Asset and liability management
• Zagrebačka Banka d.d.
• The ALM function
• The Application
  ➔ The purpose
  ➔ The Structure and Organization of Data
  ➔ Generating reports
  ➔ Additional features
  ➔ Risk analysis
• Summary
Zagrebačka Banka d.d.

- the largest bank in Croatia according to assets (3.9 bln USD = 30% of total Croatian banking sector), innovation & financial indicators
- began operations back in 1914 as “The City Savings Bank”
- in 1989 became a joint stock company, privatized in 1994
- listed on LSE, FSE and is the 2nd largest company on ZSE by market capitalization
Zagrebačka banka d.d.

- ranked #10 of 100 best banks in CE (The Banker, May 2000)
- the best bank in Croatia (CE Awards, Apr. 2000)
- the best bank in Croatia (Euromoney Awards for Excellence, Jul. 1999)
- highest rated bank in Croatia by Moody’s Investors Service
Zagrebačka banka d.d.

- 33% market share in total deposits
- 32% in corporate deposits
- 30% of total loans granted to individuals
- that makes us the leading bank in Croatia
The ALM function

- **Initiating profitable growth of the Bank by providing strategic balance sheet management involving all market risks and liquidity management**

- **Becoming the most critical function of financial institutions**
The ALM function

Strategic framework
- Board
- ALCO

Organisational framework
- Risk Mngt, Treasury

Operational framework
- Internal policies with direction to AL

Analytical framework
- Simulations, duration, gap, Value-at-Risk

Reporting (incl. regulatory compliance) framework

ALM application

Technology framework
- preparation of data
The ALM function

- The main issues of RM:
  - Eliminate risk?
    - Quantifying present risk (Value-at-Risk) as a potential loss
    - “Is it too much?“
    - BIS recomendations
    - backtesting – enabling business activities
    - analysis of P&L – strategic decisions
The ALM function

- Analysis result:
  - the ALM policies with the prescription of desired behaviour - setting the limits
The application

Authors

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Zagrebačka banka d.d.
Risk Management Division
Purpose

- supplies management and analysts with accurate and complete reports based on data previously stored in different databases on different platforms
- enables application of statistical and analytical methods
- represents complex tool for risk analysis and measurement
The Structure & Organization of Data

- application libraries divided into 3 groups:
  - application library - contains catalogues with frames, SCLs, formats, methods
  - MDDB library - contains repository, SAS/EIS Application databases with MDDB’s and multidimensional reports definitions
  - DATA library - contains data sets, MDDB tables
The Structure & Organization of Data

- **SAS/MDDB tables are created from SQL views**

```sas
proc sql;
create view WORK.FORMMDDB as
    select VAR1 as VAR1 format=$FORVAR. label='Variable 1 – less detailed',
    VAR1 as VAR2 format=$VAR. label='Variable 1 - detailed',
    VAR3 format=$FORMAT. label='Variable 3'
from DATA.DATASET
where VAR1 = VAR4
outer union corresponding
select VAR1 as VAR1 format=$FORVAR. label='Variable 1 – less detailed',
    VAR1 as VAR2 format=$VAR. label='Variable 1 - detailed',
    VAR3 format=$FORMAT. label='Variable 3'
from YEAR.DATASET
where VAR1 = VAR4;
quit;
```
The Structure & Organization of Data

- **SAS/MDDB tables and SAS/EIS applications are registered in MDDB library at design time**

- **SAS/MDDB tables are using** `proc mdddb` **created after downloading and processing data sets from MVS**

- Optimizing **SAS/MDDB tables in order to achieve best performance**
The Structure & Organization of Data

*example of proc mddb:*

```plaintext
proc mddb data=FORMDDB out=DATA.MDDB1;
class VAR1 VAR2 VAR5;
class VAR3 / ascending;

hierarchy VAR1 VAR2 VAR3;
hierarchy VAR1 VAR2 / name='HIER 1' display=yes;

hierarchy VAR3 VAR5 VAR1;
hierarchy VAR3 VAR5 / name='HIER 2' display=yes;

var VAR6 / sum;
run;
```
The Structure & Organization of Data

• According to the main principle of ALM:
  ⇨ *the whole application is based on a table extracted from several applications – analytical balance sheet structure*

• *The data are exported daily/monthly into SAS datasets. Some of the datasets contains more than 4 mln observations.*
The Structure & Organization of Data

- Datasets are compressed and merged together

Problems:

- Incorrect or missing data – collecting additional reports (Excel) from different organizational units of the Bank
- Duplicating data from different applications
The Structure & Organization of Data

- **Importing data from excel with ODBC**

```sql
proc sql;
   connect to odbc (dsn=filename);
   create table work.tab1 as
      select * from connection to odbc
      (select * from "Sheet1$");
   disconnect from odbc;
quit;
```
The Structure & Organization of Data

- **Starting Excel from the SAS**

```sas
options noxwait noxsync;
data _null_
  command='g:\appl\office97\office\excel /ed:d:\...\MyFile.xls';
call system(command);
run;
```
The Structure & Organization of Data

• Exporting files to Excel

```plaintext
filename MyFile dde excel|Sheet1!r1c1:r20c2';
data tab2;
   file MyFile;
   set tab1;
   put var1 var2;
run;
```
The Structure & Organization of Data

• *Importing files from Excel*

```plaintext
filename MyFile dde excel|Sheet1!r1c1:r20c2;
data tab1;
  infile MyFile;
  input var1 var2;
run;
```
Generating reports

- **SAS/EIS multidimensional reports used to display information**

  ⇒ *multidimensional reports are simple to use and easy to understand. The training of end-users isn’t very time consuming*
Generating reports

- multidimensional reports as standalone (.MULTI), within application screens (.APPLSCR) or desktops (.DESKTOP)

- calling SAS/EIS application from SCL:

  CALL EXECCMDI ('RUNEIS APPL=library.eis database. application screen. APPLSCR');
Additional feature

• Format review

⇒ The constant increased number of variables and formats
⇒ Allowing users to better understand report structure
Risk analysis

• The basic activities of RM:

→ monitoring and reporting on compliance with all risk exposure limits prescribed by legislation and Bank’s internal policies

→ analysis of the risk exposure – simulations, affects on P&L, “What if scenarios”
Risk analysis

• The reports are generated
  ⇒ Monthly:
    ⇒ Balance sheet structured by maturity, interest rates, business segments, products and FX
    ⇒ Gap analysis, liquidity indicators
  ⇒ Daily:
    ⇒ FX balance sheet structure, FX position, ratio of the open position, Value-at-Risk.
Risk analysis

- Internal and external (CNB) reports based on FX position are generated from the application including risk measures:
  - Ratio of the net open FX position
  - Potential loss (Value-at-Risk, variance-covariance method)
  - Daily P&L due to FX rate fluctuation
Risk analysis

- *Submitting the SAS procedures from the SCL program*

```
file='d:\..\MyProcedure.sas'
submit continue;
  %let PAR1=&PAR11;
  ...
  %let PARn=&PARnn;
  %include '&file';
endsubmit;
```
Risk analysis

- The purpose of the report
  - discovering the causes of the changes in daily P&L from the report
  - proper and on-time background for stress scenarios and simulations of the future projects with the impact on FX risk (possibility to insert the additional transaction from the application)
<table>
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<tr>
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<th>Razlika-postotka-u-odnosu-na-jk</th>
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Zagrebačka banka

Diagram zrastanja pozicije

Datum

Pozicija
Risk analysis

• Implementation of the Value-at-Risk model:
  ⇨ possibility to calculate contribution of a single currency in the total potential loss
  ⇨ monitoring correlations and volatilities of the currencies through the values of incremental VaR and non-diversified VaR
  ⇨ hedging risk
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</table>
Summary

- the efficient usage of SAS/MDDB requires:
  - detailed analysis of data structure, user needs, business processes and technical configuration
  - optimization of ratio between performance, number of MDDB tables and multidimensional reports, disk usage and user friendliness
  - indexing and compressing data sets
Summary

• the efficient function of ALM:
  ➞ integrity of all business segments in the Bank
  ➞ On-time exchange of information – establishing communication between RMD and operative divisions
  ➞ understanding present situation
  ➞ predicting future impacts