,714	261,029	4%
	1015	142,592	790,423	235,979	148,150	654,981	23,611	63%	17	182,296	195,422	228,738	11%
	1016	146,833	371,227	234,474	80,733	80,733	50,811	34%	7	168,355	228,332	288,143	26%
Interest Rate	2001	156,448	388,380	197,467	46,987	122,865	8,497	24%	27	177,624	182,457	199,550	6%
	2002	113,295	263,663	182,454	34,356	102,203	11,309	19%	27	162,116	182,106	190,228	8%
	2003	22,647	37,006	26,208	2,925	12,383	1,275	11%	27	24,671	26,112	27,310	5%
	2004	80,809	178,670	114,442	20,529	58,019	4,889	18%	27	102,537	107,535	121,354	8%
	2005	8,165	74,803	35,461	18,702	21,552	13,959	53%	13	25,777	35,777	45,605	28%
	2006	15,420	54,268	29,247	10,260	24,847	3,209	35%	23	22,965	25,909	30,731	14%
	2007	50,703	140,042	73,376	21,821	66,552	7,307	30%	23	59,547	67,394	78,127	13%
	2008	48,835	133,492	70,574	23,407	69,041	8,417	33%	23	54,363	63,839	71,840	14%
	2009	176,571	240,757	201,902	17,866	20,725	11,801	9%	27	187,736	203,185	210,091	6%
	2010	140,803	349,542	177,820	42,343	110,577	7,646	24%	27	159,862	164,211	179,544	6%
	2011	375,624	561,946	430,957	52,509	69,932	31,241	12%	27	390,956	432,383	440,335	6%
	2012	53,537	246,231	83,377	41,829	89,576	8,174	50%	24	61,639	70,067	80,920	14%
	2013	7,115	65,446	41,612	11,253	24,148	2,998	27%	26	37,785	40,412	43,801	7%
	2014	18,215	104,543	46,807	20,378	109,173	12,826	44%	18	34,048	47,937	59,064	27%
	2015	6,697	33,103	12,583	7,819	11,261	2,263	62%	23	7,450	10,653	13,623	29%
	2016	91,457	214,089	116,531	28,649	91,921	2,482	25%	23	102,178	105,053	114,192	6%
	2017	23,057	54,736	31,856	8,062	31,011	1,195	25%	23	27,668	28,977	33,198	9%
	2018	13,862	35,180	22,866	5,234	7,483	1,592	23%	25	19,775	21,529	22,917	7%
	2019	1,867	23,789	11,290	4,976	9,148	1,656	44%	26	7,965	9,365	16,240	34%
	2020	36,344	92,414	47,968	11,163	24,049	3,072	23%	26	42,370	46,851	48,684	7%
	2021	25,132	71,576	36,502	11,066	34,012	4,195	30%	23	29,280	34,253	38,296	13%
	2022	49,904	421,641	217,346	87,146	187,375	16,254	40%	22	171,165	181,949	252,160	19%
	2023	17,537	112,377	36,724	17,884	48,804	3,671	49%	26	29,443	32,318	36,693	11%
FX	3001	372,295	627,103	458,671	76,887	246,644	20,316	17%	26	416,609	427,481	515,344	11%
	3002	264,919	413,007	329,910	33,606	64,468	10,635	10%	23	311,325	319,607	350,586	6%
	3003	94,097	259,331	121,777	34,429	82,785	12,331	28%	25	101,675	111,570	128,807	12%
	3004	402,358	565,744	452,440	40,694	198,053	21,892	9%	25	421,585	443,391	473,203	6%
	3005	308,310	421,081	365,265	28,284	172,793	19,855	8%	24	341,824	367,041	383,576	6%
	3006	12,635	42,056	18,559	7,119	13,818	1,684	38%	25	14,556	16,201	18,301	11%
	3007	458,852	746,480	547,818	93,899	444,367	15,424	17%	18	497,710	515,725	556,363	6%
Commodities	4001	1,040	74,785	33,256	21,810	29,566	15,344	66%	11	18,319	31,295	44,393	42%
	4002	313,082	400,573	361,772	27,295	406,816	18,664	8%	9	351,517	364,244	382,910	4%
	4003	265,359	528,885	442,213	104,776	594,407	30,981	24%	8	379,122	482,254	511,795	15%
	4004	49,501	391,907	300,008	105,497	290,129	21,402	35%	8	305,250	332,146	351,850	7%
Credit Spread	5001	3,684	7,182	5,789	1,026	6,655	559	18%	17	5,351	6,014	6,284	8%
	5002	14,764	56,136	23,216	9,667	82,166	2,742	42%	16	18,181	22,263	22,795	11%
	5003	2,787	5,673	3,959	906	1,032	683	23%	19	3,106	3,808	4,748	21%
	5004	6,124	32,650	10,343	6,305	30,747	1,410	61%	16	7,363	9,286	10,140	16%
	5005	2,078	5,662	4,036	968	1,437	728	24%	18	3,582	4,082	4,855	15%
	5006	4,195	7,257	5,338	862	4,888	716	16%	18	4,593	5,524	6,025	13%
	5007	21,191	232,389	64,450	61,615	100,741	7,508	90%	17	27,023	33,506	65,043	41%
	5008	53,323	114,531	72,696	14,358	81,480	6,179	20%	20	63,702	70,852	77,268	10%
	5009	5,160	14,285	8,089	2,694	4,334	1,311	33%	19	6,074	7,732	10,252	26%
	5010	14,242	23,843	18,406	2,826	4,056	1,436	15%	19	16,014	18,646	19,850	11%
	5011	28,871	42,109	34,655	3,761	5,329	2,265	11%	17	31,384	35,201	37,056	8%
	5012	1,774	5,506	2,701	954	5,028	170	35%	18	2,173	2,336	2,977	16%
	5013	8,963	20,220	13,917	3,327	4,472	2,482	24%	19	11,149	14,372	16,435	19%
	5014	2,734	20,975	5,203	4,474	11,965	407	86%	18	3,320	3,639	4,735	18%
	5015	18,480	34,128	23,371	4,746	6,521	1,405	20%	18	20,118	21,841	23,478	8%
	5016	24,485	115,586	45,200	21,670	132,159	5,165	48%	15	33,006	41,402	45,979	16%
	5017	12,202	65,078	31,805	14,906	74,732	4,743	48%	15	22,213	24,366	46,463	35%
	5018	33,949	171,139	71,102	35,018	185,268	14,166	49%	15	47,598	63,604	97,993	35%
	5019	7,786	26,259	11,301	4,967	11,210	641	44%	18	8,338	9,005	14,257	26%
	5020	143,058	247,684	163,158	22,836	99,392	5,900	14%	20	150,459	155,266	167,424	5%
	5021	13,238	108,077	28,670	20,998	82,435	3,311	73%	18	19,517	22,413	28,601	19%
	5022	134,571	579,293	176,943	100,985	504,176	9,241	57%	18	146,143	154,837	162,886	5%
	5023	14,552	106,081	63,745	22,381	32,623	11,231	35%	12	52,062	67,122	73,290	17%
	5024	20,916	249,801	51,109	54,740	125,464	9,679	107%	17	24,603	32,520	62,656	44%
	5025	40,353	152,578	56,882	27,737	157,463	3,758	49%	15	43,601	48,178	56,145	13%
	5026	19,540	149,342	33,724	29,655	90,143	3,558	88%	18	22,379	25,356	30,545	15%
	5027	13,526	141,403	29,213	29,989	67,548	2,225	103%	17	17,093	19,610	25,432	20%
CTP	6001								3				
	6002								3				
	6003								3				
	6004								3				
	6005								2				
ALL-IN no-CTP **	10000	507,363	924,047	784,995	132,209	526,939	77,918	17%	8	752,455	781,685	892,671	9%
Equity Cumulative **	11000	172,417	1,140,955	277,863	233,261	704,409	7,082	84%	16	200,190	204,976	256,565	12%
IR Cumulative **	12000	113,985	473,841	352,413	87,411	166,433	19,917	25%	22	340,744	365,503	380,578	6%
FX Cumulative **	13000	527,286	1,063,354	775,752	116,109	244,344	39,966	15%	25	728,287	783,915	790,423	4%
Commodity Cumulative **	14000	312,413	438,613	363,904	36,733	406,248	21,210	10%	9	350,784	358,804	384,736	5%
CS Cumulative **	15000	179,493	253,111	212,758	17,124	153,258	7,047	8%	17	204,287	210,677	225,148	5%
CTP Cumulative **	16000								3				

'Dev trunc is the standard deviation computed excluding values below the 5th and above the 95th percentile

ders to the number of banks included in the computation of the statistics

** *For the aggregated portfolios (60 to 66), banks that reported at least a missing portfolio IMV among the ones composing the aggregate are not included in the computation of the benchmarks for that particular aggregate portfolio.*

Table 25: sVaR/VaR statistics

EU Statistics for sVaR/VaR

	Port. ID	Main statistics: Min	Max	Ave.	STDev	STDev_trunc[1]	MAD (median absolute deviation)	Coefficient of variation (STDev/Mean)	Num obs.[2]	Percentiles: 25th	50th	75th	IQD
Equity	1001	0.63	6.53	2.61	1.02			39%	28	2.20	2.41	2.90	14%
	1002	1.89	5.90	4.44	1.20			27%	22	3.92	4.71	5.43	16%
	1003	0.87	5.60	2.31	0.98			42%	23	1.82	2.19	2.55	17%
	1004	0.43	6.09	2.03	1.45			71%	21	1.21	1.44	2.55	36%
	1005	1.21	5.34	2.71	0.91			34%	27	2.09	2.71	3.26	22%
	1006	0.90	3.75	2.08	0.73			35%	24	1.68	2.02	2.47	19%
	1007	0.80	15.60	3.87	2.93			76%	20	2.74	3.19	3.82	16%
	1008	0.80	3.81	1.95	0.69			35%	22	1.60	1.84	2.06	12%
	1009	1.00	3.67	1.73	0.64			37%	25	1.43	1.51	1.68	8%
	1010	1.26	5.06	3.79	0.95			25%	25	3.26	3.76	4.55	16%
	1011	1.14	4.00	2.43	0.54			22%	27	2.17	2.36	2.81	13%
	1012	1.09	6.46	2.62	0.97			37%	27	2.21	2.39	2.82	12%
	1013	0.46	5.63	1.63	1.10			68%	29	0.93	1.44	1.65	28%
	1014	1.21	3.73	2.24	0.61			27%	28	1.83	2.26	2.53	16%
	1015	1.33	3.56	2.29	0.59			26%	19	1.98	2.34	2.59	13%
	1016	0.94	5.64	2.11	1.38			65%	11	1.23	1.42	2.75	38%
Interest Rate	2001	0.60	1.54	1.09	0.19			17%	34	0.97	1.08	1.19	10%
	2002	0.36	2.07	0.96	0.32			33%	38	0.73	1.00	1.16	23%
	2003	0.20	1.79	1.13	0.39			34%	33	0.96	1.18	1.33	16%
	2004	0.09	3.35	0.94	0.53			56%	36	0.65	0.82	1.17	29%
	2005	0.88	5.97	2.22	1.50			68%	14	1.22	1.66	2.36	32%
	2006	0.57	2.39	1.46	0.48			33%	27	1.07	1.44	1.81	25%
	2007	0.60	2.32	1.27	0.42			33%	30	0.97	1.24	1.45	20%
	2008	0.71	5.12	1.49	0.81			54%	27	1.11	1.30	1.57	17%
	2009	0.48	1.91	1.33	0.32			24%	37	1.22	1.33	1.58	13%
	2010	0.32	1.75	1.04	0.27			26%	33	0.91	1.05	1.18	13%
	2011	0.47	2.30	1.06	0.34			32%	38	0.86	1.06	1.17	16%
	2012	0.48	2.57	1.32	0.50			38%	33	1.05	1.27	1.61	21%
	2013	0.49	4.09	1.20	0.64			54%	37	0.89	1.05	1.26	17%
	2014	0.42	10.56	3.26	2.32			71%	25	1.39	2.68	4.18	50%
	2015	0.62	5.28	2.47	1.11			45%	35	1.77	2.34	3.05	27%
	2016	0.59	2.97	1.07	0.44			41%	28	0.81	0.97	1.18	19%
	2017	0.75	13.20	5.53	2.97			54%	29	3.48	5.60	6.83	32%
	2018	0.47	1.75	1.03	0.26			25%	35	0.90	1.06	1.19	14%
	2019	0.77	7.52	2.17	1.32			61%	34	1.37	1.95	2.39	27%
	2020	0.15	12.26	3.68	2.70			73%	38	1.83	2.71	5.35	49%
	2021	0.49	3.58	1.32	0.57			43%	31	0.95	1.22	1.49	22%
	2022	0.55	2.59	1.32	0.45			34%	29	1.00	1.27	1.53	21%
	2023	0.55	2.20	1.23	0.36			29%	37	0.97	1.19	1.45	20%
FX	3001	0.78	3.49	2.02	0.52			26%	32	1.79	2.13	2.27	12%
	3002	0.12	2.94	1.86	0.65			35%	30	1.37	2.09	2.24	24%
	3003	1.07	4.98	2.35	0.91			39%	28	1.92	2.11	2.33	10%
	3004	0.85	10.63	2.41	1.61			67%	30	1.95	2.26	2.48	12%
	3005	1.03	8.75	3.12	1.32			42%	33	2.61	3.08	3.39	13%
	3006	0.16	34.50	3.94	6.53			166%	36	1.37	2.13	2.69	33%
	3007	0.99	3.84	2.73	0.71			26%	28	2.51	2.88	3.19	12%
Commodities	4001	0.30	5.42	2.11	1.26			60%	15	1.11	1.83	2.83	43%
	4002	1.31	3.13	1.82	0.44			24%	13	1.58	1.67	2.05	13%
	4003	1.70	3.40	2.55	0.49			19%	11	2.43	2.56	2.71	5%
	4004	1.20	2.68	2.20	0.40			18%	12	2.11	2.20	2.47	8%
Credit Spread	5001	0.99	5.06	2.34	0.97			41%	22	1.68	1.95	2.86	26%
	5002	1.04	7.79	3.72	1.65			44%	16	2.94	3.35	4.20	18%
	5003	1.02	3.67	2.58	0.69			27%	23	2.19	2.62	3.05	16%
	5004	1.04	9.65	4.29	2.74			64%	19	2.36	3.15	6.50	47%
	5005	1.06	9.47	4.32	2.24			52%	22	2.38	3.73	6.07	44%
	5006	1.10	13.83	4.13	2.83			69%	23	2.43	2.95	5.24	37%
	5007	0.22	4.62	2.10	1.11			53%	22	1.41	1.98	2.79	33%
	5008	0.29	3.31	1.34	0.59			44%	24	1.03	1.21	1.63	22%
	5009	0.51	3.14	1.53	0.66			43%	26	1.02	1.45	1.75	26%
	5010	0.38	3.35	1.53	0.64			42%	23	1.04	1.52	1.87	28%
	5011	0.33	10.21	1.91	1.86			97%	24	1.08	1.54	1.93	28%
	5012	0.54	6.00	2.96	1.53			52%	21	1.70	3.09	3.28	32%
	5013	1.02	4.57	2.30	1.01			44%	22	1.69	1.89	2.87	26%
	5014	0.59	10.08	3.14	2.24			71%	22	1.57	2.74	3.52	38%
	5015	0.93	1.87	1.31	0.28			21%	22	1.10	1.26	1.43	13%
	5016	1.15	8.70	2.34	1.67			71%	19	1.38	1.81	2.57	30%
	5017	1.13	3.72	2.29	0.86			37%	19	1.65	2.40	2.94	28%
	5018	1.12	5.44	2.43	1.25			51%	19	1.47	2.09	2.83	31%
	5019	0.83	9.38	2.36	1.72			73%	22	1.68	1.93	2.27	15%
	5020	0.52	2.64	1.23	0.42			34%	27	0.99	1.11	1.36	16%
	5021	1.03	11.30	4.30	2.65			62%	21	2.28	3.71	6.17	46%
	5022	0.91	2.57	1.47	0.46			31%	19	1.18	1.31	1.66	17%
	5023	1.09	4.19	2.27	0.81			36%	13	1.67	2.07	2.72	24%
	5024	1.13	6.61	2.19	1.38			63%	19	1.49	1.63	2.08	17%
	5025	1.25	4.99	2.12	0.91			43%	23	1.42	1.98	2.36	25%
	5026	0.80	2.95	1.63	0.58			36%	25	1.34	1.55	2.10	26%
	5027	0.23	2.77	1.47	0.61			42%	25	1.05	1.33	1.82	27%
CTP	6001								4				
	6002								4				
	6003								3				
	6004								3				
	6005								2				
ALL-IN no-CTP **	10000	1.77	3.03	2.31	0.37			16%	11	2.05	2.46	2.53	10%
Equity Cumulative **	11000	1.35	7.70	2.79	1.29			46%	22	1.95	2.57	3.08	22%
IR Cumulative **	12000	0.62	1.81	1.15	0.26			22%	31	0.97	1.19	1.28	14%
FX Cumulative **	13000	1.03	4.40	2.27	0.74			33%	34	1.92	2.21	2.61	15%
Commodity Cumulative **	14000	1.45	4.08	2.01	0.74			37%	13	1.57	1.71	2.06	13%
CS Cumulative **	15000	0.92	2.52	1.46	0.46			32%	23	1.10	1.22	1.74	23%
CTP Cumulative **	16000								2				

[1] Dev trunc is the standard deviation computed excluding values below the 5th and above the 95th percentile

[2] ders to the number of banks included in the computation of the statistics

** For the aggregated portfolios (60 to 66), banks that reported at least a missing portfolio IMV among the ones composing the aggregate are not included in the computation of the benchmarks for that particular aggregate portfolio.

Table 26: P&L VaR/VaR statistics

EU Statistics for P&L VaR/VaR

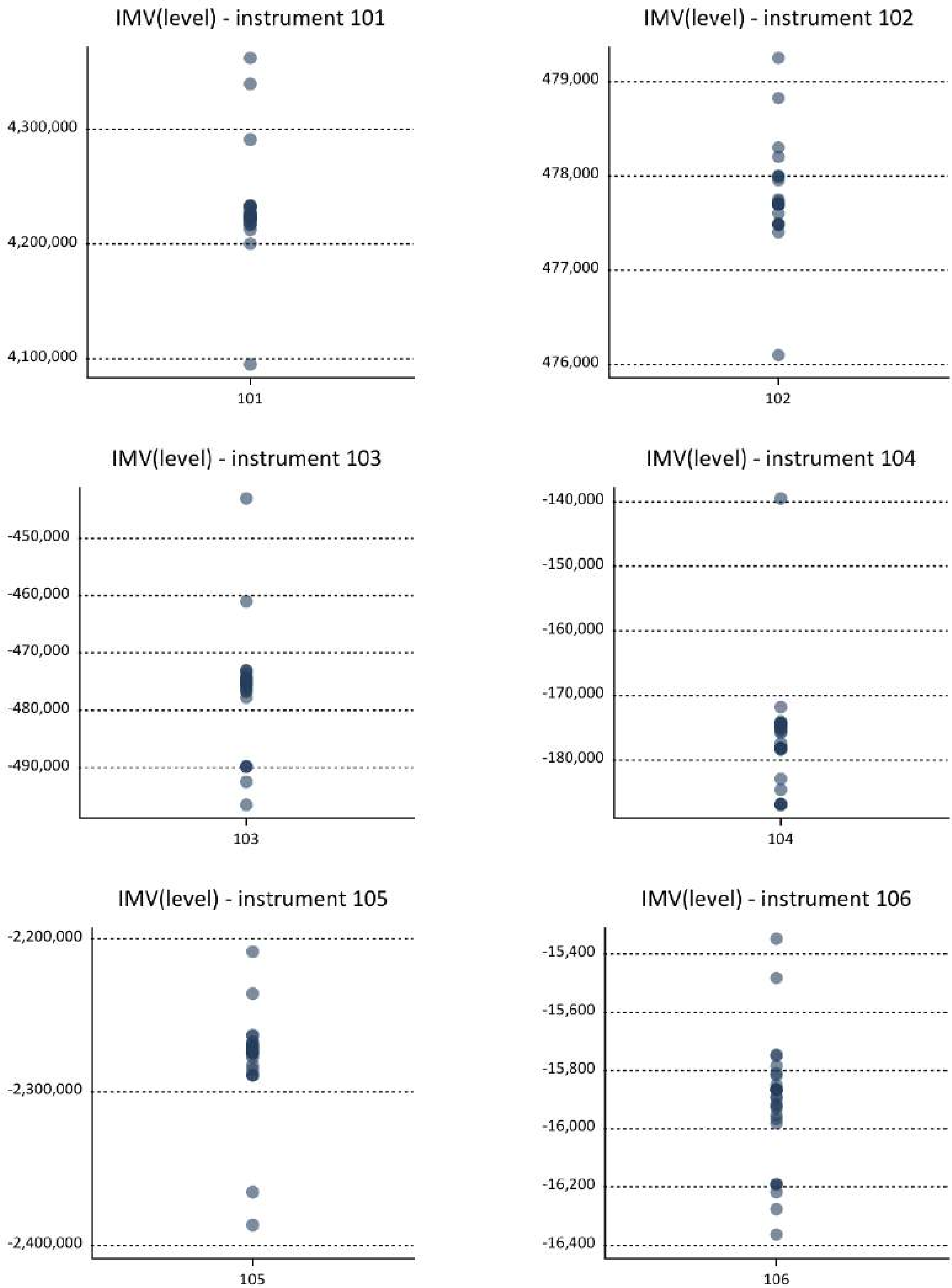
		Main statistics								Percentiles		
	Port. ID	Min	Max	Ave.	STDev	STDev_trunc [1]	MAD (median absolute deviation)	Coefficient of variation (STDev/Mean)	Num obs. [2]	25th	50th	75th
Equity	1001	0.05	1.29	0.96	0.27			28%	21	0.99	1.01	1.07
	1002	0.07	1.31	0.91	0.30			33%	16	0.96	1.01	1.01
	1003	0.12	2.55	1.14	0.49			43%	19	1.08	1.14	1.30
	1004	0.01	1.41	0.77	0.38			50%	18	0.50	0.90	1.06
	1005	0.32	179.68	26.89	60.02			223%	20	1.01	1.04	1.34
	1006	0.11	1.87	1.08	0.39			36%	19	1.00	1.14	1.28
	1007	0.11	1.89	1.02	0.44			44%	14	0.79	1.06	1.18
	1008	0.05	1.20	0.89	0.29			32%	19	0.81	0.97	1.06
	1009	0.09	1.73	1.19	0.38			32%	20	1.09	1.27	1.33
	1010	0.07	1.47	0.95	0.30			31%	19	0.98	1.01	1.06
	1011	0.05	1.31	0.96	0.29			30%	19	1.00	1.02	1.07
	1012	0.05	1.29	0.96	0.29			30%	19	0.99	1.01	1.09
	1013	0.09	1.85	1.16	0.42			36%	20	1.08	1.15	1.39
	1014	0.04	1.40	0.82	0.29			36%	19	0.78	0.84	0.90
	1015	0.04	1.19	0.76	0.28			37%	17	0.61	0.84	0.88
	1016	0.33	1.25	0.94	0.31			33%	6	0.85	1.03	1.16
Interest Rate	2001	0.08	1.34	0.97	0.26			27%	24	0.99	1.03	1.07
	2002	0.09	1.28	1.01	0.27			26%	25	1.00	1.07	1.16
	2003	0.08	1.22	0.96	0.24			25%	26	0.99	1.01	1.04
	2004	0.06	1.22	0.98	0.26			26%	24	0.94	1.03	1.12
	2005	0.32	1.62	0.97	0.35			36%	12	0.86	1.05	1.12
	2006	0.06	1.83	1.09	0.35			32%	22	1.02	1.09	1.24
	2007	0.08	1.87	1.12	0.32			29%	22	1.01	1.07	1.17
	2008	0.09	2.36	1.15	0.42			36%	25	1.02	1.07	1.23
	2009	0.57	1.20	0.99	0.16			16%	26	1.00	1.01	1.06
	2010	0.08	1.34	0.97	0.26			27%	24	0.99	1.03	1.07
	2011	0.32	1.20	1.01	0.19			18%	24	1.01	1.06	1.12
	2012	0.16	2.50	1.08	0.44			41%	25	1.02	1.05	1.20
	2013	0.05	1.14	0.93	0.24			26%	23	0.92	1.00	1.03
	2014	0.05	1.65	0.95	0.36			38%	17	0.85	1.01	1.17
	2015	0.07	1.40	0.89	0.31			34%	22	0.77	1.03	1.06
	2016	0.11	1.36	1.00	0.27			27%	23	0.99	1.03	1.05
	2017	0.06	1.74	1.04	0.36			35%	23	0.98	1.04	1.22
	2018	0.11	2.00	1.02	0.34			33%	25	1.00	1.03	1.07
	2019	0.01	2.35	1.08	0.45			41%	25	1.02	1.05	1.12
	2020	0.06	1.38	1.01	0.28			28%	26	0.99	1.07	1.17
	2021	0.10	1.97	1.07	0.38			35%	23	1.00	1.04	1.13
	2022	0.11	3.16	1.15	0.60			53%	20	1.00	1.05	1.12
	2023	0.10	3.19	1.29	0.53			41%	27	1.05	1.23	1.40
FX	3001	0.08	1.58	0.96	0.29			30%	25	0.99	1.01	1.04
	3002	0.06	1.62	1.01	0.27			26%	24	0.96	1.03	1.11
	3003	0.10	1.61	1.01	0.29			29%	26	0.99	1.03	1.12
	3004	0.32	1.30	0.98	0.18			18%	25	0.99	1.02	1.06
	3005	0.06	1.20	0.96	0.24			26%	24	1.00	1.02	1.07
	3006	0.07	1.32	0.92	0.27			30%	25	0.84	1.03	1.07
	3007	0.09	1.30	0.94	0.24			25%	18	0.95	1.02	1.03
Commodities	4001	0.34	2.00	0.98	0.48			49%	11	0.62	1.03	1.13
	4002	0.30	1.07	0.90	0.22			25%	9	0.89	0.98	1.02
	4003	0.34	1.34	1.05	0.29			28%	8	1.02	1.12	1.22
	4004	0.33	1.31	0.93	0.29			32%	8	0.79	1.02	1.12
Credit Spread	5001	0.10	1.70	1.07	0.35			33%	19	1.01	1.07	1.26
	5002	0.08	1.31	0.97	0.31			32%	16	1.00	1.09	1.13
	5003	0.37	1.35	1.00	0.23			23%	19	1.02	1.05	1.09
	5004	0.09	1.62	1.02	0.35			34%	16	1.01	1.11	1.19
	5005	0.33	2.83	1.23	0.51			41%	18	1.04	1.14	1.20
	5006	0.48	2.17	1.23	0.33			27%	18	1.09	1.15	1.34
	5007	0.07	1.50	0.95	0.33			34%	15	0.98	1.04	1.07
	5008	0.08	1.52	0.99	0.26			27%	20	1.01	1.05	1.08
	5009	0.32	1.42	1.01	0.26			26%	18	0.97	1.05	1.12
	5010	0.32	1.62	1.05	0.26			25%	20	1.01	1.02	1.20
	5011	0.33	1.20	0.98	0.18			19%	20	0.98	1.01	1.05
	5012	0.35	2.35	1.12	0.39			35%	17	0.96	1.03	1.18
	5013	0.37	1.78	1.15	0.30			26%	20	1.01	1.12	1.27
	5014	0.07	1.46	1.02	0.29			28%	17	1.01	1.05	1.14
	5015	0.10	1.28	0.93	0.28			30%	19	0.92	1.01	1.03
	5016	0.08	1.35	0.94	0.34			36%	14	0.89	1.07	1.12
	5017	0.07	1.45	0.88	0.35			40%	13	0.79	0.98	1.08
	5018	0.08	1.49	0.93	0.36			39%	14	0.81	1.02	1.07
	5019	0.08	1.74	0.95	0.33			35%	20	0.87	1.01	1.04
	5020	0.07	1.13	0.93	0.26			28%	21	1.00	1.02	1.06
	5021	0.07	1.30	0.89	0.29			33%	16	0.78	0.99	1.09
	5022	0.07	1.13	0.91	0.28			31%	18	0.89	1.03	1.05
	5023	0.33	1.22	0.95	0.25			26%	11	0.88	1.05	1.12
	5024	0.76	1.96	1.16	0.29			25%	14	1.02	1.07	1.16
	5025	0.07	1.25	0.94	0.32			34%	14	0.98	1.02	1.11
	5026	0.07	1.49	1.01	0.28			27%	17	1.01	1.03	1.12
	5027	0.08	1.27	1.01	0.27			27%	15	1.01	1.04	1.12
CTP	6001								3			
	6002								3			
	6003								3			
	6004								3			
	6005								2			
ALL-IN no-CTP **	10000	0.33	1.25	0.94	0.24			25%	9	0.95	0.96	1.03
Equity Cumulative **	11000	0.08	1.39	0.96	0.29			30%	14	0.96	0.99	1.05
IR Cumulative **	12000	0.33	2.68	1.07	0.42			39%	19	1.00	1.03	1.11
FX Cumulative **	13000	0.33	1.20	0.96	0.18			19%	23	0.90	1.01	1.05
Commodity Cumulative **	14000	0.30	1.36	0.95	0.28			29%	9	0.84	1.00	1.07
CS Cumulative **	15000	0.39	1.18	0.95	0.19			20%	16	0.96	1.01	1.03
CTP Cumulative **	16000								1			

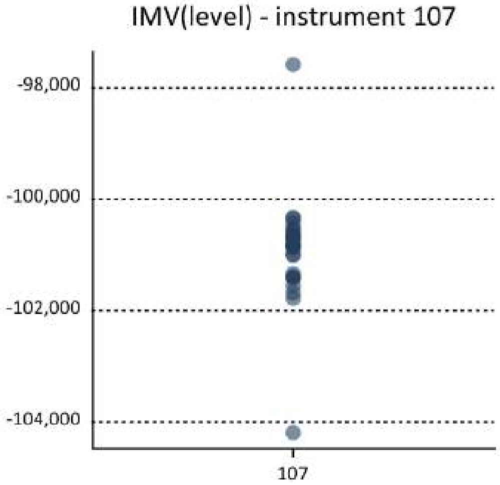
Dev trunc is the standard deviation computed excluding values below the 5th and above the 95th percentile

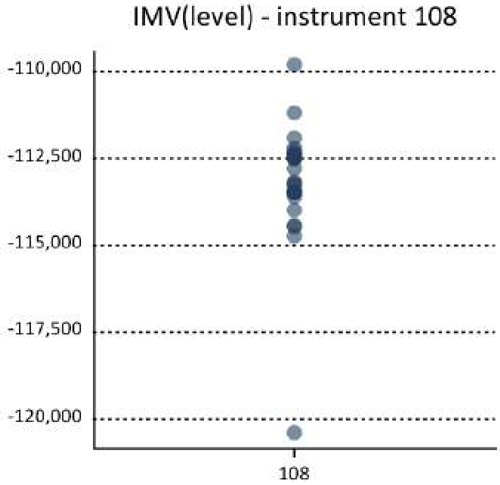
fers to the number of banks included in the computation of the statistics

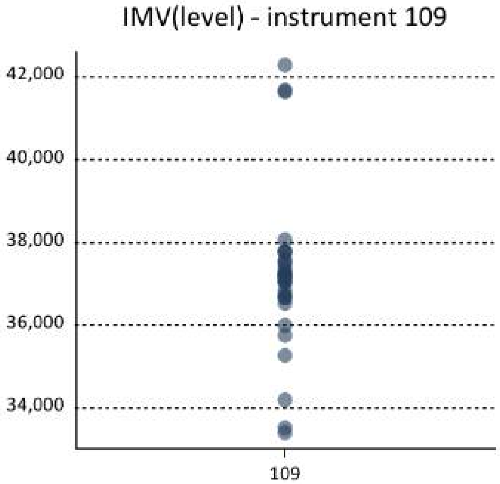
*** For the aggregated portfolios (60 to 66), banks that reported at least a missing portfolio IMV among the ones composing the aggregate are not included in the computation of the benchmarks for that particular aggregate portfolio.*

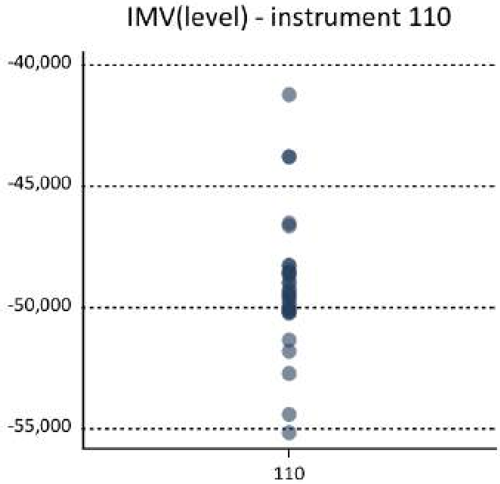
Figure 18: IMV scatter plots (all)

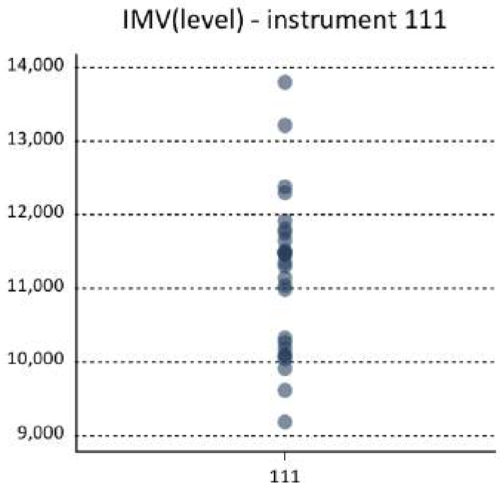


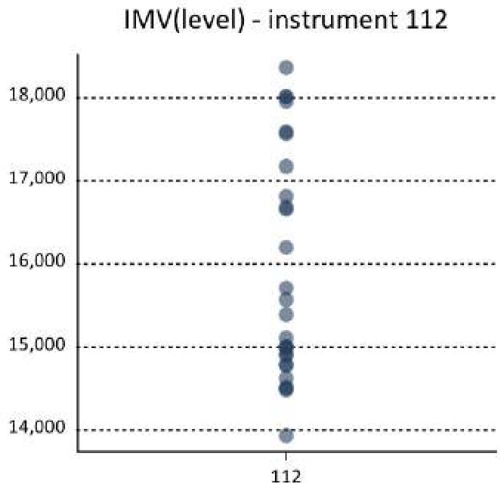

IMV(level) - instrument 107
-98,000
-100,000
-102,000
-104,000
107


IMV(level) - instrument 108
-110,000
-112,500
-115,000
-117,500
-120,000
108

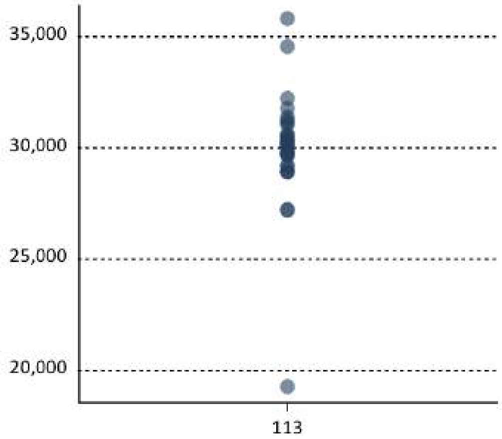

IMV(level) - instrument 109
42,000
40,000
38,000
36,000
34,000
109


IMV(level) - instrument 110
-40,000
-45,000
-50,000
-55,000
110

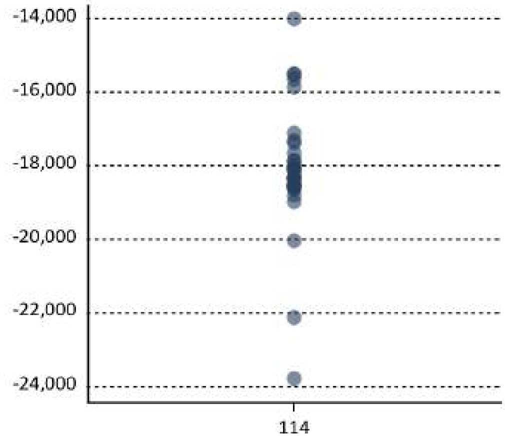

IMV(level) - instrument 111
14,000
13,000
12,000
11,000
10,000
9,000
111


IMV(level) - instrument 112
18,000
17,000
16,000
15,000
14,000
112

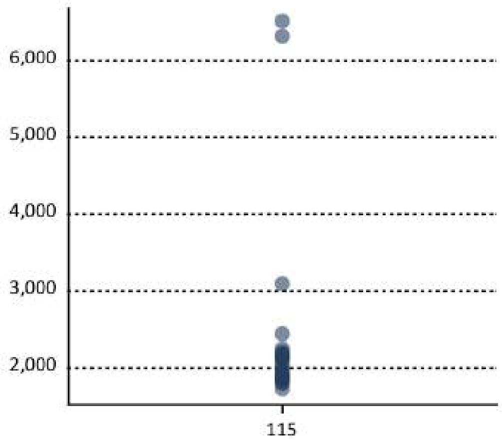
IMV(level) - instrument 113



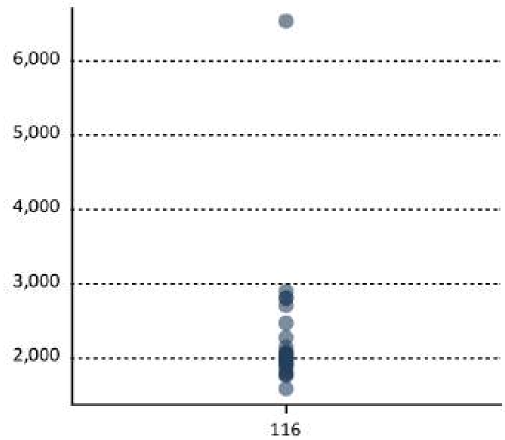
IMV(level) - instrument 114



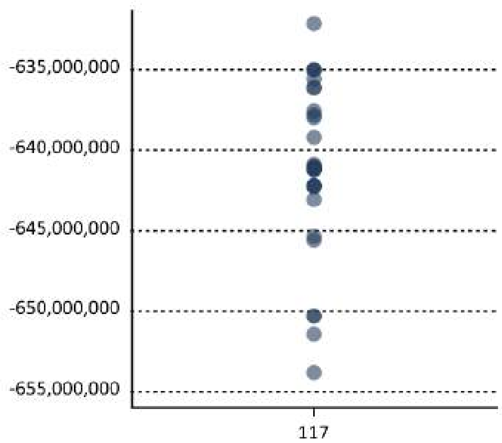
IMV(level) - instrument 115



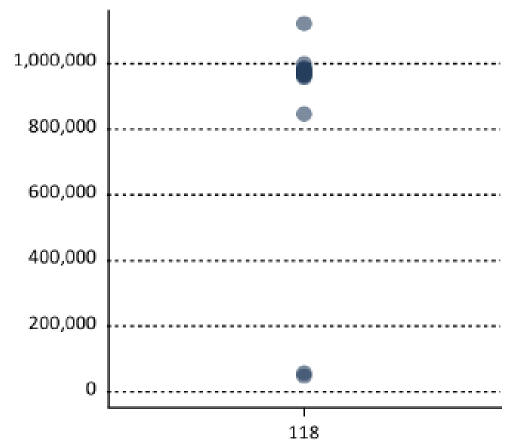
IMV(level) - instrument 116

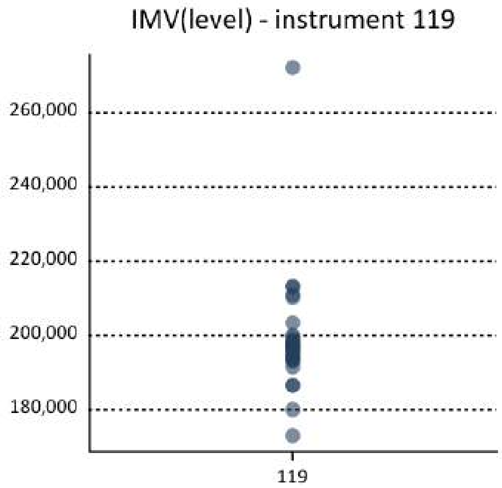


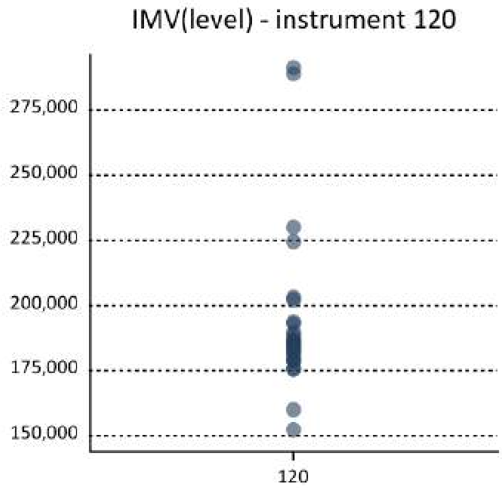
IMV(level) - instrument 117

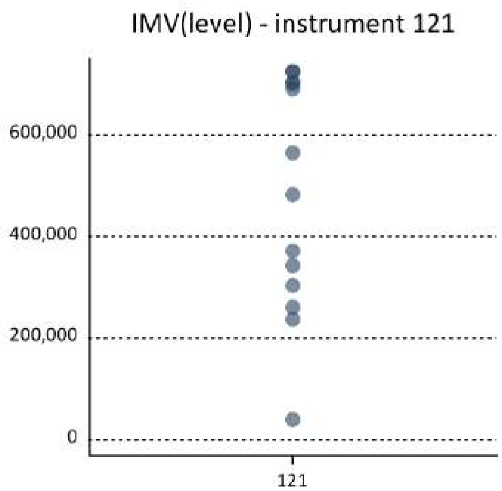


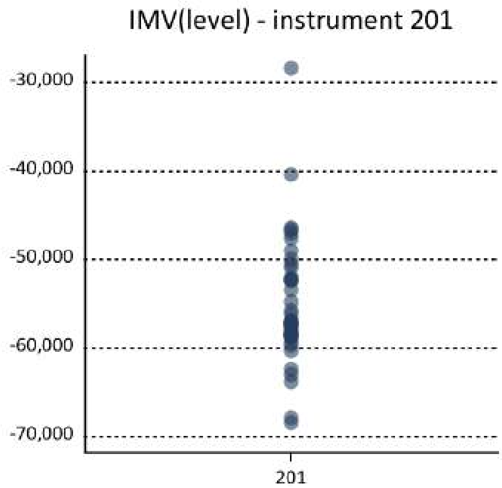
IMV(level) - instrument 118

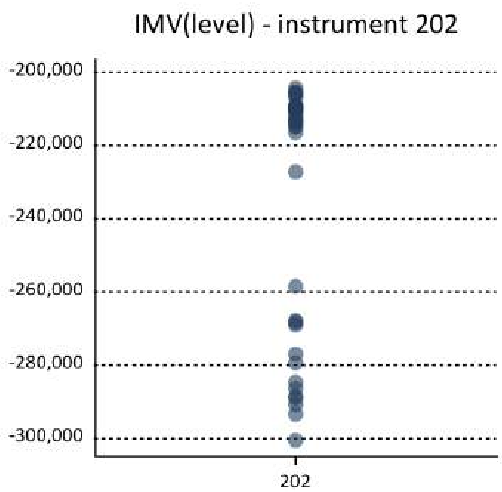


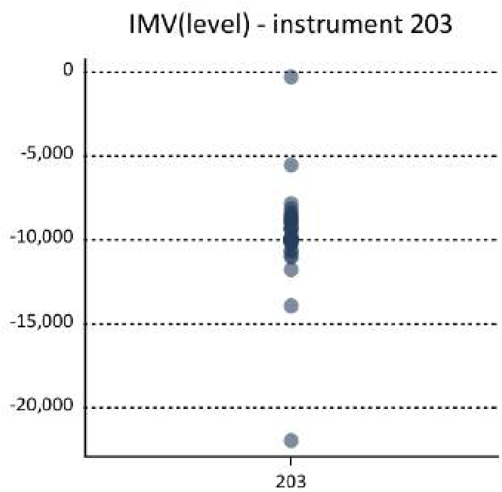

IMV(level) - instrument 119
260,000
240,000
220,000
200,000
180,000
119

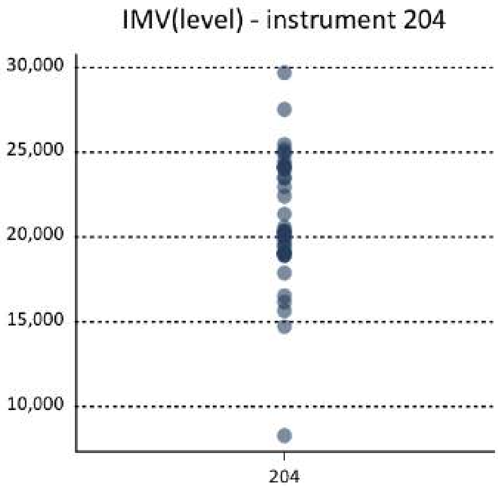

IMV(level) - instrument 120
275,000
250,000
225,000
200,000
175,000
150,000
120

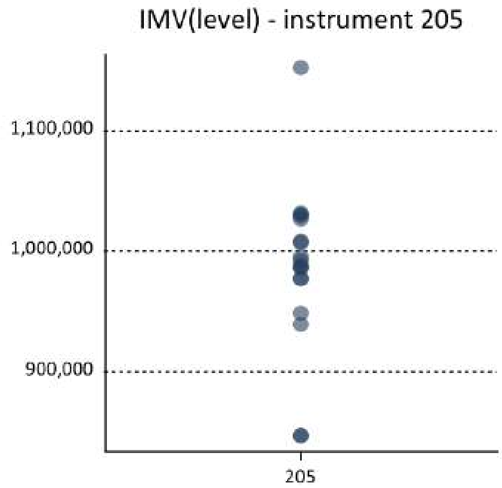

IMV(level) - instrument 121
600,000
400,000
200,000
0
121

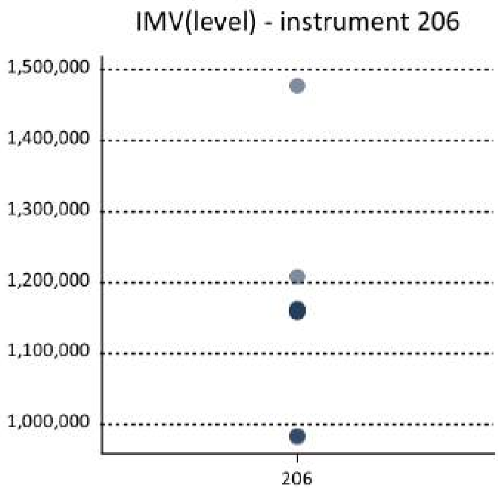

IMV(level) - instrument 201
-30,000
-40,000
-50,000
-60,000
-70,000
201

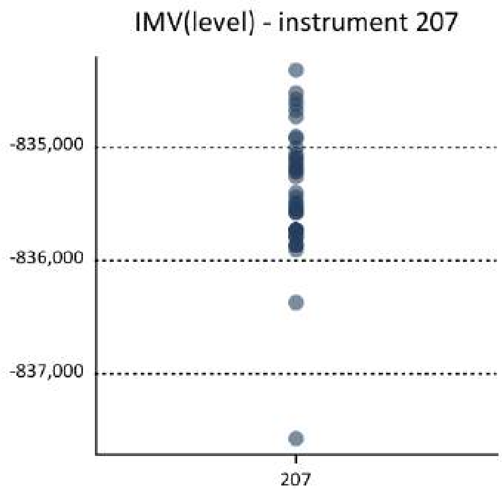

IMV(level) - instrument 202
-200,000
-220,000
-240,000
-260,000
-280,000
-300,000
202

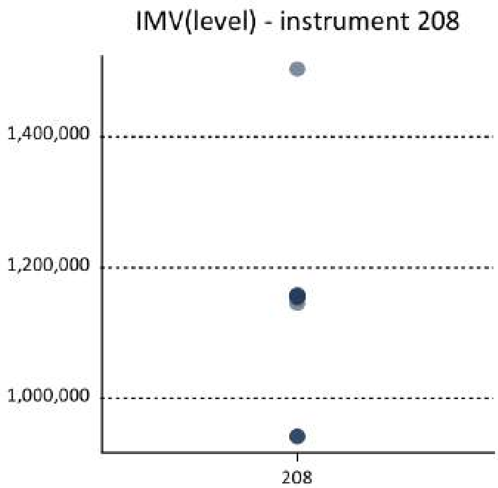

IMV(level) - instrument 203
0
-5,000
-10,000
-15,000
-20,000
203

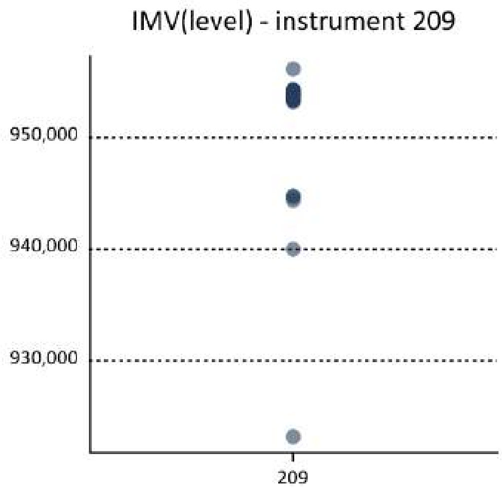

IMV(level) - instrument 204
30,000
25,000
20,000
15,000
10,000
204

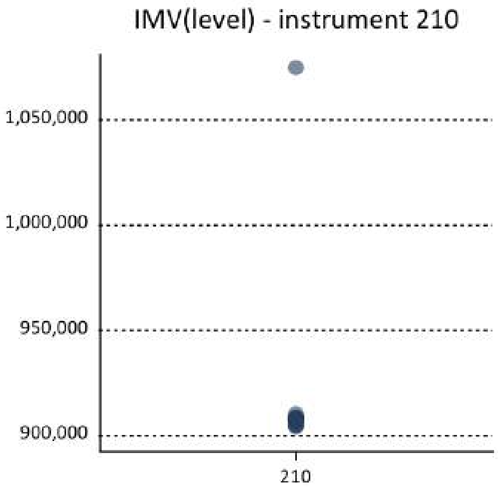

IMV(level) - instrument 205
1,100,000
1,000,000
900,000
205

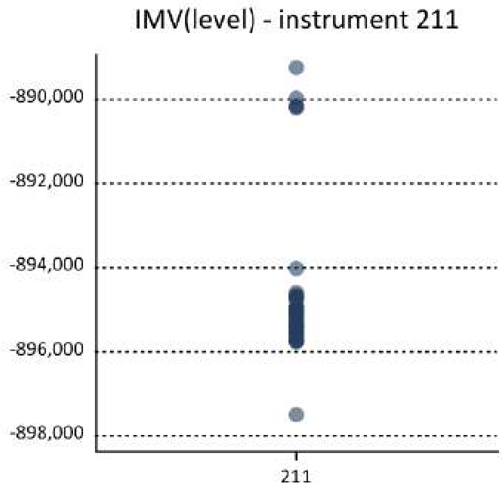

IMV(level) - instrument 206
1,500,000
1,400,000
1,300,000
1,200,000
1,100,000
1,000,000
206

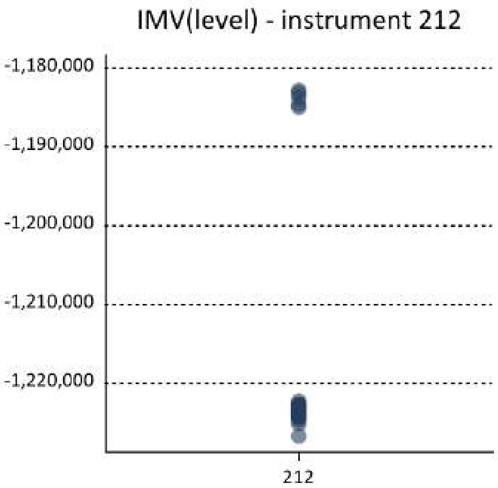

IMV(level) - instrument 207
-835,000
-836,000
-837,000
207

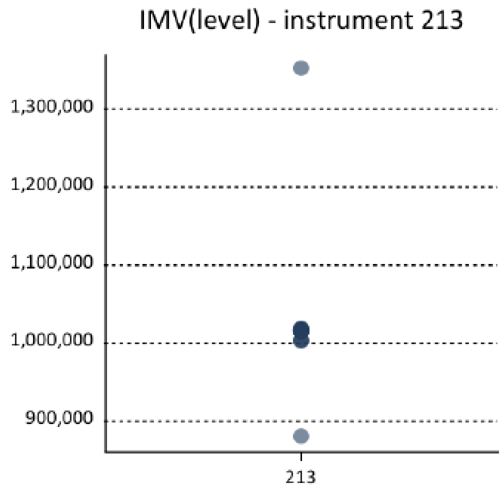

IMV(level) - instrument 208
1,400,000
1,200,000
1,000,000
208

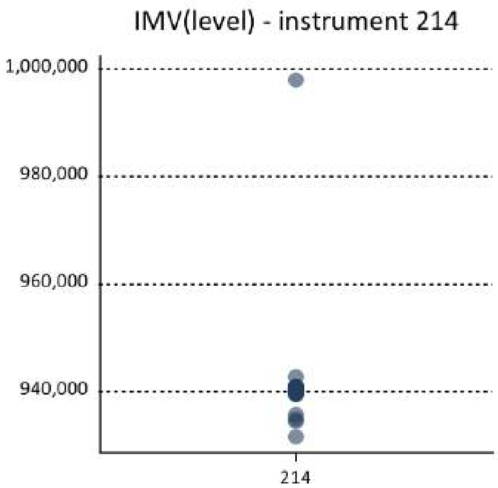

IMV(level) - instrument 209
950,000
940,000
930,000
209

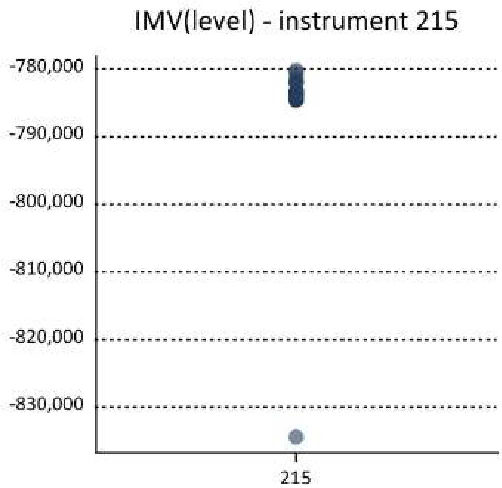

IMV(level) - instrument 210
1,050,000
1,000,000
950,000
900,000
210

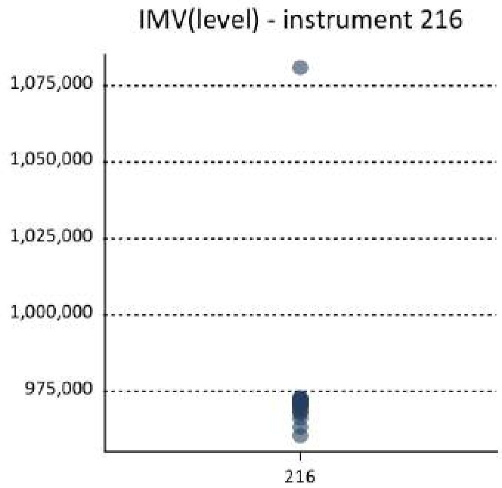

IMV(level) - instrument 211
-890,000
-892,000
-894,000
-896,000
-898,000
211

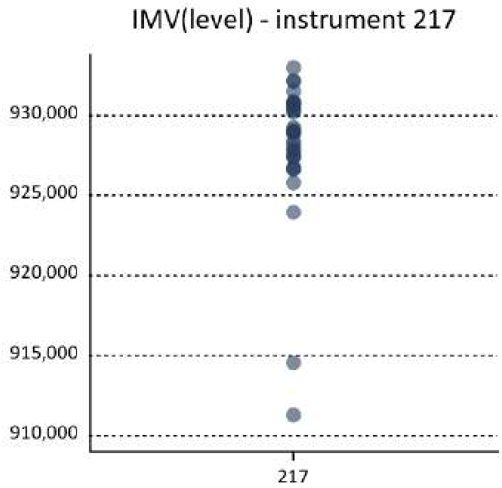

IMV(level) - instrument 212
-1,180,000
-1,190,000
-1,200,000
-1,210,000
-1,220,000
212

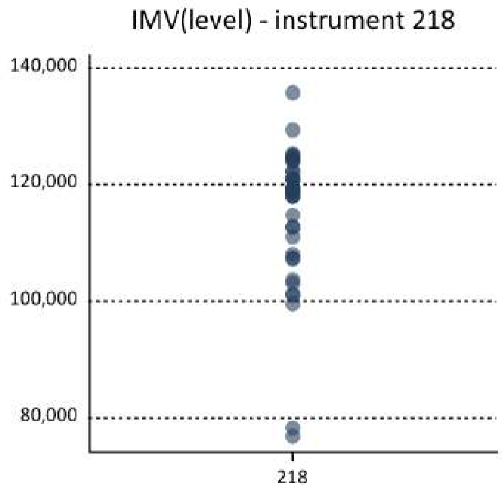

IMV(level) - instrument 213
1,300,000
1,200,000
1,100,000
1,000,000
900,000
213

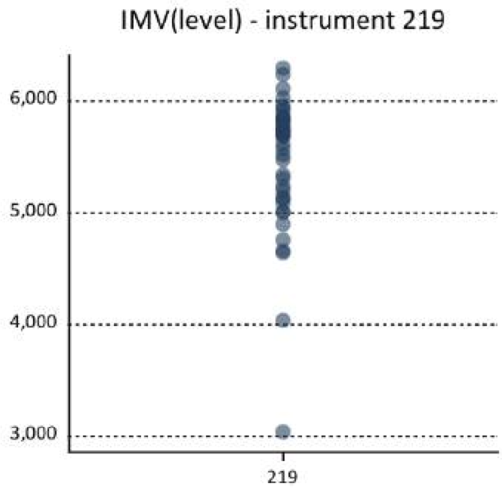

IMV(level) - instrument 214
1,000,000
980,000
960,000
940,000
214

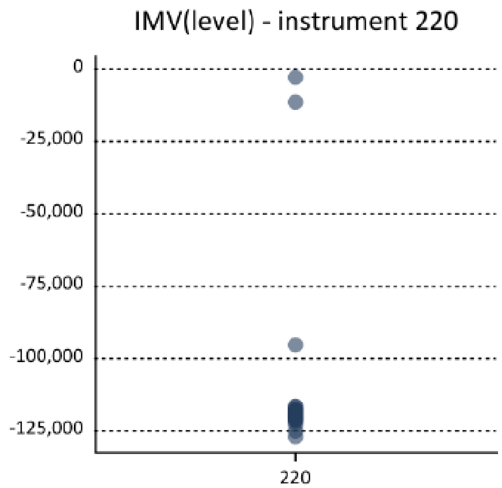

IMV(level) - instrument 215
-780,000
-790,000
-800,000
-810,000
-820,000
-830,000
215

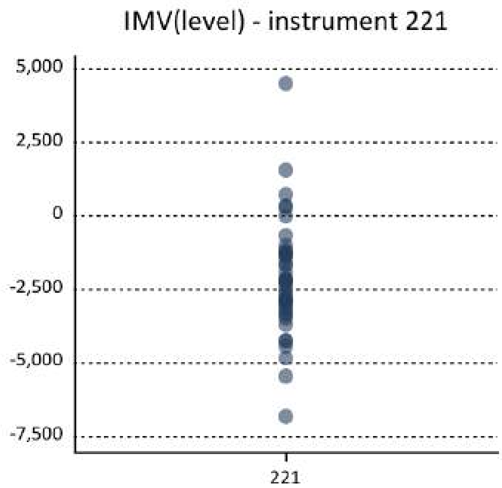

IMV(level) - instrument 216
1,075,000
1,050,000
1,025,000
1,000,000
975,000
216

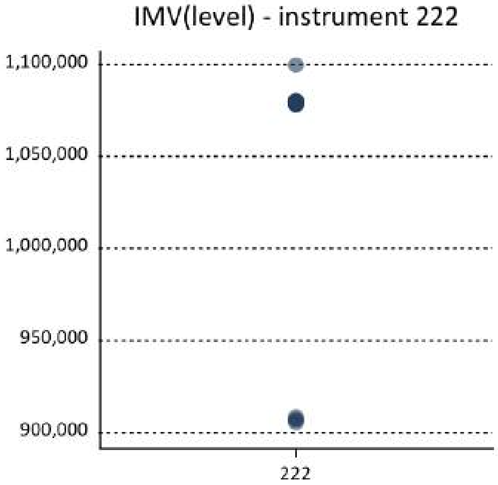

IMV(level) - instrument 217
930,000
925,000
920,000
915,000
910,000
217

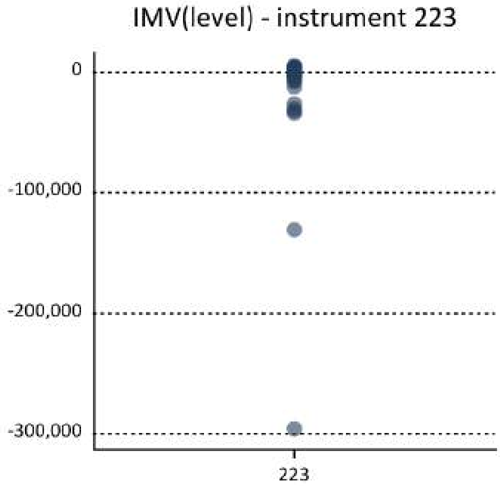

IMV(level) - instrument 218
140,000
120,000
100,000
80,000
218

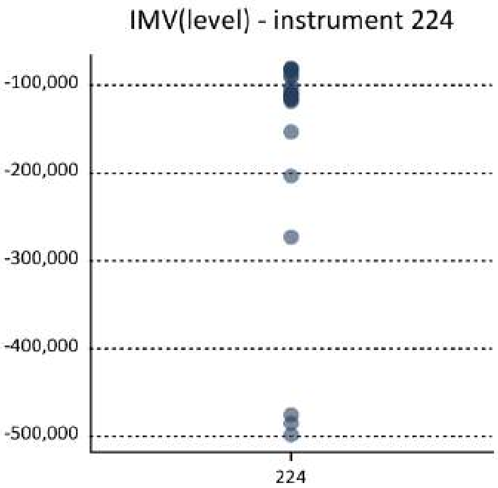

IMV(level) - instrument 219
6,000
5,000
4,000
3,000
219

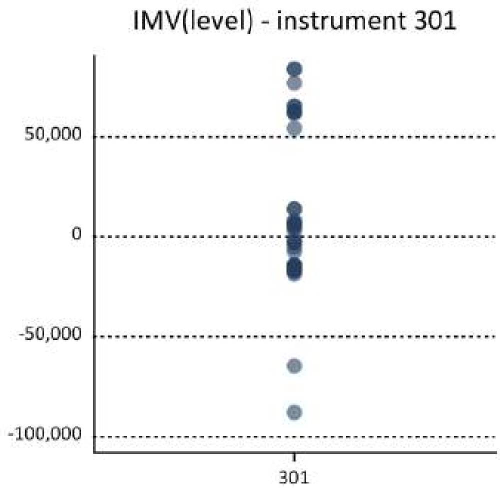

IMV(level) - instrument 220
0
-25,000
-50,000
-75,000
-100,000
-125,000
220

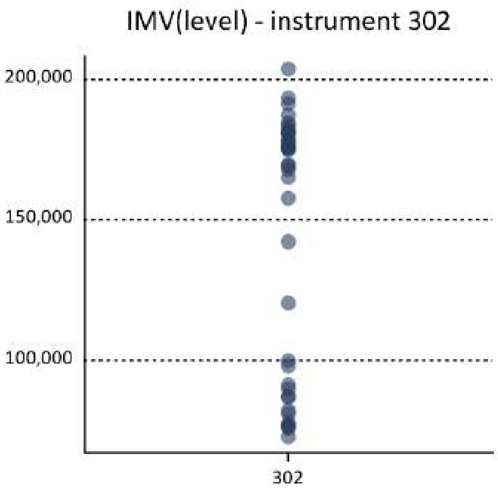

IMV(level) - instrument 221
5,000
2,500
0
-2,500
-5,000
-7,500
221

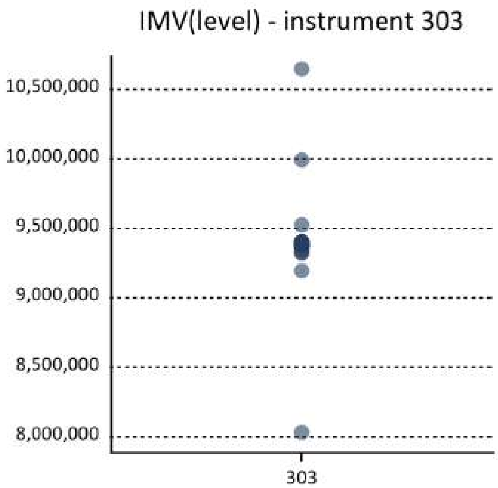

IMV(level) - instrument 222
1,100,000
1,050,000
1,000,000
950,000
900,000
222


IMV(level) - instrument 223
0
-100,000
-200,000
-300,000
223

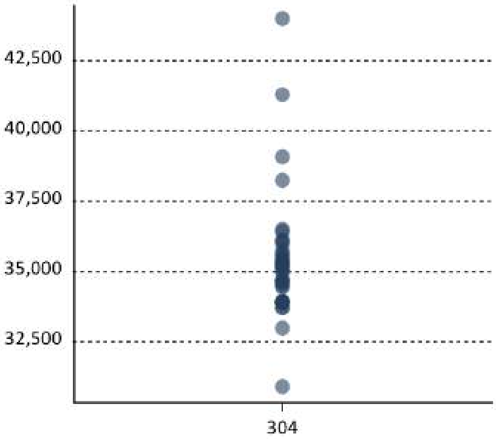

IMV(level) - instrument 224
-100,000
-200,000
-300,000
-400,000
-500,000
224


IMV(level) - instrument 301
50,000
0
-50,000
-100,000
301

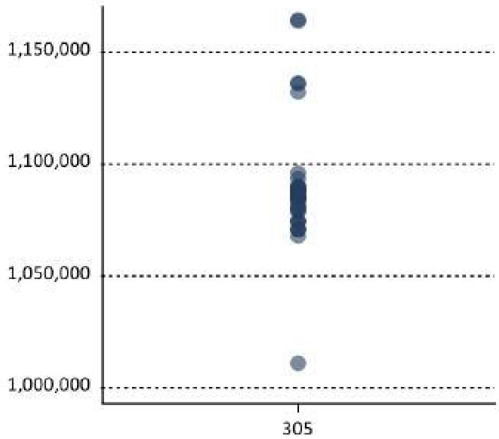

IMV(level) - instrument 302
200,000
150,000
100,000
302


IMV(level) - instrument 303
10,500,000
10,000,000
9,500,000
9,000,000
8,500,000
8,000,000
303

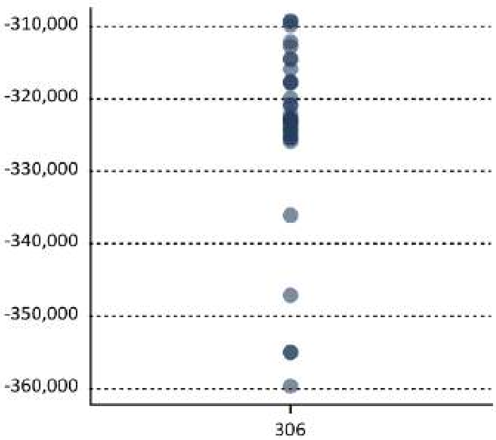
IMV(level) - instrument 304



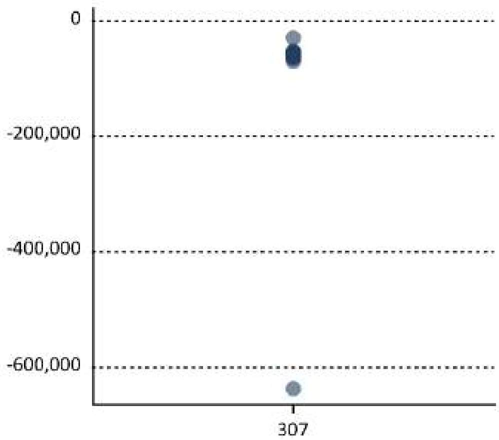
IMV(level) - instrument 305



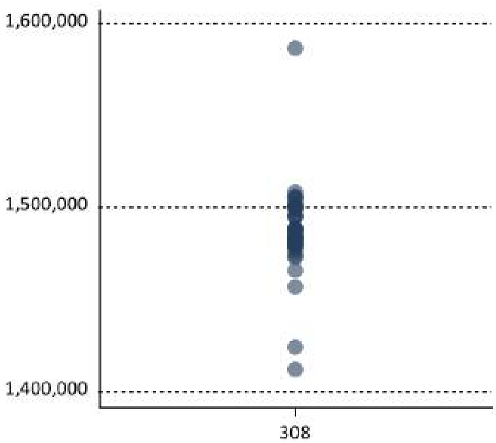
IMV(level) - instrument 306



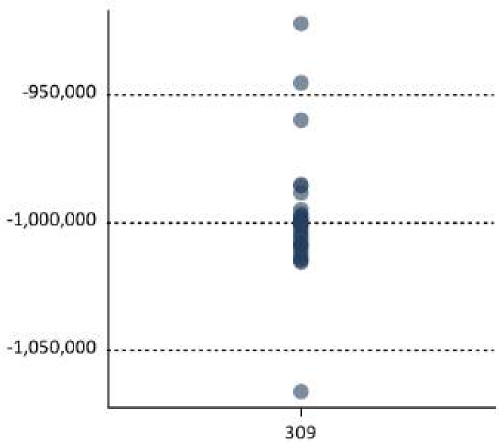
IMV(level) - instrument 307



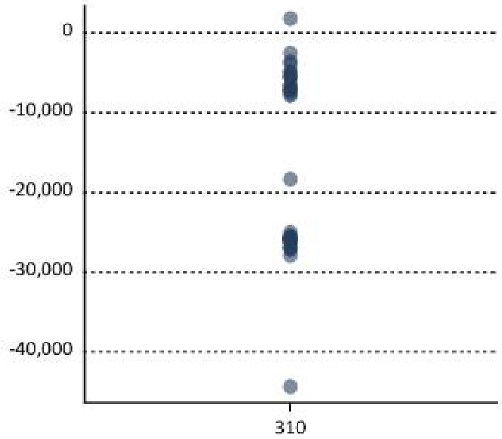
IMV(level) - instrument 308



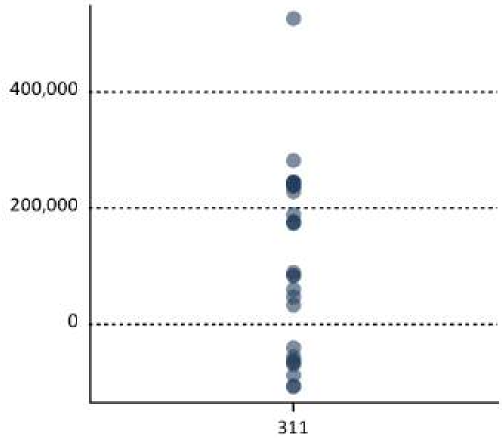
IMV(level) - instrument 309



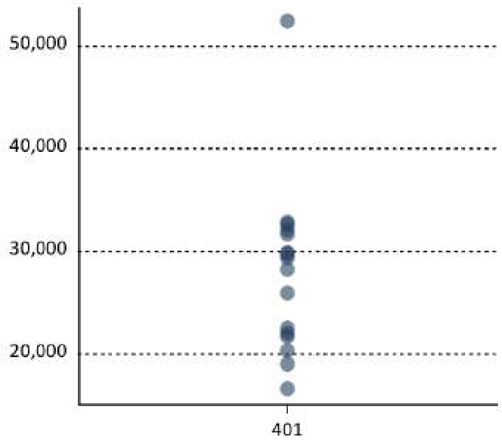
IMV(level) - instrument 310



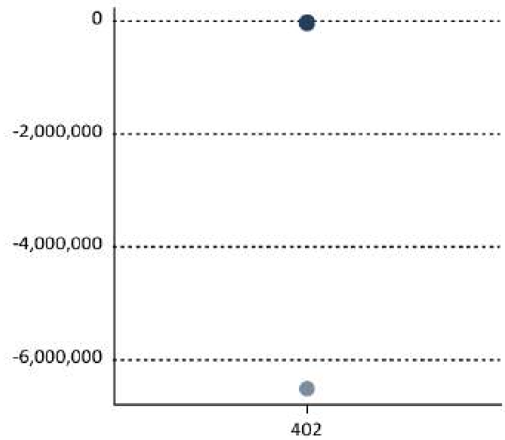
IMV(level) - instrument 311



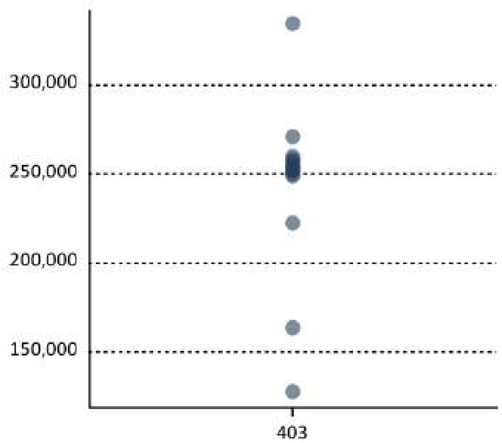
IMV(level) - instrument 401



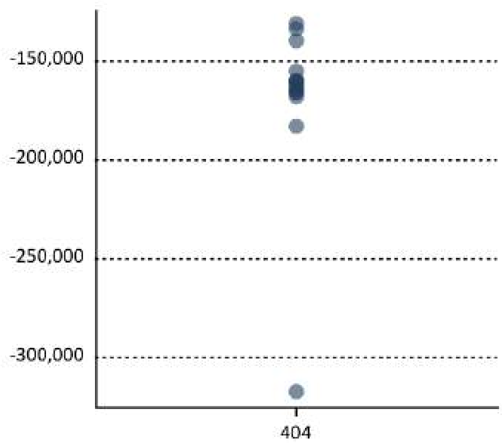
IMV(level) - instrument 402

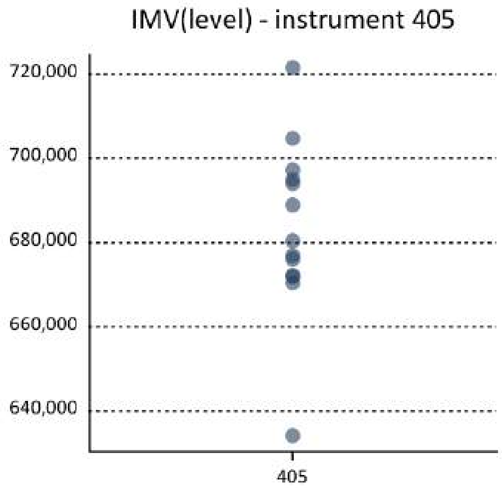


IMV(level) - instrument 403

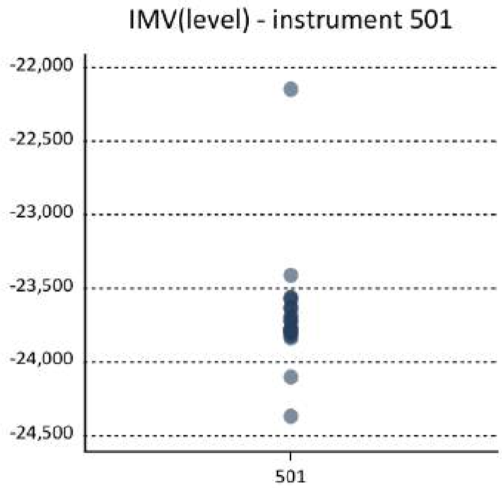


IMV(level) - instrument 404

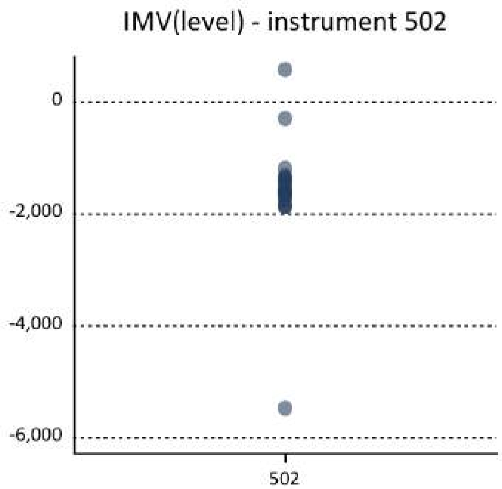




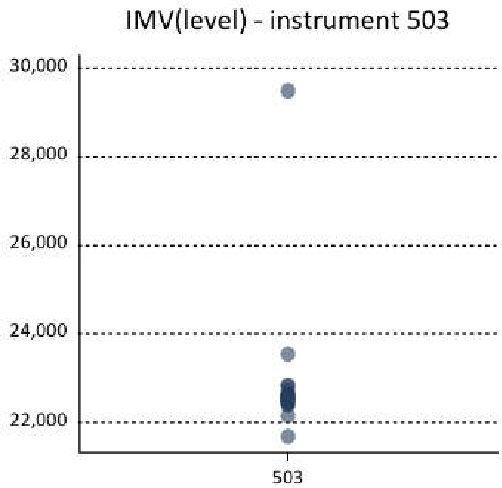
IMV(level) - instrument 405
720,000
700,000
680,000
660,000
640,000
405



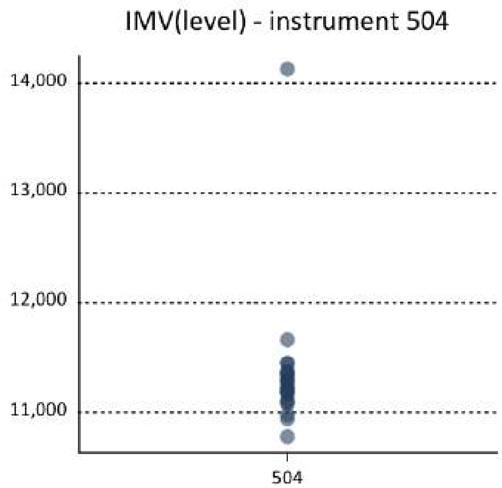
IMV(level) - instrument 501
-22,000
-22,500
-23,000
-23,500
-24,000
-24,500
501



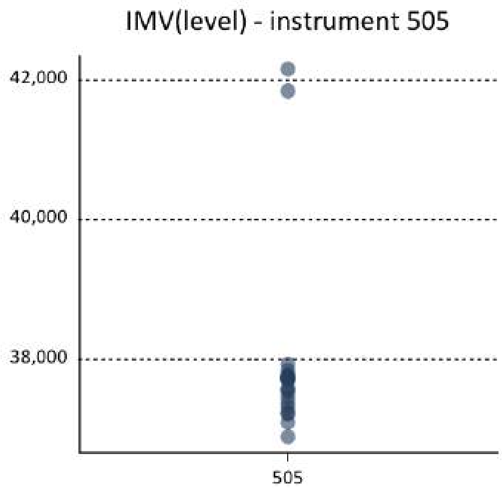
IMV(level) - instrument 502
0
-2,000
-4,000
-6,000
502



IMV(level) - instrument 503
30,000
28,000
26,000
24,000
22,000
503

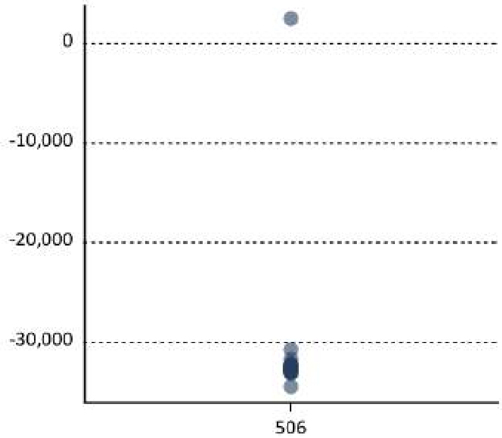


IMV(level) - instrument 504
14,000
13,000
12,000
11,000
504

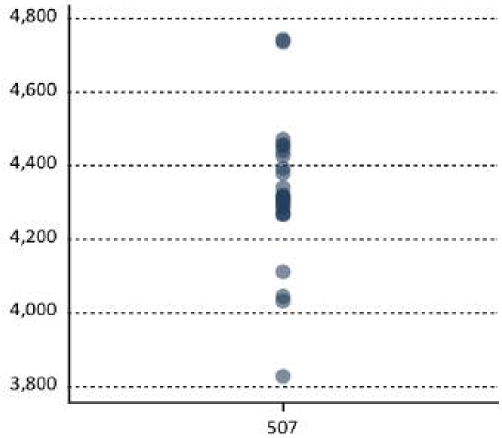


IMV(level) - instrument 505
42,000
40,000
38,000
505

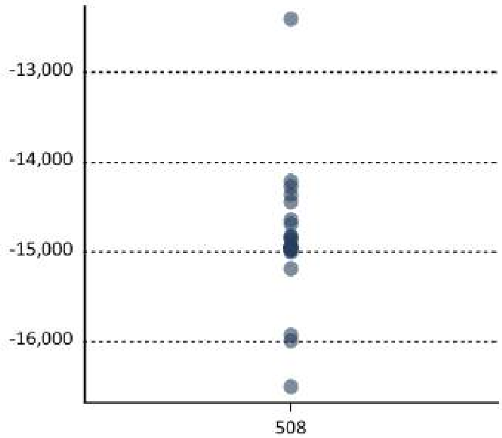
IMV(level) - instrument 506



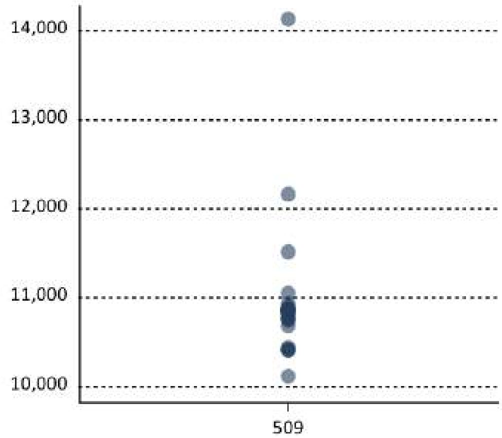
IMV(level) - instrument 507



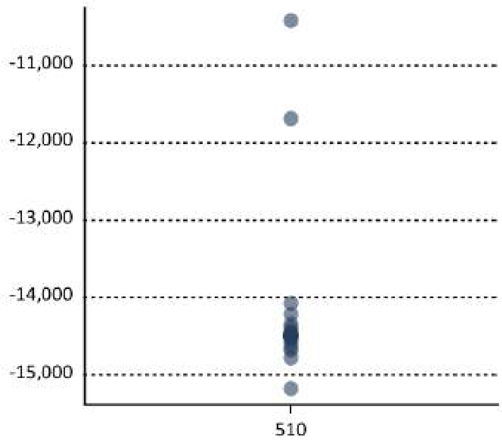
IMV(level) - instrument 508



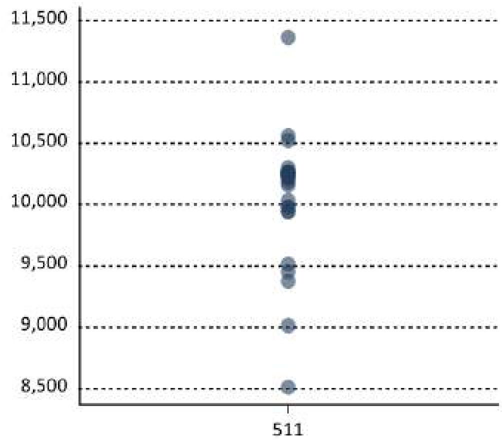
IMV(level) - instrument 509

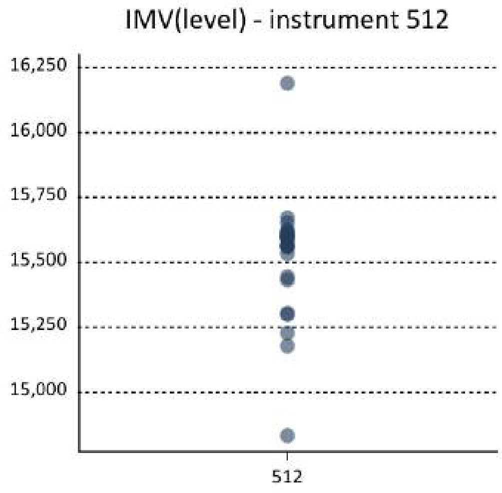


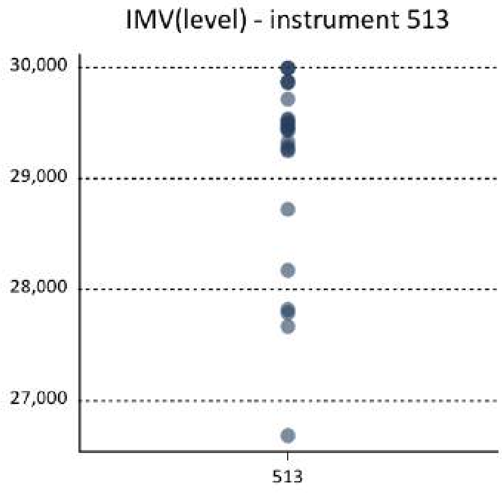
IMV(level) - instrument 510

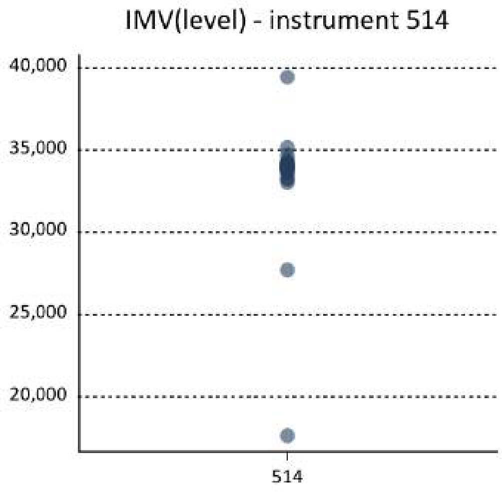


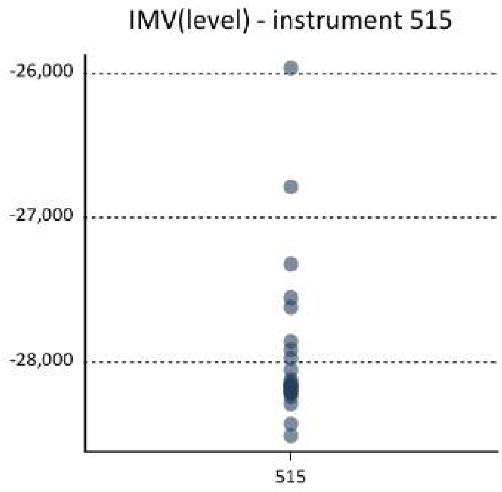
IMV(level) - instrument 511

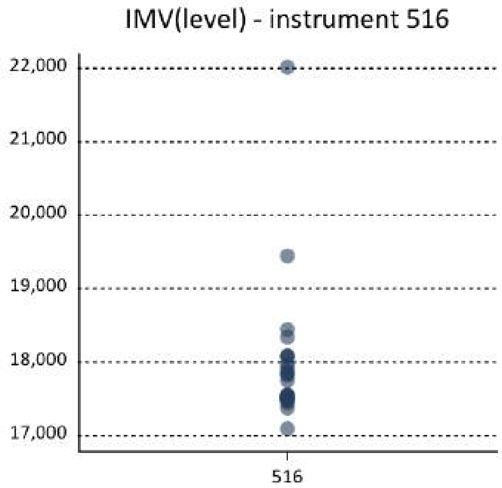


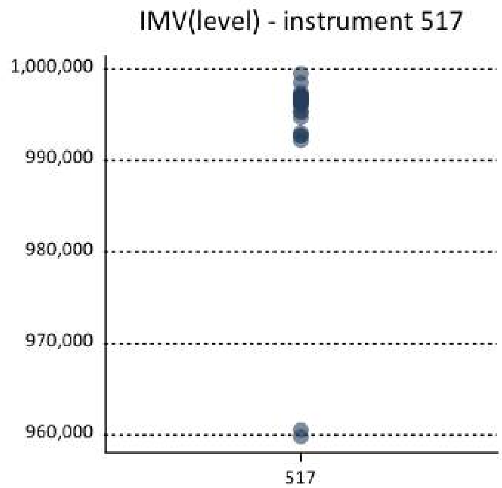

IMV(level) - instrument 512
16,250
16,000
15,750
15,500
15,250
15,000
512


IMV(level) - instrument 513
30,000
29,000
28,000
27,000
513

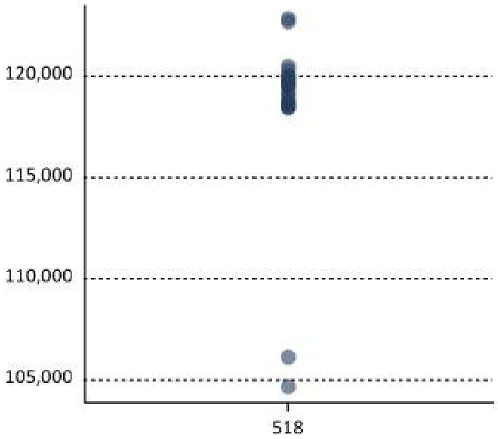

IMV(level) - instrument 514
40,000
35,000
30,000
25,000
20,000
514


IMV(level) - instrument 515
-26,000
-27,000
-28,000
515

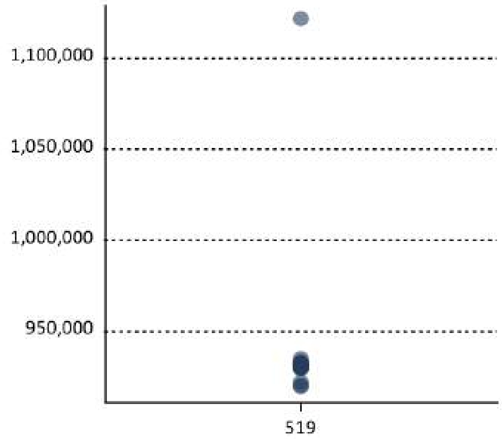

IMV(level) - instrument 516
22,000
21,000
20,000
19,000
18,000
17,000
516


IMV(level) - instrument 517
1,000,000
990,000
980,000
970,000
960,000
517

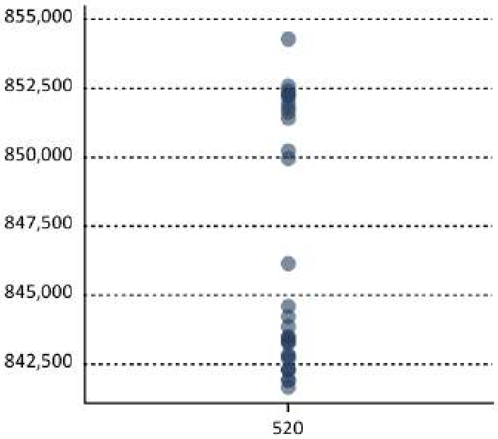
IMV(level) - instrument 518



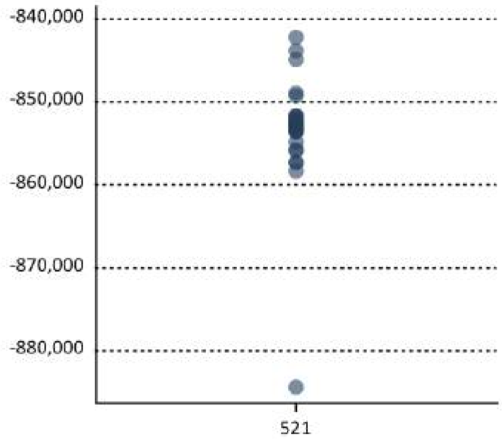
IMV(level) - instrument 519



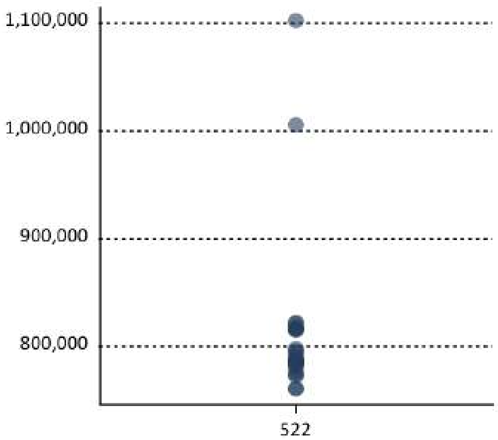
IMV(level) - instrument 520



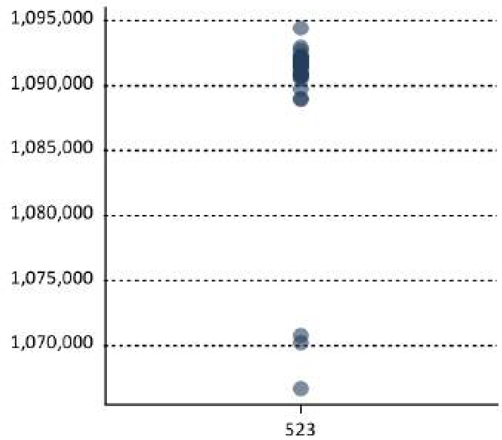
IMV(level) - instrument 521



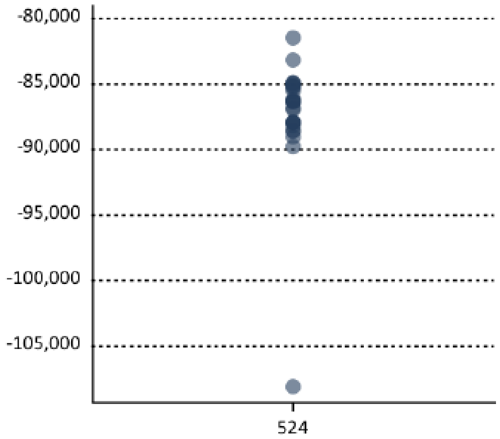
IMV(level) - instrument 522



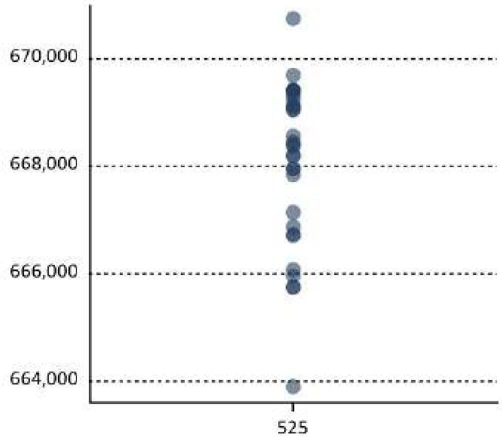
IMV(level) - instrument 523



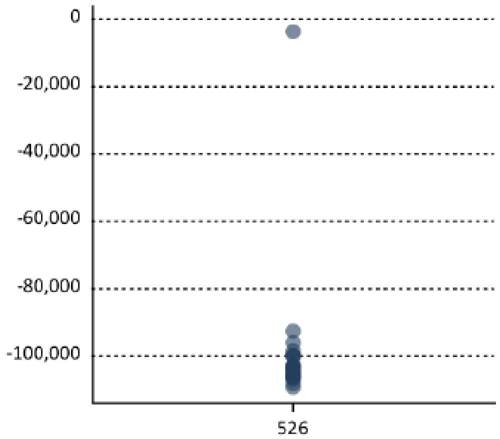
IMV(level) - instrument 524



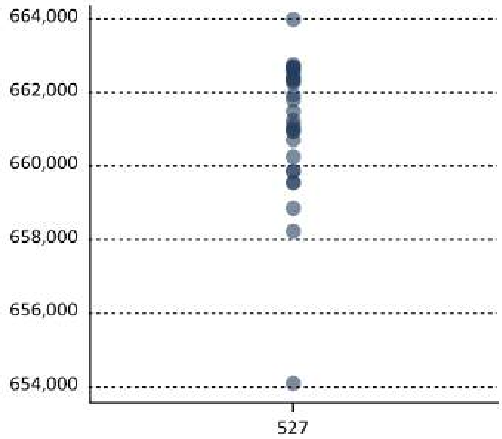
IMV(level) - instrument 525



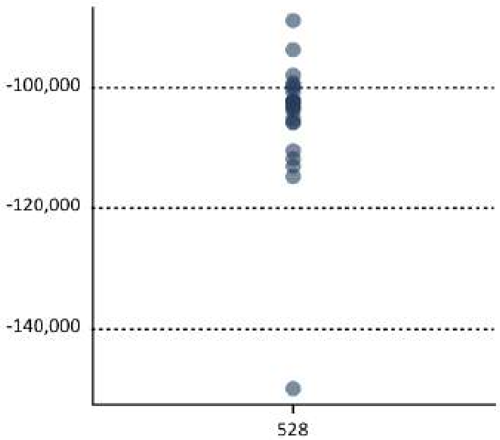
IMV(level) - instrument 526



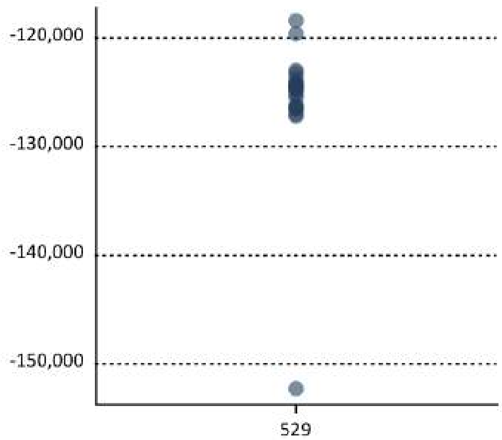
IMV(level) - instrument 527



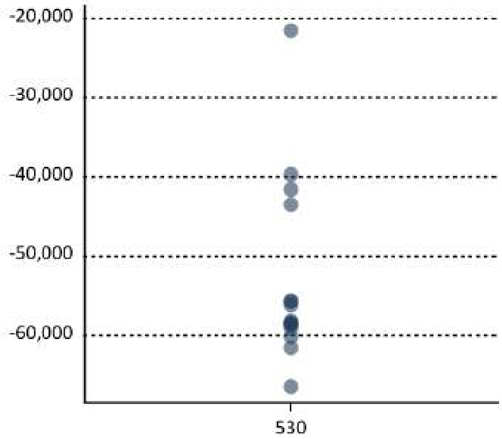
IMV(level) - instrument 528



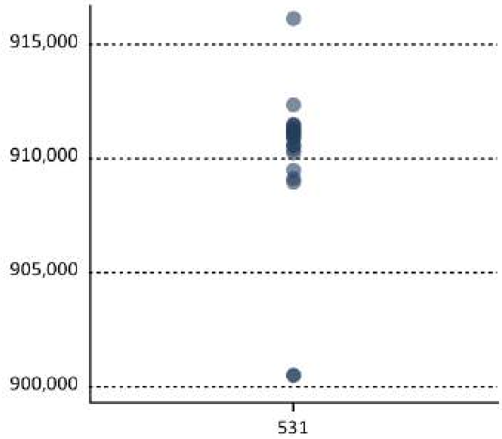
IMV(level) - instrument 529



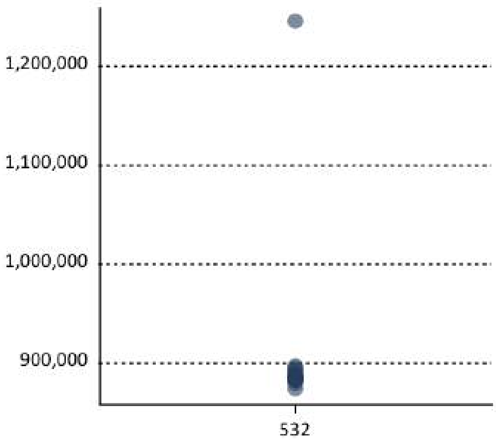
IMV(level) - instrument 530



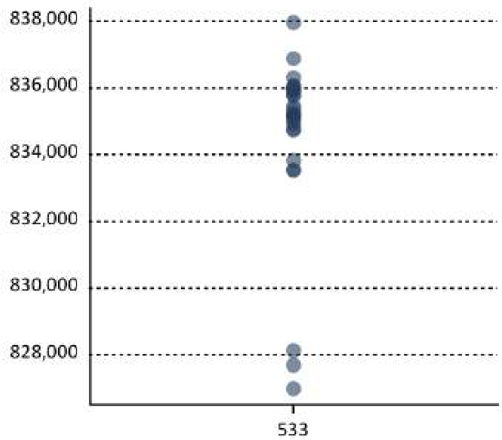
IMV(level) - instrument 531



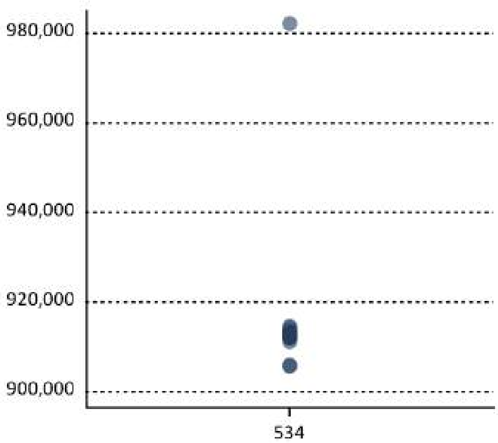
IMV(level) - instrument 532



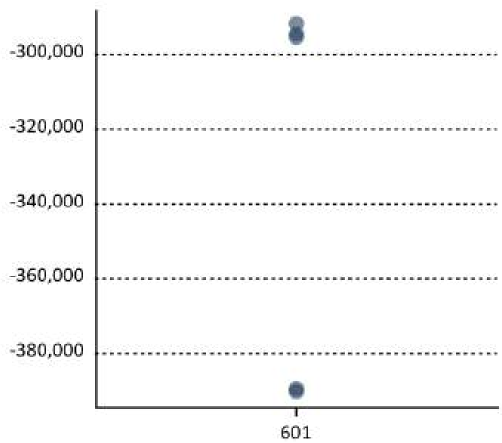
IMV(level) - instrument 533

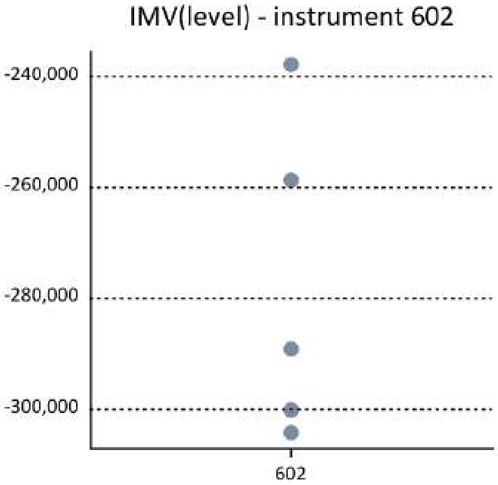


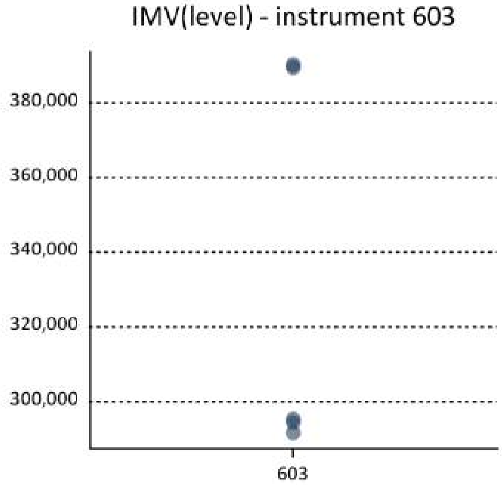
IMV(level) - instrument 534

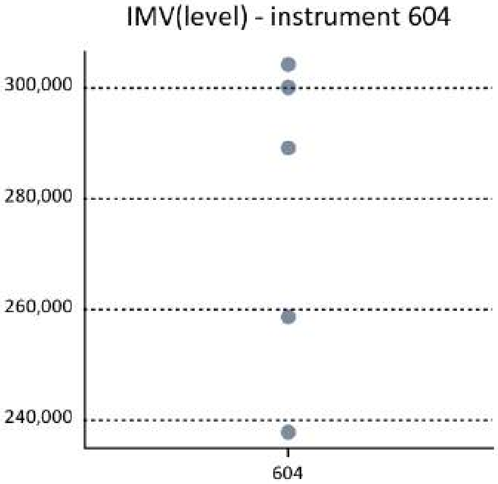


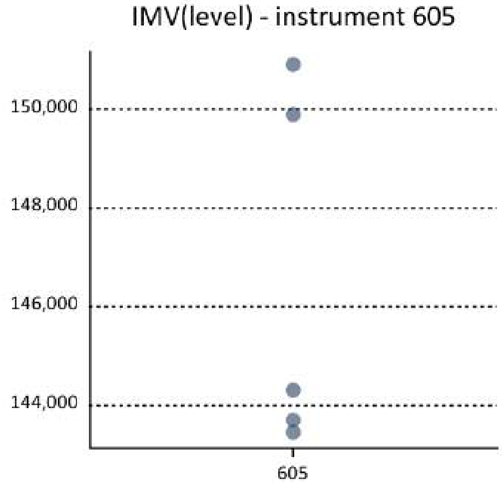
IMV(level) - instrument 601

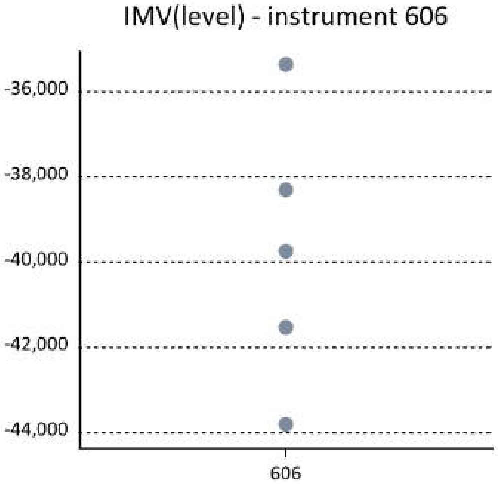


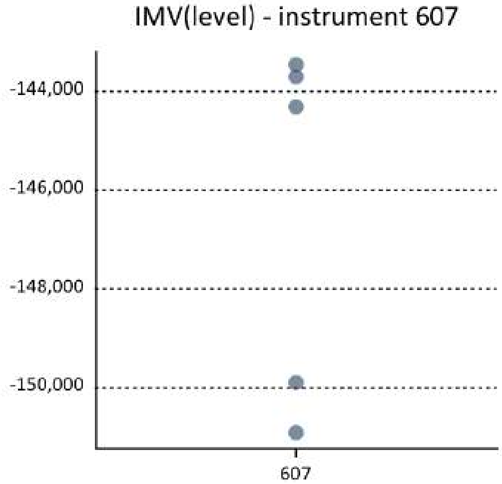

IMV(level) - instrument 602
-240,000
-260,000
-280,000
-300,000
602

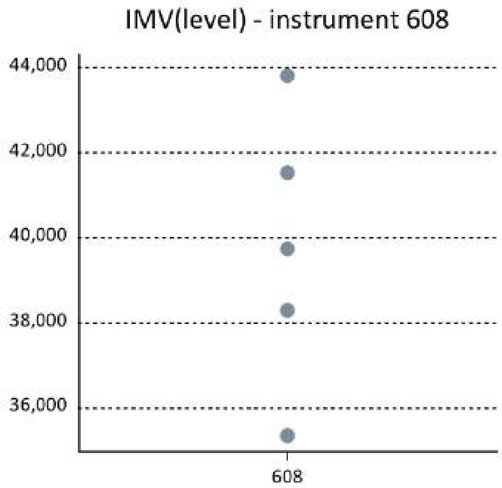

IMV(level) - instrument 603
380,000
360,000
340,000
320,000
300,000
603

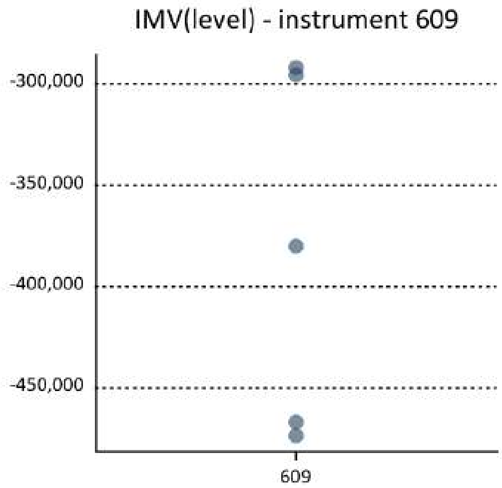

IMV(level) - instrument 604
300,000
280,000
260,000
240,000
604


IMV(level) - instrument 605
150,000
148,000
146,000
144,000
605


IMV(level) - instrument 606
-36,000
-38,000
-40,000
-42,000
-44,000
606


IMV(level) - instrument 607
-144,000
-146,000
-148,000
-150,000
607





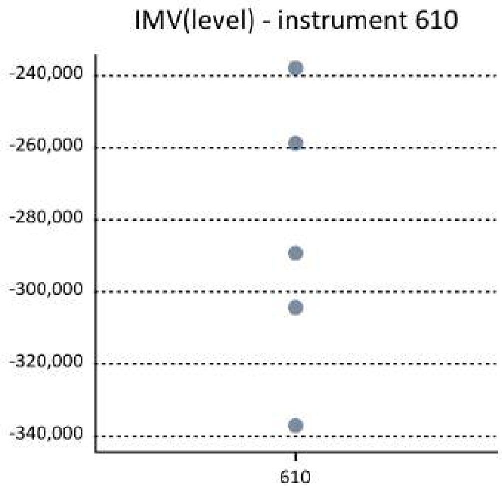
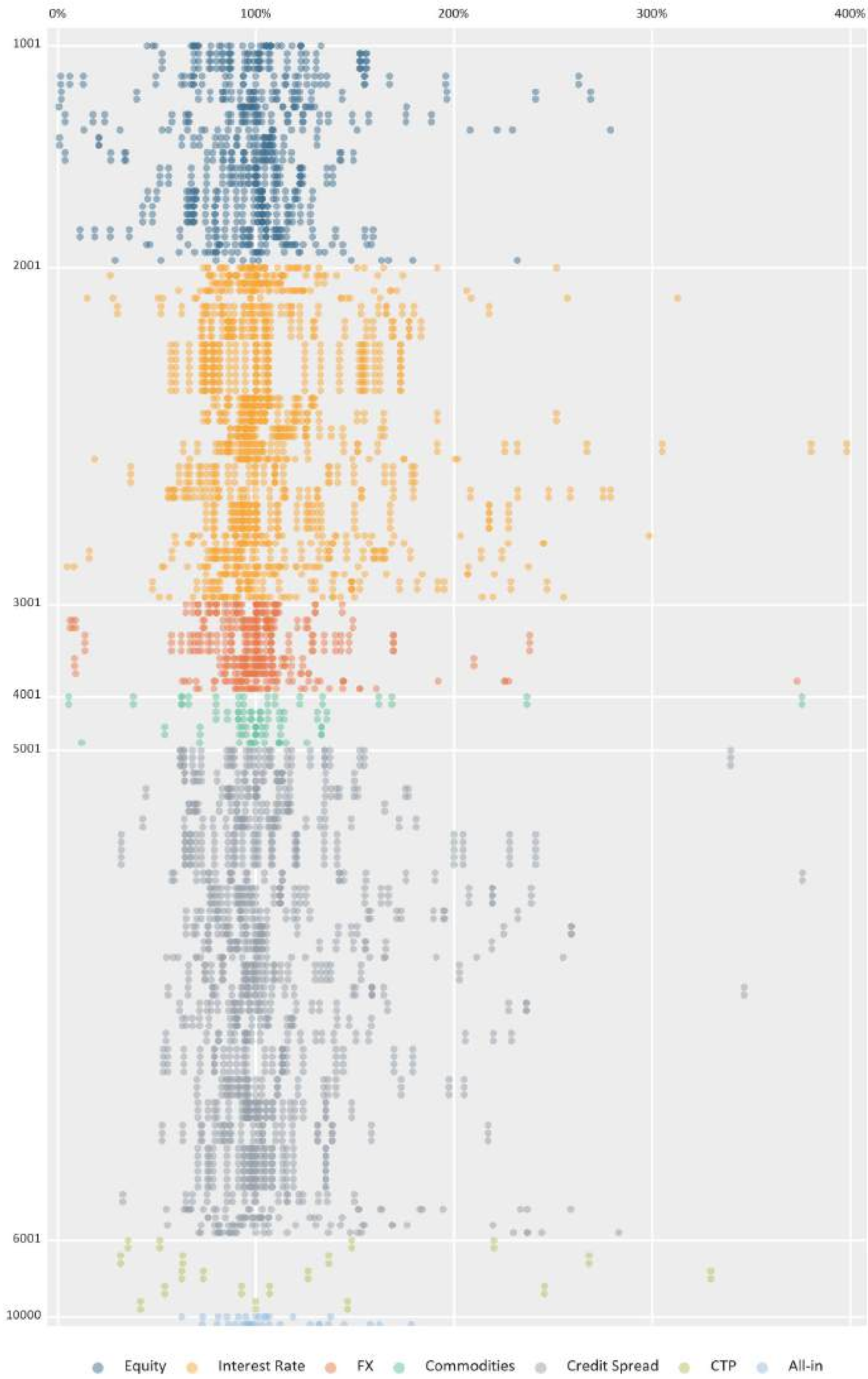
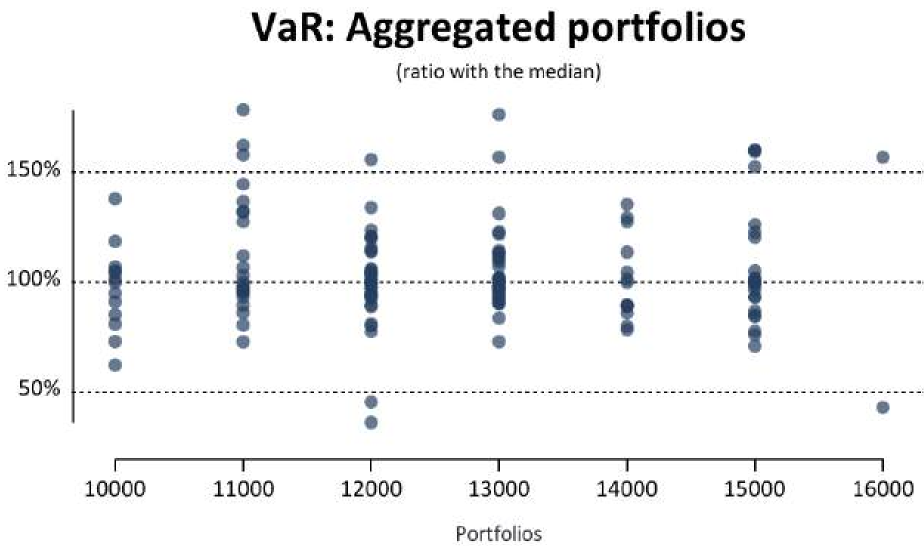


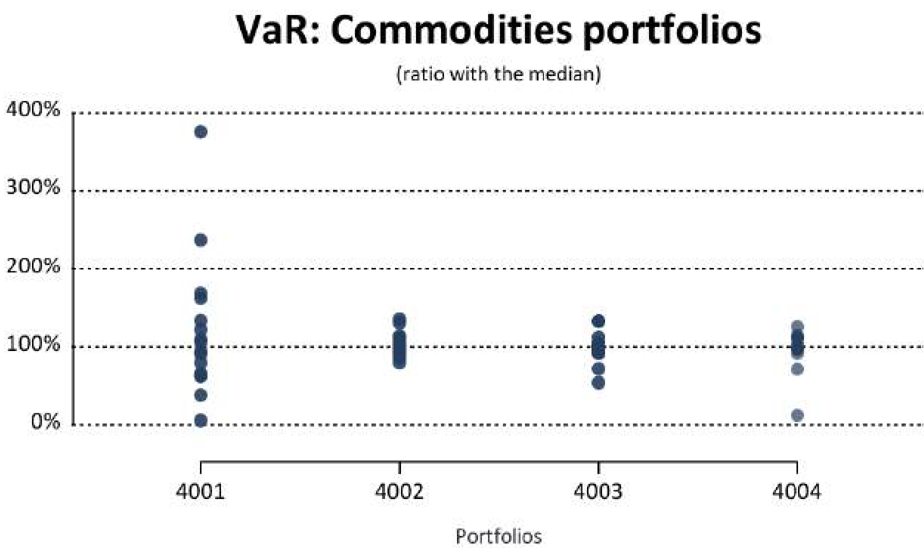
Figure 19: VaR submissions normalised by the median of each portfolio (by asset class)

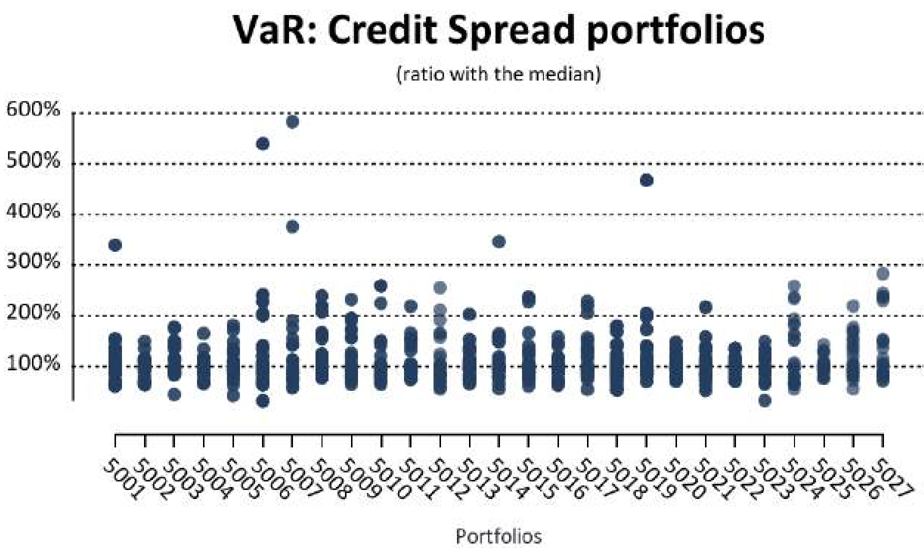
VaR: All portfolios

(ratio with the median)



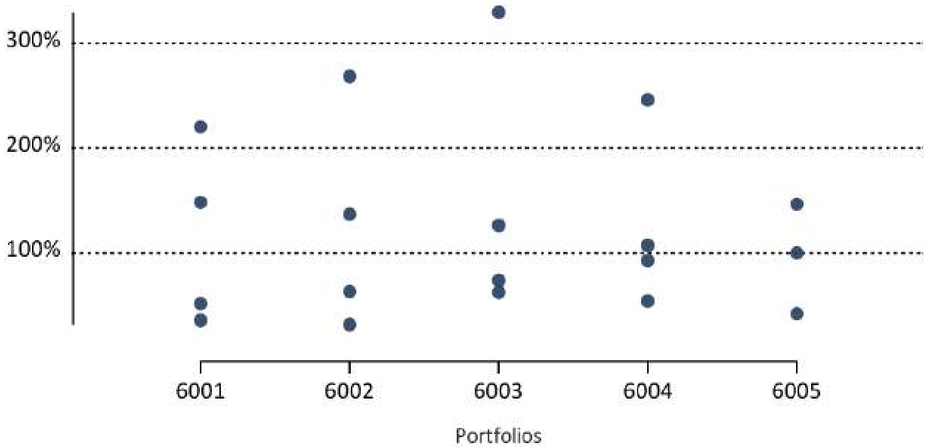

VaR: Aggregated portfolios
(ratio with the median)
150%
100%
50%
10000
11000
12000
13000
14000
15000
16000
Portfolios


VaR: Commodities portfolios
(ratio with the median)
400%
300%
200%
100%
0%
4001
4002
4003
4004
Portfolios


VaR: Credit Spread portfolios
(ratio with the median)
600%
500%
400%
300%
200%
100%
5001 5002 5003 5004 5005 5006 5007 5008 5009 5010 5011 5012 5013 5014 5015 5016 5017 5018 5019 5020 5021 5022 5023 5024 5025 5026 5027
Portfolios

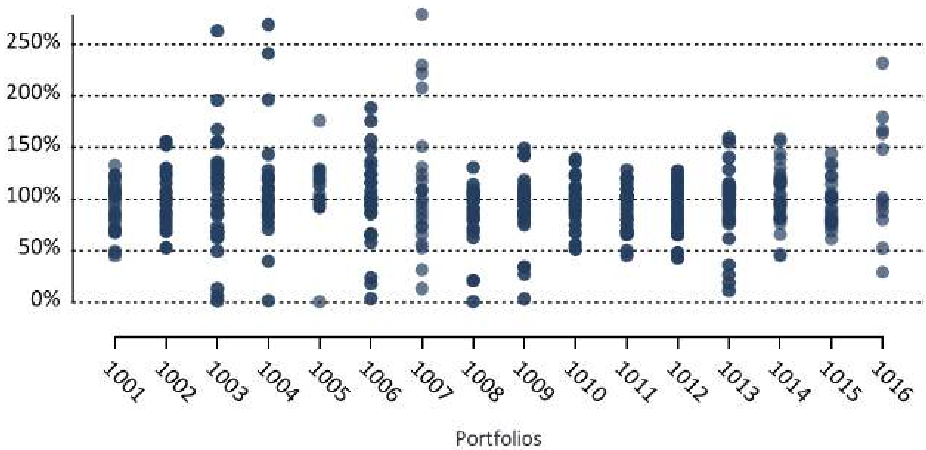
VaR: CTP portfolios

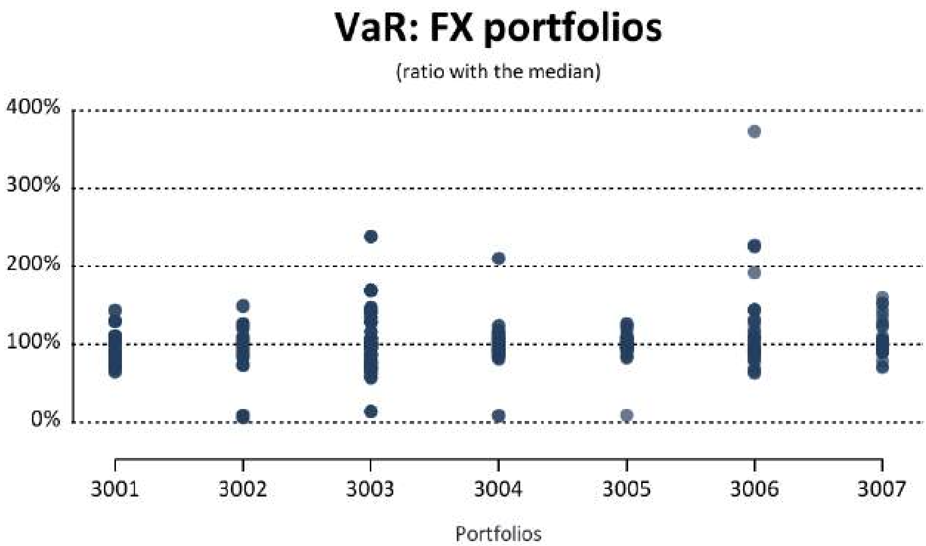
(ratio with the median)



VaR: Equity portfolios

(ratio with the median)




VaR: FX portfolios
(ratio with the median)
400%
300%
200%
100%
0%
3001
3002
3003
3004
3005
3006
3007
Portfolios

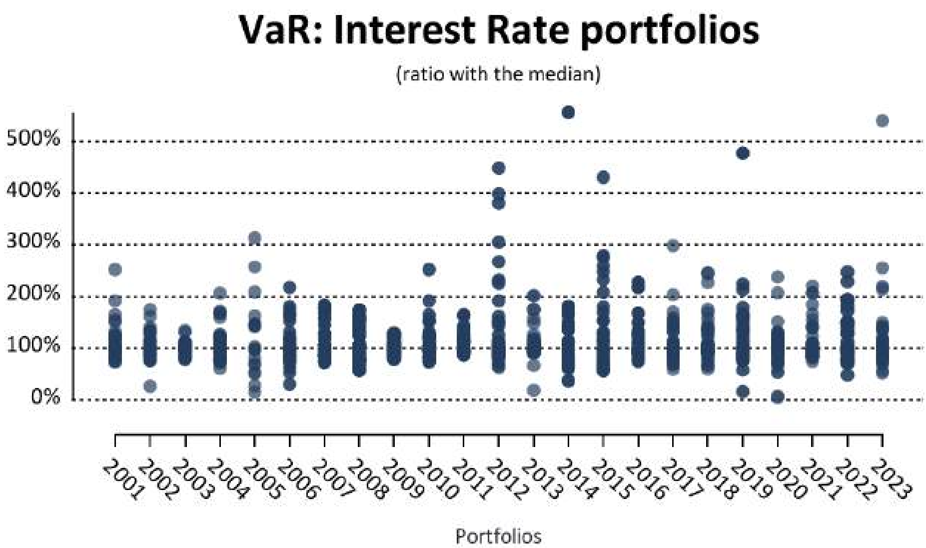
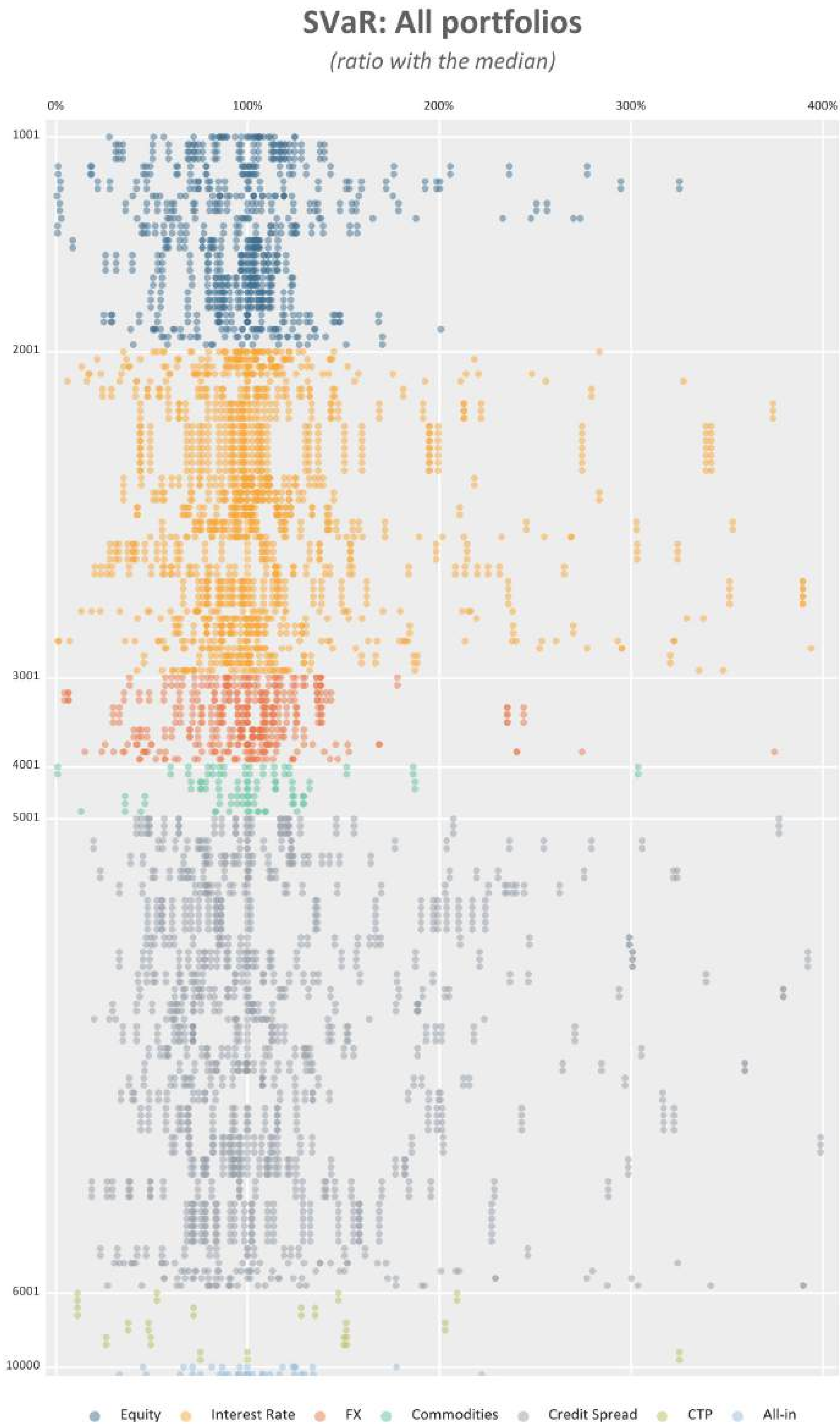
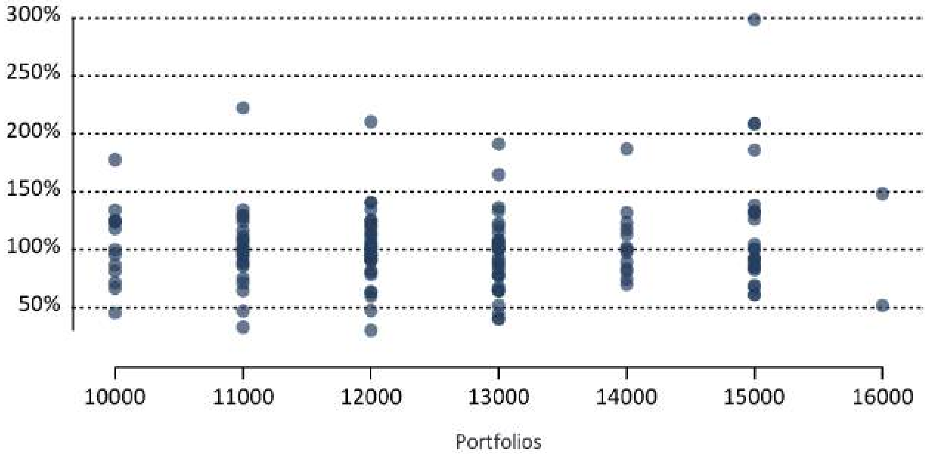

VaR: Interest Rate portfolios
(ratio with the median)
500%
400%
300%
200%
100%
0%
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
Portfolios

Figure 20: sVaR submissions normalised by the median of each portfolio (by asset class)


SVaR: All portfolios
(ratio with the median)
0%
100%
200%
300%
400%
1001
2001
3001
4001
5001
6001
10000
Equity
Interest Rate
FX
Commodities
Credit Spread
CTP
All-in

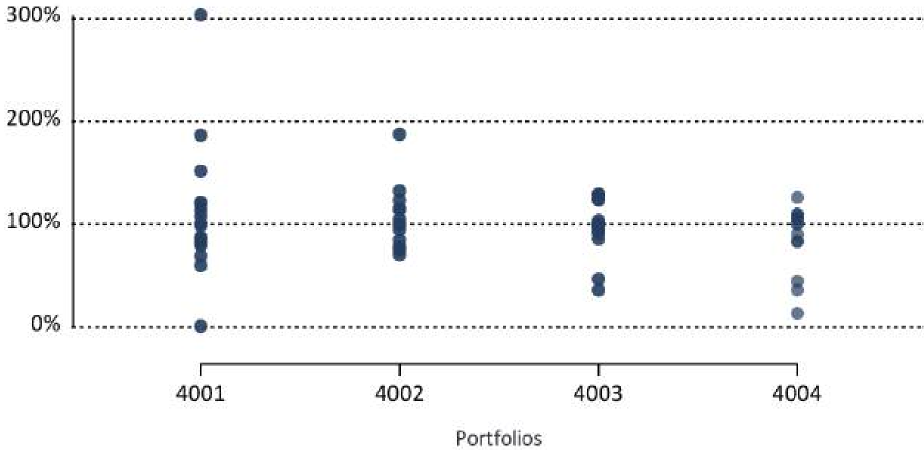
SVaR: Aggregated portfolios

(ratio with the median)



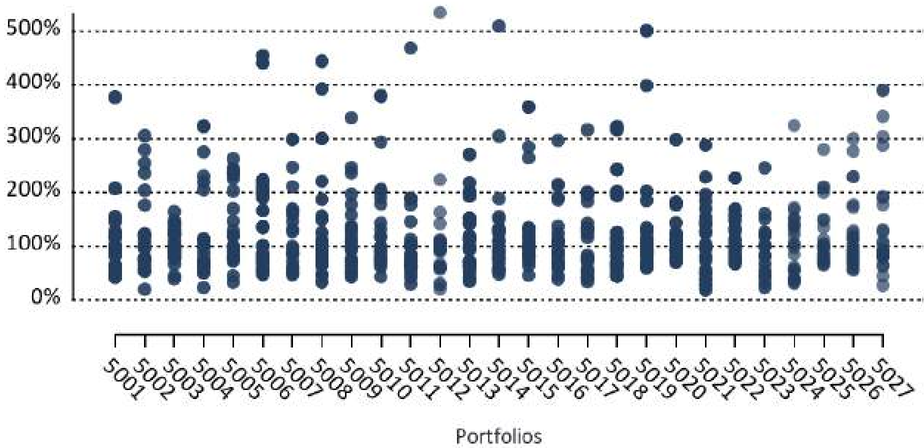
SVaR: Commodities portfolios

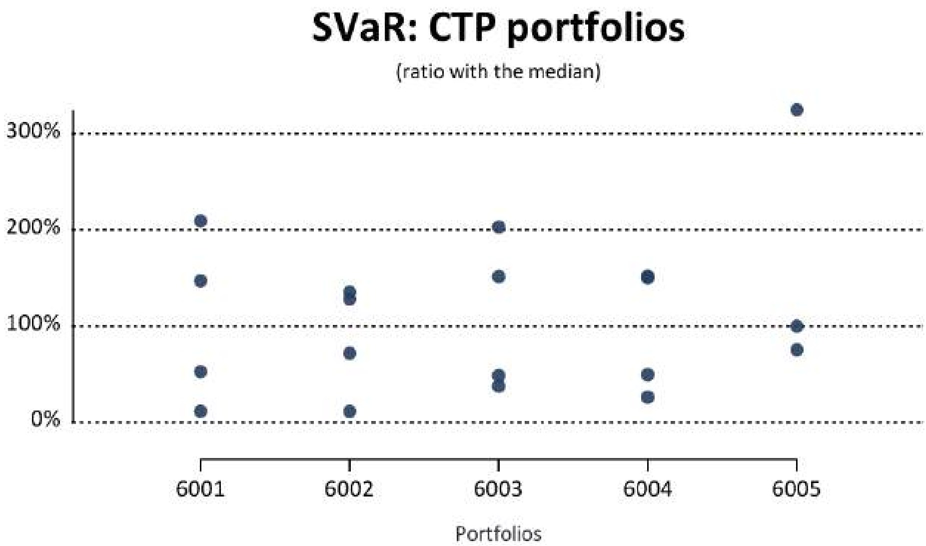
(ratio with the median)

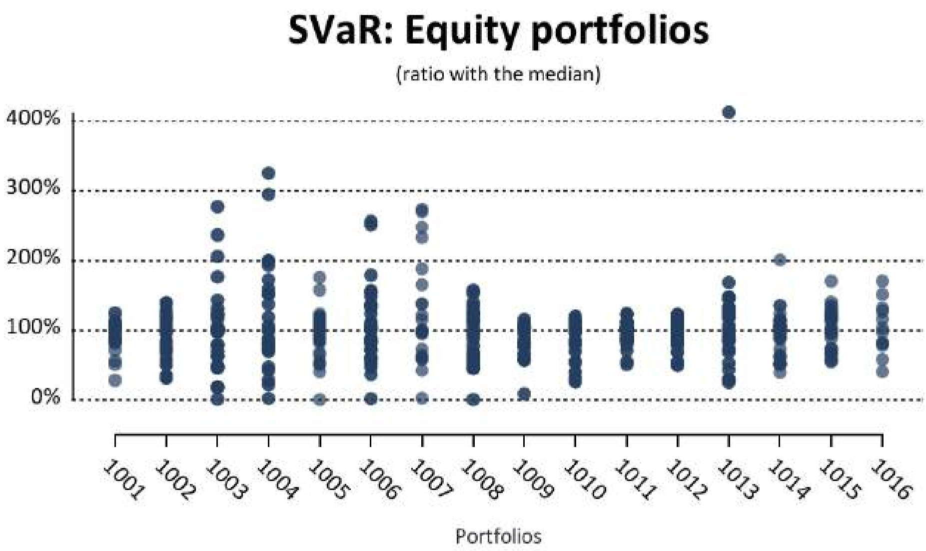


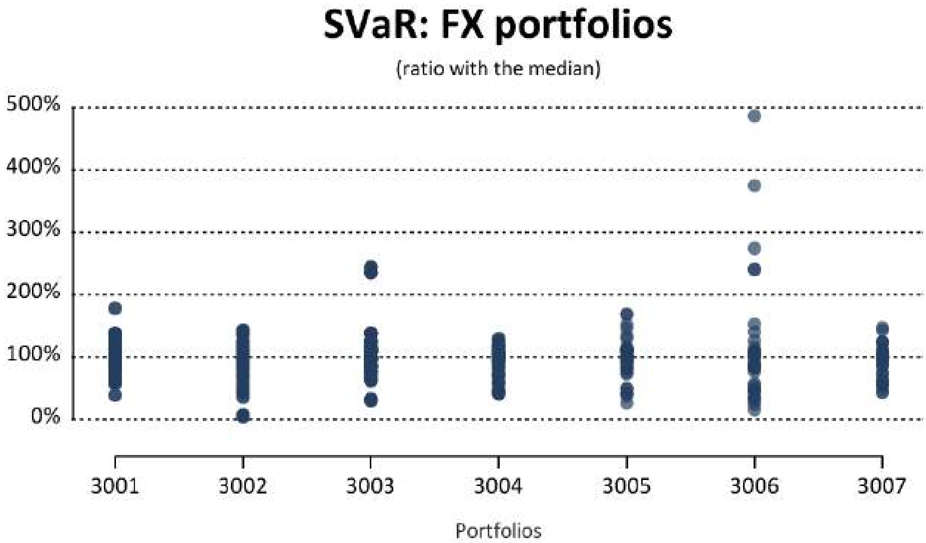
SVaR: Credit Spread portfolios

(ratio with the median)




SVaR: CTP portfolios
(ratio with the median)
300%
200%
100%
0%
6001
6002
6003
6004
6005
Portfolios


SVaR: Equity portfolios
(ratio with the median)
400%
300%
200%
100%
0%
1001
1002
1003
1004
1005
1006
1007
1008
1009
1010
1011
1012
1013
1014
1015
1016
Portfolios


SVaR: FX portfolios
(ratio with the median)
500%
400%
300%
200%
100%
0%
3001
3002
3003
3004
3005
3006
3007
Portfolios

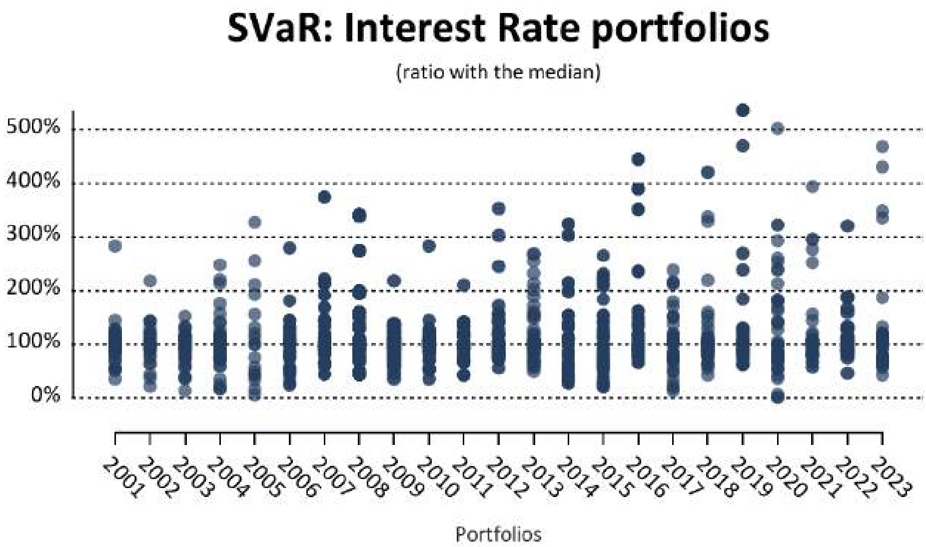
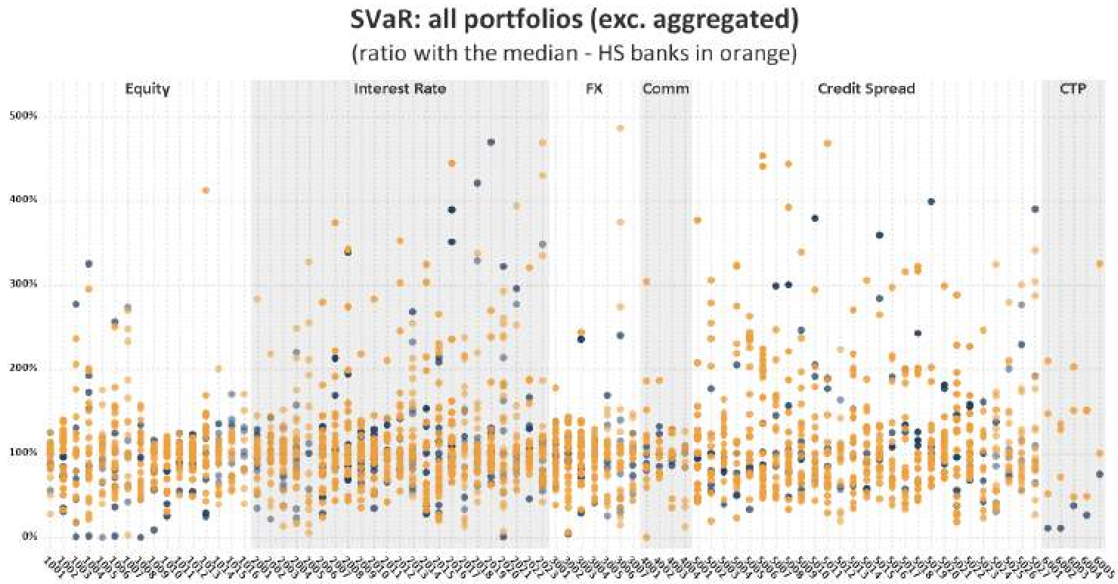

SVaR: Interest Rate portfolios
(ratio with the median)
500%
400%
300%
200%
100%
0%
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
Portfolios

Figure 21: sVaR submissions normalised by the median of each portfolio (by methodological approach)



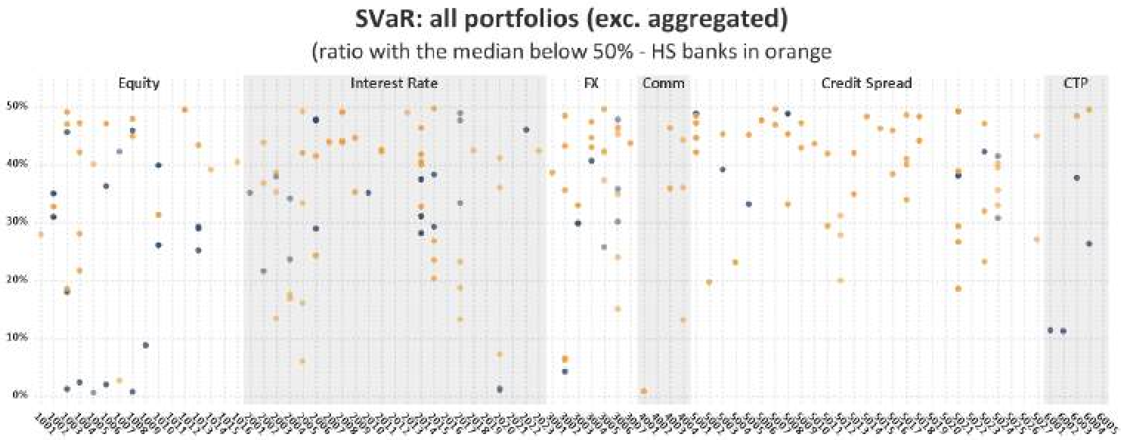


Table 27: VaR statistics (small banks only)

EU Statistics for VaR

		Other stats						Percentiles							
	Port. ID	Min	Max	Ave.	STDev	Coefficient of variation (STDev/Mean)	Num obs.	5th	10th	25th	50th (Median)	75th	90th	95th	Interquantile range
Equity	2001	281,100	430,914	347,178	70,565	20%	7	281,880	282,660	285,357	316,826	416,048	430,911	430,913	19%
	2002	138,749	279,429	215,064	54,060	25%	5	151,214	163,679	201,075	203,630	252,438	268,633	274,031	11%
	2003	204	1,331	838	577	69%	3	282	359	592	980	1,156	1,261	1,296	32%
	2004	1,180	1,531	1,378	180	13%	3	1,204	1,229	1,302	1,423	1,477	1,509	1,520	6%
	2005	51,771,147	70,540,541	56,275,642	7,113,769	13%	6	51,965,728	52,160,308	52,611,387	53,889,836	55,005,399	62,776,782	66,658,662	2%
	2006	1,863	3,278	2,571	1,001	39%	2	1,934	2,005	2,217	2,571	2,924	3,137	3,207	14%
	2007						1								
	2008	20,875	21,737	21,306	610	3%	2	20,918	20,961	21,091	21,306	21,522	21,651	21,694	1%
	2009	44,640	59,851	54,064	8,232	15%	3	45,946	47,252	51,171	57,701	58,776	59,421	59,636	7%
	2010	28,054	32,282	30,473	2,179	7%	3	28,357	28,660	29,569	31,083	31,683	32,042	32,162	3%
	2011	267,886	397,995	320,975	60,004	19%	5	268,658	269,429	271,744	295,495	371,753	387,498	392,747	16%
	2012	253,093	382,089	305,518	58,502	19%	5	254,009	254,925	257,674	281,951	352,783	370,367	376,228	16%
	2013	47,145	63,960	56,024	8,447	15%	3	48,127	49,109	52,056	56,967	60,464	62,561	63,261	7%
	2014	176,623	254,343	221,994	29,567	13%	6	182,678	188,732	206,256	225,058	244,435	252,192	253,268	8%
	2015	135,207	222,500	174,168	36,892	21%	4	138,905	142,603	153,697	169,483	189,955	209,482	215,991	11%
	2016	261,908	316,474	289,191	38,584	13%	2	264,636	267,365	275,550	289,191	302,833	311,017	313,746	5%
Interest Rate	2001	161,343	204,535	185,889	15,859	9%	8	162,619	163,896	178,228	188,419	197,140	201,970	203,252	5%
	2002	138,700	202,703	173,188	18,584	11%	9	145,712	152,725	163,090	176,580	180,813	190,770	196,757	5%
	2003	23,000	31,021	27,475	2,333	8%	10	24,428	25,256	25,907	27,476	29,291	29,566	30,293	6%
	2004	67,975	138,801	98,969	24,311	25%	8	72,231	76,488	82,959	93,949	111,506	130,227	134,514	15%
	2005						1								
	2006	22,323	48,230	29,744	12,419	42%	4	22,377	22,432	22,595	24,211	31,360	41,482	44,856	16%
	2007	57,806	123,613	86,128	31,023	36%	5	58,145	58,883	61,099	73,514	115,009	120,171	121,892	31%
	2008	46,268	126,175	89,200	36,691	41%	6	49,438	52,608	60,122	89,483	122,461	125,508	125,842	34%
	2009	186,798	223,026	197,398	10,656	5%	11	187,073	187,348	191,076	195,784	197,629	213,528	217,277	2%
	2010	145,208	184,088	167,289	14,269	9%	8	146,356	147,504	160,410	169,528	177,426	181,775	182,931	5%
	2011	352,795	463,312	396,539	33,885	9%	11	362,208	371,620	377,445	388,204	398,761	455,622	459,467	3%
	2012	49,735	181,999	96,705	51,869	54%	8	56,029	62,322	71,341	74,155	101,383	178,663	180,331	17%
	2013	28,039	42,762	37,806	5,064	13%	6	30,547	33,054	38,352	38,859	39,917	41,506	42,134	2%
	2014	27,961	69,278	46,283	17,364	37%	4	30,051	32,142	38,413	43,947	51,817	62,294	65,786	15%
	2015	6,458	18,818	11,824	3,859	33%	8	7,088	7,719	9,312	11,919	13,658	15,463	17,140	19%
	2016	111,489	150,917	119,879	17,358	14%	5	111,558	111,626	111,832	112,266	112,893	135,707	143,312	0%
	2017	27,046	45,864	36,133	7,742	21%	6	27,518	28,031	29,797	36,387	41,733	43,982	44,923	17%
	2018	21,647	37,897	26,705	5,375	20%	9	22,179	22,710	24,116	24,800	25,662	34,438	36,167	3%
	2019	8,000	17,448	12,370	3,601	29%	10	8,133	8,266	8,681	12,546	14,487	17,077	17,263	25%
	2020	28,149	56,841	44,765	9,549	21%	8	31,877	35,605	39,453	44,601	51,055	56,301	56,572	13%
	2021	28,455	53,338	37,954	9,349	25%	5	29,419	30,383	33,274	37,156	37,548	47,022	50,180	6%
	2022	157,060	262,420	186,822	50,599	27%	4	157,510	157,961	159,312	163,904	191,414	234,018	248,219	9%
	2023	19,646	97,586	50,148	32,016	64%	8	20,309	20,973	26,646	34,116	82,418	88,016	92,801	51%
FX	3001	366,905	510,435	420,500	48,899	12%	10	368,806	372,706	378,385	413,411	438,369	489,840	500,138	7%
	3002	281,869	357,896	321,073	28,238	9%	9	283,921	285,974	294,477	328,261	343,771	353,329	355,612	8%
	3003	91,527	190,625	138,352	34,452	25%	9	94,971	98,415	124,676	129,600	166,823	183,623	187,124	14%
	3004	406,964	479,814	443,335	26,188	6%	9	411,566	416,168	424,339	434,100	466,574	470,461	475,138	5%
	3005	353,786	439,428	391,866	27,886	7%	9	357,244	360,702	372,581	393,262	407,197	421,762	430,595	4%
	3006	10,359	21,853	15,207	3,297	22%	9	11,427	12,496	13,162	14,720	16,420	18,721	20,286	11%
	3007	474,144	686,574	528,917	83,494	16%	6	474,913	475,682	478,223	488,201	543,165	622,869	654,721	6%
Commodities	4001	1,319	14,774	8,047	9,514	118%	2	1,992	2,665	4,683	8,047	11,410	13,429	14,101	42%
	4002						1								
	4003						1								
	4004	317,572	323,049	320,311	3,873	1%	2	317,846	318,120	318,941	320,311	321,680	322,501	322,775	0%
Credit Spread	5001	4,259	6,582	5,409	1,106	20%	4	4,325	4,391	4,589	5,397	6,216	6,436	6,509	15%
	5002	14,807	27,093	19,224	6,832	36%	3	14,903	15,000	15,289	15,771	21,432	24,829	25,961	17%
	5003	3,664	5,328	4,537	835	18%	3	3,760	3,855	4,142	4,619	4,974	5,186	5,257	9%
	5004	7,361	13,134	8,933	2,773	31%	4	7,375	7,388	7,332	7,403	9,769	11,188	11,661	14%
	5005	3,552	5,996	5,066	1,085	21%	4	3,776	3,999	4,670	5,359	5,755	5,900	5,948	10%
	5006	5,074	10,221	7,349	2,230	30%	4	5,249	5,424	5,950	7,051	8,450	9,513	9,868	17%
	5007	32,655	42,545	36,094	5,591	15%	3	32,698	32,740	32,869	33,082	37,814	40,652	41,599	7%
	5008	67,237	117,512	82,185	20,522	25%	5	67,456	67,675	68,333	78,876	78,989	102,095	109,803	7%
	5009	4,987	13,360	7,947	3,204	40%	5	5,280	5,573	6,453	7,075	7,862	11,161	12,260	10%
	5010	15,277	29,715	21,658	6,588	30%	4	15,508	15,939	16,882	20,820	25,535	28,067	28,891	21%
	5011	32,075	52,921	38,785	9,564	25%	4	32,375	32,676	33,577	35,072	40,281	47,865	50,393	9%
	5012	1,654	5,763	3,854	1,868	48%	4	1,858	2,062	2,674	4,000	5,180	5,530	5,646	32%
	5013	11,359	19,802	15,510	3,074	20%	5	12,007	12,655	14,598	15,185	16,608	18,524	19,163	6%
	5014	2,639	4,775	3,973	969	24%	4	2,825	3,012	3,571	4,239	4,640	4,721	4,748	13%
	5015	21,050	30,341	25,200	3,881	15%	4	21,491	21,931	23,254	24,716	26,668	28,872	29,606	7%
	5016	30,289	49,930	41,543	10,129	24%	3	31,701	33,113	37,349	44,409	47,170	48,826	49,378	12%
	5017	22,309	32,626	27,355	5,162	19%	3	22,791	23,273	24,720	27,130	29,878	31,527	32,076	9%
	5018	44,512	70,145	61,584	14,785	24%	3	47,070	49,029	57,304	70,096	70,121	70,135	70,140	10%
	5019	9,187	13,859	11,188	1,997	18%	3	9,210	9,234	9,306	11,284	12,305	13,237	13,548	14%
	5020	135,022	207,875	170,976	23,934	14%	6	141,756	148,490	163,493	169,525	179,201	194,913	201,394	5%
	5021	17,066	27,698	21,572	4,308	20%	5	17,502	17,938	19,247	19,608	24,242	26,316	27,007	11%
	5022	127,251	188,894	164,415	23,367	14%	5	133,210	139,168	157,044	175,298	175,587	182,371	188,633	6%
	5023	42,894	47,501	45,198	3,258	7%	2	43,124	43,355	44,046	45,198	46,350	47,041	47,272	3%
	5024	21,602	66,064	44,833	30,025	67%	2	25,725	27,848	34,218	44,833	55,449	61,818	63,941	24%
	5025	41,811	53,985	47,898	8,608	18%	2	42,420	43,028	44,855	47,898	50,942	52,768	53,376	6%
	5026	24,786	33,787	29,287	6,365	22%	2	25,236	25,686	27,036	29,287	31,537	32,887	33,337	8%
	5027	18,143	20,098	19,121	1,382	7%	2	18,241	18,339	18,632	19,121	19,609	19,903	20,000	3%
CTP	6001														
	6002														
	6003														
	6004														
	6005														
ALL-IN no-CTP	10000														
Equity Cumulative	11000	185,924	201,214	193,569	10,812	6%	2	186,689	187,453	189,747	193,569	197,392	199,685	200,450	2%
IR Cumulative	12000	338,774	381,107	353,887	15,994	5%	6	339,653	340,532	342,993	348,780	360,847	372,389	376,748	3%
FX Cumulative	13000	699,245	835,799	754,483	39,876	5%	8	710,661	722,078	736,051	745,855	769,027	790,890	813,344	2%
Commodity Cumulative	14000						1								
CS Cumulative	15000	188,625	273,987	233,619	42,043	18%	4	193,391	194,156	202,453	236,942	268,108	270,424	271,195	14%
CTP Cumulative	16000														

Figure 22: VaR ratio with median (focus on small banks)

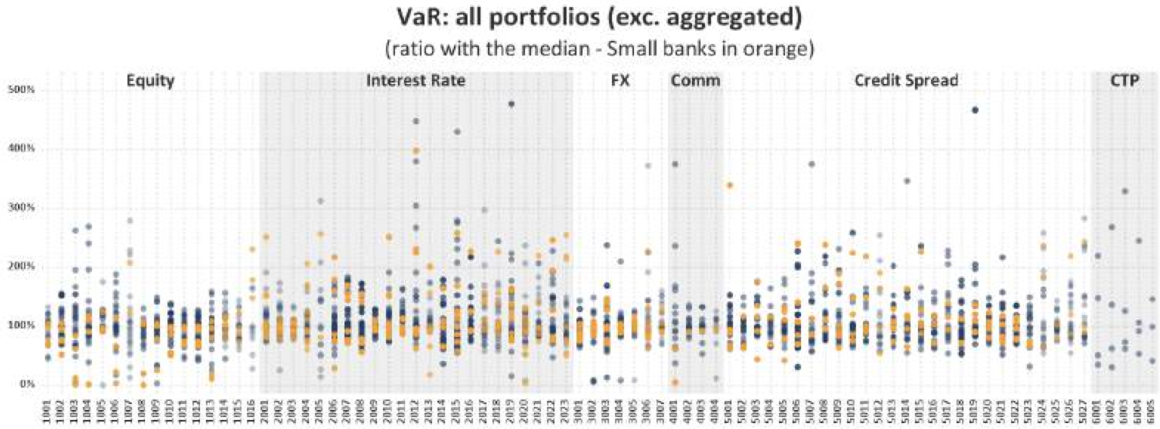


Table 28: VaR statistics (medium-sized banks only)

EU Statistics for VaR

		Other stats						Percentiles							
	Port. ID	Min	Max	Ave.	STDev	Coefficient of variation (STDev/Mean)	Num obs.	5th	10th	25th	50th (Median)	75th	90th	95th	Interquantile range
Equity	1001	281,050	545,084	398,262	78,097	20%	15	287,813	291,049	346,284	418,995	448,174	476,229	502,679	13%
	1002	180,915	343,002	256,390	54,120	21%	12	184,337	190,163	219,772	251,387	292,571	329,042	335,660	14%
	1003	779	2,636	1,612	494	31%	12	944	1,086	1,311	1,647	1,837	2,027	2,308	17%
	1004	512	1,840	1,281	321	25%	12	818	1,074	1,210	1,274	1,423	1,564	1,691	8%
	1005	51,728,788	70,284,083	59,672,891	6,656,048	11%	9	52,495,056	53,261,323	54,550,506	56,747,584	63,946,467	67,617,710	68,950,897	8%
	1006	1,633	4,213	2,898	718	25%	13	1,782	2,000	2,647	2,808	3,288	3,798	4,008	11%
	1007	2,132	21,160	12,465	5,601	45%	10	4,999	7,867	9,417	11,866	16,349	19,235	20,197	27%
	1008	13,709	22,838	19,033	3,116	16%	11	14,018	14,326	16,773	20,166	21,192	21,744	22,291	12%
	1009	42,816	84,955	59,995	12,546	21%	12	45,279	47,550	52,556	58,243	63,119	79,647	82,956	9%
	1010	24,254	43,968	33,109	5,354	16%	13	25,849	27,331	29,838	32,187	35,781	38,903	41,320	9%
	1011	257,866	506,663	375,588	74,616	20%	14	268,757	274,939	322,707	402,042	424,122	447,883	472,034	14%
	1012	246,258	481,566	358,332	72,109	20%	14	254,643	259,270	305,310	384,827	399,211	431,322	452,794	13%
	1013	36,106	93,216	62,039	16,301	26%	13	42,342	47,084	54,713	60,088	65,275	87,663	91,747	9%
	1014	165,926	300,638	218,713	42,507	19%	14	171,363	175,000	181,486	207,268	259,047	266,049	279,716	18%
	1015	142,315	239,711	174,683	33,234	19%	11	143,609	144,903	146,143	165,606	189,362	221,575	230,643	13%
	1016	155,110	288,828	195,831	62,486	32%	4	156,621	158,132	162,664	169,694	202,861	254,441	271,635	11%
Interest Rate	2001	144,168	246,875	201,815	27,715	14%	20	147,783	176,560	191,744	197,412	220,277	237,732	246,875	7%
	2002	136,316	234,325	177,789	27,963	16%	18	137,142	139,708	156,200	179,309	201,114	204,192	209,791	13%
	2003	23,181	30,910	27,517	2,299	8%	17	23,827	24,086	25,981	27,790	29,039	30,354	30,529	6%
	2004	83,694	142,257	112,780	17,504	16%	20	85,296	92,023	101,605	110,204	127,920	137,243	138,400	11%
	2005	8,632	64,885	39,011	15,948	41%	9	17,274	25,915	30,376	44,412	45,895	53,385	59,135	20%
	2006	15,587	36,440	28,635	5,751	20%	17	18,054	20,576	26,530	29,420	32,040	34,781	35,386	9%
	2007	58,076	102,764	76,858	12,151	16%	16	60,873	63,887	68,445	76,313	83,284	91,257	98,508	10%
	2008	48,382	131,950	77,626	21,353	28%	17	52,820	57,292	63,512	76,866	86,115	103,754	112,531	15%
	2009	160,752	223,656	195,300	16,090	9%	17	169,326	172,326	188,130	197,825	207,446	211,649	215,147	5%
	2010	129,752	222,188	181,647	24,939	14%	20	133,005	158,903	172,631	177,673	198,250	213,958	222,188	7%
	2011	352,525	506,035	425,009	51,442	12%	19	363,386	367,082	382,290	439,217	464,823	488,573	506,035	10%
	2012	64,158	150,338	85,380	24,706	29%	19	65,071	66,541	67,576	77,624	85,731	120,469	129,075	12%
	2013	38,728	53,227	43,135	3,990	9%	18	39,394	39,559	40,154	41,943	44,967	48,560	49,416	6%
	2014	15,534	71,063	40,493	15,354	38%	14	22,159	26,236	30,371	39,023	46,123	61,287	65,711	21%
	2015	6,260	23,132	11,931	5,139	43%	17	6,442	6,540	7,226	10,385	14,573	18,203	20,579	34%
	2016	94,258	179,909	122,767	22,126	18%	16	95,062	100,131	110,991	118,426	130,222	149,776	160,891	8%
	2017	17,062	44,847	28,711	8,263	29%	17	19,252	20,318	22,789	25,961	32,799	40,706	43,937	18%
	2018	14,378	33,415	24,335	5,122	21%	17	17,129	18,692	22,325	22,962	26,517	31,667	33,012	9%
	2019	6,079	18,782	11,895	3,910	33%	17	7,919	8,431	9,056	9,849	15,399	17,069	17,659	26%
	2020	31,857	51,795	42,193	5,925	14%	19	32,617	35,635	38,608	41,459	47,424	48,995	51,666	10%
	2021	31,103	54,940	38,289	6,143	16%	16	31,316	31,793	34,070	37,244	40,791	44,341	48,826	9%
	2022	98,104	372,082	232,698	72,351	31%	15	135,910	166,191	192,520	200,525	294,361	309,107	330,406	21%
	2023	26,065	54,535	38,806	8,862	23%	20	28,393	29,755	32,010	37,537	44,154	53,080	53,153	16%
FX	3001	389,937	630,918	495,179	57,431	12%	16	419,348	434,974	450,934	488,936	533,113	539,472	564,059	8%
	3002	241,935	413,924	333,300	44,507	13%	15	264,045	286,030	306,991	343,459	347,694	387,333	410,973	6%
	3003	74,228	185,141	121,100	32,254	27%	14	82,338	87,448	94,886	118,577	138,847	161,681	172,894	19%
	3004	374,887	525,578	458,122	50,311	11%	15	383,010	389,608	422,486	460,071	497,417	522,104	525,578	8%
	3005	315,860	411,007	363,121	32,123	9%	12	316,559	318,984	339,880	364,699	385,333	404,047	407,731	6%
	3006	10,571	23,789	17,358	4,101	24%	15	10,841	12,138	14,708	17,350	20,205	22,888	23,783	16%
	3007	371,186	660,805	523,437	78,038	15%	11	394,648	418,109	507,405	521,865	562,372	584,002	622,404	5%
Commodities	4001	8,992	39,720	24,640	10,661	43%	8	11,295	13,597	17,994	23,530	31,140	38,641	39,181	27%
	4002	293,232	418,042	358,678	44,279	12%	6	303,357	313,482	336,271	359,112	385,211	403,440	410,741	7%
	4003	382,949	708,495	536,514	95,374	18%	7	420,450	457,951	519,688	532,285	546,247	619,293	663,893	2%
	4004	233,817	412,229	343,605	66,543	19%	5	255,317	276,817	341,318	365,300	365,359	393,481	402,855	3%
Credit Spread	5001	4,371	10,534	7,215	2,128	29%	11	4,396	4,420	5,571	6,815	9,053	9,303	9,919	24%
	5002	14,822	31,316	23,653	4,908	21%	10	15,506	16,191	22,394	24,867	26,178	26,724	29,020	8%
	5003	3,278	5,908	4,068	717	18%	11	3,347	3,416	3,600	3,943	4,193	4,537	5,223	6%
	5004	6,917	14,052	10,697	2,368	22%	10	6,924	6,931	9,459	11,463	12,143	12,455	13,254	12%
	5005	2,902	4,946	4,362	599	14%	10	3,436	3,969	4,240	4,407	4,766	4,946	4,946	6%
	5006	4,660	8,741	6,868	1,573	23%	10	4,742	4,825	5,571	6,968	8,337	8,741	8,741	20%
	5007	21,691	71,614	43,249	17,280	40%	9	21,837	21,982	29,969	42,546	53,435	61,133	66,374	28%
	5008	55,529	114,856	74,752	21,090	28%	11	56,066	56,602	59,239	64,108	85,033	109,069	111,963	18%
	5009	5,573	12,075	8,069	1,879	23%	11	5,748	5,923	7,142	7,577	9,249	9,796	10,936	13%
	5010	13,737	30,295	19,511	5,626	29%	10	13,863	13,988	16,335	18,043	20,210	28,573	29,434	11%
	5011	27,058	49,744	35,685	7,248	20%	10	28,702	30,347	31,037	33,966	36,337	47,076	48,410	8%
	5012	2,110	4,745	2,731	873	32%	8	2,110	2,110	2,156	2,511	2,750	3,547	4,146	12%
	5013	10,066	20,246	14,602	2,954	20%	11	10,677	11,288	12,679	14,552	16,054	17,714	18,980	12%
	5014	3,137	6,356	4,499	1,256	28%	10	3,169	3,200	3,827	4,039	5,562	6,356	6,356	18%
	5015	16,919	39,379	24,109	7,028	29%	9	17,457	17,996	20,439	21,984	24,128	32,879	36,129	8%
	5016	28,816	59,819	41,308	9,846	24%	8	30,076	31,337	36,853	38,425	46,126	52,312	56,065	11%
	5017	12,754	36,677	26,342	7,943	30%	8	16,009	19,265	22,055	25,758	31,646	35,658	36,167	18%
	5018	34,311	87,007	61,453	17,114	28%	8	39,477	44,643	49,071	61,911	72,873	79,843	83,425	20%
	5019	7,323	20,848	10,881	4,216	39%	9	7,725	8,326	8,714	9,554	10,154	15,590	18,219	8%
	5020	118,540	200,472	162,817	26,052	16%	10	122,536	126,532	147,420	165,783	180,964	191,773	196,122	10%
	5021	12,325	32,470	23,432	7,351	31%	9	13,291	14,257	19,745	23,106	30,715	32,470	32,470	22%
	5022	114,514	183,792	150,382	23,230	15%	8	117,829	121,143	134,849	155,962	163,584	173,010	178,401	10%
	5023	59,536	94,343	74,644	11,751	16%	9	60,736	61,935	62,965	72,975	82,819	87,424	90,883	14%
	5024	19,679	58,757	37,682	13,690	36%	10	21,629	23,580	28,876	34,659	50,219	55,027	56,892	27%
	5025	39,882	55,844	50,759	5,496	11%	9	41,710	43,539	48,432	53,432	54,052	55,844	55,844	5%
	5026	22,264	40,129	27,802	6,479	23%	10	22,497	22,730	23,239	25,701	28,492	38,901	39,515	10%
	5027	15,981	30,822	22,579	6,442	29%	10	16,123	16,265	16,677	20,609	29,141	30,467	30,645	27%
CTP	6001						1								
	6002						1								
	6003						1								
	6004						1								
	6005						1								
ALL-IN no-CTP	10000	509,460	1,125,408	782,184	208,148	27%	7	535,525	561,590	629,049	852,997	864,661	973,454	1,049,431	16%
Equity Cumulative	11000	157,349	311,963	233,000	49,552	21%	11	165,678	174,006	208,138	215,708	279,820	285,214	298,589	15%
IR Cumulative	12000	289,899	437,127	363,921	44,630	12%	15	292,663	305,102	336,239	366,000	380,928	427,826	437,127	6%
FX Cumulative	13000	552,348	922,028	752,363	95,375	13%	14	637,576	683,831	693,861	737,751	827,480	862,866	885,200	9%
Commodity Cumulative	14000	291,100	502,693	369,569	73,422	20%	7	299,697	308,293	325,124	332,870	405,038	454,440	478,566	11%
CS Cumulative	15000	157,424	279,736	207,927	40,558	20%	7	161,925	166,425	182,456	206,301	223,560	251,601	265,669	10%
CTP Cumulative	16000														

Figure 23: VaR ratio with median (focus on medium-sized banks)

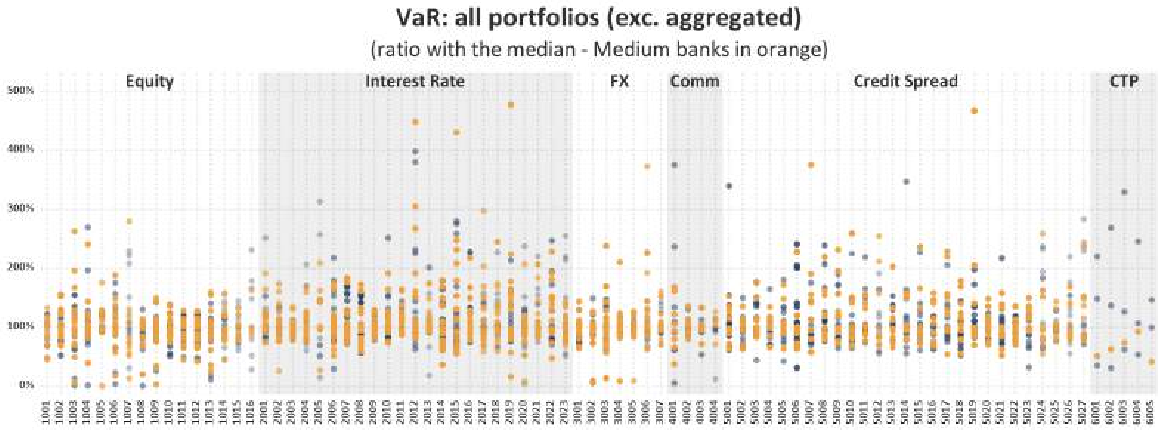


Table 29: VaR statistics (large banks only)

EU Statistics for VaR

		Other stats						Percentiles							
	Port. ID	Min	Max	Ave.	STDev	Coefficient of variation (STDev/Mean)	Num obs.	5th	10th	25th	50th (Median)	75th	90th	95th	Interquantile range
	1001	276,609	503,770	430,024	78,252	18%	9	290,970	321,131	425,536	441,198	502,231	503,416	503,593	8%
	1002	211,065	304,678	255,281	30,252	12%	8	216,828	222,591	229,207	265,684	268,574	280,134	292,406	8%
	1003	1,004	2,441	1,759	562	32%	10	1,028	1,052	1,180	1,933	2,126	2,434	2,437	29%
	1004	911	1,643	1,241	271	22%	8	938	966	1,048	1,178	1,448	1,578	1,610	16%
	1005	52,837,947	67,700,086	58,971,831	6,041,226	10%	10	52,986,531	53,135,114	54,882,929	56,263,043	64,914,015	67,515,540	67,607,813	8%
	1006	1,821	4,445	3,013	776	26%	9	2,065	2,309	2,626	2,852	3,509	3,880	4,163	14%
	1007	5,075	24,389	15,604	5,341	34%	8	8,151	11,227	14,499	15,854	17,522	19,622	22,006	9%
Equity	1008	12,507	26,168	19,540	3,698	19%	10	14,067	15,627	18,054	20,116	21,442	21,952	24,060	9%
	1009	47,697	81,006	59,341	9,593	16%	10	48,761	49,826	53,465	58,773	61,511	68,492	74,749	7%
	1010	21,826	39,997	33,403	5,940	18%	9	24,462	27,098	32,312	32,856	39,528	39,749	39,871	10%
	1011	261,378	477,757	401,126	73,342	18%	9	283,021	304,664	390,701	407,236	472,121	473,291	475,524	9%
	1012	248,179	462,573	383,306	69,947	18%	9	269,145	290,111	374,060	389,040	440,770	450,187	456,380	8%
	1013	44,653	82,195	62,590	10,020	16%	10	48,186	51,720	57,634	64,579	66,048	69,045	75,620	7%
	1014	142,739	311,626	234,593	53,775	23%	8	157,466	172,194	204,204	246,869	258,927	290,802	301,214	12%
	1015	125,828	245,197	181,694	37,425	21%	8	130,106	134,384	170,936	183,491	192,549	219,366	232,282	6%
	1016	51,102	294,876	151,724	93,534	62%	5	59,335	67,568	92,268	141,491	178,885	248,480	271,678	32%
	2001	148,895	258,202	200,204	37,922	19%	10	154,219	159,542	170,821	189,646	234,208	242,141	250,171	16%
	2002	155,247	239,967	189,163	34,791	18%	9	155,249	155,252	161,211	178,944	224,621	237,147	238,557	16%
	2003	23,462	31,062	27,485	2,217	8%	9	24,144	24,825	26,904	27,742	28,644	29,527	30,294	3%
	2004	86,326	138,396	116,117	20,262	17%	10	87,692	89,058	96,953	121,163	133,269	135,771	137,083	16%
	2005	4,629	45,314	20,899	13,479	64%	6	7,399	10,168	15,901	18,968	21,721	33,562	39,438	15%
	2006	22,262	45,679	30,502	7,548	25%	10	22,870	23,478	24,674	29,333	34,075	39,889	42,784	16%
	2007	68,107	126,190	85,181	19,300	23%	9	68,290	68,473	69,227	78,616	93,286	107,044	116,617	15%
	2008	60,474	129,668	87,238	28,030	32%	10	60,578	60,683	64,924	77,039	114,030	125,416	127,542	27%
	2009	170,747	240,874	208,841	22,447	11%	9	177,107	183,468	199,430	210,988	216,140	238,815	239,844	4%
	2010	134,005	232,375	180,625	34,560	19%	10	138,786	143,568	153,730	170,681	211,647	218,842	225,608	16%
	2011	384,530	508,469	432,998	48,201	11%	8	385,034	385,539	389,133	424,585	469,679	487,932	498,201	9%
Interest Rate	2012	55,388	113,415	80,048	18,196	23%	9	58,375	61,362	69,262	78,789	89,453	101,793	107,604	13%
	2013	38,557	50,408	43,044	3,923	9%	10	38,880	39,202	40,320	41,701	45,918	47,485	48,946	6%
	2014	30,368	59,359	42,716	11,249	26%	8	31,404	32,439	33,617	39,877	50,190	58,007	58,683	20%
	2015	6,199	11,886	8,764	1,817	21%	8	6,609	7,019	7,563	8,693	9,426	10,997	11,442	11%
	2016	89,996	159,856	125,270	24,139	19%	10	97,106	104,215	108,879	118,409	147,210	157,555	158,705	15%
	2017	19,701	40,501	28,868	5,273	18%	10	22,490	25,278	26,420	28,802	29,706	33,020	36,761	6%
	2018	15,905	35,185	23,580	6,121	26%	10	16,048	16,191	20,931	22,492	24,740	32,442	33,813	8%
	2019	8,190	17,269	11,237	3,429	31%	9	8,454	8,719	8,901	9,700	11,341	16,924	17,097	12%
	2020	30,832	55,392	44,788	9,539	21%	8	31,275	31,719	40,263	44,674	53,632	54,561	54,977	14%
	2021	32,035	63,040	42,127	11,756	28%	10	32,134	32,234	32,872	36,970	50,059	59,274	61,157	21%
	2022	144,138	353,823	223,767	71,519	32%	10	152,295	160,452	171,063	201,372	281,498	309,833	331,828	24%
	2023	30,241	57,227	38,801	7,963	21%	10	31,119	31,997	34,389	36,157	40,818	47,090	52,159	9%
	3001	342,985	630,718	471,238	94,866	20%	9	343,897	344,808	389,800	495,863	515,245	552,980	591,849	14%
	3002	239,141	488,006	343,071	72,784	21%	8	264,395	289,649	316,249	322,892	358,867	423,555	455,780	6%
	3003	80,610	174,249	126,242	26,091	21%	9	90,076	99,541	113,449	130,161	139,226	146,473	160,361	10%
FX	3004	391,769	539,861	456,613	42,235	9%	9	406,331	420,892	433,889	455,728	472,443	500,561	520,212	4%
	3005	310,237	389,130	363,838	23,080	6%	9	327,995	345,754	360,097	367,093	376,267	386,013	387,572	2%
	3006	11,510	23,760	16,531	3,429	21%	9	12,867	14,224	15,196	15,370	17,707	20,148	21,954	8%
	3007	378,329	727,498	545,337	104,549	19%	8	418,311	458,294	511,609	528,837	565,595	674,354	700,926	5%
	4001	14,629	55,740	29,843	15,735	53%	5	16,007	17,385	21,519	25,821	31,507	46,047	50,893	19%
Commodities	4002	313,613	479,620	381,874	56,938	15%	6	324,374	335,136	357,209	366,008	400,291	444,478	462,049	6%
	4003	488,404	709,464	586,316	93,746	16%	4	497,382	506,360	533,293	573,698	626,720	676,367	692,915	8%
	4004	300,636	377,326	338,274	32,789	10%	5	304,252	307,868	318,715	327,202	367,493	373,392	375,359	7%
	5001	4,278	10,678	7,352	1,821	25%	10	5,004	5,731	6,247	7,293	7,975	9,612	10,145	12%
	5002	16,044	25,698	21,308	3,525	17%	9	16,354	16,664	18,604	21,812	23,123	25,583	25,640	11%
	5003	3,387	5,976	4,400	1,099	25%	10	3,396	3,404	3,426	3,863	5,537	5,650	5,813	24%
	5004	7,157	11,642	9,519	1,647	17%	9	7,204	7,251	8,541	9,469	10,742	11,539	11,590	11%
	5005	3,321	6,121	4,440	800	18%	9	3,531	3,742	4,090	4,198	4,848	5,199	5,660	8%
	5006	2,322	14,499	7,037	3,506	50%	9	3,254	4,186	4,875	6,431	7,814	10,701	12,600	23%
	5007	26,322	66,095	37,706	13,719	36%	9	26,837	27,352	28,535	32,805	39,191	56,645	61,370	16%
	5008	54,021	88,134	68,630	11,200	16%	9	54,251	54,481	64,453	66,075	76,902	80,916	84,525	9%
	5009	5,414	13,193	8,119	2,809	35%	9	5,698	5,983	6,239	6,658	8,889	12,363	12,778	18%
	5010	12,977	21,193	18,699	2,771	15%	10	13,053	14,929	17,460	20,036	20,593	20,828	21,010	8%
	5011	26,110	37,353	33,112	4,043	12%	9	26,476	26,842	31,946	34,821	35,412	36,732	37,043	5%
	5012	1,750	4,967	2,993	961	32%	10	1,784	1,818	2,479	2,952	3,462	3,885	4,426	17%
	5013	11,823	21,007	16,348	2,896	18%	9	12,873	13,924	15,232	15,780	16,673	20,741	20,874	5%
Credit Spread	5014	2,231	6,357	4,111	1,309	32%	9	2,591	2,950	3,518	3,747	4,333	6,046	6,201	10%
	5015	14,571	33,296	22,682	5,357	24%	10	16,046	17,520	19,586	22,072	24,460	28,958	31,127	11%
	5016	26,641	50,472	39,873	8,601	22%	9	26,971	27,301	36,951	41,509	44,916	49,936	50,204	10%
	5017	17,540	31,180	21,753	4,307	20%	8	18,040	18,540	18,988	20,561	22,718	26,080	28,630	9%
	5018	32,985	89,229	57,058	16,733	29%	9	35,573	38,161	51,991	55,905	67,155	74,159	81,694	13%
	5019	8,401	20,071	11,905	3,979	33%	10	8,592	8,784	9,413	10,106	13,049	17,845	18,958	16%
	5020	132,699	196,893	164,607	16,159	10%	10	144,419	156,139	159,599	161,564	169,992	178,547	187,720	3%
	5021	16,864	30,659	22,917	4,639	20%	8	17,474	18,084	19,885	22,304	25,948	27,773	29,216	13%
	5022	122,630	192,895	159,090	18,838	12%	9	132,589	142,548	152,230	160,519	165,795	174,780	183,837	4%
	5023	40,813	76,638	59,431	14,164	24%	5	43,427	46,041	53,884	55,600	70,121	74,031	75,335	13%
	5024	22,892	69,802	39,768	19,440	49%	9	23,035	23,178	24,082	28,793	58,382	66,485	68,144	42%
	5025	39,838	66,740	51,795	7,432	14%	9	43,113	46,388	49,182	49,938	52,466	60,193	63,466	3%
	5026	15,580	43,473	29,979	9,593	32%	9	17,484	19,388	25,010	28,097	36,596	43,296	43,385	19%
	5027	14,311	21,436	17,408	2,621	15%	8	14,372	14,434	15,918	17,035	18,474	21,059	21,247	7%
	6001	7,758	47,902	29,308	20,235	69%	3	10,209	12,659	20,011	32,264	40,083	44,774	46,338	33%
	6002	6,964	58,958	32,000	26,050	81%	3	9,276	11,587	18,522	30,070	44,519	53,182	56,070	41%
CTP	6003	1,962	10,352	5,428	4,381	81%	3	2,163	2,364	2,966	3,970	7,161	9,076	9,714	41%
	6004	1,921	8,738	4,822	3,520	73%	3	2,110	2,298	2,865	3,808	6,273	7,752	8,245	37%
	6005	32,716	47,902	40,309	10,738	27%	2	33,475	34,235	36,513	40,309	44,106	46,383	47,143	9%
ALL-IN no-CTP	10000	696,529	968,126	804,733	93,405	12%	6	708,307	720,085	751,765	796,067	824,977	898,049	933,087	5%
Equity Cumulative	11000	193,118	294,879	225,017	34,399	15%	7	196,849	200,581	207,010	208,992	232,054	263,077	278,978	6%
IR Cumulative	12000	280,584	447,514	376,779	55,490	15%	9	298,206	315,828	343,320	370,628	418,670	436,060	441,787	10%
FX Cumulative	13000	633,988	929,263	779,034	88,290	11%	9	663,354	692,719	720,250	764,234	827,610	871,977	900,620	7%
Commodity Cumulative	14000	297,269	480,351	399,653	76,973	19%	5	312,031	326,793	371,080	376,691	472,873	477,360	478,855	12%
CS Cumulative	15000	168,575	338,003	225,201	46,746	21%	9	175,950	183,325	218,768	220,820	225,135	248,260	293,131	1%
CTP Cumulative	16000	1	5	3	3	94%	2	1	1	2	3	4	5	5	13%

Figure 24: VaR ratio with median (focus on large banks)

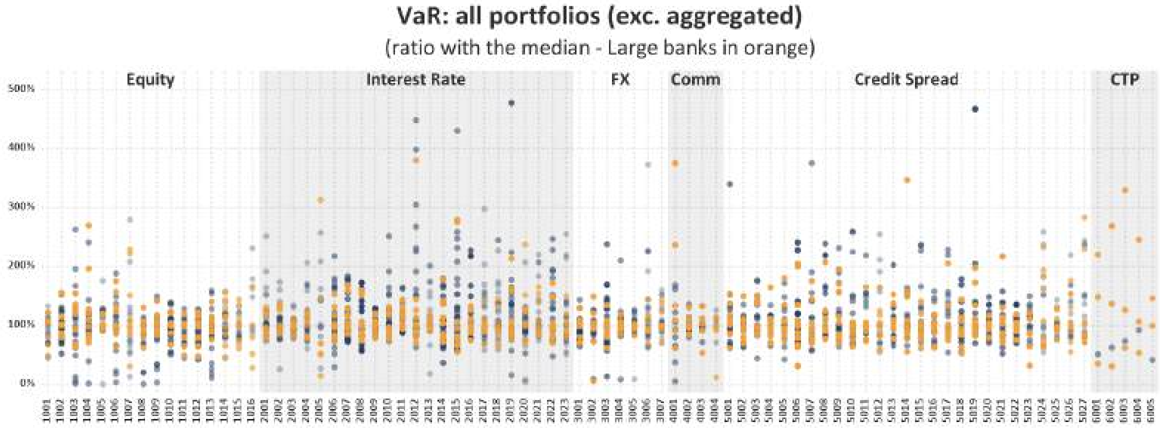


Table 30: VaR statistics (small TB banks only)

EU Statistics for VaR

		Other stats						Percentiles									Extreme Values range (Full Sample)	
	Port. ID	Min	Max	Ave.	STDev	Coefficient of variation (STDev/Mean)	Num obs.	5th	10th	25th	50th (Median)	75th	90th	95th	Interquantile range	STDev_trunc	-2*STDev_trunc	+2*STDev_trunc
Equity	1001	281,100	545,084	404,127	101,875	25%	7	282,874	286,648	320,118	418,995	468,236	520,296	532,690	19%	87,445	235,100	585,082
	1002	138,749	323,546	227,003	68,220	30%	5	151,234	163,679	201,675	217,397	254,248	295,827	309,686	12%	67,687	127,896	398,325
	1003	204	2,441	1,614	861	53%	5	457	711	1,471	1,912	2,040	2,281	2,361	16%	687	179	2,567
	1004	1,068	1,568	1,337	202	15%	6	1,096	1,124	1,202	1,329	1,530	1,560	1,564	12%	508	266	2,299
	1005	51,728,788	67,700,086	57,262,581	7,000,552	12%	[illegible]	51,741,496	51,754,203	52,184,144	54,550,500	61,545,159	67,250,705	67,475,395	8%	7,394,419	41,474,284	71,051,881
	1006						[illegible]											
	1007						2											
	1008						6											
	1009	44,640	84,965	59,211	15,348	26%	5	46,389	48,138	53,385	52,456	59,620	74,825	79,888	6%	15,628	25,689	88,120
	1010	28,054	39,997	32,717	4,877	15%	5	28,411	28,768	29,838	30,780	35,305	38,120	39,059	8%	8,262	18,789	44,835
	1011	267,886	506,663	380,293	93,156	25%	7	269,043	270,201	383,894	403,722	430,798	485,979	496,317	18%	77,139	239,851	548,745
	1012	253,093	481,568	361,062	87,730	24%	7	254,467	255,842	289,393	383,296	416,549	457,088	469,327	18%	75,097	227,484	527,872
	1013	47,145	93,256	62,508	18,436	30%	5	47,600	48,055	49,421	60,088	61,658	80,593	86,904	11%	17,880	22,768	94,287
	1014	200,841	268,450	237,376	28,375	12%	6	203,220	205,598	214,670	242,083	259,673	264,449	266,449	9%	31,745	113,094	320,072
	1015	145,758	221,575	178,512	28,864	16%	5	148,543	151,370	159,860	176,996	186,311	207,464	214,573	8%	33,844	114,299	249,587
	1016						6											
Interest Rate	2001	147,973	240,556	196,250	29,259	15%	7	158,373	168,773	183,799	195,285	211,329	226,907	233,653	7%	38,700	118,497	275,297
	2002	136,316	239,962	176,256	33,937	19%	7	142,291	148,265	158,852	163,090	188,768	214,008	226,988	9%	30,522	118,133	240,220
	2003	24,151	30,434	26,950	2,132	8%	7	24,663	25,175	25,956	26,285	27,934	29,659	30,047	4%	2,448	22,711	32,502
	2004	80,136	138,398	109,495	22,663	21%	7	81,767	83,397	94,308	110,572	124,334	137,045	138,018	14%	26,439	58,799	164,555
	2005						3											
	2006	18,671	48,250	29,186	8,775	30%	9	20,132	21,593	22,885	28,858	33,049	36,328	42,375	17%	9,758	10,372	49,242
	2007	57,406	102,764	77,395	18,180	24%	8	58,698	59,991	63,629	71,403	89,613	102,008	102,587	18%	24,984	29,327	129,303
	2008	46,268	326,175	82,532	29,066	36%	9	47,114	47,959	63,645	81,093	101,139	124,005	125,090	23%	28,419	24,275	137,951
	2009	172,887	240,874	198,308	22,387	11%	7	177,067	181,238	187,860	188,458	205,001	224,566	232,670	8%	20,895	157,639	241,220
	2010	133,376	217,558	176,775	26,586	15%	7	142,538	151,901	165,370	175,759	190,208	204,673	210,981	7%	34,902	106,545	246,111
	2011	364,563	457,607	393,984	32,613	8%	6	366,350	368,137	373,962	378,526	395,893	426,139	431,403	3%	57,813	269,238	520,462
	2012	49,735	150,338	84,801	30,260	36%	8	55,737	61,739	67,500	75,127	90,033	114,322	122,330	14%	54,204	-30,215	187,263
	2013	38,069	48,481	42,607	3,903	9%	7	38,527	38,976	39,858	42,063	44,581	47,088	48,085	6%	9,175	23,727	60,433
	2014	15,534	45,997	34,404	12,521	36%	5	18,019	20,505	27,861	40,544	43,562	44,395	45,194	29%	15,162	13,258	72,706
	2015	7,039	19,941	12,117	4,728	39%	6	7,337	7,645	8,747	11,478	14,075	17,230	18,585	23%	7,296	-3,455	25,693
	2016	95,330	179,908	130,872	29,715	23%	8	101,106	106,881	112,638	116,358	155,877	165,877	172,890	16%	40,617	38,858	201,327
	2017	24,657	61,709	33,484	6,839	20%	8	25,493	26,329	28,893	31,649	39,186	41,554	42,631	15%	9,235	10,444	47,382
	2018	14,378	35,185	23,830	6,948	29%	7	15,459	16,441	20,249	22,976	26,886	31,833	33,504	14%	7,696	8,724	39,508
	2019	8,285	17,278	12,140	3,760	31%	7	8,548	8,786	9,442	10,278	15,023	17,173	17,275	23%	4,287	1,081	19,120
	2020	28,149	51,795	43,852	8,408	19%	7	31,197	34,266	40,800	46,273	49,767	51,709	51,752	10%	9,406	24,146	61,769
	2021	28,455	52,928	39,537	7,624	19%	8	30,265	32,275	35,762	37,576	40,117	48,628	50,774	9%	13,360	13,257	64,697
	2022	152,112	312,545	211,625	68,357	32%	7	153,596	155,080	162,405	188,037	251,437	307,988	310,265	22%	65,977	32,985	376,891
	2023	21,541	97,586	42,326	23,047	54%	9	24,263	26,986	31,683	32,441	43,189	65,299	81,442	15%	31,334	-24,459	100,828
FX	3001	360,905	630,918	461,820	92,953	20%	7	368,839	370,771	381,742	447,998	501,738	561,514	596,216	12%	74,729	336,133	635,047
	3002	273,528	413,924	328,952	55,321	17%	7	276,025	278,529	288,173	315,735	361,569	403,179	408,577	11%	82,415	162,334	492,034
	3003	74,228	185,141	126,256	43,923	35%	8	78,595	82,962	98,332	119,833	158,649	182,863	183,997	27%	37,359	54,736	204,208
	3004	386,491	498,130	448,478	36,978	8%	8	399,738	412,985	427,440	448,250	470,053	492,954	495,542	5%	45,697	366,411	549,199
	3005	353,786	439,028	381,098	35,064	9%	6	354,573	355,260	358,208	365,698	396,027	422,238	430,828	5%	42,318	298,908	459,200
	3006	10,957	21,852	16,232	3,775	23%	8	11,682	12,407	13,129	16,535	18,597	20,235	21,037	17%	7,041	2,447	30,572
	3007	418,339	727,888	535,442	107,627	20%	6	432,318	446,127	474,913	493,840	536,522	636,350	681,924	6%	111,233	307,313	752,246
Commodities	4001						4											
	4002						2											
	4003						3											
	4004						1											
Credit Spread	5001	4,259	8,802	6,223	2,018	32%	6	4,287	4,315	4,453	5,556	7,797	8,397	8,600	27%	1,899	3,334	10,700
	5002						3											
	5003						4											
	5004						3											
	5005						2											
	5006	4,660	14,499	7,578	4,003	53%	5	4,743	4,826	5,874	6,491	7,318	11,567	13,033	17%	3,724	-284	14,683
	5007						2											
	5008	60,401	109,088	79,930	18,961	24%	5	61,768	63,135	67,237	76,902	86,042	99,858	104,464	12%	29,766	18,802	129,885
	5009	6,125	9,315	7,878	1,226	16%	6	6,363	6,608	7,233	7,785	8,852	9,249	9,282	10%	3,101	1,506	13,909
	5010	13,797	28,582	19,854	5,414	27%	5	14,474	15,209	17,817	19,896	20,644	25,261	26,833	8%	10,682	-1,349	41,459
	5011	32,075	46,798	36,428	6,019	17%	5	32,121	32,166	32,300	35,252	35,628	42,319	44,556	3%	9,166	17,081	53,743
	5012	1,654	4,986	3,264	1,522	47%	6	1,868	2,081	2,547	2,845	4,317	4,866	4,976	26%	1,575	138	6,157
	5013	11,259	17,138	14,385	2,080	14%	6	11,676	11,093	13,108	14,869	15,382	16,293	16,715	8%	3,125	8,981	21,483
	5014	2,639	6,027	4,131	1,333	32%	5	2,753	2,866	3,207	4,000	4,775	5,526	5,777	20%	1,212	1,581	6,430
	5015	16,919	39,379	27,005	9,059	34%	5	17,884	18,849	23,745	23,988	33,286	36,946	38,162	23%	11,547	561	46,750
	5016						4											
	5017						3											
	5018						3											
	5019	9,554	20,848	14,465	4,897	34%	6	9,704	9,854	10,692	13,682	18,538	20,450	20,654	27%	10,522	-10,889	31,197
	5020	118,543	207,875	161,005	33,980	21%	6	122,661	126,781	140,220	166,162	187,212	199,345	203,608	18%	25,024	117,764	217,662
	5021						4											
	5022	114,514	186,894	150,540	33,452	22%	5	117,061	119,609	127,251	170,251	181,702	183,653	186,274	18%	25,383	111,256	212,747
	5023						3											
	5024	23,602	69,802	45,757	20,783	45%	5	25,786	27,990	34,573	34,344	66,084	68,307	69,054	31%	20,543	-5,336	76,505
	5025						3											
	5026						4											
	5027						3											
CTP	6001						1											
	6002						1											
	6003						1											
	6004						1											
	6005						1											
ALL-IN no-CTP	10000						8											
Equity Cumulative	11000						3											
IR Cumulative	12000	289,899	433,197	360,501	40,627	11%	8	306,658	323,417	338,526	343,697	391,327	419,071	426,434	7%	59,576	242,646	480,951
FX Cumulative	13000	552,348	758,155	687,620	64,595	9%	8	598,664	644,980	668,904	705,956	734,558	749,628	758,890	3%	108,524	539,370	975,466
Commodity Cumulative	14000						3											
CS Cumulative	15000						4											
CTP Cumulative	16000																	

Table 31: VaR statistics (medium TB banks only)

EU Statistics for VaR

		Other stats						Percentiles									Extreme values range (of truncated)	
	Port. ID	Min	Max	Ave.	STDev	Coefficient of variation (STDev/Mean)	Num obs.	5th	10th	25th	50th (Median)	75th	90th	95th	Interquantile range	STDev_trunc	-2*STDev_trunc	+2*STDev_trunc
Equity	1001	281,050	541,328	413,032	70,907	17%	13	282,640	294,829	382,605	440,783	441,747	480,368	492,035	7%	67,445	255,100	585,082
	1002	211,065	329,651	265,650	32,608	17%	11	219,708	228,251	250,482	266,247	275,931	304,678	312,166	5%	67,687	127,894	398,325
	1003	588	2,638	1,575	505	32%	12	593	1,012	1,131	1,520	1,830	2,133	2,363	24%	687	179	2,567
	1004	512	1,848	1,224	373	30%	10	692	871	1,014	1,264	1,468	1,563	1,702	18%	508	266	2,299
	1005	53,158,133	78,284,083	58,872,334	6,522,594	11%	9	53,358,663	53,549,192	54,687,404	55,469,582	61,893,734	68,057,845	69,168,464	8%	7,394,419	41,474,284	71,051,881
	1006	1,921	4,213	2,954	799	16%	13	1,846	1,977	2,479	2,888	3,500	3,485	4,300	17%	1,022	786	4,879
	1007	5,075	24,388	14,462	5,643	39%	10	6,656	8,636	10,929	14,287	17,546	20,408	22,395	23%	8,685	-3,232	30,533
	1008	12,507	21,714	18,640	3,263	17%	12	13,168	13,946	16,360	18,181	21,208	21,708	21,760	13%	5,083	8,837	30,171
	1009	47,294	81,006	59,543	8,163	14%	13	48,631	50,625	56,313	58,851	61,560	64,108	71,549	4%	11,636	25,689	88,120
	1010	21,835	39,687	32,945	5,071	15%	12	24,624	27,330	33,234	32,538	35,933	39,229	39,614	7%	6,352	18,789	44,835
	1011	257,866	477,757	393,693	59,288	15%	12	291,377	322,424	387,267	406,496	414,405	451,552	464,354	3%	77,189	259,051	548,745
	1012	240,258	482,573	378,464	58,740	16%	12	275,849	304,134	371,802	388,860	405,411	435,309	448,674	4%	75,097	227,484	527,872
	1013	52,505	82,195	68,459	8,288	12%	13	53,838	54,771	56,950	63,960	65,686	73,459	78,825	7%	17,880	22,768	94,287
	1014	174,291	300,638	228,347	40,295	18%	13	176,087	178,791	202,889	222,500	251,277	277,479	289,382	11%	51,745	113,094	320,072
	1015	125,828	239,713	177,423	35,299	20%	12	132,551	138,477	145,331	182,394	196,384	221,080	230,345	15%	33,844	114,289	249,587
	1016						6											
Interest Rate	2001	148,895	238,702	196,826	27,506	14%	19	158,551	161,158	184,970	192,195	204,097	234,372	235,939	5%	38,700	118,497	275,297
	2002	137,288	236,843	181,823	26,072	16%	16	138,387	139,723	169,610	178,173	196,686	215,083	227,576	7%	30,532	118,333	240,220
	2003	23,402	31,062	27,853	2,306	9%	10	23,566	25,794	27,330	28,159	29,492	30,606	30,948	4%	2,448	22,711	32,502
	2004	87,975	142,253	114,404	20,711	18%	18	81,531	90,101	99,825	115,208	129,167	134,277	138,496	13%	26,839	58,789	164,555
	2005	4,629	94,885	32,206	21,408	66%	6	7,359	10,168	18,374	31,081	42,358	55,390	66,158	37%	24,422	-17,784	79,905
	2006	15,587	45,679	29,646	7,184	14%	14	19,655	22,066	25,720	29,420	33,631	36,040	39,674	13%	9,758	10,372	49,242
	2007	58,076	115,098	79,438	14,302	18%	13	64,170	68,431	70,862	78,636	83,623	94,428	104,257	8%	24,984	29,327	129,303
	2008	54,929	131,958	83,713	27,194	33%	15	57,854	59,910	63,970	72,854	96,896	127,727	130,353	22%	28,419	24,275	137,951
	2009	160,752	238,308	199,988	18,779	9%	18	169,248	179,262	190,958	200,880	210,035	216,214	225,851	5%	20,895	157,639	241,220
	2010	134,005	232,575	177,150	25,132	14%	18	143,036	145,035	165,568	172,926	183,098	210,938	215,964	5%	34,902	106,583	246,111
	2011	352,525	508,468	439,837	50,145	11%	18	352,255	361,211	382,134	441,176	464,873	488,659	481,847	10%	57,815	368,258	528,462
	2012	62,856	126,712	79,813	18,015	23%	14	64,261	65,018	68,265	75,384	80,828	104,712	118,869	8%	54,194	-30,315	187,263
	2013	38,728	53,227	43,024	4,203	10%	17	38,786	39,227	40,366	42,660	45,110	49,809	50,971	6%	8,175	33,712	60,433
	2014	27,423	71,063	42,002	15,930	38%	11	28,748	30,074	31,855	35,520	53,885	63,652	67,358	25%	15,162	11,258	72,706
	2015	6,199	23,132	10,367	4,621	45%	14	6,239	6,328	7,262	9,294	12,242	14,262	17,569	25%	7,256	-3,455	25,693
	2016	89,996	157,298	118,933	17,010	14%	14	100,265	106,285	109,905	115,177	120,295	141,676	149,305	5%	30,657	38,858	201,327
	2017	17,062	41,864	31,556	8,523	27%	14	21,816	24,844	26,366	28,867	38,423	44,023	45,200	19%	9,235	10,444	47,582
	2018	15,905	31,435	24,001	4,788	20%	17	16,158	19,744	22,390	22,687	24,800	31,667	33,011	5%	7,696	8,326	39,508
	2019	6,079	18,782	11,360	3,935	34%	17	7,616	8,114	8,466	9,300	14,224	16,848	17,247	25%	4,387	1,081	19,120
	2020	38,368	55,392	46,382	6,342	14%	15	38,300	37,028	35,398	41,693	48,286	53,899	54,561	10%	9,406	24,144	61,768
	2021	31,330	63,048	39,080	9,207	24%	14	31,288	31,583	32,814	36,549	40,523	50,864	52,775	10%	13,360	11,257	64,697
	2022	98,304	371,082	125,679	75,230	33%	14	128,026	157,098	183,956	199,365	265,400	333,107	360,214	17%	45,977	32,985	376,891
	2023	29,808	54,535	40,161	6,762	17%	16	30,885	32,017	36,713	39,128	44,154	48,510	51,956	9%	11,334	24,459	300,678
FX	3001	342,985	541,772	468,529	61,813	13%	20	366,596	382,466	428,898	488,272	509,780	532,653	535,603	9%	74,725	306,333	635,047
	3002	239,141	409,708	328,919	38,186	12%	15	272,647	294,118	306,991	341,648	347,207	351,870	370,552	6%	83,415	162,334	492,024
	3003	90,610	174,249	129,667	25,027	20%	15	90,858	95,559	115,611	128,158	138,281	155,667	168,684	9%	37,359	54,770	204,208
	3004	391,769	516,894	451,583	36,992	8%	14	393,403	398,561	421,695	456,898	472,981	490,842	503,771	5%	45,697	366,411	549,109
	3005	310,237	411,007	363,567	28,598	8%	15	315,063	326,542	346,686	372,463	379,353	394,211	399,811	4%	42,318	269,028	459,203
	3006	11,510	25,788	17,573	4,088	23%	15	13,180	13,386	14,708	16,420	21,229	23,777	23,783	18%	7,041	2,487	30,572
	3007	378,129	660,805	528,103	69,689	13%	11	429,788	481,231	538,711	521,895	562,372	584,003	622,406	5%	111,212	307,313	752,246
Commodities	4001	14,629	39,738	24,895	9,637	39%	6	14,865	15,106	32,390	21,873	30,081	35,614	37,667	27%	20,750	-17,891	64,550
	4002	293,232	479,620	373,661	62,041	17%	7	299,346	305,461	315,136	374,138	399,087	437,450	458,535	12%	58,472	249,065	482,951
	4003	507,263	790,464	571,383	79,638	14%	5	512,647	517,341	535,422	548,256	559,822	649,807	679,536	3%	113,220	309,828	758,742
	4004	330,636	412,779	361,727	37,371	10%		310,807	320,977	342,138	366,429	374,862	394,778	403,501	4%	93,186	140,430	513,924
Credit Spread	5001	4,278	10,678	6,912	2,433	35%	10	4,342	4,406	5,221	6,872	8,790	10,548	10,613	25%	1,899	3,104	10,700
	5002	14,822	31,338	21,879	5,222	24%	10	15,506	16,193	17,265	22,465	25,284	26,724	29,020	19%	4,320	14,083	32,183
	5003	3,274	5,565	4,903	684	14%	11	3,442	3,406	3,415	3,664	4,194	3,537	5,363	10%	1,022	1,993	5,991
	5004	6,597	14,052	9,863	2,462	25%	10	6,924	6,981	7,592	9,936	11,610	12,100	13,877	21%	2,099	6,250	14,644
	5005	2,902	4,968	3,530	572	16%	11	2,227	2,552	2,868	3,786	3,983	4,812	4,890	5%	1,077	2,277	6,685
	5006	4,652	9,753	6,636	1,763	27%	10	4,738	4,824	4,972	6,680	7,705	8,779	9,265	23%	1,724	284	14,683
	5007	22,055	58,533	35,659	11,858	32%	10	23,575	25,895	29,106	38,250	40,505	54,706	56,610	17%	44,820	-52,053	127,225
	5008	54,594	114,864	69,973	16,585	24%	12	55,109	55,784	61,943	64,938	72,493	83,518	92,898	8%	29,786	10,802	129,885
	5009	5,573	15,193	8,162	2,735	34%		5,733	5,853	6,235	7,129	8,880	12,299	12,746	18%	1,181	1,586	13,509
	5010	13,697	38,293	19,617	4,687	19%	12	14,766	16,263	16,873	19,465	20,768	25,919	26,955	10%	10,682	-1,849	41,459
	5011	27,025	49,744	34,525	5,619	16%	12	29,053	30,738	31,321	33,747	35,505	37,272	42,929	6%	8,166	17,081	53,743
	5012	1,825	5,763	2,928	1,213	41%	8	1,946	2,067	2,394	2,658	3,319	3,958	4,861	11%	1,571	378	6,157
	5013	10,066	21,007	16,272	3,907	24%	11	10,677	11,288	13,590	15,780	20,024	20,674	20,841	13%	3,125	8,881	21,483
	5014	3,130	6,357	4,068	914	22%	9	3,285	3,446	3,705	3,837	4,087	4,600	5,480	5%	1,212	1,581	6,430
	5015	14,571	31,354	22,151	4,241	19%	11	16,210	17,848	18,709	21,984	23,521	25,444	28,345	11%	11,547	561	46,750
	5016	35,641	50,472	38,443	9,955	26%	12	26,889	27,136	25,342	32,873	47,115	49,045	50,359	22%	9,445	23,479	61,257
	5017	17,548	35,233	24,926	6,610	27%	7	17,969	18,397	19,875	22,842	29,564	32,361	33,793	20%	5,592	4,585	42,151
	5018	32,985	89,229	62,875	20,749	33%	7	36,258	37,514	58,159	63,931	79,331	87,674	88,451	23%	17,586	26,738	97,083
	5019	8,627	17,598	13,435	3,848	27%	11	8,671	8,714	8,897	9,986	9,752	14,276	15,933	3%	10,522	-10,889	31,197
	5020	132,699	260,872	168,058	19,679	12%	12	138,257	146,108	159,986	165,783	177,961	195,850	198,504	5%	25,034	117,766	217,862
	5021	13,325	30,715	22,097	5,622	25%	11	14,381	15,956	19,745	21,629	25,752	28,300	29,500	13%	5,985	11,586	35,265
	5022	120,830	197,895	158,963	19,382	12%	11	129,758	136,887	152,485	160,120	167,741	177,058	184,976	5%	25,183	111,256	212,747
	5023	53,884	85,054	69,372	15,214	19%	7	54,259	54,914	57,568	70,121	80,585	83,903	84,832	17%	18,751	25,465	100,467
	5024	22,892	85,658	35,290	15,943	45%	6	25,340	25,769	24,882	28,158	37,036	60,137	62,898	21%	20,543	-5,336	76,505
	5025	39,838	56,748	50,486	7,606	15%	11	39,868	39,882	46,381	51,857	53,888	54,052	56,396	8%	7,673	37,319	67,853
	5026	15,588	40,129	27,455	6,737	25%	12	19,256	22,318	23,867	25,889	30,550	36,915	38,188	12%	9,295	9,596	46,687
	5027	14,331	30,832	20,715	5,888	28%	12	15,238	16,027	16,651	17,788	24,386	30,133	30,605	19%	11,587	-3,097	43,292
CTP	6001						1											
	6002						1											
	6003						1											
	6004						1											
	6005																	
ALL-W-no-CTP	10000	686,529	968,176	877,521	108,208	13%	5	705,951	715,473	743,840	852,771	877,151	929,736	948,931	8%	159,883	497,027	1,138,958
Equity Cumulative	11000	185,024	284,582	215,102	28,785	13%		188,802	191,679	205,516	208,463	212,689	241,024	262,788	2%	51,761	112,185	319,220
IR Cumulative	12000	293,848	447,514	370,384	39,002	10%	12	321,058	344,361	362,987	375,497	388,963	418,056	431,850	3%	59,576	242,648	480,551
FX Cumulative	13000	633,588	895,378	787,100	72,940	9%	12	681,432	721,203	739,247	800,482	840,397	857,592	863,177	7%	108,534	559,570	975,466
Commodity Cumulative	14000	291,330	480,351	377,045	84,467	22%	6	292,642	294,185	306,169	360,117	451,606	476,812	478,482	19%	71,323	228,435	513,726
CS Cumulative	15000	168,575	318,081	238,766	49,009	21%		178,139	187,203	206,381	218,368	232,845	281,058	304,571	6%	58,477	103,547	340,491
CTP Cumulative	16000																	

Table 32: VaR statistics (large TB banks only)

EU Statistics for VaR

		Other stats						Percentiles									Extreme Values range (Full Sample)	
	Port. ID	Min	Max	Ave.	STDev	Coefficient of variation (STDev/Mean)	Num obs.	5th	10th	25th	50th (Median)	75th	90th	95th	Interquantile range	STDev_trunc	-2*STDev_trunc	+2*STDev_trunc
Equity	1001	276,609	587,211	375,427	79,240	21%	8	281,840	287,071	330,508	370,673	426,881	452,309	477,276	16%	67,445	235,100	505,082
	1002	187,117	279,439	230,941	35,407	15%	6	191,268	195,384	197,864	225,365	256,282	272,275	275,857	13%	67,687	127,896	398,325
	1003	1,057	2,431	1,618	563	35%	6	1,063	1,068	1,142	1,520	1,997	2,261	2,347	27%	687	179	2,567
	1004	1,067	1,643	1,305	234	18%	5	1,078	1,088	1,123	1,267	1,423	1,555	1,599	12%	508	266	2,299
	1005	52,549,489	70,540,542	60,112,644	6,129,609	11%	8	53,401,041	54,252,012	55,978,967	57,835,362	64,687,594	67,399,844	69,170,193	7%	7,394,419	41,474,204	71,051,881
	1006	1,611	4,049	2,981	916	31%	6	1,981	2,148	2,685	2,951	3,231	3,463	4,153	9%	1,023	786	4,873
	1007						4											
	1008	14,326	26,168	20,728	8,236	28%	5	15,428	16,980	20,835	20,876	21,665	24,275	25,221	2%	5,083	6,837	30,171
	1009	42,856	81,321	59,622	13,454	23%	6	44,428	46,439	53,372	58,235	65,008	74,211	77,766	11%	15,636	25,609	88,120
	1010	24,254	39,528	30,966	5,143	17%	6	25,285	26,335	28,563	30,644	32,305	35,920	37,724	6%	6,262	19,789	44,835
	1011	201,378	472,121	349,521	81,500	24%	6	208,953	218,528	288,632	331,624	385,064	431,411	451,766	15%	77,199	210,051	548,745
	1012	248,179	447,098	327,268	77,582	24%	8	251,037	255,855	265,135	312,367	366,741	410,575	428,833	16%	75,097	227,484	527,872
	1013	46,500	90,767	63,798	15,130	24%	6	48,544	51,397	56,462	60,822	65,857	79,176	84,971	8%	17,880	22,768	94,287
	1014	142,739	311,628	230,085	64,646	30%	6	148,526	154,333	168,600	210,938	252,093	282,985	297,305	20%	51,745	113,094	320,072
	1015						4											
	1016						1											
Interest Rate	2001	144,368	235,799	191,307	31,750	17%	8	151,456	158,241	166,478	194,299	208,086	231,944	235,571	11%	38,700	118,497	275,297
	2002	148,754	234,325	178,084	27,968	16%	8	151,027	153,294	160,460	172,433	183,111	212,190	223,257	7%	30,532	118,333	248,220
	2003	23,181	31,021	27,745	2,464	9%	8	23,972	24,752	26,729	28,375	29,113	29,866	30,444	4%	2,448	22,711	32,502
	2004	85,388	138,801	110,255	23,149	21%	8	85,711	86,043	88,802	108,081	133,407	138,378	138,590	20%	26,419	58,789	164,555
	2005						4											
	2006	22,202	39,244	30,007	6,576	22%	6	23,151	24,008	25,335	28,825	34,338	37,199	38,221	14%	5,758	10,372	49,242
	2007	68,565	126,198	91,811	23,981	26%	7	70,059	71,514	73,825	81,171	108,450	124,644	125,417	19%	24,994	29,327	120,303
	2008	58,948	124,943	87,057	24,855	29%	7	60,321	61,694	70,419	86,399	100,526	119,169	122,056	18%	28,419	24,275	157,951
	2009	171,439	216,148	195,880	13,285	7%	8	177,821	184,172	190,651	193,652	203,621	211,802	213,977	3%	20,885	157,639	241,220
	2010	129,252	212,272	172,659	29,182	17%	8	135,709	142,067	149,830	174,809	188,135	210,011	211,416	11%	34,902	106,583	246,111
	2011	468,225	470,539	469,260	35,058	9%	7	474,286	480,347	484,491	490,387	497,740	458,605	464,577	3%	57,813	269,258	528,467
	2012	55,288	181,099	90,664	48,074	50%	8	58,806	62,404	67,493	78,474	80,453	178,186	180,093	14%	54,394	-30,315	187,263
	2013	38,357	46,354	41,004	2,534	6%	7	39,024	39,111	39,470	40,281	41,060	43,035	44,894	2%	4,175	33,712	44,433
	2014	25,727	69,278	47,396	14,872	31%	7	28,851	31,938	38,986	43,678	57,558	63,314	65,800	19%	15,162	11,258	72,706
	2015	6,458	18,818	10,440	4,055	39%	8	6,499	6,539	8,364	9,244	12,099	14,560	16,690	20%	7,256	-3,455	25,659
	2016	94,258	157,008	125,808	21,697	17%	7	98,287	103,335	110,827	120,990	141,638	151,450	153,675	12%	30,657	38,858	201,327
	2017	19,201	37,926	27,149	7,102	26%	7	19,726	19,751	23,335	26,661	30,063	35,035	36,480	13%	9,235	10,446	47,382
	2018	19,275	37,807	26,930	6,369	24%	7	19,757	20,239	21,667	25,662	32,117	34,818	36,167	20%	7,694	8,326	39,508
	2019	8,451	17,448	12,780	3,484	27%	7	8,630	8,935	9,490	12,883	13,289	17,305	17,376	24%	4,287	1,081	19,120
	2020	31,857	56,861	48,704	9,867	21%	7	31,967	32,026	40,263	46,440	51,183	56,300	56,572	12%	9,406	24,146	61,788
	2021	33,274	58,855	42,255	9,947	24%	7	33,507	33,003	35,398	38,844	47,408	55,546	57,200	15%	11,360	11,257	64,697
	2022						4											
	2023	26,065	83,915	43,953	24,220	55%	8	26,523	27,280	29,410	33,877	46,581	82,518	83,216	27%	31,334	-24,459	100,838
FX	3001	388,539	630,718	466,579	78,385	17%	8	388,980	389,422	425,841	445,228	491,234	546,520	588,619	7%	74,729	336,133	635,047
	3002	241,915	488,006	343,570	74,249	22%	7	262,743	283,551	318,755	328,458	356,082	409,940	448,971	5%	82,445	162,334	492,034
	3003	89,182	190,625	137,578	32,801	24%	7	99,134	109,085	123,514	130,161	153,025	176,344	183,484	11%	37,359	54,270	204,208
	3004	374,887	539,860	450,076	52,120	12%	7	387,962	401,036	426,179	437,836	473,194	503,834	521,848	5%	45,697	366,411	549,199
	3005	315,860	417,285	375,615	33,702	9%	7	329,131	342,402	362,595	372,581	398,168	411,256	414,303	5%	42,358	288,838	459,200
	3006	10,359	19,245	14,614	2,930	20%	8	10,433	10,507	13,887	15,288	15,685	16,829	18,837	7%	7,041	2,487	30,572
	3007	371,186	686,574	537,495	115,586	22%	6	401,531	431,875	493,216	511,533	620,657	669,076	677,825	11%	111,333	307,313	752,246
Commodities	4001						3											
	4002						2											
	4003						2											
	4004						4											
Credit Spread	5001	6,094	8,150	7,014	715	10%	6	6,226	6,338	6,840	6,902	7,338	7,801	7,975	5%	1,899	3,184	10,700
	5002	14,807	27,093	22,569	4,336	19%	6	16,356	17,906	22,334	23,479	25,124	26,574	26,709	8%	4,520	14,085	32,163
	5003	3,387	5,461	4,382	988	10%	4	3,491	3,874	3,666	4,264	5,151	5,490	5,470	17%	1,022	1,902	5,991
	5004	7,403	11,134	9,897	1,608	16%	6	7,912	8,421	9,447	9,682	10,755	11,588	11,861	6%	2,099	6,250	14,644
	5005	4,221	6,121	5,468	1,087	22%	6	4,558	4,779	4,270	4,705	5,768	6,058	6,090	15%	1,077	3,277	6,685
	5006	2,322	10,222	6,613	2,619	40%	6	3,178	4,034	5,870	6,788	7,698	9,018	9,620	13%	3,724	204	14,683
	5007	23,891	66,095	34,945	15,809	45%	6	25,171	24,656	27,841	30,595	32,595	49,589	57,842	8%	44,820	-52,053	127,225
	5008	54,021	117,512	74,774	21,207	28%	7	54,785	55,570	62,968	68,959	78,994	94,472	105,950	13%	29,766	10,802	129,885
	5009	4,587	15,308	7,772	2,968	38%	7	5,115	5,243	5,830	6,453	8,592	11,272	12,291	21%	3,181	1,586	13,909
	5010	14,016	29,715	18,940	5,859	31%	6	14,399	14,587	15,179	16,959	20,261	25,251	27,483	14%	10,682	-3,389	41,459
	5011	26,110	52,921	35,592	9,642	27%	6	26,347	26,584	28,999	35,448	36,493	44,749	48,835	11%	9,166	17,081	53,743
	5012	1,750	3,765	2,920	815	28%	5	1,904	2,056	2,515	3,058	3,554	3,681	3,723	17%	1,571	338	6,157
	5013	11,823	16,673	15,012	1,854	12%	6	12,448	13,074	14,393	15,223	16,468	16,645	16,657	7%	3,125	8,981	21,483
	5014	2,231	5,968	3,927	1,276	32%	6	2,458	2,684	3,290	3,815	4,417	5,282	5,625	15%	1,212	1,581	6,430
	5015	18,265	30,341	23,664	5,030	21%	6	18,479	18,694	19,604	22,889	27,539	29,408	29,875	17%	11,547	561	46,750
	5016	28,819	49,930	39,836	5,513	21%	6	29,184	29,553	31,955	40,090	46,159	49,868	49,898	20%	9,445	21,479	61,257
	5017	12,754	31,188	22,935	6,282	27%	6	14,651	16,548	20,855	23,302	26,531	29,155	30,168	12%	5,592	4,585	42,151
	5018	34,011	70,991	55,550	14,222	26%	6	36,861	39,412	47,360	56,995	67,093	70,244	70,317	17%	17,586	26,738	97,083
	5019	7,325	13,645	10,150	2,301	23%	6	7,443	7,762	8,598	10,264	11,278	12,466	13,055	13%	10,522	-10,889	31,197
	5020	127,439	181,951	161,578	16,914	10%	7	136,817	146,214	160,350	162,146	169,618	175,217	178,584	3%	25,034	117,764	217,862
	5021	14,740	30,659	22,259	6,001	27%	6	15,322	15,903	17,877	22,277	25,903	28,598	29,628	18%	5,985	11,586	35,205
	5022	121,084	175,582	154,018	17,336	11%	6	129,879	135,754	149,807	152,241	161,299	169,057	172,333	4%	25,383	111,256	212,747
	5023						3											
	5024						4											
	5025						4											
	5026						4											
	5027						4											
CTP	6001						1											
	6002						1											
	6003						1											
	6004						1											
	6005						1											
ALL-IN no-CTP	10000						2											
Equity Cumulative	11000	174,006	222,213	204,421	18,714	9%	5	179,448	184,888	201,214	208,892	215,708	219,623	220,920	3%	51,761	112,185	319,220
IR Cumulative	12000	280,584	363,678	335,540	31,223	9%	6	290,534	301,283	325,560	340,530	358,041	361,808	362,735	3%	39,576	242,648	400,551
FX Cumulative	13000	683,468	929,263	765,309	79,843	10%	7	688,201	692,934	724,633	758,152	767,099	834,600	885,977	3%	108,534	539,370	973,466
Commodity Cumulative	14000						2											
CS Cumulative	15000	171,426	271,963	213,521	34,563	16%	6	176,073	179,720	192,825	213,738	221,784	247,111	259,536	7%	56,477	102,542	340,491
CTP Cumulative	16000						1											

Table 33: VaR statistics (same business model – cross-border universal bank)

EU Statistics for VaR

		Other stats								Percentiles							
	Port. ID	Min	Max	Ave.	STDev	STDev_trunc'	MAD (median absolute deviation)	Coefficient of variation (STDev/Mean)	Num obs.	5th	10th	25th	50th (Median)	75th	90th	95th	Interquartile range
Equity	2001	283,700	503,770	387,024	72,891			19%	16	288,958	291,133	330,466	400,800	436,771	471,989	502,616	14%
	2002	180,915	329,653	245,841	44,970			18%	15	185,270	193,734	214,231	248,526	268,921	307,026	325,378	11%
	2003	779	2,441	1,538	505			33%	15	920	990	1,068	1,573	1,933	2,069	2,195	29%
	2004	512	1,840	1,304	350			27%	12	774	897	1,109	1,355	1,536	1,634	1,732	16%
	2005	51,728,788	67,700,086	57,858,830	5,826,559			10%	14	52,262,231	52,636,012	53,547,951	55,782,461	62,084,697	66,959,074	67,215,256	7%
	2006	1,633	3,872	2,675	614			23%	14	1,783	1,868	2,442	2,739	2,903	3,371	3,636	9%
	2007	5,075	21,360	15,107	4,651			31%	13	7,132	9,150	11,995	16,139	17,579	19,770	20,438	19%
	2008	12,507	22,838	18,516	3,551			19%	12	13,168	13,771	15,562	19,781	21,447	21,712	22,232	16%
	2009	42,816	81,321	59,709	10,952			18%	14	45,989	48,407	53,403	59,304	62,311	76,077	81,116	8%
	2010	21,826	38,997	32,307	5,314			16%	14	23,404	25,679	30,149	32,484	35,562	38,404	39,692	8%
	2011	274,622	472,375	367,997	64,026			17%	15	275,361	283,605	317,141	390,701	404,739	446,283	472,157	12%
	2012	259,158	447,090	350,963	61,241			17%	15	259,418	268,498	300,319	374,060	388,524	423,966	442,666	13%
	2013	44,653	90,767	63,715	12,838			20%	14	45,854	47,376	57,591	64,221	65,583	80,110	85,195	6%
	2014	165,926	311,626	219,633	40,476			18%	14	171,363	175,000	189,535	210,511	248,844	257,696	278,160	14%
	2015	125,828	245,397	171,217	37,432			22%	11	131,940	138,051	142,609	165,606	185,691	222,500	233,849	13%
	2016	51,102	294,876	191,036	103,314			54%	5	69,180	87,258	141,491	178,885	288,828	292,457	293,666	34%
Interest Rate	2001	144,168	240,356	195,034	26,335			14%	23	148,065	152,511	189,214	192,473	204,626	234,096	236,624	4%
	2002	136,316	239,967	176,576	27,575			16%	19	138,462	146,743	157,963	178,581	188,305	209,204	226,156	9%
	2003	23,181	30,910	27,686	2,264			8%	21	23,462	23,600	26,904	27,790	29,371	30,101	30,454	4%
	2004	83,694	138,396	108,716	16,747			15%	23	84,048	86,176	93,785	109,805	121,750	130,907	135,112	13%
	2005	8,632	64,885	32,092	18,454			58%	10	11,816	15,000	17,725	26,023	45,750	51,948	58,416	44%
	2006	15,587	39,246	28,611	5,568			19%	19	21,220	22,179	24,835	29,420	31,585	34,667	35,534	12%
	2007	58,076	126,190	82,195	17,850			22%	19	65,179	67,679	68,541	79,315	84,608	105,213	116,127	10%
	2008	48,382	124,943	79,877	23,725			30%	19	53,374	59,165	61,949	76,866	86,205	123,739	124,851	16%
	2009	160,752	240,874	197,827	19,093			10%	22	170,783	171,613	187,875	198,628	209,159	220,537	223,525	5%
	2010	129,752	217,338	175,582	23,781			14%	23	133,259	137,259	170,416	173,224	184,178	210,689	212,962	4%
	2011	352,525	479,131	408,765	39,726			10%	20	363,990	367,862	383,009	389,196	445,611	464,308	473,565	8%
	2012	55,388	126,712	78,776	14,420			18%	20	63,720	66,998	72,331	76,998	80,909	88,240	103,278	6%
	2013	28,039	51,227	41,709	4,700			11%	23	38,574	38,742	40,101	40,560	43,377	46,999	48,349	4%
	2014	15,534	71,063	39,299	15,200			39%	14	22,159	26,236	30,040	34,701	46,753	58,858	63,455	22%
	2015	6,199	19,941	10,347	3,711			36%	19	6,254	6,442	7,299	9,029	13,136	14,529	15,110	29%
	2016	89,996	159,856	119,819	20,284			17%	19	93,832	95,116	108,009	116,758	124,939	152,510	155,082	7%
	2017	19,800	45,864	30,470	7,105			23%	20	20,620	24,258	25,955	28,400	34,081	40,661	42,288	14%
	2018	14,378	35,385	24,117	5,061			21%	23	16,382	18,109	22,305	23,747	25,739	31,626	33,287	7%
	2019	6,079	17,378	10,901	3,242			30%	21	8,000	8,190	8,851	9,490	13,939	15,399	17,269	22%
	2020	30,832	55,392	42,462	7,391			17%	19	31,755	32,532	37,574	42,929	48,041	52,010	53,636	12%
	2021	31,387	58,855	37,987	7,370			19%	19	31,970	32,166	33,145	36,378	40,042	44,098	53,514	9%
	2022	98,104	304,945	209,188	61,074			29%	16	112,630	148,125	164,778	192,809	263,413	296,701	304,710	23%
	2023	19,646	57,227	36,773	8,488			23%	21	28,515	29,800	31,643	34,484	40,213	45,964	51,096	12%
FX	3001	342,985	630,918	468,016	82,638			18%	17	344,808	363,106	416,686	486,346	495,863	561,434	630,758	9%
	3002	239,141	488,026	327,286	58,904			18%	16	241,237	257,728	301,346	326,758	344,589	371,651	418,951	7%
	3003	74,228	139,529	114,557	21,463			19%	16	79,015	83,658	100,501	123,073	129,832	135,778	139,302	13%
	3004	374,887	539,863	442,370	44,751			10%	16	383,590	389,130	408,148	435,264	470,383	494,435	508,563	7%
	3005	310,237	405,050	372,010	28,259			8%	15	314,171	330,348	364,996	376,600	391,196	400,506	404,432	3%
	3006	10,571	23,789	16,111	3,405			21%	19	10,918	11,399	14,273	15,370	18,180	19,795	21,177	12%
	3007	371,196	727,498	533,069	94,303			18%	17	376,900	402,197	495,170	527,895	564,068	655,269	674,144	7%
Commodities	4001	8,992	55,740	27,611	14,624			53%	9	11,247	13,502	18,802	22,124	38,179	42,024	49,332	34%
	4002	313,613	409,336	361,379	29,028			8%	9	321,661	329,708	343,889	358,860	374,334	392,937	401,136	4%
	4003	382,949	599,139	521,869	64,390			12%	8	419,858	456,768	520,668	532,478	551,148	571,617	585,378	3%
	4004	222,817	413,229	326,326	60,208			18%	6	250,522	267,227	305,150	322,959	355,820	388,794	400,512	8%
Credit Spread	5001	4,278	10,678	7,443	1,800			24%	12	5,225	6,014	6,548	7,293	8,032	10,296	10,599	10%
	5002	16,044	31,316	23,232	4,316			19%	11	16,432	16,819	21,459	23,835	25,626	26,214	28,765	9%
	5003	3,406	5,976	4,451	956			21%	12	3,437	3,473	3,638	4,176	5,480	5,609	5,777	20%
	5004	7,157	14,053	10,207	2,022			20%	11	7,216	7,275	9,284	10,447	11,342	11,885	12,969	10%
	5005	3,552	6,121	4,505	675			15%	11	3,700	3,847	4,218	4,568	4,740	4,968	5,545	6%
	5006	4,652	14,499	7,552	2,610			35%	10	5,144	5,637	6,515	7,207	7,694	8,523	11,511	8%
	5007	21,691	58,513	35,740	11,924			33%	10	24,354	27,017	28,606	31,387	38,389	54,706	56,610	15%
	5008	54,021	88,134	69,327	11,643			17%	14	54,395	55,198	58,658	68,205	78,946	82,550	85,462	15%
	5009	5,414	12,356	8,503	2,392			28%	10	5,734	6,054	6,504	8,519	9,676	12,083	12,120	20%
	5010	12,977	24,222	18,321	3,624			20%	12	13,395	13,765	14,864	19,747	20,672	21,152	22,556	16%
	5011	26,110	37,353	32,713	4,215			13%	11	26,568	27,025	29,502	34,077	36,131	36,577	36,965	10%
	5012	1,750	5,763	3,172	1,205			38%	11	2,109	2,468	2,509	2,656	3,475	4,967	5,365	16%
	5013	14,324	20,674	16,954	2,314			14%	11	14,458	14,552	15,540	16,047	18,758	20,246	20,460	10%
	5014	3,130	6,357	4,117	1,035			25%	12	3,134	3,144	3,440	3,999	4,207	5,805	6,143	10%
	5015	16,919	33,296	23,475	5,315			22%	13	17,476	17,931	19,122	22,913	25,444	30,698	32,071	14%
	5016	26,641	50,472	38,305	8,289			22%	10	27,012	27,384	30,850	40,014	44,494	45,670	48,071	18%
	5017	12,754	36,677	22,956	7,541			33%	10	14,908	17,061	18,975	21,334	23,631	35,367	36,022	11%
	5018	32,985	89,229	59,315	19,191			32%	11	33,648	34,311	45,723	58,084	69,364	87,007	88,118	21%
	5019	7,123	20,071	10,743	3,428			32%	13	7,890	8,464	8,826	9,667	10,443	14,150	16,594	8%
	5020	118,540	183,465	159,052	19,373			12%	14	124,312	129,004	159,102	162,989	170,238	176,494	178,594	3%
	5021	14,740	30,715	23,411	4,943			21%	13	16,014	17,213	20,462	23,685	26,536	30,067	30,681	13%
	5022	114,514	175,298	151,577	19,480			13%	13	119,384	122,901	147,528	157,407	165,795	169,879	172,270	6%
	5023	40,813	94,343	72,290	18,571			26%	7	45,249	49,685	62,861	76,608	84,257	89,154	91,748	15%
	5024	19,679	69,802	37,516	18,321			49%	11	21,286	22,892	24,817	28,793	48,735	65,656	67,729	33%
	5025	39,838	66,740	51,935	6,395			12%	11	44,135	48,432	49,387	52,466	53,808	54,052	60,396	4%
	5026	15,580	43,473	29,317	8,649			30%	12	18,198	20,597	24,485	26,962	34,489	42,586	43,351	17%
	5027	14,311	27,478	19,032	4,046			21%	11	14,399	14,486	16,346	17,990	21,167	23,288	25,383	13%
CTP	6001	7,758	47,902	27,830	28,386			102%	2	9,765	11,772	17,794	27,830	37,866	43,888	45,895	36%
	6002	6,964	58,958	32,961	36,765			112%	2	9,564	12,163	19,963	32,961	45,960	53,759	56,358	39%
	6003	1,962	10,352	6,157	5,933			96%	2	2,382	2,801	4,060	6,157	8,255	9,513	9,933	34%
	6004	1,921	8,738	5,330	4,820			90%	2	2,262	2,603	3,625	5,330	7,034	8,056	8,397	32%
	6005	32,716	47,902	40,309	10,738			27%	2	33,475	34,235	36,513	40,309	44,106	46,383	47,143	9%
ALL-IN no-CTP	10000	509,460	988,326	764,143	139,943			18%	8	542,763	616,067	687,836	796,067	835,271	890,458	929,292	10%
Equity Cumulative	11000	157,349	294,879	215,209	38,398			18%	13	167,343	176,390	193,118	208,463	230,142	268,445	283,004	9%
IR Cumulative	12000	289,899	433,397	362,373	36,863			10%	17	315,565	323,576	337,782	359,929	376,538	415,792	421,575	5%
FX Cumulative	13000	683,408	929,263	768,151	74,809			10%	16	684,376	687,496	706,679	745,289	829,657	855,446	881,343	8%
Commodity Cumulative	14000	297,269	502,693	376,816	69,719			19%	9	306,263	315,258	330,492	371,080	387,804	478,837	490,765	8%
CS Cumulative	15000	157,424	266,822	208,531	31,537			15%	12	163,557	168,960	183,366	219,591	225,307	232,143	248,135	10%
CTP Cumulative	16000	1	5	3	3			94%	2	1	1	2	3	4	5	5	33%

Table 34: VaR statistics (low L3 A&L banks only)

EU Statistics for VaR

	Port. ID	Min	Max	Ave.	STDev	Coefficient of variation (STDev/Mean)	Num obs.	5th	10th	25th	50th (Median)	75th	90th	95th	Interquantile range	STDev_trans'	-2*STDev_trans	+2*STDev_trans
Equity	1001	281,100	502,231	384,871	81,066	12%	7	281,880	282,660	318,451	401,187	436,328	465,943	484,086	16%	67,495	235,108	505,082
	1002	201,075	270,423	245,713	31,404	14%	5	204,339	207,604	217,397	252,438	268,227	274,948	277,189	10%	67,607	127,896	398,325
	1003																	
	1004						4											
	1005	51,728,788	56,910,573	56,274,349	5,461,799	10%	6	51,995,876	52,262,965	53,343,489	54,997,736	55,922,485	61,566,367	64,239,640	2%	7,394,419	41,474,204	71,051,881
	1006						4											
	1007																	
	1008						4											
	1009	44,440	61,344	54,700	7,315	13%	5	45,724	46,809	50,063	57,781	59,851	60,742	61,043	9%	15,638	25,609	88,320
	1010	28,054	39,528	32,240	3,986	12%	6	28,500	28,946	30,199	31,683	32,563	36,092	37,810	4%	6,362	19,789	44,635
	1011	267,886	472,121	373,287	69,495	19%	8	284,525	301,165	343,271	386,874	405,143	439,824	455,972	8%	77,199	219,051	548,745
	1012	253,093	447,093	359,154	67,378	19%	5	270,397	287,108	319,026	367,436	384,583	422,936	435,008	9%	75,097	227,484	527,872
	1013	47,145	65,686	58,010	7,355	13%	5	48,975	50,804	55,293	56,967	63,460	64,996	65,341	6%	17,880	22,768	94,287
	1014	176,423	311,628	235,730	42,001	18%	7	186,743	196,882	216,428	227,631	259,859	275,417	293,521	7%	51,345	113,064	320,072
	1015	135,307	245,197	184,936	42,055	23%	6	137,831	140,459	154,059	180,582	212,310	233,849	239,525	16%	33,844	114,309	249,587
	1016						2											
Interest Rate	2001	164,990	235,799	195,850	19,755	10%	9	171,936	178,881	182,680	192,389	204,716	211,298	223,549	6%	38,300	118,697	273,297
	2002	136,118	203,103	169,067	23,476	14%	8	137,150	137,985	151,868	175,681	181,528	192,362	197,483	9%	30,522	118,113	240,220
	2003	23,600	31,021	28,354	2,336	8%	7	24,674	25,748	27,742	28,335	30,301	30,553	30,786	4%	2,448	23,711	32,502
	2004	83,900	138,801	114,570	22,920	20%	5	86,568	89,237	92,391	126,553	133,314	136,143	137,472	18%	28,439	56,798	164,555
	2005						1											
	2006	15,587	39,346	25,481	7,696	30%	7	17,961	19,136	21,141	24,815	29,583	32,482	35,869	9%	8,138	10,573	49,342
	2007	58,076	128,190	81,662	27,288	33%	7	58,981	59,890	64,806	69,227	94,263	115,481	122,836	15%	24,994	29,317	129,303
	2008	48,582	124,545	79,451	34,451	44%	7	50,346	53,110	56,459	60,434	94,245	124,882	124,913	25%	28,429	24,215	157,591
	2009	186,648	216,140	198,922	10,902	5%	9	187,770	188,893	190,651	197,196	207,446	214,050	215,095	4%	20,895	157,639	241,220
	2010	148,488	212,222	176,096	17,783	10%	9	154,742	160,997	164,384	175,151	184,268	190,169	201,396	6%	34,902	106,503	246,131
	2011	366,959	459,622	396,943	34,059	9%	8	367,352	369,512	374,324	382,668	402,237	447,738	451,671	3%	52,853	288,788	520,462
	2012	65,172	87,057	75,016	7,300	10%	9	66,190	67,208	69,262	75,067	80,709	82,618	84,837	8%	54,194	30,915	187,263
	2013	38,800	46,354	42,225	2,449	6%	8	39,308	39,815	40,339	42,165	43,206	45,081	45,718	3%	9,175	25,712	60,433
	2014	15,554	45,992	36,087	12,486	34%	5	19,091	22,651	33,327	41,897	43,679	45,078	45,535	13%	15,362	11,258	72,706
	2015	2,571	18,839	12,024	3,931	33%	7	7,728	8,085	9,387	11,180	14,094	16,171	17,545	20%	7,290	-3,493	25,093
	2016	111,489	152,000	120,310	14,304	12%	7	111,722	111,955	112,580	116,674	118,426	132,856	142,428	3%	40,617	38,858	201,327
	2017	24,057	45,868	34,951	9,083	26%	7	25,487	26,117	27,503	32,189	43,474	45,254	45,559	23%	9,335	10,844	47,382
	2018	16,378	32,137	24,508	5,376	22%	9	17,286	20,193	22,687	24,193	25,775	31,098	31,617	6%	7,696	8,724	39,508
	2019	8,000	18,382	11,839	4,155	35%	9	8,076	8,152	8,451	9,410	14,324	17,572	18,377	26%	4,387	1,961	19,129
	2020	36,168	56,847	44,815	7,757	17%	8	37,219	38,035	39,853	41,783	49,759	55,827	56,335	12%	9,466	24,144	61,789
	2021	32,035	58,855	38,129	9,358	25%	7	32,407	32,778	33,593	36,122	37,352	46,071	52,463	5%	13,360	11,257	64,607
	2022	98,104	304,631	195,830	68,323	35%	7	116,093	135,279	163,904	187,687	225,729	279,104	291,968	16%	85,977	32,985	376,891
	2023	21,541	40,211	33,573	6,357	18%	8	24,452	27,122	31,182	35,823	38,850	39,577	39,894	11%	51,334	-24,455	100,878
FX	3001	366,905	630,718	463,810	88,977	19%	8	369,738	372,572	406,203	438,575	515,423	560,484	595,601	12%	78,720	316,113	635,087
	3002	273,520	488,006	347,464	72,804	21%	8	276,442	279,364	285,717	340,730	366,567	433,187	460,603	12%	62,435	162,204	492,074
	3003	86,705	138,739	121,513	20,291	17%	7	90,735	94,764	112,406	128,600	134,877	138,433	138,571	9%	37,359	54,778	204,308
	3004	394,303	538,863	445,066	47,309	11%	7	401,539	408,705	421,404	434,180	452,276	496,839	538,341	4%	45,657	366,413	549,199
	3005	317,133	405,050	369,358	28,329	8%	7	328,128	339,124	360,440	372,581	384,931	397,977	401,514	3%	42,158	289,508	459,200
	3006	13,020	20,887	16,489	2,669	16%	8	13,404	13,779	14,085	15,858	17,893	19,012	20,409	5%	7,041	1,907	30,572
	3007	474,144	653,578	535,821	71,218	14%	5	475,561	476,979	481,251	510,477	560,675	615,227	633,397	8%	111,113	307,513	752,240
Commodities	4001						1											
	4002						1											
	4003																	
	4004																	
Credit Spread	5001						4											
	5002						4											
	5003	3,664	5,565	4,708	931	19%	5	3,728	3,791	3,983	5,328	5,451	5,519	5,542	16%	1,022	1,900	5,091
	5004						4											
	5005	3,352	6,121	4,754	986	21%	5	3,658	3,760	4,088	4,968	5,043	5,689	5,905	10%	1,077	1,317	6,685
	5006	4,842	7,850	6,033	1,091	18%	6	4,901	4,959	5,242	5,954	6,384	7,145	7,502	10%	3,724	204	14,693
	5007						4											
	5008	63,332	78,112	70,223	7,073	10%	6	63,537	63,843	65,109	67,785	76,310	79,041	78,076	8%	28,366	10,803	120,865
	5009	6,058	13,360	8,671	2,882	33%	5	6,792	6,926	7,329	7,862	8,248	11,175	12,318	5%	3,301	1,506	13,929
	5010	15,277	24,232	19,267	3,361	17%	6	15,634	15,990	16,884	19,162	21,093	22,708	23,466	11%	10,692	-1,349	41,439
	5011	30,995	36,577	33,606	2,348	7%	6	31,158	31,421	31,978	33,076	35,570	36,322	36,450	5%	9,166	17,081	53,743
	5012						4											
	5013	11,359	19,602	15,401	3,031	20%	6	11,702	12,045	13,356	15,600	16,857	18,238	19,020	11%	3,125	8,081	21,483
	5014						4											
	5015	21,050	28,476	24,374	2,797	11%	5	21,421	21,795	22,013	23,088	25,444	27,163	27,870	5%	11,547	563	46,750
	5016						4											
	5017						4											
	5018						4											
	5019	8,826	13,645	10,053	2,179	20%	5	8,898	8,970	9,187	9,104	12,305	13,109	13,377	15%	10,522	-10,888	31,197
	5020	135,022	200,472	165,250	21,097	13%	6	141,312	148,602	161,225	162,052	168,749	185,711	193,093	2%	25,024	117,764	217,862
	5021	19,608	30,859	24,534	4,703	19%	5	19,779	19,950	20,462	24,142	27,508	29,475	30,067	15%	5,905	11,588	35,205
	5022	127,253	175,298	156,565	18,003	12%	5	133,210	139,168	157,044	157,417	165,795	171,497	173,397	3%	25,389	111,218	212,747
	5023						2											
	5024						3											
	5025	39,882	54,985	47,042	5,992	13%	5	40,268	40,654	41,811	49,552	49,938	52,366	53,176	9%	7,673	37,119	67,813
	5026	22,304	33,782	26,688	4,394	16%	5	22,768	23,273	24,786	25,030	27,591	31,309	32,548	5%	9,295	9,506	46,687
	5027	16,736	30,428	21,890	5,379	25%	5	17,011	17,299	18,143	20,098	24,897	26,616	28,522	7%	11,597	3,097	49,292
CTP	6001																	
	6002																	
	6003																	
	6004																	
	6005																	
ALL-IN no CTP	10000																	
Equity Cumulative	11000																	
IR Cumulative	12000	289,899	383,507	350,257	32,450	9%	9	302,997	316,095	345,205	358,889	364,889	375,868	378,487	3%	58,576	243,648	480,951
FX Cumulative	13000	704,509	929,263	784,431	75,920	10%	9	713,584	722,658	738,223	771,643	804,577	873,185	901,226	4%	108,524	539,378	973,466
Commodity Cumulative	14000																	
CS Cumulative	15000	188,625	266,822	229,749	28,906	13%	5	192,312	196,000	207,061	220,434	228,820	248,421	257,622	5%	59,477	101,582	340,491
CTP Cumulative	16000																	

Table 35: VaR statistics (medium L3 A&L banks only)

EU Statistics for VaR

		Other stats						Percentiles									Extreme Values range (Full Sample)	
	Port. ID	Min	Max	Ave.	STDev	Coefficient of variation (STDev/Mean)	Num obs.	5th	10th	25th	50th (Median)	75th	90th	95th	Interquantile range	STDev_trans'	-2*STDev_trans	+2*STDev_trans
Equity	1001	276,609	503,770	381,319	75,304	19%	14	283,371	288,122	335,095	422,168	448,045	471,514	491,248	13%	87,495	235,108	585,082
	1002	138,749	329,653	249,802	54,058	23%	12	161,940	183,537	217,453	265,130	272,775	319,438	326,294	11%	67,607	127,898	358,525
	1003	304	2,441	1,486	655	44%	13	549	835	1,079	1,478	1,981	2,354	2,436	29%	657	179	2,967
	1004	512	1,840	1,254	334	27%	13	751	927	1,057	1,267	1,414	1,544	1,600	14%	500	266	2,239
	1005	51,771,167	67,200,686	58,321,716	5,452,782	9%	13	52,411,227	52,999,249	54,687,404	56,300,445	61,863,754	66,350,187	67,250,705	8%	7,304,459	41,474,264	71,051,881
	1006	1,635	4,445	2,877	854	30%	12	1,756	1,827	2,440	2,857	3,505	3,836	4,330	18%	1,022	786	4,873
	1007	8,904	24,389	15,581	5,060	32%	9	9,312	10,159	11,796	15,569	17,817	21,866	23,097	20%	8,635	1,312	33,510
	1008	15,709	26,168	19,440	3,792	20%	11	16,018	16,126	17,001	20,635	21,388	22,838	24,503	11%	5,681	9,847	30,171
	1009	47,697	81,321	59,467	8,938	15%	12	48,884	50,109	53,438	58,773	62,319	66,829	73,500	8%	15,638	25,609	88,120
	1010	24,254	39,997	33,606	4,556	14%	11	26,335	28,416	32,250	33,786	35,715	38,555	39,776	5%	6,362	19,784	44,835
	1011	261,178	472,173	367,912	70,733	19%	13	267,598	272,320	315,486	400,362	407,250	444,288	463,902	13%	77,193	239,051	548,745
	1012	248,178	440,770	350,408	68,669	19%	13	253,876	257,931	300,084	381,296	389,040	427,875	438,689	13%	75,897	227,484	527,822
	1013	44,653	90,787	84,052	11,716	18%	12	47,275	50,175	60,455	64,579	64,522	74,475	82,230	5%	17,880	22,768	94,287
	1014	142,739	300,638	217,300	41,739	15%	12	180,993	174,527	182,776	206,738	251,334	260,360	278,533	16%	53,745	113,064	320,072
	1015	138,051	238,731	173,567	31,815	18%	9	139,757	143,402	144,903	182,900	184,081	197,782	218,747	12%	31,844	114,309	249,587
	1016	51,102	316,474	203,038	107,006	53%	5	75,721	100,143	174,205	178,885	294,878	307,815	312,358	26%	103,309	-50,863	383,952
Interest Rate	2001	144,168	246,875	196,007	31,839	16%	16	147,323	154,349	180,372	191,879	224,814	238,536	241,880	10%	38,300	118,697	273,297
	2002	154,709	238,662	185,204	31,751	16%	16	155,111	155,250	161,817	170,641	203,308	229,673	235,736	11%	30,522	118,133	260,320
	2003	23,181	30,810	26,934	2,033	8%	15	23,746	24,459	25,919	26,984	28,217	29,103	29,673	4%	2,448	22,711	32,502
	2004	80,138	142,257	110,523	19,854	18%	16	82,805	85,033	91,374	111,092	120,773	138,297	139,361	14%	28,439	56,798	164,555
	2005	8,432	50,510	32,590	14,805	46%	9	11,772	14,913	21,452	30,376	45,314	46,818	48,804	36%	24,422	-17,784	75,985
	2006	22,362	48,730	30,301	4,930	17%	15	22,305	22,839	26,777	29,867	32,821	35,135	39,045	11%	9,138	10,977	49,242
	2007	57,406	102,784	79,656	13,396	17%	14	62,971	66,633	68,344	78,946	84,075	99,566	102,434	10%	24,594	29,317	129,303
	2008	46,268	151,550	84,091	23,276	30%	16	56,218	60,120	65,330	82,983	99,006	124,825	127,819	18%	28,429	24,215	157,551
	2009	171,470	240,834	201,709	18,489	9%	14	172,398	177,067	192,198	201,614	210,920	220,466	229,682	5%	20,895	157,638	245,220
	2010	125,752	222,188	176,757	23,032	16%	16	132,320	138,903	162,356	172,691	199,590	215,193	218,551	10%	34,502	106,503	246,111
	2011	348,776	506,045	426,487	41,802	10%	15	371,561	377,439	388,079	404,835	458,881	475,684	487,202	9%	57,858	389,398	520,462
	2012	45,735	126,712	79,180	21,575	27%	15	53,092	58,375	67,403	74,668	85,051	110,900	121,249	12%	54,354	30,915	187,263
	2013	38,069	48,481	41,891	3,237	8%	15	38,411	38,844	39,769	40,291	44,348	46,140	47,550	5%	9,175	23,712	60,433
	2014	25,727	71,063	44,353	15,588	35%	12	26,660	27,477	29,434	40,334	57,910	62,482	66,534	33%	15,362	11,258	72,786
	2015	8,574	19,941	10,042	4,379	39%	13	6,965	7,306	8,011	9,026	11,886	16,519	18,235	20%	2,296	-3,493	25,693
	2016	94,258	159,656	119,779	20,780	17%	14	94,955	98,230	106,524	112,956	129,679	151,686	156,408	10%	40,637	38,858	201,327
	2017	19,701	40,630	28,564	6,376	22%	15	20,374	21,533	25,137	27,068	31,354	38,353	39,282	11%	9,235	10,444	47,382
	2018	17,817	25,185	24,418	3,021	13%	14	18,765	19,637	22,340	23,197	24,810	32,265	34,035	6%	7,696	8,724	39,508
	2019	8,295	17,328	11,257	3,327	30%	15	8,354	8,477	8,979	9,780	12,830	16,967	17,159	17%	4,387	1,861	19,129
	2020	28,189	54,305	41,663	8,268	20%	14	30,561	31,466	35,810	41,289	47,275	52,547	53,633	14%	9,466	24,144	61,789
	2021	28,455	52,920	37,108	6,205	17%	14	30,178	31,432	32,287	37,138	40,323	41,768	45,752	11%	13,360	11,257	64,687
	2022	152,113	304,945	211,089	53,088	25%	13	155,081	158,101	185,615	200,525	279,140	296,439	304,598	16%	85,877	37,945	378,881
	2023	26,005	57,386	42,101	16,897	40%	15	26,005	25,429	32,547	36,547	43,815	55,343	63,281	22%	51,334	-24,455	100,878
FX	3001	345,364	630,918	472,897	73,585	15%	15	368,925	379,933	425,866	488,146	509,065	535,087	585,295	5%	78,720	316,113	635,087
	3002	241,926	295,833	220,415	35,386	13%	13	273,460	296,541	306,128	317,980	331,129	352,239	370,636	4%	62,435	162,204	492,074
	3003	74,228	183,873	118,653	37,207	33%	14	83,948	89,886	98,392	123,073	131,788	138,540	154,349	16%	37,359	54,778	304,208
	3004	374,887	525,578	458,767	44,306	10%	15	383,010	395,212	428,324	453,933	475,347	500,388	523,493	5%	45,697	366,411	549,193
	3005	315,800	438,428	369,799	28,544	8%	13	331,116	343,556	360,097	368,998	384,306	388,351	409,249	3%	42,128	289,928	459,200
	3006	10,571	23,780	16,981	4,357	14%	16	10,861	12,060	14,854	15,723	19,833	22,836	23,782	15%	7,041	1,407	30,572
	3007	371,186	727,498	524,908	94,467	18%	12	396,994	424,020	488,728	519,933	531,568	646,418	690,817	4%	111,113	307,513	752,348
Commodities	4001	8,992	55,740	28,054	15,503	54%	8	11,016	13,039	17,705	28,533	38,564	44,526	53,333	37%	20,730	-17,891	64,550
	4002	323,732	409,336	361,044	27,278	8%	7	333,813	333,694	338,946	358,660	373,745	388,335	398,835	5%	58,472	249,065	482,551
	4003	382,949	556,139	514,045	62,700	12%	8	419,858	456,768	495,028	521,854	536,567	563,535	581,330	4%	113,129	305,828	758,342
	4004	233,817	362,493	318,889	45,023	14%	7	255,863	273,508	309,104	318,725	346,281	366,212	388,891	6%	93,386	140,436	513,574
Credit Spread	5001	4,778	10,534	6,808	1,773	26%	11	4,531	4,759	5,892	6,089	7,451	9,041	9,295	12%	1,899	1,104	10,300
	5002	16,044	31,330	22,050	4,705	21%	11	16,194	16,343	19,316	23,123	25,866	26,214	28,705	14%	4,520	14,083	32,103
	5003	3,387	5,595	4,126	493	12%	11	3,397	3,406	3,899	3,839	4,282	5,634	5,705	10%	1,022	1,903	5,951
	5004	6,932	14,652	9,894	2,304	23%	11	7,045	7,157	7,908	9,885	11,463	12,143	13,098	18%	2,093	6,258	14,644
	5005	3,323	5,875	4,492	817	14%	11	3,584	3,847	4,217	4,533	4,830	4,946	5,311	7%	1,077	1,317	6,685
	5006	2,322	14,459	7,342	3,423	47%	9	3,254	4,186	4,875	7,333	8,671	9,853	12,596	28%	3,724	204	14,653
	5007	21,491	66,095	37,663	15,970	43%	10	21,855	22,039	26,664	32,979	49,874	55,464	60,290	30%	44,820	-51,093	127,225
	5008	54,021	114,854	71,772	17,377	24%	12	54,850	55,636	59,451	67,517	78,682	87,723	100,159	14%	28,366	10,803	129,865
	5009	5,414	13,193	8,146	2,644	32%	11	5,494	5,573	6,085	7,142	9,556	12,156	12,675	21%	3,301	1,508	13,929
	5010	13,737	30,395	18,727	4,554	24%	11	13,877	14,016	16,104	18,641	20,598	20,634	25,465	11%	10,692	1,349	41,439
	5011	26,110	49,344	34,341	6,595	19%	10	26,537	26,963	31,110	34,159	36,245	38,592	44,168	8%	9,166	17,081	53,743
	5012	1,760	4,986	3,011	1,086	36%	11	1,430	2,110	2,481	2,656	3,326	4,967	4,877	17%	1,571	118	6,157
	5013	10,066	21,607	15,849	3,526	22%	11	10,945	11,623	14,438	15,185	18,547	20,674	20,841	13%	3,125	8,081	21,483
	5014	2,221	6,156	3,818	962	25%	12	2,775	3,151	3,518	3,837	4,080	4,687	5,417	7%	1,212	1,583	6,430
	5015	16,039	33,396	22,978	5,555	22%	11	17,550	18,165	19,781	21,233	24,300	31,254	32,275	10%	11,547	565	46,750
	5016	28,816	50,472	42,355	6,873	16%	10	32,877	36,138	38,378	43,213	48,505	49,869	50,171	11%	9,445	21,419	63,257
	5017	12,754	26,677	25,462	7,440	28%	10	15,562	18,270	22,122	23,268	30,554	35,267	36,022	16%	9,202	4,585	42,151
	5018	34,311	88,229	65,288	16,533	25%	11	41,691	49,675	53,948	67,155	74,573	87,007	88,318	16%	17,586	26,738	97,083
	5019	7,123	20,671	11,115	3,406	23%	12	7,826	8,424	9,407	9,962	11,810	14,234	16,884	12%	10,522	-10,889	31,197
	5020	118,540	207,875	184,493	23,581	14%	12	123,424	130,552	159,240	167,788	179,472	181,869	193,900	5%	25,024	117,764	217,862
	5021	14,740	32,470	23,084	5,251	22%	12	16,867	18,671	19,621	22,168	25,348	30,257	31,505	14%	5,995	11,588	35,205
	5022	114,514	186,894	155,227	23,597	13%	11	119,249	123,584	149,879	160,539	165,458	170,151	178,575	5%	25,383	111,216	212,747
	5023	40,813	94,343	71,187	18,776	26%	8	45,494	50,175	62,806	74,807	81,274	88,581	91,402	13%	18,751	25,462	100,467
	5024	19,679	69,802	45,535	18,611	43%	12	21,640	23,333	28,842	46,643	60,482	66,023	67,746	35%	20,543	5,196	76,595
	5025	48,452	66,140	54,503	5,544	10%	9	48,751	49,052	51,817	54,432	55,884	60,153	63,466	4%	7,673	37,119	67,815
	5026	20,340	45,473	31,101	8,450	27%	11	21,561	22,782	24,577	29,212	38,363	43,252	43,363	23%	9,295	9,506	46,687
	5027	14,486	30,822	19,164	4,866	25%	10	15,159	15,832	16,321	17,580	20,560	24,041	27,432	11%	11,597	-3,097	43,292
CTP	6001						2											
	6002						2											
	6003						2											
	6004						2											
	6005						2											
ALL IM non CTP	10000	589,400	908,126	736,541	116,358	21%	7	535,525	563,550	629,089	776,141	821,382	884,033	920,080	13%	158,483	497,027	1,134,559
Equity Cumulative	11000	157,349	294,879	221,978	41,721	19%	10	164,848	172,340	206,415	215,948	238,943	277,066	285,979	7%	51,361	113,185	319,230
IR Cumulative	12000	280,384	437,127	369,939	45,377	12%	15	311,423	328,661	338,278	356,929	413,203	427,396	434,376	10%	58,576	242,648	480,551
FX Cumulative	13000	683,466	857,655	750,478	53,393	7%	14	684,255	686,369	752,011	746,914	767,575	872,684	838,326	6%	108,526	539,370	973,466
Commodity Cumulative	14000	319,755	502,693	379,751	78,320	18%	8	323,513	327,271	331,286	351,975	400,737	481,819	492,256	9%	71,123	238,415	513,726
CS Cumulative	15000	157,424	232,845	206,218	25,978	13%	9	163,425	165,426	187,013	218,768	225,535	227,128	230,097	9%	59,477	102,582	340,491
CTP Cumulative	16000						2											

Table 36: VaR statistics (high L3 A&L banks only)

EU Statistics for VaR

		Other stats						Percentiles									Extreme Values range (Full Sample)	
	Port. ID	Min	Max	Ave.	STDev	Coefficient of variation (STDev/Mean)	Num obs.	5th	10th	25th	50th (Median)	75th	90th	95th	Interquantile range	STDev_trans	-2*STDev_trans	+2*STDev_trans
Equity	1001	291,555	545,084	389,977	106,003	28%	5	296,509	301,663	316,826	382,685	463,814	512,576	528,830	19%	87,495	235,108	585,082
	1002						4											
	1003	1,148	2,636	1,860	532	29%	5	1,261	1,377	1,720	1,884	1,912	2,346	2,491	5%	697	179	2,967
	1004						2											
	1005						3											
	1006	2,475	4,233	3,171	855	27%	5	2,546	2,617	2,890	3,050	3,288	3,843	4,029	7%	1,022	788	4,873
	1007						4											
	1008						4											
	1009	42,316	88,955	64,741	19,090	30%	5	43,711	44,607	47,294	62,613	80,086	85,375	88,365	26%	15,638	25,699	88,120
	1010						4											
	1011	275,678	508,463	373,591	96,841	26%	5	279,841	283,605	295,495	355,081	435,080	478,014	492,336	19%	77,199	239,951	548,745
	1012	259,530	485,566	356,273	93,937	26%	5	264,014	268,498	281,951	340,942	417,370	455,888	468,727	19%	75,097	327,484	527,822
	1013	46,500	93,238	67,050	19,452	29%	5	48,201	49,902	55,008	61,484	82,595	88,468	91,017	20%	17,880	22,768	94,287
	1014						4											
	1015						4											
	1016						1											
Interest Rate	2001	148,895	233,368	198,251	25,846	13%	8	163,581	178,268	192,058	194,299	210,273	229,118	231,239	5%	38,700	118,497	273,297
	2002	137,288	203,647	169,717	25,331	15%	6	140,155	143,021	151,868	169,886	186,263	196,235	199,941	10%	30,522	118,133	240,220
	2003	23,462	28,754	27,917	2,320	8%	7	24,665	25,868	27,742	28,295	29,211	29,524	29,639	3%	2,448	22,711	32,502
	2004	85,580	129,790	107,953	15,050	14%	8	88,580	91,580	100,497	106,167	115,560	128,045	128,917	7%	26,439	56,798	164,555
	2005						2											
	2006	18,671	38,440	28,279	4,455	13%	7	19,614	20,536	24,388	29,044	32,710	35,388	35,874	15%	8,138	10,572	49,342
	2007	61,805	97,080	77,966	12,567	16%	6	63,412	65,019	69,756	78,441	83,479	90,440	93,764	9%	24,994	29,327	129,303
	2008	80,540	107,679	88,470	10,821	12%	6	81,283	82,026	86,851	88,939	91,566	94,450	101,065	10%	28,429	24,215	137,591
	2009	160,752	223,626	184,946	21,240	11%	8	164,250	167,749	183,198	197,675	211,306	215,412	218,224	7%	20,895	157,639	241,220
	2010	134,005	210,635	178,458	23,253	13%	8	147,309	160,612	172,322	174,889	189,205	206,280	208,118	4%	34,502	106,503	246,111
	2011	352,526	484,308	429,353	51,686	12%	8	363,324	374,122	442,282	471,999	465,803	476,553	480,383	10%	57,853	388,288	520,462
	2012	64,158	150,238	87,881	31,325	36%	6	66,429	68,700	74,020	77,573	89,001	117,572	133,850	6%	54,354	-30,915	187,263
	2013	28,039	53,127	41,100	7,365	17%	8	31,780	35,521	38,870	40,731	43,013	48,590	53,909	5%	9,175	25,712	60,413
	2014	30,568	57,688	38,894	11,458	29%	5	30,631	30,698	31,693	32,739	41,383	51,466	54,547	14%	15,362	11,258	72,706
	2015	6,199	14,025	10,154	3,627	36%	7	6,211	6,136	6,474	12,623	12,741	13,756	13,641	33%	7,296	-5,499	25,099
	2016	89,956	170,909	126,835	30,481	24%	6	94,324	98,652	150,701	124,039	132,687	156,914	168,413	0%	40,617	36,858	201,327
	2017	19,800	40,309	31,163	9,116	29%	6	21,340	22,881	26,468	28,581	37,630	42,105	42,907	17%	9,235	10,844	47,382
	2018	16,727	32,931	24,300	4,705	19%	8	18,259	20,494	22,555	24,064	25,876	28,435	30,671	7%	7,696	8,724	39,508
	2019	6,079	16,287	11,005	3,935	34%	7	6,795	7,511	8,059	12,083	14,998	15,754	16,091	27%	4,367	1,961	19,129
	2020	31,857	53,785	43,964	4,813	10%	6	34,758	38,658	41,827	45,315	47,375	50,065	53,839	6%	9,406	24,144	61,789
	2021	31,387	54,940	41,189	8,558	21%	6	32,536	33,684	36,097	38,858	43,429	50,864	52,912	11%	13,360	11,257	64,687
	2022	146,138	373,082	262,031	91,320	35%	5	154,634	165,131	186,820	286,773	332,585	368,267	380,275	23%	85,577	32,985	376,891
	2023	19,646	44,185	35,752	10,170	28%	6	21,863	24,081	29,376	38,753	43,744	44,364	44,575	15%	31,334	-24,455	100,878
FX	3001	342,989	583,172	458,820	71,873	17%	6	356,176	369,362	413,120	447,288	498,993	572,189	577,080	9%	38,720	386,111	535,087
	3002	220,143	413,924	337,293	56,390	17%	6	261,421	282,701	332,267	347,207	347,856	380,971	397,448	2%	62,425	162,324	402,079
	3003	80,610	185,141	130,743	38,691	30%	6	87,871	95,135	110,585	131,375	157,069	175,730	180,431	17%	37,159	54,778	204,208
	3004	371,760	477,183	439,214	38,539	9%	5	384,808	397,847	436,364	447,080	473,094	475,535	476,349	8%	45,697	346,411	549,199
	3005	310,237	411,007	374,301	47,621	13%	5	318,906	326,974	352,080	395,023	404,367	408,272	409,639	7%	42,138	289,928	459,200
	3006	11,510	18,168	15,557	2,522	16%	6	12,244	12,979	14,515	15,640	17,593	18,063	18,111	10%	7,041	1,407	30,572
	3007	378,525	584,002	516,146	83,947	16%	5	401,097	425,065	485,170	555,163	564,060	576,038	580,015	7%	111,133	307,513	752,240
Commodities	4001						2											
	4002						2											
	4003						1											
	4004						1											
Credit Spread	5001						3											
	5002						3											
	5003						3											
	5004						3											
	5005						2											
	5006						3											
	5007						3											
	5008						4											
	5009						4											
	5010						3											
	5011						3											
	5012						3											
	5013						3											
	5014						3											
	5015						2											
	5016						2											
	5017						2											
	5018						1											
	5019						1											
	5020						3											
	5021						4											
	5022						3											
	5023						3											
	5024						3											
	5025						2											
	5026						2											
	5027						3											
CTP	6001						1											
	6002						1											
	6003						1											
	6004						1											
	6005						1											
ALL IR no CTP	10000																	
Equity Cumulative	11000	193,118	311,963	242,391	52,530	22%	5	195,817	198,516	206,614	215,768	284,552	300,999	306,481	16%	51,761	112,185	319,230
IR Cumulative	12000						4											
FX Cumulative	13000						3											
Commodity Cumulative	14000																	
CS Cumulative	15000						2											
CTP Cumulative	16000						3											

Table 37: VaR statistics (IR and CS asset classes – only banks with general and specific IR risk approval)

EU Statistics for VaR

		Other stats						Percentiles							
	Port. ID	Min	Max	Ave.	STDev	Coefficient of variation (STDev/Mean)	Num obs.	5th	10th	25th	50th (Median)	75th	90th	95th	Interquantile range
Interest Rate	2001	144,168	258,202	194,763	33,254	17%	20	147,783	159,450	166,478	191,286	211,238	241,008	247,441	12%
	2002	148,754	239,967	184,268	28,382	15%	18	154,273	155,251	161,054	178,763	202,673	228,167	236,971	11%
	2003	23,183	31,062	27,840	2,055	7%	16	24,670	25,574	26,749	28,190	29,074	30,213	31,031	4%
	2004	67,975	138,801	112,522	21,598	19%	20	84,510	85,552	91,374	114,596	132,161	135,771	138,416	18%
	2005	4,629	64,885	30,903	20,903	68%	9	6,230	7,831	16,483	21,810	45,314	53,385	59,135	47%
	2006	18,671	45,679	28,846	6,930	24%	16	21,364	22,474	24,337	27,694	31,738	37,195	40,854	13%
	2007	61,099	126,190	81,589	18,855	23%	16	61,629	64,956	68,482	75,464	87,390	108,633	117,804	12%
	2008	58,948	131,950	89,031	28,491	32%	19	60,321	60,527	63,419	81,003	124,152	130,124	131,950	32%
	2009	171,470	240,874	204,149	18,773	9%	18	172,683	182,523	192,951	203,678	213,402	226,208	238,686	5%
	2010	129,752	232,375	175,521	30,199	17%	20	133,005	143,485	149,830	172,280	190,972	217,823	222,697	12%
	2011	352,795	508,469	422,712	50,974	12%	18	365,911	370,602	383,549	397,511	465,724	487,202	506,400	10%
	2012	55,388	150,338	82,330	23,296	28%	19	62,109	63,898	68,490	75,067	85,081	114,514	122,051	11%
	2013	28,039	53,227	42,375	5,500	13%	17	36,453	38,987	40,135	41,822	44,608	48,459	50,972	5%
	2014	25,727	59,359	43,665	9,852	23%	14	30,667	33,443	37,192	42,831	47,364	57,610	58,273	12%
	2015	6,574	19,941	11,900	4,337	36%	14	7,092	7,448	8,627	11,251	13,903	18,286	19,211	23%
	2016	94,258	179,909	123,832	24,567	20%	17	95,116	101,609	108,710	112,893	132,839	158,322	163,867	10%
	2017	19,701	45,864	30,379	7,857	26%	20	19,795	22,490	25,518	28,802	33,623	43,823	44,898	14%
	2018	15,905	35,185	23,988	4,867	20%	18	17,530	18,838	21,807	23,053	25,404	31,228	32,594	8%
	2019	8,190	18,782	12,255	3,694	30%	19	8,425	8,463	9,233	10,555	16,119	16,944	17,420	27%
	2020	30,832	56,843	43,553	8,060	19%	19	31,755	32,051	39,015	42,929	50,063	54,442	55,537	12%
	2021	31,387	63,040	40,136	9,624	24%	17	31,905	32,168	33,274	37,156	41,477	55,294	59,692	11%
	2022	152,112	353,823	228,061	67,465	30%	16	158,075	161,164	167,213	201,372	304,120	308,745	322,865	29%
	2023	19,646	57,227	38,609	10,436	27%	21	21,541	28,515	32,192	37,498	44,785	54,535	54,535	16%
Credit Spread	5001	4,259	9,493	7,049	1,539	22%	16	4,273	5,085	6,071	7,101	8,032	9,053	9,351	14%
	5002	15,771	27,093	22,212	3,828	17%	15	15,962	16,354	19,804	23,123	25,623	25,986	26,453	13%
	5003	3,387	5,976	4,315	969	22%	19	3,404	3,412	3,489	3,943	5,390	5,673	5,915	21%
	5004	7,157	12,278	9,958	1,834	18%	15	7,230	7,267	8,835	9,895	11,578	12,139	12,184	13%
	5005	3,323	6,121	4,478	659	15%	17	3,506	3,729	4,090	4,368	4,848	4,998	5,258	8%
	5006	2,322	14,499	7,050	2,549	36%	19	4,419	4,805	5,410	6,768	8,265	8,943	10,226	21%
	5007	21,693	71,614	42,213	15,879	38%	14	24,701	26,708	29,565	37,443	54,071	63,820	68,027	29%
	5008	54,023	114,856	75,262	19,381	26%	18	56,215	57,635	63,537	67,785	79,076	110,805	114,856	11%
	5009	5,414	13,160	8,633	2,526	29%	18	6,018	6,205	6,779	7,720	9,676	12,467	13,218	18%
	5010	13,737	30,295	20,200	5,004	25%	19	13,988	14,920	16,880	20,105	20,990	28,765	30,295	11%
	5011	26,110	49,744	35,858	6,676	19%	18	26,916	29,744	32,132	35,087	36,450	47,669	49,744	6%
	5012	1,654	5,763	2,986	1,170	39%	18	1,736	1,803	2,171	2,586	3,462	4,812	5,086	23%
	5013	10,066	21,007	15,299	3,219	21%	19	10,066	11,100	13,527	15,232	16,906	19,976	20,707	11%
	5014	2,231	6,357	4,219	1,343	32%	15	2,517	2,838	3,363	3,882	5,151	6,224	6,356	21%
	5015	14,571	39,379	23,634	6,143	26%	16	16,332	17,592	20,515	23,285	24,907	30,886	34,817	10%
	5016	27,466	59,819	40,886	8,941	22%	14	28,344	29,258	37,182	40,014	44,789	50,271	53,743	9%
	5017	12,754	36,677	23,858	6,874	29%	12	15,386	17,685	20,004	22,191	28,143	32,481	34,449	17%
	5018	34,313	89,229	58,119	15,192	26%	13	37,397	40,466	49,071	55,905	70,145	71,337	78,635	18%
	5019	7,123	20,848	11,711	4,207	36%	16	8,082	8,558	9,097	9,962	12,640	18,835	20,265	16%
	5020	118,540	200,472	163,664	21,963	13%	17	125,644	131,981	159,405	162,146	170,950	193,241	197,609	3%
	5021	14,740	32,470	23,716	4,799	20%	14	17,254	18,907	20,349	23,915	26,340	29,771	31,293	13%
	5022	114,514	192,895	156,288	21,607	14%	15	121,143	125,291	149,879	157,437	168,023	180,394	186,523	6%
	5023	40,813	94,343	67,167	17,653	26%	9	43,489	46,164	53,884	70,121	76,638	87,424	90,883	17%
	5024	19,679	69,802	38,155	17,667	46%	13	21,822	23,320	24,082	28,793	54,613	64,201	67,314	39%
	5025	39,882	66,740	51,422	6,647	13%	14	41,136	43,676	48,620	50,878	53,897	57,742	61,420	5%
	5026	20,340	43,473	31,458	7,922	25%	16	21,783	22,587	24,954	28,986	39,105	41,691	43,307	22%
	5027	14,486	30,822	21,916	6,121	28%	15	15,754	16,336	17,035	20,098	28,587	30,664	30,822	25%
IR Cumulative	12000	280,584	447,514	371,430	47,869	13%	16	311,633	323,311	337,010	367,149	414,067	435,162	439,724	10%
CS Cumulative	15000	157,424	338,003	222,442	44,937	20%	15	167,925	178,261	197,463	220,414	225,480	274,570	297,216	7%

Table 38: VaR statistics (IR and CS asset classes – only banks with general IR risk approval)

EU Statistics for VaR

		Other stats						Percentiles							
	Port. ID	Min	Max	Ave.	STDev	Coefficient of variation (STDev/Mean)	Num obs.	5th	10th	25th	50th (Median)	75th	90th	95th	Interquantile range
Interest Rate	2001	148,895	233,368	198,450	19,659	10%	15	174,055	186,592	192,020	195,897	204,945	223,547	229,110	3%
	2002	136,316	234,325	170,759	26,107	15%	14	136,948	137,712	156,335	173,302	179,375	192,702	208,351	7%
	2003	23,462	30,434	27,405	2,242	8%	17	23,572	23,833	26,058	27,790	29,039	29,973	30,328	5%
	2004	80,136	142,257	108,870	20,294	19%	15	82,627	83,776	93,785	105,843	124,793	136,204	139,415	14%
	2005	15,707	45,895	29,496	10,935	37%	5	17,619	19,531	25,268	30,236	30,376	39,687	42,791	9%
	2006	15,587	36,440	28,263	6,525	23%	11	18,717	21,846	23,515	29,420	33,301	35,122	35,781	17%
	2007	57,406	123,613	80,833	20,358	25%	11	57,741	58,076	67,242	79,315	90,440	102,764	113,189	15%
	2008	46,268	115,320	74,956	24,258	32%	11	47,325	48,382	56,732	66,123	91,273	107,676	111,498	23%
	2009	160,752	213,020	194,532	14,265	7%	16	168,248	178,773	188,928	195,419	205,186	210,726	211,306	4%
	2010	134,005	210,035	178,600	17,696	10%	15	156,650	167,933	172,768	176,307	184,462	201,193	206,200	3%
	2011	352,525	484,208	406,220	40,681	10%	16	361,576	368,792	381,831	388,981	442,221	464,823	473,956	7%
	2012	49,735	181,999	88,359	39,808	45%	14	59,769	65,814	67,603	76,862	83,681	150,180	178,901	11%
	2013	38,069	48,481	41,696	3,161	8%	15	38,530	38,757	39,214	40,560	43,601	46,006	47,166	5%
	2014	15,534	71,063	41,266	20,580	50%	9	20,505	25,476	29,930	31,093	62,829	69,635	70,349	35%
	2015	6,199	14,573	9,767	2,899	30%	15	6,242	6,339	7,245	9,663	11,862	13,806	14,535	24%
	2016	89,996	154,551	121,651	18,852	15%	11	97,464	104,931	112,956	120,093	127,404	150,917	152,734	6%
	2017	20,663	44,847	33,188	8,425	25%	10	22,460	24,258	26,366	32,471	40,598	42,375	43,611	21%
	2018	14,378	37,897	25,615	6,156	24%	16	15,762	19,158	22,644	24,450	29,895	33,242	34,654	14%
	2019	6,079	18,782	11,845	4,207	36%	15	7,424	8,118	8,502	9,550	15,385	17,420	17,848	29%
	2020	28,149	56,069	43,240	7,592	18%	14	31,108	33,801	39,245	43,573	48,321	50,972	53,198	10%
	2021	28,455	54,940	38,798	8,672	22%	11	29,779	31,103	33,056	35,981	41,623	53,338	54,139	11%
	2022	98,104	372,082	206,907	81,276	39%	9	116,518	134,931	157,060	189,037	229,140	302,233	337,158	19%
	2023	26,065	83,915	40,858	18,484	45%	14	27,548	28,783	30,331	33,592	39,340	70,526	82,618	13%
Credit Spread	5001						4								
	5002						4								
	5003						4								
	5004						4								
	5005						4								
	5006						3								
	5007						4								
	5008	54,596	117,512	73,347	23,501	32%	6	54,829	55,063	57,455	66,783	76,741	98,194	107,853	14%
	5009	4,987	8,889	6,646	1,536	23%	5	5,104	5,221	5,573	6,453	7,329	8,265	8,577	14%
	5010	12,977	29,715	19,097	6,326	33%	5	13,723	14,469	16,706	17,062	19,023	25,438	27,577	6%
	5011	27,025	52,921	35,619	10,253	29%	5	27,762	28,500	30,712	30,895	36,543	46,370	49,645	9%
	5012						2								
	5013						4								
	5014						4								
	5015						4								
	5016						3								
	5017						4								
	5018						4								
	5019						4								
	5020	132,699	200,472	171,249	22,376	13%	6	141,478	150,256	167,885	172,280	180,578	191,212	195,842	4%
	5021						4								
	5022						4								
	5023						4								
	5024						3								
	5025						3								
	5026						4								
	5027						4								
IR Cumulative	12000	289,899	413,874	357,038	31,838	9%	10	311,893	333,887	345,584	356,817	372,342	381,628	397,751	4%
CS Cumulative	15000						4								

Table 39: VaR statistics (EQ asset class – only banks with general and specific EQ risk approval)

EU Statistics for VaR

		Other stats						Percentiles							
	Port. ID	Min	Max	Ave.	STDev	Coefficient of variation (STDev/Mean)	Num obs.	5th	10th	25th	50th (Median)	75th	90th	95th	Interquantile range
Equity	1001	276,609	545,084	411,630	83,599	20%	22	281,230	284,401	346,910	433,171	477,217	503,218	503,748	16%
	1002	180,915	343,002	258,675	48,151	19%	17	185,893	195,500	227,531	265,121	279,429	325,989	332,323	10%
	1003	779	2,441	1,570	537	34%	18	950	997	1,079	1,526	2,025	2,227	2,434	30%
	1004	911	1,840	1,356	249	18%	18	977	1,044	1,152	1,400	1,528	1,591	1,673	14%
	1005	52,797,141	67,700,086	58,558,723	5,629,959	10%	15	52,825,705	53,577,730	54,997,776	56,225,640	62,917,057	67,277,468	67,556,550	7%
	1006	1,633	4,445	2,923	774	26%	19	1,802	1,855	2,453	2,915	3,501	3,766	3,920	18%
	1007	2,132	24,389	15,154	5,436	36%	15	6,592	9,797	12,525	15,569	18,300	20,679	22,129	19%
	1008	14,326	26,168	20,182	2,713	13%	18	15,727	16,731	18,450	20,855	21,442	22,067	23,338	8%
	1009	42,816	84,955	57,986	10,711	18%	20	44,549	47,391	50,011	58,215	61,400	68,523	81,503	10%
	1010	24,254	43,968	34,154	5,147	15%	19	27,674	28,344	31,184	32,856	39,542	39,749	40,394	12%
	1011	261,378	506,661	390,492	74,353	19%	21	267,886	274,622	355,081	403,722	453,387	472,175	477,757	12%
	1012	248,179	481,566	372,610	71,766	19%	21	253,093	259,158	340,942	388,357	437,302	447,090	462,573	12%
	1013	36,106	93,216	60,403	13,469	22%	21	44,653	46,500	52,505	61,484	65,275	67,584	90,767	11%
	1014	142,739	311,626	230,065	47,730	21%	21	165,926	176,623	194,090	227,615	260,447	300,638	300,638	15%
	1015	135,207	245,197	189,341	36,802	19%	16	137,340	141,477	162,557	183,491	221,806	239,711	241,083	15%
	1016	51,102	294,876	172,358	94,326	55%	6	61,394	71,685	107,979	166,998	241,152	278,392	286,634	38%
Equity Cumulative	11000	157,349	311,963	226,338	45,863	20%	15	169,009	178,773	203,385	208,992	258,481	291,013	300,004	12%

Table 40: VaR statistics (EQ asset class – only banks with general EQ risk approval)

EU Statistics for VaR

		Other stats						Percentiles							
	Port. ID	Min	Max	Ave.	STDev	Coefficient of variation (STDev/Mean)	Num obs.	5th	10th	25th	50th (Median)	75th	90th	95th	Interquantile range
Equity	1001	287,013	430,914	349,307	54,074	15%	5	292,976	298,938	316,826	353,223	358,559	401,972	416,443	6%
	1002						4								
	1003						2								
	1004						2								
	1005	51,728,788	70,540,542	57,284,091	8,009,150	14%	6	51,739,378	51,749,968	51,965,728	52,858,801	61,251,884	67,243,505	68,892,023	8%
	1006						1								
	1007						1								
	1008						1								
	1009						1								
	1010						2								
	1011						3								
	1012						3								
	1013						1								
	1014						3								
	1015						3								
	1016						3								
Equity Cumulative	11000						1								

Table 41: Stress VaR statistics (2008-2009 stress period only)

EU Statistics for SVaR

		Other stats						Percentiles							
	Port. ID	Min	Max	Ave.	STDev	Coefficient of variation (STDev/Mean)	Num obs.	5th	10th	25th	50th (Median)	75th	90th	95th	Interquantile range
Equity	1001	695,666	1,210,174	965,207	115,037	12%	23	802,155	829,357	863,845	999,963	1,032,601	1,069,671	1,084,923	9%
	1002	856,224	1,710,748	1,270,682	272,445	21%	21	865,052	893,197	1,027,575	1,395,183	1,477,855	1,546,966	1,590,275	18%
	1003	45	6,175	3,258	1,488	46%	20	604	1,499	2,497	3,541	4,136	4,612	5,075	25%
	1004	56	4,645	2,412	1,364	57%	18	563	963	1,689	1,918	3,428	4,508	4,609	34%
	1005	114,333,423	207,722,826	174,419,383	27,176,692	16%	18	134,548,896	142,385,147	151,253,279	181,734,188	198,626,435	200,685,021	201,864,314	14%
	1006	2,034	8,770	5,925	1,880	32%	19	3,245	3,437	4,754	5,853	7,482	8,364	8,649	22%
	1007	1,328	92,329	45,566	21,570	47%	16	15,929	24,087	29,924	47,725	57,331	67,679	74,047	31%
	1008	15,129	50,545	34,323	10,195	30%	18	16,799	19,123	29,333	37,273	41,093	44,556	46,635	17%
	1009	64,768	98,092	82,933	9,715	12%	18	67,499	68,900	74,846	86,635	89,068	91,331	94,592	9%
	1010	91,888	157,766	134,164	16,596	12%	20	103,562	109,767	128,578	135,604	145,329	151,882	152,206	6%
	1011	763,041	1,130,107	909,295	95,446	10%	21	763,498	781,269	820,105	926,487	960,810	1,015,853	1,031,412	8%
	1012	705,648	1,079,333	876,306	99,839	11%	21	729,030	741,638	773,476	894,652	946,970	979,798	989,109	10%
	1013	20,752	120,621	73,144	28,581	39%	21	21,045	31,099	61,110	71,778	90,869	105,903	106,097	20%
	1014	354,221	663,630	484,179	114,941	24%	22	369,614	302,444	436,932	514,385	554,161	602,194	658,894	12%
	1015	217,138	522,090	387,077	87,816	23%	16	235,328	258,187	343,809	402,671	447,836	477,825	498,406	13%
	1016	143,776	604,922	361,484	140,721	39%	11	175,177	206,577	283,474	345,069	458,337	537,370	571,146	24%
Interest Rate	2001	153,539	277,488	219,768	29,130	13%	25	176,847	188,425	205,946	217,422	235,883	255,113	264,691	7%
	2002	108,963	210,802	173,559	24,029	14%	25	134,634	153,101	162,910	171,569	192,407	204,526	208,372	8%
	2003	19,445	44,997	34,996	5,879	17%	24	26,272	27,813	31,923	35,717	38,611	42,043	43,904	9%
	2004	60,995	162,913	102,910	25,829	25%	26	74,317	75,156	80,308	104,179	118,912	136,786	146,252	19%
	2005	4,342	181,397	76,322	56,346	74%	12	14,992	24,317	33,689	62,281	117,130	148,591	164,080	55%
	2006	22,144	66,868	45,379	11,486	25%	22	25,058	27,755	39,298	47,276	50,847	58,902	61,209	13%
	2007	42,207	161,832	96,572	26,966	28%	22	61,627	63,180	83,962	93,738	106,712	135,915	141,180	12%
	2008	42,708	193,909	102,377	38,809	38%	23	45,167	66,909	80,005	97,241	105,925	153,570	186,041	14%
	2009	189,529	370,636	281,613	43,614	15%	25	226,732	238,174	256,346	273,590	296,482	348,846	363,153	7%
	2010	138,186	249,740	197,862	26,215	13%	25	159,163	169,586	185,351	197,013	212,295	229,602	238,224	7%
	2011	300,109	584,888	447,250	67,260	15%	26	330,488	368,776	409,738	435,607	504,915	524,324	532,597	10%
	2012	81,730	174,883	114,221	28,055	25%	25	82,556	85,196	93,837	106,046	133,394	160,751	164,476	17%
	2013	27,619	66,742	44,328	9,718	22%	21	29,905	31,947	40,465	43,509	47,100	52,848	64,846	8%
	2014	35,443	269,420	116,842	69,516	59%	19	38,759	40,719	54,588	125,622	140,652	204,231	251,246	44%
	2015	14,494	62,222	32,421	13,908	43%	22	16,315	17,678	21,772	30,606	40,298	52,833	60,471	30%
	2016	88,245	164,469	117,970	21,303	18%	22	90,795	93,536	102,050	115,663	134,778	141,685	158,424	14%
	2017	60,853	326,623	186,005	71,438	38%	19	86,139	104,783	133,650	189,038	233,979	275,410	282,245	27%
	2018	11,041	33,775	23,856	4,961	21%	23	14,394	17,217	22,344	25,578	26,637	27,562	28,469	9%
	2019	12,729	25,775	19,323	3,405	18%	23	13,207	15,811	17,374	19,438	20,904	24,055	24,944	9%
	2020	7,740	276,819	137,683	73,459	53%	23	58,358	70,110	88,277	105,878	191,668	247,267	267,363	37%
	2021	26,118	66,206	44,031	8,980	20%	22	26,845	34,935	37,889	45,661	48,821	50,237	53,878	13%
	2022	119,610	346,475	257,159	47,173	18%	21	210,683	225,246	232,092	259,911	285,739	297,696	336,005	10%
	2023	21,115	66,035	42,103	11,662	28%	24	28,060	30,369	33,761	38,778	51,743	56,333	58,801	21%
FX	3001	558,145	1,217,111	954,708	181,116	19%	24	722,884	777,367	790,826	951,483	1,106,492	1,195,207	1,211,302	17%
	3002	362,315	926,123	708,897	144,968	20%	21	534,277	534,722	611,031	705,610	789,748	893,235	910,544	13%
	3003	80,700	374,845	263,612	66,306	25%	21	175,993	192,230	231,339	270,058	305,190	338,310	339,216	14%
	3004	578,384	1,315,742	1,043,953	161,563	15%	21	712,169	942,930	985,635	1,079,000	1,119,616	1,200,076	1,211,228	6%
	3005	572,711	1,758,842	1,201,741	272,460	23%	21	863,709	930,798	1,097,737	1,154,781	1,294,253	1,545,157	1,684,820	8%
	3006	14,414	96,440	39,667	18,015	45%	22	18,527	18,763	25,946	41,081	43,863	55,612	61,059	27%
	3007	1,021,016	2,423,672	1,726,943	352,941	20%	18	1,166,890	1,343,408	1,584,738	1,709,458	1,852,976	2,136,295	2,366,470	8%
Commodities	4001	27,580	69,841	46,377	12,389	27%	9	31,166	34,753	39,312	45,536	52,434	58,789	64,315	14%
	4002	489,389	917,919	701,055	141,213	20%	10	504,466	519,544	606,431	693,577	795,377	862,133	890,026	13%
	4003	651,717	1,814,706	1,368,453	333,886	24%	9	871,321	1,090,924	1,282,149	1,403,230	1,453,524	1,749,684	1,782,195	6%
	4004	649,554	851,341	782,077	72,155	9%	8	667,884	686,214	758,520	801,000	830,815	850,397	850,809	5%
Credit Spread	5001	7,415	24,325	15,635	5,626	36%	15	7,723	7,963	10,044	16,540	19,890	20,817	22,151	33%
	5002	43,469	159,284	71,999	34,151	47%	10	45,785	48,101	54,882	60,045	74,104	102,386	130,835	15%
	5003	8,063	14,823	11,240	2,275	20%	15	8,139	8,487	9,449	10,665	13,120	14,138	14,544	16%
	5004	16,642	76,513	35,039	20,880	60%	11	16,866	17,090	22,565	25,538	37,680	72,726	74,620	26%
	5005	4,646	32,798	16,959	8,939	53%	13	7,962	10,316	10,982	12,709	20,547	30,967	32,082	30%
	5006	13,030	52,753	30,655	14,604	48%	15	15,016	16,157	18,597	23,902	45,616	49,437	51,617	42%
	5007	38,947	194,212	92,016	44,895	49%	14	39,833	42,193	53,127	89,507	121,394	132,646	154,596	39%
	5008	33,171	221,144	103,136	42,908	42%	16	60,049	71,931	80,149	97,971	106,081	152,928	172,774	14%
	5009	5,559	27,894	13,128	6,214	47%	15	5,851	6,025	8,498	11,768	15,975	20,041	23,034	31%
	5010	11,566	54,369	30,126	14,256	47%	16	16,060	18,314	19,771	23,745	40,298	52,218	53,928	34%
	5011	16,553	106,101	56,084	27,308	49%	17	25,880	31,327	35,446	47,765	63,518	102,009	105,811	28%
	5012	4,970	12,248	8,018	2,067	26%	14	5,154	5,290	6,268	8,118	9,303	9,495	10,459	19%
	5013	12,372	71,170	40,742	18,587	46%	15	19,019	22,291	25,283	39,774	51,971	69,358	70,387	35%
	5014	5,927	19,522	11,391	3,808	33%	14	6,003	6,682	8,469	11,428	13,534	15,029	16,963	23%
	5015	13,479	38,580	28,216	6,450	23%	14	16,917	20,429	27,752	28,973	29,776	35,995	38,165	4%
	5016	40,738	169,297	91,938	40,995	45%	12	47,459	53,660	62,251	86,340	103,477	160,014	167,202	25%
	5017	25,828	125,566	70,172	31,171	44%	13	30,530	36,295	48,875	73,444	84,227	115,856	123,650	27%
	5018	68,955	242,254	130,600	55,946	43%	12	73,206	77,321	94,619	116,139	141,898	225,438	237,548	20%
	5019	14,642	42,568	22,579	6,888	31%	14	16,334	17,267	18,704	20,690	24,173	27,786	33,214	13%
	5020	129,809	264,353	186,430	39,105	21%	15	131,382	137,003	157,421	184,122	209,436	228,250	240,820	14%
	5021	36,046	185,369	104,838	52,341	50%	13	42,381	46,611	53,076	98,528	145,984	171,719	178,778	47%
	5022	144,339	335,507	230,817	66,281	29%	14	150,212	155,639	176,685	225,317	278,859	324,161	331,409	22%
	5023	33,865	235,521	131,870	64,968	49%	12	49,234	62,508	77,910	134,091	180,399	216,537	227,005	40%
	5024	27,952	156,446	77,869	42,511	55%	14	30,850	33,673	40,846	66,721	106,689	134,473	144,721	45%
	5025	66,819	145,107	99,519	26,714	27%	12	68,658	70,794	80,060	95,282	108,694	141,591	143,834	15%
	5026	24,467	76,948	42,758	16,390	38%	14	24,522	26,483	32,054	38,239	48,943	68,642	75,701	21%
	5027	7,077	74,995	30,850	17,401	56%	15	13,657	18,171	20,974	23,598	40,141	50,021	57,642	31%
CTP	6001	9,432	173,404	87,100	74,355	85%	4	14,560	19,687	35,070	82,782	134,811	157,967	165,685	59%
	6002	9,686	116,513	74,547	49,650	67%	4	17,512	25,337	48,814	85,994	111,726	114,598	115,556	39%
	6003	2,661	14,305	7,762	5,661	73%	4	2,774	2,887	3,227	7,040	11,575	13,213	13,759	56%
	6004	2,203	12,701	7,909	5,525	70%	4	2,494	2,785	3,659	8,366	12,616	12,667	12,684	55%
	6005	40,269	173,404	88,999	73,388	82%	3	41,575	42,880	46,797	53,325	113,365	149,388	161,396	42%
ALL-IN no-CTP	20000	1,429,751	2,353,012	1,953,237	351,840	18%	8	1,462,984	1,496,217	1,645,148	2,124,905	2,189,219	2,243,489	2,298,250	14%
Equity Cumulative	21000	485,203	865,476	672,183	105,839	16%	15	532,713	558,790	613,982	645,546	735,569	816,209	837,786	9%
IR Cumulative	22000	269,331	599,569	446,910	74,270	17%	22	383,441	388,446	404,727	430,350	497,642	533,185	570,582	10%
FX Cumulative	23000	1,216,020	2,572,732	1,892,325	386,162	20%	21	1,221,716	1,274,411	1,744,885	1,929,046	2,041,067	2,310,793	2,510,858	8%
Commodity Cumulative	24000	487,420	919,882	698,637	146,852	21%	10	501,406	515,393	594,702	689,625	813,849	865,446	892,664	16%
CS Cumulative	25000	180,948	411,157	301,200	79,376	26%	14	193,173	201,369	255,268	285,455	385,692	394,036	400,390	20%
CTP Cumulative	26000	1	4	3	2	85%	2	1	1	2	3	3	4	4	30%

Table 42: PV statistics

EU Statistics for PV

		Main statistics								Percentiles			
	Port. ID	Min	Max	Ave	STDev	STDev_trunc[1]	MAD (median absolute deviation)	Coefficient of variation (STDev/Ave)	Num obs.[2]	25th	50th (Median)	75th	Interquantile range
Equity	2001	4,388,300	4,525,586	4,458,837	18,835	772,471	900	0%	31	4,457,486	4,459,300	4,459,708	0%
	2002	-2,917,561	-2,874,072	-2,906,317	8,687	63,428	2,917	0%	26	-2,909,623	-2,907,964	-2,903,579	0%
	2003	-2,291	-1,105	-1,459	234	553	114	16%	23	-1,536	-1,401	-1,341	7%
	2004	2,992	4,192	3,474	262	456	143	8%	21	3,295	3,451	3,668	5%
	2005	-719,170,000	-531,710,000	-707,843,322	35,296,187	131,718,381	1,085,015	5%	27	-715,980,000	-714,710,000	-713,647,801	0%
	2006	-4,007	-1,965	-2,925	432	742	249	15%	24	-3,159	-2,932	-2,699	8%
	2007	989,417	1,022,554	1,011,583	8,190	14,494	4,630	1%	20	1,007,878	1,011,145	1,018,739	1%
	2008	35,242	39,128	37,094	795	1,370	400	2%	20	36,671	36,915	37,489	1%
	2009	326,688	328,091	327,365	416	416	322	0%	26	327,081	327,328	327,740	0%
	2010	-263,704	-246,161	-259,767	3,303	43,669	627	1%	26	-260,955	-260,316	-258,660	0%
	2011	4,070,328	4,206,306	4,136,604	19,617	62,489	901	1%	26	4,134,822	4,136,729	4,137,156	0%
	2012	3,880,124	4,022,843	3,947,289	21,254	63,461	1,615	1%	26	3,939,403	3,950,722	3,951,070	0%
	2013	127,719	142,970	139,387	5,472	31,453	579	4%	26	140,500	141,999	142,444	1%
	2014	261,663	288,733	269,297	5,251	9,938	2,847	2%	26	266,366	269,901	270,867	1%
	2015	186,100	234,061	210,161	11,733	16,849	5,011	6%	21	204,308	209,948	213,853	2%
	2016	74,323	408,577	249,654	116,649	116,649	115,716	47%	11	162,923	241,141	358,059	37%
Interest Rate	2001	213,878	239,026	225,265	7,217	7,974	5,254	3%	38	219,159	224,584	232,293	3%
	2002	-447,038	-277,500	-350,888	40,700	57,610	5,479	12%	34	-343,572	-335,092	-330,504	2%
	2003	25,607	30,504	27,340	1,123	4,351	772	4%	32	26,484	27,132	27,837	2%
	2004	220,035	298,171	254,780	11,360	35,370	3,271	5%	37	250,224	253,155	256,600	1%
	2005	946,034	1,160,761	1,026,246	52,868	121,970	26,237	5%	16	991,696	1,023,633	1,042,380	2%
	2006	281,075	346,370	300,700	11,095	70,361	324	4%	31	298,031	298,261	298,878	0%
	2007	1,451,127	1,535,930	1,493,270	11,735	133,264	823	1%	30	1,492,000	1,492,644	1,493,551	0%
	2008	1,240,194	1,324,762	1,282,606	13,138	152,780	677	1%	30	1,280,731	1,281,366	1,282,183	0%
	2009	-249,564	-221,569	-240,257	5,924	10,849	3,554	3%	34	-245,441	-240,431	-237,012	2%
	2010	192,491	215,124	202,719	6,530	7,283	4,596	3%	38	197,243	202,079	209,326	3%
	2011	-509,557	-466,808	-487,178	11,114	18,127	8,539	2%	36	-494,405	-486,238	-477,746	2%
	2012	-229,174	-39,500	-132,419	48,786	61,928	4,877	37%	37	-124,998	-110,980	-107,982	7%
	2013	1,032,794	1,035,708	1,034,826	584	1,341	257	0%	32	1,034,680	1,034,912	1,035,177	0%
	2014	1,101,809	1,141,797	1,130,579	7,494	26,715	1,743	1%	23	1,130,000	1,132,470	1,133,503	0%
	2015	-801,779	-754,925	-787,818	7,882	17,777	710	1%	35	-788,936	-788,081	-787,344	0%
	2016	3,976,591	4,124,416	4,109,326	26,583	100,716	1,339	1%	29	4,113,785	4,115,977	4,117,240	0%
	2017	-86,350	-65,693	-78,083	3,487	28,899	300	5%	33	-78,802	-78,589	-78,035	0%
	2018	985,703	989,020	987,395	549	990	183	0%	34	987,305	987,480	987,580	0%
	2019	963,001	966,572	964,856	789	1,089	451	0%	36	964,352	964,837	965,437	0%
	2020	102,820	110,678	106,232	1,868	4,338	1,121	2%	35	105,195	105,962	107,401	1%
	2021	1,084,383	1,134,660	1,109,182	7,499	43,420	268	1%	30	1,109,451	1,109,936	1,110,221	0%
	2022	-136,197	3,944	-66,810	28,678	36,766	9,458	43%	29	-73,710	-67,892	-52,932	16%
	2023	-69,700	-808	-42,362	10,908	50,537	2,056	20%	37	-47,589	-45,997	-36,109	14%
FX	3001	-232,074	-151,521	-178,004	17,001	32,752	7,933	10%	33	-183,015	-173,886	-168,127	4%
	3002	9,138,620	9,398,753	9,222,829	50,521	2,636,273	1,654	1%	30	9,214,260	9,215,355	9,217,567	0%
	3003	851,159	869,300	861,620	3,328	15,746	1,662	0%	32	859,902	861,537	863,338	0%
	3004	1,093,652	1,109,067	1,098,984	3,692	5,800	2,355	0%	30	1,096,752	1,098,660	1,101,803	0%
	3005	-1,052,107	-1,034,532	-1,044,152	3,689	5,176	1,810	0%	30	-1,046,267	-1,043,856	-1,042,715	0%
	3006	-11,004	15,374	323	10,302	10,302	7,035	3193%	35	-8,909	-3,621	10,415	4017%
	3007	-74,362	277,385	127,846	137,144	154,063	100,668	107%	26	-28,742	209,864	257,203	125%
Commodities	4001	6,970	15,016	10,543	2,379	3,204	1,908	23%	14	8,485	11,588	12,087	18%
	4002	-202,566	-113,407	-183,715	22,929	74,003	3,118	13%	12	-191,801	-190,578	-183,784	2%
	4003	-8,832	66,087	22,604	18,613	42,647	7,334	82%	11	12,963	17,768	28,730	38%
	4004	178,169	818,980	608,849	167,267	317,900	16,290	25%	11	677,878	707,570	725,293	3%
Credit Spread	5001	-14,787	-11,215	-13,404	648	1,510	65	5%	21	-13,460	-13,413	-13,354	0%
	5002	9,365	10,582	10,083	322	1,279	97	3%	20	9,933	10,171	10,247	2%
	5003	-2,935	-1,535	-2,382	247	1,645	80	10%	24	-2,481	-2,350	-2,337	3%
	5004	21,617	22,160	21,905	154	205	101	1%	19	21,803	21,918	22,033	1%
	5005	-825	817	244	303	778	15	124%	23	220	235	264	9%
	5006	44,541	46,661	45,903	494	2,170	203	1%	21	45,636	46,131	46,214	1%
	5007	1,111,220	1,122,749	1,116,812	2,417	4,611	419	0%	21	1,115,473	1,117,304	1,117,601	0%
	5008	2,637,257	2,695,238	2,670,010	11,258	21,153	4,417	0%	23	2,665,584	2,669,856	2,676,185	0%
	5009	-13,293	-3,955	-8,255	2,297	2,913	1,432	28%	26	-9,395	-7,720	-6,452	19%
	5010	918,855	922,155	921,054	1,045	1,332	484	0%	22	920,328	921,481	921,816	0%
	5011	786,809	848,850	816,803	12,024	20,582	4,486	2%	21	810,966	817,706	819,839	1%
	5012	27,907	28,845	28,576	286	398	112	1%	20	28,417	28,700	28,790	1%
	5013	-10,249	-1,391	-5,634	2,281	2,927	1,676	41%	24	-6,945	-5,220	-3,803	29%
	5014	-5,742	-3,928	-4,482	419	739	43	9%	22	-4,650	-4,288	-4,268	4%
	5015	974,126	976,673	975,665	690	1,706	248	0%	21	975,238	975,788	976,110	0%
	5016	949,604	956,505	953,644	1,450	2,507	414	0%	17	953,157	954,103	954,386	0%
	5017	997,702	1,007,467	1,002,866	2,298	2,578	1,749	0%	18	1,001,955	1,002,505	1,004,761	0%
	5018	1,951,962	1,959,599	1,956,797	2,127	4,779	1,074	0%	16	1,956,432	1,956,790	1,958,283	0%
	5019	951,530	954,322	953,207	935	2,802	930	0%	21	952,464	953,149	954,115	0%
	5020	2,586,828	2,596,284	2,593,497	2,200	15,021	1,136	0%	23	2,592,769	2,593,698	2,595,028	0%
	5021	-318,159	-278,224	-299,019	8,061	13,185	2,479	3%	20	-301,666	-298,209	-295,678	1%
	5022	2,279,771	2,338,218	2,313,393	14,274	34,391	4,017	1%	20	2,304,668	2,318,385	2,321,437	0%
	5023	-260,141	-200,062	-207,173	15,381	40,153	1,969	7%	14	-205,890	-202,572	-201,408	1%
	5024	966,606	972,426	970,321	1,250	6,690	276	0%	19	970,083	970,604	970,936	0%
	5025	943,727	1,000,194	971,800	11,080	21,993	653	1%	18	972,325	972,896	973,584	0%
	5026	850,764	854,409	853,062	1,033	1,343	473	0%	20	852,638	853,335	853,789	0%
	5027	939,743	946,241	942,633	1,327	4,168	359	0%	20	942,214	942,701	943,139	0%
CTP	6001								4				
	6002								4				
	6003								4				
	6004								4				
	6005								3				
ALL-IN no-CTP **	10000	13,301,578	19,961,081	18,586,151	2,056,802	3,319,817	99,960	11%	10	19,256,594	19,339,971	19,456,514	1%
Equity Cumulative **	11000	2,537,767	3,214,675	2,884,644	110,550	224,270	7,877	4%	20	2,876,753	2,887,367	2,895,099	0%
IR Cumulative **	12000	417,035	952,584	665,949	93,870	148,366	12,697	14%	30	650,946	689,649	697,665	3%
FX Cumulative **	13000	10,907,145	11,194,883	11,003,968	60,980	2,449,042	14,976	1%	29	10,980,202	10,995,295	11,013,244	0%
Commodity Cumulative **	14000	-194,717	-102,416	-173,095	24,564	76,810	3,426	14%	11	-183,559	-180,056	-169,372	4%
CS Cumulative **	15000	4,970,586	5,054,387	5,024,597	22,264	50,905	11,497	0%	18	5,018,560	5,027,532	5,039,921	0%
CTP Cumulative **	16000												

[1] STDev trunc is the standard deviation computed excluding values below the 5th and above the 95th percentile

[2] Refers to the number of banks included in the computation of the statistics

** For the aggregated portfolios (60 to 66), banks that reported at least a missing portfolio INV among the ones composing the aggregate are not included in the computation of the benchmarks for that particular aggregate portfolio.

Table 43: IRC – modelling choice: source of LGD – market convention

EU Statistics for IRC

		Other stats						Percentiles									Extreme Values range (Full Sample)	
	Port. ID	Min	Max	Ave.	STDev	Coefficient of variation (STDev/Mean)	Num obs.	5th	10th	25th	50th (Median)	75th	90th	95th	Interquantile range	STDev_trunc	-2*STDev_trunc	+2*STDev_trunc
Equity	1001																	
	1002																	
	1003																	
	1004																	
	1005																	
	1006																	
	1007																	
	1008																	
	1009																	
	1010																	
	1011																	
	1012																	
	1013																	
	1014																	
	1015																	
	1016																	
Interest Rate	2001																	
	2002																	
	2003																	
	2004																	
	2005	0	271,298	365,339	97,045	59%	7	25,744	51,498	127,548	177,780	138,801	271,116	271,200	28%	145,663	-108,095	471,531
	2006	0	58,535	12,126	16,353	124%	30	0	0	521	7,244	17,658	33,130	40,803	94%	28,847	33,901	82,488
	2007	98,981	867,898	464,273	294,981	64%	30	102,427	105,863	185,831	471,660	683,593	847,112	857,235	57%	234,388	55,686	991,240
	2008	147,537	1,579,283	816,293	557,506	68%	30	164,558	591,802	273,649	775,263	1,383,545	1,496,383	1,534,803	65%	427,464	118,437	1,609,291
	2009																	
	2010																	
	2011																	
	2012																	
	2013	0	197,073	64,240	56,981	89%	9	8,136	16,271	38,933	51,026	78,043	112,463	154,763	32%	84,353	134,342	222,670
	2014	397,260	846,878	587,028	263,482	45%	7	224,030	274,630	378,126	730,201	788,302	824,147	835,512	35%	282,064	188,633	1,231,069
	2015						2											
	2016	152,347	1,644,845	891,988	578,410	65%	30	180,038	207,731	332,621	825,994	1,452,551	1,511,698	1,579,271	62%	449,663	104,836	1,903,538
	2017																	
	2018	35,999	717,199	347,841	274,987	79%	30	38,029	40,058	85,551	305,660	625,820	647,046	682,122	76%	219,109	-62,253	854,481
	2019	35,999	717,199	347,841	274,987	79%	30	38,029	40,058	85,551	305,660	625,820	647,046	682,122	76%	214,454	-85,300	772,338
	2020																	
	2021	51,947	788,168	416,057	297,114	71%	9	59,011	66,075	173,891	451,967	612,758	744,382	777,265	57%	214,449	-3,875	881,930
	2022						1											
	2023																	
FX	3001																	
	3002																	
	3003																	
	3004																	
	3005																	
	3006																	
	3007																	
Commodities	4001																	
	4002																	
	4003																	
	4004																	
Credit Spread	5001	0	303,630	63,083	91,504	145%	9	8,164	16,328	23,998	29,529	58,288	111,308	206,864	42%	174,514	-290,380	407,277
	5002	40,542	108,535	70,072	25,159	36%	7	43,858	46,169	56,922	61,038	88,882	99,482	103,999	26%	29,015	9,250	125,309
	5003	34,178	115,485	78,402	26,075	33%	7	43,598	53,010	68,648	78,760	98,653	104,093	109,789	56%	27,043	15,661	121,241
	5004	0	278,256	66,938	95,851	143%	7	4,880	9,760	21,383	26,144	60,900	149,539	213,898	48%	180,245	-290,905	430,073
	5005	67	84,817	40,738	27,685	68%	5	3,489	6,911	25,131	38,966	57,633	74,185	79,493	39%	68,752	-93,980	181,028
	5006	618,405	803,886	665,235	86,851	12%	7	618,725	619,040	633,528	620,474	665,410	753,722	793,864	4%	184,571	250,852	580,377
	5007	99,500	144,683	119,044	13,399	11%	7	101,950	108,391	115,865	118,400	120,295	138,623	137,683	2%	89,646	-58,998	299,588
	5008	387,435	858,002	574,042	126,848	22%	30	411,410	435,384	539,705	554,226	610,237	675,899	765,958	7%	142,206	303,820	870,643
	5009	2,052	14,934	7,199	6,775	94%	30	2,578	3,104	3,827	4,496	7,652	12,433	18,704	33%	16,880	-26,757	40,810
	5010	10,849	143,848	61,939	50,584	82%	8	13,268	15,684	28,756	45,673	85,235	135,909	139,878	52%	57,573	-73,880	156,410
	5011	47,127	247,928	123,630	65,578	53%	9	48,134	49,171	95,281	109,403	138,125	206,954	228,941	20%	76,688	-45,306	261,546
	5012	63,707	185,315	112,315	43,315	39%	8	64,587	65,467	78,278	109,953	135,794	168,644	172,980	31%	67,934	-33,487	238,249
	5013	4,312	43,533	20,333	13,537	67%	9	4,490	4,671	10,478	21,889	23,938	33,687	40,610	39%	13,616	-4,386	50,157
	5014	0	299,199	58,567	99,029	169%	8	3,875	7,749	12,128	20,262	38,862	134,357	216,758	52%	181,374	-270,252	454,500
	5015	2,537	85,803	38,813	32,685	84%	8	2,589	2,641	13,887	31,010	68,588	76,550	81,177	66%	50,511	-90,792	147,252
	5016	37,285	256,421	129,688	90,419	70%	7	41,525	45,765	56,745	90,921	203,850	243,882	250,153	56%	92,544	-78,221	291,959
	5017	1,426	14,880	10,126	5,178	51%	5	3,213	5,000	10,363	10,914	13,131	14,133	14,866	12%	59,017	-93,896	144,379
	5018	40,805	248,077	107,362	78,479	73%	6	43,459	46,113	54,082	80,162	132,132	195,751	221,914	42%	106,936	-131,174	296,529
	5019	2,537	85,803	38,813	32,685	84%	8	2,589	2,641	13,887	31,010	68,588	76,550	81,177	66%	45,156	-64,352	115,930
	5020	35,883	580,164	220,998	172,330	78%	30	57,898	89,913	87,507	182,156	333,990	375,794	478,029	58%	205,810	-180,024	643,239
	5021	0	68,341	35,393	20,705	59%	9	6,310	12,619	20,385	45,989	50,397	55,973	58,156	42%	43,848	-39,440	135,952
	5022	3,006	169,654	69,669	57,153	82%	9	1,359	5,792	6,928	72,798	105,352	125,972	147,813	88%	128,458	-177,408	336,428
	5023	0	52,772	44,546	28,903	65%	8	10,061	20,123	29,179	36,808	64,347	76,254	84,513	37%	63,882	-91,438	162,309
	5024	308,994	564,578	275,566	150,445	55%	8	114,348	119,701	150,076	240,810	403,300	454,718	479,648	46%	184,395	-140,390	597,188
	5025	499,262	678,403	582,618	50,166	9%	8	524,371	549,479	571,757	573,602	586,253	636,984	656,693	1%	88,961	389,665	745,509
	5026	335,373	557,530	457,652	63,405	14%	9	366,935	390,496	440,984	451,475	505,027	519,421	538,470	7%	46,453	268,724	622,537
	5027	358,252	608,039	436,474	159,394	37%	9	182,170	205,989	338,388	491,977	542,308	555,982	581,013	23%	187,423	8,659	758,351
CTP	6001																	
	6002																	
	6003																	
	6004																	
	6005																	
ALL-IN no-CTP	10000	645,623	1,339,683	901,424	284,453	32%	6	651,834	658,046	681,835	803,883	1,083,628	1,212,344	1,291,018	23%	378,417	288,876	1,802,584
Equity Cumulative	11000																	
IR Cumulative	12000																	
FX Cumulative	13000																	
Commodity Cumulative	14000																	
CS Cumulative	15000	619,889	918,556	720,112	111,667	16%	8	626,491	633,092	640,424	664,658	794,320	854,093	889,325	11%	135,786	490,279	1,033,422
CTP Cumulative	16000																	

Table 44: IRC – modelling choice: source of LGD – non-market convention

EU Statistics for IRC

		Other stats						Percentiles									Extreme Values range (Full Sample)	
	Port. ID	Min	Max	Ave.	STDev	Coefficient of variation (STDev/Mean)	Num obs.	5th	10th	25th	50th (Median)	75th	90th	95th	Interquantile range	STDev_trunc[1]	-2*STDev_trunc	+2*STDev_trunc
Equity	1001																	
	1002																	
	1003																	
	1004																	
	1005																	
	1006																	
	1007																	
	1008																	
	1009																	
	1010																	
	1011																	
	1012																	
	1013																	
	1014																	
	1015																	
	1016																	
Interest Rate	2001																	
	2002																	
	2003																	
	2004																	
	2005	20,889	425,633	226,363	168,403	74%	8	33,607	46,325	108,833	176,030	408,381	425,633	425,633	58%	145,663	-109,095	471,521
	2006	6,471	56,173	28,733	16,855	59%	14	7,005	8,223	12,840	28,600	43,238	47,700	53,138	54%	28,847	33,901	82,489
	2007	105,788	874,888	500,662	276,630	45%	16	160,461	207,775	251,887	528,463	642,670	801,650	849,228	29%	234,188	55,686	991,280
	2008	156,896	1,543,643	907,546	398,363	44%	16	241,048	308,386	686,967	1,011,549	1,099,339	1,315,979	1,401,733	23%	427,464	138,437	1,839,291
	2009																	
	2010																	
	2011																	
	2012																	
	2013	9,702	176,900	51,226	48,415	95%	13	10,860	11,591	14,570	44,203	55,561	108,909	143,845	58%	84,353	-134,342	222,870
	2014	366,456	983,175	721,415	205,668	20%	12	446,517	515,657	537,500	753,520	882,080	945,730	963,953	26%	282,084	188,633	1,236,069
	2015	6,158	65,984	34,507	29,291	85%	5	7,285	8,415	11,807	23,056	65,988	65,984	65,984	70%	28,168	-38,888	73,750
	2016	585,175	1,763,730	986,470	438,405	44%	16	331,445	387,000	738,846	1,068,700	3,238,339	1,488,189	1,619,708	24%	449,663	104,826	1,903,528
	2017																	
	2018	43,513	668,177	359,186	209,898	58%	17	60,313	71,892	193,266	428,857	490,296	599,636	645,443	48%	219,109	-62,253	854,481
	2019	43,513	668,177	326,254	200,755	62%	15	58,313	69,455	154,578	376,064	477,171	571,446	580,002	56%	214,454	-85,300	772,158
	2020						1											
	2021	85,218	798,337	418,898	215,728	51%	16	113,668	144,189	239,409	442,299	563,332	658,587	697,193	40%	224,449	-3,871	893,930
	2022						2											
	2023						1											
FX	3001						1											
	3002																	
	3003																	
	3004						1											
	3005						1											
	3006						1											
	3007						1											
Commodities	4001						1											
	4002																	
	4003						1											
	4004						1											
Credit Spread	5001	10,359	392,380	112,137	129,883	116%	13	10,916	14,036	27,301	38,731	117,302	316,923	358,274	67%	174,514	-290,780	407,277
	5002	41,727	118,649	69,602	25,267	36%	12	43,159	44,369	56,176	64,674	76,344	112,989	116,646	20%	29,015	9,250	125,809
	5003	22,335	106,239	62,533	23,238	37%	14	22,335	28,981	51,436	66,507	76,158	83,643	92,835	19%	27,043	15,061	123,241
	5004	19,464	412,563	136,043	138,823	102%	17	21,435	23,069	27,382	69,584	237,308	346,717	382,559	78%	180,245	-290,905	430,073
	5005	12	93,569	43,875	22,498	51%	15	4,547	17,031	37,401	40,639	56,372	62,303	72,206	20%	68,752	-93,580	181,028
	5006	350,333	818,285	617,734	161,278	26%	15	358,158	405,891	459,221	648,856	752,884	798,563	806,318	23%	184,571	250,852	980,177
	5007	34,720	256,434	120,571	65,842	55%	14	38,875	47,688	67,803	115,868	144,217	211,686	245,000	36%	89,646	-58,998	299,588
	5008	393,613	779,289	618,074	139,066	22%	14	407,864	434,148	492,868	672,824	736,408	753,315	766,567	19%	142,204	303,820	870,643
	5009	2,312	22,885	9,744	7,078	73%	15	3,242	3,908	4,903	7,802	20,869	22,443	22,885	38%	16,892	26,757	40,810
	5010	0	132,347	48,996	48,095	98%	16	2,669	5,496	31,742	30,124	86,235	125,652	132,304	76%	57,573	-73,880	156,410
	5011	58,369	252,246	101,872	66,029	65%	15	30,768	45,019	64,675	87,982	130,847	193,635	242,387	31%	76,688	-45,306	261,546
	5012	29,231	159,756	97,794	35,904	37%	13	48,202	62,183	78,782	93,626	131,841	138,887	148,076	25%	67,934	-33,487	238,249
	5013	3,320	34,357	19,414	10,678	55%	15	3,781	5,006	10,468	22,986	25,987	32,938	35,683	42%	13,636	-4,386	50,157
	5014	11,287	447,899	141,286	143,308	101%	13	16,193	19,710	22,994	103,215	197,563	368,447	412,587	79%	181,374	-270,252	484,500
	5015	315	119,015	34,843	37,804	108%	15	437	3,134	9,895	22,383	70,828	98,846	109,345	59%	59,511	-80,752	147,252
	5016	24,107	163,065	109,538	74,717	68%	12	32,818	40,626	57,247	78,597	154,844	196,140	226,258	46%	92,544	-78,221	295,996
	5017	390	74,886	35,804	27,232	76%	14	1,643	3,786	13,699	22,428	57,567	74,835	74,886	62%	59,017	-80,896	144,173
	5018	40,591	266,616	94,871	61,793	65%	12	43,858	47,894	65,542	78,401	93,152	147,169	202,775	20%	106,926	-131,174	298,529
	5019	315	84,116	22,956	22,613	99%	13	382	1,847	7,388	15,711	28,230	41,717	59,833	57%	45,156	-64,302	115,930
	5020	60,049	528,501	255,703	156,726	61%	14	68,564	85,150	183,220	219,851	383,675	468,608	503,459	52%	205,818	-180,624	643,235
	5021	0	186,754	47,534	33,182	70%	11	8,751	17,501	30,345	38,880	60,649	103,494	105,124	33%	43,848	-39,440	135,952
	5022	2,565	330,539	106,588	111,342	104%	12	5,847	10,080	25,140	60,015	149,275	283,065	310,000	71%	128,458	-177,408	336,428
	5023	9,200	78,887	35,523	23,347	66%	8	11,188	13,166	22,696	29,202	43,380	78,887	70,880	32%	63,882	-91,438	162,309
	5024	82,452	572,087	277,503	172,272	62%	13	86,190	94,639	103,224	222,491	373,593	543,887	554,793	29%	184,395	-140,390	597,188
	5025	459,874	687,834	541,554	67,445	12%	10	459,874	459,874	477,468	549,102	569,232	621,678	639,828	9%	88,963	380,665	745,509
	5026	276,909	604,547	414,426	90,264	22%	12	291,688	304,367	378,355	400,857	454,837	491,349	544,519	9%	66,453	268,324	622,537
	5027	28,788	788,463	297,908	220,773	74%	15	35,797	43,036	80,907	343,288	437,658	535,633	630,958	69%	187,423	8,659	758,351
CTP	6001																	
	6002																	
	6003																	
	6004																	
	6005																	
ALL-IN no-CTP	10000	656,734	1,435,718	1,041,638	277,368	27%	8	670,207	683,680	850,876	1,092,689	1,184,148	1,353,078	1,394,394	16%	378,417	288,876	1,802,584
Equity Cumulative	11000						1											
IR Cumulative	12000	347,683	1,543,043	1,029,694	429,591	42%	5	494,241	640,798	1,080,471	1,088,636	1,088,636	1,361,288	1,452,162	0%	429,591	229,454	1,947,827
FX Cumulative	13000																	
Commodity Cumulative	14000																	
CS Cumulative	15000	492,813	1,021,310	771,935	168,364	22%	16	511,048	529,601	662,438	804,813	879,321	973,885	1,008,630	14%	135,784	490,279	1,033,422
CTP Cumulative	16000																	

Table 45: IRC – modelling choice: source of LGD – 1-2 modelling factors

EU Statistics for IRC

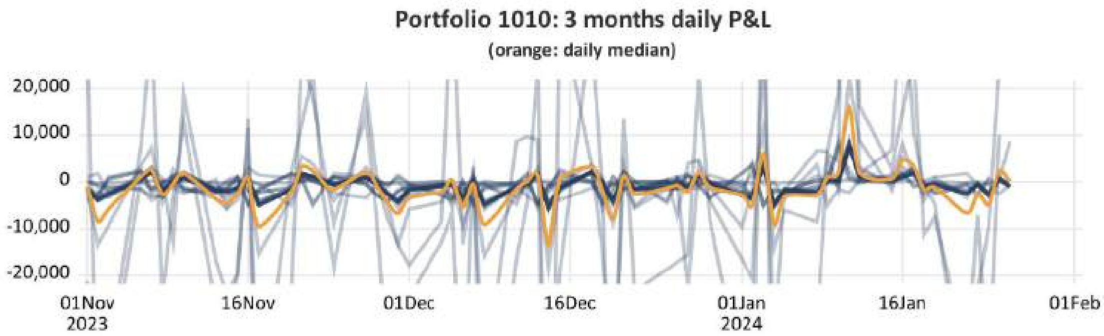
		Other stats						Percentiles									Extreme Values range (Full Sample)	
	Port. ID	Min	Max	Avg.	STDev	Coefficient of variation (STDev/Mean)	Num obs.	5th	10th	25th	50th (Median)	75th	90th	95th	Interquantile range	STDev_trunc	-2*STDev_trunc	+2*STDev_trunc
Equity	1001																	
	1002																	
	1003																	
	1004																	
	1005																	
	1006																	
	1007																	
	1008																	
	1009																	
	1010																	
	1011																	
	1012																	
	1013																	
	1014																	
	1015																	
	1016																	
Interest Rate	2001																	
	2002																	
	2003																	
	2004																	
	2005	57,226	435,615	235,492	139,644	59%	30	70,090	87,954	136,847	195,920	369,602	435,615	435,615	46%	145,663	-108,095	471,531
	2006	0	58,535	21,750	18,640	86%	14	0	0	7,290	17,151	40,341	45,217	47,608	69%	28,847	33,901	83,488
	2007	305,788	874,884	497,807	751,914	51%	15	131,228	156,754	133,388	591,867	672,138	812,155	854,086	36%	234,588	55,686	591,283
	2008	156,896	1,543,643	890,904	472,057	52%	15	104,189	233,736	508,990	1,083,471	1,275,343	1,438,155	1,496,266	43%	437,464	118,437	1,639,291
	2009																	
	2010																	
	2011																	
	2012																	
	2013	0	197,073	58,638	49,912	85%	15	8,133	11,599	27,391	51,026	70,837	108,608	141,212	44%	84,353	134,342	222,870
	2014	430,411	983,179	705,956	185,948	26%	11	473,034	515,657	531,886	767,211	850,832	868,281	925,780	24%	282,004	188,633	1,236,003
	2015						4											
	2016	585,175	1,763,738	985,154	498,705	51%	15	207,168	284,170	651,831	1,080,688	1,420,798	1,542,678	1,679,308	37%	449,663	104,836	1,903,528
	2017																	
	2018	43,513	668,177	372,744	236,549	63%	16	61,320	72,034	162,808	405,712	680,650	639,504	646,864	57%	219,109	-62,253	854,481
	2019	43,513	668,177	354,945	226,979	64%	15	60,133	71,076	155,351	376,066	539,348	618,938	647,979	55%	214,454	-85,300	772,138
	2020																	
	2021	45,216	790,217	439,913	346,654	56%	14	106,341	142,107	224,054	547,927	638,127	717,934	771,167	47%	214,449	-3,871	883,930
	2022						1											
	2023																	
FX	3001																	
	3002																	
	3003																	
	3004																	
	3005																	
	3006																	
	3007																	
Commodities	4001																	
	4002																	
	4003																	
	4004																	
Credit Spread	5001	0	335,530	96,058	122,066	127%	12	5,667	10,852	20,817	36,100	142,680	295,735	316,888	75%	174,514	295,780	407,277
	5002	41,727	116,646	80,639	28,128	35%	30	43,054	44,385	60,735	81,391	104,751	116,646	116,646	27%	29,015	9,250	125,809
	5003	22,335	66,449	50,040	21,589	40%	15	22,335	26,704	44,487	65,565	73,740	84,095	89,601	25%	17,043	15,661	123,731
	5004	0	358,030	110,167	131,018	119%	30	8,759	17,518	23,977	43,413	380,274	288,235	322,137	75%	180,245	-290,905	430,073
	5005	67	73,412	40,455	20,485	51%	13	3,921	10,218	36,724	40,639	53,754	68,744	65,275	25%	68,752	93,980	181,028
	5006	472,371	833,880	661,280	123,978	19%	13	482,650	495,390	638,409	655,651	794,580	813,482	824,477	12%	184,571	250,892	580,377
	5007	59,429	256,434	136,207	62,876	46%	11	58,879	59,429	103,656	122,736	144,557	218,844	247,638	16%	89,646	-58,998	299,588
	5008	393,613	856,002	615,194	134,667	22%	15	426,582	455,465	530,009	626,298	730,408	762,938	802,303	16%	142,206	303,820	870,643
	5009	2,052	32,885	8,465	7,283	86%	16	2,247	2,767	3,842	5,088	8,369	22,333	23,885	37%	16,892	26,757	40,810
	5010	7,433	143,846	58,621	52,826	90%	15	8,449	10,408	13,669	36,705	108,362	132,444	135,909	78%	57,573	-73,880	156,410
	5011	18,369	208,460	89,038	47,266	53%	13	35,624	47,626	63,988	87,882	108,130	135,369	163,059	27%	76,688	-45,306	261,546
	5012	60,850	185,135	106,575	37,243	35%	12	64,518	68,461	78,128	98,690	132,373	148,785	165,933	26%	67,934	-33,487	238,249
	5013	3,974	36,357	18,154	10,693	59%	14	4,194	4,447	7,534	19,845	25,503	28,913	33,346	54%	13,636	4,386	50,157
	5014	0	388,713	207,025	152,677	124%	12	6,089	11,092	17,420	27,945	152,922	293,081	335,458	80%	181,374	-270,552	454,938
	5015	315	72,585	28,150	23,481	83%	12	3,899	7,077	11,308	22,926	40,751	64,882	69,654	57%	59,511	-60,792	147,252
	5016	39,947	256,425	136,046	77,616	57%	11	43,342	46,736	73,845	106,814	196,340	235,522	245,972	46%	92,544	-78,221	291,950
	5017	399	74,886	33,739	29,361	87%	30	751	1,303	10,874	28,633	57,567	74,886	74,886	68%	59,017	-91,896	144,378
	5018	46,516	248,077	102,078	58,641	57%	30	52,718	58,920	66,490	82,678	112,176	153,890	200,064	26%	106,936	-131,174	298,529
	5019	315	72,585	28,150	23,481	83%	12	1,898	7,071	11,308	22,926	40,751	64,882	69,654	57%	45,156	-64,302	115,920
	5020	70,149	580,264	242,488	129,905	58%	25	70,504	88,009	147,019	209,290	330,890	381,675	441,252	38%	205,810	-180,624	643,235
	5021	0	183,494	46,173	26,838	58%	11	10,393	20,785	30,345	46,118	58,890	64,268	83,877	31%	43,848	-39,440	135,952
	5022	3,808	330,539	84,839	83,988	99%	15	6,503	11,626	38,291	72,798	185,352	111,062	213,255	47%	128,458	-177,408	336,428
	5023	0	78,807	43,067	29,013	67%	8	1,223	6,446	24,495	47,473	68,582	78,807	70,807	48%	63,882	-91,438	162,309
	5024	82,452	534,459	245,653	149,856	61%	13	98,377	110,888	124,390	207,975	323,683	490,332	517,338	29%	184,595	-140,190	597,188
	5025	459,874	678,403	558,124	67,913	12%	11	459,874	459,874	530,632	569,753	596,330	620,083	648,248	8%	88,963	380,665	745,909
	5026	363,715	569,896	441,250	55,813	13%	12	368,549	406,221	413,401	450,876	464,979	564,065	507,218	6%	66,453	268,724	622,537
	5027	49,389	748,463	408,169	201,283	50%	14	59,994	91,444	339,402	443,776	529,576	600,844	654,366	22%	187,423	8,659	758,351
CTP	6001																	
	6002																	
	6003																	
	6004																	
	6005																	
All-IM no-CTP	10000	656,734	1,339,683	884,742	258,256	26%	8	670,207	683,680	710,999	1,002,680	1,140,985	1,260,484	1,271,548	23%	378,427	288,876	1,802,584
Equity Cumulative	11000																	
IR Cumulative	12000						4											
FX Cumulative	13000																	
Commodity Cumulative	14000																	
CS Cumulative	15000	492,813	1,021,310	775,628	156,663	20%	14	508,614	547,955	672,297	822,975	869,531	922,674	960,985	13%	135,786	490,279	1,033,422
CTP Cumulative	16000																	

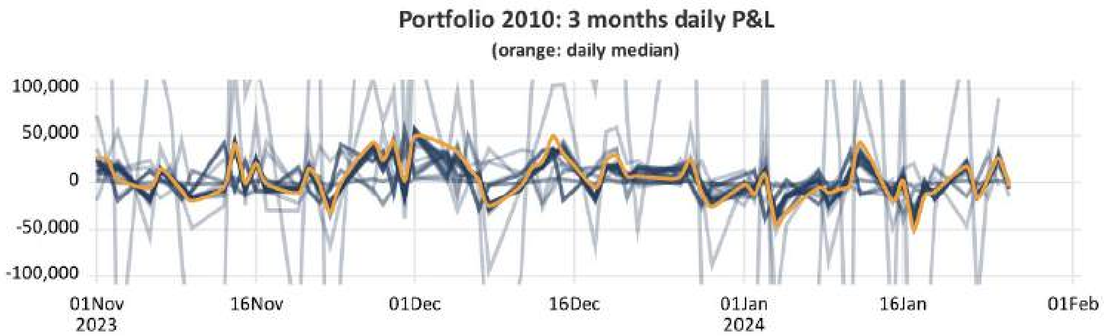
Table 46: IRC – modelling choice: source of LGD – >2 modelling factors

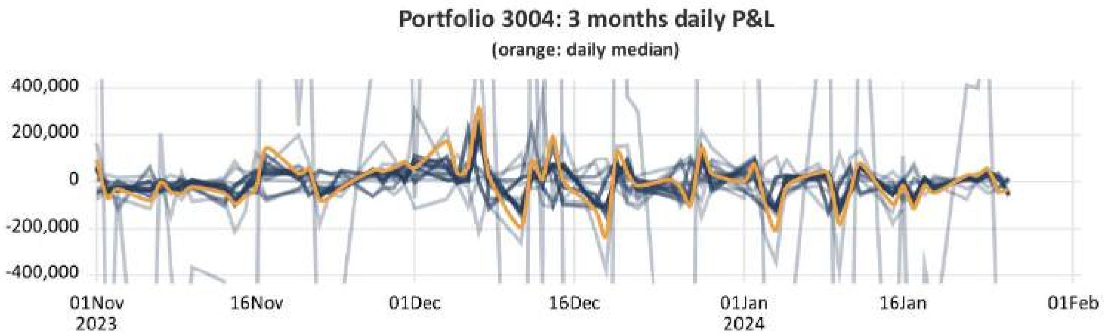
EU Statistics for IRC

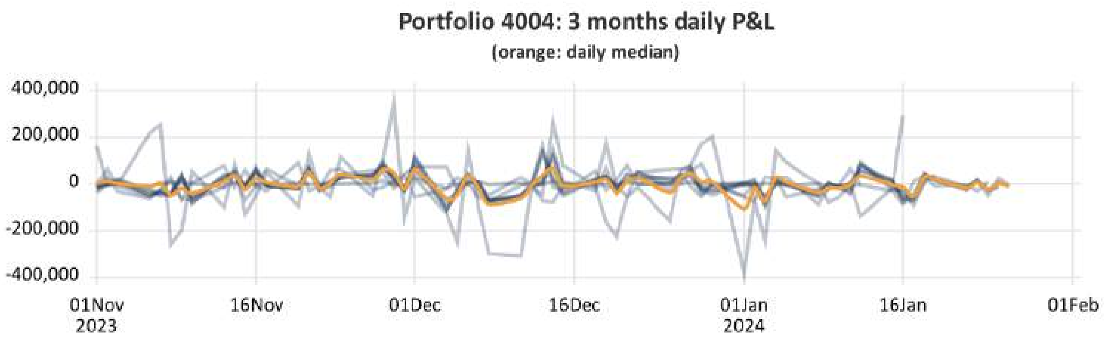
		Other stats						Percentiles									Extreme Values range (Full Sample)	
	Port. ID	Min	Max	Ave.	STDev	Coefficient of variation (STDev/Mean)	Num obs.	5th	10th	25th	50th (Median)	75th	90th	95th	Interquantile range	STDev_trunc[1]	-2*STDev_trunc	+2*STDev_trunc
Equity	1001																	
	1002																	
	1003																	
	1004																	
	1005																	
	1006																	
	1007																	
	1008																	
	1009																	
	1010																	
	1011																	
	1012																	
	1013																	
	1014																	
	1015																	
	1016																	
Interest Rate	2001																	
	2002																	
	2003																	
	2004																	
	2005	0	273,298	122,639	112,869	92%	5	4,178	8,356	20,889	141,228	177,390	213,893	253,594	79%	145,663	-109,095	473,531
	2006	2,085	56,173	22,911	18,240	80%	10	3,371	4,656	9,367	17,537	33,755	49,393	52,682	54%	28,847	33,901	83,488
	2007	98,981	867,898	480,760	756,948	53%	11	102,805	106,678	183,437	523,219	588,640	848,682	853,890	28%	234,588	55,686	990,240
	2008	147,537	1,579,283	835,463	456,333	55%	11	166,448	185,743	538,920	882,046	1,079,895	1,317,327	1,448,305	33%	427,464	138,437	1,839,291
	2009																	
	2010																	
	2011																	
	2012																	
	2013	9,762	178,930	52,078	57,608	111%	7	13,933	16,108	22,565	30,156	55,282	108,930	143,915	39%	84,353	-134,342	222,870
	2014	397,368	948,222	625,870	289,120	46%	8	242,474	287,579	256,402	716,601	820,910	938,708	939,465	40%	282,084	188,633	1,236,069
	2015						3											
	2016	352,347	1,644,845	902,373	492,296	55%	11	181,116	213,885	586,313	907,792	1,273,130	1,388,678	1,516,762	37%	449,663	104,836	1,903,528
	2017																	
	2018	35,959	717,199	329,151	240,125	73%	11	38,254	40,509	81,502	349,209	503,329	572,887	645,043	72%	219,109	62,253	834,481
	2019	35,959	717,199	304,778	238,540	78%	10	38,079	40,058	73,008	327,775	455,548	559,712	658,455	72%	214,454	-85,300	772,138
	2020						1											
	2021	51,947	788,168	398,193	259,475	62%	11	60,777	69,607	189,933	439,570	573,875	666,182	727,175	45%	224,449	-3,875	800,936
	2022						2											
	2023						1											
FX	3001						1											
	3002																	
	3003																	
	3004						1											
	3005						1											
	3006						1											
	3007						1											
Commodities	4001						1											
	4002																	
	4003						1											
	4004						1											
Credit Spread	5001	20,078	392,390	88,080	113,897	136%	10	20,237	20,377	26,408	42,727	66,850	162,635	277,518	43%	174,514	-260,380	407,277
	5002	40,542	75,099	57,703	12,295	21%	9	42,057	48,572	49,921	58,922	67,279	73,283	74,190	15%	29,015	9,250	125,809
	5003	55,900	115,485	82,094	20,577	25%	8	58,580	63,281	70,403	74,676	95,268	108,013	112,249	15%	37,043	15,661	129,231
	5004	16,266	412,563	111,045	129,292	116%	9	18,978	21,691	26,344	63,728	137,302	248,581	330,572	68%	180,745	-290,905	430,073
	5005	32	93,549	45,374	28,458	63%	11	4,317	8,622	34,627	38,353	60,342	84,877	89,223	27%	68,752	93,980	181,028
	5006	350,103	801,212	590,223	158,884	27%	9	354,744	359,295	554,810	610,594	648,890	791,185	797,158	8%	184,571	250,832	989,377
	5007	34,720	148,149	102,303	36,348	36%	10	38,249	41,858	98,443	115,065	139,308	139,566	138,972	30%	89,646	-58,998	299,588
	5008	387,435	759,736	573,956	134,199	23%	9	398,670	409,905	490,431	552,687	734,836	777,836	743,790	19%	142,206	303,820	870,643
	5009	3,792	24,974	9,225	6,656	72%	9	3,914	4,035	5,285	7,026	11,640	15,344	20,154	35%	16,892	-26,757	40,810
	5010	0	119,015	44,459	40,781	92%	9	1,424	2,847	10,849	37,803	66,331	97,048	108,031	72%	57,573	-73,880	158,410
	5011	36,071	252,246	134,864	76,678	57%	11	47,257	58,447	89,642	115,817	183,239	247,938	250,087	34%	76,688	-45,306	261,546
	5012	29,231	159,756	98,958	41,974	42%	9	43,021	56,812	66,221	93,626	132,877	144,183	151,970	33%	67,934	-33,487	238,249
	5013	3,129	47,533	22,005	12,888	59%	10	5,743	8,155	13,461	23,161	35,863	36,643	43,083	30%	13,616	4,386	50,357
	5014	12,547	447,859	113,409	139,253	123%	9	16,728	20,900	26,344	65,728	137,302	247,630	347,765	68%	181,374	-270,552	454,900
	5015	960	118,015	45,031	44,574	99%	11	1,549	2,537	8,999	22,588	85,060	105,200	113,108	81%	59,511	-90,792	147,252
	5016	24,107	163,065	90,720	77,920	86%	8	28,718	33,332	47,886	67,275	90,992	177,674	220,370	31%	92,544	-78,221	291,956
	5017	2,410	74,648	23,973	22,214	93%	9	4,243	6,067	10,418	18,800	37,555	47,403	61,025	43%	59,017	-90,896	144,178
	5018	40,591	266,616	95,154	77,699	82%	8	40,666	40,741	48,766	67,275	95,170	145,364	275,990	32%	106,916	-131,174	298,529
	5019	560	85,863	30,125	33,118	110%	9	1,351	2,142	2,686	22,383	34,541	84,613	85,208	86%	45,156	-64,302	115,920
	5020	25,885	528,541	239,265	199,864	84%	5	57,674	89,460	93,049	137,827	392,885	497,680	513,092	72%	205,810	-182,624	643,220
	5021	0	106,754	37,054	30,711	83%	9	6,310	12,619	17,501	36,562	38,931	65,254	86,004	38%	43,848	-39,440	135,952
	5022	2,565	293,195	100,958	109,371	108%	8	3,062	3,561	6,393	69,879	175,214	212,285	257,740	93%	128,458	-177,408	336,428
	5023	14,862	92,772	37,000	23,754	64%	8	18,518	22,174	25,774	31,334	36,002	55,638	74,159	17%	63,882	93,438	162,309
	5024	88,682	572,097	327,422	174,014	53%	8	113,178	137,674	214,505	315,265	430,582	551,909	562,003	33%	184,395	-140,390	597,188
	5025	462,623	687,834	562,420	57,478	10%	7	487,008	511,394	549,302	571,001	573,662	607,408	632,693	2%	88,963	389,665	745,509
	5026	276,909	604,547	421,487	109,067	26%	9	290,289	303,589	335,373	405,967	453,527	566,925	585,716	15%	66,453	268,724	622,537
	5027	26,788	542,668	268,403	195,040	73%	10	31,294	37,800	133,670	283,688	423,563	540,813	543,890	58%	187,423	8,659	758,351
CTP	6001																	
	6002																	
	6003																	
	6004																	
	6005																	
All-IR no-CTP	10000	645,623	1,435,718	977,288	329,562	34%	6	651,834	658,046	725,729	807,134	1,213,626	1,376,684	1,406,201	25%	378,417	288,876	1,802,584
Equity Cumulative	11000						1											
IR Cumulative	12000						1											
FX Cumulative	13000																	
Commodity Cumulative	14000																	
CS Cumulative	15000	542,076	1,604,436	725,306	146,424	20%	10	585,584	629,044	641,276	658,613	720,997	949,444	976,044	9%	135,786	490,279	1,033,422
CTP Cumulative	16000																	

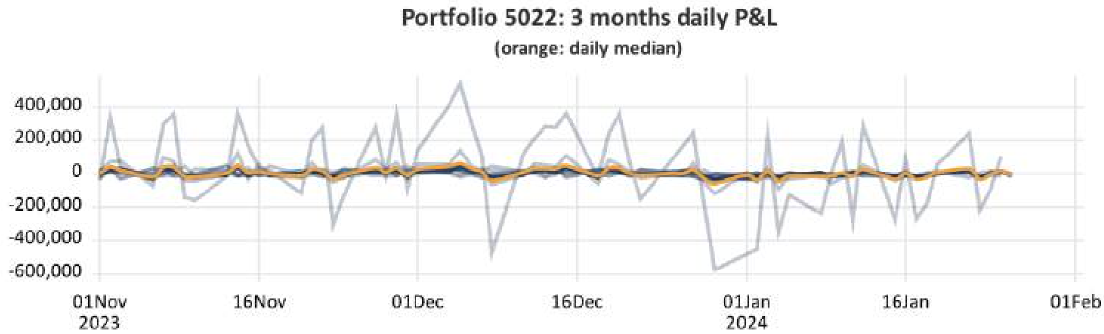
Figure 25: Additional P&L charts with examples of low IQD










Portfolio 5022: 3 months daily P&L
(orange: daily median)
400,000
200,000
0
-200,000
-400,000
-600,000
01Nov 2023
16Nov
01Dec
16Dec
01Jan 2024
16Jan
01Feb

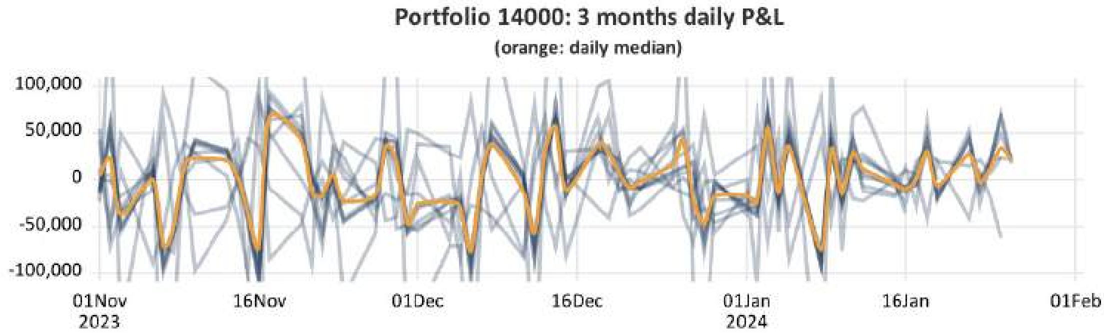
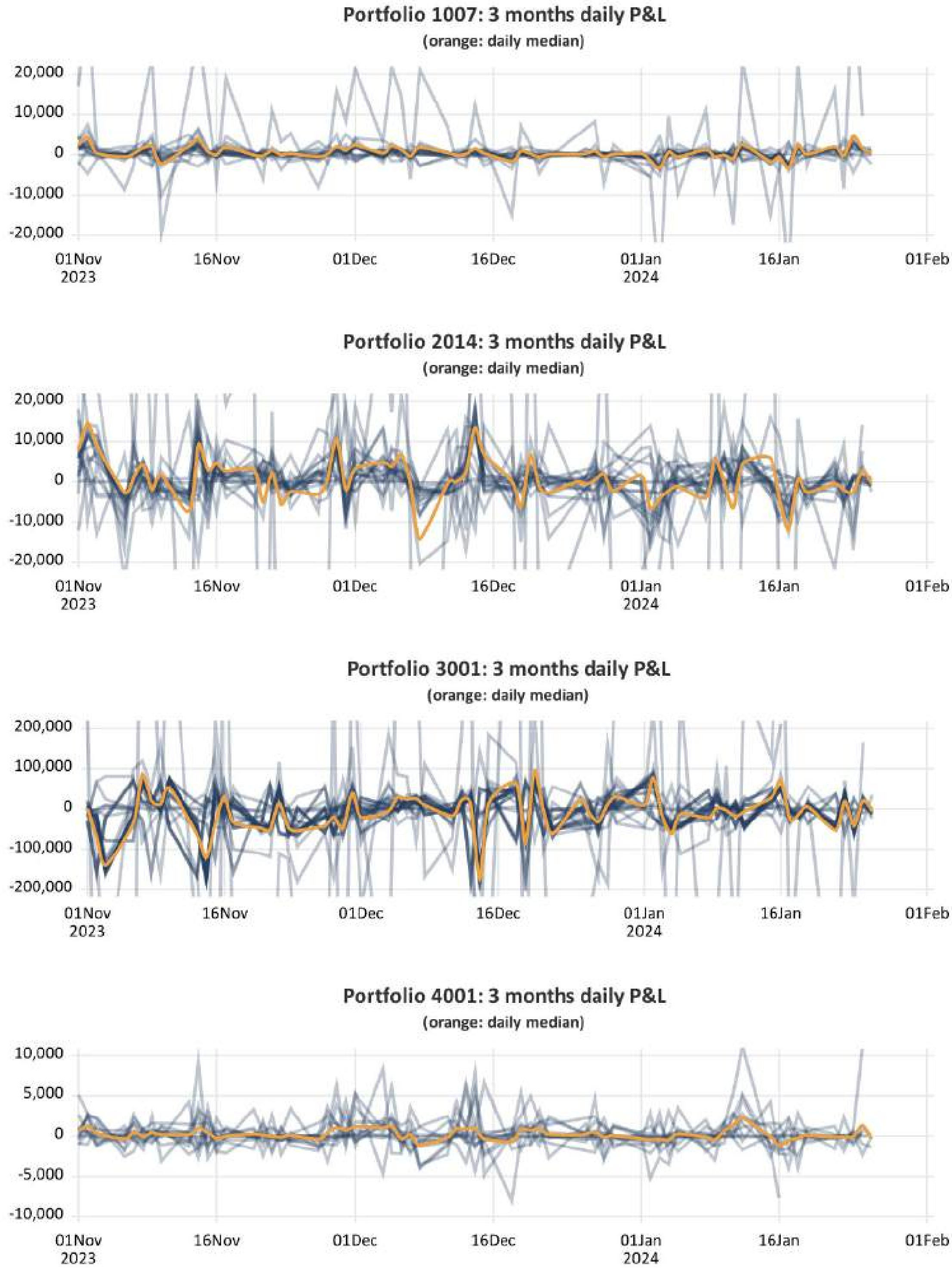
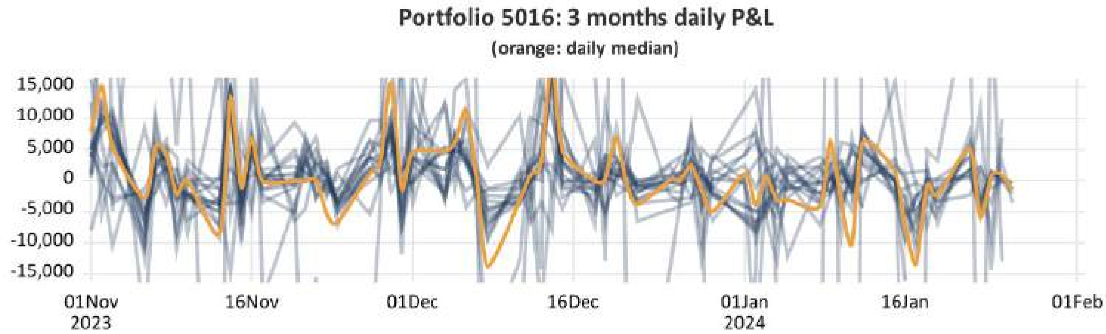

Portfolio 14000: 3 months daily P&L
(orange: daily median)
100,000
50,000
0
-50,000
-100,000
01Nov 2023
16Nov
01Dec
16Dec
01Jan 2024
16Jan
01Feb

Figure 26: Additional P&L charts with examples of high IQD




Portfolio 5016: 3 months daily P&L
(orange: daily median)
15,000
10,000
5,000
0
-5,000
-10,000
-15,000
01Nov
2023
16Nov
01Dec
16Dec
01Jan
2024
16Jan
01Feb

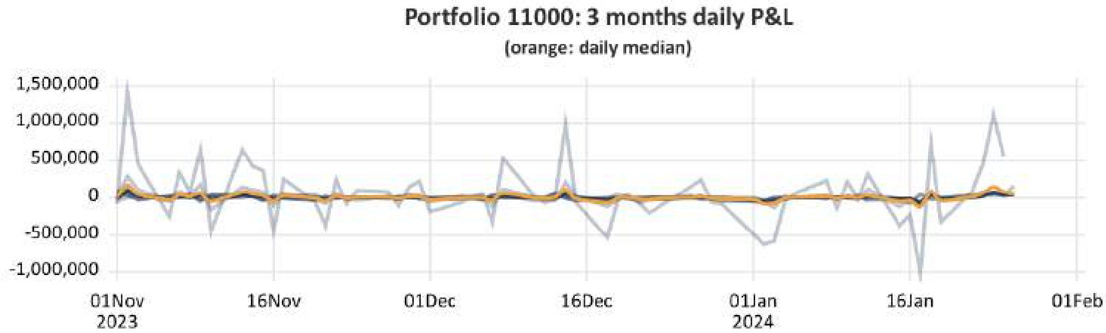
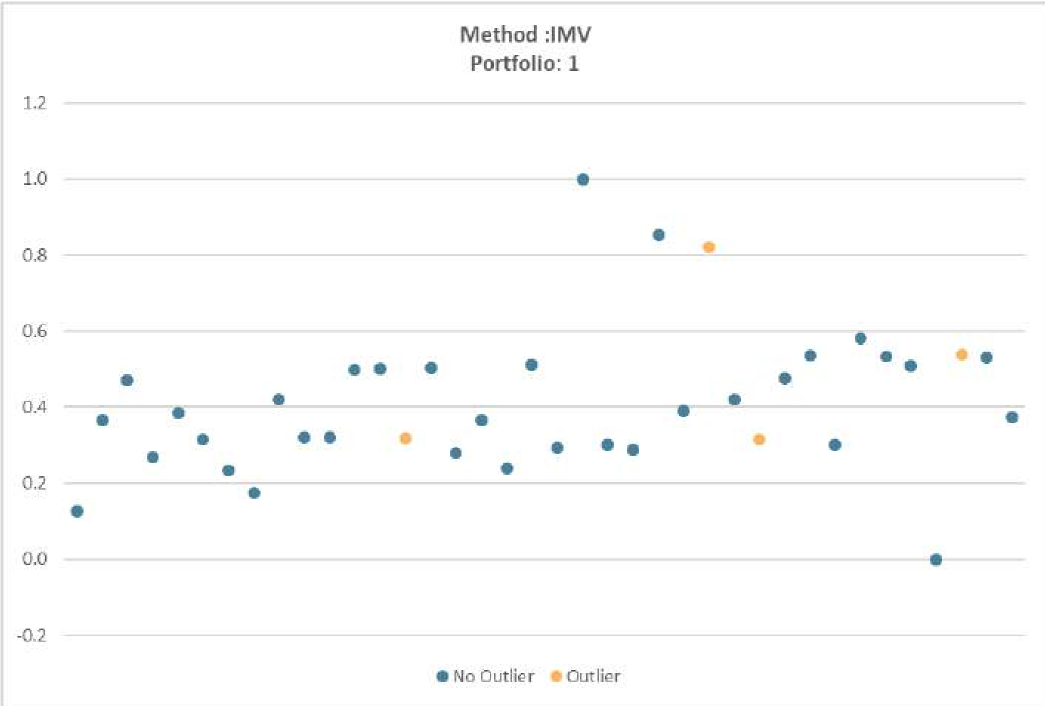

Portfolio 11000: 3 months daily P&L
(orange: daily median)
1,500,000
1,000,000
500,000
0
-500,000
-1,000,000
01Nov
2023
16Nov
01Dec
16Dec
01Jan
2024
16Jan
01Feb

Figure 27: Comparison between IMV and truncated STD deviation method to select outliers for risk measures



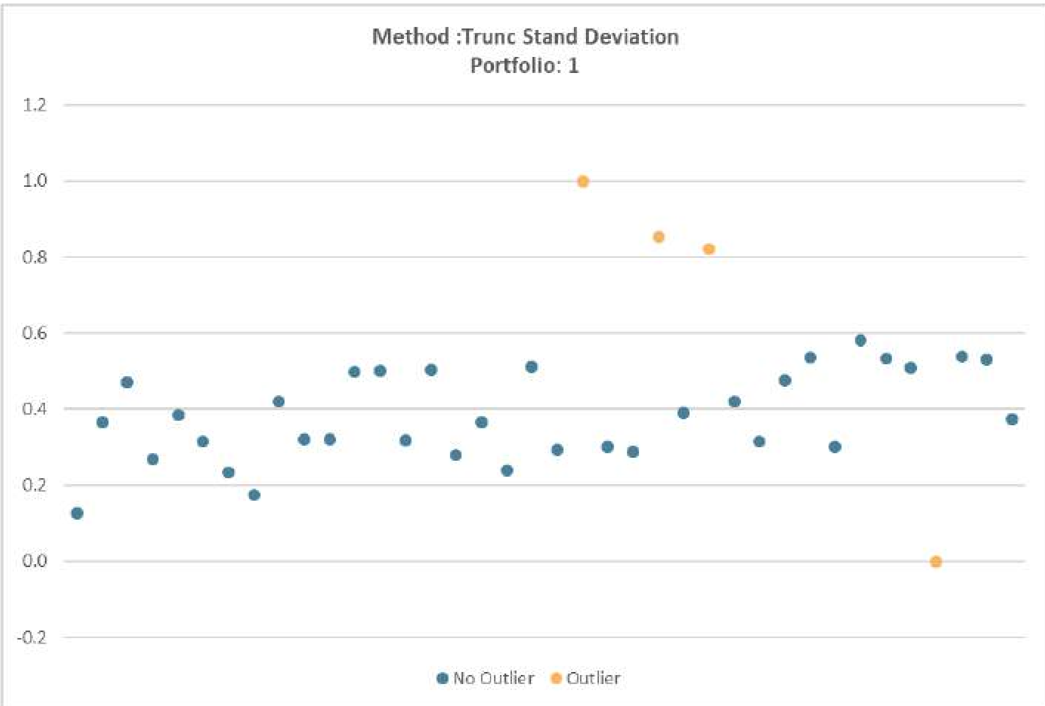


Figure 26. Example of dispersion in VaR submission for portfolio 1. Above the chart, marked in yellow: the portfolios which would have been excluded based on the IMV methodology outlier, which was used in 2019 (and before) to detect outliers among risk measures. Below the chart: the same submission, but marked in yellow, indicating the submissions that have been excluded in VaR and benchmarking statistics in the 2020 exercise (and onward) based on the +/- two times truncated standard deviation of the sample.

8. Annex 2 – Legal background

226. European legislators have acknowledged the need to ensure consistency in the calculation of RWA for equivalent portfolios, and the CRR and CRD include several mandates for the EBA to deliver technical standards, guidelines and reports with the aim of reducing uncertainty and differences in the calculation of capital requirements.

227. In this regard, Article 78 of the CRD requires the EBA to produce a benchmarking study on both credit and market risk to assist CAs in the assessment of internal models. The study should highlight potential divergences among banks or areas in which internal approaches might have the potential to underestimate their own funds requirements that are not attributable to differences in the underlying risk profiles. CAs are required to share this evidence within colleges of supervisors as appropriate and take appropriate corrective actions to overcome these drawbacks when deemed necessary. Directive (EU) 2019/878[20] of the European Parliament and of the Council of 20 May 2019 amending Capital Requirements Directive IV (CRD V) has not changed this mandate.

228. The EBA has devoted significant effort to the analysis of the consistency of outcomes in RWA, to understand the causes of possible inconsistencies and to inform the regulatory repair process. The EBA's ongoing work on benchmarking, supervisory consistency and transparency is fundamental to restoring trust in internal models and the ways in which banks calculate asset risks.

229. The use of internal models gives banks the opportunity to model their risks according to their business models and the risks faced by the bank itself. The introduction of a benchmarking exercise does not change this objective; rather, it helps to identify the non-risk-based variability drivers observed across institutions.

230. This MR benchmarking exercise is an MRWA variability assessment performed over a large sample of banks (43 banks at the highest level of consolidation across 13 jurisdictions within the EU). The banks participating in this exercise are those that have been granted permission to calculate their own funds requirements using internal models for one or more of the following risk categories:

a) general risk of equity instruments;

b) specific risk of equity instruments;

[20] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019L0878&from=EN

c) general risk of debt instruments;

d) specific risk of debt instruments;

e) foreign exchange risk;

f) commodities risk; and

g) correlation trading.

231. Pursuant to Article 362 of the CRR, the general risk of debt instruments should refer to interest rate risk. Similarly, the general risk of equity instruments refers to the change in the value of indices.

232. Banks that have approval only for the general risk of equity or debt instruments (in accordance with Article 363 of the CRR) may use a different definition of general risk (e.g., by including credit spread risk in the interest rate general risk) if they are able to demonstrate that this leads to higher RWA. Separate permission is required for each risk category. Many banks do not have permission for internal models for all risk categories, so the number of contributions for each hypothetical portfolio in this exercise varies across the sample.

233. Banks that have permission to use the internal model for calculating MR own funds requirements for one or more – but not all – of the risk categories in accordance with Article 363(1) of the CRR ('partial use') exclude certain risks or positions from the scope of the internal model approval. In this case, the own funds requirements for the risk categories outside the scope of the internal model are calculated according to the standardised approach.

234. In addition, as set out in Article 369(1)(c) of the CRR, banks should conduct validation exercises on hypothetical portfolios to test that the model is able to account for structural features. These portfolios should not be limited to the portfolios defined in this exercise; however, this exercise is a useful starting point for banks to meet this legislative requirement.

235. The assessed MR results, when provided and where applicable, are VaR, sVaR, IRC and APR figures for specific and aggregated trades. Moreover, a preliminary assessment of IMV was performed, primarily to ensure that the participating banks make uniform assumptions when entering the hypothetical trades.

236. In addition to these submissions, banks using an HS approach for VaR were requested to provide one year of P&L data for each of the individual and aggregated portfolios modelled. The objective of collecting this additional information was to employ the data vector to perform alternative calculations for VaR using, where possible, a consistent 1-year lookback period and controlling, as far as possible, for the different options that banks can apply within regulation.

Regulation (EU) 2019/876[21] of the European Parliament and of the Council of 20 May 2019 amending the Capital Requirements Regulation as regards the leverage ratio, the net stable funding ratio, requirements for own funds and eligible liabilities, counterparty credit risk, market risk, exposures to central counterparties, exposures to collective investment undertakings, large exposures, reporting and disclosure requirements (CRR II) will have a significant impact on the market risk benchmarking exercise once it is fully implemented. However, for the time being the CRR framework will be applied for the purpose of the benchmark exercise in accordance with Article 78 of the CRD.

[21] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019R0876&from=EN

European Banking Authority

Tour Europlaza, 20 avenue André Prothin CS 30154
92927 Paris La Défense CEDEX, FRANCE

Tel. +33 1 86 52 70 00

E-mail: info@eba.europa.eu

https://eba.europa.eu