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THE FINANCIAL SUPERVISORY
AUTHORITY OF NORWAY

Risk-based supervision

Market Risk Module

Evaluation of market risk level

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1. Introduction

The market risk module consists of a guideline for the assessment of the *market risk level* of a financial institution and another guideline for the assessment of the financial institution's *market risk management and control* system. This document is the guidance on Finanstilsynet's assessment of the institution's market risk level. The purpose of this market risk module is to describe a benchmark methodology for assessing the level of market risk in the individual institution. It also serves as a guide for supervisory assessment and can be used at on-site inspections to review banks' market risk. It must not be confused with the assessment made of Pillar 2 requirements for market risk as part of Finanstilsynet's SREP, even though the stress factor level used to estimate the loss potential of individual market risk factors is the same as that used in the SREP¹.

The generic methodology that the risk assessment is based on is further described in section 2. The assessment criteria for each of the market risk components (equity, interest rate, currency, spread and property risk) are further described in sections 3, 4, 5, 6 and 7.

Internal templates have been prepared to ease the risk assessment exercise. The forms follow the same structure as this document.

¹ See circular 12/2016: Finanstilsynet's methodologies for assessing risk and capital needs, Appendix 3: Finanstilsynet's assessment of Pillar 2 capital add-ons for market risk

2. Methodology

Finanstilsynet's methodology for assessing the market risk level of a financial institution is based on a calculation of the loss potential, estimated by stress testing various risk factors for positions in both trading books and banking books. An assessment of the level of market risk includes both portfolio exposure and the risk attached to the exposure. The exposure is a measure of the institution's positions of financial instruments, whose value is influenced by market price fluctuations. The risk is a measure of the likelihood of changes in market prices.

The assessment is made in respect of the following asset classes: equities, fixed-income securities, foreign currencies, property and credit spread. Positions in derivatives are included in the overall assessment within each asset class. In addition, risks related to a deterioration in the creditworthiness of counterparties to derivative transactions (CVA risk) should be assessed². As a general rule, risk assessment is based on the market risk limits established by the institution³. The assessment is based on three different risk factors⁴:

1. Exposure
2. Diversification
3. Market liquidity

Exposure

The assessment of the risk factor Exposure is based on stress test scenarios for specific changes in the equity, interest rate, currency, bond and property markets:

- a drop in equity prices of 45 per cent
- a parallel shift in the yield curve of 2 percentage points
- a change in foreign currency exchange rates of 25 per cent
- specific changes in credit spreads for different rating categories
- a fall in the property market of 30 per cent

The stress scenarios are roughly equally likely to occur during a period of one year according to analyses of historical market data.⁵ By calculating the potential loss of value from each of the scenarios the risk can thus be expressed in a consistent and comparable way for each asset class.

Risk diversification and market liquidity

The risk factors Diversification and Market Liquidity are based on qualitative assessments of the market risk inherent in the institution's positions. The assessment should result in a classification based on the following scale:

1. Low risk
2. Moderate risk
3. Substantial risk

The risk factor Diversification describes the degree of risk diversification of the institution's positions. The institution's positions are assessed against the theoretically best possible risk diversification (the "global index"). The degree of deviation from the reference value for risk diversification, e.g. in the form

² Credit Valuation Adjustment (CVA) risk represents counterparty risk related to OTC derivative contracts. On 12 November 2015, the EBA launched a consultation on Guidelines on the treatment of CVA risk under the supervisory review and evaluation process (SREP) – EBA/CP/2015/21. However, this work has been put on hold until further notice, partly due to changes in the Basel Committee's standard for CVA risk under Pillar 1.

³ Finanstilsynet is of the view that the assessment of the loss potential for market risk should be based on the maximum potential risk exposure approved by the board of directors, assuming full utilisation of risk limits. However, it may be logical to make additional calculations based on the institution's actual portfolio.

⁴ In this context, *risk factor* means a variable that is used as a measure of different aspects of the position's market risk.

⁵ See the memorandum "About the prerequisites for stress testing in the market risk module", which explains the basis for this assumption. (This analysis was initially carried out in 2004 and thereafter recalibrated based on data up till the end of 2015. However, spread risk is based on Solvency II calibration and is thus not included in this analysis.) The probability is estimated at approximately 99 per cent, calculated on the basis of annual returns and long data series.

of exposure to individual counterparties, geographical markets or business sectors, determines the classification.

The risk factor Market Liquidity describes how the quick sale of market positions may affect market value. The institution's positions are considered against market liquidity in a well-functioning and diversified market. The degree of deviation from the reference value for market liquidity, e.g. in the form of positions in unlisted securities or large holdings in individual securities, determines the classification

The three risk factors can be summarised as follows:

| Risk factor | Purpose of the evaluation |
|--------------------|---|
| Exposure | Determine the loss potential in defined stress test scenarios |
| Diversification | Determine the risk of loss due to lack of diversification |
| Market liquidity | Determine the risk of loss in cases where positions are quickly sold or reduced |

Overall assessment within each asset class⁶

In the overall risk assessment within each asset class, qualitative assessments made under the risk factors Diversification and Market Liquidity must be coordinated with the risk factor Exposure. This is done by assigning additional loss potential to the various grades emerging from the qualitative assessment in addition to the loss potential calculated under Exposure. The additions are set as a share of the loss potential under Exposure, where the share rises with the level of risk. Hence, the overall assessment for an asset class equals the sum of the stress-test-based loss potential under Exposure including the additions based on the qualitative assessments of Diversification and Market Liquidity.

Overall assessment of market risk

An assessment of the overall level of market risk is obtained by compiling the assessments made in respect of equity, interest rate, currency, property and credit spread risk. This is done by summing the loss potential for all risk types. Hence, diversification effects between the different risk factors are not taken into account.

Institutions' own calculations

Where an institution has carried out its own calculations of the level of market risk, such calculations shall be taken into account in parallel with the assessments described in this document. Any deviation between the institution's own assessments and the institution's assessments of market risk should be analysed. This can provide valuable input to the review of the institution's system for management and control of market risk.

⁶ The purpose of calculating and assessing the loss potential is to use a set of criteria that ensure the greatest possible degree of objectivity and equal treatment of institutions. The methodology also makes it possible to compare the different asset classes by using the same scale (benchmark). Calculations based on this methodology will never be able to give a fully accurate picture of market risk, and it is necessary to make discretionary adjustments of potential losses for individual risk factors, asset classes and also for market risk overall. This may be necessary, for example to capture risks not covered by the risk factors or the methodology. This may include elements of non-linear risk in the portfolio. However, such discretionary adjustments should be justified in the assessment.

3. Equity risk

Equity risk comprises market risk associated with positions in equity instruments, including derivatives with equity instruments as underlying assets. Investments in equity funds and hybrid funds and any alternative investments such as hedge funds, private equity funds, venture capital funds and seed capital funds are included under equity risk. Shares in subsidiaries and shares that are part of a consolidated or strategic holding in the financial sector should not be included.

The risk factor Exposure is measured as the size of potential losses in a stress test scenario where the market value of the shares fall by 45 per cent. In the assessment of the risk factors Diversification and Market Liquidity, add-ons to the potential loss calculated under Exposure are made.

Positions in both the trading book and the banking book should be included. The general rule is that the risk assessment should be based on the market risk limits approved by the institution's board of directors. For the trading book, a risk limit⁷ must be established. For equity positions in the banking book that are not subject to explicit limits, but treated separately by the board, the assessment may be based on the market value of the actual portfolio on the assessment date.

If the institution uses only VaR limits to manage its equity risk and the limit covers the major part of the institution's equity risk exposure, the assessment may be based on this limit. To the extent that the VaR model takes into account the factors considered under the risk factors Diversification and Market Liquidity, no add-ons should be calculated for these factors. In Finanstilsynet's opinion, however, the VaR limits alone are not an adequate measurement parameter in risk management, and the institution's limit structure should be included in the assessment of the management and control of market risk.

The total loss potential for equity risk is defined as the sum of the loss potentials calculated for the three risk factors.

⁷ When assessing the institution's equity risk in the SREP, a distinction is made between positions in the trading book and in the banking book, as the trading book is part of the Pillar 1 requirement. When assessing the risk level (exposure) in contexts not related to the SREP, the basis for calculation in the stress test is full utilisation of trading book limits in connection with Finanstilsynet's assessment of the loss potential of the equity portfolio. In addition, the market value of the actual shareholdings included in the calculation base for the banking book is used.

3.1 Exposure

| <p>The purpose of evaluating the risk factor Exposure: – Determine the loss potential for equity risk in a standardised stress test scenario</p> | |
|--|---|
| Required information | Criteria |
| <p>The estimated loss from a market-wide reduction in equity prices of 45 per cent.</p> <p>The calculation should be based on approved limits. For equity positions in the banking book that are not subject to explicit limits, the assessment should be based on the actual portfolio.</p> <p><u>When the exposure is calculated from regular exposure limits or actual exposure:</u></p> <ul style="list-style-type: none"> • The starting point is the general risk limits adopted by the board.⁸ • Shares in subsidiaries and shares that are part of a consolidated or strategic holding, as well as equity certificates and shares in the financial sector, should not be included. • Positions that are not subject to limits or board resolutions should be assessed conservatively. • The basis for the calculation of the loss potential is the market value of the positions. • All financial instruments with equity risk should be included in the calculations, including equity funds. Further, all alternative investments, such as hedge funds, private equity funds, venture capital funds and seed capital funds, should be included. • Linear derivatives should be included with the value of the underlying instrument and non-linear derivatives with the delta value. • All types of short positions are to be deducted from the exposure. • Stop loss mechanisms are not taken into account. <p><u>When the exposure is calculated from the VaR limits:</u></p> <ul style="list-style-type: none"> • For institutions that use only VaR models in their risk management, the institution’s approved VaR limits can also be used as the starting point for the assessment. • If the VaR limits apply to a large part, but not all of the equity risk, a discretionary assessment can be made of whether the calculation should be based on the VaR limits. If VaR limits apply only to a small portion of the equity risk, the regular exposure limits or actual exposure should be used for the entire equity risk. • The starting point is the institution's actual overall VaR limits approved by the board. The limits must be adjusted to reflect the maximum loss within a period of one year at a confidence level consistent with the stress scenario that is used (see above). | <p>The estimated loss potential forms the basis for add-ons to potential losses calculated under the risk factors Diversification and Market Liquidity.</p> |

⁸ It must be considered whether to adjust the basis for calculation based on the institution’s definition of the limits.

3.2 Diversification

| <p>The purpose of the evaluation of the risk factor Diversification:</p> <p>– Establish an add-on to potential losses for equity risk due to lack of risk diversification.</p> | |
|--|---|
| Required information | Criteria |
| <p>Information showing the degree of risk diversification in terms of exposure to companies, business sectors and geographical markets.</p> <p>The starting point is established limits and guidelines for risk diversification.</p> <p>For institutions where the risk factor Exposure is based on VaR limits, the risk diversification is not evaluated if this is already covered by the VaR model.</p> <p>Elements for assessment:</p> <ul style="list-style-type: none"> • The degree of risk diversification is assessed in terms of deviations from the optimal spread between individual counterparties, business sectors and geographical markets, as represented by the Oslo Børs Benchmark Index or corresponding indices abroad. • The principal risk is unsystematic risk (risk that can be diversified away) in terms of concentrations on certain countries, regions, sectors and counterparties. • The level of systematic risk (risk that cannot be diversified away) may also be emphasised if the level of unsystematic risk is low. High systematic risk results from overweight in companies with a high beta value and this will lead to larger fluctuations in value than the fluctuations in the benchmark index. • It is essential to clarify the extent to which limits have been established to ensure that the investments have a sufficient spread of risk, such as requirements for geographical diversification, sector diversification and limits for maximum investment in individual companies. • If relevant limits have not been established, any relevant qualitative formulations on risk diversification requirements may be taken into account upon making a conservative estimate of the actual positioning. • If neither limits nor qualitative guidelines on risk diversification are established the grade should be increased one level in relation to an assessment of risk diversification in the actual portfolio. | <p><i>1. Low risk</i></p> <p>The institution's investments track Norwegian or international indices, and the distribution between these country and sector indices largely reflects the size of the markets. Additional loss potential: 0 per cent of the loss potential under Exposure.</p> <p><i>2. Moderate risk</i></p> <p>The institution's investments are largely diversified with respect to a number of significant dimensions, such as individual companies, business sectors and geographical markets, but allow a certain degree of concentration. Additional loss potential: 10 per cent of the loss potential under Exposure.</p> <p><i>3. Substantial risk</i></p> <p>The institution's investments are not very diversified with respect to a number of significant dimensions, such as individual companies, business sectors and geographical markets. Investments could make the risk in large sub-portfolios significantly higher than the index. Additional loss potential: 20 per cent of the loss potential under Exposure.</p> |

3.3 Market liquidity

| <p>The purpose of the evaluation of the risk factor Market Liquidity:</p> <p>– Establish an add-on to potential losses if large positions are sold quickly.</p> | |
|--|--|
| Required information | Criteria |
| <p>Investments in financial instruments with low market liquidity (wide bid-ask spread and low order depth).</p> <p>For institutions where the risk factor Exposure is based on VaR limits the market liquidity is not evaluated if this is already covered by the VaR model.</p> <p>Elements for assessment:</p> <ul style="list-style-type: none"> • The starting point is an assessment of established limits and guidelines for investments in financial instruments with low liquidity. For example, requirements may be set for the proportion of listed securities and the maximum holding in individual companies. Transferability in the banking book will be a key factor. • It must be considered whether low liquidity is a real issue, or whether equity risk can easily be hedged by taking opposite positions in other (liquid) instruments, including short sales and derivatives. • Long-term positions, including portfolios subject to little change over time, may be assessed less conservatively. • If relevant limits have not been established, any relevant qualitative formulations on risk diversification requirements may be taken into account upon making a conservative estimate of the actual positioning. • If neither limits nor qualitative guidelines for market liquidity are established the grade should be increased one level in relation to an assessment of market liquidity in the actual portfolio. | <p><i>1. Low risk</i> The institution's equity-related positions are traded on a stock exchange, and the daily turnover is consistently high with a narrow bid-ask spread and high order depth in relation to the institution's exposure. Additional loss potential: 0 per cent of the loss potential under Exposure.</p> <p><i>2. Moderate risk</i> A large share of the institution's equity-related positions is traded on a stock exchange, and the daily turnover is consistently high with a narrow bid-ask spread and high order depth in relation to the institution's exposure. Additional loss potential: 10 per cent of the loss potential under Exposure.</p> <p><i>3. Substantial risk</i> The greater part of the institution's equity-related positions is not traded on a stock exchange, or the daily turnover is variable or low with occasional wide bid-ask spreads and low order depth in relation to the institution's exposure. Additional loss potential: 20 per cent of the loss potential under Exposure.</p> |

4. Interest rate risk

Interest rate risk comprises market risk associated with positions in fixed-income securities, including derivatives with fixed-income instruments as underlying assets. Investments in fixed-income funds, bond funds and money market funds are included. Interest rate risk in the institution's banking book is also a key element in the assessment of the interest rate risk level and shall be evaluated separately.⁹

The risk factor Exposure is measured as the size of potential losses in a stress test scenario where the entire yield curve experiences a parallel shift of 2 percentage points in the direction that causes the institution a loss¹⁰. The effect of a change in the shape of the yield curve should also be considered¹¹. Institutions should calculate the impact of changes in interest rates both as a decline in value (effect on economic value) and as a change in earnings (effect on net interest income¹². Positions in both the trading book and the banking book shall be included in the calculation base¹³. In the assessment of the risk factors Diversification and Market Liquidity add-ons to the potential loss calculated under Exposure are made.

The general rule is that the risk assessment should be based on the market risk limits approved by the institution's board of directors.

If there are no limits or board resolutions for all or part of the interest rate risk, a conservative assessment based on the actual portfolio should be made. In such a case, the grade for the risk factors Diversification and Market Liquidity should be increased one level compared with an assessment of the actual portfolio.

If the institution uses only VaR limits to manage its interest rate risk and the limit covers the major part of the institution's interest rate risk exposure, the assessment may be based on this limit. To the extent that the VaR model takes into account the factors considered under the risk factors Diversification and Market Liquidity, no add-ons should be calculated for these factors.

The total loss potential for interest rate risk is defined as the sum of the loss potentials calculated for the three risk factors.

⁹ See the following documents from the EBA and the Basel Committee: EBA/GL/2018/02: "Guidelines on the management of interest rate risk arising from non-trading activities, July 2018" and BCBS: "Standards – Interest rate risk in the banking book, April 2016".

¹⁰ According to CRD IV (2013/36/EU) Section 98 (5), the loss potential under a "standard shock" with a 2 percentage point parallel shift of the yield curve is to be calculated. This has been implemented in EBA/GL/2018/02, see point 113.

¹¹ Finanstilsynet uses the methodology described in the Basel standard BCBS: "Standards – Interest rate risk in the banking book, April 2016". Six defined interest rate shock scenarios should be used in the calculations of interest rate risk. This has also been implemented in EBA/GL/2018/02, see point 114.

¹² See EBA/GL/2018/02 points 13 and 81. Finanstilsynet considers the effect of the two supervisory outlier tests as shown in points 113-116.

¹³ In the same way as for equity risk, fixed-income securities in the trading book are included in the Pillar 1 requirement. This is taken into account by Finanstilsynet when setting the Pillar 2 requirement in the SREP, cf. Circular 12/2016, appendix 3. In assessments of the market risk level in contexts not related to the SREP, for example at on-site inspections, the limits for both the trading book and the banking book are included when calculating the loss potential from the stress test.

4.1 Exposure

| <p>The purpose of the evaluation of the risk factor Exposure:</p> <p>– Determine the loss potential for interest rate risk in a standardised stress scenario</p> | |
|---|---|
| Required information | Criteria |
| <p>The estimated loss from a general change in the market interest rate of 2 percentage points over the yield curve.</p> <p>The general rule is that the calculation is based on approved limits for both the trading book and the banking book.</p> <p><u>When the exposure is calculated from the exposure limits or actual position:</u></p> <ul style="list-style-type: none"> • The starting point is the general risk limits adopted by the board.¹⁴ • Positions that are not subject to limits should be assessed conservatively. • The basis for the calculation of the loss potential is the market value of the positions. • All financial instruments exposed to interest rate risk should be included, hereunder derivatives and bond/money market funds. • Linear derivatives should be included with the value of the underlying asset, and non-linear derivatives with the delta value. • All types of short positions are to be deducted from the exposure. • Stop loss mechanisms are not taken into account. <p><u>When the exposure is calculated from the VaR limits:</u></p> <ul style="list-style-type: none"> • For institutions that use only VaR models, the institution’s approved VaR limits can also be used as the starting point for the assessment. • If the VaR limits apply to a large part, but not all of the interest rate risk, a discretionary assessment can be made of whether the calculation should be based on the VaR limits. If VaR limits apply only to a small portion of the interest rate risk, the regular exposure limits or actual exposure should be used for the entire interest rate risk. • The starting point is the institution's actual overall VaR limits approved by the board. The limits must be adjusted to reflect the maximum loss within a period of one year at a confidence level consistent with the stress scenario that is used (see above). | <p>The estimated loss potential forms the basis for add-ons to potential losses calculated under the risk factors Diversification and Market Liquidity.</p> |

¹⁴ It must be considered whether to adjust the basis for calculation based on the institution’s definition of the limits.

4.2 Diversification

| <p>The purpose of the evaluation of the risk factor Diversification:</p> <p>– Establish an add-on to potential losses for interest rate risk due to lack of risk diversification.</p> | |
|--|--|
| Required information | Criteria |
| <p>Information showing the degree of diversification in interest rate risk exposure in individual currencies and exposure to yield curve risk.¹⁵</p> <p>The starting point is the institution's established limits and guidelines for risk diversification.</p> <p>For large banks (categories 1 and 2): Estimated losses in connection with a twist in the yield curve, as specified in the stress scenarios in the Basel standard (see footnote 11).</p> <p>For institutions where the risk factor Exposure is based solely on VaR limits, the risk diversification is not evaluated if this is already covered by the VaR model.</p> <p>Elements for assessment:</p> <ul style="list-style-type: none"> • The degree of risk diversification is assessed in terms of deviations from the optimal allocation between currencies and distribution of exposure across the yield curve. • It is essential to clarify to which extent the limits have been established to ensure that positions have a good risk diversification. (Limits to manage yield curve risk often entail dividing the positions into intervals based on fixed-rate periods, setting interest rate risk limits for net exposure within each interval (gapping limits). • If relevant limits have not been established, any relevant qualitative formulations on risk diversification requirements may be taken into account upon making a conservative estimate of the actual positioning. • If neither limits nor qualitative guidelines for diversification are established the grade should be increased one level in relation to an assessment of actual positions. | <p><i>1. Low risk</i> The institution's positions are well diversified across currencies and evenly distributed across the yield curve. Additional loss potential: 0 per cent of the loss potential under Exposure.</p> <p><i>2. Moderate risk</i> A significant portion of the institution's positions has an acceptable spread across currencies and an even exposure across the yield curve, but allows a certain degree of concentration. Additional loss potential: 10 per cent of the loss potential under Exposure.</p> <p><i>3. Substantial risk</i> The institution has a limited spread across major dimensions of risk diversification. Additional loss potential: 20 per cent of the loss potential under Exposure.</p> |

¹⁵ Yield curve risk is the risk of losses in connection with non-parallel shifts in the yield curve (changes in the gradient and curvature of the yield curve).

4.3 Market liquidity

| <p>The purpose of the evaluation of the risk factor Market Liquidity:</p> <p>– Establish an add-on to potential losses if large positions are sold quickly.</p> | |
|---|---|
| Required information | Criteria |
| <p>Positions with low market liquidity (wide bid-ask spread and low order depth).</p> <p>For institutions where the risk factor Exposure is based solely on VaR limits the market liquidity is not evaluated if this is already covered by the VaR model.</p> <p>Elements for assessment:</p> <ul style="list-style-type: none"> • The starting point is an assessment of established limits and guidelines for positions with low liquidity. • It must be considered whether the low liquidity is a real issue, or whether the interest rate risk can easily be hedged by taking opposite positions in other (liquid) instruments. • If relevant limits have not been established, any relevant qualitative formulations on risk diversification requirements may be taken into account upon making a conservative estimate of the actual positioning. • If neither limits nor qualitative guidelines for market liquidity are established the grade should be increased one level in relation to an assessment of market liquidity in the actual portfolio. | <p>1. Low risk The institution's interest rate-related positions have a consistently high daily turnover with a narrow bid-ask spread and high order depth in relation to the institution's exposure. Additional loss potential: 0 per cent of the loss potential under Exposure.</p> <p>2. Moderate risk The institution's interest rate-related positions largely have a consistently high daily turnover with a narrow bid-ask spread and high order depth in relation to the institution's exposure. Additional loss potential: 10 per cent of the loss potential under Exposure.</p> <p>3. Substantial risk A large part of the institution's interest rate-related positions has a variable or low daily turnover and at times wide bid-ask spreads and low order depth in relation to the institution's exposure. Additional loss potential: 20 per cent of the loss potential under Exposure.</p> |

5. Currency risk

Currency risk consists of the risk of loss from changes in exchange rates. All financial instruments and other positions with foreign exchange risk should be included in the assessment.

The risk factor Exposure is measured as the size of potential losses in a stress scenario with adverse movements of 25 per cent in exchange rates. In the assessment of the risk factors Diversification and Market Liquidity add-ons to the potential loss calculated under Exposure are made.

The general rule is that the risk assessment should be based on the risk limits approved by the institution's board of directors for both the trading book and the banking book¹⁶.

If there are no limits or board resolutions for all or part of the currency risk, a conservative assessment based on the actual portfolio should be made. In such a case, the grade for the risk factors Diversification and Market Liquidity should be increased one level compared with an assessment of the risk limits.

If the institution has established only VaR limits to manage its currency risk, and the limit covers the major part of the institution's exposure to currency risk, the assessment may be based on this risk limit. To the extent that the VaR model takes into account the factors considered under the risk factors Diversification and Market Liquidity, no add-ons should be calculated for these factors.

The total loss potential for currency risk is defined as the sum of the loss potentials calculated for the three risk factors.

¹⁶ See footnote 13.

5.1 Exposure

| <p>The purpose of the evaluation of the risk factor Exposure:</p> <p>– Determine the loss potential for currency risk in a standardised stress scenario</p> | |
|---|---|
| Required information | Criteria |
| <p>Estimated losses from adverse movements of 25 per cent in the value of foreign currencies relative to Norwegian kroner.</p> <p>The general rule is that the calculation is based on approved limits for the institution's/group's total net currency position (including both the trading book and the banking book).</p> <p><u>When the exposure is calculated from the exposure limits or actual position:</u></p> <ul style="list-style-type: none"> • The starting point is the general risk limits adopted by the board.¹⁷ • Positions that are not subject to limits should be assessed conservatively. • The basis for the calculation of the loss potential is the current market value converted into Norwegian kroner at spot rates. The net currency position shall be calculated according to Section 38-3 of the Capital Requirements Regulations. • All financial instruments and other assets exposed to currency risk should be included. • Linear derivatives should be included with the value of the underlying asset, and non-linear derivatives with the delta value. • All types of short positions are to be deducted from exposures in each individual currency and in the total currency exposure converted into Norwegian kroner. • Stop loss mechanisms are not taken into account. <p><u>When the exposure is calculated from the VaR limits:</u></p> <ul style="list-style-type: none"> • For institutions that use only VaR models, the institution's approved VaR limits can also be used as the starting point for the assessment. • If the VaR limits apply to a large part, but not all of the currency risk, a discretionary assessment can be made of whether the calculation should be based on the VaR limits. If VaR limits apply only to a small portion of the currency risk, the regular exposure limits or actual exposure should be used for the entire currency risk. • The starting point is the institution's actual overall VaR limits approved by the board. The limits must be adjusted to reflect the maximum loss within a period of one year at a confidence level consistent with the stress scenario that is used (see above). | <p>The estimated loss potential forms the basis for add-ons to potential losses calculated under the risk factors Diversification and Market Liquidity.</p> |

¹⁷ It must be considered whether to adjust the basis for calculation based on the institution's definition of the limits.

5.2 Diversification

| <p>The purpose of the evaluation of the risk factor Diversification:</p> <p>– Establish an add-on to potential losses for currency risk due to lack of risk diversification.</p> | |
|--|---|
| Required information | Criteria |
| <p>Information showing the degree of diversification in relation to exposure in individual currencies or markets with correlated currencies.</p> <p>The starting point is established limits and guidelines for risk diversification.</p> <p>For institutions where the risk factor Exposure is based on VaR limits, the risk diversification is not evaluated if this is already covered by the VaR model.</p> <p>Elements for assessment:</p> <ul style="list-style-type: none"> • The degree of risk diversification is assessed in terms of deviations from the optimal diversification across currencies and geographical markets. • If there is concentration in individual currencies, an assessment of marketability and the size of the exposure in relation to the market turnover in the relevant currency should also be made. A certain concentration in USD and EUR is considered to be relatively unproblematic. • Ratio of exposure to individual currencies. • It is essential to clarify to which extent risk limits have been established to ensure that the investments are well diversified. Guidelines should also be prepared to specify the currencies to which the institution may be exposed. • If relevant limits have not been established, any relevant qualitative formulations on risk diversification requirements may be taken into account upon making a conservative estimate of the actual positioning. • If neither limits nor qualitative guidelines for diversification are established the grade should be increased one level in relation to an assessment of actual positions. | <p><i>1. Low risk</i> The institution's positions are well diversified across currencies and geographical markets. Additional loss potential: 0 per cent of the loss potential under Exposure.</p> <p><i>2. Moderate risk</i> The institution's positions are essentially well diversified across currencies and geographical markets, but allow a certain degree of concentration. Additional loss potential: 10 per cent of the loss potential under Exposure.</p> <p><i>3. Substantial risk</i> The institution's positions are poorly diversified across currencies and geographical markets. Additional loss potential: 20 per cent of the loss potential under Exposure.</p> |

5.3 Market liquidity

| <p>The purpose of the evaluation of the risk factor Market Liquidity:</p> <p>– Establish an add-on to potential losses if large currency positions are quickly reduced.</p> | |
|---|---|
| Required information | Criteria |
| <p>Positions in currencies with low liquidity and investments in foreign currency instruments with low liquidity (wide bid-ask spread and low order depth).</p> <p>For institutions where the risk factor Exposure is based on VaR limits the market liquidity is not evaluated if this is already covered by the VaR model.</p> <p>Elements for assessment:</p> <ul style="list-style-type: none"> • The starting point is an assessment of established limits and guidelines for investments in foreign currency and foreign exchange instruments with low liquidity. • For currency positions the limits on taking positions in non-convertible and illiquid currencies have to be assessed. (In general, currency markets are liquid, and exposures to major currencies (e.g. USD, EUR, GBP, CHF, etc.) with high turnover are considered to be sufficiently liquid). • For foreign exchange instruments it has to be assessed whether the low liquidity is a real issue, or whether the currency risk can be hedged by taking opposite positions in other (liquid) instruments. | <p><i>1. Low risk</i> The institution only has positions in convertible currencies and can quickly hedge all currency risk. Additional loss potential: 0 per cent of the loss potential under Exposure.</p> <p><i>2. Moderate risk</i> The institution primarily has positions in convertible currencies and can quickly hedge the major part of its currency risk. Additional loss potential: 10 per cent of the loss potential under Exposure.</p> <p><i>3. Substantial risk</i> The institution has significant positions in non-convertible currencies, and in some cases has difficulties hedging the remaining currency risk. Additional loss potential: 20 per cent of the loss potential under Exposure.</p> |

6. Spread risk

Spread risk is defined as the risk of changes in the market value of bonds, commercial paper and credit derivatives due to general changes in credit spreads. The methodology is based on the Solvency II framework regulations for insurance undertakings. However, the methodology used for banks is somewhat simplified.

The risk factor Exposure is measured as the sum of the loss potentials calculated for each credit exposure. The loss potential for the individual credit exposure is calculated on the basis of credit spread changes for each risk category as shown in the table below and the duration of the credit exposure. As a simplification the remaining term of the security may be used in the calculation. Market values should be used in the calculation, ignoring the fact that some portfolios may be carried as amortised cost in the accounts (held to maturity).

The risk assessment is based on the institution's actual positions in fixed-income securities in both the trading book and the banking book¹⁸. Government bonds issued by OECD states (in their own currency) and holdings of subsidiaries' covered bonds are not included in the basis for calculation. Multilateral development banks, international organisations and other counterparties which are weighted at 0 per cent under the Capital Requirements Regulations are also excluded from the basis for calculation. Any short positions in corresponding instruments issued by the same issuer are deductible. Positions in fixed-income funds and bond funds shall be included in the basis for calculation. Where the average duration and rating of the fund are not specified, a maturity of three years will be utilised and it will be assumed that the holding is not rated. Finanstilsynet's methodology does not cover spread risk related to the institutions' own borrowings.

If the institution has established only VaR limits to manage its spread risk and the limit covers the major part of the institution's exposure to spread risk, the assessment may be based on this risk limit. To the extent that the VaR model takes into account the factors considered under the risk factors Diversification and Market Liquidity, no add-ons should be calculated for these factors.

The total loss potential for spread risk is defined as the sum of the loss potentials calculated for the three risk factors.

Credit spread changes per risk category

| Rating | Risk category ¹⁹ | Change in spread |
|---------------------|-----------------------------|------------------|
| AAA | 1 | 0.9% |
| AA | | 1.1% |
| A | 2 | 1.4% |
| BBB | 3 | 2.5% |
| BBB | 4 | 4.5% |
| B or lower | 5 | 7.5% |
| Not rated | - | 3.0% |
| Covered bonds (AAA) | 1 | 0.7% |
| Covered bonds (AA) | 1 | 0.9% |

¹⁸ See footnote 13.

¹⁹ See Finanstilsynet's circular no. 9/2014 on ratings for determining risk weights for exposures when calculating capital adequacy. Standard & Poor's rating classes are included in the table as an illustration.

6.1 Exposure

| <p>The purpose of the evaluation of the risk factor Exposure:</p> <ul style="list-style-type: none"> – Identify potential losses based on standard credit spread changes. | |
|--|---|
| Required information | Criteria |
| <p>Estimated losses resulting from credit spread changes as defined in the table above. The calculation may be done per rating category (total market value of the rating category multiplied by the average duration of the rating category multiplied by the defined credit spread change for the relevant rating category). The total loss potential is equal to the sum of the loss potentials for each rating category.</p> <p>The calculation should as a rule be based on actual positions. However, the institution's limit should also be assessed and deviations analysed.</p> <ul style="list-style-type: none"> • The basis for the calculation of the loss potential is the market value of positions, thus disregarding that individual portfolios may be recognised at amortised cost in the accounts. • Bonds and commercial paper (only assets), fixed-income funds and credit derivatives should be included in the analysis. • Government bonds denominated in the issuer's own currency in the OECD area are not included. • Some multilateral development banks and international organisations are excluded from the basis for calculation, as are other counterparties with a 0 per cent weighting defined in the Capital Requirements Regulations. • Furthermore, positions in covered bonds issued by wholly or partially owned mortgage companies on behalf of the institution, are excluded ("own" covered bond holdings). • Any short positions are deductible from the exposure. • Stop loss mechanisms are not taken into account. • Only official ratings from an approved rating agency can be used. | <p>The estimated loss potential forms the basis for add-ons to potential losses calculated under the risk factors Diversification and Market Liquidity.</p> |

6.2 Diversification

| <p>The purpose of the evaluation of the risk factor Diversification:</p> <p>– Assess the impact on the overall spread risk due to lack of risk diversification.</p> | |
|--|---|
| Required information | Criteria |
| <p>Information showing the degree of risk diversification in terms of exposure to individual issuers, business sectors and geographical markets.</p> <p>The starting point is the institution's actual exposure, as well as established limits and guidelines for risk diversification.</p> <ul style="list-style-type: none"> • The degree of risk diversification should be assessed in terms of deviations from optimal diversification among individual issuers, business sectors and geographical markets. • It is essential to clarify to which extent limits have been established to ensure that positions have a good risk diversification, including allocation limits for fixed-income securities. • If relevant limits have not been established, any relevant qualitative formulations on risk diversification requirements may be taken into account upon making a conservative estimate of the actual positioning. • If neither limits nor qualitative guidelines for diversification are established the grade should be increased one level in relation to an assessment of actual positions. | <p><i>1. Low risk</i></p> <p>The institution's investments track indices in different countries, and the distribution between these countries largely reflects the size of the markets. For small institutions, a limited international diversification is accepted.</p> <p>Additional loss potential: 0 per cent of the loss potential under Exposure.</p> <p><i>2. Moderate risk</i></p> <p>The institution's investments are well diversified with respect to all significant dimensions, such as individual issuers, business sectors and geographical markets, but allow a certain degree of concentration.</p> <p>Additional loss potential: 10 per cent of the loss potential under Exposure.</p> <p><i>3. Substantial risk</i></p> <p>The institution's investments are not very diversified with respect to significant dimensions, such as individual issuers, business sectors and geographical markets. Investments could make the risk in large sub-portfolios significantly higher than the index.</p> <p>Additional loss potential: 20 per cent of the loss potential under Exposure.</p> |

6.3 Market liquidity

| <p>The purpose of the evaluation of the risk factor Market Liquidity: – Establish an add-on to potential losses if large positions are sold quickly.</p> | |
|--|---|
| Required information | Criteria |
| <p>Positions with low market liquidity (wide bid-ask spread and low order depth).</p> <ul style="list-style-type: none"> • The starting point is an assessment of actual positions and guidelines for positions with low liquidity. • It should be considered whether the low liquidity is a real issue, or whether the credit spread risk can be hedged by taking opposite positions in other (liquid) instruments. • If relevant limits have not been established, any relevant qualitative formulations on risk diversification requirements may be taken into account upon making a conservative estimate of the actual positioning. • If neither limits nor qualitative guidelines for market liquidity are established the grade should be increased one level in relation to an assessment of market liquidity in the actual portfolio. | <p><i>1. Low risk</i> The institution’s spread risk can be hedged by taking positions in instruments with a consistently high daily turnover with a narrow bid-ask spread and high order depth in relation to the institution's exposure. Additional loss potential: 0 per cent of the loss potential under Exposure.</p> <p><i>2. Moderate risk</i> The institution may hedge the major part of its spread risk by taking positions in instruments with consistently high daily turnover with a narrow bid-ask spread and high order depth in relation to the institution's exposure. Additional loss potential: 10 per cent of the loss potential under Exposure.</p> <p><i>3. Substantial risk</i> A large share of the institution’s spread risk cannot be hedged or can only be hedged by taking positions in instruments with a variable or low daily turnover and at times wide bid-ask spreads and low order depth in relation to the institution's exposure. Additional loss potential: 20 per cent of the loss potential under Exposure.</p> |

7. Property risk

Property risk comprises market risk related to positions in and direct ownership of property, including business premises owned by the institution (e.g. bank buildings and properties used by employees), property companies and repossessed properties. Investments in property funds are also included in the assessment of property risk.

The risk factor Exposure is measured as the size of potential losses in a stress scenario where the market value of property positions declines by **30 per cent**. In the assessment of the risk factors Diversification and Market Liquidity add-ons to the potential loss calculated under Exposure are made.

The main rule is that the risk assessment is to be based on the market value of actual holdings.

The total loss potential for property risk is defined as the sum of the loss potentials calculated for the three risk factors.

7.1 Exposure

| <p>The purpose of evaluating the risk factor Exposure:</p> <ul style="list-style-type: none"> – Determine the loss potential for property risk in a standardised stress scenario | |
|---|---|
| Required information | Criteria |
| <p>The estimated loss from a general fall in property prices of 30 per cent.</p> <ul style="list-style-type: none"> • The calculation should as a rule be based on actual positions. • The basis for the calculation of the loss potential is the market value (fair value) of the positions. • Ownership positions and participations in commercial property, property companies, property funds as well as direct ownership of property, including a bank's own buildings and property for own use or for the use of employees. • Properties repossessed in the wake of defaulted credit exposures should be included. • Book value relative to market value of properties not carried at fair value. If there are significant excess values (market value exceeding book value), a discretionary assessment should be made of whether the loss potential should be reduced accordingly. | <p>The estimated loss potential forms the basis for add-ons to potential losses calculated under the risk factors Diversification and Market Liquidity.</p> |

7.2 Diversification

| <p>The purpose of the evaluation of the risk factor Diversification:</p> <p>– Establish an add-on to potential losses for property risk due to lack of risk diversification.</p> | |
|--|--|
| Required information | Criteria |
| <p>Information showing the degree of risk diversification in terms of exposure to individual counterparties, property segments and geographical markets.</p> <p>Elements for assessment:</p> <ul style="list-style-type: none"> • The degree of risk diversification should be assessed in terms of deviations from optimal diversification across counterparties, business segments and geographical markets. • It is essential to clarify the extent to which limits have been established to ensure that the investments have a sufficient risk diversification, such as requirements for geographical diversification, segment diversification and limits for maximum investment in individual companies. • If relevant limits have not been established, any relevant qualitative formulations on risk diversification requirements may be taken into account upon making a conservative estimate of the actual positioning. • If neither limits nor qualitative guidelines on risk diversification are established the grade should be increased one level in relation to an assessment of risk diversification in the actual portfolio. | <p><i>1. Low risk</i> The institution's positions are well diversified across segments and geographical markets. For local savings banks, limited geographical diversification is accepted. Additional loss potential: 0 per cent of the loss potential under Exposure.</p> <p><i>2. Moderate risk</i> The institution's positions are essentially well diversified across segments and geographical markets, but allow a certain degree of concentration. Additional loss potential: 10 per cent of the loss potential under Exposure.</p> <p><i>3. Substantial risk</i> The institution's positions are poorly diversified across segments and geographical markets. Additional loss potential: 20 per cent of the loss potential under Exposure.</p> |

7.3 Market liquidity

| <p>The purpose of the evaluation of the risk factor Market Liquidity:</p> <p>– Establish an add-on to potential losses if large positions are sold quickly.</p> | |
|---|---|
| Required information | Criteria |
| <p>Information showing all individual property positions.</p> <p>Elements for assessment:</p> <ul style="list-style-type: none"> • The starting point is an assessment of actual positions and guidelines for property investments. • Geographical location in large markets with a significant number of commercial property transactions. • The property's location and exposure to cyclical fluctuations. • It must be considered whether low liquidity is a real issue, or whether property positions can be hedged by taking opposite positions in other (liquid) instruments. | <p><i>1. Low risk</i> The institution only has positions in properties in prime locations, with a high sales volume, and can quickly sell its positions. Additional loss potential: 0 per cent of the loss potential under Exposure.</p> <p><i>2. Moderate risk</i> The institution mainly has positions in properties in prime locations, with a moderate sales volume, and is probably able to sell the major part of its property holdings. Additional loss potential: 10 per cent of the loss potential under Exposure.</p> <p><i>3. Substantial risk</i> The institution has large property positions at less attractive locations, with a low transaction volume, and will in some cases have difficulty selling its positions. Additional loss potential: 20 per cent of the loss potential under Exposure.</p> |

