

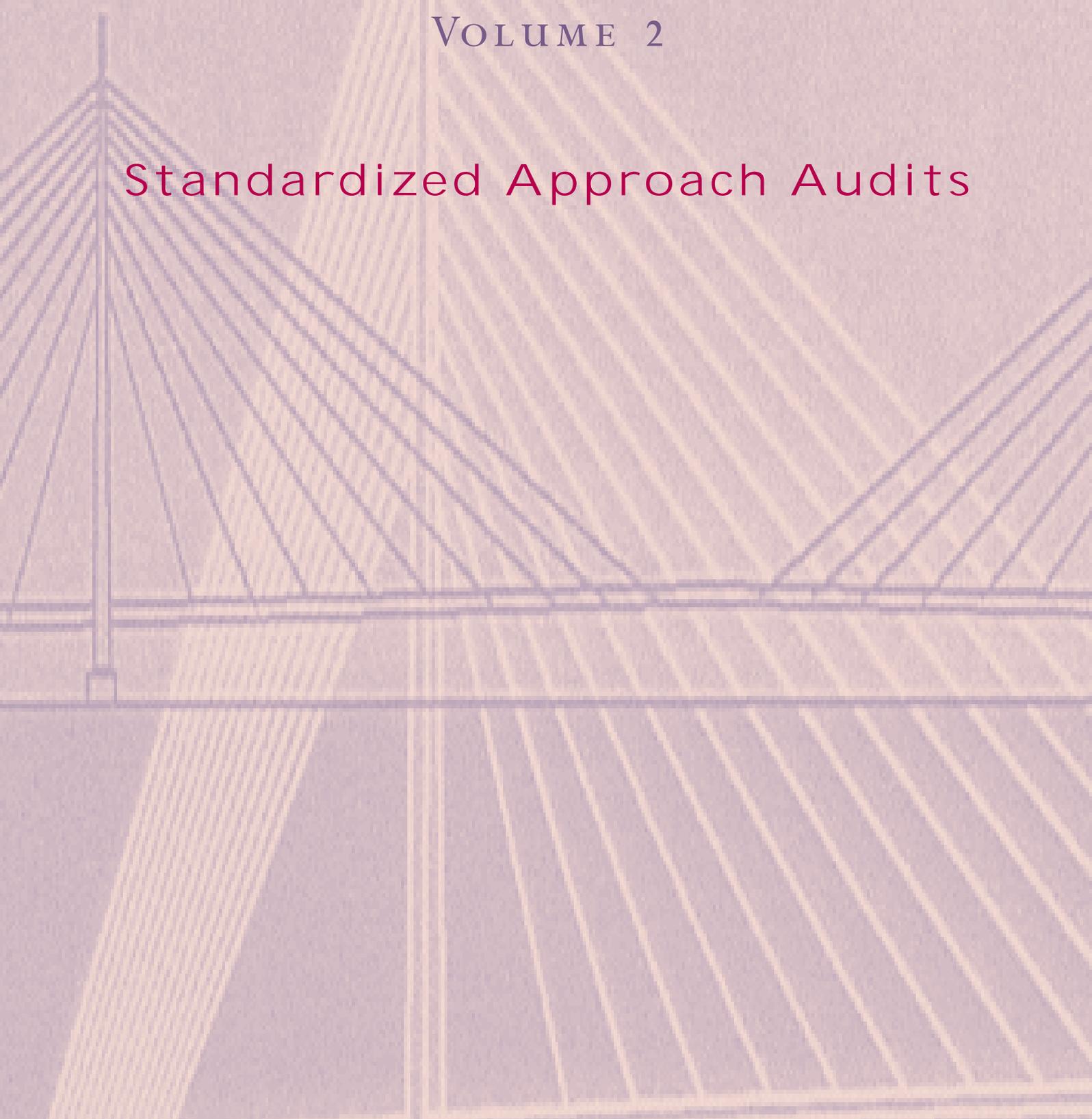


OESTERREICHISCHE NATIONALBANK

GUIDELINES ON MARKET RISK

VOLUME 2

Standardized Approach Audits





Guidelines on Market Risk

**Volume 1: General Market Risk of Debt Instruments
2nd revised and extended edition**

Volume 2: Standardized Approach Audits

Volume 3: Evaluation of Value-at-Risk Models

Volume 4: Provisions for Option Risks

Volume 5: Stress Testing

Volume 6: Other Risks Associated with the Trading Book

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The second major amendment to the Austrian Banking Act, which entered into force on January 1, 1998, faced the Austrian credit institutions and banking supervisory authorities with an unparalleled challenge, as it entailed far-reaching statutory modifications and adjustments to comply with international standards.

The successful implementation of the adjustments clearly marks a quantum leap in the way banks engaged in substantial securities trading manage the associated risks. It also puts the spotlight on the importance of the competent staff's training and skills, which requires sizeable investments. All of this is certain to enhance professional practice and, feeding through to the interplay of market forces, will ultimately benefit all market participants.

The Oesterreichische Nationalbank, which serves both as a partner of the Austrian banking industry and an authority charged with banking supervisory tasks, has increasingly positioned itself as an agent that provides all market players with services of the highest standard, guaranteeing a level playing field.

Two volumes of the six-volume series of guidelines centering on the various facets of market risk provide information on how the Oesterreichische Nationalbank appraises value-at-risk models and on how it audits the standardized approach. The remaining four volumes discuss in depth stress testing for securities portfolios, the calculation of regulatory capital requirements to cover option risks, the general interest rate risk of debt instruments and other risks associated with the trading book, including default and settlement risk.

These publications not only serve as a risk management tool for the financial sector, but are also designed to increase transparency and to enhance the objectivity of the audit procedures. The Oesterreichische Nationalbank selected this approach with a view to reinforcing confidence in the Austrian financial market and – against the backdrop of the global liberalization trend – to boosting the market's competitiveness and buttressing its stability.

Gertrude Tumpel-Gugerell

Vice Governor

Oesterreichische Nationalbank

Today, the financial sector is the most dynamic business sector, save perhaps the telecommunications industry. Buoyant growth in derivative financial products, both in terms of volume and of diversity and complexity, bears ample testimony to this. Given these developments, the requirement to offer optimum security for clients' investments represents a continual challenge for the financial sector.

It is the mandate of banking supervisors to ensure compliance with the provisions set up to meet this very requirement. To this end, the competent authorities must have flexible tools at their disposal to swiftly cover new financial products and new types of risks. Novel EU Directives, their amendments and the ensuing amendments to the Austrian Banking Act bear witness to the daunting pace of derivatives developments. Just when it seems that large projects, such as the limitation of market risks via the EU's capital adequacy Directives CAD I and CAD II, are about to draw to a close, regulators find themselves facing the innovations introduced by the much-discussed New Capital Accord of the Basle Committee on Banking Supervision. The latter document will not only make it necessary to adjust the regulatory capital requirements, but also requires the supervisory authorities to develop a new, more comprehensive coverage of a credit institution's risk positions.

Many of the approaches and strategies for managing market risk which were incorporated in the Oesterreichische Nationalbank's Guidelines on Market Risk should – in line with the Basle Committee's standpoint – not be seen as merely confined to the trading book. Interest rate, foreign exchange and options risks also play a role in conventional banking business, albeit in a less conspicuous manner.

The revolution in finance has made it imperative for credit institutions to conform to changing supervisory standards. These guidelines should be of relevance not only to banks involved in large-scale trading, but also to institutions with smaller voluminous trading books. Prudence dictates that risk – including the "market risks" inherent in the bank book – be thoroughly analyzed; banks should have a vested interest in effective risk management. As the guidelines issued by the Oesterreichische Nationalbank are designed to support banks in this effort, banks should turn to them for frequent reference. Last, but not least, this series of publications, a key contribution in a highly specialized area, also testifies to the cooperation between the Austrian Federal Ministry of Finance and the Oesterreichische Nationalbank in the realm of banking supervision.

Alfred Lejsek
Director General
Federal Ministry of Finance

Preface

Volume 2 of the Guidelines on Market Risk primarily targets those Austrian credit institutions which, given the volume of their trading books, employ the standardized approach to calculate the regulatory capital requirement for market risk. This guideline is designed to provide such banks with information on the standardized approach audit procedure of the Oesterreichische Nationalbank.

The first chapter of this publication sheds light on the general audit principles; the second chapter elucidates the qualitative and quantitative standards underlying standardized approach audits. Finally, the third chapter provides a representative sample of the required documents. With this information the OeNB wishes to lend support to the credit institutions concerned, paving the way for a smooth and efficient audit.

Last, but not least, this publication should even be of interest to institutions for which - due to size or business policy - use of the standardized approach is currently out of the question. One or the other section of this guideline may prove relevant for their risk management as well.

The six-volume Guidelines on Market Risk including this publication on the standardized approach were authored by the Risk Management Unit of the Financial Markets Analysis and Surveillance Division: Thomas Breuer, Gerhard Coosmann, Gabriela de Raaij, Annemarie Gaal, Gerald Krenn, Ronald Laszlo, Manfred Plank and Burkhard Raunig.

Special thanks are due to the head of the division, Helga Mramor, who promoted the production of this series of guidelines on market risk.

Vienna, September 1999

The authors

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1 General Audit Principles

1.1 Audit Request and Subject of Audit

Banks which keep a comprehensive securities trading book need to compute the regulatory capital requirement¹ for market risk. In line with the Austrian Banking Act, this may be accomplished either via the standardized approach or via the use of a value-at-risk (VaR) model.

Auditing of the proper implementation of the standardized approach commences with an audit request made by the Federal Minister of Finance to the Oesterreichische Nationalbank (OeNB).

The standardized approach audit may comprise the following areas: separation of the bank and trading book, daily valuation of the risk positions, calculation of the regulatory capital requirement for the respective risk categories as well as related qualitative criteria resulting from the duty of care and diligence exercised by a prudent businessman.

1.2 Written Notification

The Federal Ministry of Finance advises the credit institution concerned that the OeNB will perform an audit. The OeNB then informs the bank separately, specifying the time of audit and the members of the audit team.

1.3 Advance Contact

The credit institution concerned is contacted in advance, i.e. prior to the commencement of the on-site audit. Such advance contacts help preclude misunderstandings that could impede or delay the audit process.

1.4 Initial Meeting

The audit begins with a presentation of the procedure at the credit institution to be inspected. The following representatives of the credit institution should attend the presentation: the board members in charge, the heads of the respective departments as well as the staff members who play a crucial role in implementing the standardized approach. The bank is expected to outline how risk management is organized and how the standardized approach is to be implemented. Additionally, information should be provided about who will be the contact for a given issue.

¹ Referred to as „own funds requirement“ in the Austrian Banking Act.

1.5 On-site Inspection

In order to enhance the efficiency of the inspection to be conducted at the site, OeNB staff are to be furnished with the appropriate infrastructure, e.g a room that can be locked, telephone line, etc. The duration of the audit hinges on the scope of the audit request and the size of the credit institution. Depending on these factors, an on-site inspection by the OeNB ranging from a few weeks up to three months is to be expected.

1.6 Final Meeting

The most important results of the audit are presented in the final meeting, which is to be attended by the responsible board members as well as the other representatives of the departments involved. After the final meeting, the OeNB, as a rule, does not have any activities to be conducted at the credit institution. The credit institution is informed of the prospective date by which the audit report will be delivered to the institution.

1.7 Statement by the Credit Institution

Following delivery of the audit report by the OeNB, the credit institution may issue a statement on this report. The statement is to be transmitted to the OeNB's Financial Market Analysis and Surveillance Division, which will forward it to Federal Ministry of Finance.

2 Qualitative and Quantitative Standards for Standardized Approach Audits

2.1 Quantitative Audit

2.1.1 Analysis of the Trading Book

The trading book including all foreign branch offices is to be presented to the OeNB on certain dates which will be fixed for the credit institution by the OeNB. These may be several dates *prior to* the commencement of the audit, but the credit institution, in the course of the audit, may be notified of another date *after* the audit is underway. The trading book data should be transmitted using an appropriate electronic data medium. Prior agreement is to be reached concerning data formats and field specifications.

The documents are expected to provide information about all organizational units engaged in trading. This holds particularly true for all domestic and foreign subsidiary credit institutions and branch offices. Desirably, the product categories traded by the unit concerned and their main trading areas are also set forth.

The credit institution must present the documentation in which the internal criteria are laid down for the allocation of transactions to the trading book. In particular, transfers of entries between the books are to be listed and justified within a period of time specified by the OeNB. In order to validate the proper assignment of positions in the trading or bank book, an excerpt of selected products from the bank book is also required.

The data are to be transmitted in the form of raw data (individual positions) and in a processed form (aggregated data). The credit institution is informed in due time of the exact specifications of the desired aggregation. The list of documents makes mention of an example of a possible form of aggregation.

Special attention needs to be paid to instruments with complex terms of issue. Structured issues and issues containing exotic options are to be described in detail. When providing the documents, the credit institution shall enclose at least the issuing prospectus, the valuation method and the type of hedging.

2.1.2 Risk Categories

Banks whose trading book does not exceed the limits laid down in § 22b para 2 Banking Act may calculate their regulatory capital requirement in the conventional manner, i.e. in accordance with the solvency ratio Directive (§ 22 para 1 lit 1 Banking Act). However, if those limits are exceeded, as of the subsequent fiscal year regulatory capital backing must proceed, for a duration of at least two years, according to the capital adequacy Directive implemented in the Banking Act.

The following risk categories of the trading book need to be backed with regulatory capital:

- (1) General position risk of debt instruments
- (2) Specific position risk of debt instruments
- (3) General position risk of stocks
- (4) Specific position risk of stocks
- (5) Risk inherent in stock index futures contracts
- (6) Open foreign exchange position
- (7) Settlement risks
- (8) Exposure due to free deliveries
- (9) Repurchase agreements and securities lending
- (10) Credit risk of OTC derivatives, mutual funds shares and other positions

For financial instruments specified in § 22e para 5 Banking Act, the regulatory capital requirement may be calculated pursuant to the provisions contained in that paragraph. However, the authors do not recommend their application.

When determining the regulatory capital requirement for the foreign exchange risk, all positions of the trading and bank book must be considered.

The regulatory capital requirement for the risk categories listed in (1) through (6) may be calculated using either the standardized approach or a value-at-risk model. A combination of both is possible if it covers all risk categories. While in value-at-risk models the regulatory capital requirement for commodities positions is determined by the Regulation on Internal Models for the Limitation of Market Risks, there is currently no such regulation in the Banking Act for the standardized approach.

With regard to debt instruments and stocks, the position risk is comprised of the general and the specific risk. The general risk of debt instruments or stocks results from price movements

which, in turn, are traceable to market changes (interest rate variations or general movements in the stock market). The specific risk is caused by price movements depending on issuer-related factors.

2.1.3 Basic Steps for Determining the Regulatory Capital Requirement

One fundamental principle of the capital adequacy Directive is the valuation of all trading book positions at market prices (“marking to market”). This fundamental principle is laid down in § 22a Banking Act. It is stipulated by law that all positions of the trading book be valued daily at market prices for reporting purposes and for calculating the regulatory capital requirement. When dealing with listed financial instruments, the current exchange quoted price (i.e. same-day price) including accrued interest is to be used as the market price. In the absence of available exchange quoted prices a model-based valuation is necessary.

The regulatory capital requirement for the above-mentioned risk categories needs to be determined on a daily basis.

When calculating the regulatory capital requirement against the general and specific risk of stocks and debt instruments, mutual netting may be performed for long and short positions in identical financial instruments. Financial instruments are regarded as identical provided they:

- were launched by the same issuer,
- are denominated in the same currency,
- are traded in the same national market²,
- grant the same voting rights status to the owner,
- have the same rank in the case of insolvency.

In the case of debt instruments, the criterion concerning owners’ voting rights is not applicable; however, nominal interest return and bullet maturity must correspond.

In calculating net positions, synthetic financial instruments may also be incorporated provided they meet the above-mentioned conditions. Options are to be treated in the same way as positions whose value matches the value of the underlying financial instrument after it has been multiplied by the delta factor. The provisions pertaining to the decomposition of various financial products are set forth in § 22e Banking Act. Convertible bonds are to be treated as stocks. On certain conditions specified in § 22d para 2 Banking Act, they may be netted off against the stocks into which they could be converted.

An additional netting method is the “matched-pairs approach.” However, it is only applicable to the general position risk of debt instruments (e.g. currency forwards, currency options, money

² See also section 2.1.8.

market transactions, caps, floors, swaptions, etc.) unless the duration method has been employed. The matched-pairs approach allows for the netting of long and short positions of the same nature in debt instruments, provided the following conditions are met:

- The positions are denominated in the same currency,
- the reference interest rates for floating-rate instruments or nominal interest rates for fixed-rate instruments diverge by 15 basis points at the most,
- the upcoming interest-fixing dates for floating-rate instruments or, for fixed-rate instruments, residual maturity corresponds with the following limits:

less than one month: same day,

between one month and one year: seven days,

over one year: thirty days.

The net positions determined and broken down by individual currencies are the basis for the further calculations. To compute the general and specific risk of stocks and the specific risk of debt instruments, the net positions in the various currencies need to be converted into euro at the given spot exchange rate. When calculating the general risk of debt instruments, the regulatory capital requirement is to be determined by the maturity band or duration approach separately for each currency. The regulatory capital requirement thus calculated for each individual currency is to be converted into euro at the respective current exchange rates.

2.1.4 Consolidation

The capital adequacy Directive permits netting of equal financial instruments of the trading book and of exchange rate positions (bank and trading books) according to their sign within the group of credit institutions. The relevant provisions are laid down in §§ 22c and 26 Banking Act.

The superordinate credit institution has to calculate the regulatory capital requirement resulting from the risks specified in section 2.1.2 if at least one credit institution of the group keeps a large-volume trading book and is thus obliged to calculate the regulatory capital requirement. For credit institutions within the group having their corporate seats abroad, the provisions set forth in the Austrian Banking Act are applicable as to when a trading book is considered to be large-volume.

As regards the calculation of net positions on a consolidated basis, a distinction is made between Member States and third countries. Member States include all countries of the European Union and the European Economic Area (EEA). Third countries encompass all those countries which are not members of the EEA.

For Member States long and short positions in identical financial instruments may be netted off against each other within the group of credit institutions. Netting is conducted in compliance with the same principles as those governing the determination of net positions and the “matched-pairs approach” and can only be performed for the risk categories designated there.

For third countries the above procedure is admissible for the netting of positions if

- the institution has been authorized in a third country, is supervised and either satisfies the definition of credit institution or the definition of an investment firm given in Directive 77/780/EEC and Directive 93/22/EEC,
- the regulatory capital is adequately distributed within the group of credit institutions and
- no regulations exist in the third country in question which might significantly impede the transfer of funds within the group.

Adequate distribution of the regulatory capital within the group of institutions can be assumed if the given calculation and the available regulatory capital of the individual subordinate banks comply with the requirements of the Banking Act.

The superordinate credit institution must ascertain for which subordinate institutions the above preconditions for sign-dependent consolidation apply. The superordinate credit institution must be able to furnish proof at all times that these conditions are met. The bank auditor shall confirm compliance with the conditions in the supervisory authority’s audit report.

Sign-dependent consolidation represents an option for the superordinate credit institution to be exercised under the conditions specified above. Sign-neutral consolidation can be carried out in any case. Sign-neutral netting refers to the summing of all regulatory capital requirements of the subordinate credit institutions.

Regardless of whether subordinate credit institutions are included in the consolidation, the superordinate credit institution must have systems for monitoring and controlling market risks that cover all subordinate credit institutions.

Consolidation of open foreign exchange positions

The consolidation of open foreign exchange positions is defined in § 26 para 4 Banking Act. According to this section, a group of credit institutions must include those institutions in the consolidation for which the overall net amount of foreign exchange positions is greater than the allowance of 2% of the institution's regulatory capital. The group may take the decision to include those institutions which do not *need* to be incorporated in the consolidation provided this is done on a regular basis. For group member institutions in EU Member States positions may be summed according to currency. (The USD position of a London-based subsidiary may, for instance, be summed with the USD position of a Paris-based subsidiary.) For group member institutions in third countries such netting is only admissible if the conditions of § 22c para 4 are fulfilled.

2.1.5 Implementation of the Standardized Approach

Daily determination of the regulatory capital requirement makes it necessary that the standardized approach be implemented in a computerized manner. Apart from correct coverage of position data, provision of input data for valuating the individual positions via adequate pricing models is required.

Position data: To compute the regulatory capital requirement, it must be ensured that the position data be correct and complete. For this purpose, the flow of business data from front-office systems to the software used for the computations must be clearly traceable. Therefore, it is desirable to have documentation which traces the data flow in a straightforward manner and describes the systems used. It should comprise:

- a presentation of the data flow (diagrams),
- the front-office systems employed,
- the required interfaces,
- trial results of test runs verifying the correct functioning of the data flow.

Valuation models and data input: In the absence of available exchange quoted same-day prices a model-based valuation of positions must be used. Furthermore, valuation models for determining the delta, gamma and vega risks of option-like financial instruments are necessary. Hence, the credit institution must indicate which valuation models are used for which products. It is important to provide a detailed explanation of mathematical formulas and required input parameters for each valuation model.

For the yield curves used to calculate market values, the provider and the underlying method for determining the interest rate pattern should be indicated. If the credit institution carries out its own calculations, an in-depth description of the approach taken and the data base used is necessary.

Standardized approach: The credit institution is expected to have at its disposal documentation on the software used to calculate regulatory capital. The documentation should refer to whether an in-house solution or a third-party software has been implemented. Additionally, there ought to be a comprehensive program documentation, i.e. a step-by-step description of how the regulatory capital requirement is computed. Desirably, test results of trial calculations already conducted are available. The mechanisms in place to ensure that the calculation method proceeds as planned should also be indicated.

2.1.6 The Decomposition of Financial Instruments and Handling Options

2.1.6.1 The Decomposition of Financial Instruments pursuant to § 22e para 1 and para 4 Banking Act

Structured or derivative financial instruments must be properly decomposed into their underlying elements. § 22e Banking Act contains a number of instructions for how to split up widely used derivatives into their individual components. Generally, the “two-leg approach” is stipulated by law and exemplified by means of interest rate futures, forward-rate agreements, forward transactions in debt instruments and interest rate swaps. Despite these provisions, there is still considerable leeway. What is more, many instruments may be replicated by underlying elements in different ways. For this reason, the methods preferred by the OeNB for decomposing interest rate products and handling options are discussed at great length in two guidelines.³ Credit institutions choosing other methods shall document them in a manner that is understandable to third parties. The decomposition of structured products and the way synthetic positions resulting therefrom are handled in individual risk categories are to be presented by the credit institution in a straightforward fashion.

A particular problem is posed by exotic options that may not be decomposed, since such options cannot be captured by the standardized approach. Credit institutions trading in such products must employ an adequate method for calculating regulatory capital backing (such as the scenario matrix or Monte Carlo approach, etc.). Credit institutions which are engaged in such transactions to a larger extent are expected to start using internal models within the framework of risk management and for the purpose of computing the required regulatory capital. The same holds true for those credit institutions substantially trading in at-the-money options with short residual maturities. Such strategies necessitate more precise valuation methods, as the delta plus method yields unsatisfactory results.

2.1.6.2 Handling Options pursuant to § 22e para 2 and para 3 Banking Act

The credit institution shall draw up a list of all financial instruments - and of their pricing tools - that are optional in nature and are found in the trading book. The OeNB evaluates the adequacy of the valuation models used and tracks the calculation of the sensitivities. Comprehensive documentation on the option pricing models used and their implementation is to be submitted to the OeNB. It is to be ensured that the implemented version matches the documentation.

³ *Volume 1 of the Guidelines on Market Risk entitled “General Market Risk of Debt Instruments”, 2nd revised and extended edition (Coosmann and Laszlo, 1999), and volume 4 of the Guidelines on Market Risk entitled “Provisions for Option Risks” (Gaal and Plank, 1999).*

In compliance with the Options Risk Regulation (or by means of another established approach, e.g. a scenario matrix), the gamma and vega risks need to be backed with regulatory capital. When calculating the gamma and vega risks particular attention must be paid to proper scaling; the latter is to be confirmed by means of full valuation.

Credit institutions using the scenario matrix method are expected to adhere to the minimum standards proposed by the Amendment to the Capital Accord to Incorporate Market Risks:

- The bucket for the value of the underlying instrument needs to consist of at least seven points, and equal intervals need to be selected.
- The margins must be $\pm 8\%$ for stocks, foreign exchange, and gold as well as $\pm 15\%$ for commodities.
- As regards interest rate options, the highest assumed yield changes from the standardized approach table are to serve as margin.
- The volatility bucket should comprise at least three points: the current value and a $\pm 25\%$ change of the current volatility.

2.1.7 Regulatory Capital Backing of Interest Rate Instruments

2.1.7.1 General Position Risk pursuant to § 22h Banking Act

The general position risk of debt instruments may be computed using a system that is maturity-based or which reflects duration.⁴ When calculating the regulatory capital requirement for the general position risk of debt instruments, the following factors must be borne in mind.

The regulatory capital requirement needs to be calculated separately for each currency and then converted into euro at the given spot exchange rate. The individual currencies must not be set off against each other.

When employing the maturity band method, the individual instruments are allocated to the maturity bands depending on the interest rate (greater or smaller than 3%) and the residual maturity.

Floating-rate notes are taken into account with the residual maturity up to the next interest rate refix date.

The instruments need to be allocated at their current market value including accrued interest.

Options on interest rate-dependent instruments are assigned with their delta equivalent. For options the gamma and vega risks must be backed with regulatory capital in compliance with the Options Risk Regulation.⁵

2.1.7.2 Specific Position Risk pursuant to § 22g Banking Act

The computed net positions in individual debt instruments, on the basis of their residual maturities, are to be multiplied by the weights shown in the following table, for the purpose of calculating the regulatory capital requirement for the specific risk, and the signless positions are then to be summed:

Central government issues	Qualifying items			Other positions
	up to 6 months	over 6 and up to 24 months	over 24 months	
0%	0.25%	1%	1.6%	8%

⁴ For a description of these two methods, refer to volume 1 of the Guidelines on Market Risk entitled "General Market Risk of Debt Instruments", 2nd revised and extended edition (Coosmann and Laszlo, 1999).

⁵ For details concerning regulatory capital backing for these risks, see volume 4 of the Guidelines on Market Risk entitled "Provisions for Option Risks" (Gaal and Plank, 1999).

The following factors must be considered in the calculation:

When determining the specific position risk, long and short positions in own issues, money-market deposits and the refinancing of trading book positions are not taken into account.

The regulatory capital requirement must be calculated separately for each currency and subsequently converted into euro at the given spot exchange rate.

With regard to debt instruments, the current market price including accrued interest is to be used for calculating the net positions.

Contrary to the approach taken for the general market risk, the net positions summed must be signless.

Qualifying items must be properly identified pursuant to § 2 lit 38 Banking Act. Prerequisite characteristics are either no subordination and a solvency weight for the issuer of 20% or admission to trading on a recognized securities exchange, sufficient liquidity and good credit standing of the issuer (rating). The assignment of qualifying items should not be carried out manually, but should be automated. Compliance with these criteria must be adequately documented by the credit institution.

Central government issues include positions in debt instruments to be backed pursuant to § 22 para 3 lit 1 Banking Act (e.g. all OECD countries and countries with special credit agreements with the IMF).

Floating-rate notes (provided they are qualified items) must be considered with their entire residual maturity, rather than - as with the general market risk - only for the period until the interest rate is reset.

Transitional rules for mortgage bonds, public-sector debentures and funded bank debentures may be applied; within such a framework the backing rates applicable may be cut to half. This transitional regime only holds for mortgage bonds, public-sector debentures and funded bank debentures issued prior to 1 January 1998 pursuant to the provisions of the Mortgage Bond Act of 1927, dRGrBl.⁶ I p. 492, the Mortgage Bank Act as promulgated in the dRGrBl. I p. 1574/1938, as well as the Act of 27 December 1905 on Funded Bank Debentures, RGrBl No. 213.

⁶ *The law gazette of that time (Deutsches Reichsgesetzblatt).*

Derivatives without issuer-specific risk (e.g. caps, swaptions, FRAs, interest rate swaps, etc.) may be disregarded when calculating the specific risk. For these instruments, however, the counterparty-specific default risk is to be backed with regulatory capital pursuant to § 22o.⁷

⁷ See volume 6 of the Guidelines on Market Risk entitled "Other Risks Associated with the Trading Book" (Plank, 1999).

2.1.8 Regulatory Capital Backing of Stocks and Stock Index Futures Contracts

When determining the specific and general position risk in stocks, the overall gross position (specific risk) and the overall net position (general risk) in stocks must be computed per national market. Hence, a sign-neutral addition of all net positions must be performed for the specific risk - in analogy to the approach taken for interest rate instruments. Contrary to interest rate instruments, the net positions are to be determined per national market and not per currency.

When determining the overall gross or overall net positions the following must be borne in mind.

First, the net positions are defined per stock. Stocks of issuers quoted in different national markets are allocated to the national market of the issuer's home country, i.e. a long and a short position in the same stock quoted in two different national markets may be set off against each other and the net position is allocated to the national market corresponding to the issuer's home country. If there are several stock exchanges in a given country, these need to be aggregated into one national market.

2.1.8.1 General Position Risk in Stocks

For calculating the general position risk in stocks, the overall net position is to be determined separately for each national stock market. Positions in different stocks may be netted off against each other within a national market. Positions of different national markets, however, may not be set off. A long position of the issuer A in the Austrian stock market, for instance, may be netted off against a short position of the issuer B in the Austrian stock market, but not against a short position in the British stock market. Unlike the calculations for determining interest rate risk, positions in euro area stocks continue to be allocated to their respective national markets and may thus not be netted off against each other.

The regulatory capital requirement for the general position risk in stocks amounts to 8% of the computed overall net positions of the individual national markets.

2.1.8.2 Specific Position Risk in Stocks

When determining the specific position risk, long and short positions in own issues are not considered. To compute the specific position risk in stocks, the overall gross position must be determined separately for each national stock market. Positions in different stocks within one national market may not be netted off against each other. A long position in stock A in the Austrian

stock market, for instance, may thus not be set off against a short position in stock B in the Austrian stock market.

The regulatory capital requirement for the specific position risk in stocks accounts for 4% of the overall gross positions of the individual national markets. For stocks complying with the criteria listed below, a reduced rate of 2% becomes applicable for regulatory capital backing:

- The issuer has also launched traded debt instruments which, for the specific position risk, need to be backed with less than 8% of regulatory capital.
- The stocks may not bear a special credit risk and must be highly liquid, which is the case when they are included in the Austrian Traded Index (ATX) or in the index of volume leaders of another recognized stock exchange.
- The portfolio must be highly diversified, i.e. no individual position shall comprise more than 5% of the overall value of the credit institution's stock portfolio. This percentage shall be 10% for stocks included in the ATX, provided the total value of all positions in highly qualified stocks does not exceed 50% of the entire stock portfolio.

In analogy to the qualified items of interest rate instruments, the allocation of stocks should proceed in an automated fashion rather than manually. The activities for monitoring compliance with these individual criteria need to be documented for each stock in a logical and straightforward manner by the credit institution.

2.1.8.3 Stock Futures Contracts

Positions in options in stocks, stock indices and stock index futures contracts are converted into synthetic stock or stock index positions according to the decomposition rules laid down in section 2.1.6. Their delta-weighted equivalents are factored into the calculations of the general and specific position risk. For options the gamma and vega risks must be backed with regulatory capital pursuant to the Options Risk Regulation.⁸

For stock index futures contracts, it is possible to net opposite positions if the indices are identical and have matching maturities. Maturities shall be considered as matching within the following limits:

- in the case of terms up to one month: same day,
- in the case of terms from one month up to one year: seven days,

⁸ For details concerning regulatory capital backing for these risks, see volume 4 of the Guidelines on Market Risk entitled "Provisions for Option Risks" (Gaal and Plank, 1999).

- in the case of more than one year: 30 days.

Stock index futures contracts may either be broken down into the stocks of the index or treated as separate positions. The credit institution shall document the method it applies. The method chosen is to be applied consistently so as to avoid cherry picking.

The breaking-down option may be exercised separately for each stock index. If, after decomposing the stock index into synthetic stock positions, the latter are netted off against individual stocks, the remaining basis risk of the matched positions must be backed with regulatory capital. The regulatory capital requirement amounts to 0.5% of the matched positions. The basis risk results from the fact that it is uncertain that the stock index will evolve in a manner consistent with the sum total of stocks composing it.

Once an index has been broken down, the positions are to be treated like individual securities. This means that the constituent positions are to be backed with regulatory capital both against the general and the specific risk as stipulated by law. If, however, the indices are sufficiently diversified, they may be disregarded when calculating the specific position risk. The following indices are included in this category: ATX and indices formed from at least 20 stocks traded on a recognized stock exchange. The credit institution shall document for which indices it calculates no specific position risk.

2.1.9 Regulatory Capital Backing of Other Risks

Credit institutions which need to calculate the regulatory capital requirement for the trading book according to the provisions set forth in § 22b para 1 Banking Act must back with regulatory capital not only the general and specific risk of debt instruments and stocks as well as the risks associated with options, but also the so-called other risks. In connection with the capital adequacy Directive, these other risks refer to those risks generated by issuing underwriting commitments, by the incomplete processing of trading book transactions and by potential defaulting of counterparties. This gives rise to additional capital backing requirements for underwriting commitments, settlement and delivery risks and counterparty's default risk.⁹

⁹ For details concerning the calculation of the regulatory capital requirement of other risks, see volume 6 of the Guidelines on Market Risk entitled "Other Risks Associated with the Trading Book" (Plank, 1999).

2.1.10 Regulatory Capital Requirement for the Open Foreign Exchange Position

§ 26 Banking Act describes how to calculate the regulatory capital requirement for the open foreign exchange position. A two-step approach must be taken. First, open positions are calculated for each currency; then, these positions are used to calculate the net total of the open foreign exchange position and, thus, the required regulatory capital.

2.1.10.1 Calculating positions for each currency

The position for any given currency equals the difference between asset items and liabilities items in this currency. This position needs to be calculated separately for each currency. If, when calculating such a position, asset and liabilities items of different currencies were mingled, the resulting regulatory capital requirement would be too low.

In some or all currencies known to be closely correlated, opposite positions yielding equivalent amounts following their conversion into euro may be disregarded when calculating the position for a given currency. Details about how these matched positions in closely correlated currencies are to be included in calculations of the regulatory capital requirement are described below under the heading "Calculating the net total and the regulatory capital requirement."

When calculating the individual currency positions all euro currencies must be combined. The open foreign exchange position in euro is therefore the difference between the sum total of long positions in euro currencies and the sum total of short positions in euro currencies. If a credit institution computes the individual currency positions separately for each euro currency, the resulting regulatory capital requirement is too high.

§ 26 para 2 Banking Act specifies which positions need to be taken into consideration for individual currency positions. It is to be noted that as regards the foreign exchange risk the regulatory capital requirement applies to the entire business, i.e. trading book and bank book. Credit institutions using an internal model for calculating the regulatory capital requirement on the foreign exchange risk may choose whether they wish to compute the foreign exchange risk of the bank book by means of the internal model or the standardized approach described in this guideline. Three aspects need to be highlighted at this point: the assessment basis to be applied for considering positions, the taking into account of interest rates as well as of specific value adjustments.

As for the assessment basis, § 22a Banking Act stipulates that all positions of the trading book *must* be accounted for at their market values. Positions of the bank book *may* all be accounted for

at their market values (according to § 26 para 2, last sentence).¹⁰ Alternatively, the following assessment bases may be used for bank book positions: for foreign currency options - the equivalent of their delta-weighted nominal value (lit 5); for on-balance assets, guarantees, as well as assets sold under agreements to repurchase or assets purchased under agreements to resell - the book values; for off-balance spot and forward transactions as well as off-balance financial swaps - the nominal values. For options other than foreign currency options, the market values must always be taken into account (lit 6), regardless of whether they are contained in the trading or bank book.

Accrued interest not yet due needs to be included when determining the individual currency position. Expected but not yet accrued interest income and interest payment obligations *may* be included, provided they are fully hedged. For each currency, the credit institution needs to decide whether these amounts are included or not in a manner that is both consistent and uniform.

Specific value adjustments are to be included in computing the individual currency position, regardless of whether they are indicated as assets or liabilities.

2.1.10.2 Calculating the net total and the regulatory capital requirement

The net total of the open foreign exchange position is computed as follows: The individual currency positions (possibly without regard to the matched amounts in all or some closely correlated currencies) are converted into euro at the mean spot rate. The positive converted individual currency positions are summed, and so are the negative ones. The larger of the two sum totals is the overall net amount of the open foreign exchange position.

The regulatory capital requirement amounts to

- 4% of the matched individual currency positions in closely correlated currencies plus
- 8% of the following amount: the net total of the open foreign exchange positions without regard to the matched individual currency positions in closely correlated currencies less the 2% allowance of the credit institution's eligible regulatory capital.

Granting a 2% allowance of the eligible regulatory capital is done in accordance with the provisions contained in the capital adequacy Directive (Annex III, lit 1). The Basle Market Risk Re-

¹⁰This regulation matches lit 3.2 of the capital adequacy Directive. The Basle Market Risk Regulations, in contrast, mention that only forward transactions involving gold and foreign exchange may be accounted for at market prices (Amendment to the Capital Accord to Incorporate Market Risk, Article 3, lit 7). Principle 1 of the German Banking Act (§ 15, para 3, 2nd sentence) also provides that only forward transactions involving gold and foreign exchange may be accounted for at market prices.

gulations are more restrictive in this regard and only provide for a limit of 2% (Section A.3, lit 13).

Which currencies may be considered as being closely correlated is laid down in § 26 para 1 lit 3 Banking Act. For selected currency pairs the OeNB publishes information in its monthly statistical publication (table 7.2.6), indicating whether they are closely correlated.¹¹ For currency pairs not included in this table, credit institutions must use their own calculations to determine, on a daily basis, whether they are closely correlated.

Accounting for closely correlated currencies is an option, not an obligation. Credit institutions not wishing to make use of the lesser backing requirement for closely correlated currencies must provide regulatory capital in the order of 8% of the following amount: the net total of open foreign exchange positions minus the 2% allowance of the credit institution's eligible regulatory capital.

It is also possible, after having made use of this option in a consistent manner, to apply it only to certain currency pairs. This means that for these selected pairs calculations are made daily to determine whether they are closely correlated; with all other currency pairs, however, opposite amounts are always included in the calculation of individual currency positions. This approach results in the following regulatory capital requirement:

- 4% of the matched individual currency positions in closely correlated currencies plus
- 8% of the following amount: the net total of open foreign exchange positions without regard to the matched individual currency positions in selected closely correlated currencies minus the 2% allowance of the credit institution's eligible regulatory capital.

¹¹ This table can also be accessed from the OeNB homepage: <http://www.oenb.co.at/stat-monatsheft/tabellen/726p.htm>.

2.2 Qualitative Audit

The statutory regulations pertaining to the standardized approach do not stipulate explicit qualitative standards for managing the market risk. It goes without saying, though, that banks which keep large-volume trading books and are thus faced with corresponding exposures need to comply with standards that are as stringent as those applied to credit institutions employing value-at-risk models. The auditing of qualitative standards for market risk management rests on provisions set forth in § 39 Banking Act:

"In conducting their business, the managers of a credit institution shall apply the diligence of a prudent and conscientious manager within the meaning of § 84 para 1 of the Stock Corporation Act. In particular, they shall inform themselves about and appropriately limit the risks of banking transactions and of operating the bank and give consideration to parallel risks. They shall furthermore give consideration to the overall earnings situation of the credit institution. Regarding new transactions with respect to which there exists no experience as to the risks involved, due consideration shall be given to the security of third parties' moneys entrusted to the credit institution and the preservation of own funds, in particular when determining the scope of such transactions. Parallel risks shall mean all potential negative consequences that may result from concentrations or interplays of similar or different risk categories.

Credit institutions shall establish such administrative, accounting and control procedures as are necessary for the purpose of recording and evaluating the risks of the credit institution's banking transactions and of operating the credit institution, and to record and evaluate as far as possible the potential risks resulting from new business and parallel risks. The adequacy of these procedures and their enforcement shall be reviewed by the internal audit at least once a year."

2.2.1 Management Duties

Within the scope of its overall corporate responsibility and duty of care, the executive management shall ensure and verify that the necessary framework conditions are in place. The following are management tools that are instrumental in accomplishing this task:

- An appropriate reporting system and corresponding meetings;
- a limit allocation process based on the credit institution's risk capacity;
- a risk management handbook documenting all important procedures and criteria for trading and risk control.

Even if a credit institution has good organizational control mechanisms and a clearly defined division of powers, in order for overall risk management to be efficient, management must actively participate in the risk management process. Risk control shall therefore present the impact of possible stress situations to management, whose task it is to (co-)evaluate this impact.

2.2.2 Procedures and Responsibilities

Credit institutions shall organize their workflow and related procedures in such a way as to guarantee that all relevant transactions and risk positions be captured completely and time-continuously. An organizational chart covering the following points must be provided for the audit:

- Structure of the credit institution (credit institution group) and its activities on the domestic market and abroad;
- Organizational setup stating the names of the persons involved in the credit institution's trading activities (including foreign offices);
- Description of the distribution of duties among the offices involved in trading.

The areas of responsibility and powers accorded to all organizational units concerned must concur with the principles laid down in the risk management handbook and be devoid of responsibility conflicts. Accordingly, the credit institution shall establish a separate organizational unit for risk management. This unit is to be independent of the trading department and be provided with sufficient resources. In other words, risk control, at the very least, does not receive its instructions from the same authority as the trading department. Moreover, risk control is responsible for making sure that both legal provisions and those laid down internally in the risk management handbook are implemented and observed throughout the credit institution.

Should there be any changes in a given procedure, they are to be entered in the risk management handbook without delay upon approval and brought to the attention of employees.

2.2.3 Reporting

Risk control shall periodically report on the risk positions of the trading book. To ensure that the reports can be used as stipulated in the provisions, an appropriate deadline for preparing and relaying the reports must be fixed. The flow of risk-related data and information between and

within organizational units of the credit institution or group of credit institutions must also be laid down in the risk management handbook.

2.2.4 Limit Control

For individuals and organizational units involved in trading, limits are to be defined and adjusted in accordance with the institution's risk capacity. The limits are to be approved by management or another appropriate body and evaluated periodically.

In distributing and controlling the limits at branch offices, the credit institution shall indicate how the limit process is administrated (centralized/decentralized). The individual steps and systems must be documented in order to keep the procedure uniform.

The allocation and distribution of limits to individual trading areas shall only be done in coordination with risk control.

The individuals and organizational units involved are to be informed of the limits and their utilization. Risk control shall review the limits and take the appropriate measures when limits are exceeded.

2.2.5 Risk Analysis when Introducing New Products

Before a decision can be taken on introducing new products, analyses of all of the departments concerned – risk control in particular – should identify their risk profile. All points relating to this (e.g. responsibilities, product specifications, system compatibility) are to be defined in the risk management handbook.

2.2.6 Risk Management Handbook

The principles and procedures of risk management shall be documented in a handbook. Risk control is responsible for putting together and adapting the risk management handbook. Utmost care shall be taken to use the handbook uniformly throughout the credit institution.

The risk management handbook is to be submitted to management for approval not only upon its introduction, but also whenever a significant change occurs. The procedure for revisions should be included in the documentation. All departments affected shall have access to the risk management handbook at all times.

2.2.7 Internal Audit

The internal audit department is to review the implementation of the standardized approach, considering both qualitative and quantitative standards. Both risk control and management are to be informed of the results.

In particular the internal audit shall cover the following:

- The appropriateness of the documentation of the system and the risk management procedures,
- the organization of risk management for the entire credit institution,
- the integration of the risk positions into risk management,
- the approval process for the valuation systems used by employees in the front and back offices,
- the allocation of positions in the trading book as well as any potential transfers according to the internal criteria pertaining to their consideration in the trading book,
- the quality of the management information system,
- the accuracy and completeness of position data,
- verification of uniformity, recentness of data, reliability and independence of the data sources used,
- the accuracy and appropriateness of the valuation procedures.

The internal audit department shall verify the correction of detected defects in due time.

In principle, the OeNB proceeds on the assumption that the internal audit department applies the same criteria in the course of its examination of the standardized approach as the OeNB in its audit process.

3 Required Documents

Reporting and Risk Management Handbook

- Description of how the calculation of the regulatory capital requirement is effected and monitored
- Risk reports
- Reports drawn up by other departments (e.g. trading, back office) in connection with the risk control process
- Samples of risk analyses performed for the approval and introduction of a new product
- Copy of the risk management handbook
- Authorization of the risk management handbook
- List of addressees receiving the risk management handbook

Organization and Responsibilities

- Description of the consolidation process (in the case of a group of credit institutions)
- Organizational chart of the entire credit institution group
- Organizational chart of the main credit institution paying special attention to trading, risk control, back office and internal audit
- Organizational chart of all branch offices and subsidiaries engaged in trading
- Description of the duties of the member of the executive board responsible for the risk control process
- Description of the duties of the member of the executive board responsible for trading
- Description of the duties assigned to the risk control department with the names and job descriptions of all employees, including particulars of their qualifications and work experience
- Training schedule for employees in the area of risk control

Trading Book

- The complete trading book on an electronic data medium, on the dates set by the OeNB. The data are to be transmitted in the form of raw data (individual positions) and in processed form (aggregated presentation). Credit institutions are required to aggregate data in the following form:

Stocks:

- ◆ Exposure broken down by markets, i.e. aggregation through spot positions, option positions (delta-weighted) and index positions (broken down and delta-weighted in the case of index options). The data can be provided in ATS or EUR.
- ◆ Illustration of the individual markets in the form of a pie chart with numerical data

Exchange rates:

- ◆ Illustration of the currency dispersion in the form of a pie chart with numerical data

Interest rates:

- ◆ Description of total interest rate exposure per currency on all interest rate instruments according to time to maturity (at yearly intervals). This is to be presented in the form of a bar chart accompanied by the appropriate numerical data.
 - ◆ Description of interest rate exposure per currency and per interest rate instrument according to time to maturity (at yearly intervals). This is to be presented in the form of a bar chart with the appropriate numerical data.
- Complex issues are to be described in detail (issue terms, payment profile, valuation, hedging).
 - Documentation of the internal guidelines for allocating positions to the trading or banking book
 - List of all internal deals and transfers between the trading and banking book during a period specified by the OeNB. All transfers are to be documented and justified. Submission of an excerpt from the banking book on specific product categories

Valuation

- Sources for market prices not derived from model-based calculations
- List of all model-valuated financial instruments including the valuation models used
- Documentation of the valuation models including the necessary input parameters
- Sources and calculation methods of input parameters
- Sources and calculation methods of yield curves

- Data base used for determining yield curves (e.g. treasury curve, swap curve, etc.) including a detailed description of input parameters
- Archiving of yield curves

The required documents shall include the following for each valuation model used:

- Principles behind the methods
 - ◆ references to publications stating sources
 - ◆ for internally developed methods: documentation
- Assumptions for the applicability of the model
- Indication of any modifications made to standard formulas
- Source of input parameters
- Input parameter formulas with a definition of the variables
- Scaling of input parameters
- Procedure, result and documentation of all test calculations pertaining to the valuation model
- Strengths and weaknesses of the valuation model as assessed by the credit institution

Data Flow

- Diagram illustrating the data flow from the front office to the standardized approach software
- List of all front office systems used
- List of all interfaces necessary for computing the regulatory capital requirement
- Test results verifying the correct functioning of the data flow
- Software and system documentation used for computing the regulatory capital requirement
- Test schedules for verifying the correct implementation of the standardized approach
- Diagram of the routing of documents pertaining to the capturing of positions distinguished by trading location
- List of all interfaces from the front office system to the computation of the regulatory capital requirement
- Interfaces for data delivery
- Report on the validation of the standardized approach software
- List (including descriptions) of the software used in trading and settlement for capturing positions (This list should show which software is used for which financial instruments in which trading locations.)

Limits

- Description of the limits system
- Reports on the utilization of daily limits
- Authorization of the used limits
- Discretionary power when limits are exceeded

Internal Audit

- Description of the duties assigned to the internal audit department with the names and job descriptions of those employees responsible for auditing the standardized approach, including particulars of their qualifications and work experience
- Training program
- Annual audit schedules
- Standardized approach audit reports

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