BANCO DE ESPAÑA
Directorate General Banking Supervision

AUTHORISATION APPLICATION FILE FOR INTERNAL MODELS TO BE USED TO CALCULATE MINIMUM CAPITAL REQUIREMENTS FOR POSITION RISK ON TRADING BOOK, COMMODITY, FOREIGN EXCHANGE AND/OR GOLD POSITIONS

Pursuant to Section 2 of Rule thirty-eight of Banco de España Circular 5/1993 of 26 March 1993, amended by Circular 3/2003 of 24 June 2003, consolidable groups of financial institutions wishing to use internal models to calculate minimum capital requirements for position risk on trading book, commodity, foreign exchange and/or gold positions must submit an application for authorisation to the Banco de España inspection service (see model letter in Annex 1) accompanied by a report which, as specified in this file, describes the model developed by the "Institution" and the risk management control system established and accredits compliance with the quantitative and qualitative requirements set out in Rule thirty-nine.

The application must clearly define and justify the scope of application of the model or models the approval of which is requested, both in relation to the risks and in relation to the institutions of the consolidable group covered by them.

The application must expressly state that the internal calculation model whose conformity the Banco de España inspection service is requested to verify forms part of an integrated market risk measurement, management and control system which is applied effectively and consistently in the daily management of this risk.

In providing the information required, regard must be had to the following:

1. An application file must be completed for the full scope to which the application refers. However, if, within the requested scope, various internal market risk models coexist with distinct features (either in different institutions of the group or for different risk categories in a single institution), the relevant sections must be duplicated in order to complete the information required for each of the models.

2. Any information additional to that indicated herein that the institution may consider important for the purpose of evaluating compliance with minimum requirements should be provided.

CONTENTS:

1. **Scope of application**

1.1. **Potential scope:**
Identify all the units or centres which are able to assume position risk on trading book, commodity, foreign exchange and gold positions, specifying the systems used to measure these risks in each of them.

1.2. **Identification of scope for which authorisation is requested.** State the following:

1.2.1. **Group institutions included.** Describe the group institutions as a whole and indicate the risk covered by the internal model as a percentage of the total risk of the same type in the consolidable group.

1.2.2. **Types of risks:** Indicate the risk categories covered by the model (price risk on trading book, foreign exchange, gold and/or commodity positions).

1.2.3. **Types of financial instruments included in the trading book**. Indicate the criteria for inclusion of products in the trading book and the criteria for separation from the banking book.

1.2.4. **Details of market risk management units included in the scope of the application**. Specify the levels reached by the measurements (business units, trading desks, products, risk factors, etc.) and describe the policy on authorised products/markets in the main business units.

1.3. **Justification of the excluded portion:** If the potential scope does not coincide with that of the application for authorisation, the reasons for excluding a portion must be explained.

2. **Description of exposures**

2.1. **Exposure by product.** Detail the exposures (value of positions) by product type and the VaR by product type.

2.2. **Current distribution of risk by business unit:** Current level of risk at business unit level, and treasury desks, together with any available disaggregation (risk factors and/or products).

3. **Estimate of regulatory capital**
Give an estimate of regulatory capital calculated using the internal model, as specified in Rule forty, and the regulatory capital calculation performed so far using the standardised measurement method.

4. **Policies and organisation**

4.1. **Market risk management policies and organisational structure:** Organisation chart and committees, with definition of responsibilities and functions. Describe the involvement of senior management in the risk control process, specifying the documents evidencing approval given by it, and detail the reports sent to it for assessment.

4.2. **Details of the functioning of the units involved in market risk management:** functions performed, composition (with details of the number of technically skilled people assigned to them) and details of reporting hierarchies and relationships with other risk control areas and with business units.

4.3. **New product authorisation procedures and list of authorised products**. Describe the units involved, the approval procedure and the post-approval procedures for monitoring new products (market inputs, monitoring of valuation models, sensitivity measurements).

4.4. **Manuals**: List of internal manuals relating to market risk information on policies, methodology, complementary analyses (backtesting and stress testing), information and control systems, and procedures, with a summary of the content of each of them detailing when they were last updated, the persons responsible for preparing them and, where applicable, the bodies to which they were submitted for approval.

5. **Measurement system**

Describe in the greatest possible detail the methodology or methodologies used to calculate VaR, the price series used, including reasons justifying the historical observation period chosen, and the valuation models used.

Indicate expressly whether the model covers the specific risk on debt and equity positions and describe, where applicable, the measurement methodology.

Explain why the structure of the internal models is suitable for the institution's activity and identify the assumptions and limitations of the measurement systems used.

The description of the measurement system should include at least the following:

5.1. **Model inputs:**

5.1.1. **Parameters**.

5.1.1.1. **Holding period**:

5.1.1.1.1. Describe the methodology for estimating market risk with the regulatory time horizon, indicating whether it is a 1 day calculation scaled up to that holding period or a direct calculation.

5.1.1.1.2. Indicate whether the use of longer holding periods than the regulatory one is envisaged for illiquid instruments/markets and, if not, state what limitation this places on market risk measurement, according to the importance of the operations in illiquid positions.

5.1.1.2. **Historical observation period for risk factors.**

Describe the procedures used to select the historical observation period for risk factors, indicate how often that period is revised and state why it is suitable.

5.1.2. **Details of market variables captured,** indicating their source and describing the **secondary calculations** performed using these market inputs and the related methodology.

5.1.3. **Position inputs**.

Description of position inputs entered in market risk calculation systems. If cash flow decompositions and/or mappings are carried out, indicate the methodology, specifying the particular features of each product type. In the case of optional instruments, if it is necessary for measuring market risk, indicate the method of

calculating sensitivity to the various risk factors (underlying, implied volatility and others).

5.2. **Methodology**.

5.2.1. **Type of methodology or methodologies used** and detailed description thereof, specifying the following:

5.2.1.1. **Risk factor categories and the factors within each category, detailing the method of aggregation within and between risk factors.**
Provide a table setting out the risk factors used in each risk category (interest rates –detailing the credit categories used-, exchange rates, equity factors, implied volatilities of options, etc.) and specify the vertices used in each category.

5.2.1.2. **Method of aggregating business unit risk measurements.** Where applicable, describe also the manner of incorporating the measurement of risk on positions held in Local Units whose currency differs from that of the parent company**.**

5.2.1.3. **Valuation models used.** Select the complex products that are most significant in terms of exposures generated, and attach their valuation models.

5.2.1.4. **Risk factor simulation models**. Where applicable, explain the models used to simulate the behaviour of risk factors when Monte Carlo simulation techniques are used to estimate market risk.

5.2.1.5. **Treatment of specific risk.** Indicate whether the internal model covers the specific risk on non-government debt and equity positions, specifying whether it covers event/default risk. Describe, where applicable, the measurement methodology.

5.2.2. **Identification of known limitations of the methodology.**

6. **Stress testing programme**

6.1. **Description of structure of stress testing programme**. The description should refer to both the scenarios considered and to their periodicity and their influence on policy-making and risk taking limits. Explain the minimum periodicity set for reviewing the stress testing structure, and indicate when the current scenarios were last reviewed. Specify who is responsible for defining their content. Specify also the periodic and/or isolated stress testing reports sent to senior management.

6.2. **Results of stress testing in the past year**.

7. **Backtesting programme**

7.1. **Types of backtesting**. Detail the types of backtesting conducted ("clean" and/or "dirty") and specify the level of disaggregation reached (by business unit/treasury desk and disaggregations by product and/or risk factor).

7.2. **Description of the methodology used in constructing results.**
State who is responsible for calculating results, detail the price series used and describe the particular features of calculation of the results used in backtesting. Specifically, detail the following:

7.2.1. **"Clean" results.**
Describe the procedure used to obtain these results, i.e. whether it is by re-evaluating the previous day's positions at the new prices or by stripping out from the day's actual outcomes the portion relating to intraday operations and other result components not linked to price movements (market fees and commissions, customer margins, etc.).
If "clean" results are calculated from a hypothetical portfolio instead of from an actual portfolio, describe the composition of the portfolio, indicating the parameters that turn out to be a representation of the actual portfolio. Indicate also the frequency established for reviewing its composition.

7.2.2. **Actual results.** Describe, where applicable, possible adjustments made to actual results so that they can be used in cross-checks.

7.3. **Backtesting analysis procedures.**
Describe the type of analyses conducted, detailing whether, in addition to recording the number of overshootings, complementary analyses are carried out (examination of size of exceptions, symmetry studies of profit and loss exceptions, tests of normality of results, analyses of the ratio of variability of results to variability of VaR, etc.). State also the type of analysis conducted to identify the causes of exceptions.
In addition, describe to what extent backtesting results are taken into account to improve VaR measurement methodology. Give specific examples.

7.4. **Backtesting results for the previous year**.

7.4.1. **"Clean" backtesting results for the previous year (minimum of 250 observations).** Provide the number of overshootings at all available disaggregation levels, with an explanation of each.

7.4.2. **"Dirty" backtesting results for the previous year (250 observations).** If complementary cross-checks against actual results are being conducted, provide the number of overshootings at all available disaggregation levels.

8. Technological environment and information integrity controls

8.1. **Description of technological environment of the applications involved in the model.**
Prepare an explanatory diagram of all the systems involved in the market risk measurement and control process (market variable input systems, systems for entering position inputs and systems for calculating VaR and results. Explain in detail the calculations carried out in each system. The description should also specify estimates made on spreadsheets (valuations of out-of-systems transactions, measurement of sensitivities, partial calculation of VaR, etc.) that can be used as inputs to other processes. Describe also the information flows between systems, specifying whether transmission is automatic or manual.

8.2. **Description of controls.** Detail the internal procedures established to ensure the consistency and reliability of positions and of market sources, indicating who is responsible for these controls and what their periodicity is. Explain explicitly the following:

8.2.1. **Reconciliation of front-office positions with accounting.**

8.2.2. **Procedures for identifying the scope** of portfolios included in the model, both for calculating market risk and for calculating results.

8.2.3. **Reconciliation of positions between the front-office systems and the market risk calculation systems.** Describe the type of reconciliation and its level (total of business units/by treasury desk/by product).

8.2.4. **Procedures for daily analysis of risk exposures** enabling errors to be detected in position data capture. Indicate the lowest level reached by this analysis.

8.2.5. **Procedures (automatic and manual controls) for validating market sources and for calculating volatilities and correlations.** In the case of institutions with Local Units in different geographical locations that capture price data, state the procedures for validating the market variables captured, indicating whether the reliability and independence of the data sources is to be validated by Local Units or by a Central Risk Unit.

8.2.6. **Automatic procedures in systems for calculating risk on position input and market variables capture.**

9. **Limits structure**

9.1. **Description of the types of limits and their hierarchical structure, detailing the procedures for approval, change, control and reporting of excesses.**

9.2. **Limits structure during the previous year.** Attach the latest limits structure imposed on the model scope, with the greatest level of detail defined.

9.3. **Procedures for establishing the level of limits**. Detail the methodology used to ensure that the limits at hierarchically lower levels are consistent with the market risk limits at higher levels in a business unit. Attach as an annex the consistency study on the latest limits structure.

9.4. **Exceptions to limits in the previous year.**

10. **Information systems**

10.1. **Periodic and non-periodic reports** with their supporting documentation, particularly those sent to senior management. Indicate the periodicity of each, their recipients and to what extent they are prepared manually.

10.2. **Contingency plans for market crises**. Specification, where applicable, of contingency plans for market crises that affect activities within the model's scope, describing their content. Indicate any provisions made in this respect in manuals and detail the contingency plans that would be set in motion.

11. **Databases**

11.1. Daily time series of aggregated and disaggregated VaR with the greatest level of detail available for at least the past year.

11.2. Daily time series of results used in backtesting, with the greatest level of detail reached by these tests for at least the past year. If "clean" backtesting is not conducted on the actual portfolio, but rather on a hypothetical one, give the daily VaR time series of this portfolio at all available levels of disaggregation.

11.3. Daily time series for the last two years of interest rates, exchange rates and equity prices that are most significant for measuring market risk on the positions within the scope of the model.

12. **Operational manual and input tables of the market risk calculation application or applications**
    Provide the operational manual of the VaR calculation application and the input tables (of positions and market inputs) in the market risk calculation applications, with a list and description of fields, as well as the tables of partial calculations needed to estimate the overall market risk within the scope of the model. The institution should state that it is able to provide the Banco de España's inspection service with the data needed to verify the integrity of the information and enable the VaR calculations to be replicated as at a specific date.

13. **Future developments**

    13.1. **Schedule designed to ensure that the potential scope of application excluded from the requested authorisation meets the requirements** for using models in capital calculations.

    13.2. **Details of anticipated changes or future plans** relating to the models and systems used to measure and control the risks to which this authorisation application refers.

14. **Internal audit**
    Updated internal audit report with the scope specified in Rule 39.1.h) of Circular 5/1993, and the content of the internal audit tests conducted in reviewing the risk control systems, particularly the measurement systems and the systems for verifying the accuracy and rigour of data on positions.

15. **Other independent assessments**
    List of other independent reviews (external auditors, consultants) conducted, specifying the objectives of the reviews and the conclusions drawn.

Annex 1

Letter requesting authorisation to calculate minimum capital requirements for position risk on trading book, commodity, foreign exchange and/or gold positions

(place), *(day) (month) 200X*

Banco de España
Dirección General de Supervisión
Alcalá, 48
28014 Madrid

Dear Sirs,

[*Name of parent/group*] requests authorisation to use the internal model of the institution to calculate minimum capital requirements for [position risk on trading book, commodity, foreign exchange and/or gold positions] of [*Name of parent/group*]. Consequently, [*Name of parent/group*] manifests its readiness to participate in the necessary validation processes.

For this purpose we are sending you the initial information required in the application file, including the necessary internal audit reports.

We expressly state that the internal calculation model the authorisation of which is requested herein forms part of an integrated market risk measurement, management and control system which is applied effectively and consistently in the day-to-day management of this risk.

We also inform you that the Board of Directors of [*Name of parent/group*] approved the content of this letter of application on (day) (month) 200X.

We are at your disposal to complete any matters you may consider appropriate and to assist in any pertinent checks.

Yours faithfullly,

[*SIGNATURE OF MANAGING DIRECTOR OR SIMILAR*]