

7 September 2012

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Basel Committee on Banking Supervision  
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Sent by email to: [baselcommittee@bis.org](mailto:baselcommittee@bis.org)

**Consultative Document: Fundamental review of the trading book<sup>1</sup>**

Dear Mr. Adkins and Ms. Barger,

This letter contains the response of Nomura Holdings, Inc. ("Nomura") to the Basel Committee on Banking Supervision ("BCBS") Consultative Document *Fundamental Review of the Trading Book* dated May 2012 ("Fundamental Review" or "FTRB").

Nomura is pleased to have the opportunity to comment on the Fundamental Review, and to meet with the Basel Committee's Trading Book Group ("TBG") in Washington in June 2012 and in Frankfurt in August 2012.

We hope to continue this productive dialogue and are committed to support the TBG's efforts of refining the FRTB proposals.

Yours sincerely,



Eduardo Epperlein

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cc: Japan Financial Services Agency

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<sup>1</sup> Basel Committee on Banking Supervision, May 2012

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## 1. Summary & Overview

Overall, we welcome the publication of FRTB and the many of the objectives set out in it, in particular:

- The desire of regulators to create a more consistent framework, eliminating some of the double and triple counts under the Basel 2.5 framework.
- Recognition of liquidity as an important factor in determining risk and capital requirements
- The goal of revising the standardized rules, to make them more risk sensitive and having less of a gulf between internal models capital and that from Standard Rules.
- Use of Expected Shortfall (ES), if other components of the framework such as e.g. confidence level and multiplier can be recalibrated appropriately.

We would also like to highlight some specific areas of concern, however, including:

- The proposed approach to apply stress add-ons for 'non-modellable' risk factors with no diversification benefit may lead to an unbalanced Trading Book capital charge, dominated by relatively immaterial risks
- Given the clear move towards more regulatory control of internal models, what does this mean for the 'use test', and how will this align to backtesting results.
- We believe the proposal to use a floor based on standardized rules is undesirable, as it will create a break between incentives for risk management and capital requirements, as we already see to some extent under CRM.
- We believe the proposed approach to limit hedging and diversification benefit under the internal models approach has several technical limitations, which would make it very difficult to implement in practice.

## 2. Trading Book/Banking Book Boundary

*"Which boundary option do you believe would best address the weaknesses identified with the current boundary, whilst meeting the Committee's objectives?"*

As a broker/dealer, we currently apply mark-to-market accounting and Trading Book capital treatment to a large proportion of the assets on our balance sheet, and hence the use of a valuation-based boundary would be acceptable to us.

However we understand that other firms, with a different business model, may find this challenging. If an evidence-based boundary is applied, we would ask that regulators consider carefully how banks can reasonably demonstrate 'trading intent', which may be a somewhat subjective criterion. Also, where a firm has assets which are not held for Trading, but may be hedged or otherwise co-managed with Trading-type products (e.g. corporate loans hedged by credit default swaps); these should be in the same Book for regulatory capital calculation.

## 3. Liquidity Risk

*“What are commenters’ views on the likely operational constraints with the Committee’s proposed approach to capturing market liquidity risk and how might these be best overcome?”*

Nomura welcome the introduction of liquidity as a factor in the calibration of market risk capital requirements, which we see as more risk sensitive than the current ‘one-size-fits-all’ calculation based on 3x 10-day VaR and Stress VaR. Approach (1) outlined in the FRTB – i.e. assigning a different liquidity horizon to different portfolios – is in fact the same approach currently used by Nomura<sup>2</sup> to compute Economic Capital. The Nomura approach relies on risk manager expert opinion, guided by specified guidelines, to determine the liquidity horizons for each portfolio.

While we believe this approach is robust, we recognise that regulators may prefer to prescribe fixed buckets according to risk type, rather than relying on banks own judgmental view. This choice will not however affect the mathematical formulation of the model, which we hope gives regulators comfort that approach (1) is feasible to implement in practice, and would be happy to present the details of how we have implemented this to the JFSA and/or Basel Committee. In prescribing liquidity buckets, it will be important to allow for longer holding periods for liquid products/risk factors (e.g. CDS indexes) which act as hedges to less liquid products (e.g. exotic credit derivatives or corporate loans). That is to say, regulators should apply floors on liquidity, but not caps.

The proposed alternative approach to capitalizing liquidity risk – an add-on based on jumps in liquidity premia – is conceptually appealing, and in some sense equivalent to the previous approach: we can either extend the risk horizon and not pay a liquidity premium, or keep the risk horizon relatively short, and pay an additional cost to liquidate positions. However this method would in effect require a separate, new model for liquidity premia, and hence seems more challenging to implement and supervise – how could it be calibrated for exotic (and hence illiquid) product types, and what correlation structure would be applied where we have offsetting positions in similar but non-identical illiquid instruments? For this reason we would recommend the former approach to capture liquidity risk.

## 4. Standard Rules

*“Which of the two approaches better meets the Committee’s objectives for a revised standardised approach?”*

*“What are commenters’ views on the proposed regime to strengthen the relationship between the standardised and internal models-based approaches?”*

In general we support the objective of recalibrating the standardized rules for market risk, in order to make these more risk sensitive and shrink the gap between capital requirement under internal models and under standard rules. Of the two approaches discussed in FRTB, the ‘fuller risk factor approach’ based on factor sensitivities seems more aligned to an internal models approach and would therefore be our preferred approach, as it would be more risk sensitive and relatively simple to implement (since it is based on the same sensitivity inputs as VaR/ES, but without the need for a model of market outcomes).

Regarding the use of the standard rules result, we are very concerned about the suggestion in section 3.5.3 of the FRTB to apply a floor based on Standard Rules. Such an approach is currently

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<sup>2</sup> We also understand that other banks apply a similar approach for their EC model

implemented for CRM, and has the effect that when the floor is binding, risk reduction<sup>3</sup> by the business often has no impact on the capital requirement, or may even lead to higher regulatory capital. Such a conflicting set of incentives between risk management and capital management makes it more difficult for risk to communicate with FO the need to hedge or otherwise de-risk a portfolio, where this will not lead to a reduction in allocated capital usage, which is an increasingly important constraint in assessing business performance.

For this reason using the standardised capital charge as a reporting benchmark, or as a surcharge/fallback where the regulator feels the model performance is not adequate, is much preferable to applying a floor. Moreover the additional degree of prescription in FRTB and enhanced standards of model approval would in our view reduce the need for floors on the model-based capital.

## 5. Model Approval Process

*“What are commenters’ views on the Committee’s proposed desk-level approach to achieve a more granular model approval process, including the implementation of this approach for banking book risk positions? Are there alternative classifications that might deliver the same objective?”*

Regarding the proposed model approval process outlined in FRTB, we are very concerned about the proposal to aggregate ‘non-modellable risk factors’ into capital on a simple sum basis. Combined with the stringent proposals on the availability of ‘real’ and ‘continuously available’ prices, we expect that this could lead to Trading Book capital being dominated by non-modellable risks, the omission of which would have already been shown by desk level backtesting not to materially affect the accuracy of the model. To avoid such a skewed outcome, we would strongly suggest that ‘non-modellable risks’ can be diversified against other risks, if a firm can demonstrate this to the satisfaction of their supervisor.

The FRTB expresses a desire to make the model approval process more granular, in order to avoid the extreme sensitivity of capital requirements under an ‘all-or-nothing’ approach to model approval. While we think this more gradual approach makes sense, we would strongly advocate that non-approved products/desks can still be included in an internal model (plus a standardised charge, to reflect their lack of model approval), to having ‘split hedges<sup>4</sup>’ between approved and unapproved products, which can create uneconomic and volatile model-based capital requirements.

One of the key questions which arises from the FRTB is around the ‘use test’, i.e. the regulatory requirement that internal models are also used in the firms’ risk management process. Given the much greater degree of regulatory intervention in internal models which is implied by FRTB, it is not clear how the use test will be applied in future. For example, if a firm believes that the correlations or liquidity horizons specified by a regulator are not reasonable, would it be forced to use them for internal risk management, or would it be acceptable to deviate and still pass the use test (and if it is not acceptable to deviate, will this not create a risk from having all firms using the same model)? While such an issue already happens to some extent under Basel 2.5 (where firms may try to correct for some perceived double counts of risk in the regulatory rules), but likely to be exacerbated by FRTB, and we believe there is a need for clear guidance from regulators on this point.

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<sup>3</sup> We assume that, even under a calibrated set of rules, Standard Rules are likely to be much less risk sensitive than an Internal Model-based calculation.

<sup>4</sup> i.e. two trades which hedge each other economically and are risk managed as such, but where only one is included in the risk model leading to an unrealistic output.

A similar issue arises with regard to backtesting – should backtesting be conducted against the ‘capital model’ (i.e. using regulator specified correlations, liquidity horizons, stress period, etc) or against the bank’s own internal model or risk? If the former, what action will be taken if a backtesting exception occurs due to a problem with the regulatory specified parameters? If the latter, will backtesting exceptions necessarily be seen as indicative of a model weakness, if the exception is due to (e.g.) illiquidity, which is explicitly capitalized by the regulatory set parameter?

## 6. Stress Calibration

*“What are commenters’ views on the merits of the “direct” and “indirect” approaches to deliver the Committee’s objectives of calibrating the framework to a period of significant financial stress?”*

We generally support the idea of using stress calibration to determine capital requirements, subject to the comments above about how the ‘use test’ will be applied.

Regarding the proposed alternatives in FRTB, we believe that a direct calibration to a stress period may be difficult due to unavailability of historic data for ‘new’ risk factors, especially if and when the stress period recedes further into history.

## 7. Hedging & Diversification

*“What are commenters’ views on the merits of the desk-based and risk-factor-based aggregation mechanisms to deliver the Committee’s objectives of constraining diversification benefits?”*

We understand that regulators are concerned about excessive diversification in Value at Risk (“VaR”) or Expected Shortfall (“ES”) models, but see several technical challenges with the proposed approach<sup>5</sup>. We believe that an internal model incorporating full diversification but appropriately calibrated to stress conditions (and satisfying the enhanced validation standards outlined in FRTB) offers a better approach for cross risk-diversification, eliminating the issues described above and linking capital more closely to firm’s internal risk management processes.

Challenges in implementing the proposed approach include

1. The formula specified in Equation 1 (Section 4.5.6) of the FRTB requires firms and/or regulators to determine whether a category of risk is ‘long’ or ‘short’. It is not clear how this could be done in practice, given a complex portfolio which may be subject to range of complex risk factors - see examples below
2. The proposed approach requires risk factors to be classified by risk type. This may be clear for most risk factors, but in some cases the allocation would be ambiguous – for example, should local currency sovereign bond yields be classed as interest rate risk (as they will often be classified for risk management purposes on non-distressed sovereigns) or credit risk (as would seem to be implied by recent guidance on IRC models)? Under the proposed approach, such judgmental classification could have material impact on capital held by a firm, for example by effectively disallowing the hedging of swaps (interest rate risk) with local currency sovereign bonds (possibly classed as credit risk).

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<sup>5</sup> In the chapter we repeat the points made in the ISDA letter to the Basel Committee, as this section of the ISDA paper was drafted by Nomura.

3. Under the proposed approach we may see examples<sup>6</sup> of portfolio risk failing to be sub-additive, i.e. where  $\text{Capital}(X) + \text{Capital}(Y) < \text{Capital}(X+Y)$ . By replacing VaR with ES as a risk metric the FRTB would eliminate one potential reason for this undesirable effect, so it seems unfortunate if this is re-introduced via the diversification framework.
4. It is not clear how cross-risk calibrations could be calibrated – the true correlation between potential losses in different risk types will depend heavily on the portfolio composition – see example below. Whichever values are chosen would then imply optimal portfolio weights/hedge ratios to minimize total capital – is it desirable for regulators to pre-specify these weights, regardless of portfolio composition?
5. A maximally conservative result could of course be achieved by simply taking the sum of each risk category. However this would create the perverse incentive for firms to take risk in concentrated risk categories (within which diversification can be modelled by firms), rather than a diversified business model.

If, despite the additional controls proposed in the Fundamental Review, regulators are not confident in the level of diversification implied by internal models, an alternative is to compute the ‘diversification benefit’, defined as the sum of standalone risk by category, minus the fully diversified risk value. Capital could then be set as the sum of the standalone values, less some proportion  $\alpha$  of the diversification benefit. Using the notation of the Fundamental Review,

$$\text{Capital} = \sum_{i=1}^N \text{IMCC}(C_i) \times (1 - \alpha) + \text{IMCC}(C) \times \alpha$$

where  $\alpha$  would be a factor between 1 and 0 set by supervisors according to their view on the quality of a firm’s model of diversification. This would be a more natural approach since it does not seek to specify a hard-to-calibrate set of cross-risk correlation factors and long/short classification of portfolios, but instead uses a risk-sensitive portfolio model, with a limit on correlation benefit. This would still require some categorisation of risk types, but is seen as preferable to the approach proposed in Equation 1 of the Fundamental Review.

If an approach based on a prescribed set of correlations must be adopted, it is preferable that this be based on risk factors rather than trading units, as correlations between the former would be somewhat more stable than between the latter, although subject to the multiple technical issues outlined above.

Specific examples of why long/short categorizations may not work:

Example 1: suppose a firm has a \$100 long equity position in stock A and \$75 short position in stock B. Presumably this would be a ‘long’ portfolio due to net \$25 long position, but what if stock B is twice as volatile as stock A, or has higher systemic risk? Is this portfolio ‘long or ‘short’? Should we also take into account difference in the correlation of the stocks to systemic risk (i.e. compute beta), and if so how is systemic risk defined?

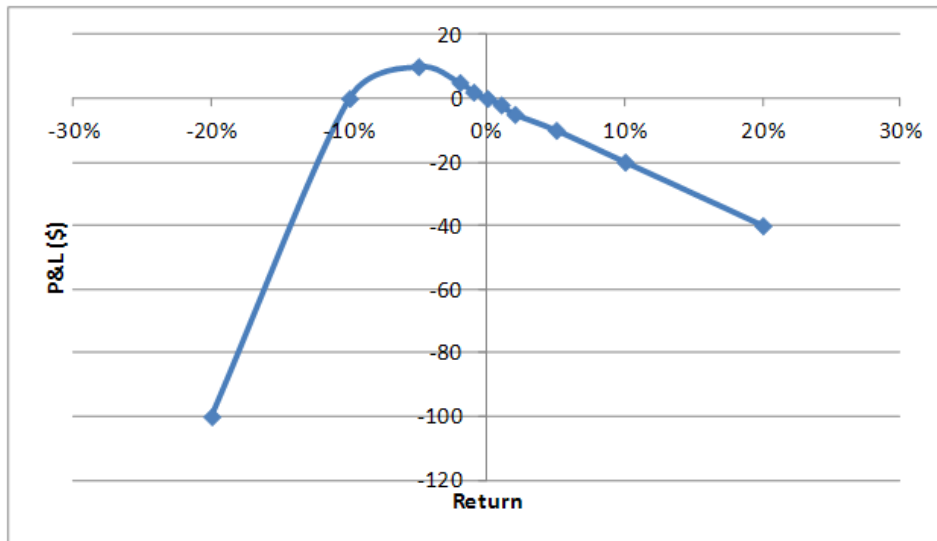
Example 2: suppose a firm is trading basis risk between two stocks, and holds a sell protection position in stock A with value \$100, and a bought protection position in another similar stock B with value -\$98. Presumably this would be considered as a ‘long’ position,

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<sup>6</sup> See Marinescu & Piterbarg (2012), ‘On the non-coherence property of the aggregate models-based regulatory capital formula’, *Barclays Capital technical note*.

even though the key risk to this portfolio is clearly the basis between the two stocks rather than directional market moves. If the firm makes a small change to its exposure to have -\$101 position in stock B, the portfolio would flip from 'long' to 'short', with possibly large capital impact, even though the risk exposure (around \$100 exposure to basis risk between the stocks) has hardly changed.

Example 3: suppose the firm holds a position in a derivative which results in the exposure profile shown below – a loss if asset prices rise, a gain if asset prices fall a little, and a large loss if asset prices fall a lot. How could firms decide if this portfolio should be considered as 'long' or 'short'?



#### Example of difficulty in calibrating cross risk correlations

To illustrate how the correlation between risk categories could depend on portfolio composition in a complex way, consider the correlation between the 'equity' and 'interest rate' categories. For spot prices we expect the correlation to be quite low, and this is what we see in the below example – correlation of 10-days changes in S&P500 and 3m USD LIBOR during the 2008-09 stress period is just -6%. This may lead one to set a low correlation between the Equity and Interest Rate risk classes, reflecting the diversification one would usually expect to see. But, the correlation between changes in implied volatility risk could be much greater – as shown below, the correlation between changes in equity implied volatility ("vol<sup>7</sup>") and interest rate implied vol<sup>8</sup> over the same period is much higher. So while 'most' interest rate portfolios will have low correlation to equity portfolios, even in a stress, this would not be conservative for two portfolios driven by vega risk.

<sup>7</sup> 3 month ATM implied vol on S&P 500

<sup>8</sup> 3 month – 3 month EUR caplet implied vol



### Correlation of 10-day changes, 2008-2009

	S&P 500 spot	S&P 500 3M ATM implied vol	3M EUR LIBOR spot	3M-3M EUR LIBOR implied vol
S&P 500 spot	100%	-72%	-6%	-46%
S&P 500 3M ATM implied vol		100%	20%	51%
3M EUR LIBOR spot			100%	46%
3M-3M EUR LIBOR implied vol				100%

## 8. Expected Shortfall

*“What are the likely operational constraints with moving from VaR to ES, including any challenges in delivering robust backtesting, and how might these be best overcome?”*

The FRTB paper introduces the concept of Expected Shortfall (ES) as the risk measure for Trading Book capital, in contrast the quantile. We broadly welcome this change as technical improvement which may enhance the capture of tail risk and ensure sub-additivity of risk<sup>9</sup>, although would caution that the most challenging aspect of risk modelling is to fully capture tail events in the model, not to select the risk measure! Also, the definition of ES is a little less intuitive than VaR, which may create some difficulty in communicating model results to a less technical audience.

If ES is adopted for regulatory capital calculation, the percentile should be chosen carefully to ensure that the output is reasonably stable, whilst still capturing the tail events which capital is required to protect against – 95% confidence, say, may be reasonable. Moreover, if ES is used to cover tail events, in conjunction with a stressed calibration of the risk model and illiquid positions, the ‘3 multiplier’ applied to VaR at present should be revised and potentially removed, on the basis that it is place to cover illiquidity, stress markets and tail events, all which would be captured more effectively by the revised internal model.

Regarding backtesting, we believe that while this would be somewhat more complex using ES, there are a range of statistical techniques available to do so<sup>10</sup>, and indeed firms already apply such techniques to backtest EPE as part of the IMM-approval process. In this case, however, the definition of an ‘exception’ would become less clear-cut, and hence the current requirements from some regulators to report backtesting exceptions on a T+2 basis may need to be revised. If regulators are keen to keep a highly responsive test in place, one option could be to retain the current requirement

<sup>9</sup> Although the lack of sub-additivity of VaR has been widely documented in the academic literature, see for example (Acerbi & Tasche, 2001); in practice it is very rare to see this condition violated for real Trading portfolios.

<sup>10</sup> See for example Pearson’s Q test, which examines the predictive power of the model in the tail region, as described in Campbell 2005, ‘A Review of Backtesting & Backtesting Procedures’, Federal Reserve Board.

to report exceptions on 1-day 99% VaR, supplemented with more sophisticated but less frequent testing of the capital metric itself.

## 9. Market Risk and Credit Risk modelling

*“How can regulators ensure robust supervision of integrated market and credit risk modelling? In particular, how would an integrated modelling approach affect other elements of the proposed framework (eg the choice of the quantile parameter for ES, the P&L attribution and backtesting processes, etc)”*

We believe that it is possible to consistently model credit risk events with a relatively small adjustment to the Basel 2.5 framework, specifically:

- Eliminate the requirement for spread risk to be covered in IRC, as this is covered by the VaR/ES model
- Remove CRM carve out, and permit correlation products to be included in the VaR/ES model, subject to the usual requirements for calibration data and appropriate capture of non-linear exposures and market illiquidity.

Default risk (which is exceptional, since by definition it will not have occurred in the historic period used to calibrate the VaR/ES model) could then be modelled using an IRC-style credit risk model, techniques for which are well developed.

## 10. Other Comments

One aspect of Trading Book capital which is briefly discussed in FRTB is CVA. We fully support the BCBS desire to have a coherent and consistent framework, and for this reason we would strongly advocate the inclusion of CVA risk capital within the scope of the FRTB, as this risk is modelled and managed by Nomura (and other firms) in conjunction with Trading Book positions. Applying a carve out for CVA, and restricting CVA risk to credit spread risk only, goes against the objective of having a comprehensive framework.