INTESA SANPAOLO

FINANCIAL AND MARKET RISK HEAD OFFICE DEPARTMENT

Response to:
BCBS Consultative Document d436
"Revisions to the minimum capital requirements for market risk"

20 June 2018

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Executive summary[1]

Intesa Sanpaolo (hereinafter "the Bank") welcomes the opportunity to contribute with comments and insights on the latest Basel Committee on Banking Supervision (BCBS) Consultation Paper ("CP") on the Fundamental Review of the Trading Book (FRTB). The revisions proposed with the CP improve and clarify a significant number of elements of the revised market risk capital rules. However, there is still room for clarifications regarding different topics. In its responses, the Bank focuses its efforts on the Standardised Approach, P&L attribution and NMRF that represent its main concerns[2].

The revisions of the **Standardised Approach** can be classified as positive. The reduction of Risk Weights aligns the SBA calibration with historical data observed from stressed periods. FX Triangulation guarantees consistency within the capital charge for FX exposures in liquid currencies.
The CP acknowledged the potential **double counting effect of FX curvature risk**. The Bank's evidences confirm the existence of double counting for instruments where neither of the underlying currencies coincide with the bank reporting currency.

The Bank welcomes the new revisions which propose significant enhancements to the **PLA tests.** The new metrics and the longer sampling window make the model eligibility test more robust and stable. The Traffic Light Approach preserves the incentive to monitor and improve the alignment between Front Office and Risk engine, reducing the probability of a cliff effect on capital charge; a point of attention that needs to be assessed is the **'one-way rule' of Traffic Light Approach**, that prevents desks to have softer capital charges changes.
Concerning the test thresholds, the Bank would stress that **a wider calibration of the intervals might be recommended** to have a smoother capital charge transition, **in particular for the Amber zone**.
Despite the remarkable improvement brought by new tests, the model eligibility test still suffers from the **low volatility desk fallacy**. In fact, when a desk is very well hedged, **the Spearman test tends to have unstable outcomes** because it measures the correlation between two noises resulting from possible hedges mismatches that, by definition, approach to zero.
Regarding the choice between the metrics, the Bank believes that, even if the distribution tests proposed seem to behave similarly, the Kolmogorov-Smirnov shows positive features that might make it preferable.

In line with the Industry, the **NMRF** represent **the main concern of the Bank.** The Bank appreciates the new definition of real price and the possibility of data pooling. However, **the current Risk Factor Eligibility Test still affect a large share of portfolios** penalizing those instruments subject to higher number of risk factors (such as Swaps) regardless of whether they are structured or plain vanilla. **The proposed framework still results in a very punitive capital charge for IMA due to NMRF**, jeopardizing the incentive to adopt IMA in favor of SBA.

[1] Please be aware that all the quantitative findings in this document are evidences derived from numerical simulations performed on realistic data samples that do not mirror the actual figures of Intesa Sanpaolo.

[2] As for the general framework of the Consultation Paper, the Bank participates and supports ISDA position.

1. Standardised Approach

1.1 Introduction

The previous implementation phase of the revised Standardised Approach (BCBS d352) included areas where risk factor-level losses, and their aggregation, are not commensurate with the actual risk. In order to solve these issues, the Committee proposes the followings:

- Revisions to the treatment of liquid FX pairs
- Revision to correlation scenarios
- Revisions to capital requirements for non-linear instruments
- Revisions to risk weights
- Revisions to clarify the treatment of multi-underlying options and index instruments

The Bank welcomes all the proposed revisions as they reduce the risk of cliff effects between the approaches in the capital charge computation, enhancing the risk sensitivity and making the Standardised Approach a more appropriate fallback for the Internal Models Approach. Moreover, the revision to the treatment of liquid FX pairs contributes to create a more consistent framework between the different jurisdictions.

1.2 Evidences on FX curvature double-counting issue

1.2.1 Background

The revised Standardised Approach requires banks to define FX exposures relative to their reporting currency. Such an approach may lead to double-counting in the calculation curvature risk capital requirements when FX options do not include the bank's reporting currency.

The rationale behind the issue is in the FX curvature framework construction (the same reasoning could be extended also to delta framework) and can be better explained through a simple example. Being $X_{A/B}$ the exchange rate for currency A in units of currency B, assume an option on GBP/USD valued in USD with value $Y = Y(X_{GBP/USD})$. Under USD reporting there is only one risk factor (i.e. GBP/USD), while under EUR reporting there are two risk factors (i.e. GBP/EUR & USD/EUR). The option is valued in EUR with the value V = $X_{USD/EUR} * Y(X_{GBP/EUR}/X_{USD/EUR})$. Under EUR reporting a shock to USD/EUR should be conducted as:

$$(1 + RW) * X_{USD/EUR} * Y(X_{GBP/EUR}/(1 + RW) * X_{USD/EUR})$$

Which is equivalent to:

$$(1 + RW) * X_{USD/EUR} * Y(X_{GBP/USD}/(1 + RW))$$

Numerical results deriving from the application of the developments exposed above are shown in the following section.

1.2.2 Analysis approach

The performed analysis has the goal to assess the materiality of the issue above described within the bank's trading portfolio.

1. *Perimeter Definition*: assesses perimeter of non-linear FX instruments where neither of the underlying currencies is the bank's reporting currency. Three examples have been analyzed: GBP/USD, JPY/USD, TRY/USD.
2. *FX Curvature Charge Computation with EUR Reporting Currency:* computes the FX curvature charge on identified perimeters for a bank with EUR reporting currency.
3. *FX Curvature Charge Computation with USD Reporting Currency:* computes the FX curvature charge on identified perimeters for a bank with USD reporting currency.
4. *Results Comparison and Ratio Definition.*

1.2.3 Evidences

Here below the results of the analysis are presented. All the data are expressed in EUR.

Example 1 – FX Options on GBP/USD

Bank Reporting EUR	Bank Reporting USD	Ratio
10.256.024	6.309.250	**1,63**

Tab.1 - FX Curvature Charge for FX Options on GBP/USD

Considering the FX curvature risk definition for the two hypothetical banks the involved currency pairs are GBP/USD for the USD reporting bank, and USD/EUR & GBP/EUR for the EUR reporting bank.
All the involved currency pairs are included in the current regulatory liquid currency pairs list, then the risk weight applied for the curvature computation is 21,2%.
On the considered perimeter, the capital charge for a bank with reporting currency EUR is **63% higher** than the capital charge for a bank with reporting currency USD.

Example 2 – FX Options on JPY/USD

Bank Reporting EUR	Bank Reporting USD	Ratio
2.951.170	2.423.952	**1,22**

Tab.2 - FX Curvature Charge for FX Options on JPY/USD

Considering the FX curvature risk definition for the two hypothetical banks the involved currency pairs are JPY/USD for the USD reporting bank, and USD/EUR & JPY/EUR for the EUR reporting bank.
All the involved currency pairs are included in the current regulatory liquid currency pairs list, then the risk weight applied for the curvature computation is 21,2%.
On the considered perimeter, the capital charge for a bank with reporting currency EUR is **22% higher** than the capital charge for a bank with reporting currency USD.

Example 3 – FX Options on TRY/USD

Scenario	Bank Reporting EUR	Bank Reporting USD	Ratio
Base	8.183.357	3.403.294	**2,40**

Alternative 1	8.183.357	6.358.573	**1,29**
Alternative 2	5.807.053	3.403.294	**1,71**

Tab. 3 – FX Curvature Charge for FX Options on TRY/EUR

Considering the FX curvature risk definition for the two hypothetical banks the involved currency pairs are TRY/USD for the USD reporting bank, and USD/EUR & TRY/EUR for the EUR reporting bank.
The three alternative scenarios analyzed consider possible different treatment of involved currency pairs in term of applied risk weights.

- In the *Base Scenario*, a risk weight of 21,2% is applied to TRY/USD because it is a currency pairs considered liquid by the Regulator; the same treatment is adopted for USD/EUR, while for the currency pair TRY/EUR a risk weight of 30% is applied, being a non-liquid currency pair under the current regulatory definition.
- In the *Alternative Scenario 1,* the USD reporting bank applies a risk weight of 30% on TRY/USD even if it is considered a liquid currency pair (this possibility is given by the Regulator).
- In the *Alternative Scenario 2* the EUR reporting bank applies 21,2% on TRY/EUR, applying the revision on the treatment of FX liquid currency pairs (i.e. triangulation).

On the considered perimeter, the capital charge for a bank with reporting currency EUR is **140% higher** (*Base Scenario*), **29% higher** (*Alternative Scenario 1*) and **71% higher** (*Alternative Scenario 2*) than the capital charge for a bank with reporting currency USD. This final example remarks also the importance of having a level playing field in the FX risk weights framework: the application of different risk weights could bring indeed significant inconsistencies between banks with different reporting currencies.

1.2.4 Conclusions

The Bank's evidences suggest that, considering the range of values that the ratio could assume on different perimeters (as demonstrated through the examples above), a *one-size fits all* approach for the definition of the scalar [X] would not be appropriate: **the scalar should be properly calibrated for each currency pair**.

The examples above support the materiality of the FX curvature double-counting issue: ratios between the charges computed for EUR and USD reporting banks on the same perimeter could assume remarkable values. Allowance to use triangulation will reduce the impact, but the Bank would welcome a specific revision for the issue that otherwise could bring inconsistency within the framework and reduce the comparability of capital outcomes between different jurisdictions.

The Bank believes that the proposal included in the Consultative Document would not be sufficiently risk-sensitive compared to the overall standardised framework. The calculation depends on the representation of the risk exposures and on the reporting currency. This concern derives from the FX curvature framework construction (though the same reasoning could be extended also to delta framework).

1.3 Feedback on the proposed revisions

The Bank has performed quantitative analysis to assess the impacts of proposed revisions on real instruments. The application of these revisions reliefs the capital charge outcomes, contributing to

align the Standardised Approach to the actual level of risk and to make it a more credible fallback for the Internal Models Approach.

The revision to the risk weights for GIRR, ER and FXR classes in particular has remarkable impacts: *Delta* charge of these risk classes will decrease linearly and proportionally with the risk weights reduction, while the *Curvature* charge decrease will be non-linear and more than proportional in respect of the risk weights reduction.

1.3.1 Revisions to the treatment of liquid FX pairs

The Committee proposal allows banks to combine two currency pairs in the current list of liquid pairs and treat the resulting new FX pair as liquid.

The Bank welcomes the proposed revision since it would contribute to create consistency within the framework and to align the regulatory capital outcomes between the different jurisdictions.

The Bank highlighted the quantitative impact within the exercise on the FX curvature double counting explained in the previous section. Considering a real perimeter of FX options on USD/TRY the curvature charge computed by an EUR reporting bank reduces of 29% by applying the new risk weight of 21,2%, and the ratio with the charge computed by a USD reporting bank on the same perimeter reduces from 2,40 to 1,71.

1.3.2 Revisions to the correlation scenarios

The Committee proposes to revise the "low correlations" scenario to recalibrate the capital charge outcomes for risk factors that are observed empirically to be consistently highly correlated in all market conditions, by limiting the reduction in correlations in these cases.

The Bank welcomes the proposed revision because the Bank believes that the new formulation defines a more sensitive floor for the "low correlations" scenario that would better align the capital charge outcomes to the actual level of risk of each portfolio properly reflecting the market conditions, especially for those desks trading in Commodity and Interest Rates asset classes.

1.3.3 Revisions to the Curvature risk capital requirements

The Committee proposes:

- to revise the approach to apply shock scenarios so that consistent ones are applied to risk factors that are defined to be in the same Standardised Approach bucket for CSR, ER and CR classes;
- to replace the alternative specification with a simple fix that applies a floor to the part of the formula causing the cliff effect.

The Bank welcomes the proposed revisions because they bring consistency within the curvature risk framework and would avoid cliff effects in capital requirements computation making the framework sensitive to actual risk reductions not captured by the current alternative formulation.

The Bank has performed an analysis on an Equity Desk considering only the *Equity Risk Class*, responsible of about 70% of total curvature charge for the selected perimeter.

1. Intra-Bucket Aggregation – New Consistent Shock Scenarios

Adopting both the current methodology (*BCBS d352*) and the revised one (*BCBS d436*), the Bank has compared the obtained results on each bucket.

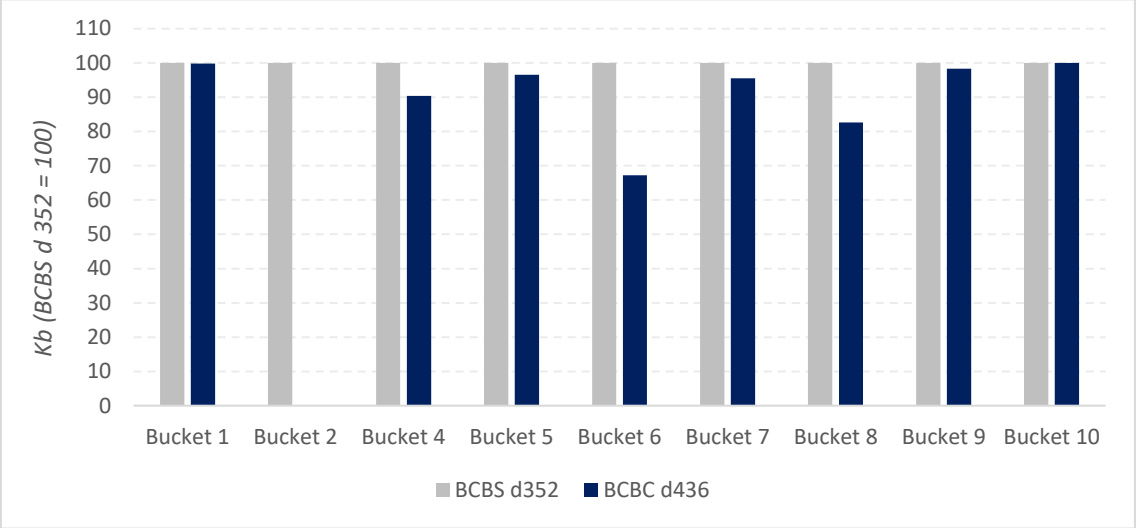

Fig. 1 – Equity Intra-Bucket Curvature Charge

The results show a K_b reduction for most of the buckets; this reduction assumes remarkable values in some cases (*-10%* for *Bucket 4*, *-33%* for *Bucket 6* and *-17%* for *Bucket 8* while for *Bucket 2* the curvature requirement falls to zero under the new methodology).

2. Cross-Bucket Aggregation – Zero Floor Application

The Bank has performed the cross-bucket aggregation with the values obtained from the previous step using both the current formula (*BCBS d352*) and applying the zero floor to the aggregation formula instead of the alternative formulation.

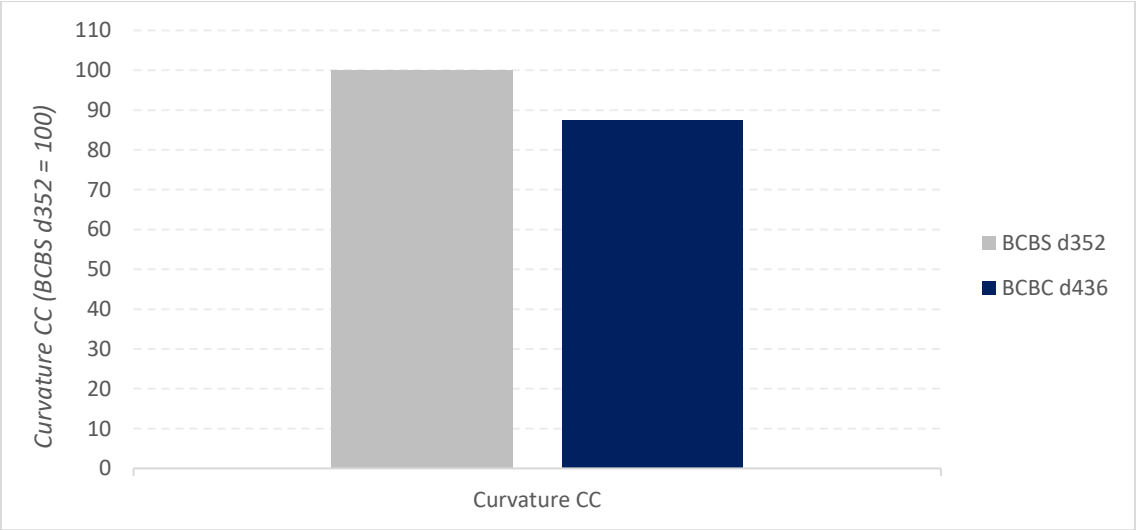

Fig. 2 – Equity Cross-Bucket Curvature Charge

The overall revision impact on Equity Curvature capital charge is a 12% benefit considering the analyzed perimeter.

1.3.4 Revisions to GIRR, ER and FXR risk weights

The Committee proposes to reduce the risk weights for GIRR class by 20-40% and for ER and FXR classes by 25-50%.

The Bank welcomes the proposed revision because the Bank believes it would reduce the risk of cliff effects between the approaches in the capital requirements calculation making the Standardised Approach a more appropriate and credible fallback for the Internal Models Approach.

The Bank has performed an analysis to assess the impact of the reduction in two possible scenarios:

- *High RW Scenario:* assuming a reduction of 20% on GIRR risk weights and of 25% on ER and FXR risk weights.
- *Low RW Scenario:* assuming a reduction of 40% on GIRR risk weights and of 50% on ER and FXR risk weights.

1. High RW Scenario

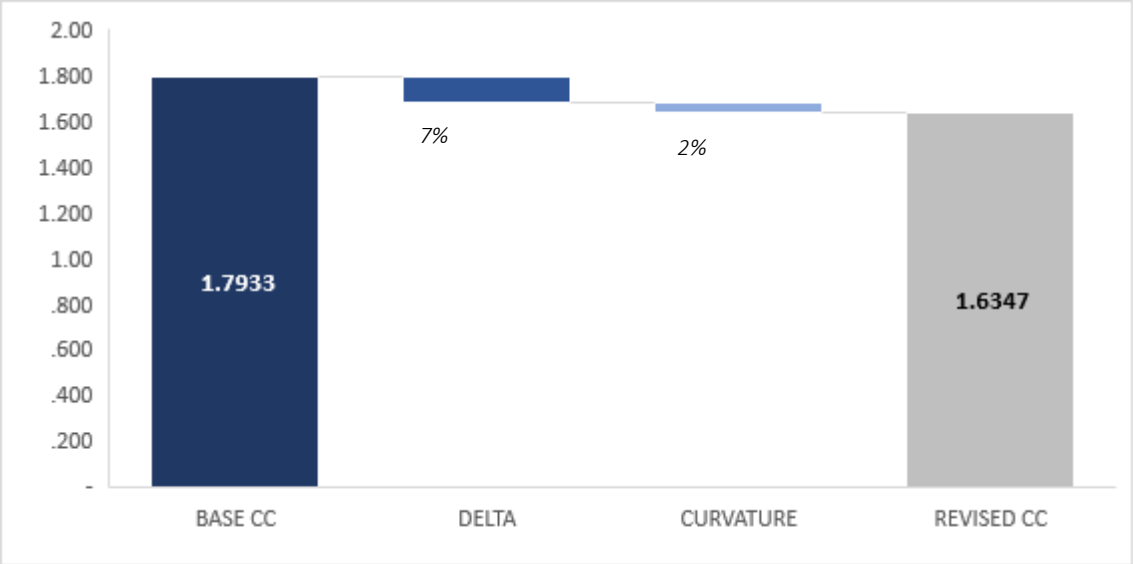

Fig. 3 – High RW Scenario: impacts on SBA/IMA(ES) Ratio

The overall impact is a 9% benefit on SBA capital charge: 7% of the reduction is explained by Delta component, while the remaining 2% is explained by Curvature component. The SBA/IMA ratio (computed assuming a regulatory multiplier of 1,5 for the IMCC) decreases from 1,8 to 1,6.

2. Low RW Scenario

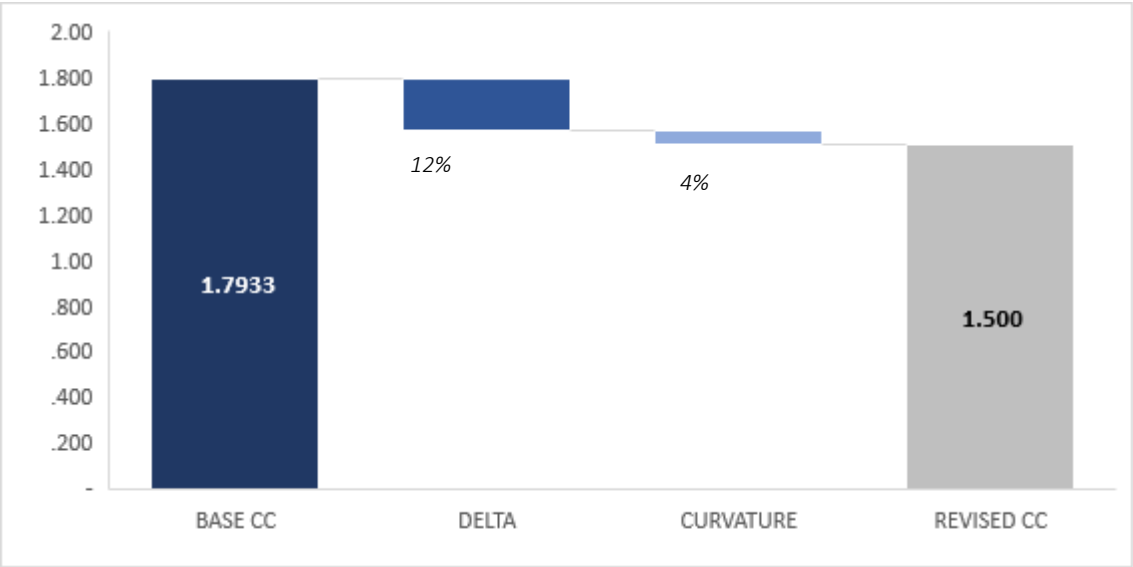

Fig. 4 – Low RW Scenario: impacts on SBA/IMA(ES) Ratio

The overall impact is a 16% benefit on SBA capital charge: 12% of the reduction is explained by Delta component, while the remaining 4% is explained by Curvature component. The SBA/IMA ratio (computed assuming a regulatory multiplier of 1,5 for the IMCC) decreases from 1,8 to 1,5.

2. Internal Model Approach

2.1 P&L attribution

2.1.1 Introduction

The Consultative Document provides an extensive transformation of the P&L attribution process. New metrics are introduced to substitute Basel's Mean Ratio and Variance Ratio in the task of assessing the good performance of the risk models, by measuring the degree of misalignment between Hypothetical P&L, produced by the Front Office, and Risk Theoretical P&L, produced by the Risk Department. The new metrics are better focused than the old ones on what they aim to capture, nevertheless, the Bank believes in some cases the tests are still subject to statistical errors, as further explained later in this document.

The Bank appreciates the introduction of the traffic light approach, as it aims to prevent the risk of a cliff-effect whenever desks are capitalized under both the Standardised and the Internal Model Approach. However, this effect can still arise in the case of lack of desk capitalized under the amber zone. As empirical evidence shows, in very few cases the amber zone achieves the effect of reducing cliff effect, since the interval is too shrunk to prevent desks from falling directly to red zone. Therefore, the Bank suggests to reconsider the extension of the amber zone in order to smooth capital charge variations and prevent cliff-effect.

The Bank suggests to revise is the "one way rule" for the passage from the amber to the red zone, which requires a desk to become fully green to get out of the red zone.

2.1.2 Impact on low risky portfolio

As widely observed in the former P&L attribution test metrics, desks with a strong component of hedged exposures can end up having an unstable outcome of the tests.

There is evidence that this issue remains relevant with the new test metrics as well, especially with the Spearman Correlation coefficient. In order to exemplify this, here below the case of a sample desk with two components hedging together.

Figure 5 represents the normalized cumulated Hypothetical P&L (y-axis) of the two asset classes (*AC 1* and *AC 2*) considered over a long period of observations in time (x-axis). The two asset classes are managed in order to hedge most of the risk; therefore, the correlation between the two AC is -98% and the P&L produced by the two AC combined is significantly smaller than stand-alone ones.

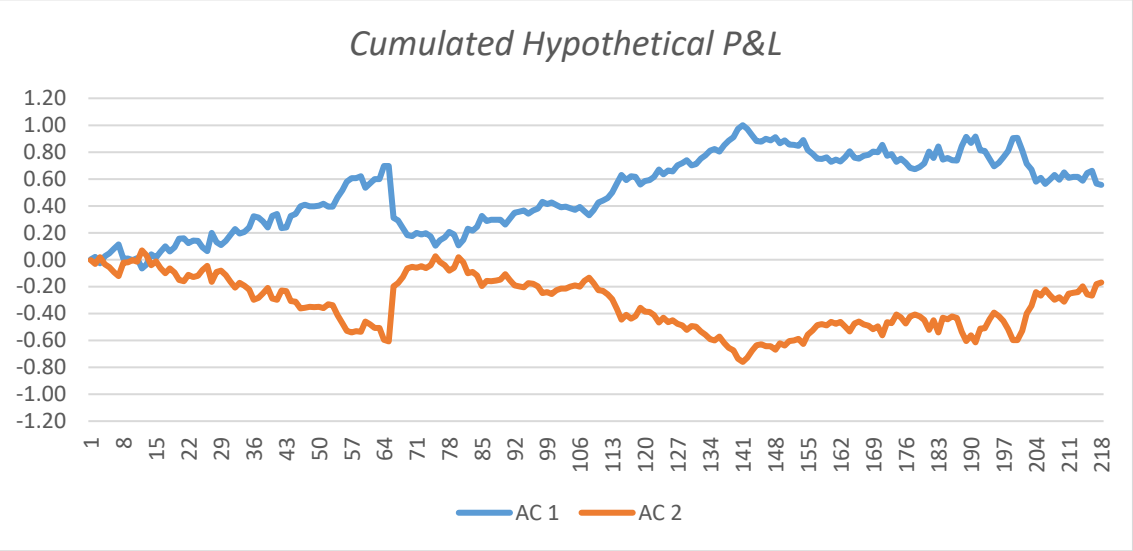

Fig. 5 – Cumulated Hypothetical P&L of two asset classes

Once assessed that the two asset classes stand-alone show a very good level of Spearman correlation, it is expected a level of correlation as good as the stand-alone ones. Unfortunately, the empirical evidence does not confirm the expectation.

A well hedged desk ends up with poorer correlation test results as illustrated in the table below.

	Asset Class 1 stand-alone	Asset Class 2 stand-alone	Aggregated desk
Spearman Test Result	0,964	0,959	0,473
Magnitude[3]	4.740.555	4.773.360	859.333

As can be seen, even though its RTPL and HPL differences are negligible, the desk fails the Spearman test by large extent, and it is therefore poised to be capitalized under the Standardised Approach. The sample desk is only composed by linear, plain-vanilla, IR-products, and the Bank rules therefore out the small P&L numbers due to a lack of model precision or an underestimation of the market-data sets.
Similar weakness of the Spearman Correlation test can arise considering different granularities (i.e. portfolios).

As an example of the grade of alignment needed to pass PLA test for a desk managed hedging risks, in *Figure 6* Spearman Correlations are calculated assuming AC1 and AC2 alternatively with perfect alignment. As can be noticed, even starting from a good level of alignment stand-alone (see above) and adding to this a perfect alignment between RTPL and HPL for one of the two AC alternatively, this is not sufficient to impute this Desk to the green zone. For example, even with AC1 totalizing a 100% and AC2 a 95,9% of Spearman Correlation stand-alone, the Desk is merely collocated at the beginning of the amber zone interval. When a hedging strategy is in place, an almost perfect alignment between RTPL and HPL within a desk is needed to have good test results.

[3] *As a measure of the P&L magnitude, the average of absolute value of Hypothetical P&L (€) has been considered.*

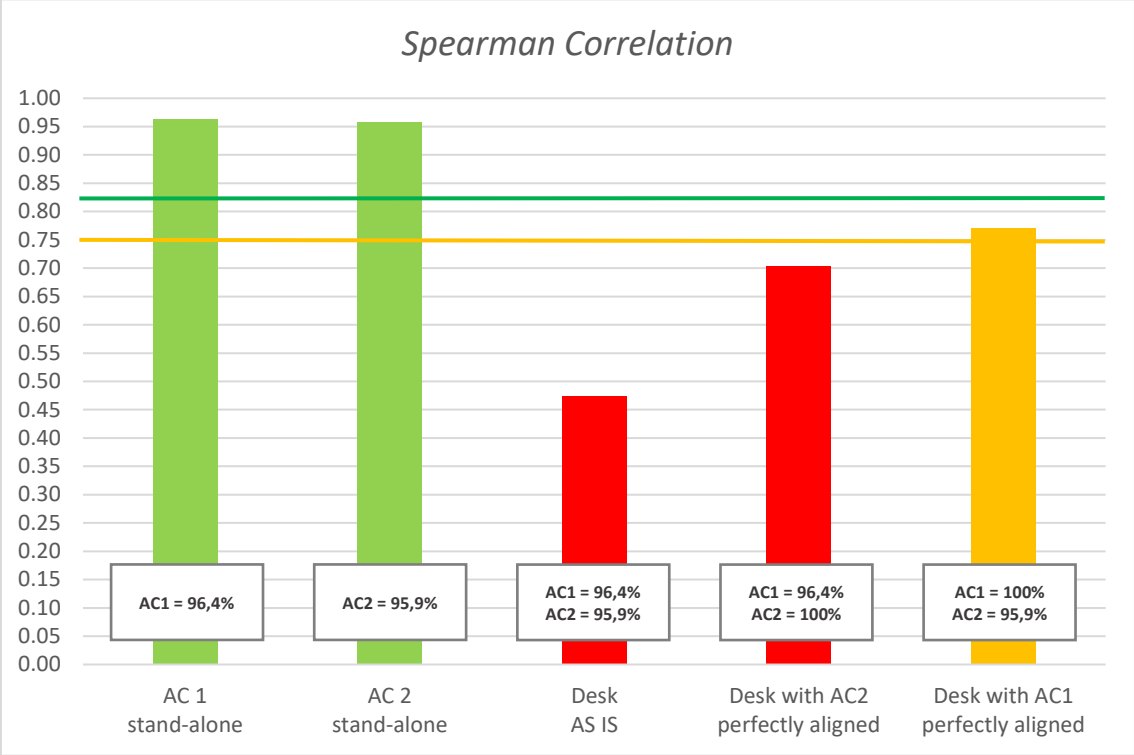

Fig. 6 – Spearman Correlations of Asset Classes and Desks represented (stand-alone Asset Classes' reported in boxes)

As a side effect, this Spearman test behavior might even suggest or incentivize, in cases like the one pointed out in this example, a bank to put up unilateral-risk desks, and the Bank believes that it is a scenario to be avoided in a risk management perspective. Furthermore, it will penalize the banks which could not exploit scale economy in setting up a large number of desks, ending up with two different level of capital for same exposure but different organization.

As a further exemplification of this behavior of the Spearman Correlation test, the Bank considered a stand-alone desk, mainly composed by IR-products with various complexity and the Bank runs a simulation dependent on the level of hedging present in the Desk. In order to do this, all values of components that make HPL and RTPL are considered in absolute value as a Desk with no netting strategies in place.

$$HPL_{D,t} = \sum_{c=1}^{n} |HPL_{c,t}|$$

$$RTPL_{D,t} = \sum_{c=1}^{n} |RTPL_{c,t}|$$

Where $HPL_{D,t}$ and $RTPL_{D,t}$ are equal to the total HPL and RTPL of the Desk at time t with n components, and $HPL_{c,t}$ and $RTPL_{c,t}$ the P&L of the single components of the Desk.

The simulation is consequently performed by introducing a variable Alpha, which measures the level of hedging in place in the desk. As Alpha (α) increases by 1%, an additional negative P&L component corresponding to the one produced by 1% of total Notional amount is included in the desk,

representing P&L netting between a position and the inherent hedge. Therefore, if Alpha is 0 there is no netting in P&L and the desk is completely directional, on the other hand if Alpha is 1 the desk is almost completely hedged. A small random normal noise (ε) is also included to the additional P&L, as to simulate operational noise and avoid back-to-back effects that would basically cancel the position. Considering $\widehat{RTPL_{D,t}}$ and $\widehat{HPL_{D,t}}$ as hedged P&L at time *t* for the whole Desk.

$$\widehat{HPL_{D,t}} = \sum_{c=1}^{n} |HPL_{c,t}| + \sum_{c=1}^{k(\alpha)} \widehat{HPL_{c,t}}$$

$$\widehat{RTPL_{D,t}} = \sum_{c=1}^{n} |RTPL_{c,t}| + \sum_{c=1}^{k(\alpha)} \widehat{RTPL_{c,t}}$$

Where $\widehat{RTPL_{c,t}}$ and $\widehat{HPL_{c,t}}$ are the hedgings of the component *c*, namely:

$$\widehat{RTPL_{c,t}} = -RTPL_{c,t} + \varepsilon$$

$$\widehat{HPL_{c,t}} = -HPL_{c,t} + \varepsilon$$

The simulation is performed sampling the values of Alpha, and *Figure 7* shows the results, with a significant deterioration of Spearman Correlation as the portion of components hedged increases.

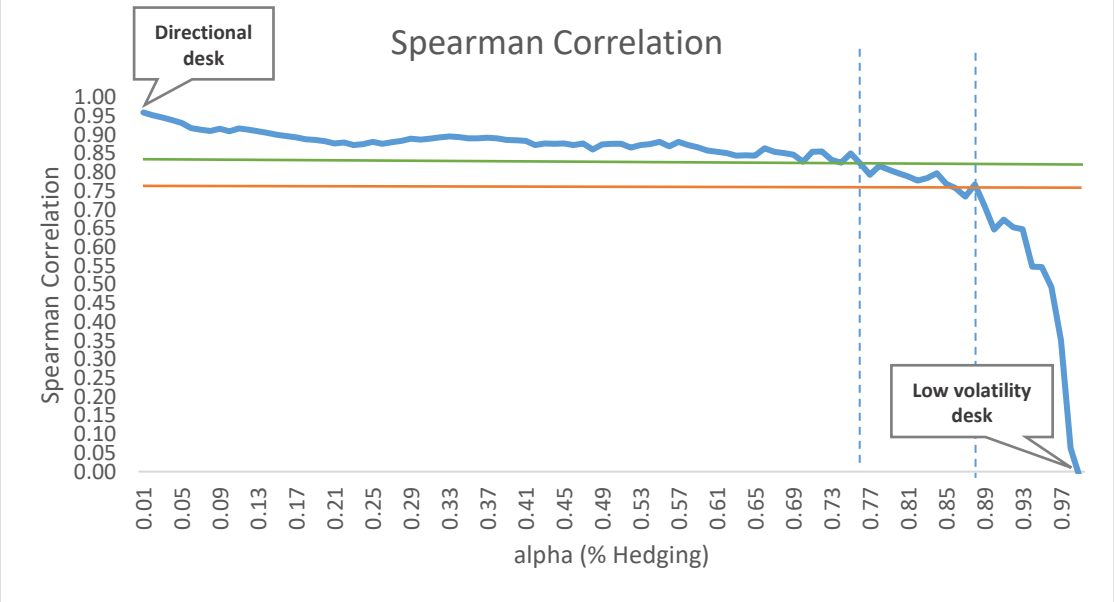

Fig. 7 – Spearman Correlation behavior

The issue of low volatility desks was one of the main concerns of previous PLA test (the variance ratio), and despite the Committee has removed a test build up on inverse function relation between the riskiness of portfolio and the level of implied correlation, the issue of low risk portfolio is still there. Bank's educated guess suggests that, as long as an institution is testing the estimation power, error terms could not be wiped out. It means that as long as the expected value of the estimator gets smaller the error terms become stronger causing the failure of any test based on estimation power. The Bank

would really appreciate a PLA framework that, under given criteria, would discriminate between directional and low risky desk.

Subject to supervisory approval, banks should retain the possibility to remove any PLA failure proving that the breach arises from the decorrelation effect of the hedging strategy. The related analysis should prove that the instruments hedges each other and the desk can be split in two (or more) directional sub-desks, whereas both sub desk are green the breach can be ignored otherwise the breach counts.

2.1.3 Choice of the metric to assess the similarity of the distributions

Intesa Sanpaolo expresses its preference towards the Kolmogorov-Smirnov metrics, for the reasons hereby specified:

- **Stability of the metric.** A strong evidence suggests the Kolmogorov-Smirnov metric to be sensibly more stable than the CHI-Squared one to small variations in the input time series.
- **Continuous-time scope.** The Kolmogorov-Smirnov metric is continuous-time oriented and therefore does not rely on a specific number of observations in the time series. The CHI-Squared metric, on the other hand, strongly depends on the number of observations, and can be considered more limited in scope.
- **Existing adoption in the Industry.** The Kolmogorov-Smirnov statistical test is already familiar in the Industry best practice, for example in the Counterparty Risk backtesting process, and the Bank believes this can carry operational benefits.

2.1.4 Conclusions

Despite the great improvements the PLA framework still suffers from low volatility desk fallacy: lower is the magnitude and lower is the volatility of P&L, higher is the chance of failing the PLA tests. The exercise proposed exacerbates this evidence and suggests that it would be more appropriate to introduce a discrimination between directional and almost perfectly hedged portfolios. Subject to supervisory approval, banks should retain the possibility to remove any PLA failure if a dedicated analysis shows that it is due to the hedged nature of the desk.

The Traffic Light Approach is another innovation that the Bank considers as a proper answer to the doubts expressed by the Industry, as it aims to mitigate the cliff effect issue. Thresholds need to be calibrated in order to smooth the capital charge variations.

Regarding the choice between the two distribution-oriented metrics proposed by the document, the Kolmogorov-Smirnov test seems to be superior because of its stability, the continuous-time orientation and the fact that it is a test already well known in the Industry.

2.2 Non-Modellable Risk Factors

2.2.1 Introduction

As specified by both the BCBS[4] and the Council of the European Union[5], institutions shall assess, on a monthly basis, the modellability of all the Risk Factors of the positions attributed to trading desks for which they have been granted the permission to use Internal Models Approach for Market Risk.
This Risk Factor Eligibility Test (RFET) requires that a Risk Factor must have at least 24 observable *real prices* per year (measured over the period used to calibrate the current Expected Shortfall model) with a maximum period of one month between two consecutive observations. A "real price" is representative for a risk factor of a bank where the bank is able to extract the value of the risk factor from the value of the real price.

In addition, a price is considered *real* if it meets at least one of the following criteria:

- It is a price at which the institution has conducted a transaction;
- It is a verifiable price for an actual transaction between other arm's length parties;
- It is a price obtained from a committed quote collected and verified through a third-party vendor, a trading platform or an exchange and made by the bank itself or another party.
- It is a price obtained from a third-party vendor, where:
  - The transaction or committed quote has been processed through the vendor;
  - The vendor agrees to provide evidence of the transaction or committed quote to supervisors upon request
  - The price meets the three criteria listed immediately above.

In its document, the Committee specifies proposals related to the main topics debated in the Industry:

- In order to determine how observations of similar Risk Factors should be counted in Modellability Assessment framework, two alternative bucketing definitions are identified;
- With the aim to avoid an exceptional treatment of idiosyncratic credit spread risk with respect to idiosyncratic equity risk, the same aggregation formula – square-root-sum-of-squares approach – could be applied in both cases.

As already highlighted in Industry studies[6], the current formulation of the modellability assessment is rather restrictive and, in the sample analyzed, leads to 58% of Risk Factor deemed Non-Modellable. Nevertheless, this percentage is based on estimations provided by major financial players while, for smaller institutions, results could be worse: in fact, in some situations, the RFET could lead to a higher number of relevant Risk Factor deemed Non-Modellable. This approach has a clear impact on NMRF Capital Charge, which results excessively burdensome.

2.2.2 Process for satisfying modellability requirements - bucketing

The main change introduced by the Consultative Document is that it clearly states for the first time the possibility of using a bucketing approach in order to count real price observations for RFET and

[4] Minimum Capital Requirements for Market Risk (January 2016)
[5] Consolidated CRR Text & Outstanding Issues (November 2017)
[6] BCBS FRTB Consultation Paper, MRG Meeting 17th May 2018

proposes two alternatives. From a general point of view, the Bank believes that apply a bucketing approach is useful in this framework, because it encourages market liquidity and eases Risk Factor modellability assessment (and, therefore, subsequent NMRF capitalization).

Proposed alternatives – PROs and CONs

Alternative 1 (Bank specific buckets)
Any bank can use in the RFET the same buckets that are also used in P&L attribution. Banks are allowed to define these buckets in the similar way as they can currently define Risk Factor granularity.

PROS	CONS
• Banks have some level of control regarding their Risk Factor set and the observability assessment.	• No real benefit compared to original paper. The flexibility to define Risk Factors, as long as PLA is passed, was explicitly available in CRR2 and mostly possible in original BCBS text. • Evident trade-off between PLA and NMRF.

Alternative 2 (SBA pre-defined buckets):
Decouples Risk Factors used in the internal model and the PLA from buckets used for the observability assessment. These observability buckets will be standardized for each asset class across banks.

PROS	CONS
• Decoupled granularity between ES/PLA and NMRF. • Observability assessment somewhat standardized.	• Complexity: buckets need to be mapped to bank-specific Risk Factors and possibly large variety of Risk Factors. • The SBA bucket structure is very granular and may decompose areas of the curve where not necessary (there will be cases in which sections can be merged without losing accuracy). • One static bucket structure may not be the optimal structure for different Risk Factors within the same asset class. Risk Factors tend to have different behaviours at different curve sections.

In the following sections, the above cited alternatives are deeper analyzed with practical examples.

Deeper analysis of Alternative 1 – Trade-off between RFET and PLA tests

This assumption recognizes that there is a trade-off in bucketing structured definition, since high Risk Factor granularity leads to an overly burdensome NMRF Capital Charge due to large number of NMRFs but facilitates a trading desk's success in meeting the PLA test requirement (in fact, an accurate pricing requires a thick granularity of the Risk Factors scenarios in the simulation) and vice-versa.

In order to assess this trade-off existence, the Bank performed a practical example focusing on a sample desk of linear plain vanilla IR instruments and considering a subset of more impactful IR curves. In this context, as expected, taking into account the most granular bucket definition (i.e. single pillar level) results on PLA test are encouraging while this can lead to a skyrocketing NMRF Capital Charge as it can be seen from the charts below.

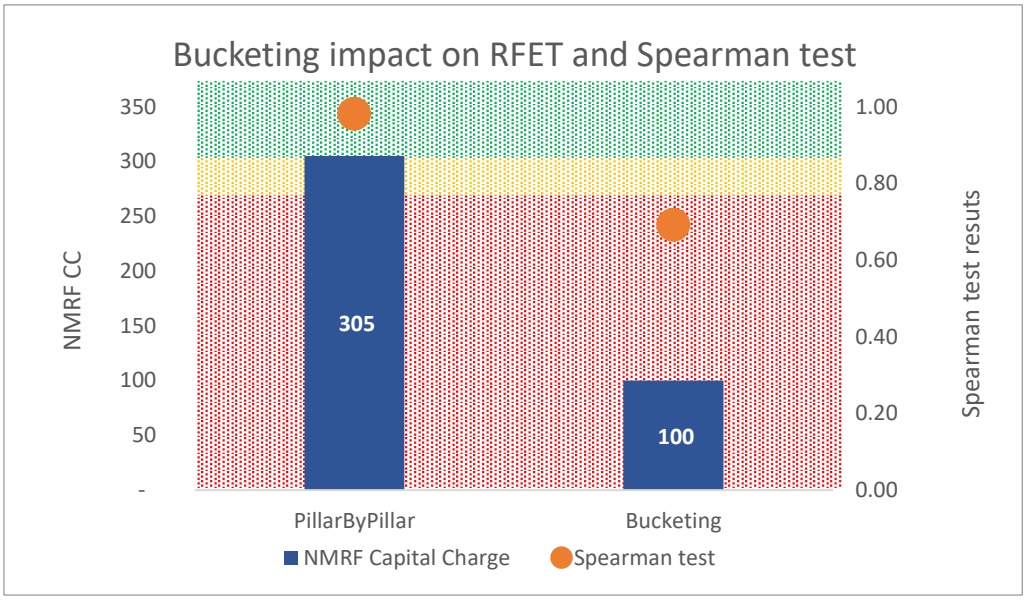

Fig. 8 - Impact of the Risk Factor bucketing on the capital charge and the Spearman P&L attribution test

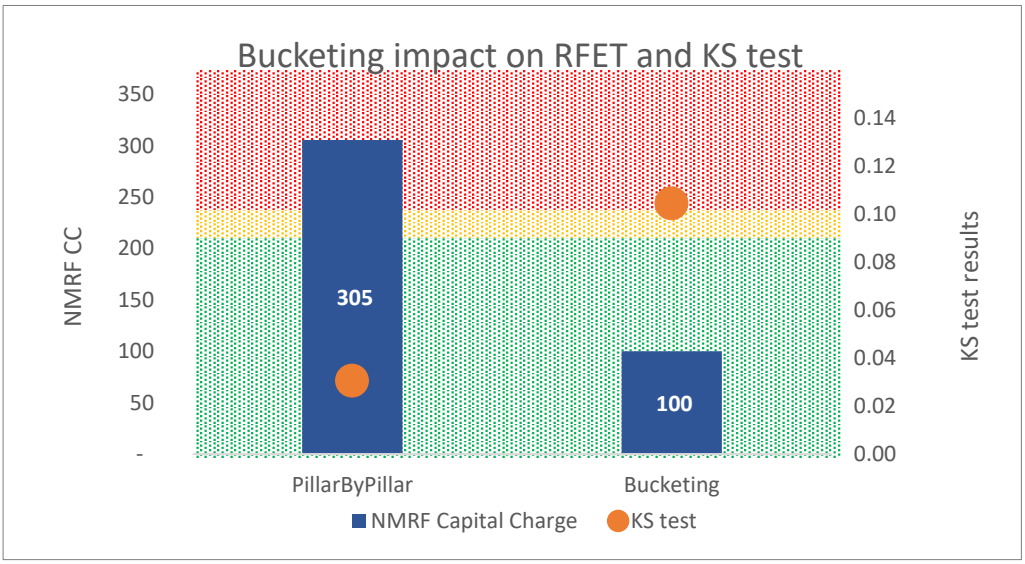

Fig. 9 - Impact of the Risk Factor bucketing on the capital charge and the Kolmogorov-Smirnov P&L attribution test

Considering the maximum granularity approach into RFET, the number of Risk Factors deemed Non-Modellable is 31% higher than the case in which a bucketing definition is applied and this leads to an increase of NMRF Capital Charge by 3 times. On the other hand, binding the shocks to be parallel within every bucket severely affects the P&L attribution metrics (i.e. the Kolmogorov-Smirnov test, the Spearman Test and the Chi-Square Test), hampering the chances to gain internal model eligibility.

In particular:

- Unexplained P&L (calculated as the difference between RTPL and HPL, divided by HPL) grows from 7.73% to 17.65%.
- Spearman metric plummets from 98.2% to under 69.1% (Thresholds: red zone under 75%, amber zone from 75% to 82.5%; green zone over 82.5%). See ***Figure 8***.
- KS metric raises from 0.03 to over 0.104 (Thresholds: red zone over 0.095, amber zone from 0.095 to 0.083; green zone under 0.083). See ***Figure 9***.

Therefore, as expected, in the Alternative 1 there is a clear trade-off between RTEF and PLA test and this makes not doable, unless the Bank unlink bucketing definition between the aforementioned tests.

Deeper analysis of Alternative 1 – Focus on domestic market and fallback solution

In order to avoid an overly burdensome NMRF capital requirement, the Bank retains that a fallback solution is more suitable. For example, the Bank believes that, by definition, IR domestic curves should be entirely modellable and this treatment should be extended also for the major currencies (i.e. USD, GBP). This proposal is based on the following reasons:

- These Risk Factors, both in IMA and in SBA, have a sort of *preferential treatment* since a higher degree of liquidity is recognized (i.e. due to barrier-free access to domestic Capital Market);
- The proposed approach fosters the level playing field, since medium-sized institutions not always trade each tenor of the curve and this could introduce distortions among players of different size;
- Since domestic IR curves have a significant impact in the institutions activities, banks are forced to retrieve these data from Vendors if they are deemed Non-Modellable, adding other costs to IMA implementation.

For these reasons, the Bank believes that the proposed approach should also be applied in the Modellability Assessment Framework.

To evaluate the impact of this assumption the Bank performed a real example where the Bank focused on a sample desk of linear plain vanilla IR instruments and considered as Non-Modellable only a subset of domestic IR curves[7]. In the following example, few assumptions were made:

- The IMCC component does not exclude NMRFs and is comprehensive of 1.5 regulatory multiplier;
- The SBA component is based on the old Risk Weight definition. The Bank is considering a linear plain IR desk and RRAO component could be approximated to zero.

The chart below outlines the effect in terms of Capital Charge:

[7] The scenario of future shock applied to Non-Modellable Risk Factors is determined according to paragraph 4.8.2 of EBA/DP/2017/04.

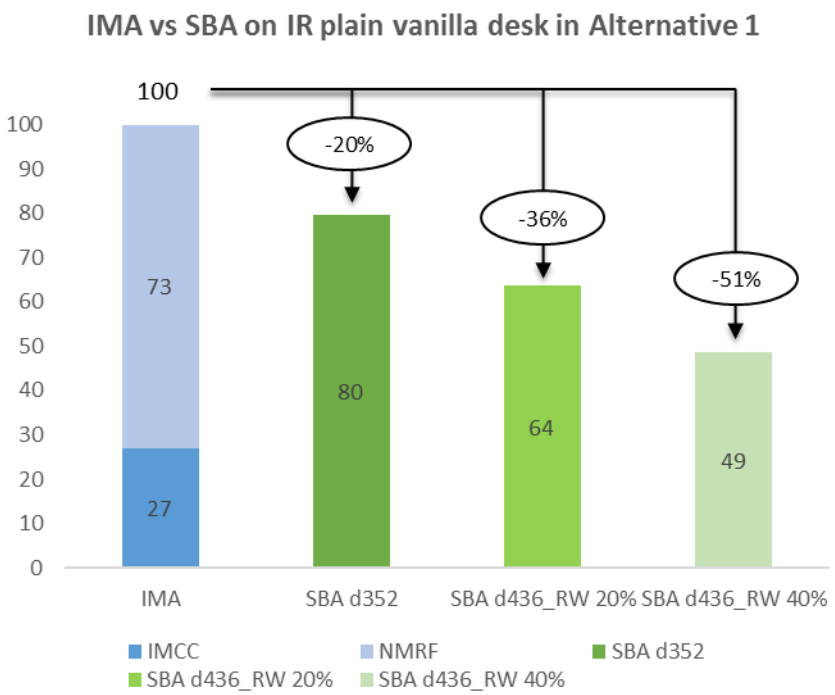

Fig. 10 - Impact of the NMRF component on Capital Charge

The constraints on RFET are too binding and lead to an unsustainable IMA Capital Charge: in fact, if the Bank considers the domestic IR curves modellable – the Internal Model Capital Charge would be 3.7 times lower. This impact is even more evident if the Bank compares the Internal Model Approach capital Charge with the one requested in the standard context: the latter is about 20% lower than the former and this implies that, **under Alternative 1, institutions are incentivized to capitalize under SBA** (particularly with the new RW reduction proposed in CP d436).

Impact of bucketing definition on NMRF Capital Charge on both Alternative 1 and Alternative 2

According to methodology illustrated in the article 253 of the Discussion Paper (EBA/DP/2017/04), the Bank has investigated the impact on the capital charge focusing, also in this example, a sample market making portfolio of linear IR plain vanilla instruments and considering as Non-Modellable Risk Factor the *Forward Euribor 1M* interest rate curve. Applying the Alternative 1 ("*Single Term*" approach with bank's specific buckets) the Bank has seen that the impact on the capital requirement represents the worst outcome ever possible, since the resulting add-on to capital charge is by far larger than the IMA Expected Shortfall capital requirement (total capital charge is 20 times IMA Expected Shortfall charge computed on a standalone basis). On the other hand, applying the alternative 2 "*SBA Bucketing*" the Bank has a **lower impact** on the capital charge measure multiplier. Results are summarized in below table.

Time interval: Stress period 2011-2012		Stress/IMA Ratio ADD ON
No Proxy	Single Term Euribor 1M	x 16
	SBA Bucketing Euribor 1M	x 9
	ISP Bucketing Proposal Euribor 1M	x 8
Proxy	Single Term Base Euribor 1M-6M	x 4
	SBA Bucketing Base Euribor 1M-6M	x 1
	ISP Bucketing Proposal Base Euribor 1M-6M	x 0.8

Data in mln € - IMA Expected Shortfall Charge is 2 mln €

From the example above is clear that to avoid an excessively punitive Capital Charge – which incentivizes banks to capitalize under SBA – the bucketing definition should not be the same in NMRF and PLA context. On the other hand, the second alternative proposed by the Committee is too static, defining a *one-size fits all* approach. The Bank believe that between the two alternatives, the one based on standard buckets is more suitable, even if the first best would be that the Regulator allows banks to use a dynamic bucketing definition based on their Risk Factors structure.

For example, different Risk Factors belonging to the same asset class (i.e. IR curves) could have different features (i.e. liquidity) and so a one-size fits all approaches could not be capable to describe a Risk Factor properly. Hence, the Bank proposes that institutions, starting from a standard bucket approach, should have the flexibility to change the definition based on a prescribed statistics test metrics.

Assuming alternative 2 as a benchmark solution for bucketing, it could make sense to think about a simple variant of the alternative under discussion, which allows banks to define their own Risk Factors bucketing, under the assumption that no loss of data explained occurs with respect to the SBA bucketing. The bank internal bucketing structure must have a variance explained greater or equal to the one calculated from the SBA bucketing (no loss of data variance). In particular, a practical methodology as the Principal Component Analysis (PCA) can be used in order to choose representative solutions in terms of internal bucketing approach, without loss of information respect to the static SBA proposal. Alternatively, some statistical indicators, such as intra-bucket correlations, can be measured to define a bank-specific bucketing structure.

2.2.3 Impact of the NMRF framework on seasonal markets

As widely observed from market participants, seasonal effects have a significant impact on the number of Risk Factors passing the RFET, since there are clear seasonal changes in trading activities that influence the outcome of the 30-day gap rule. In particular, seasonality exists across all asset classes with periods of limited activity peculiar for particular markets, such as commodity market, or simply due to summer and year-end holidays. This means that many Risk Factors, even if liquid based on the number of observations, still result Non-Modellable due to seasonality effect (that is, failure of the 30-day gap rule rather than 24-real observations rule).

In order to highlight the materiality of these concerns, the figure below shows the modellability test on a real traded curve. The dataset covers period March 2017 - March 2018 and it does not contain pooled data. The figure clearly shows that some seemingly liquid risk factors results non-modellable

according to the RFET with the "one-month gap" rule, even though they would commonly be deemed liquid, such as 6M, 1Y and 30Y.

RPOs on real traded curve (as of 29 March 2018)

Bucket	6M	1Y	3Y	5Y	10Y	20Y	30Y
One-month gap (dd)	97*	73**	14	7	12	27	74***
Annual deal	125	137	743	1212	1609	1290	130

* Higher gap between 10 **August** and 15 **November**
** Higher gap between 29 **August** and 10 **November**
*** Higher gap between 7 **July** and 19 **September**

Fig. 11 – Evidence of Seasonality impact on RFET

As shown in the example above, there is a clear asymmetry between the two modellability criteria, since the 30-days gap rule is more restrictive than the 24-obervations rule. For this reason, the Bank believes that in this framework, new proposals to address the seasonality issue, without weakening the modellability test, should be drawn up.

The Bank agrees with the Industry (ISDA Working Group), which proposes two different alternatives:

- At least 3 observations in any 90 day period
- At least 4 observations in any 90 day period

These assumptions are substantially similar to the 24-observation rule and, in addition, the largest gap will lead to increase the number of Risk Factors deemed modellable, since it relaxes the most constraining rule. This is clear in the example above, in fact applying the "3 in 90" alternative gap rule both 1Y and 30Y buckets would become modellable.

2.2.4 Impact of NMRF idiosyncratic equity risk

As specified in the BCBS Final Text, capital requirements for NMRFs are calculated by aggregating the stress losses without recognition of diversification benefits. However, the regulator, in order to avoid disproportionately high capital requirement for idiosyncratic credit Risk Factors, defines an alternative aggregation formula. Since financial Industry expects a considerable number of Risk Factors to be Non-Modellable both for credit and equity, in this Consultation Paper the Committee proposes to apply the same treatment for the equity Risk Factors.

From the Bank's point of view, since most of the Risk Factor to be capitalized under NMRF are idiosyncratic – the hypothesis of full correlation appears extremely conservative – the proposal to have both equity and credit aggregated under the assumption of zero correlation is agreeable. In order to assess this proposal, the Bank has investigated the impact on the NMRF Capital Requirement of an Equity Trading desk, considering as Non-Modellable a sample of more impactful EQ volatility Risk Factors.

Results are summarized in the chart below:

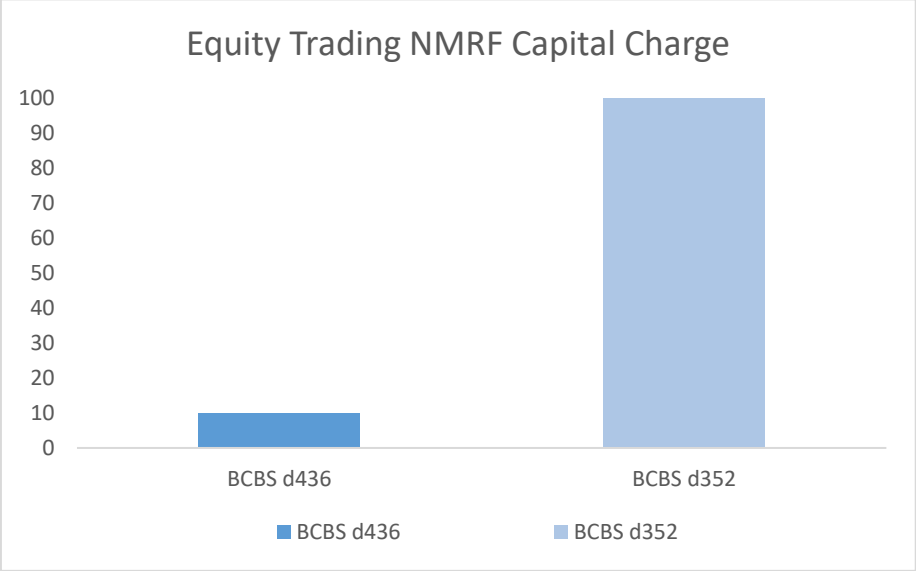

Fig. 12 - Impact of the Idiosyncratic Equity Risk Factor

As stated above, the assumption of full correlation among Risk Factor is overly conservative and hence leads to a NMRF Capital Charge excessively burdensome. On the other hand, the recognition of diversification benefits also for idiosyncratic Equity Risk Factors is more suitable. The chart above shows that, even when using the square-root-sum-of-squares approach and therefore reducing the capital requirement of 90% with respect to the Final Text (d352) aggregation formula, an adequate Capital Charge on portfolio level is ensured.

2.2.5 Conclusions

As provided by the evidences in this document, the Bank strongly supports the decoupling of PLA and NMRF.

Among the two alternatives the Bank prefers the alternative 2 with the possibility of customizing the buckets, with the burden of proving that the customized buckets have greater explanatory power than the SBA ones.

The domestic curves should be exempted from RFET.

Due to the intrinsic nature of financial markets, there are clear seasonal changes in trading activities that influence the outcome of the 30-day gap rule and therefore a revision of criteria for the modellability assessment is welcome in order to increase the number of Risk Factors passing the RFET.

Finally, since the Bank expects a significant number of Risk Factors to be Non-Modellable for both credit and equity, the Bank believes the revision of the capitalization formula by considering the square-root-sum-of-squares approach also for EQ is more suitable than the current framework.

3. Scope of market risk capital requirements

3.1 Treatment of structural FX positions

3.1.1 Introduction

The Consultative Document proposed many revisions to the treatment of the structural FX position clarifying the definition of the corresponding perimeter that could be excluded from the computation of the "net open currency positions".

The Bank welcomes new proposed changes to paragraph 4 of the Basel II framework and supports most of the views introduced by the Committee to address gaps existing in the current framework.

The Bank agrees that a matched currency risk position will not necessarily protect the Bank's capital ratio against the adverse movements in exchange risk, because it depends also on other factors (like reserves, taxes, etc…). The Bank strongly supports the Committee proposal to allow banks to protect the capital ratio by running a structural FX position that could be excluded from the open net foreign exchange position computation.

However, the Bank wants to underline some concerns on the perimeter exclusions principles and the related treatment of the structural FX positions.

3.1.2 FX perimeter exclusion

As reported above, the structural FX position exclusion is based on the banks' needs to protect their capital ratio to the adverse movements of foreign currencies. For this purpose, the consequent banks' strategies on FX risk management could take into account different kind of positions depending on its portfolio composition, investments structures and capital ratio targets.

The definition of the structural FX position is the result of the overall foreign net open position computation and could be composed by different kinds of instruments.

In addition to the Committee's proposal, the structural FX position could be composed also by all other kinds of FX positions useful to reduce the sensitivities of bank's capital ratio (i.e. Derivatives, bonds, etc…).

The Bank suggests the integration of paragraph 4, letter (b).

Finally, in line with the principle underline on letter (a) the Bank invites to modify the paragraph 4, letter (c) as follow: "*The exclusion is limited to the amount of the risk position that neutralizes* ***or partially neutralizes*** *the sensitivity of the capital ratio to movements in exchange rates*".

3.1.3 Limits to structural FX position exclusion

The Committee proposed specifics limitations to the treatment of the structural FX position by:

- letters (d) and (f) that impose the exclusion for "at least 6 months" and extend it to related hedge "remaining in place for the life of the assets or other items";
- also striking a pre-approval process on letter (e).

These rules limit Bank's FX strategy and efficient management of capital ratio sensitivities to foreign currency movements. The variability of structural FX position arises from either new investments or markets movements, in line with principle defined in the general Bank's structural FX strategies.

For these reasons the Bank invites the Committee to review the two paragraph (d) and (f) in order to guarantee more flexibility on structural FX management.

Finally, for the same reason exposed above, the Bank considers strongly limiting the pre-approval of the structural FX positions with all the eventually following changes.

The Bank asks for the revision of the paragraph 4, letter (e) with the elimination of "*structural FX position and any changes in its position*" and the introduction of the notion of "*Policy on Bank's structural FX management and related management of capital ratio*" pre-approval, that guarantees to banks an adequate flexibility on the efficient structural FX risk management.

3.2 Boundary between the Trading Book and the Banking Book

The introduction of a 'presumption list' is an element of excessive rigidity that does not consider the possibility of exceptional circumstances aside from changes in accounting standards and limits the ability of banks to move instruments between banking and trading book which is strictly prohibited and subject to a rigid supervisor's authorization. The Bank believes that the concept of 'trading intent' should still be the fundamental factor for designing the classification of an instrument.

After the first designation, the 'trading intent' might be reviewed as a consequence of certain circumstances like changes in business model or market liquidity. A more flexible framework should allow institutions to manage reclassification as a consequence of material liquidity shocks (e.g. listing or delisting events).

3.2.1 Equity Investments on Funds

The CP introduces three conditions to allow their classification in the Trading Book. In the Bank's view, trading intent should be the main designation driver. Where the look-through is not available the presence of daily NAV prices would be sufficient for IMA inclusion; the classification might be supported by the evidence of Funds Mandate, and the daily variability is ensured by daily NAV.

3.2.2 Internal Risk Transfer

The Bank would like to stress the review of the Internal Risk Transfer and the regulator's attempt to set a strong and objective boundary in order to avoid regulatory arbitrage.

The Bank recommends a less rigid approach on the Banking – Trading book classification, especially for the hedging instruments that support the activities of Treasury, Funding and Asset-Liability Management Departments.

Moreover, it should be straightforward to allow the same classification for the hedged item and the hedging instruments. This would avoid the hedged item and hedging instrument classification in different books.

4. Comments on the proposed additional Annex D

According to **Principle 4** institutions are required to compare data used with real price observed and/or quoted in the market. The principle does not take into account that RPOs incorporate "noises" such as timing, bid-ask spread, XVAs, CSA impacts, etc. These distortions impact level and volatility of each price as well as correlations across prices. The Bank suggests removing **Principle 4**.

Principle 6 states that risk factors are not eligible to the reduced set, unless they have full history, including the stressed period. Regardless the parameterization of the bank internal model, the principle prevents bank modelling of proxies and basis, even if a conservative approach is in place.
Data representativeness of observed/quoted prices can be assessed on the current window (see the modellability assessment).
As for the stressed period, a fallback approach must be allowed in order to include the possibility to model new market segments/products.
Nowadays financial institutions models include, without losing information, some risk factors that during the stressed period did not exist (see CDS case) or were defined in a dramatically different way (for instance, the risk-free - Euribor versus OIS basis - or shifted interest rate volatility surface).
Given the required complexity of front office models, the strictness of the PLA test, and the highly punitive NMRF treatment, the **Principle 6** simply increases costs, without improving accuracy or prudential features of the model.
The Bank urges the Committee to allow more discretion and flexibility to banks in modelling stressed period proxies and basis, and capitalizing them without forcing the prohibitive NMRF charge. The Bank would suggest to either better specify the additional set of requirements for a risk factor to be eligible to the reduced set or to definitively remove **Principle 6**.

5. Further considerations

5.1 Default Risk Charge (DRC)

The Bank supports the Industry position that recommends removing the 3 basis point floor for the Probability of Default for Sovereigns.