

## CAPITAL MANAGEMENT - FOURTH QUARTER 2010

### 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, II and III. Pillar I contains a set of rules for calculating the minimum capital requirement. Pillar II describes the framework for the Bank's Internal Capital adequacy assessment process and the supervisory review, while Pillar III contains the disclosure aspect.

#### 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
  - Step 5: Disclosure (Pillar III)
- } (Pillar II)

#### Capital requirements, 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 pillar I risks:

- Credit risk: The standard method
- Market risk: The standard method
- Operational risk: Basic indicator method

Saxo Bank does not take diversification effects between the risk types into account. The capital charge for each risk category is simply aggregated.

*At the end of the fourth quarter 2010, the risk-weighted assets calculated using the CRD method, totalled at 11,933.3m. The capital requirement is 8%, equal to an overall capital requirement of 954.7m. The capital contribution in each of the main risk categories were as follows; Credit risk: 330.8m Market risk: 307.7m and Operational risk: 316.1m.*

## Risk self assessment, Pillar II

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**

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

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% default 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 99.9% confidence level on a one year time horizon.

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

Concentration risk from credit is captured in the credit portfolio model making large credit exposures relative more expensive (in term of capital) than small exposures.

*At the end of the fourth quarter 2010, the self assessed credit risk capital charge was 446.5m for the group.*

### **Market risk**

Market risk is determined using the internal market risk model of the Bank. The model is a Monte-Carlo VaR model used for deriving the Expected Shortfall on the Bank's actual outstanding market exposures. To better reflect the Bank's risk appetite, the most recent monthly and weekly ES averages are compared and the largest number is selected as being representative of the Bank's current market risk appetite. The model uses full correlation within the traded portfolio. Expected shortfall is determined with 99.97% confidence level, using a one day time horizon on foreign exchange, and a two day time horizon for products traded on an exchange, as the vast majority of the trading exposure can be eliminated within one or two days respectively.

Concentration risk from market risk is captured in the internal market risk model making large market exposures relative more expensive (in term of capital) than small exposures.

Subsidiaries' market risk has been included using the standard method under the CRD Pillar I.

*At the end of the fourth quarter 2010, the self assessed market risk capital charge was 103.3m for the group.*

### **Operational, Compliance and legal 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 operational risk in the Bank has been determined using a portfolio approach and Monte Carlo simulation with a 0% event correlation. A one year time horizon and expected shortfall less expected loss, with a 99.9% confidence level has been applied.

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Subsidiaries' operational risk is calculated based on 15%-20% of the last years operating income. Under the standard indicator approach under CRD pillar 1, the average of the last three years' operating income is used to calculate operational risk. To adequately reflect the ongoing growth of the Bank, the latest single years operating income is used. To further ensure a more conservative calculation of operational risk in subsidiaries, the operating income from the last year is increased with the growth prediction for the coming year, 25%-35%, depending on the entity.

*At the end of the fourth quarter 2010, the self assessed operational and business risk capital charge was 402.2m for the group.*

### **Business risk**

The key potential business risks are identified, assessed and discussed on a meeting with participation of the CED's office and the Risk Director. The outcome of the discussions forms the basis for sensitivity analyses of net operating income.

The results of the sensitivity analyses are subsequently analyzed with the aid of a portfolio approach using Monte Carlo simulation assuming that each risk event happens once every 25 years and that the various events have 0% correlation. Expected shortfall with a 99.9% confidence level is applied with a one year time horizon.

Due to the impact nature of business risks, these are analysed in relation to decrease in the income stream and added costs to the Bank. To the extent that the events can not be absorbed by the budgeted income, capital will be explicitly allocated to cover the risk

Concentration risk from large events is captured in the risk model, making large impacts relative more expensive (in term of capital) than small impacts.

*At the end of the fourth quarter 2010, no explicit capital charge, beyond the budgeted income, has been set aside to cover business risk.*

### **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.

To the extent that the events can not be absorbed by the budgeted income, capital will be explicitly allocated to cover the risk.

*At the end of the fourth quarter 2010, no explicit capital charge, beyond the budgeted income, has been set aside to cover liquidity risk.*

### **Buffer**

Saxo Bank includes a buffer to take into account increased trading activity and growth.

*At the end of the fourth quarter 2010, the capital buffer was set to 50.0m for the group.*

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### Total capital

The capital needs for each risk category are aggregated using simple addition, without considering potential diversifying benefits from portfolio effects.

*At the end of the fourth quarter 2010, the total self assessed capital charge was 1,002.0m 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.

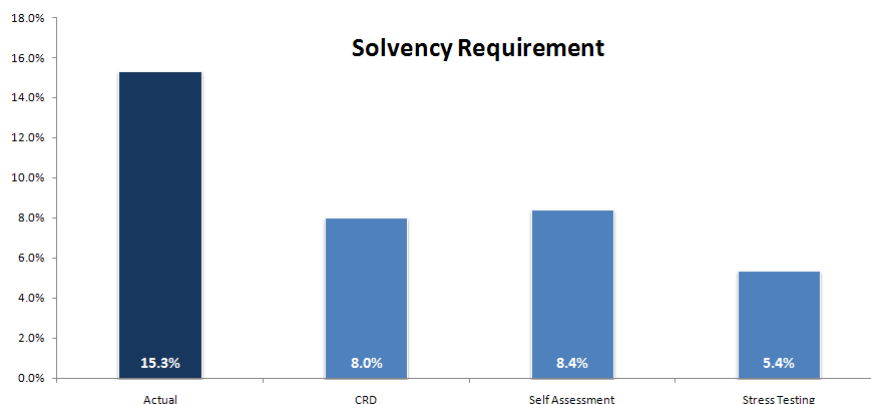
The stress scenarios are updated and reviewed according to changes in the market and economic environment, and at least once a year.

*At the end of the fourth quarter 2010, the most severe stress scenario, on the simulated events, represented a capital impact of 642.9m 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 2010, the method that gave the largest capital requirement was the self assessment based approach. This led to a self assessed capital requirement of 1,002.0m equal to a solvency level of 8.4%. At that time the Group had an actual solvency of 15.3%*



### **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

## 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 is examined to derive risk measures like VaR and expected shortfall.

**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).