

# **CAPITAL MANAGEMENT - FOURTH QUARTER 2009**

#### **CAPITAL MANAGEMENT**

The purpose of the Bank's capital management practice is to ensure that the Bank has sufficient capital at all times to cover the risks associated with its activities. The framework for the Bank's capital management is rooted in the Capital Requirement Directive's (CRD) Pillar I and II, where Pillar I contains a set of rules for calculating the capital requirement, while Pillar II describes the framework for the Bank's Internal Capital adequacy assessment process and the supervisory review.

# **Internal Capital Adequacy Assessment Process (ICAAP)**

Saxo Bank's ICAAP process follows four steps:

Step 1: Capital requirements using CRD (Pillar I)

Step 2: Risk self assessment

Step 3: Stress testing

Step 4: Capital adequacy determination

## Capital requirements using CRD pillar I

This first step calculates the minimum capital using the Capital Requirements Directive (CRD), pillar I.

Saxo Bank uses the following methods to calculate risk-weighted assets for the three types of risks:

Credit risk: The standard method

• Market risk: The standard method

• Operational risk: Basic indicator method

Saxo Bank does not take diversification effects into account. The capital charges for each risk category are simply aggregated.

At the end of the fourth quarter 2009, the risk-weighted assets calculated using the CRD method, totalled at 7,801.6m. The capital requirement is 8%, equal to an overall capital requirement of 624.1m. The capital contribution in each of the main risk categories were as follows; Credit risk: 142.8m Market risk: 226.8m and Operational risk: 254.5m.



#### Risk self assessment

The second step is to assess the actual risks to which the Bank is exposed.

Different risk types that the Bank is exposed to have been examined and split into ICAAP risk categories as shown in table 1

Table 1: Risk types mapped in ICAAP risk categories

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Risk categories	Credit Risk	Market Risk	Operational Risk	Legal & Compliance Risk	Business Risk	Liquidity Risk
General	٧	٧	٧	٧	٧	٧
Earnings					٧	
Growth					٧	
Credit risk	٧					
Market risk		٧				
Concentration risk	٧	٧				
Group risks	٧	٧	٧	٧	٧	
Liquidity risk						٧
Operational risk			٧	٧		
Control risk			٧			
Business size					٧	
Settlement risk	٧		٧			
Strategic risk					٧	
Reputational risk			٧		٧	
Non-trading interest rate risk		٧				
External risk	٧		٧		٧	
Other conditions	٧				٧	
Stress testing	V	v	٧	٧	٧	٧

Different methods are applied to assess the Bank's capital need in each category which is described below.



#### **Credit risk**

To assess the credit risk to which the Bank is exposed the different counterparty types are examined, and the outstanding counterparty risk is determined in each case or each segment wherever possible. The risk is assessed using impact and likelihood based on empirical data and credit ratings wherever applicable. In a similar fashion the credit risk is determined on outstanding credit lines and accepted bank guarantees.

Using this input, a portfolio credit risk model using Monte Carlo simulation is employed, running one million scenarios with an assumed 10% event correlation. This yields the loss distribution due to credit risk. The Bank uses expected shortfall (average of events greater than Value-at-Risk) with a 99% confidence level.

Furthermore, credit risk outside the traded portfolio, including tangible assets and off-balance sheet items, is added using the standard method under the CRD.

If no significant change in the Banks credit risk is observed, a full self assessment is run annually. The annually assessed capital requirement is in turn scaled with actual development in the business level at a given point in time. This means that the annual assessment serves as a benchmark that is scaled with the relative change in the credit risk charge from the benchmark point in time to the current point in time, using the CRD model.

At the end of the fourth quarter 2009, the self assessed credit risk capital charge was 70.9m for the group.

#### Market risk

Market risk is determined using the internal market risk model of the Bank. The model employs full diversification effects implied by risk factors within the traded portfolio.

VaR is determined with 99% confidence, and a two day time horizon for the traded portfolio, where the trading exposure can be eliminated within one day, and a ten day time horizon for residual exposures. Interest risk outside the traded portfolio is determined by stressing the interest curve one percentage point, and evaluating the impact.

At the end of the fourth quarter 2009, the self assessed market risk capital charge was 67.5m for the group.

### **Operational and Business risk**

The risk from the Bank's operations including compliance and legal risk is assessed through an interview process where likelihood and impact levels of events are determined in cooperation with the applicable stakeholders. In addition, the Bank integrates external risk events into its risk management programme in order to determine factors that could materialise and challenge the Bank's risk overview. Third party risk experts in cooperation with internal parties carry out the assessment of external data. The risks are analysed using the derived scenarios and the same simulation model as described under credit risk.

At the end of the fourth quarter 2009, the self assessed operational and business risk capital charge was 274.0m for the group.



## Liquidity risk

The liquidity risk is determined as the increased cost of raising capital in a very illiquid market. Saxo has determined the liquidity risk based on scenarios with a liquidity shortfall within the Bank.

At the end of the fourth quarter 2009, the self assessed Liquidity risk was 8.0m for the group.

#### **Buffer**

Saxo Bank includes a buffer to take into account increased trading activity and growth. The buffer also includes all other risks in Pillar 2.

At the end of the fourth quarter 2009, the capital buffer was set to 150.0m for the group.

The capital needs for each risk category are aggregated using addition.

At the end of the fourth quarter 2009, the total self assessed capital charge was 570.4m for the group.

#### Stress testing

The third step in the ICAAP estimates the capital and earnings effects of stress test scenarios regardless of the previous capital adequacy levels.

Stress tests are developed on the basis of the risk register. One or more stress scenarios are made in the major categories, consisting of one or more events from the register in the applicable risk category. Furthermore, Saxo Bank uses a number of combined stress scenarios, combining multiple events across risk categories. One of the combined events entails a close to unlikely chain of events, in order to ensure the utmost degree of stress. Where applicable, the stress test takes insurance coverage into account.

The stress scenarios are updated and reviewed according to changes in the market and economic environment, and at least once a year.

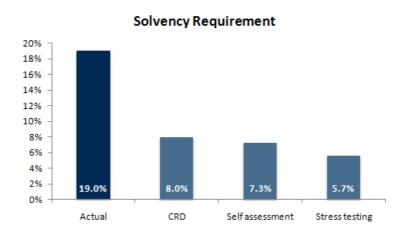
At the end of the fourth quarter 2009, the most severe stress scenario, on the simulated events, represented a capital impact of 443.0m for the group.

# **Capital adequacy determination**

To determine the appropriate level of capital, the results of the three steps are compared – both in nominal terms and as percentages. For step two and three, the percentage is determined by using the risk weighted assets calculated in step one as denominator. This represents the minimum regulatory required 8% of the risk weighted assets.



The largest percentage is determined and is considered as the minimum solvency level within which the Bank should operate.



At the end of the fourth quarter 2009, the method that gave the largest capital requirement was the CRD based approach. This led to a self assessed capital requirement of 624.1m equal to a solvency level of 8%. At that time the Group had an actual solvency of 19%

## **Capital planning**

Part of the ICAAP is planning future capital needs in relation to the business environment, growth and strategic plans in the years to come. Potential major changes to the risk profile, and thereby the future solvency need, are estimated using the ICAAP. This could be changes in the business strategy or competitive landscape, significant increases in traded volumes, fundamental changes in the market conditions, changes in the internal organisation, M&A activity, material changes in regulatory requirements or introductions of new products. This input is used in the strategic decision-making process by the Board of Directors and the Board of Management.

Furthermore the result of the ICAAP is used as input to the capital plan and the capital contingency plan.

The capital plan is a function of the estimated (budgeted) forecast of capital, risk and earnings.

The result of the ICAAP step three (stress testing) is used as input to the capital contingency plan. The financial consequences following the various scenarios and potential management actions are estimated using the methodology described under the ICAAP step two - whereby the most likely net financial consequences from a scenario appear. The potential management actions are revised should the estimated net financial consequences bring Saxo Bank below the required minimum capital level.

A full ICAAP is performed as often as required, but at least once a year. Capital adequacy levels adjusted according to the ongoing limit utilisation are reported to the Danish FSA on a quarterly basis.

Saxo Bank A/S Hellerup, March 17th 2010



#### **DEFINITIONS**

**Monte Carlo Simulation** – A technique used to approximate the probability of large portfolio event losses by running multiple simulations. Depending on the type of portfolio, this is based on empirical historic evidence, or on business expert's assessed impacts and probabilities. A very large number of simulations are generated to properly cover events with low probability. Based on the outcome, a loss distribution curve can be examined.

**Expected Loss** – A measure that expresses a risk event's likelihood over a given period of time (probability) and the impact the Bank will suffer given the event occurs. By multiplying the annual probability with the impact, we are able to extract the annual expected loss for a given event, or for a given number of events. Expected loss with high predictability can be included in the budget as a cost, and be included as a part of operating the business.

*Value-at-Risk (VaR)* - A measure that expresses the largest loss likely to be suffered on a portfolio over a holding period with a given probability (confidence level). One-year VaR at 99% confidence, means that the one-year loss level will not (on average) be exceeded in 99 out of 100 years. In other words, in only 1 out of 100 years the losses is expected to exceed VaR.

**Expected shortfall (ES)** – An alternative measure to VaR. ES is more sensitive to the shape of the loss distribution in the tail of the distribution, and is the average impact of the simulated portfolio event losses greater than the level determined by VaR (at a given confidence level).