

Proč řídit rizika?

EJ Smith, 1907: "If someone asks me, how I would describe my 40 years of experience at sea, I would describe them as boring. Of course, there are winter storms, fog and similarities. But during my entire experience I cannot remember any havaries. I have only once seen a ship in distress. I have never seen a wreck, neither have I been in distress at sea, nor have I ever been in a dangerous situation, that could have led to a catastrophe."



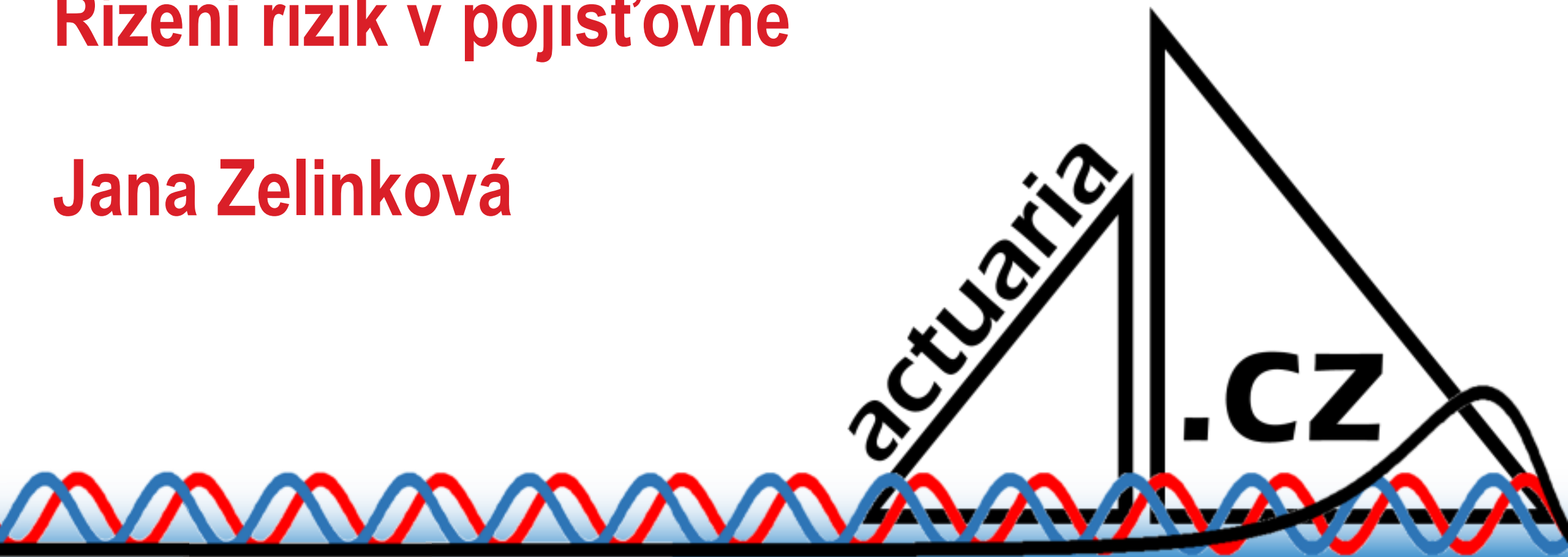
Capt. Smith maintained that shipbuilding was such a perfect art nowadays that absolute disaster, involving the passengers on a great modern liner, was quite unthinkable. Whatever happened, he contended, there would be time before the vessel sank to save the lives of every person on board.

"I will go a bit further," he said. "I will say that I cannot imagine any condition which could cause a ship to founder. I cannot conceive of any vital disaster happening to this vessel. Modern shipbuilding has gone beyond that."

April 14, 1912 the SS Titanic sank after the collision with an iceberg. The accident demanded 1500 lives including that of captain EJ Smith.

Řízení rizik v pojišťovně

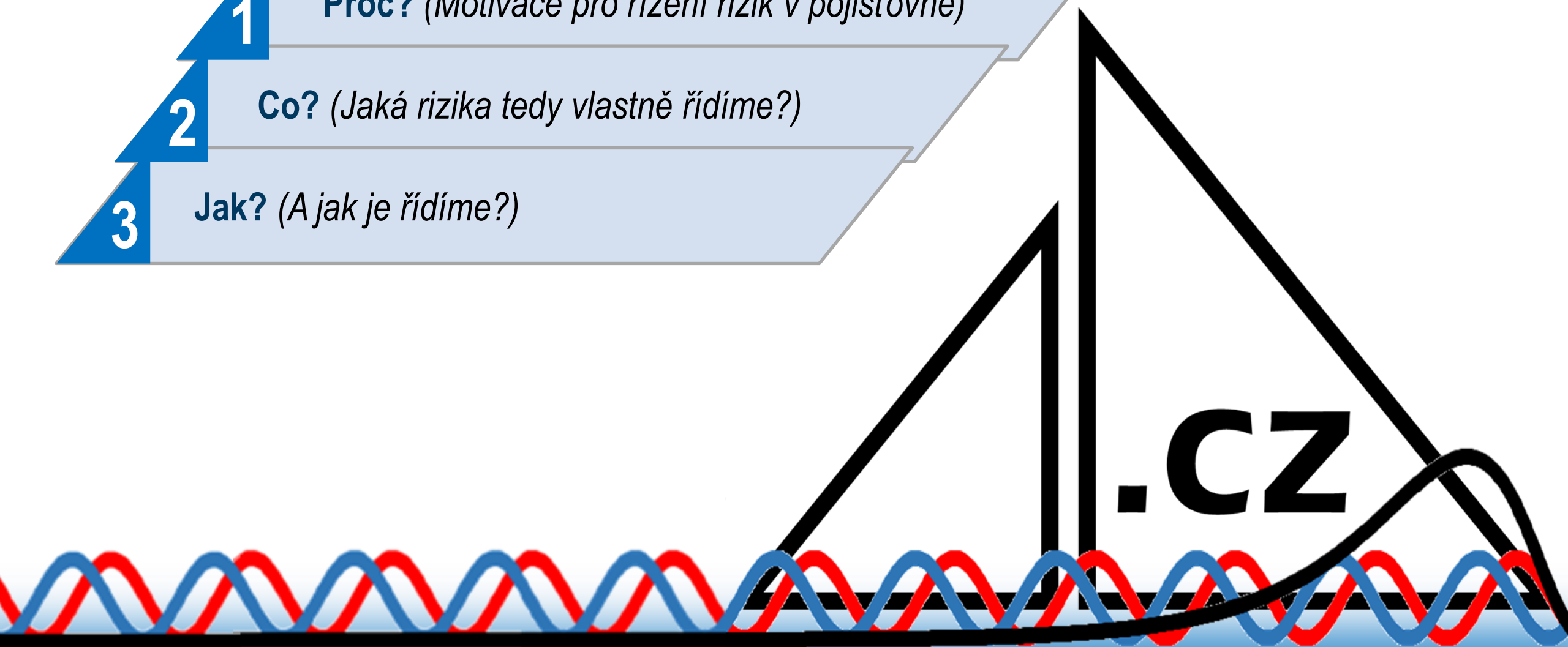
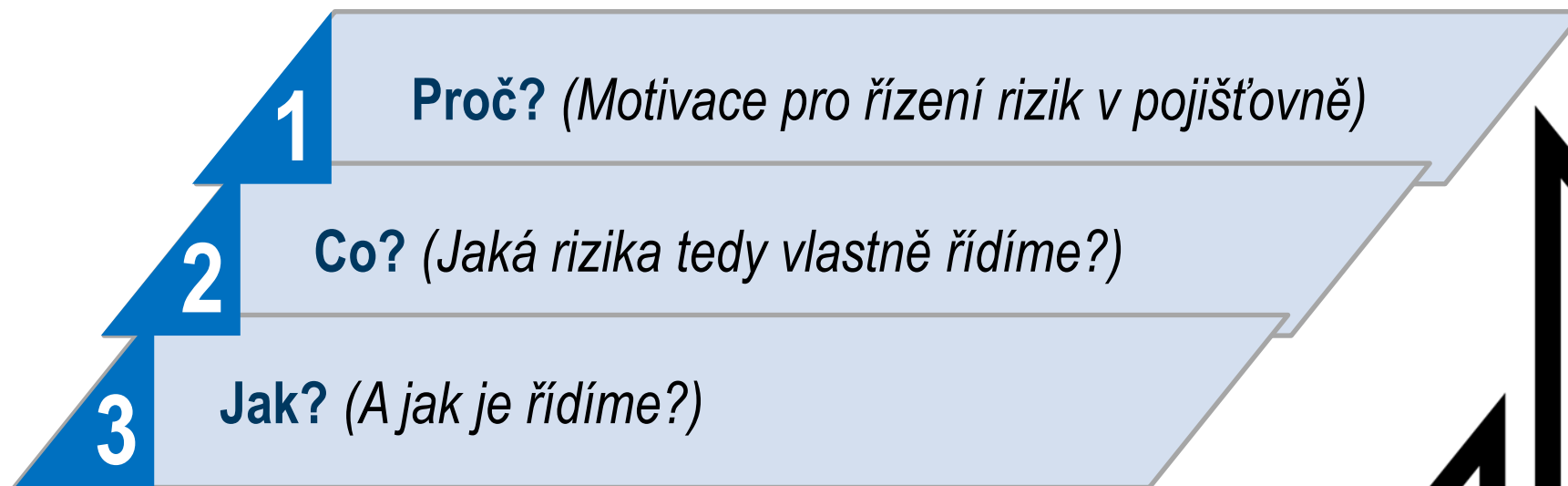
Jana Zelinková



Seminář z aktuárských věd

16. 10. 2015

Obsah přednášky



▲ MFF UK obor Finanční a pojistná matematika, abs. 2003

▲ University of Pittsburgh (Prague) – MBA – abs. 2010

▲ KPMG – pojistný matematik (2004 – 2008)

Poradenství, podpora auditu, due diligence, ...

▲ Generali PPF Holding (2008 – 2012) – Risk manager

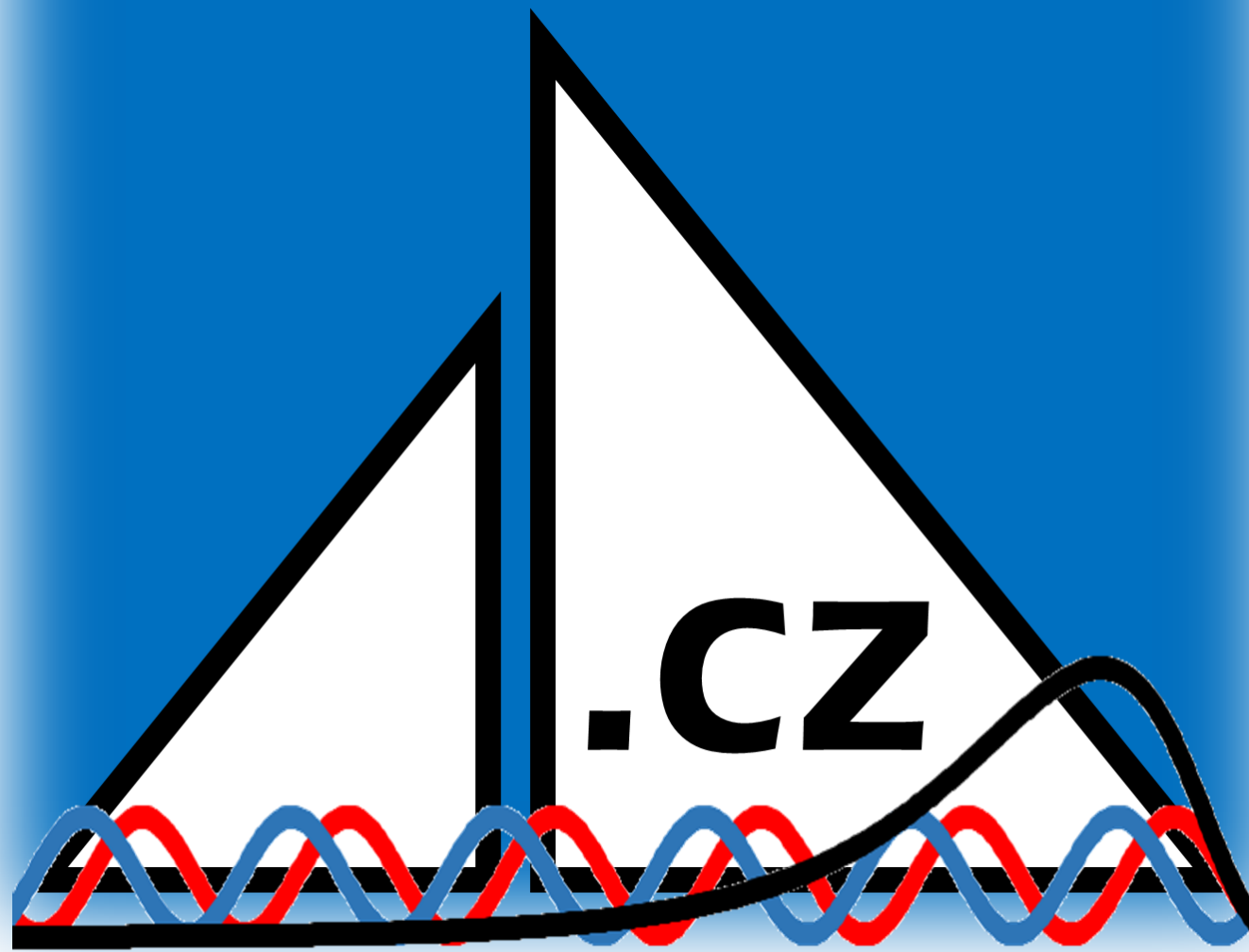
Risk management – Investiční rizika

▲ Česká pojišťovna (2013 - ...) – Senior risk manager

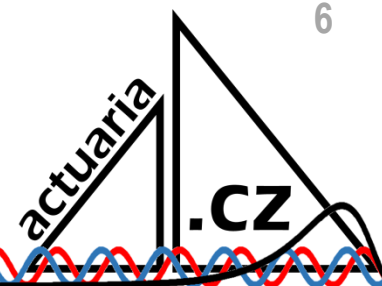
Manažer týmu řízení ekonomické solventnosti



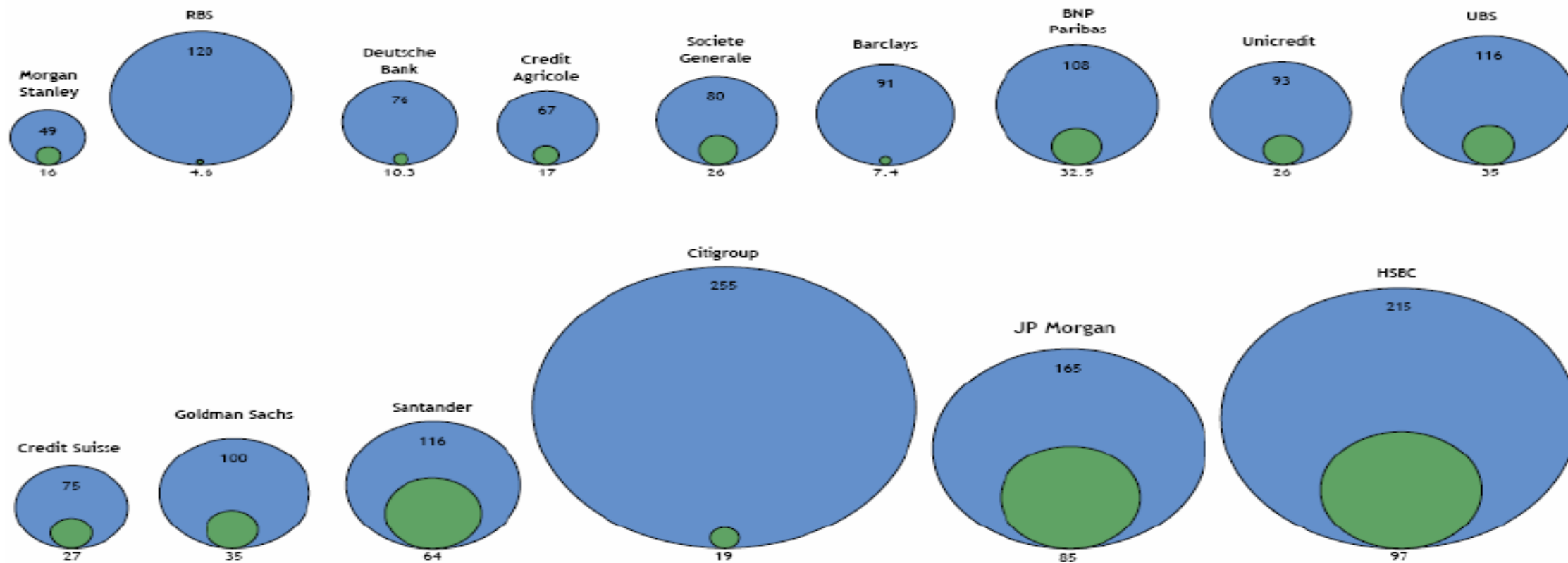
Motivace pro řízení rizik v pojišťovně

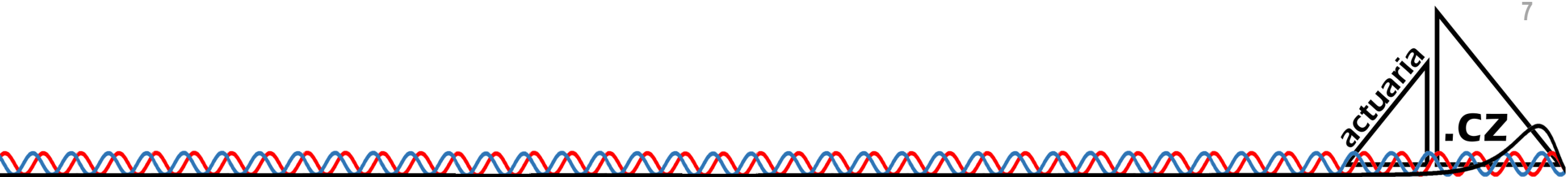


Dopad ekonomické krize?



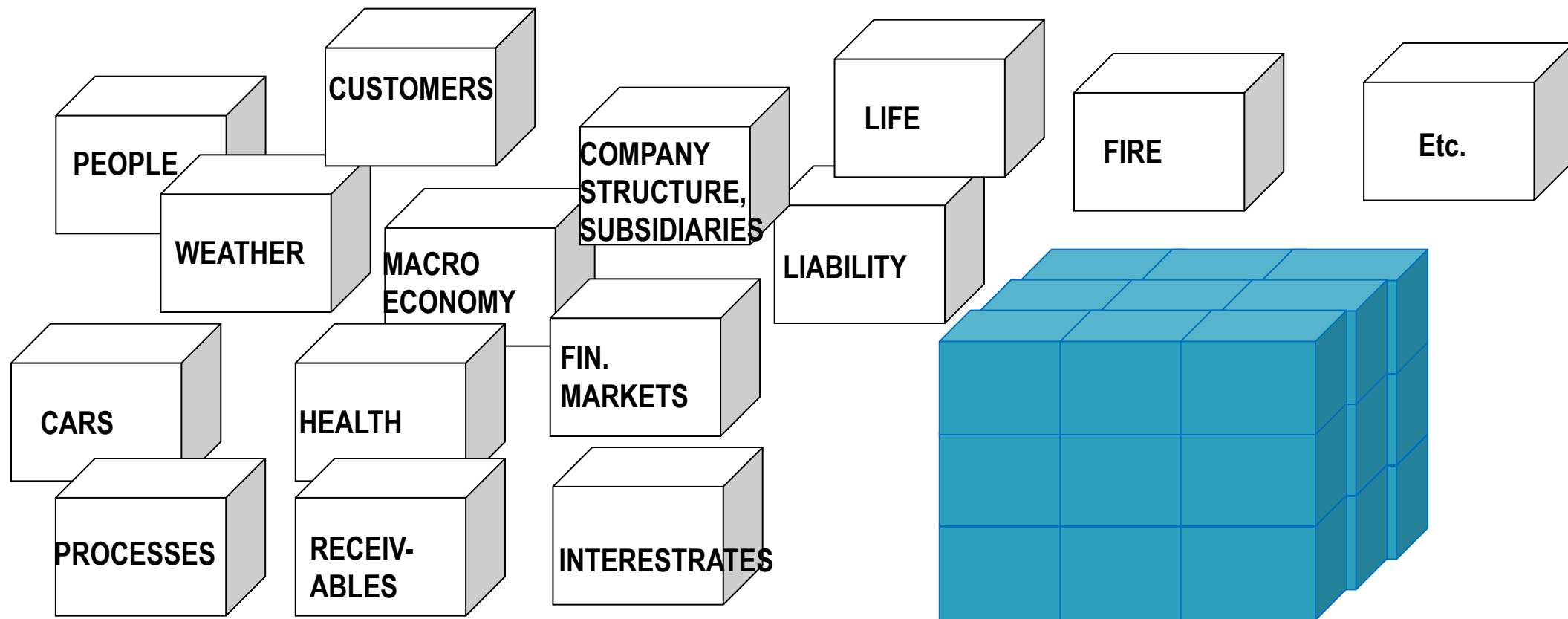
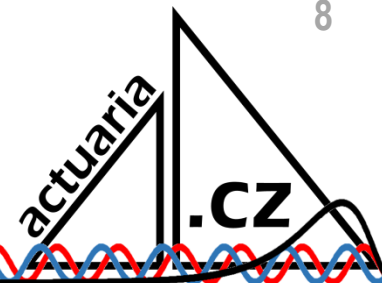
- Market Value as of January 20th 2009, \$Bn
- Market Value as of Q2 2007, \$Bn





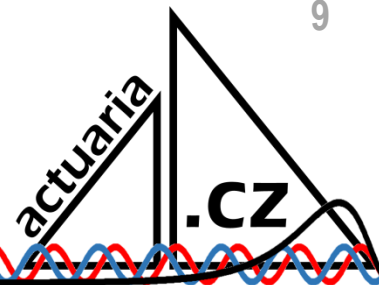
„Enterprise Risk Management“

8



Effects of correlation and risk diversification has significant practical purposes.

Interní potřeba versus regulace?

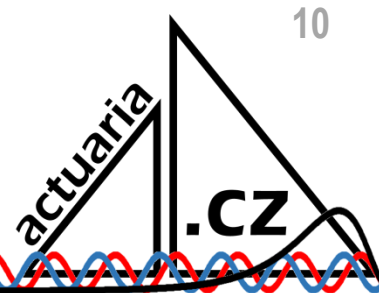


- ▲ V Evropě zejm. Solvency II, ale v jakýchkoliv globálních regulacích je kladen čím dál tím větší důraz na pozici risk managementu
- ▲ Promítá se i do očekávání investorů, akcionářů, ratingových agentur

Ale:

Nemělo by být jen externím požadavkem, risk management musí generovat přidanou hodnotu pro pojišťovnu tak, aby pojišťovně samotné záleželo na dobrém řízení rizik.

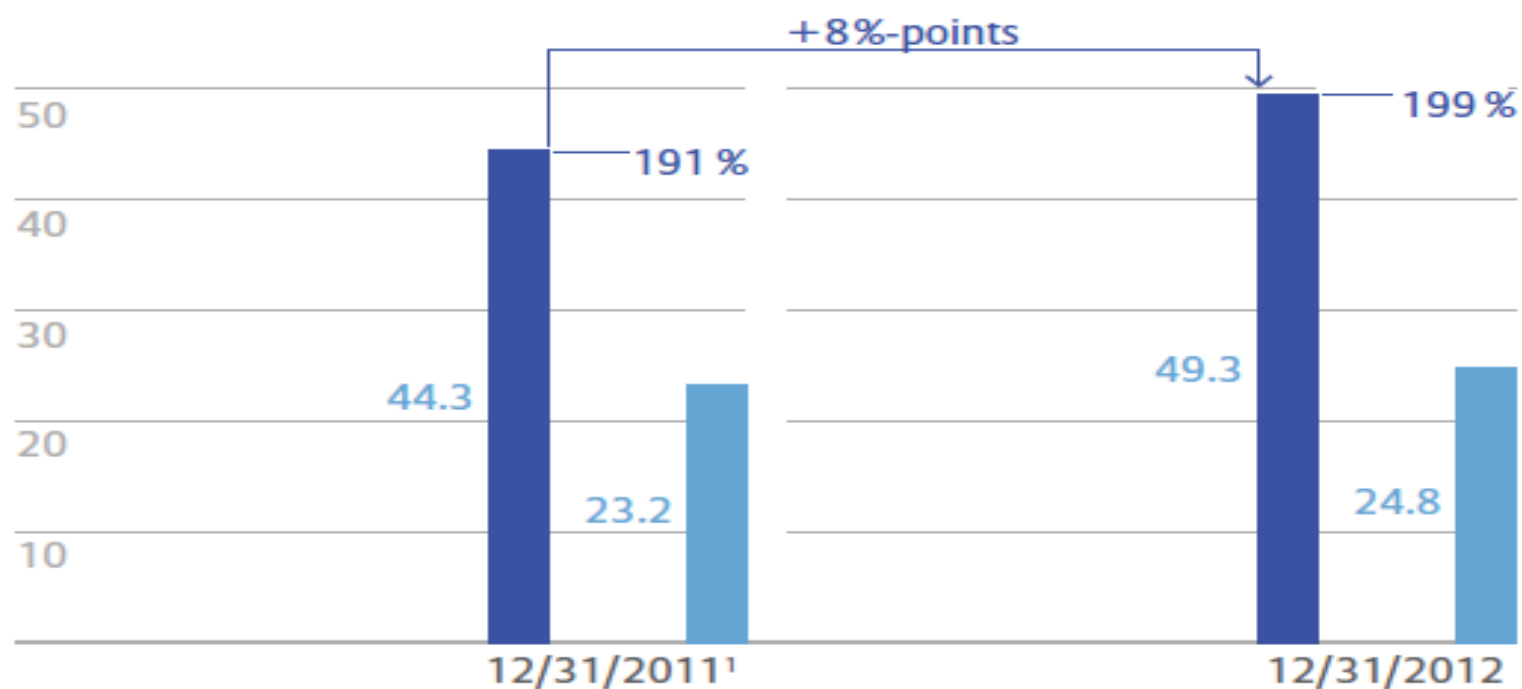
Úloha risk managementu?



AVAILABLE CAPITAL AND INTERNAL RISK CAPITAL

C 085

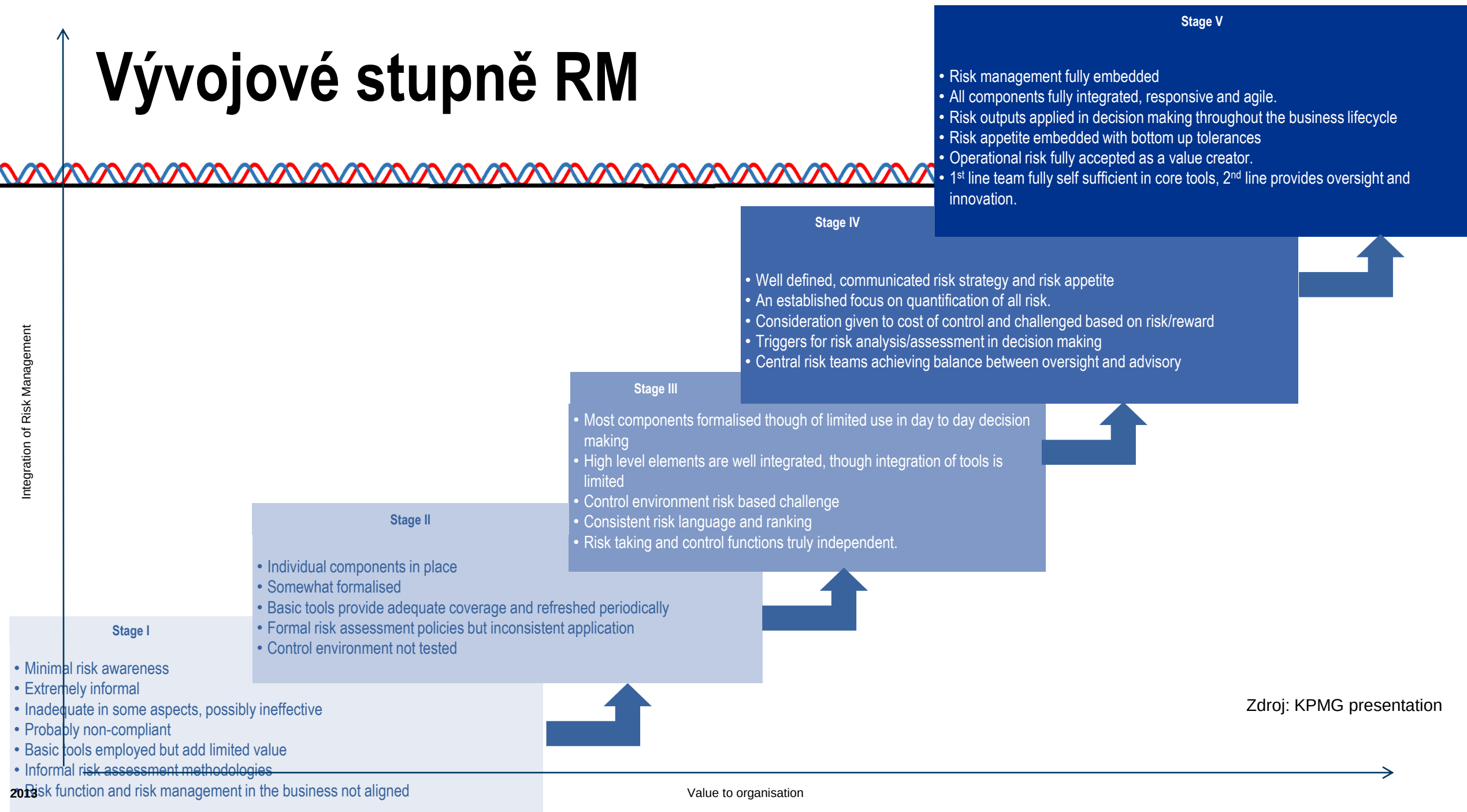
€ BN



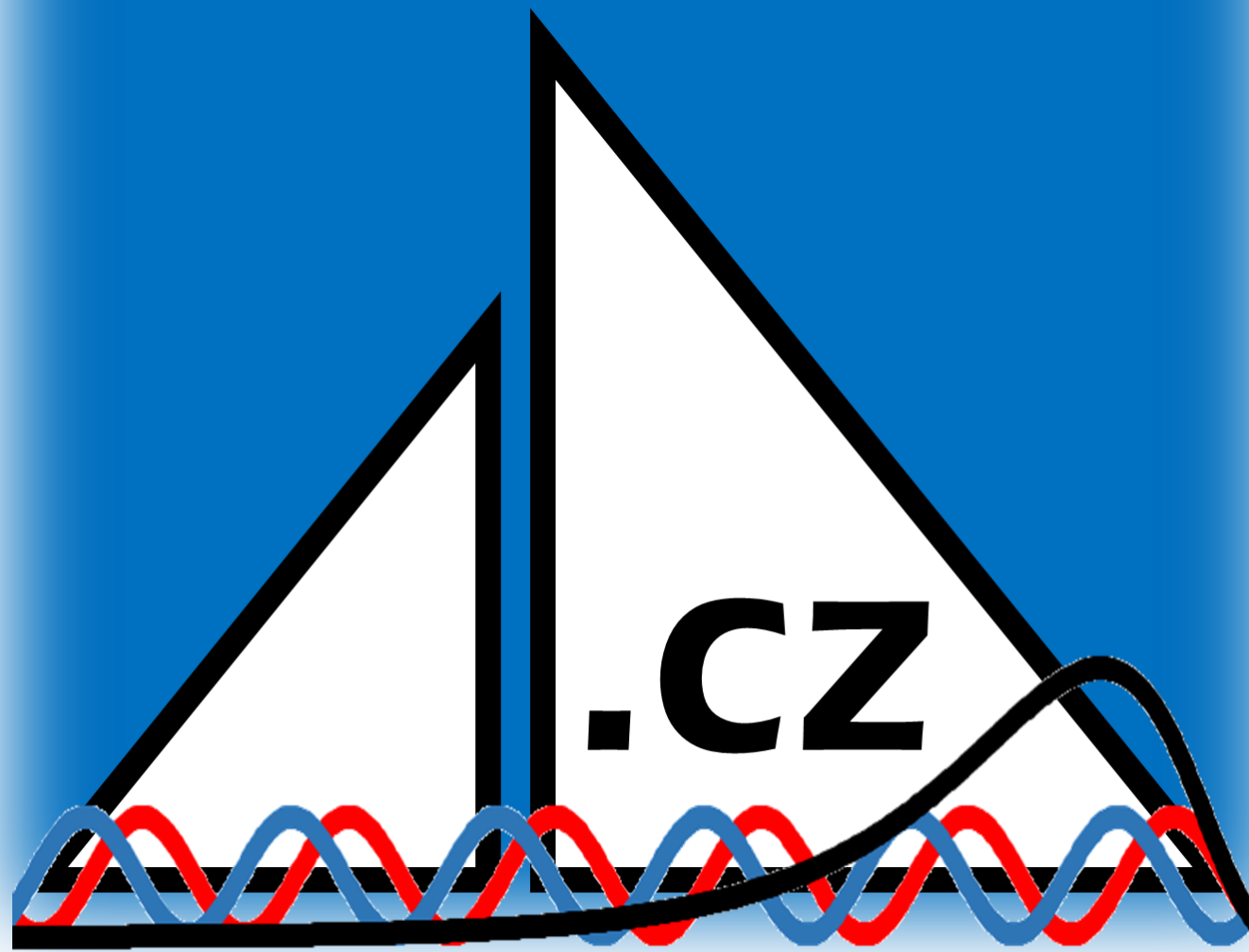
Capital ratio ■ Available capital ■ Internal risk capital

Zdroj: Allianz group Annual report 2012

Vývojové stupně RM



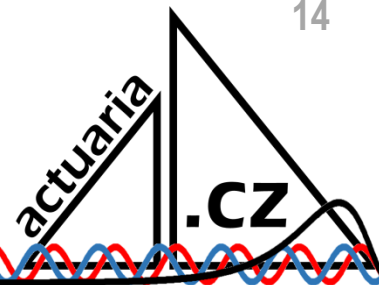
Jaká rizika tedy vlastně
řídíme?



Mapa rizik

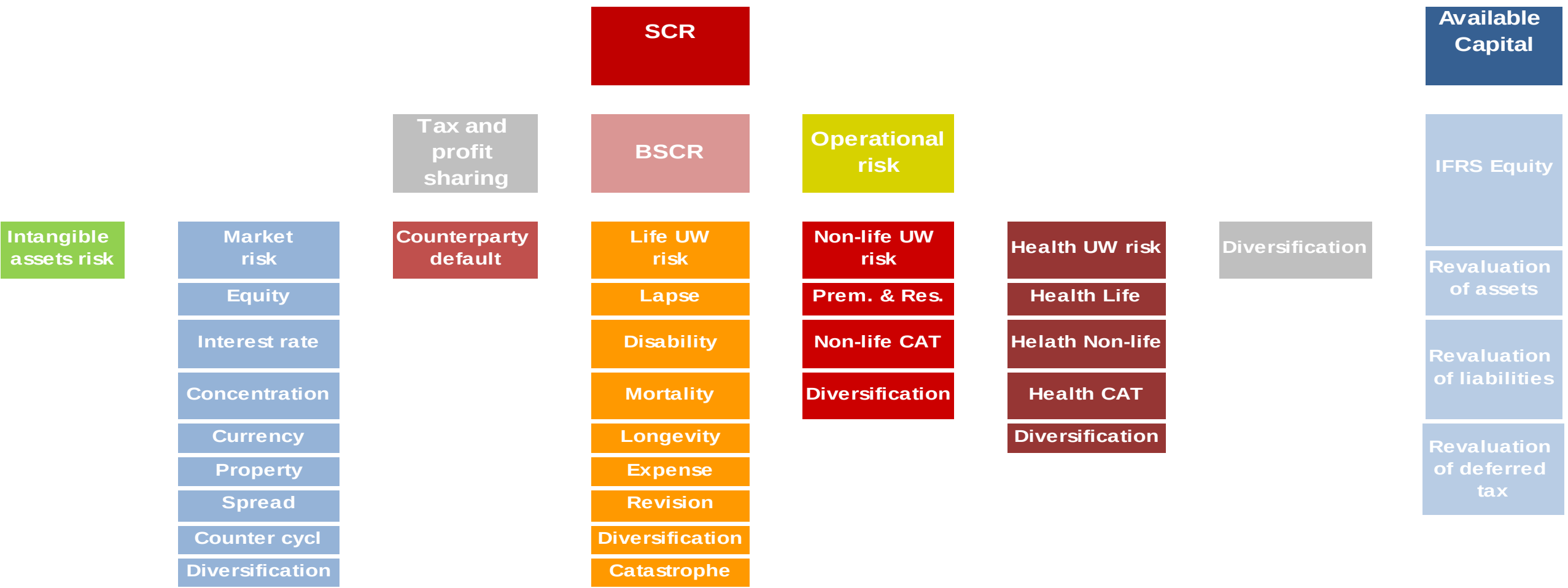
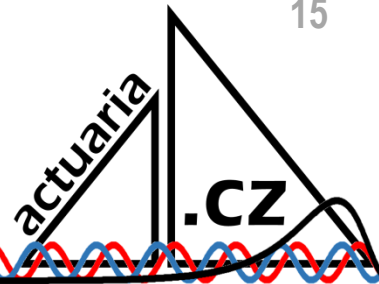
- ▲ Důležitá je identifikace rizik důležitých pro pojišťovnu
- ▲ Mapa rizik je individuální, je nástrojem řízení rizik
- ▲ Výpočet rizik po jednotlivých modulech
- ▲ Měla by být dlouhodobá, ale není fixní

Mapa rizik



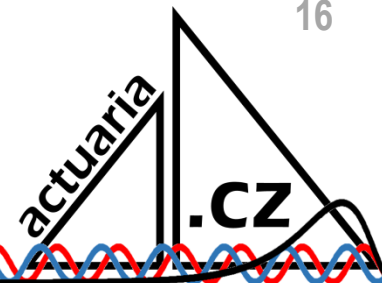
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- ▲ Mapa rizik je individuální, je nástrojem řízení rizik
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- ▲ Měla by být dlouhodobá, ale není fixní

Mapa rizik standardního modelu



Mapa rizik skupiny Generali

16

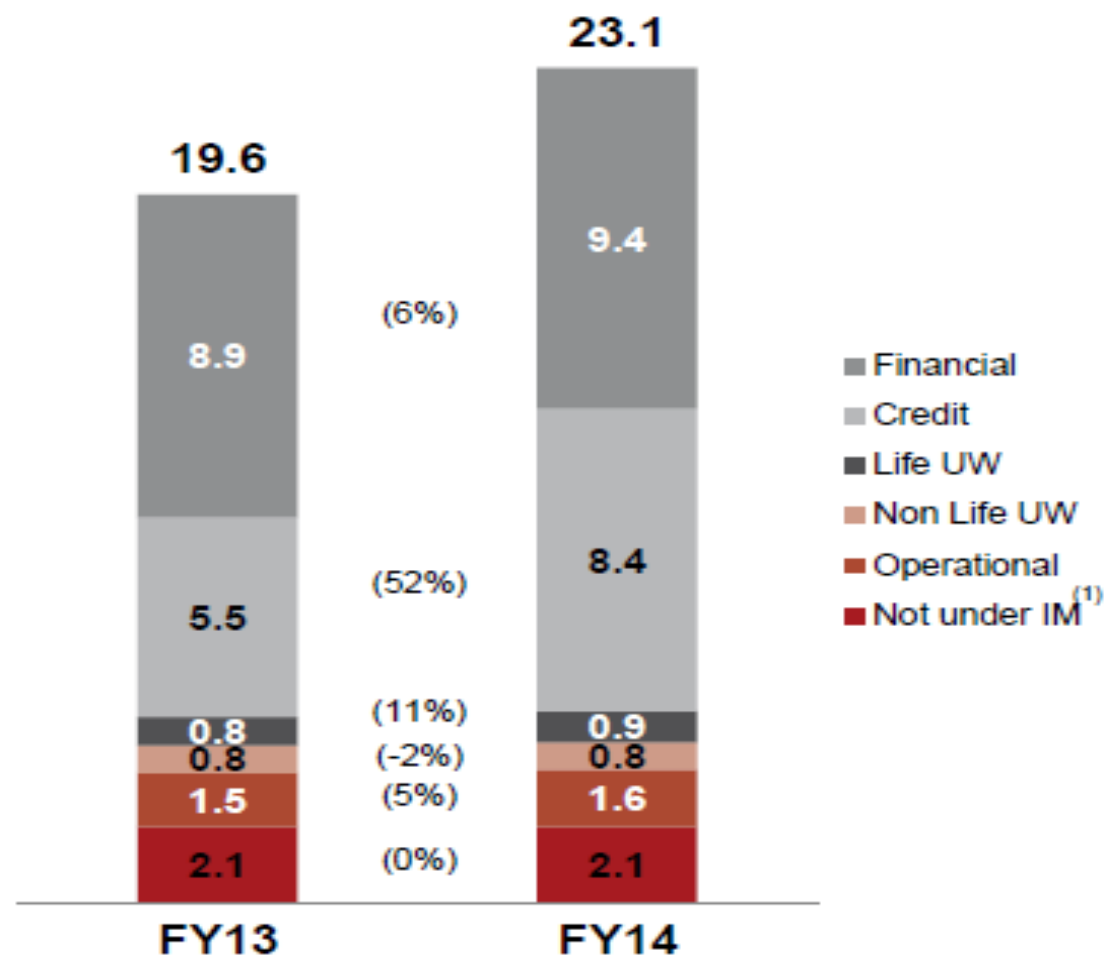


Risks covered by Partial Internal Model					
Financial risks	Credit risks	Insurance risks	Rischi sottoscrittivi vita e malattia	Rischi operativi	Non-Pillar I risks
Interest rate	Spread widening	Pricing	Mortality	Compliance risk	Liquidity risk
Interest rate volatility	Default	Reserving	Longevity	Financial reporting risk	Strategic risk
Equity		CAT	Morbidity/ Disability	Internal fraud	Reputational risk
Equity volatility			Lapse	External fraud	Contagion risk
Property			Expense	Employment practice	Emerging risk
Currency			Health	Clients & products	
Concentration				Damage to physical assets	
				Business disruption and system failure	
				Execution and process management	

Mapa rizik skupiny Generali

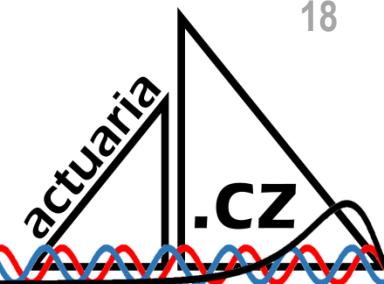
Group Risk Capital (RAC)

Group RAC at 99.5% after diversification
(Euro m)



Mapa rizik skupiny Allianz

18



€ MN

BY RISK CATEGORY

Pre-diversified before tax

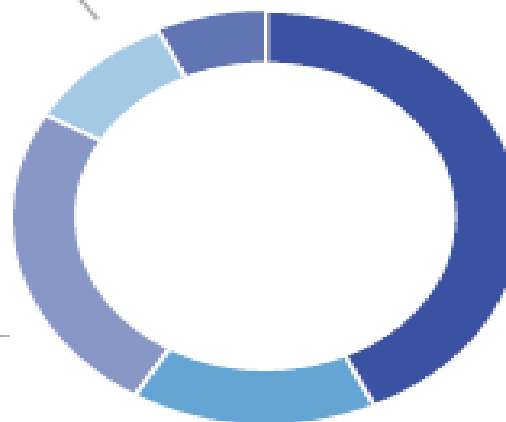
Total Group internal risk capital: 45,063 [41,747]

Operational risk 3,026 [2,836]

Business risk 4,444 [4,076]

Possible losses resulting from unexpected changes in business assumptions and unanticipated earnings fluctuations due to a decline in income without corresponding decrease in expenses, as well as changes in policyholder behavior related to early termination of contracts and unanticipated use of options such as renewals and annuitization.

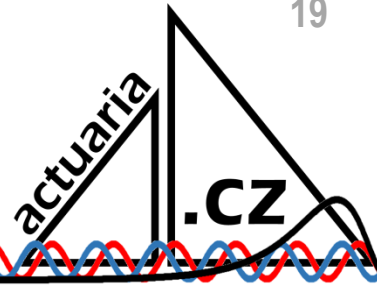
Underwriting risk
11,117 [10,900]



Market risk
19,415 [17,091]

Credit risk 7,061 [6,844]

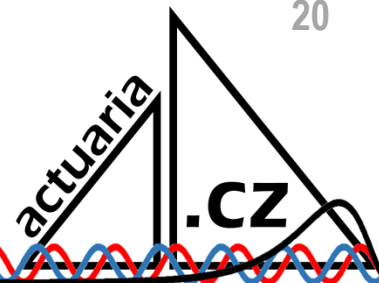
Hlavní trendy v pojistných rizicích



- ▲ Demografie
 - ▲ Potřeba nástrojů pro individuální krytí
 - ▲ Rostoucí koncentrace hodnot
- ▲ Klimatické změny
 - ▲ Rostoucí rozmanitost
 - ▲ Faktory přirozené a vyvolané člověkem
- ▲ Technologický pokrok
 - ▲ Rychlejší inovace a nová rizika (hacking, ztráta či odcizení dat, ...)
 - ▲ Významně se zvyšuje komplexnost rizik
 - ▲ Nanotechnologie, biotechnologie, informační technologie
- ▲ Provázanost rizik
 - ▲ Rostoucí vzájemná závislost
 - ▲ Rychlejší šíření epidemií, provázanost světa informačními technologiemi
- ▲ Reputační riziko

Změny klimatu

20

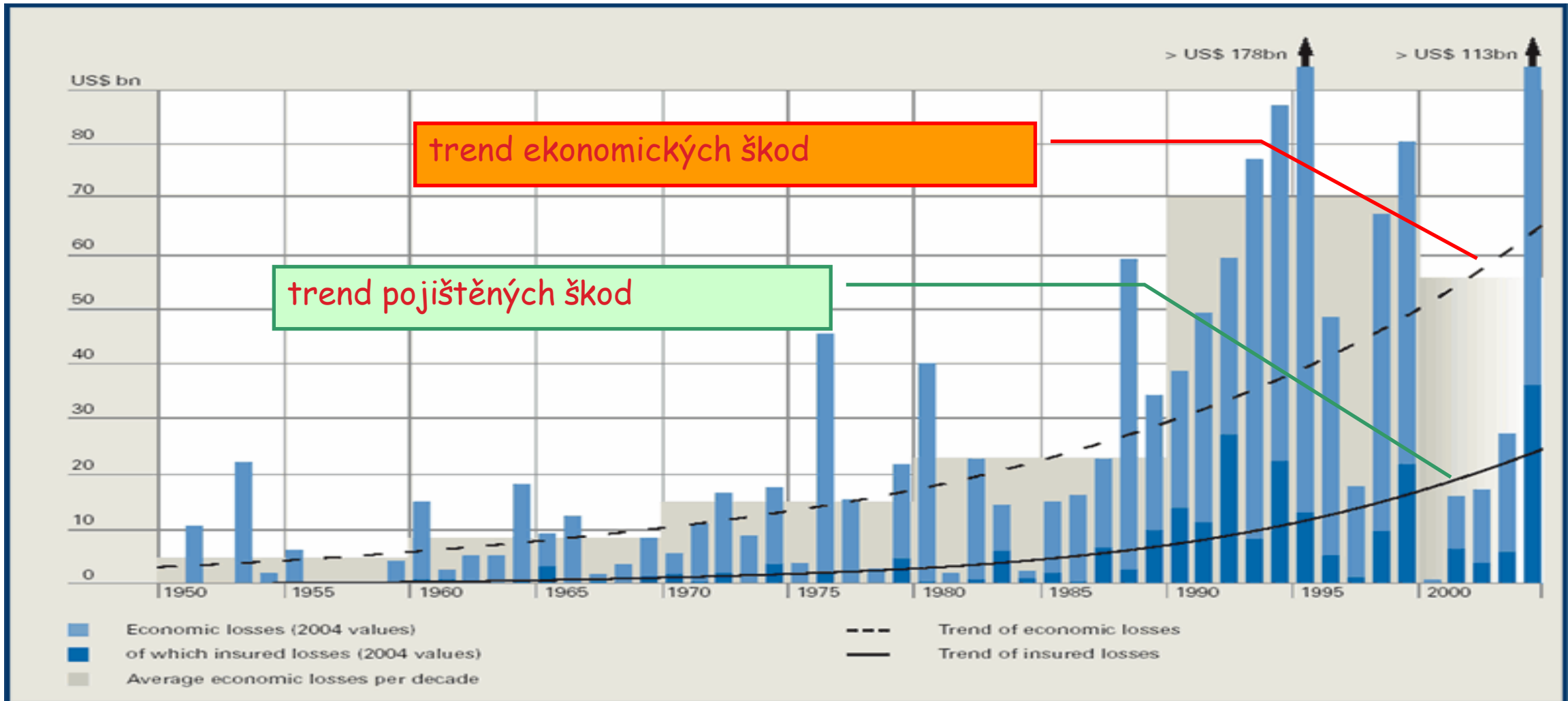


**Dopad do
životního,
zdravotního,
majetkového
pojištění, dále
pojištění
finančních
závazků,
přerušení
provozu,
odpovědnosti**

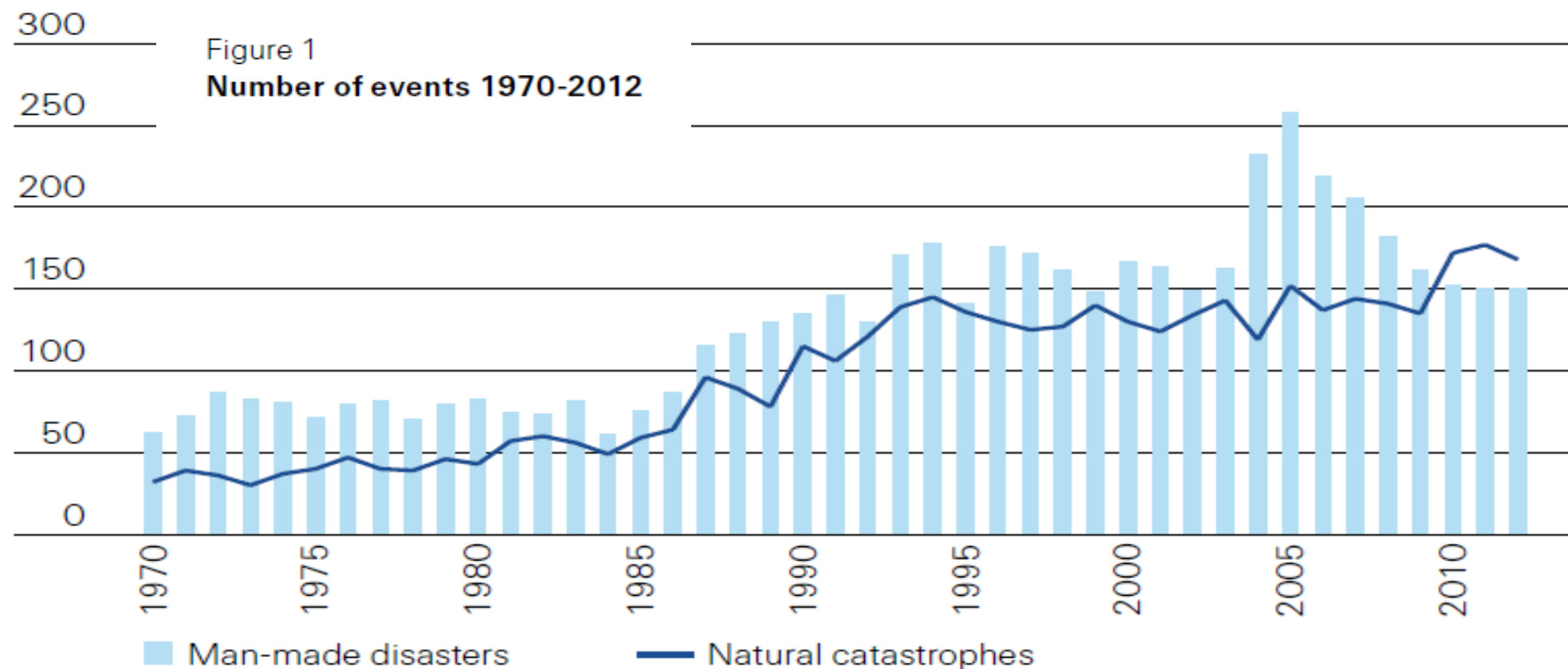
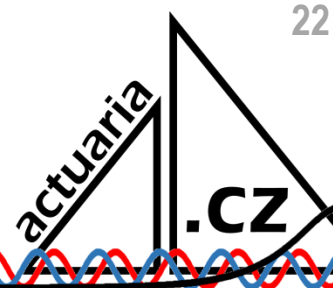
změna klimatu = problém globální
dopady, zranitelnost = problém regionální / lokální

plošná nehomogenita zranitelnosti a dopadů

Vývoj škod spojených s počasím



Katastrofická rizika



Source: Swiss Re Economic Research & Consulting

Katastrofická rizika

23

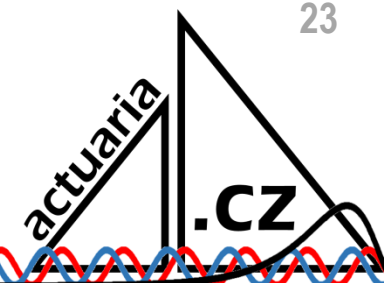


Table 4
The 20 most costly insurance losses in 2012

Natural catastrophes and man-made disasters in 2012:
A year of extreme weather events in the US

Insured loss ¹⁹ (in USD m)	Victims ²⁰	Date (start)	Event	Country
35 000 ²¹	237	24.10.2012	Hurricane Sandy	US, et al
11 000 ²²	123	15.07.2012	Drought in the Corn Belt	US
2 500	42	02.03.2012	Severe storms, tornadoes	US
2 500	1	28.04.2012	Thunderstorms, large hail, tornadoes	US
2 000	28	28.06.2012	Derecho storm with winds up to 146 km/h, tornadoes, hail	US
1 700	–	25.05.2012	Thunderstorms, hail, tornadoes	US
1 622	26	May 2012	Earthquakes (M _w 5.9 and M _w 5.7), aftershocks	Italy
1 600 ²³	40	26.08.2012	Hurricane Isaac	US, et al
1 000	–	06.06.2012	Thunderstorms, large hail, tornadoes	US
950	–	11.06.2012	Thunderstorms, large hail, tornadoes	US
910	6	13.04.2012	Thunderstorms, >100 tornadoes, hail, flooding (Wichita)	US
841	4	03.04.2012	Storms with winds up to 150 km/h	Japan
813	1	June 2012	Floods caused by heavy rains (two events)	UK
813	4	23.11.2012	Floods caused by heavy rains	UK
775	–	02.04.2012	Thunderstorms, tornadoes, hail, heavy rains	US
532	–	12.08.2012	Hailstorm	Canada
515	32	13.01.2012	Cruise liner Costa Concordia capsizes after hitting rocks	Italy
450	2	24.06.2012	Waldo Canyon Fire; 346 houses destroyed	US
443	5	04.01.2012	Windstorm Andrea	Germany, et al
npa ²⁴	2	31.03.2012	Explosion at chemical plant	Germany

Source: Swiss Re Economic Research & Consulting

Katastrofická rizika

24

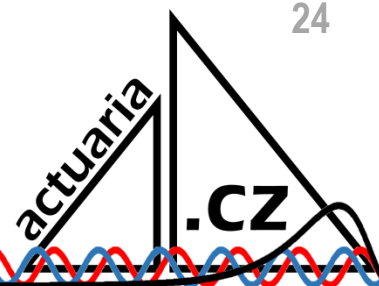


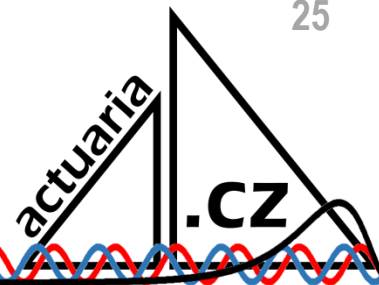
Table 5
The 20 worst catastrophes in terms of victims 2012

Natural catastrophes and man-made disasters in 2012:
A year of extreme weather events in the US

Victims ²⁰	Insured loss ¹⁹ (in USD m)	Date (start)	Event	Country
1 901	–	04.12.2012	Typhoon Bopha	Philippines
824	250	21.01.2012	Cold wave, severe frost	Europe
455	–	03.09.2012	Floods caused by heavy monsoon rains	Pakistan
361	–	15.02.2012	Fire in a prison started by an inmate	Honduras
317	–	07.12.2012	Cold wave	Eastern Europe
306	–	11.08.2012	Earthquakes (M_W 6.2 and M_W 6.0)	Iran
286	–	04.03.2012	Explosion at arms depot caused by a short circuit	Congo, Republic of
252	–	01.06.2012	Cold wave	Peru
246	–	02.02.2012	Overcrowded ferry capsizes	Papua New Guinea
244	10	22.07.2012	Floods caused by heavy rains	Nigeria, et al
240	–	12.09.2012	Fire at garment factory	Pakistan
237	35 000 ²¹	24.10.2012	Hurricane Sandy	US, et al
205	–	30.04.2012	Ferry capsizes on Brahmaputra River	India
185	–	20.01.2012	Armed attacks on police buildings	Nigeria
172	30	07.07.2012	Flash floods; 7 200 houses destroyed	Russia
169	–	18.07.2012	Floods caused by heavy rains	North Korea
153	npa ²⁴	03.06.2012	Dana Air McDonnell Douglas MD-83 crashes	Nigeria
149	140	21.07.2012	Floods caused by heavy torrential rains	China
144	–	18.07.2012	Ferry capsizes in rough weather	Tanzania
135	–	07.04.2012	Avalanche from Himalaya glacier hits military base	Pakistan

Riziko pandemií – případová studie

25



So...?

- Long overdue a pandemic

1918: "Spanish Flu" (strain H1N1) – killed 40-50 million people

1957: "Asian Flu" (strain H2N2) – killed 1 million people

1968: "Hong Kong Flu" (strain H3N2) – killed 1 million people

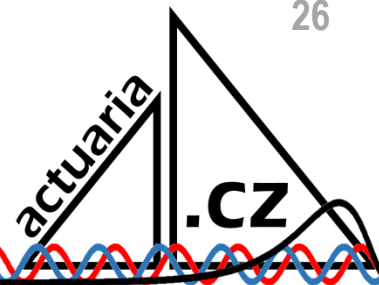
H5N1 has similar characteristics to H1N1

So what's going to happen then?

- Previous pandemics show between 25%-35% of people will suffer a clinical illness of some severity. 0.375% - 2.5% of these will die.

- In UK, this means between 56,000 - 520,000 people will die (based on population of 59.6m)

Riziko pandemií – případová studie



Managing People Related Impacts

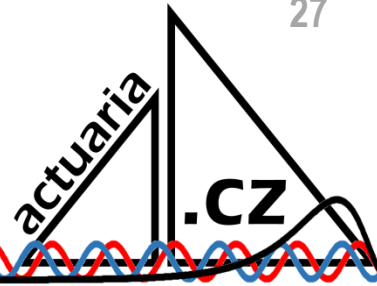
- Accounting for people
- Communications with staff
- Corporate vs individual responsibilities
- Psychological impacts
- Large-scale absence from work

Organisational Resilience

- Exploiting technology
- Split-site
- Transfer of operations
- Remote working
- Business as usual or regularly tested
- Supply chain dependencies may be a weak link

Riziko pandemií – případová studie

27



Life and PHI claims...

Claims going up => claims processing going up
+ Headcount going down
= A backlog of claims to be processed

Model developed to estimate the size of the backlog.

More obviously...

- Shock in mortality/CI rates
- Do the CI plans cover for pandemics?

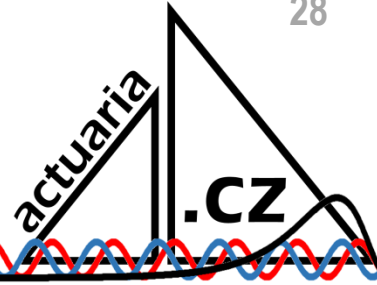
Scenario 2

Clinical Attack Rate
Mortality Rate

50.00%
2.50%

Scenario 2 Time to clear backlog: 108 weeks

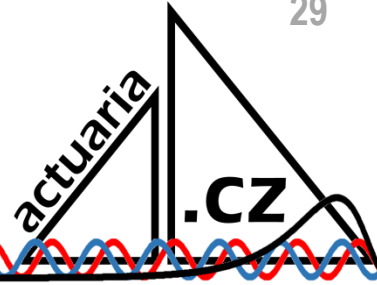
Regulace – Systemic risks



On 18 July 2013, the Financial Stability Board (FSB) published a press release endorsing the assessment methodology and policy measures published by the International Association of Insurance Supervisors (IAIS) discussed below, and naming the *firsts nine globally systemically important insurers - G-SIIs*. The list will be published each November, starting in 2014 and initially comprises:

Allianz SE;
American International Group, Inc.;
Assicurazioni Generali S.p.A.;
Aviva plc;
Axa S.A.;
MetLife, Inc.;
Ping An Insurance (Group) Company of China, Ltd.;
Prudential Financial, Inc.; and
Prudential plc.

Regulace – Systemic risks



Enhanced supervision

These measures entail the development of Systemic Risk Management Plans, enhanced liquidity planning and management and the granting of direct powers over holding companies to group-wide supervisors. There is also a reasonably detailed discussion of:

- the nature of traditional insurance versus non-traditional insurance and non-insurance (NTNI) activities; and
- effective separation of NTNI business.

Effective recovery and resolution

The IAIS's proposals for the effective resolution of G-SIIs are based on the FSB's [Key Attributes of Effective Resolution Regimes for Financial Institutions](#) but takes account of the specificities of insurance. This entails the establishment of Crisis Management Groups, **the development of recovery and resolution plans (RRPs)**, the conduct of resolvability assessments, and the adoption of institution-specific cross-border cooperation agreements.

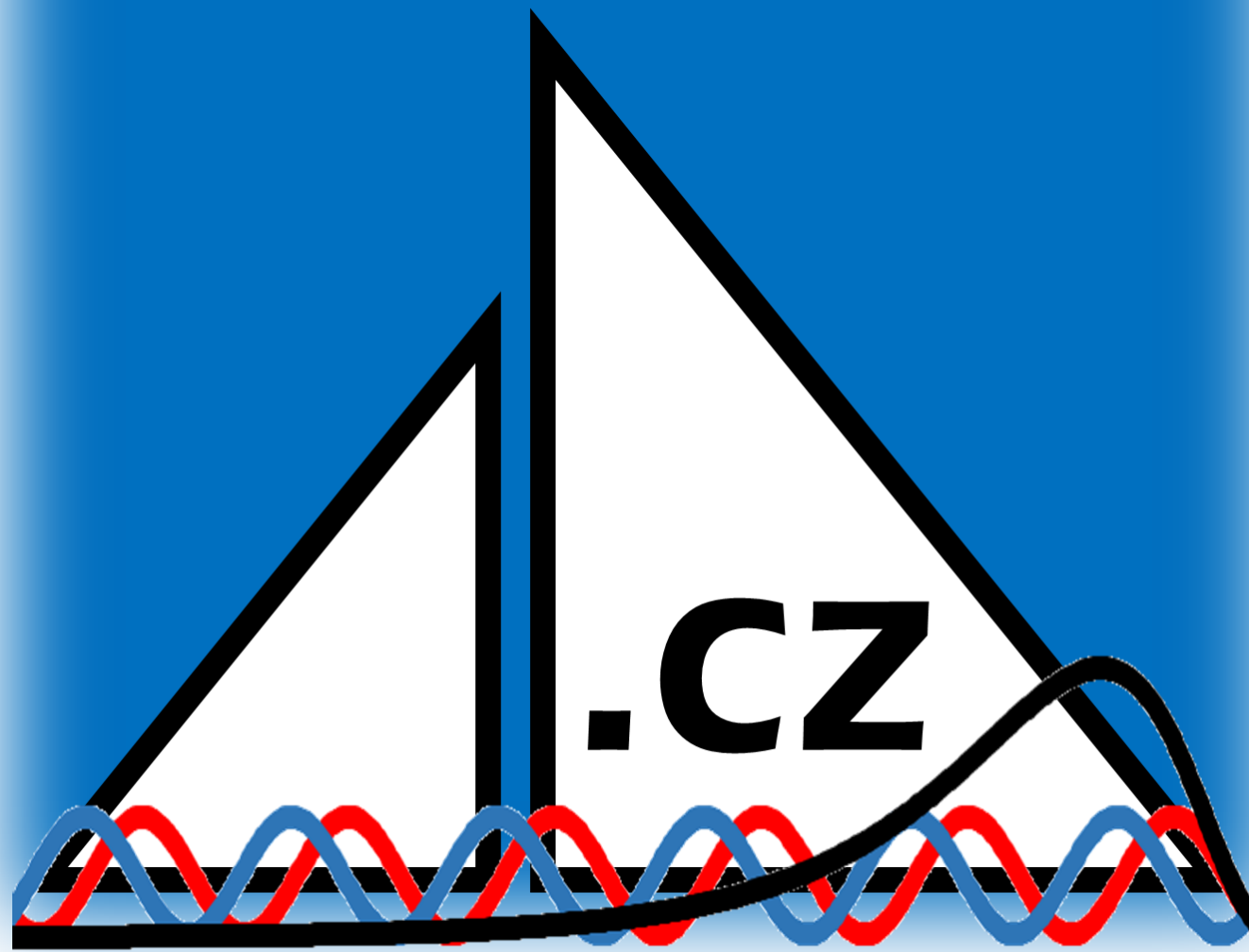
Higher Loss Absorbency (HLA)

G-SIIs will be required to have HLA capacity. ***This may only be met by “highest quality capital”, being permanent capital that is fully available to cover losses of the insurer at all times on a going-concern and a wind-up basis.*** In applying this requirement a distinction may be made based upon whether a firm's NTNI activities have been effectively separated from traditional insurance business. HLA may be targeted at the entities where systemically important activities are located and also take account of whether group supervisors have authority over any non-regulated financial subsidiaries.



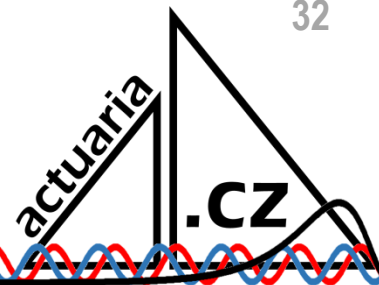
Source: Dilbert's guide to the rest of your life, Running Press Book Publishers, 2007

A jak je tedy řídíme?



Řízení rizik

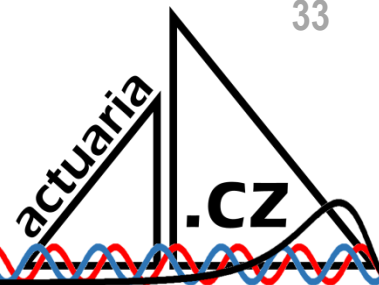
32



- ▲ Rizika popsat, změřit
- ▲ Pravidelné sledování vývoje, identifikace nových rizik
- ▲ Metody snížení rizik
- ▲ Definice rizikového apetitu
- ▲ Komunikace

Kvantifikace rizik

33



Least squares Monte Carlo

Faktorový přístup

Korelace

Replikační portfolia

Value-at-risk, tail value-at-risk

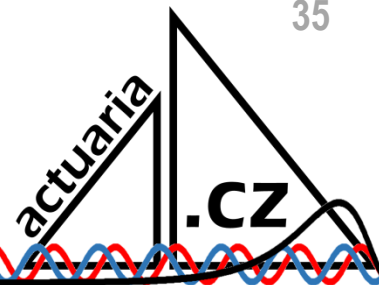
Stress testing

Curve fitting

Kopuly

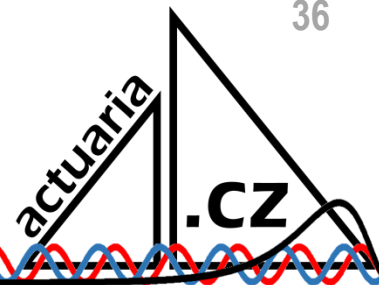
Disclosure	AZ	Aviva	AXA	Generali	ING	ZIG	Hannover Re	Munich Re	Swiss Re
Economic Solvency Ratio (AC/RC)	✓	✓	✓	✓	✗ ^(a)	✓	✓	✓	✓
Required capital by risk	✓	✗ ^(b)	✓	✓	✓	✓	✓	✓	✓
Required capital by operating unit	✓	✗	✓	✓	✓	✓	✗	✓	✓
Impact of diversification	✓	✗	✗	✓	✓	✗	✓	✓	✓
Starting Point	MCEV	ICA/SII	MCEV	MCEV	Direct	Direct	MCEV	Direct	Direct
Risk Measure	VaR	VaR	VaR	VaR	VaR	VaR ^(c)	VaR	VaR	Tail VaR ^(d)
Confidence Level (%)	99.5 ^(e)	99.5	99.5	99.95 ^(f)	99.5	99.95	99.97	99.5 ^(g)	99.0
Reconciliation EV/IFRS to AC	✗	✓	✗	✓	✗	✓	✓	✓	✓
Other Reconciliations	✗	✗	✗	✗	✗	SST to EC	✗	✗	✗
Sensitivity Tests	✓	✗	✓	✗	✓	✓	✗	✓	✓
Projected EC	✗	✗	✗	✗	✗	✗	✗	✗	✗
Frequency	Quarter-ly	Half-yearly	Half-yearly	Half-yearly	Yearly	Half-yearly	Yearly	Yearly	Yearly

Kvantifikace rizik



- ▲ Faktorový přístup
 - ▲ Přístup solvency I
 - ▲ i v solvency II ve standardní formuli přetrvává, typicky pro operační rizika (ve standardní formuli použito pro více rizik)
 - ▲ Procento z pojistného/rezerv
 - ▲ Jednoduchý, rychlý, je nutné si být vědom omezení tohoto přístupu

Kvantifikace rizik – faktorový přístup



Operational risk module

The capital requirement for the operational risk module shall be equal to the following:

$$SCR_{Operational} = \min(0.3 \cdot BSCR; Op) + 0.25 \cdot Exp_{ul}$$

where:

- (a) *BSCR* denotes the Basic Solvency Capital Requirement;
- (b) *Op* denotes the basic capital requirement for operational risk charge;
- (c) *Exp_{ul}* denotes the amount of expenses incurred during the previous 12 months in respect of life insurance contracts where the investment risk is borne by policy holders.

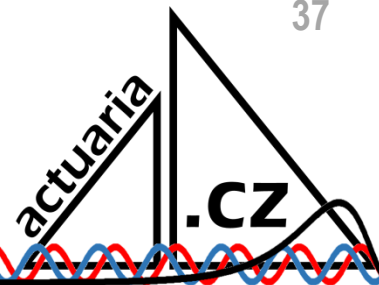
The basic capital requirement for operational risk shall be determined as follows:

$$Op = \max(Op_{premiums}; Op_{provisions})$$

where:

- (a) *Op_{premiums}* denotes the capital requirement for operational risks based on earned premiums;
- (b) *Op_{provisions}* denotes the capital requirement for operational risks based on technical provisions.

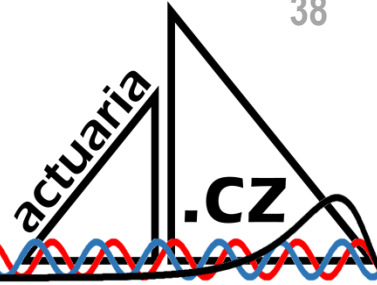
Kvantifikace rizik – VaR, TVaR



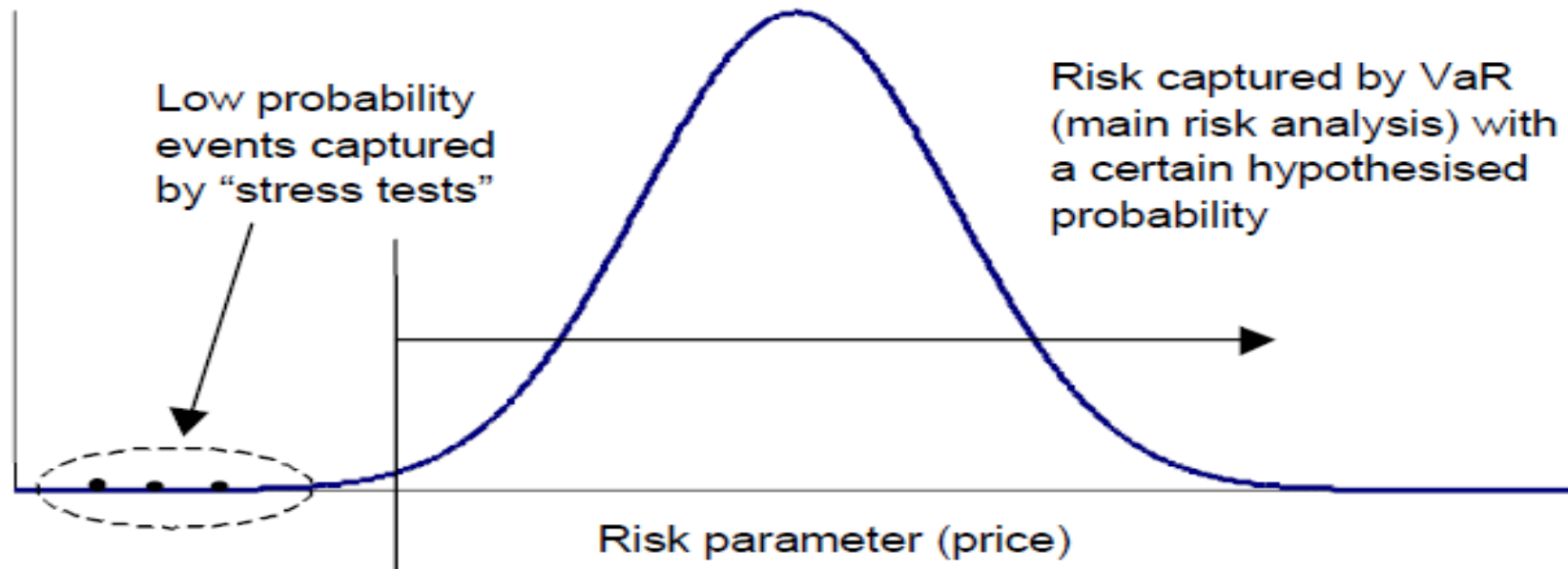
Value-at-risk, tail value-at-risk

- ▲ Typické pro investiční rizika, v bankovníctví běžné
- ▲ Důležité nastavení časového horizontu
 - ▲ V bankovníctví běžné spíš dny
 - ▲ V pojišťovnictví se pro výpočet kapitálu používá spíš roční horizont

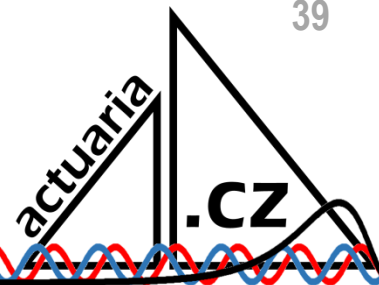
Stress testing vs Value at Risk approach



Stress tests capturing exceptional but plausible events



Kvantifikace rizik – stress testing



Testy citlivosti

- ▲ Již nyní povinné podle IFRS – v příloze citlivost na pohyby/posuny úrokových křivek, změny cen akcií/indexů, ...

Stress testy (zátěžové testy)

- ▲ Požadavky regulátora (zejm. týkající se investičních rizik)
 - ▲ Obvyklé u bank
 - ▲ Analogie v pojišťovnictví
- ▲ Storna – standardní model zahrnuje lapse mass stress
- ▲ Interně definované

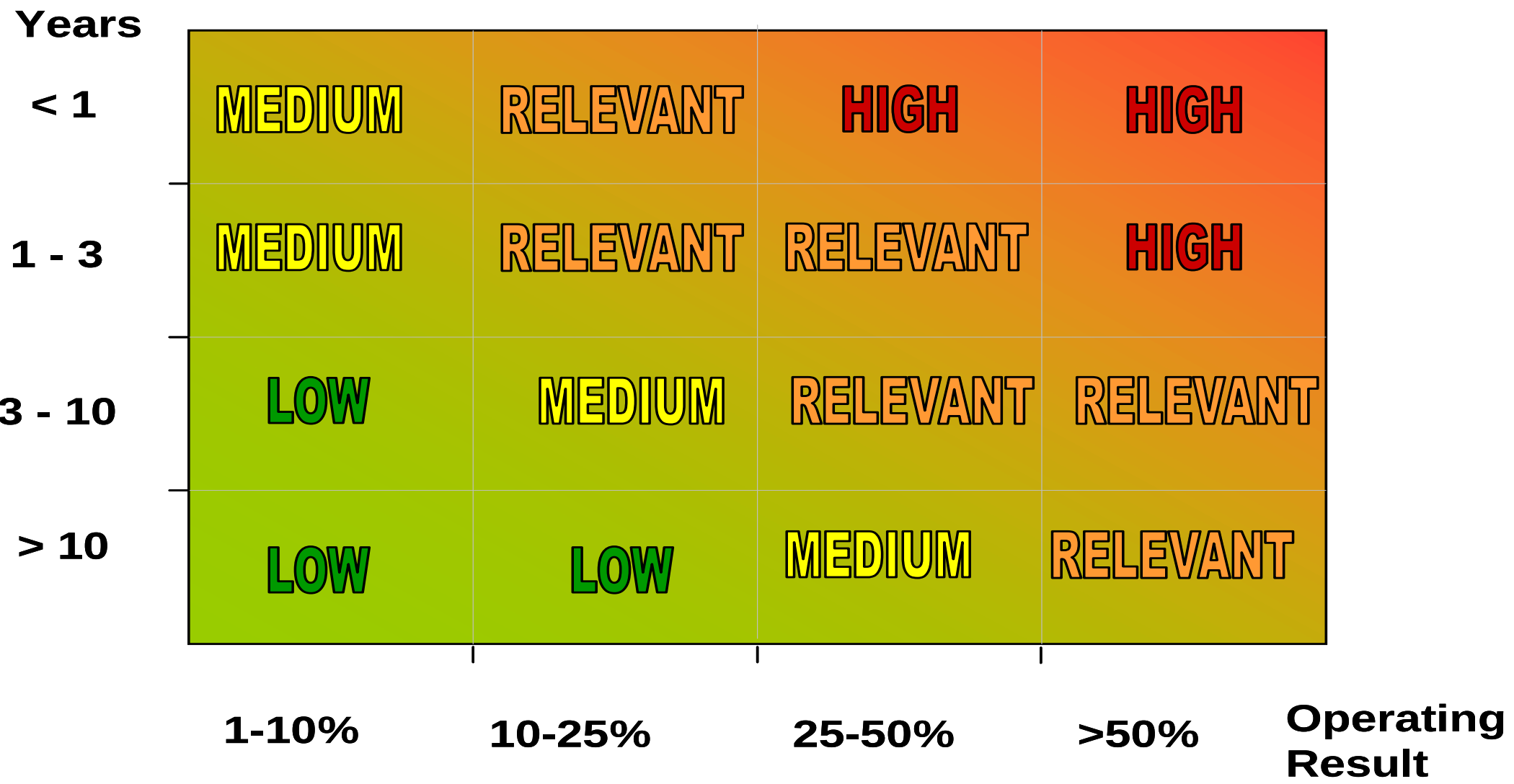
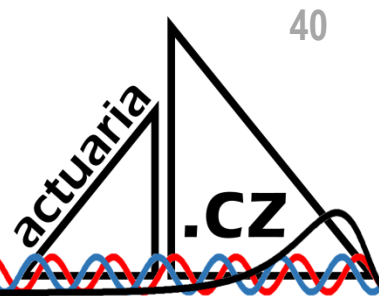
What-if analýzy

- ▲ Kreditní riziko – náhlé zhoršení ratingu všech/vybraných protistran, zvýšení kreditních spreadů...
- ▲ Katastrofická rizika
- ▲ Operační rizika

Marginální riziko

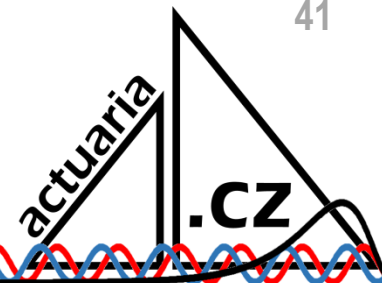
Marginální statistika pro jednu událost vyjadřuje míru jejího příspěvku k celkovému riziku portfolia. Marginální riziko je rovno rozdílu hodnoty daného parametru rizika pro celé portfolio a pro portfolio bez dané události.

Řízení rizik - „Heat maps“



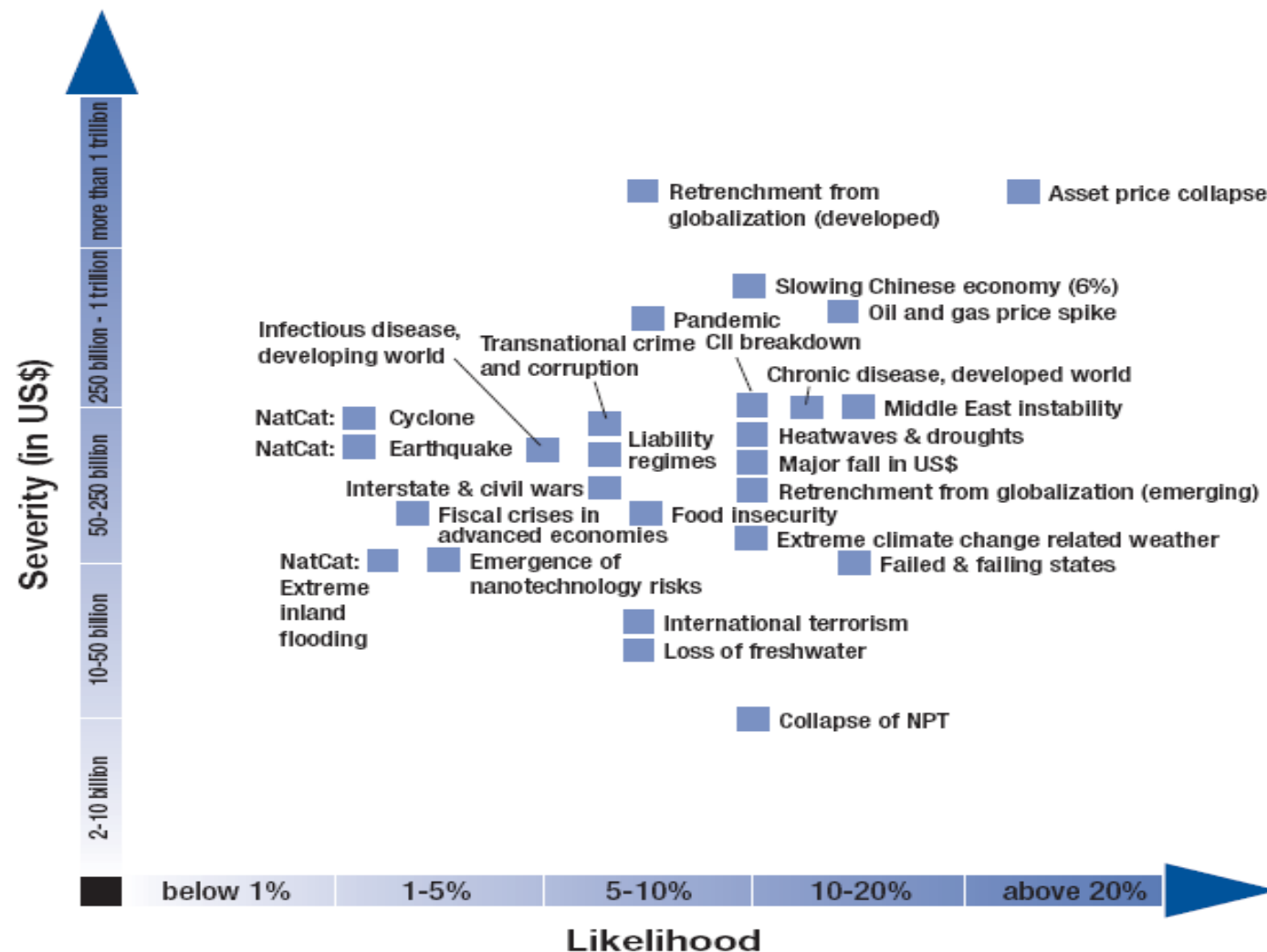
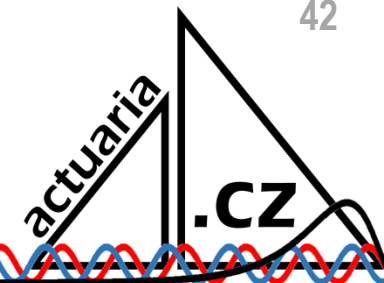
Řízení rizik - „Heat maps“

41



Řízení rizik - „Heat maps“

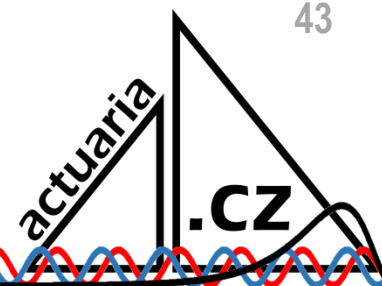
42



World Economic Forum
Global Risks 2008
February 2008

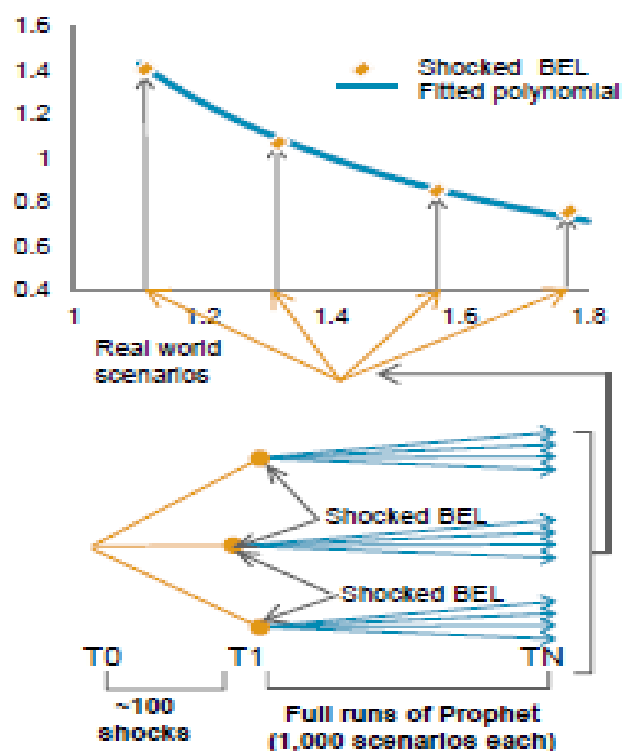
Stochastické přístupy

43



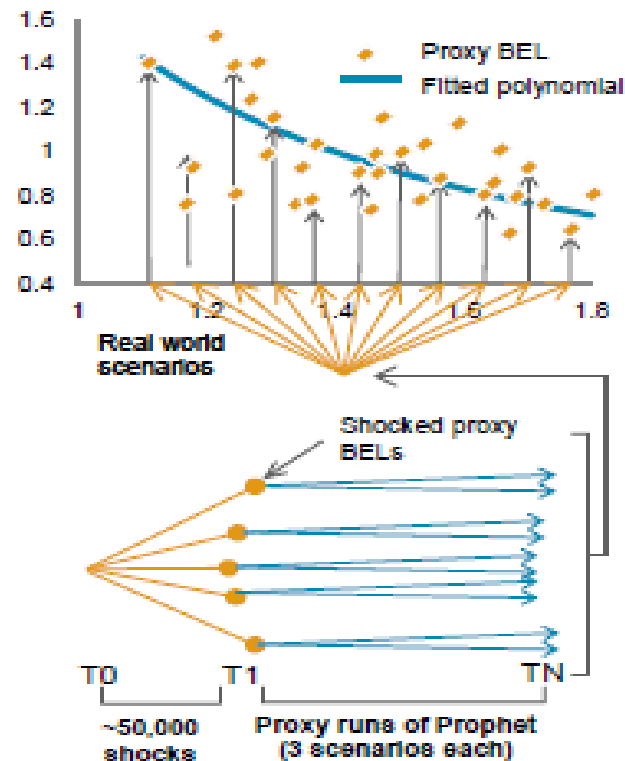
A. Curve fitting (similar to UPRAC)

Determine small number of 1-year-out shocks (e.g. 100 shocks) and run Prophet on each of the shocks to calculate shocked BEL. Then fit a curve to the shocked BELs and use this curve as the in the Monte-Carlo simulation.



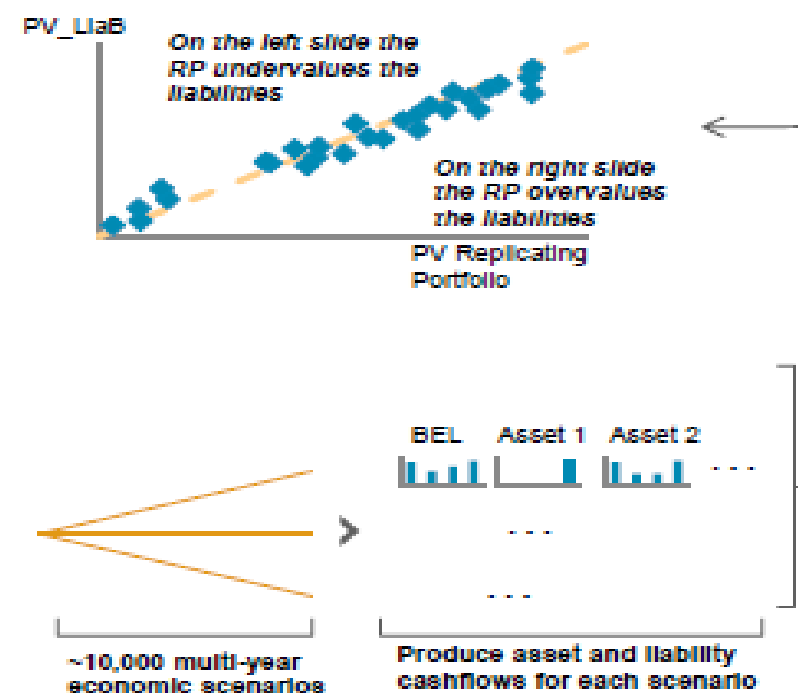
B. Least Squares Monte-Carlo (LSMC)

Generate large set of 1-year out shocks (e.g. 50,000) and perform small Prophet runs (2-3 risk neutral projections) on each of these scenarios to estimate shocked BEL. Then fit a curve to the point cloud and use this curve in the Monte-Carlo simulation

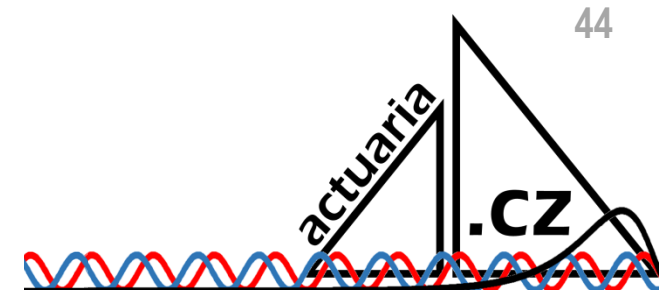


C. Replicating portfolios

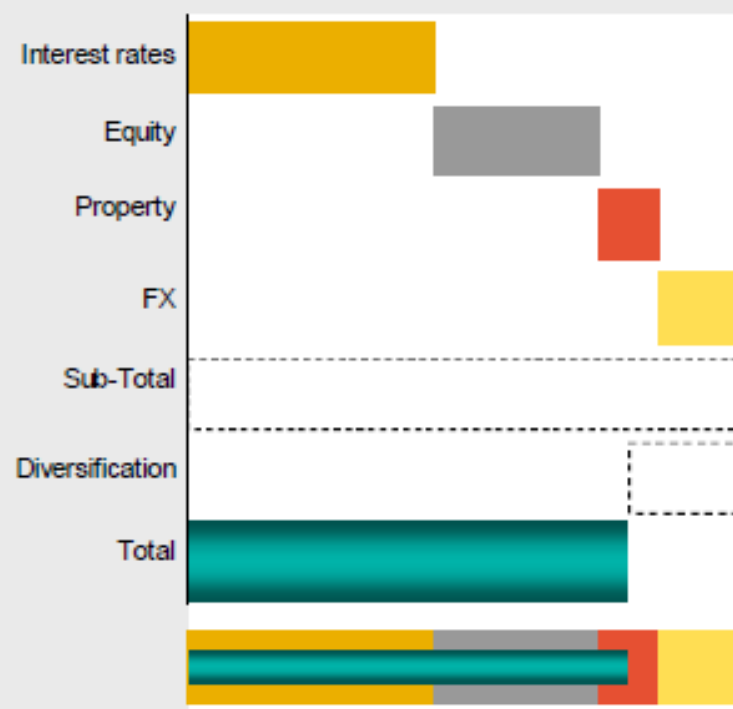
Produce large set of multi-year economic scenarios. Then run asset valuation models and Prophet to calculate cashflows of assets and liabilities in each scenario. Then calculate their PV and run linear regression to determine asset portfolio that matches liability PVs best.



Investments: Optimising diversification to reduce volatility and capital



Market Risk – current ALM strategy

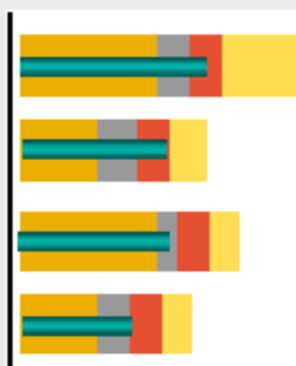


Current ALM strategy

Receiver Swaptions

Equity hedging

Combined

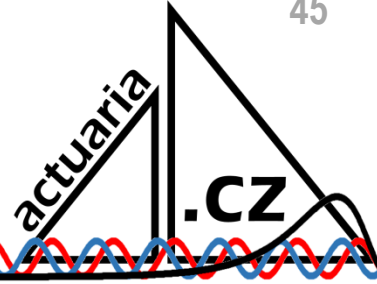


Overall required market risk capital after diversification

ILLUSTRATIVE

Různé přístupy vedou k různým výsledkům

45



Interní model

Pilíř I

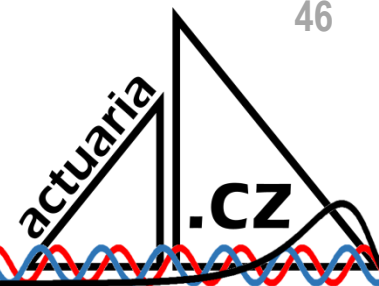
Pilíř II

?

Standardní formule

Ratingový model

Rizikový apetit vs tolerance rizika



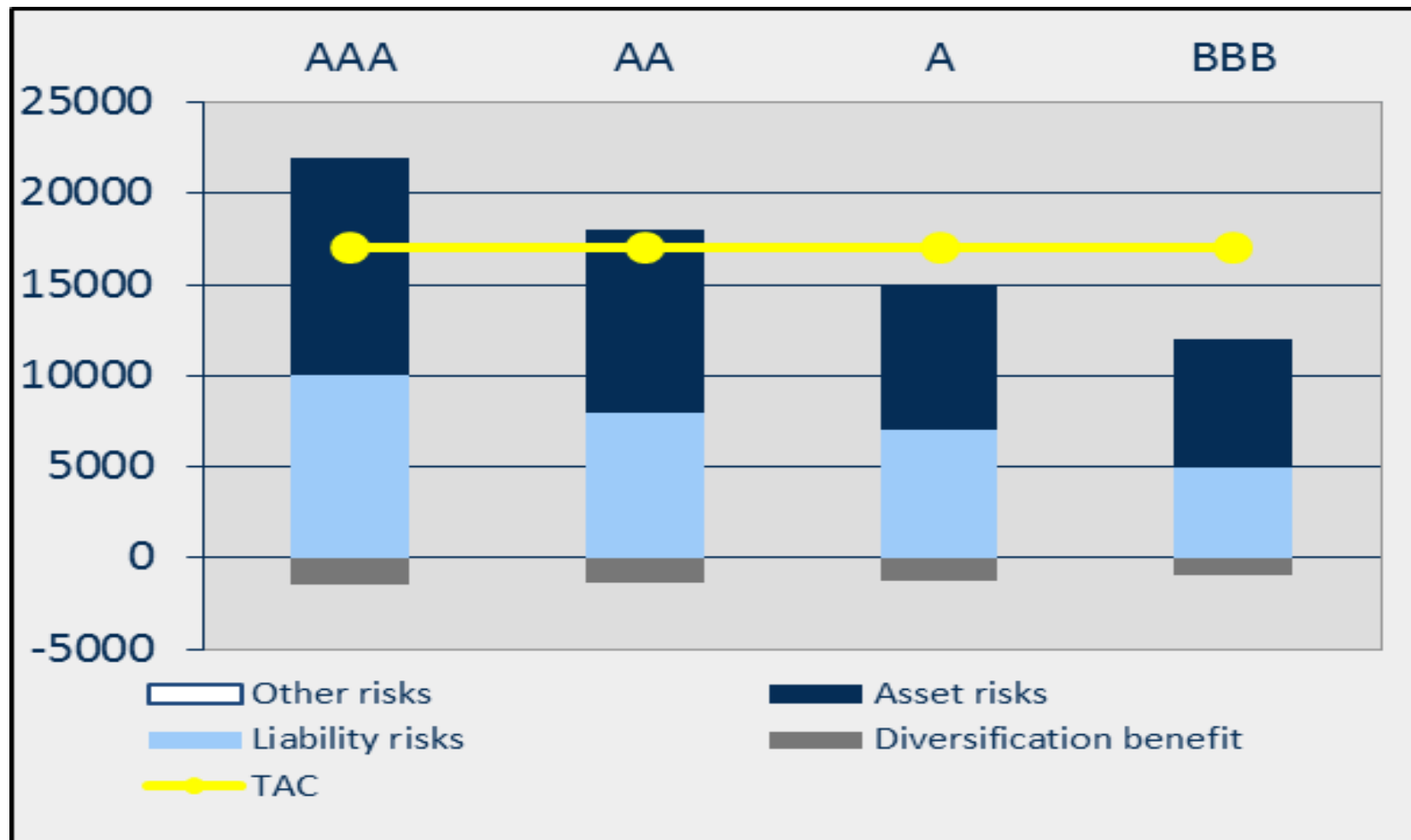
Risk appetite = Amount and type of risk that an organization is prepared to pursue, retain or take = desired risk profile(s)

Risk tolerance = Largest amounts in individual types of risks which an organization can afford to take = acceptable most adverse risk profile(s)

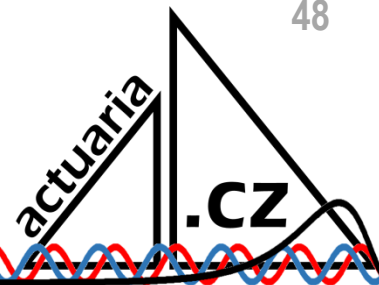


- ▲ Definice po jednotlivých rizicích i přes celkový rizikový kapitál firmy
 - Omezení na úrovni vstupu rizik – úpis, správce aktiv
 - Omezení na agregovanějších úrovních
- ▲ Segmentace záleží na uvážení firmy – může jít do jednotlivých produktů, divizí, regionů...
- ▲ Časový horizont – měření, revidování
- ▲ Eskalační proces při porušení

Rizikový apetit od ratingu firmy

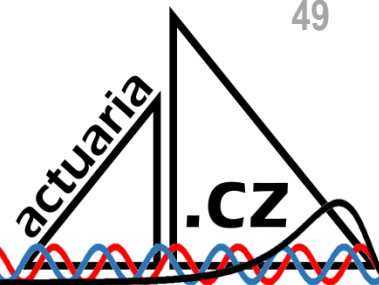


Snižování akceptovaného rizika



- ▲ Sladění aktivní a pasivní strany
(ALM - Asset Liability Management)
 - ▲ Dopad zejm. na investiční rizika (úrokové, cizoměnové, tržní)
 - ▲ Zohlednění investičního pojištění
 - ▲ Při výpočtu rizikového kapitálu musím brát v úvahu aktivní i pasivní stranu zároveň a používat konzistentní předpoklady
 - ▲ U dlouhodobých pojistných závazků problém s dostupností příslušných finančních instrumentů na trhu

Snižování akceptovaného rizika

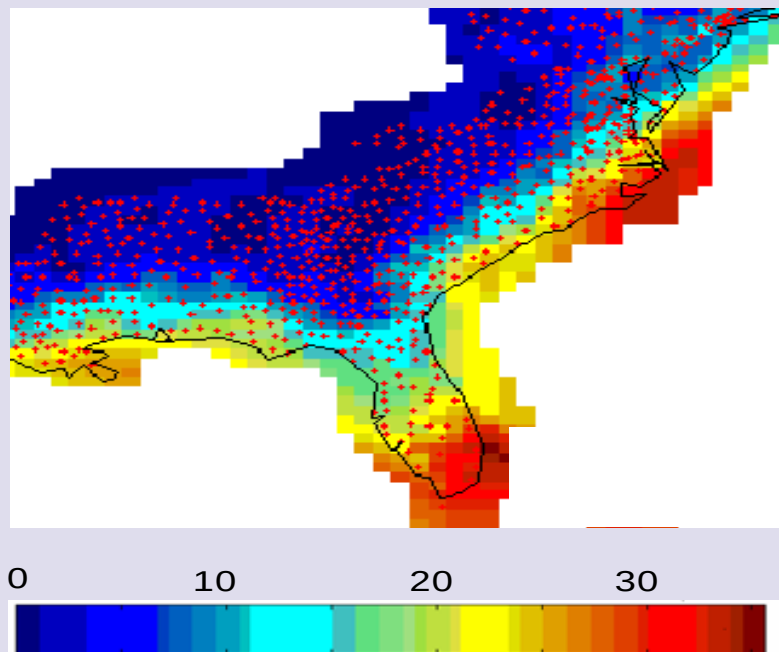


▲ Diversifikace

- ▲ Regionálně – mapa upsaných rizik v rámci jedné země nebo na úrovni skupiny mezi jednotlivými zeměmi
- ▲ Mezi riziky – pojišťování protichůdných rizik, typicky v životním pojištění (důchodové versus rizikové pojistky)

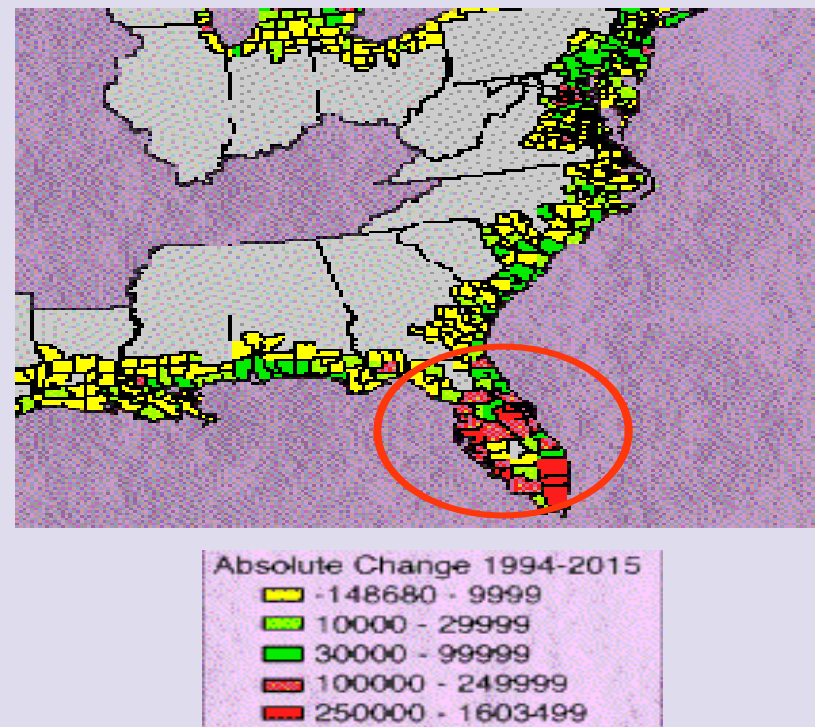
Rostoucí koncentrace majetku

Observed Hurricanes in the US in the last 110 years



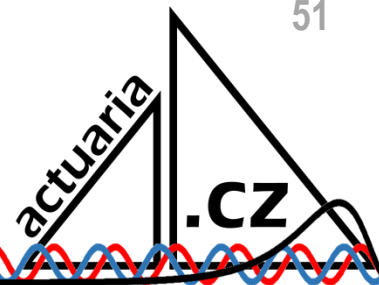
Source: Swiss Re's Nat Cat team

Projected population change 1994-2015



Source: National Oceanic and Atmospheric Administration (NOAA).

Snižování akceptovaného rizika

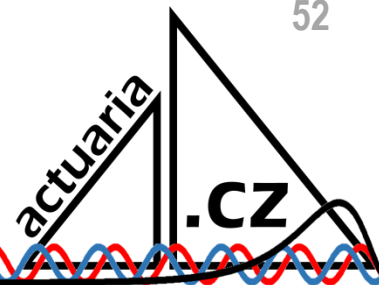


▲ Odprodej rizika

- ▲ Zajištění upisovacích rizik (soupojištění, zajištění u externího subjektu nebo interní/kaptivní zajišťovny)
- ▲ Umístění pojistného rizika na finančních trzích (katastrofické bondy, úmrtnostní deriváty, ...) – stále omezené možnosti
- ▲ Redukce investičních rizik – deriváty snižující kreditní, cizoměnové, úrokové riziko

! *Pozor na přelévání rizik – zajištěním upisovacího rizika mi vznikne kreditní riziko té zajišťovny, zakoupením derivátu také a ještě mám cenu toho zajištění – nutné vyhodnocovat !*

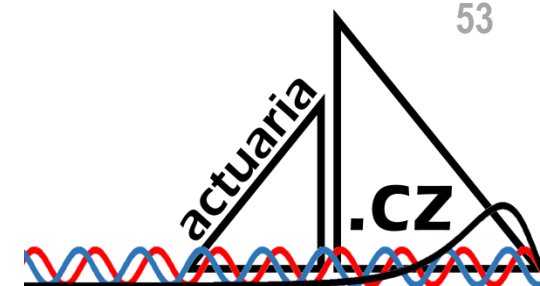
Snižování akceptovaného rizika



- ▲ Práce s rizikem – interní opatření
 - ▲ Snížení limitů pro upisovatele, dopad do cenotvorby produktů
 - ▲ Limity pro asset managery na jednotlivá rizika a portfolio jako celek
 - ▲ Účinné u operačních rizik

Capital management toolbox

53



Areas of Capital Management

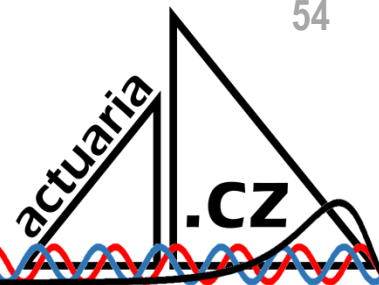
Financial/ actuarial	Business management	Investment	Reinsurance	Capital solutions	Business reorganisation
-------------------------	------------------------	------------	-------------	----------------------	----------------------------

Review models for prudence	Product redesign/ repricing	Asset portfolio redesign/ restructure	Reinsurance optimisation	Equity raising	Discontinue/ run-off certain lines of business
Review actuarial reserves/DAC for prudence	In-force management	Cashflow/duration matching	Internal reinsurance	Debt structuring	Reorganisation of corporate legal structures
Accounting and tax optimisation	Ongoing business volume/mix management	Derivatives/static/ dynamic hedging	Risk transfer/ external reinsurance	Contingent capital	Redomiciling/ branch structures
Regulatory arbitrage	Underwriting and claims management	Credit	Financial reinsurance	Sidecars or equivalent	Internal captives/ resources
Inter-group arrangements	Expense management and outsourcing	Alternative Investments	Securitization	Other (non- reinsurance) internal transactions	Purchase/sale of business/blocks of business

Possible Capital Management Actions

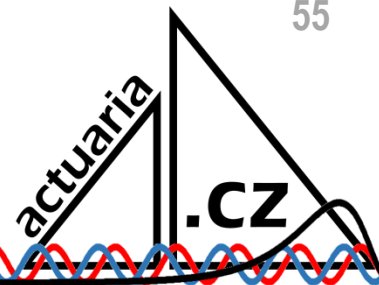
Increasing Time — Costs — Complexity

Překročení limitů – příklad



- ▲ Překročen kreditní limit týkající se konkrétní protistrany
 - Okamžité zrušení pozice
 - Dočasná výjimka
 - Snížení jiné kreditní expozice tak, aby celkový rizikový kapitál zůstal stejný
 - Trvalá změna limitu

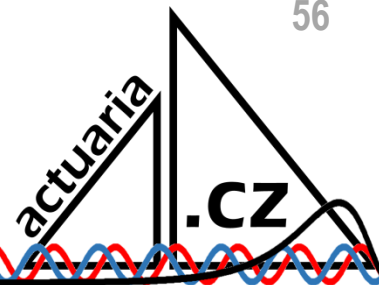
Překročení limitů – příklad



- ▲ Životní upisovací riziko trvale narůstá, blíží se k hranici mého rizikového apetitu
 - ▲ Špatná selekce kmene (antiselekce)
 - ▲ Indikuje trend v demografii?
 - ▲ Chyba modelu?
 - ▲ Špatné cenování produktu / počáteční předpoklady?

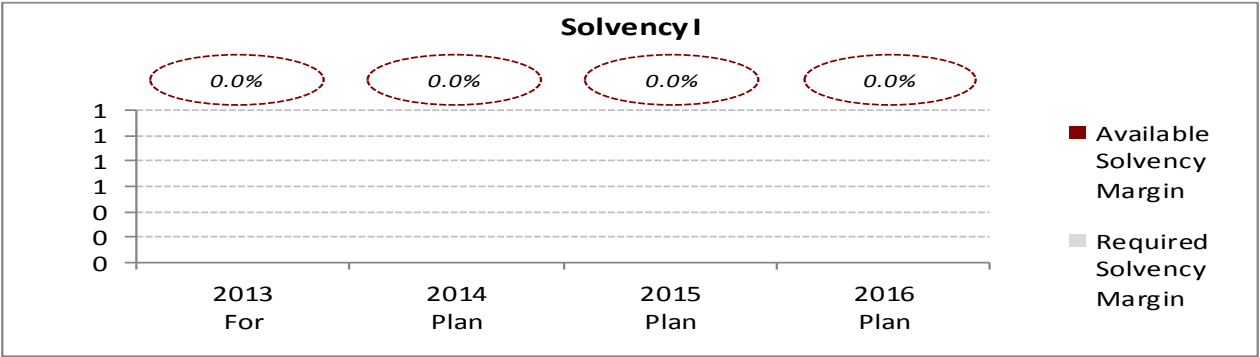
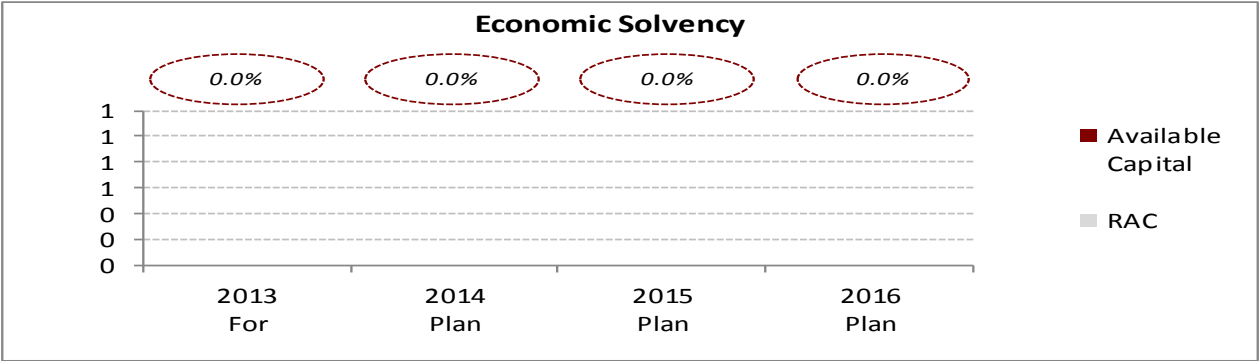
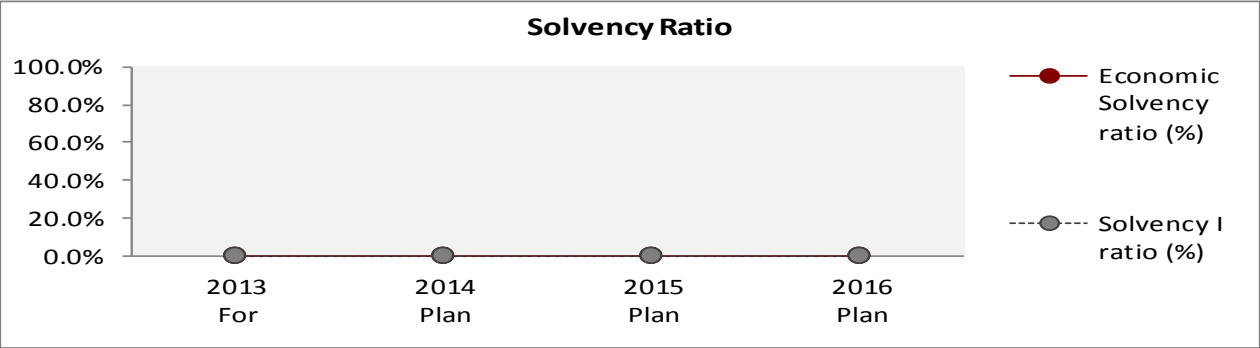
Projekce rizikového kapitálu

56



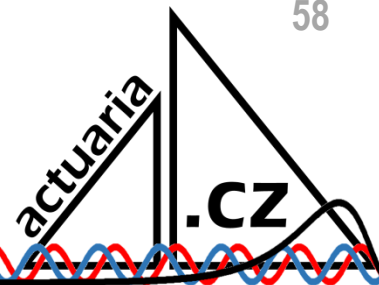
- ▲ Nejobvyklejší na tři roky
- ▲ Musí být provázáno s obchodním plánem
- ▲ Top management cíluje solventnostní poměr a výši rizikového kapitálu
 - ▲ V jaké granularitě?
 - ▲ Volatilita výpočtů?
- ▲ Zjednodušené odhady (výpočetní přístupy) při výpočtu v obdobích mezi kalkulacemi celého modelu

€ Mln	2013 For	2014 Plan	2015 Plan	2016 Plan	CAGR 13-16
1st. Company					
Available Capital (after Dividend)					n.a.
of which PVFP Life /Reserve Adequacy P&C					n.a.
of which Subordinated Debt					n.a.
of which Dividend					n.a.
Risk Adjusted Capital detail:					
Equity					n.a.
Property					n.a.
Interest Rate - PC1 movement					n.a.
Interest Rate - PC2 movement					n.a.
Interest Rate - PC3 movement					n.a.
Implied Volatility risk - Equity					n.a.
Implied Volatility risk - Interest Rate					n.a.
Credit					n.a.
Concentration					n.a.
Currency					n.a.
Life UW - Mortality CAT					n.a.
Life UW - Mortality Trend/Uncertainty					n.a.
Life UW - Longevity					n.a.
Life UW - Morbidity / Disability					n.a.
Life UW - Lapse					n.a.
Life UW - Expenses					n.a.
Non Life UW - Pricing (no CAT)					n.a.
Non Life UW - CAT					n.a.
Non Life UW - Reserve					n.a.
Operational					n.a.
Diversification benefit (value)					n.a.
Non Linearity & Non Additivity adjustment					n.a.
Tax absorption after recoverability assessment					n.a.
Risk Adjusted Capital (RAC)					n.a.
Economic Solvency ratio (%)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	n.a.
Available Solvency Margin after dividend					n.a.
Required Solvency Margin					n.a.
Solvency I ratio (%)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	n.a.



Řízení rizik v podnikové struktuře

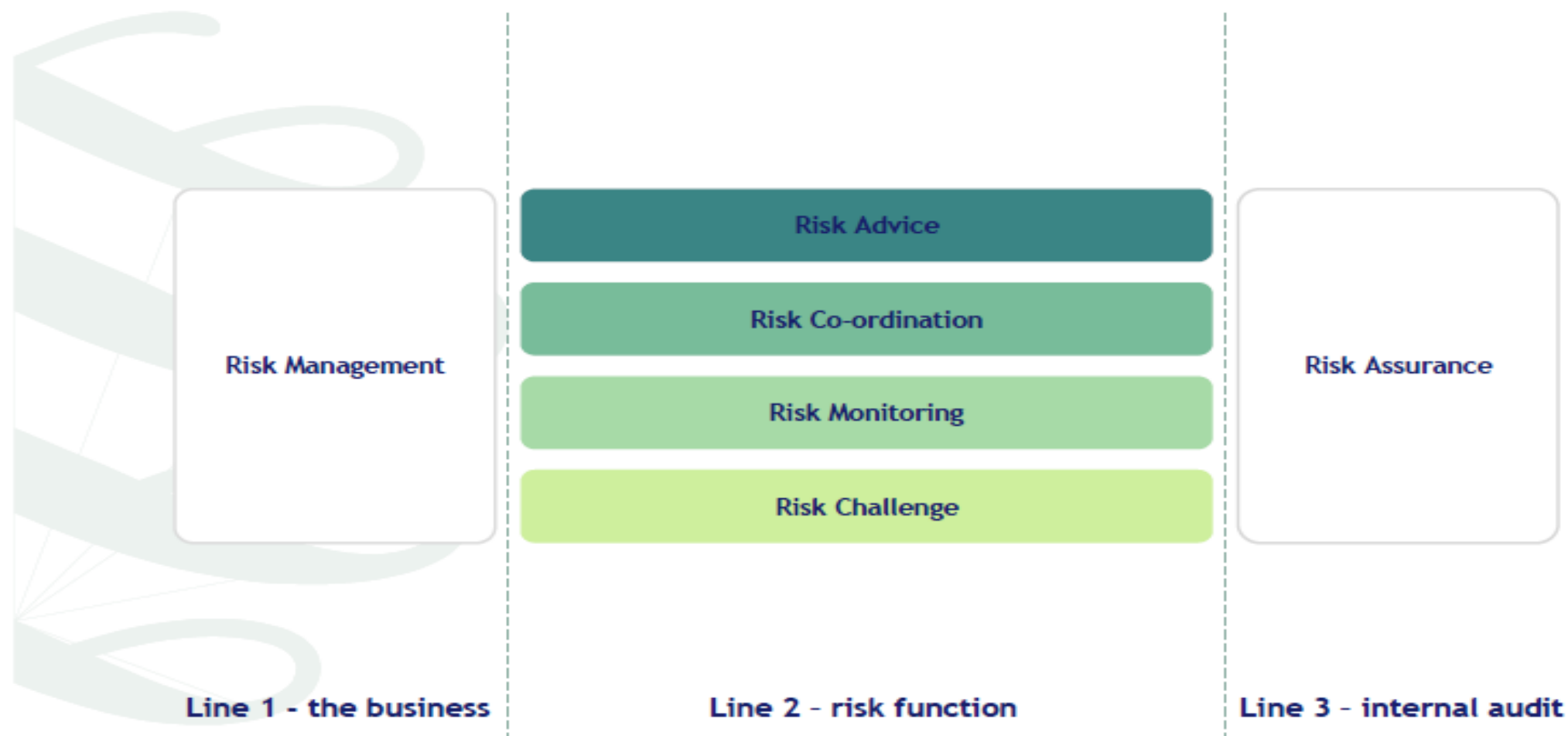
58



„Risk culture“

- ▲ Řízení rizik se týká celé firmy, nejen oddělení risk managementu
- ▲ Rizikový apetit se musí propsat až do „první linie“ a musí být srozumitelný a jednoduše aplikovatelný
- ▲ Top management by měl považovat informace z risk managementu za užitečné a žádat si je, tj. úlohou risk managementu je, mu je v takové formě předkládat

Designing the CRO mandate



Line of defense

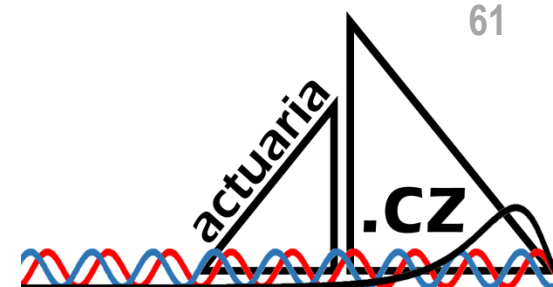
Risk

1. Units carrying out **Trade activities**
Risk environment, lot of checking.
Acceptance and daily risk management.
Managerial and internal controls.
2. Units carrying out **Controlling activities**
Risk management, compliance
Strategic management, methodologies, supervision.
Financial controls, monitoring, ...
3. Units carrying out **Securing activities**
internal audit
Independent assessment and securing
of proper functioning of the company
and its lines of defense.

Board,
Risk management committee,
Audit committee ...

Our research shows insurers understand the role risk culture plays in contributing to ERM

61



How important is each of the following aspects in your ultimate/end-state vision for your ERM programme?



Eighth Biennial Global Enterprise Risk Management Survey 2015

Komunikace!!!



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Děkuji za pozornost!

jana.zelinkova@ceskapojistovna.cz

