

# **CAPITAL MANAGEMENT - FOURTH QUARTER 2012**

# **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: Self assessed capital requirement using a quantitative approach

Step 3: Capital requirements using 8+ methodology

Step 4: Self assessed capital requirement using a scenario based approach

Step 5: Capital adequacy determination

Step 6: Disclosure (Pillar III)

#### **Business Activities**

The Bank carries out the following main activities

- Online trading and investment and other investment services within capital markets to retail clients, corporations, financial institutions and white label clients.
- Professional portfolio, fund and asset management to retail and professional clients.
- Classic bank services in Denmark, primarily to retail clients, hereunder bank accounts and debit/credit cards, mortgage credit, bank advice services and pension products.

The Bank is exposed to a number of risk types stemming from these activities, which can be categorised as follows:

Market Risk: The risk of loss due to movements in market risk factors.

Credit Risk: The risk that counterparts or clients of the Bank fail to fulfil their obligations.

**Operational Risk:** The risk of loss resulting from inadequate or failed processes, people or systems, inaccuracy and improper disclosure of data. (including Legal and Information security risk)

**Liquidity Risk:** The risk of loss resulting from lack of liquidity.

**Business Risk:** reflects the risk of direct or indirect loss, or damaged reputation as a result of changes in external circumstances or events. Business risk includes all risks not mentioned under other risk categories.

Each risk category is described in details in the coming sections including a description of the measurement methods.



# 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.

# Saxo Bank Group

At the end of the quarter, the risk-weighted assets calculated using the CRD method, totalled at 12,625m. The capital requirement is 8%, equal to an overall capital requirement of 1,010m. The capital contribution in each of the main risk categories were as follows; Credit risk: 344.7m Market risk: 194.4m and Operational risk: 470.8m.

### Saxo Bank A/S

At the end of the quarter, the risk-weighted assets calculated using the CRD method, totalled at 10,294m. The capital requirement is 8%, equal to an overall capital requirement of 824m. The capital contribution in each of the main risk categories were as follows; Credit risk: 310.6m Market risk: 161.0m and Operational risk: 352.0m.



# 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	٧	٧	٧	٧	٧
Earnings				٧	
Growth				٧	
Credit risk	٧				
Market risk		٧			
Concentration risk	٧	٧		٧	
Group risks	٧	٧	٧	٧	
Liquidity risk					٧
Operational risk			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	
	1				
Stress testing	٧	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 that the Bank is exposed to, the different counterparty types have been examined, and the outstanding counterparty risk has been determined in each case or each segment.



For retail and institutional clients, credit exposure at default (EAD) is estimated based on derived client loss distributions (across actual daily individual client portfolios). EAD is calculated as the average of losses exceeding the collateral placed for margin. For banks and brokers the exposure is the outstanding cash and unrealized profit amount on open positions. For credit lines it is the issued line.

For retail and institutional clients, exposure at default is used as a conservative capital measure, for all others the risk has been assessed using impact and likelihood, based on empirical data, expert judgement and credit ratings wherever applicable.

A Monte Carlo simulation has been utilized, running a statistically significant number of simulations with a 30% event correlation on bank and broker counterparties, and full event correlation on trading clients, to determine the loss distribution of credit risk events. Correlation is applied to simulate a stressed credit environment. The Bank uses expected shortfall, less expected loss (average of events greater than VaR) with a 99.9% confidence level on a one year time horizon. This means that all events in the tail of the distribution are considered when determining the adequate capital level. Credit risk outside the traded portfolio, domicile building, tangible assets and off balance sheet items, has been added using the standard method under the CRD.

Subsidiaries' credit risk has been included based on the underlying business activity. Subsidiaries within online trading and investment and other investment services within capital markets, are included using the same approach, in essence running simulations on the group's combined portfolio. Domicile buildings, tangible assets and off balance sheet items, are included using the standard method under the CRD. Subsidiaries offering professional portfolio, fund and asset management or classic bank services have been included using their respective individual capital adequacy numbers. These are aggregated at a group level using simple addition, offering no diversification effects.

### Saxo Bank Group

At the end of the quarter, the self-assessed credit risk capital charge within online trading and investment services and classic bank services was 498.0m for the Group.

# Saxo Bank A/S

At the end of the quarter, the self-assessed credit risk capital charge within online trading and investment services and classic bank services was 315.2m for the Bank.

### Market risk

The market risk in the Group has been determined using an exponentially weighted moving average VaR approximation to derive Expected Shortfall (ES) on the Bank's actual outstanding exposures. To better reflect the Bank's risk appetite the most recent monthly and weekly averages are compared and the largest number is selected as being representative of the Bank's current market risk appetite. The model uses actual correlations within the traded portfolio. ES is determined with 99.97% confidence, and 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.



To cater for concentration risk in the trading portfolio, if appropriate, a buffer consisting of a 2% USD stress, is added to offset for price moves beyond what is embedded in the market risk ES calculation

Subsidiaries' market risk has been included based on the underlying business activity. Online trading and investment and other investment services within capital markets, are included using a CRD Pillar I approach where applicable. Results are aggregated at a group level using simple addition. Portfolio, fund and asset management or classic bank services have been included using their respective individual capital adequacy numbers. These have been aggregated at a group level using simple addition, offering no diversification effects.

### Saxo Bank Group

At the end of the quarter, the self-assessed market risk capital charge within online trading and investment services and classic bank services was 142.2m for the Group.

#### Saxo Bank A/S

At the end of the quarter, the self-assessed market risk capital charge within online trading and investment services and classic bank services was 120.9m for the Bank.

#### Operational, Compliance and legal risk

The risk from the Group's operations is assessed through an interview process where likelihood and impact levels of events are determined in co-operation with applicable stakeholders. The risks have been assessed using the same simulation model as described under credit risk. The operational risk in the Bank has been determined using a portfolio approach and Monte Carlo simulation with a 0% event correlation. To incorporate stress, a number of combined event scenarios have been introduced in the simulation. These scenarios imply 100% correlation between underlying events, and consider severe impacts, setting impact and probability levels at average, worst out of 20 occurrences and worst out of 100 occurrences. The events are constructed using external data sources, and expert advice. A one-year time horizon and expected shortfall, less expected loss, with a 99.9% confidence level has been applied.

Subsidiaries' operational risk has been included based on the underlying business activity. Subsidiaries within online trading and investment and other investment services within capital markets, are included using the same simulation approach, in essence running simulations on the group's combined portfolio. Subsidiaries offering professional portfolio, fund and asset management or classic bank services have been included using their respective individual capital adequacy numbers. These are aggregated at a group level using simple addition, offering no diversification effects.

### Saxo Bank Group

At the end of the quarter, the self-assessed operational risk capital charge within online trading and investment services and classic bank services was 389.5m for the Group.

### Saxo Bank A/S

At the end of the quarter, the self-assessed operational risk capital charge within online trading and investment services and classic bank services was 337.3m for the Bank.



### **Business risk**

The key potential business risks are identified as part of the budgeting process. The outcome of this process forms the basis for sensitivity analyses of the net income, which is published in the annual budget report. Business risk is covered by the budgeted income. However, if the income is not sufficient, capital must explicitly be set aside. Throughout the year the performance is evaluated to determine whether capital should be set aside. Furthermore capital is set aside in recognition of the granted, unutilized, market risk exposure limits, not included under Pillar I.

#### Saxo Bank Group

At the end of the quarter, the self-assessed business risk capital charge within online trading and investment services was 103m for the Group.

#### Saxo Bank A/S

At the end of the quarter, the self-assessed business risk capital charge within online trading and investment services was 103m for the Bank.

## Liquidity risk

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

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

## Saxo Bank Group

At the end of the quarter, no explicit capital charge within online trading and investment services, beyond the budgeted income, has been set aside to cover liquidity risk.

# Saxo Bank A/S

At the end of the quarter, no explicit capital charge within online trading and investment services, beyond the budgeted income, has been set aside to cover liquidity risk.

# Other risk

Other risk covers strategic risk, and risk not included in the previous categories. Methodologies for assessing capital requirement vary depending on the underlying risk event type.

## Saxo Bank Group

At the end of the quarter, the self-assessed capital charge within classic bank services was 50m for the Group.

### Saxo Bank A/S

At the end of the quarter, the self-assessed capital charge within classic bank services was 50m for the Bank.

# **Buffer**



Saxo Bank includes buffers to incorporate additional capital requirements identified, not covered by the previously described assessments. A buffer is added, considering an increased volatility environment relative to the risk factor that contributes the most to the Banks market risk. Growth and new initiatives consider general growth expected to reach the set goals. Mergers, acquisitions and outsourcing agreements take into account planned projects but also the potential effect of terminating outsourcing agreements. New products and services consider increased exposure to new markets, products and added complexity. The buffers are allocated to the relevant main risk categories described previously.

### **Total capital**

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

Saxo Bank Group

At the end of the quarter, the total self-assessed capital charge was 1,182.5m for the Group.

Saxo Bank A/S

At the end of the quarter, the total self-assessed capital charge was 926.1m for the Bank.

# Capital requirements, 8+ methodology

The third step calculates the capital requirement in line with the requirements of the Danish Financial Supervisory Authorities capital adequacy requirement guideline (referred to as 8+)

Each defined risk category is examined, in order to determine whether additional capital beyond the Pillar I requirement should be set aside, and as determined by the internal Pillar II calculation.

Currently, Saxo uses the following methods for determining the capital requirement under the 8+ method:

Credit risk: Pillar II - Additional Capital add on

Market risk: Pillar I - No additional Capital add on

Operational risk: Pillar I - No additional Capital add on

**Liquidity:** No additional Capital add on **Business:** Pillar II - Additional Capital add on

Saxo Bank Group

At the end of the quarter, the total capital charge using the 8+ method was 1,353m for the Group.

Saxo Bank A/S

At the end of the quarter, the total capital charge using the 8+ method was 999m for the Bank.



# Scenario based approach

The fourth 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.

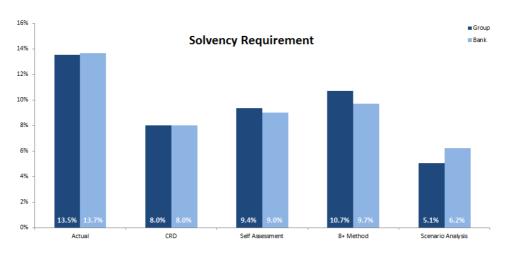
The stress scenarios are updated and reviewed according to changes in the market and economic environment, and at least once a year.

At the end of the quarter, the most severe stress scenario, on the simulated events, represented a capital impact of 640m both for the Group and the Bank.

# Capital adequacy determination

To determine the appropriate level of capital, the results of the four steps are compared – both in nominal terms and as percentages. 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 Group should operate.



# Saxo Bank Group

At the end of the quarter, the method that gave the largest capital requirement was the 8+ methodology based approach. This led to a capital requirement of 1,353m equal to a solvency level of 10.7%. At that time the Group had a base capital of 1,709m and an actual solvency of 13.5%

### Saxo Bank A/S

At the end of the quarter, the method that gave the largest capital requirement was the 8+ methodology based approach. This led to a capital requirement of 999m equal to a solvency level of 9.7%. At that time the Bank had a base capital of 1,408m and an actual solvency of 13.7%



# **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 (scenario based approach) 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 on-going limit utilisation are published and reported to the Danish FSA on a quarterly basis.

The Saxo Bank Group



### **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).