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ORDINE NAZIONALE DEGLI ATTUARI

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Tax model and loss absorption capacity under Solvency II

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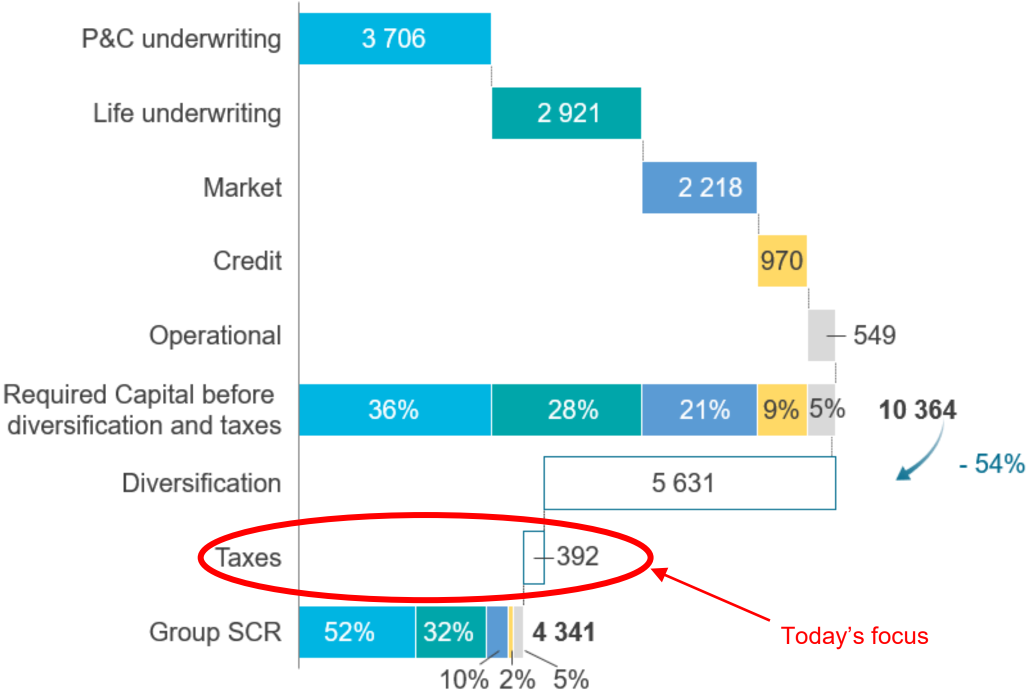
“In this world nothing can be said to be certain …

… except death and taxes”

Benjamin Franklin

SCOR's balanced risk portfolio benefits from excellent diversification

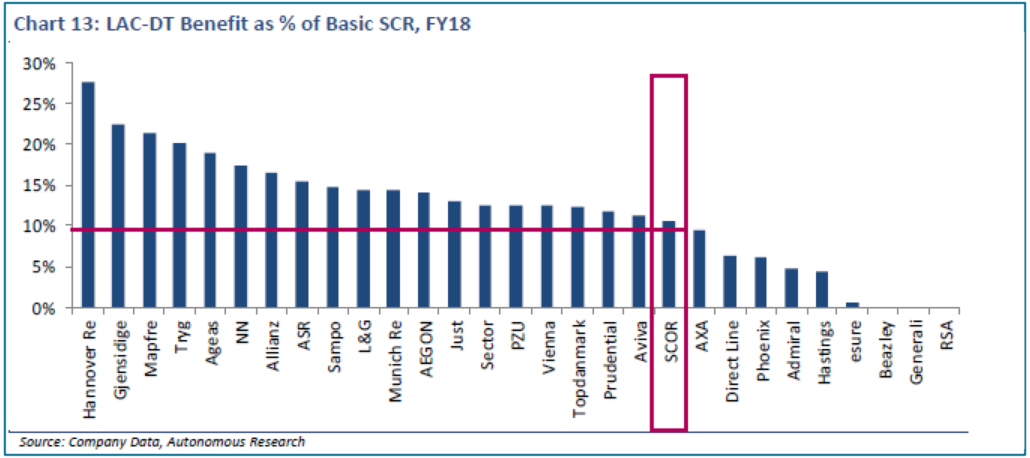
H1 2021 risk capital breakdown by risk category (in EUR millions, rounded)



- SCOR requires capital mainly for underwriting risks
- Recent Life in-force transaction reduces Life contribution to SCR
- SCOR's balanced P&C and Life portfolio and strong business model ensure a very strong diversification benefit

Note: Figures on this slide have not been audited

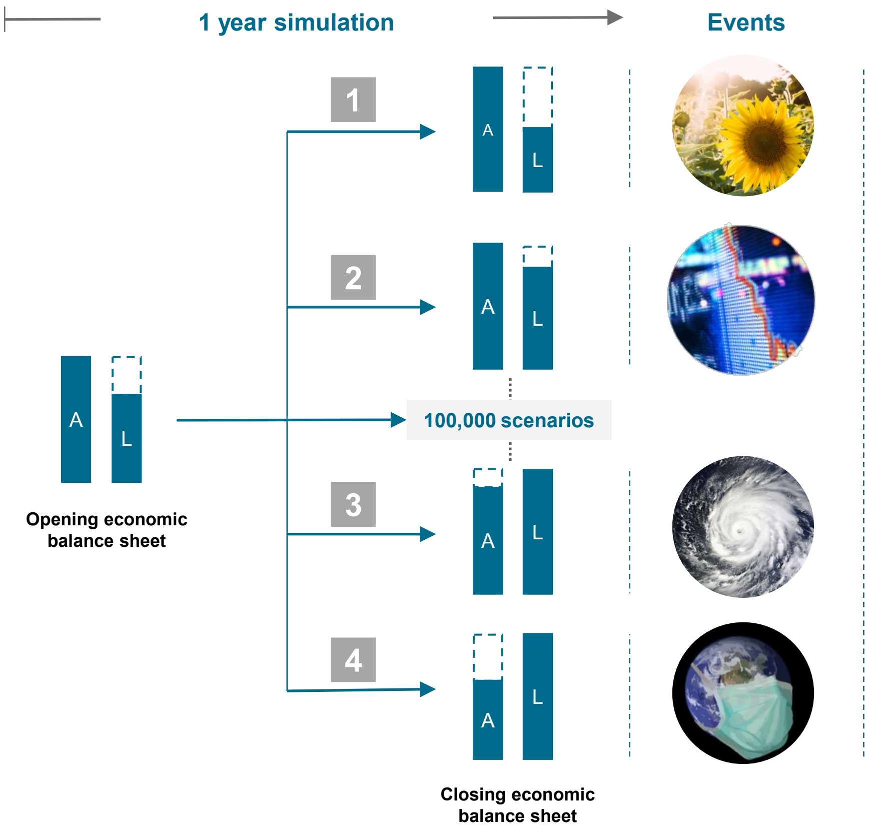
Loss absorbing capacity of deferred taxes in Solvency 2

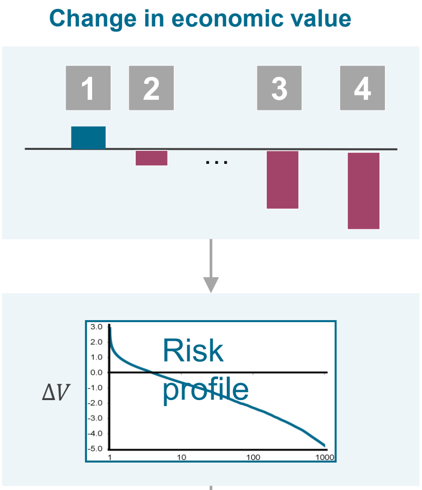


- Companies publish under Solvency II a wide range of tax impacts on their solvency capital requirement
- This is driven by four factors:
  1) Tax law under which the companies operate
  2) Individual risk situation of the companies
  3) Different tax models and the corresponding parameterizations
  4) Non convergence of supervisory practice

Source: Autonomous, 29 July 2019, pp 10-11

“Classical” stochastic internal model





We assume that ΔV is the pre-Tax change in economic value distribution and $\Delta\hat{V}$ post-tax change in economic value distribution

What is the function f_{tax} that transforms ΔV to $\Delta\hat{V}$?

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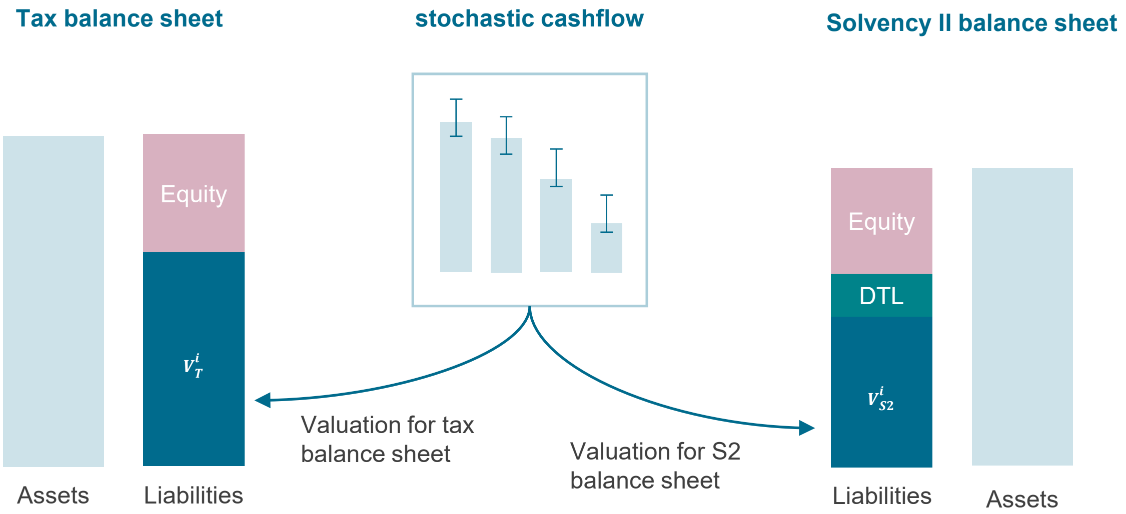
What do we need to consider in a tax model?
Difference in valuation and profit earnings lead to DTL

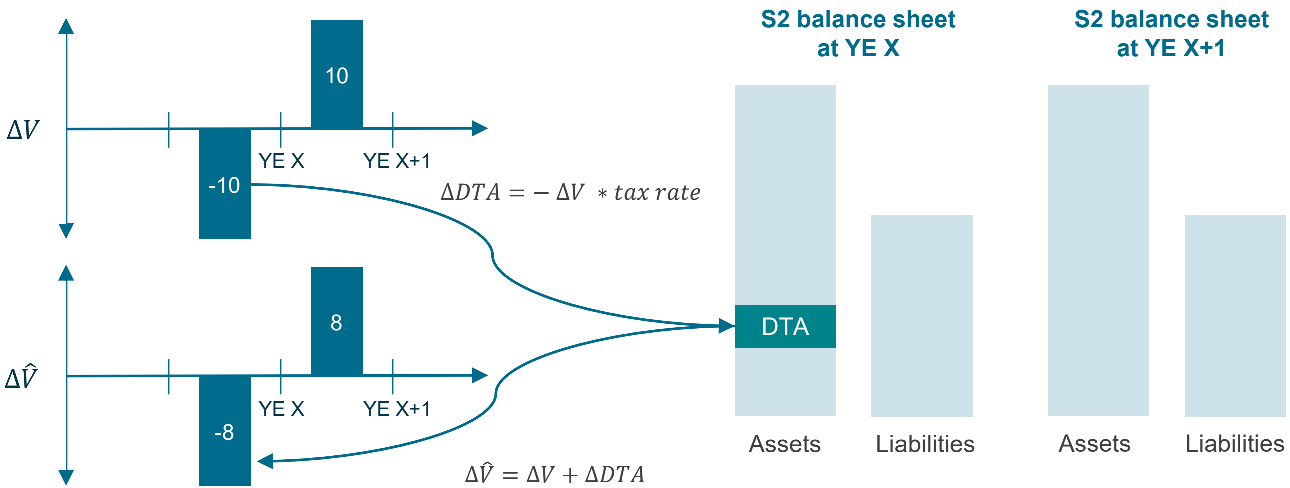


Timing difference in profit recognition in the different valuation schemes lead to a deferred tax liability (DTL)

$$DTL = tax\ rate\ * (V_{S2} - V_T)$$

This is usually used to calculate the Own Funds under Solvency 2. To incorporate this in a stochastic model one needs to project not only the S2 balance sheet but also a tax balance sheet since the «state of the world» at t=1 acts differently on the different balance sheets

What do we need to consider in a tax model?
Tax losses can be used to offset taxable profits



If a company makes a loss in a financial year, it is entitled to use that loss in order to lower its taxable income in the following years. This "compensation" right has a value and needs to be reflected as a deferred tax asset (DTA) on the balance sheet

This asset can be created depending on:

- when the loss occurs, tax law can limit the numbers of years that losses can be carried forward
- the existence of "more likely than not" future profits

These factors determines also if pre-existing DTA can be kept or must be written-off (recoverability test)

Tax-Rate is assumed to be 20%

Several factors can impact the post-tax results in an internal model

Did the company registered already losses in the past / does it has already DTA?

Computed for each simulated scenario

The higher, the more DTA can be created and sustained

$$f_{tax} = (\Delta V,\ \text{initial S2 balance sheet, tax rate,}$$

$$\text{expected future profits, carry}-\text{forward horizon, …)}$$

The company must provide evidence that it will record sufficient profits in the future to abosrb the tax credit

The numbers of years the fiscal losses can be carried forward to reduce future tax profits – it varies by country

Examples

B C A

	0	1	2	3	4	5
ΔV		10	10	10		
$loss_1$	0					
$loss_2$	0					
$loss_3$	0					
DTA	0					
ΔDTA						
$Tax\ Paid$						
$\Delta\hat{V}$						

Tax-Rate is assumed to be 20%

Median “expected” profits

Example 1 - Startup, making profits

	0	1	2	3	4	5
ΔV		10	10	10	10	
$loss_1$	0	0				
$loss_2$	0	0				
$loss_3$	0	0				
DTA	0	0				
ΔDTA		0				
$Tax\ Paid$		-2				
$\Delta\hat{V}$		8				

Tax-Rate is assumed to be 20%

Median "expected" profits

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Example 2 - Startup, making a loss - no future profits

	0	1	2	3	4	5
ΔV		-10	0	0	0	
$loss_1$	0	-10				
$loss_2$	0	0				
$loss_3$	0	0				
DTA	0	0				
ΔDTA		0				
$Tax\ Paid$		0				
$\Delta\hat{V}$		-10				

It allows for up to 10 * 20% = 2 DTA

Tax-Rate is assumed to be 20%

Median "expected" profits

Example 2 - Startup, making a loss - “not enough” future profits

	0	1	2	3	4	5
ΔV		-10	2	2	2	
$loss_1$	0	-10				
$loss_2$	0	0				
$loss_3$	0	0				
DTA	0	1.2				
ΔDTA		1.2				
$Tax\ Paid$		0				
$\Delta\hat{V}$		-8.8				

It allows for up to 10 * 20% = 2 DTA

= future profits * tax rate = (2+2+2) * 20%

Tax-Rate is assumed to be 20%

Median “expected” profits

Example 2 - Startup, making a loss - “enough” future profits

	0	1	2	3	4	5
ΔV		-10	10	10	10	
$loss_1$	0	-10				
$loss_2$	0	0				
$loss_3$	0	0				
DTA	0	2				
ΔDTA		2				
$Tax\ Paid$		0				
$\Delta \hat{V}$		-8				

Tax-Rate is assumed to be 20%

Median “expected” profits

Example 4 - Startup, making a loss then a profit - “enough” future profits

	0	1	2	3	4	5
ΔV		-10	$\boxed{5}$	10	10	10
$loss_1$	0	$\boxed{-10}$	0			
$loss_2$	0	0	$\boxed{-5}$			
$loss_3$	0	0	0			
DTA	0	2	1			
ΔDTA		2	-1			
$Tax\ Paid$		0	0			
$\Delta\hat{V}$		-8	4			

Tax-Rate is assumed to be 20%

Median “expected” profits

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Example 5 - Running company – existing DTA is written-off

	t-1	t	t+1	t+2	t+3
ΔV		-15 (B)	0	0	0 (C)
$loss_1$	-10	-15			
$loss_2$	-10	-10			
$loss_3$	-10	-10			
DTA	6 (A)	0			
ΔDTA		-6			
$Tax\ Paid$		0			
$\Delta \hat{V}$		-21			

Tax-Rate is assumed to be 20%

Median “expected” profits

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Conclusions

1	Taxes are an important economic reality under Solvency II → a full internal model should include a tax module to capture the main tax effects
2	Different tax regimes applied in different countries influence the SCR of the various entities and thus the Group solvency ratio
3	The specific company situation (e.g. past losses, future expected profits from existing and new business) influences heavily how taxes will impact the SCR

SCOR has already supervised two master thesis jointly with ETH Zürich (Prof. M. Wüthrich) on this topic:

- *Tax modeling in an internal Solvency model*, S.A. Gubler, 2019
- *Tax modelling in the Solvency II context*, C. Longhitano, 2018

Q&A

Thank you for your attention !

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