Market and Liquidity Risk management in the Insurance company : CSOB case studies

Topics : Market risk management, Liquidity risk management, risk measurement, case study

Homework

- Annual reports of Slovak insurances – find the information about different types of market risks

Result ?

Content

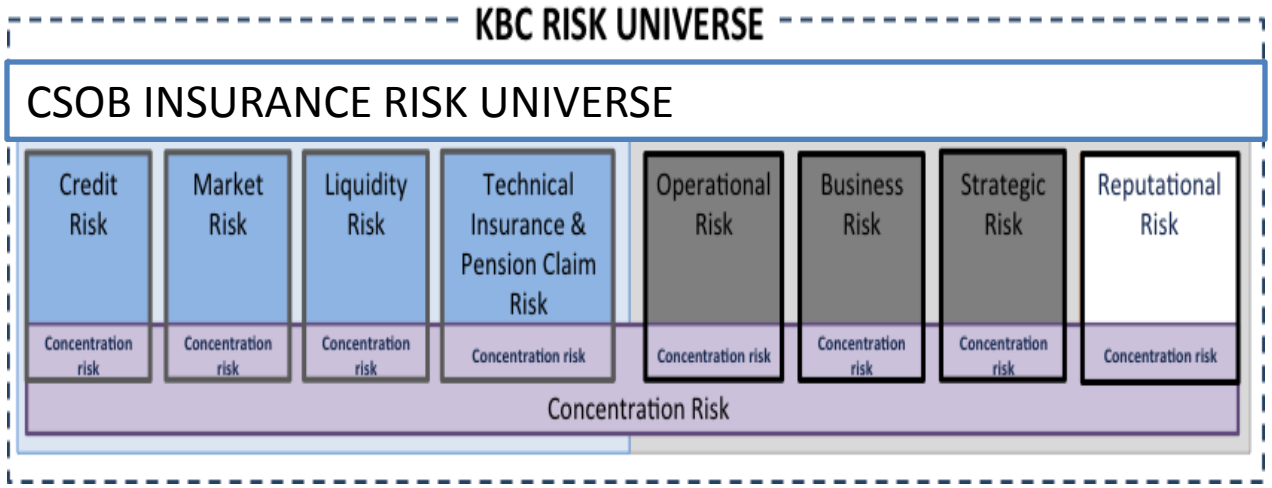
Topics : Market risk management, Liquidity risk management, risk measurement, case study

1. Risk types
2. Market risk measurements
3. Insurance company simplified balance sheet
4. Risk management process
5. Main objactives of ALM risk strategy
6. Business case for Market risk

Objectives

- Familiarize yourself with the basics of market risk management in Inusrance
- Get a view on the basics steps of assessment of interest risk
- How to look into liquidity risk of insurance company
- Case study

Positioning of Market risk within the risk universe



Focus in the presentation is on Market risk and Liquidity risk

•Do you know what each type of the risk means?

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Market risk

KBC definition for market risk: *The potential negative deviation from the expected value of a financial instrument (or portfolio thereof) due to changes in the level or in the volatility of market prices.*

- Interest rate (volatility) risk: the potential negative deviation from the expected value of a financial instrument or portfolio thereof due to changes in the level (or in the volatility) of interest rates.
- Currency price (volatility) risk: the potential negative deviation from the expected value of a financial instrument or portfolio thereof due to changes in the level (or in the volatility) of currency exchange rates (also often referred to as FX or foreign exchange rate risk).

Credit spread (volatility) risk: the potential negative deviation from the expected value of a financial instrument or portfolio thereof due to changes in the level (or in the volatility) of credit spreads (excluding credit spread changes due to rating migration or default of the issuer).

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Liquidity risk

Funding risk

Funding cost liquidity

Operational liq. risk

Structural liq. risk

KBC definition for Liquidity Risk: *The risk that an organization will be unable to meet its liabilities/obligations as they come due, without incurring unacceptable losses.*

- **Funding risk:** *The risk that the company is unable to procure sufficient funding to fund its assets.*
- **Funding cost risk:** *The risk that the value of the company will decrease due to an increased spread of the company's funding rate curve over the risk free cash curve.*

- **Operational liquidity risk:** *The risk that a company does not have a liquidity buffer that is able, in the short term, to absorb the net effects of current transactions and expected changes in liquidity.*
- **Structural liquidity risk:** *The risk that the company's structural, long-term balance sheet cannot be financed timely or at a reasonable cost*.
- **Contingency liquidity risk:** *The risk that a company is unable to attract additional funds or replace maturing liabilities under potential, future stressed market conditions.*

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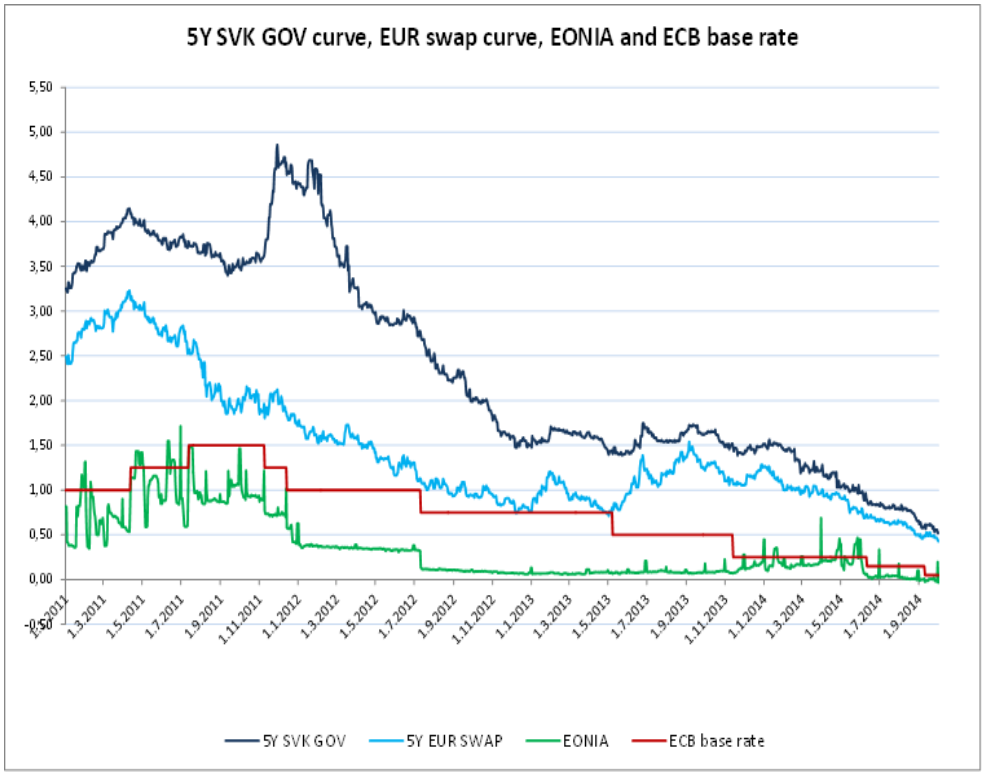
The market changes every day. How long you will survive?



Case study 1 :

You are a risk manager of the Insurance. You plan investments into SVK government bonds (e.g. 5Y) : Look at the graph and consider :

- What type of the risks you might face?
- What are the specifics of Insurance separately that you should take into account?
- Which factor might limit your decision?

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Market risk measurements

1. *Basis Point Value (BPV)*

The BPV (basis point value) measures the instantaneous, full change in economic value due to a (+/-10bp, +/-100bp, +/-200bp) parallel shift of the yield curves.

2. *IFRS Equity sensitivities*

A) Interest rate risk

The IFRS Equity sensitivities for interest rate risk are measured by calculating the impact on IFRS Equity of an instantaneous change in economic value due to a (+/-10, +/-100, +/-200 basis points) parallel shift of the yield curves.

B) Equity risk

The IFRS Equity sensitivities for equity risk are measured by calculating the impact on IFRS Equity of an instantaneous change in economic value due to a (-12.5% / -25%) drop of the equity indices.

3. *IFRS P&L sensitivities*

A) Interest rate risk

The IFRS P&L sensitivities for interest rate risk are measured by calculating the impact on IFRS P&L of a (+/-10, +/-100, +/-200 basis points) parallel shift of the yield curves.

B) Equity risk

The IFRS P&L sensitivities for equity risk are measured by calculating the impact on IFRS P&L of a (-12.5% / -25%) drop of the equity indices.

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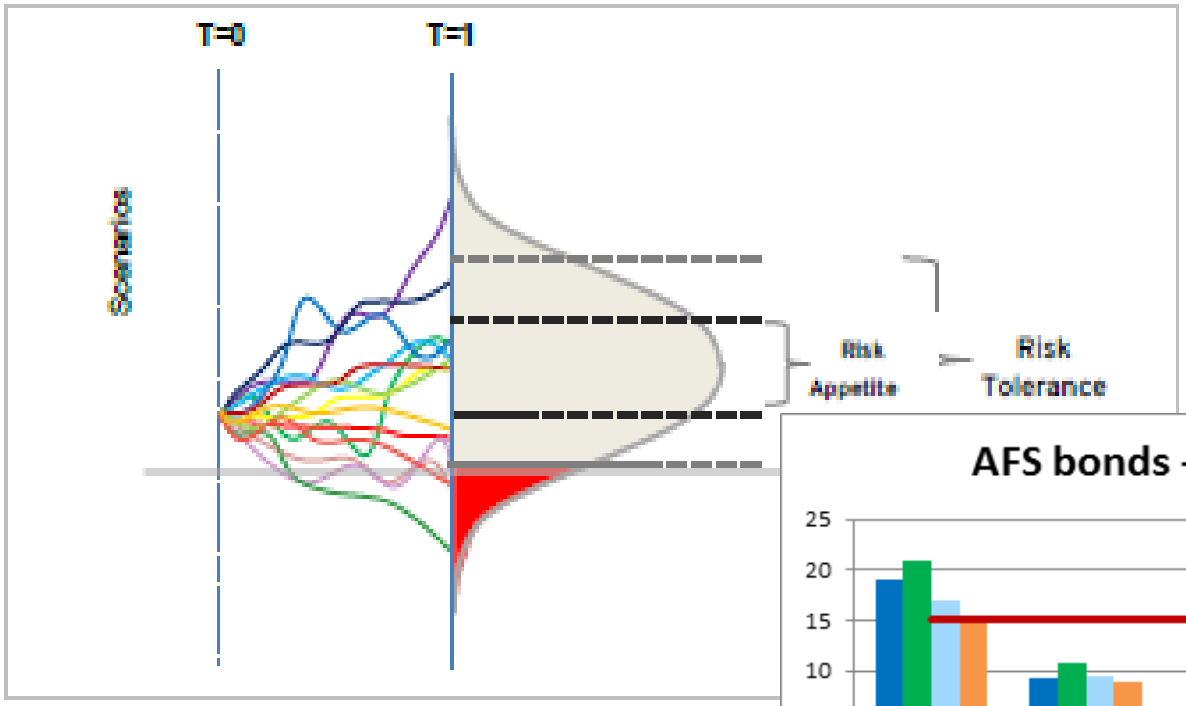
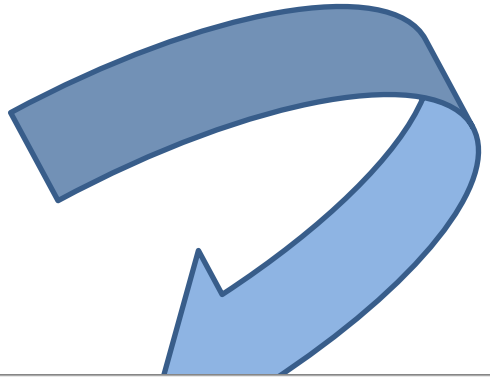
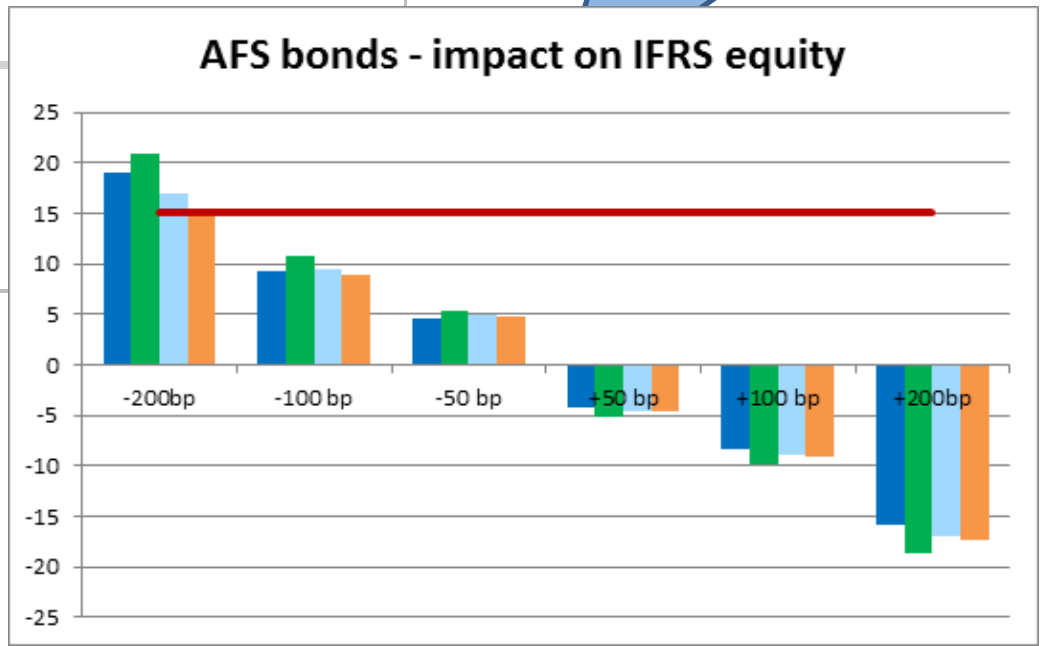
Balance sheet sensitity of available capital







Case Study 2

- **Create of limit definition for Insurance company market risk**

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Key risk indicators

1. **Capital Adequacy**– achieve the adequate available capital

2. **Performance** – maximalisation of return within „risk playing field“, avoid risk concentration in profit generation and dependency on one product or distribution channel

3. **Liquidity and Concentration risk** – hold sufficiently liquid assets with aim to be able to pay unexpected shock in portfolio

4. **Asset And Liability Management Risk (ALM)** - create sufficient matching of asset and liability cash-flow with aim to minimize the capital

Key risk indicators

1. **Capital Adequacy**– achieve the adequate available capital = **solvency ratio**

2. **Performance** – maximalisation of return within „risk playing field“, avoid risk concentration in profit generation and dependency on one product or distribution channel **= ROE**

3. **Liquidity and Concentration risk** – hold sufficiently liquid assets with aim to be able to pay unexpected shock in portfolio **= investment limits, concentration limits**

4. **Asset And Liability Management Risk (ALM)** - create sufficient matching of asset and liability cash-flow with aim to minimize the capital **= Liability coverage ratio, BPV**

Risk limit

Allocation of aggregated risk appetite to

- Business line (life, non-life, retail, ...)
- product (MTPL, Unit Linked, ...)
- Specific risk category(market risk, operational risk, ..)
- Risk concentration

In order to achieve efficient monitoring and reporting the limits has to be specific, sensitive towards the portfolio movements, measurable, regularly reported and based on forward looking assumptions

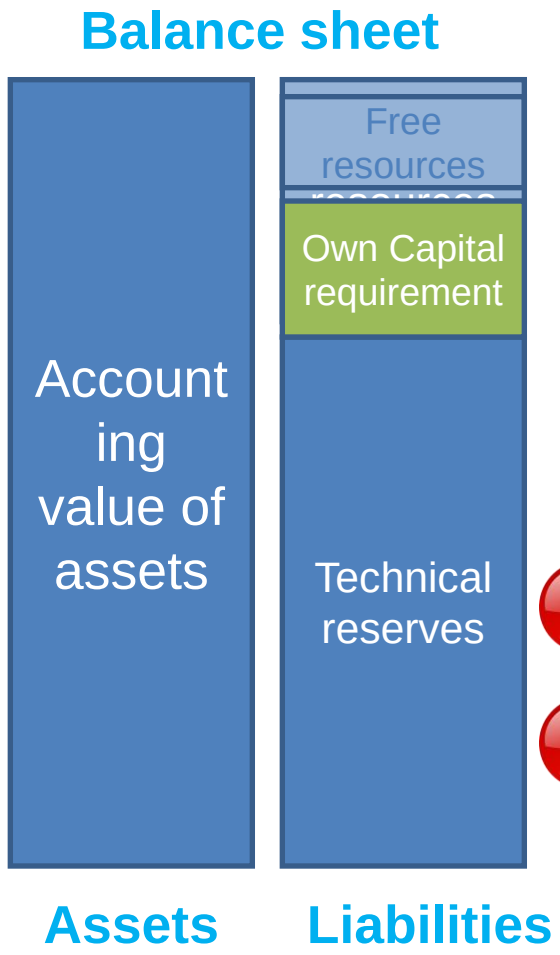
= Stress test
= Measuring of actual position

Stress test should be done on company level,
Take into account the diversification amongst risk type, business lines and risk specifics

Number of risk limits cannot be large, to achieve the balanced message for management, costs and efficiency of reporting

When is the insurance company solvent?

In insurance business, the required amount of own resources is defined by the law and it is called capital requirement.



The insurance company is solvent, if its own resources achieve the amount of the capital requirement. The insurance company is **able to cover the loss** that equals the amount of this capital requirement without threatening its stability.

If the amount of own resources drops below the value of the capital requirement, it is in danger of receivership, eventually loss of the insurance license.

Solvency rate of the insurance company =
Own resources / Capital requirement

Return on Capital
Profit / Capital requirement

Insurance company simplified balance sheet

Balance sheet

ASSETS

Cash

Government bonds
- Slovak Government
- German Government
- Other EU governments

Corporate bonds
- Financial insitutions EU
- Other companies EU, outside EU...

Unit Linked investments
- divided per UL asset fund

Shares and participations

Property

LIABILITIES

Capital
- Shareholders capital
- Reserve fund

Asset revaluation reserve
- Revaluation of AFS portfolios

Life traditional reserves
- Life insurance reserves
- Claim reserves RBNS, IBNR
- Unused premium reserves

Life Unit Linked reserves
- Number of unit x value of units
- Value of other parts of reserves

Non Life reserves
- Claim reserves RBNS, IBNR
- Unused premium reserves

Other

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Case study 3

1. Súvaha poisťovne (Balance sheet)

Assets			Liabilities
property	5 000	Own equity	20 000
Cash at bank	9 000	revaluation	
Fixed income (Life insurance)	50 000	Life insurance reserves	45 000
Fixed income (non life insurance	6 000	Non life insurance reserves	5 000
Total	70 000	Total	70 000

CRO find out that there is error and that asset prices were not properly used.
Face amount instead of market value was used in booking.

What shall be done?

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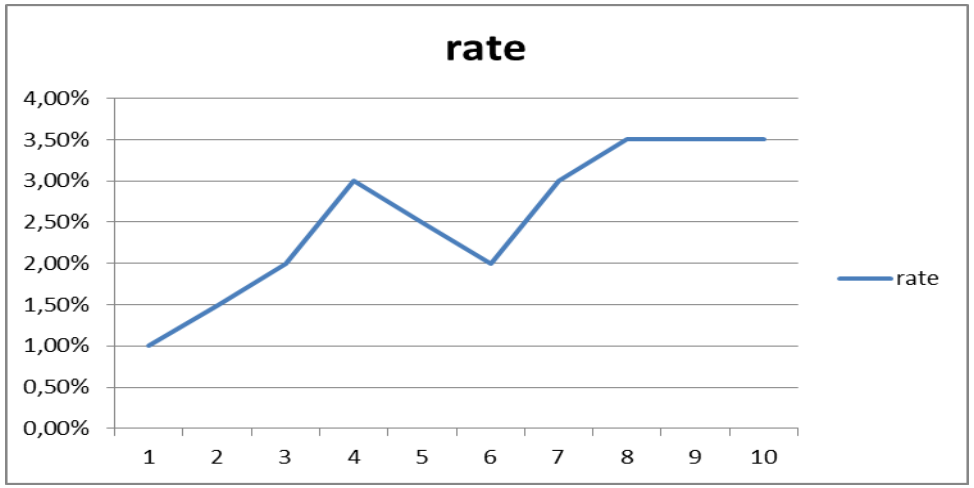
What we will do?

1. find out what bond do we have and what is their coupon yield, face amount maturiy date
2. find out interest rate curve
3. create the asset pricing model
4. Calulate the market value of each bond and sum it up

Data collection:

5. Insurance company assets

Name of the fixed income	Portfolio	Nominal value	Coupon yield	Rating	Modified duration	Maturita
Slovak government bond	NL	4 000	2,50%	A	0,75	2 015
Bond of SNS bank	NL	2 000	4,25%	BBB	1,50	2 016
Slovak government bond	Life	9 000	5,00%	A	2,25	2 017
Slovak government bond	Life	11 000	4,00%	A	7,50	2 024
Belgium governmnet bond	Life	9 000	3,00%	AA	3,00	2 018
Greek governmnet bond	Life	4 000	10,00%	CCC	6,75	2 023
Mortgage bond of VUB bank	Life	5 000	6,00%	BBB	5,25	2 021
Mortgage bond of Tatra bank	Life	5 000	6,00%	A	6,00	2 022
Mortgage bond of CSOB bank	Life	7 000	6,00%	BBB	4,50	2 020
cash at bank	Life	9 000	0,50%	BBB		



We have data,

Now we need model.

Case study 3 – results Market value assets

Assets			Liabilities
property	5 000	Own equity	20 000
Cash at bank	9 000	revaluation	9 670
Fixed income (Life insurance)	59 493	Life insurance reserves	45 000
Fixed income (non life insurance	6 177	Non life insurance reserves	5 000
Total	79 670	Total	79 670

Change:

MV of balance sheet is higher, it increased from 70 000 to 79 670

Solvency I ratio increased to 277% from 187%
Liability coverage ratio Life increased to 132% from 111%.

conclusion: level of interest rate make difference, what risk do we face?

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Main objectives of ALM risk strategy

- **to define the playing field** by translating the Risk Appetite Statement into a set of workable ALM risk measures and business guidelines.
  - investment limit for each investment type
  - minimal rating of eminent,
  - counterparty limit (concentration limits),
  - competencies (limits and decision power) for different managerial levels

- **to provide useful and timely information to senior management - reporting**;
- **to monitor compliance with current and future regulation** with respect to non-trading market risk.
- **to monitor the quality of the investments** of CSOBP SK (for this purpose the Investment strategy of CSOBP SK defining investment policy is compiled yearly)

Investment committee

- to **oversight the investment portfolios** of insurance company,
- to **oversight the profitability of the investment titles** and **their risk profile** to be in line with ALM risk strategy,
- to **take buy and sell decision** of investment tools,
- to **oversight the external financing** of insurance company
- to **optimize the effective risk management** per portfolio

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Case study 3 – results Market value assets

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Total	79 670	Total	79 670

3. Kapitálové požiadavky (Capital requirements)

Solvency I required capital	
Life insurance	6 800
Non Life insurance	3 900
Solvency I required capital	**10700**
Solvency I ratio	**277%**
liability coverage ratio life	**132%**
liability coverage ratio non life	**124%**

Key risk indicators are proposed :

Solvency I ratio
Liability coverage ratio life insurance
Liability coverage ratio Non life insurance

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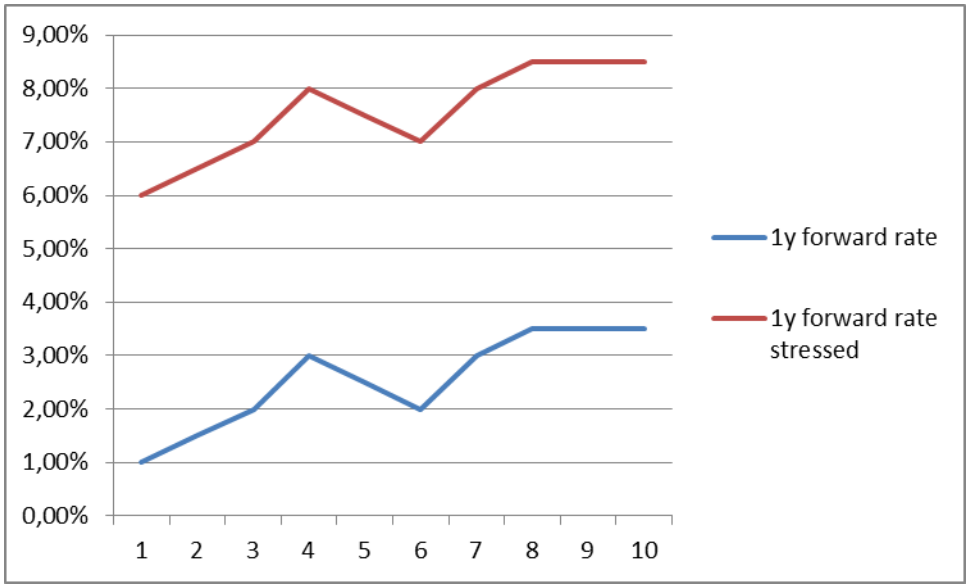
Case study 4 – stress testing – Interest rate +5%

We are going to do what if analyses – stress testing.
IT move up by 5% - paralel shift



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Case study 4 – stress testing – Interest rate +5%

1. Súvaha poisťovne (Balance sheet)

Assets		Liabilities	
property	5 000	Own equity	20 000
Cash at bank	9 000	revaluation	-4 607
Fixed income (Life insurance)	45 598	Life insurance reserves	45 000
Fixed income (non life insurance	5 795	Non life insurance reserves	5 000
Total	65 393	Total	65 393

3. Kapitálové požiadavky (Capital requirements)

Solvency I required capital	
Life insurance	6 800
Non Life insurance	3 900
Solvency I required capital	**10700**
Solvency I ratio	**144%**
liability coverage ratio life	**101%**
liability coverage ratio non life	**116%**

After stress +5%

Solvency I ratio - still OK
Liability coverage ratio life insurance - OK
Liability coverage ratio Non life insurance - OK

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Other market risk – credit spread

It is important to look into the position of credit exposure, the lower the credit quality, the high the absolute spreads risk.

The volatility and impact on balance sheet will then be higher.

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Liquidity risk

The Key Risk indicators are:

- investment limits (per asset category, asset tpe ect.)
- concentration limits (regulatory or internal, per maturity or dration)

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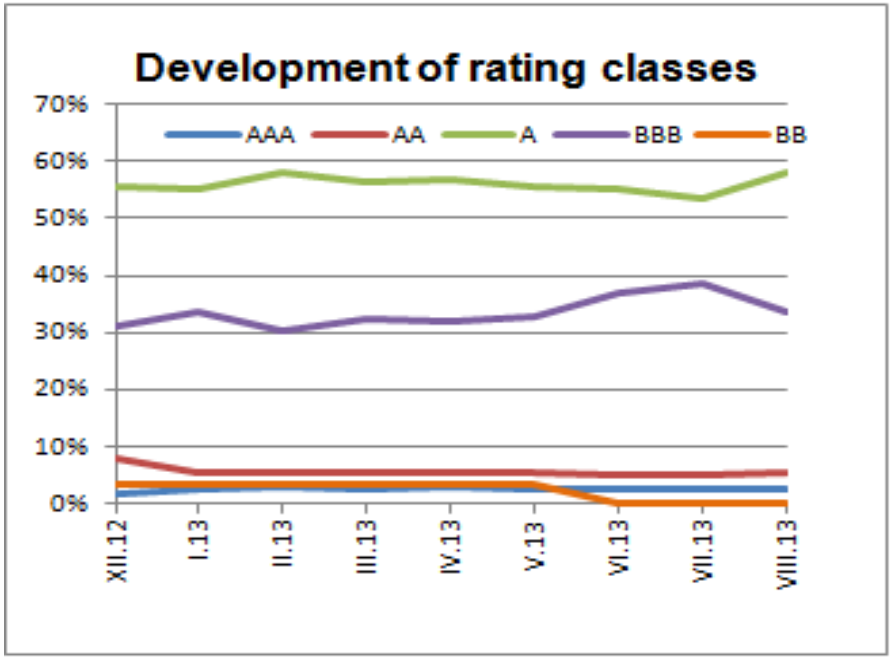
Credit classes monitoring

credit rating	sum	ratio	limit
AAA	0		
AA	9 000	14%	75%
A	29 000	45%	55%
BBB	23 000	35%	25%
BB	0	0%	2%
CCC	4 000	6%	0%
total	**65000**	**100%**	



We see 2 limit breaches, what shall we do?

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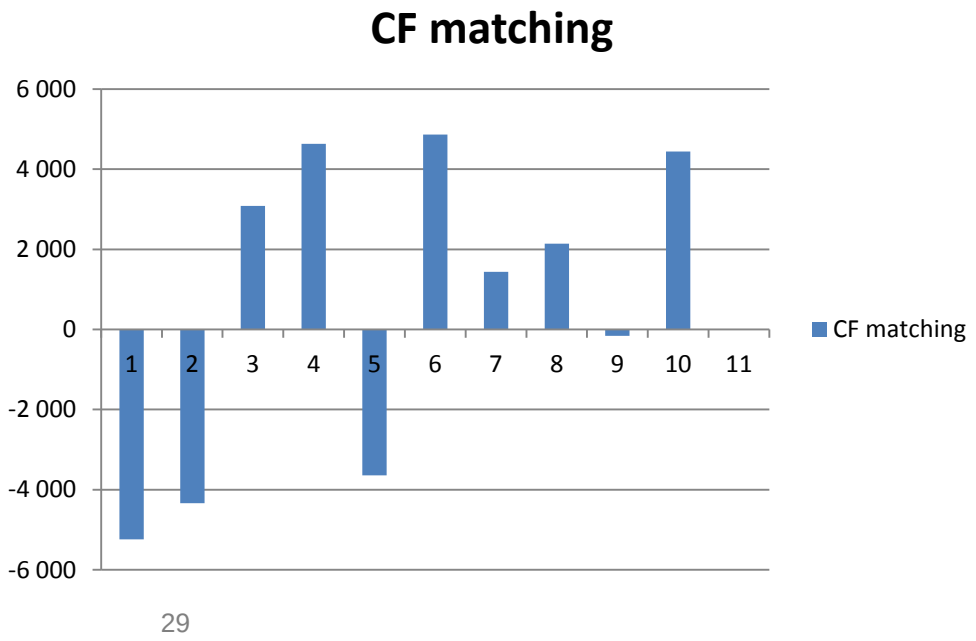
Cash flow matching

1. How to do it?

1. Take sum of cash flow of assets
2. Take sum of cash flow of liabilities
3. Find out cash flow gap
4. Think what you can do



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Make a change in portfolio – what if analyse

Task: Replace Greek bond with better one

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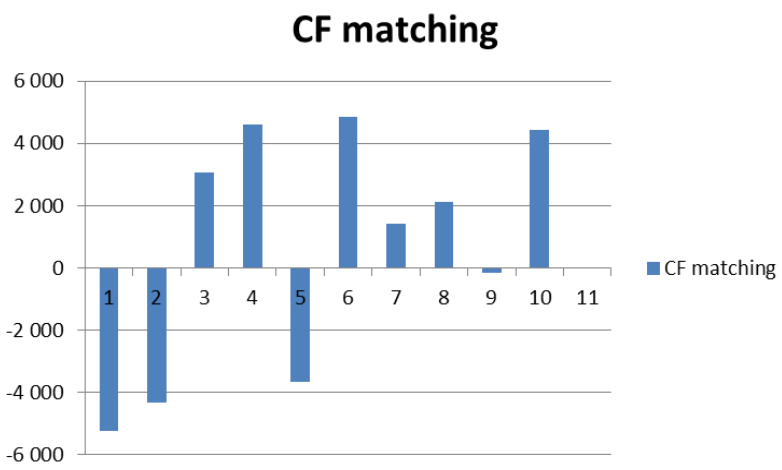
Make a change in portfolio – what if analyse

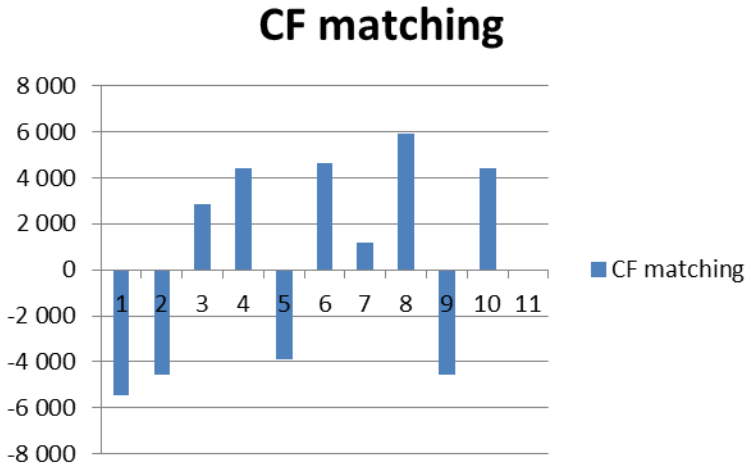
Before change

credit rating	sum	ratio	limit
AAA	0		
AA	9 000	14%	75%
A	29 000	45%	55%
BBB	23 000	35%	25%
BB	0	0%	2%
CCC	4 000	6%	0%
total	**65000**	**100%**	



after change

credit rating	sum	ratio	limit
AAA	0		
AA	9 000	14%	75%
A	33 000	51%	55%
BBB	23 000	35%	25%
BB	0	0%	2%
CCC	0	0%	0%
total	**65000**	**100%**	



conslusion

- Market and liquidity risk are very important one
- Influences many items in balance sheet of insurance company
- Due to long term nature of liabilities investment has to be long as well
- There is difficult to satisfy all criteria, many of them are in conflict
- Choices need to be made by management

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