

# Balloon Insurance

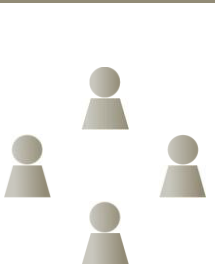


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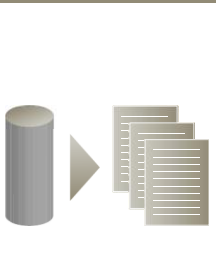




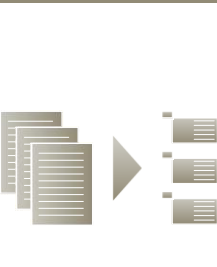
Modeling



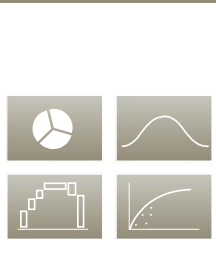
Data requirements



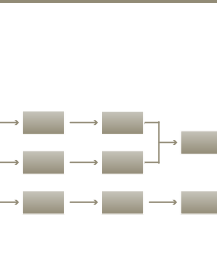
Data and Calibration



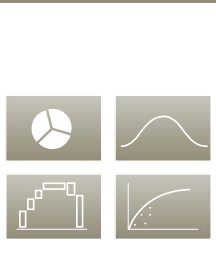
Gross evaluation

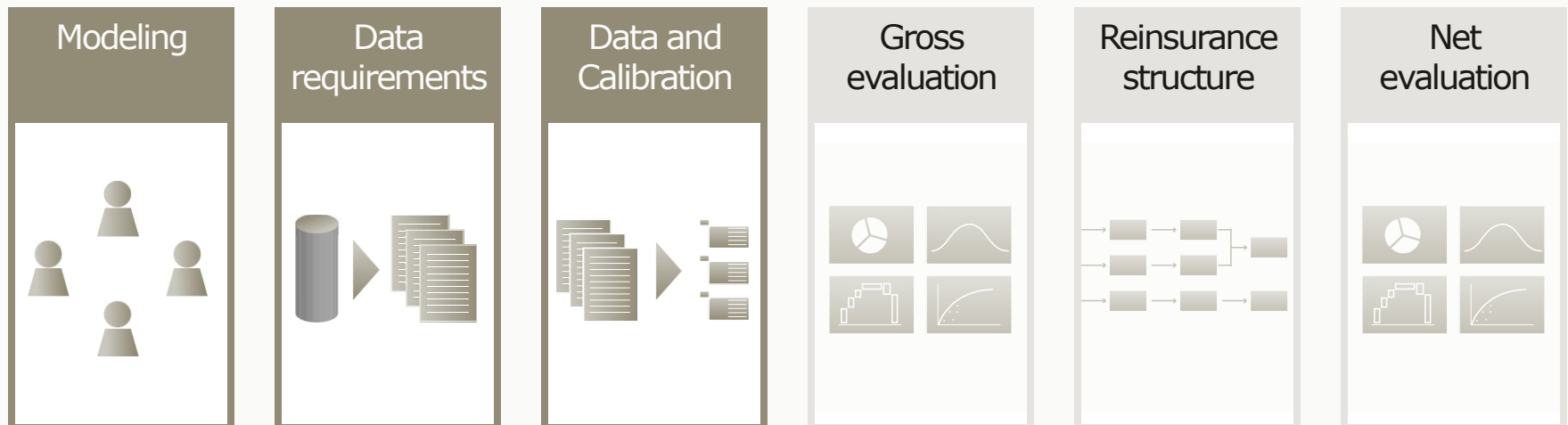


Reinsurance structure



Net evaluation





Identify relevant LoBs/perils and determine correct parameters

## LoBs of the current reinsurance programme

- Motor Third Party Liability (Premium: € 10 m)
  - Attritional Loss
  - Large Loss
- Property (Premium: € 5 m)
  - Attritional Loss
  - Large Loss
  - Cat Loss

# Data and Calibration

## All losses

		MTPL	Prop
Gross premium		10.0	5.0
loss threshold $x_0$		0.3	0.2
<b>Attritional loss (<math>\leq x_0</math>)</b>			
loss ratio distribution		LogNorm	LogNorm
	$\mu$	70.0%	40.0%
	$\sigma$	15.0%	10.0%
<b>Large loss (<math>&gt; x_0</math>)</b>			
frequency distribution		Poisson	Poisson
	$\lambda$	3.0	4.0
severity distribution		Pareto	Pareto
	$\alpha$	2.5	2.1
	Limit	100.0	20.0
<b>Cat loss</b>			
	$x_0$		0.5
frequency distribution			Poisson
	$\lambda$		1.1
severity distribution			PML curve
	Limit		50.0

# Data and Calibration

## Correlations between lines of business

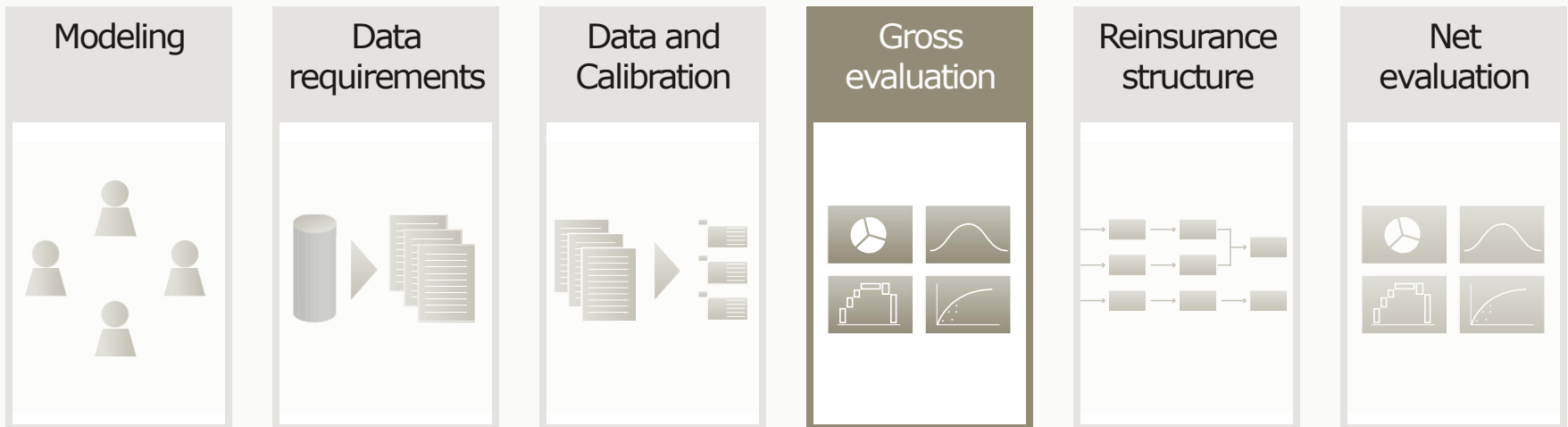


### Correlations matrix

	MTPL	Prop
MTPL	100%	
Prop	25%	100%

Source: European Commission

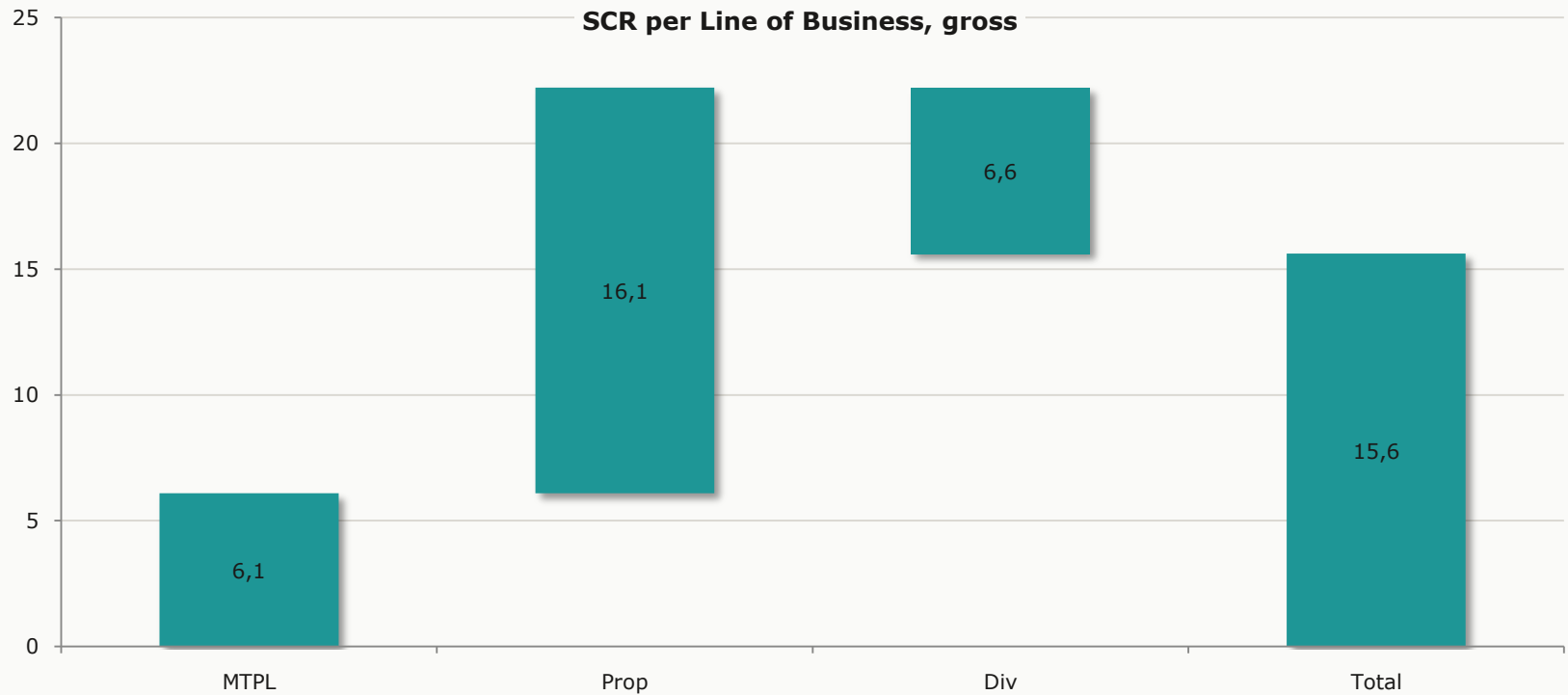
# Fourth step



Identify relevant LoBs/perils and determine correct parameters

# Gross evaluation

## All Lines of Business



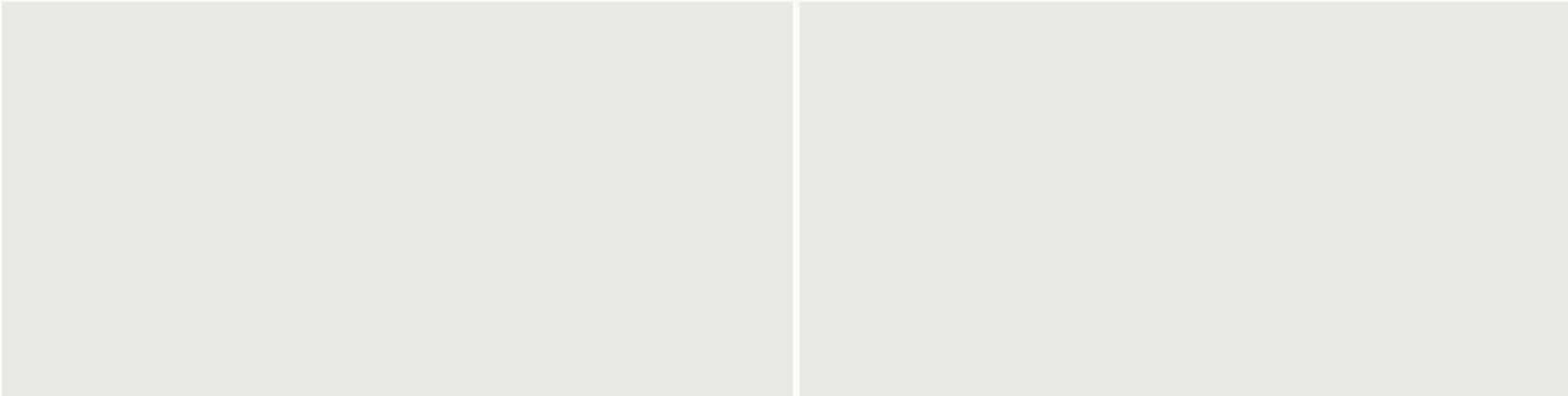
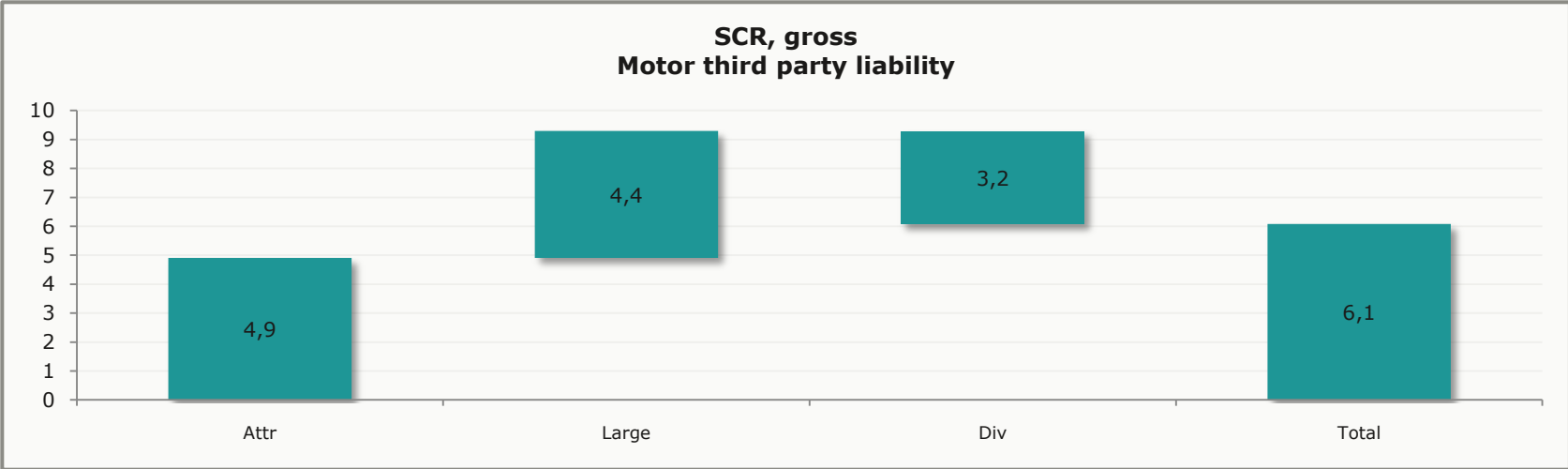
in m€

gross

What to say?

# Gross evaluation

## Motor third party liability

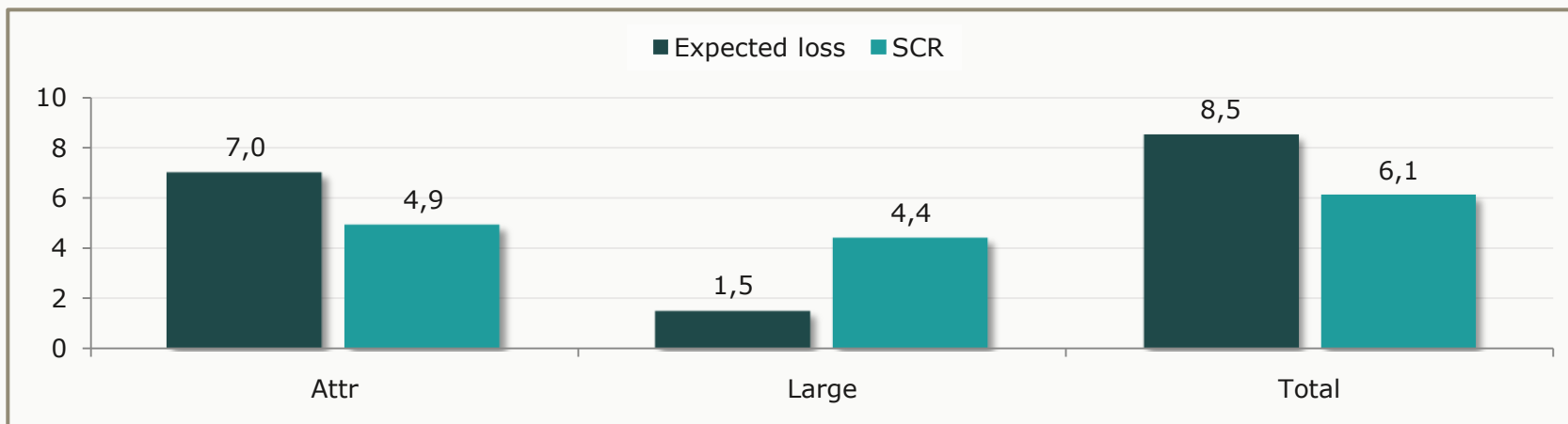


in m€

# Gross evaluation

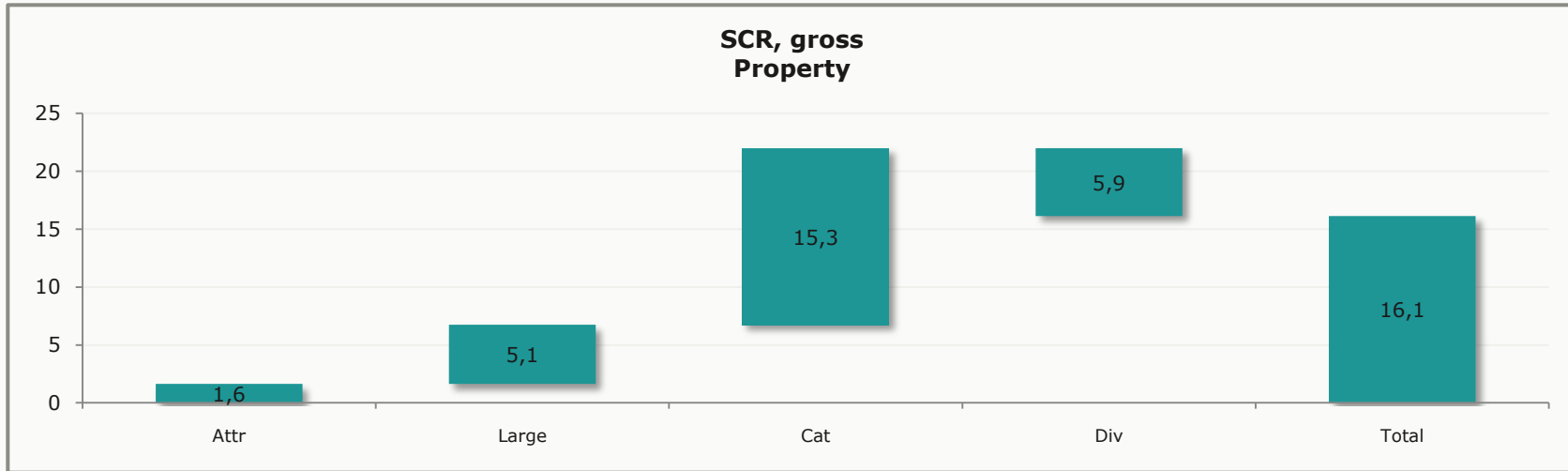
## Motor third party liability

Motor third party liability			
	Expected loss	Standard deviation	SCR
Attritional	7.0	1.5	4.9
Large	1.5	1.1	4.4
Simple sum	<b>8.5</b>	<b>2.6</b>	<b>9.3</b>
Diversification		0.7	3.2
Total	<b>8.5</b>	<b>1.9</b>	<b>6.1</b>



in m€

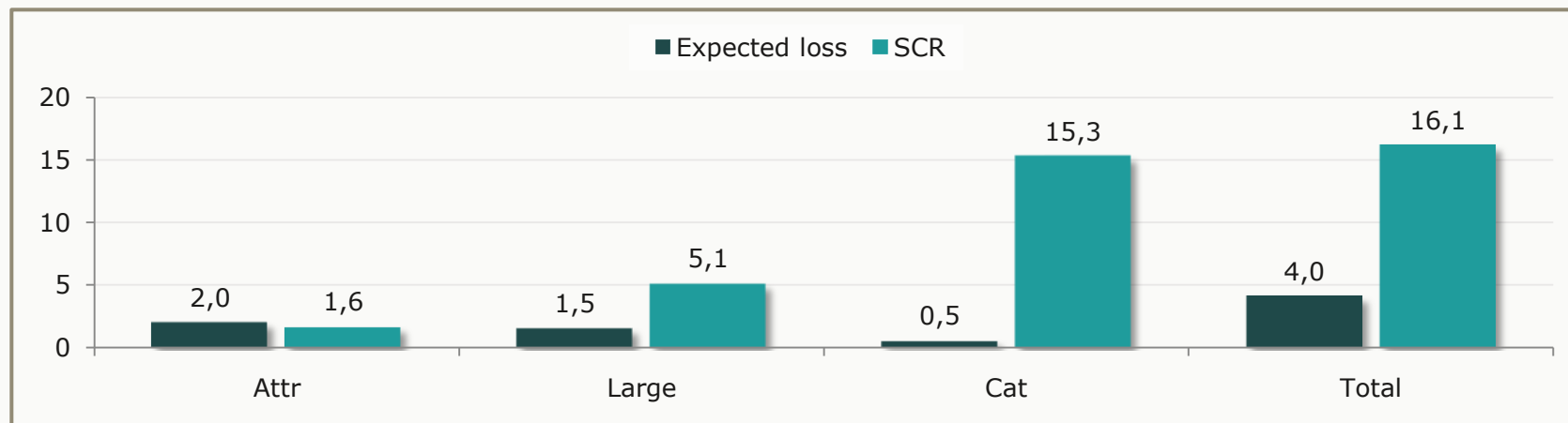
# Gross evaluation Property



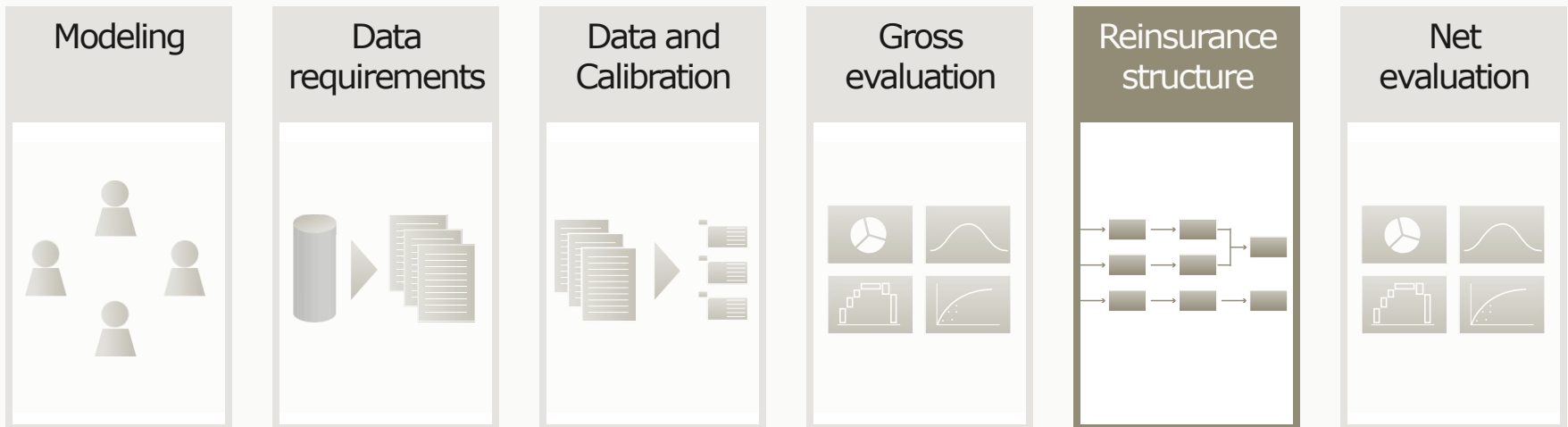
in m€

# Gross evaluation Property

Property			
	Expected loss	Standard deviation	SCR
Attritional	2.0	0.5	1.6
Large	1.5	1.1	5.1
Cat	0.5	2.3	15.3
Simple sum	<b>4.0</b>	<b>3.9</b>	<b>22.0</b>
Diversification		1.3	5.9
Total	<b>4.0</b>	<b>2.6</b>	<b>16.1</b>



in m€



We integrate reinsurance

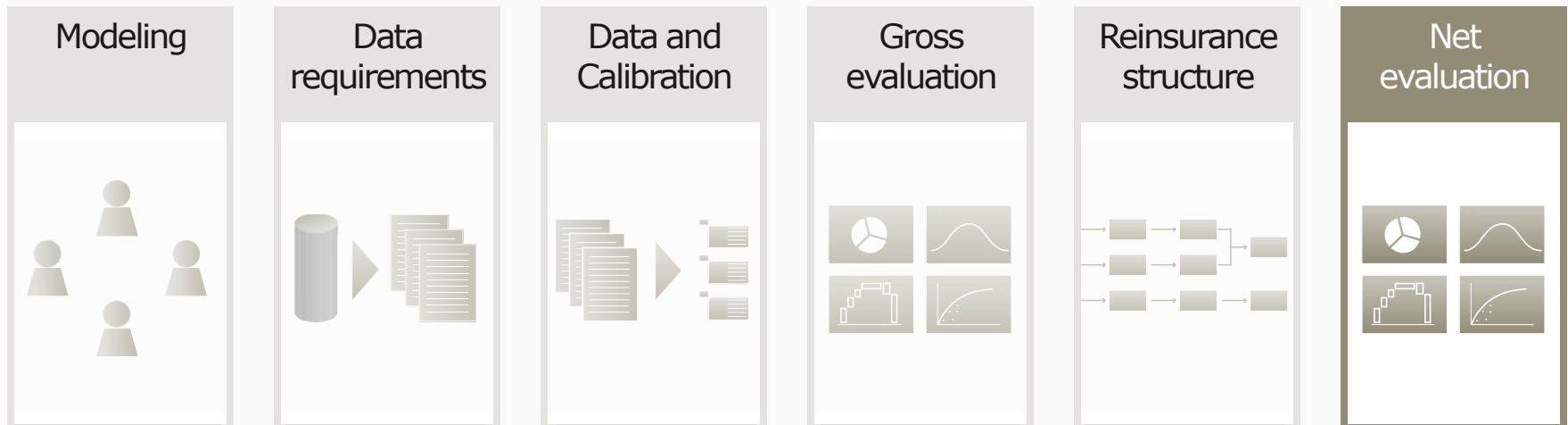
MTPL	Wxl 100 xs 0.5	
Prop	Wxl 20 xs 0.5	→ Cxl 25 xs 1

# Reinsurance programme Details, 2010

MTPL	Wxl 100 xs 0.5
Based on	GNPI
Limit	100.0
Att. Point	0.5
Rate	4.0%
AAL	1,000.0
Reinstatements	unlimited free
Share	100%

Prop	Wxl 20 xs 0.5	→	Cxl 25 xs 1
Based on	GNPI		GNPI
Limit	20.0		25.0
Att. Point	0.5		1.0
Rate	8.0%		12.0%
AAL	40.0		50.0
Reinstatements	1@100%		1@100%
Share	100%		100%

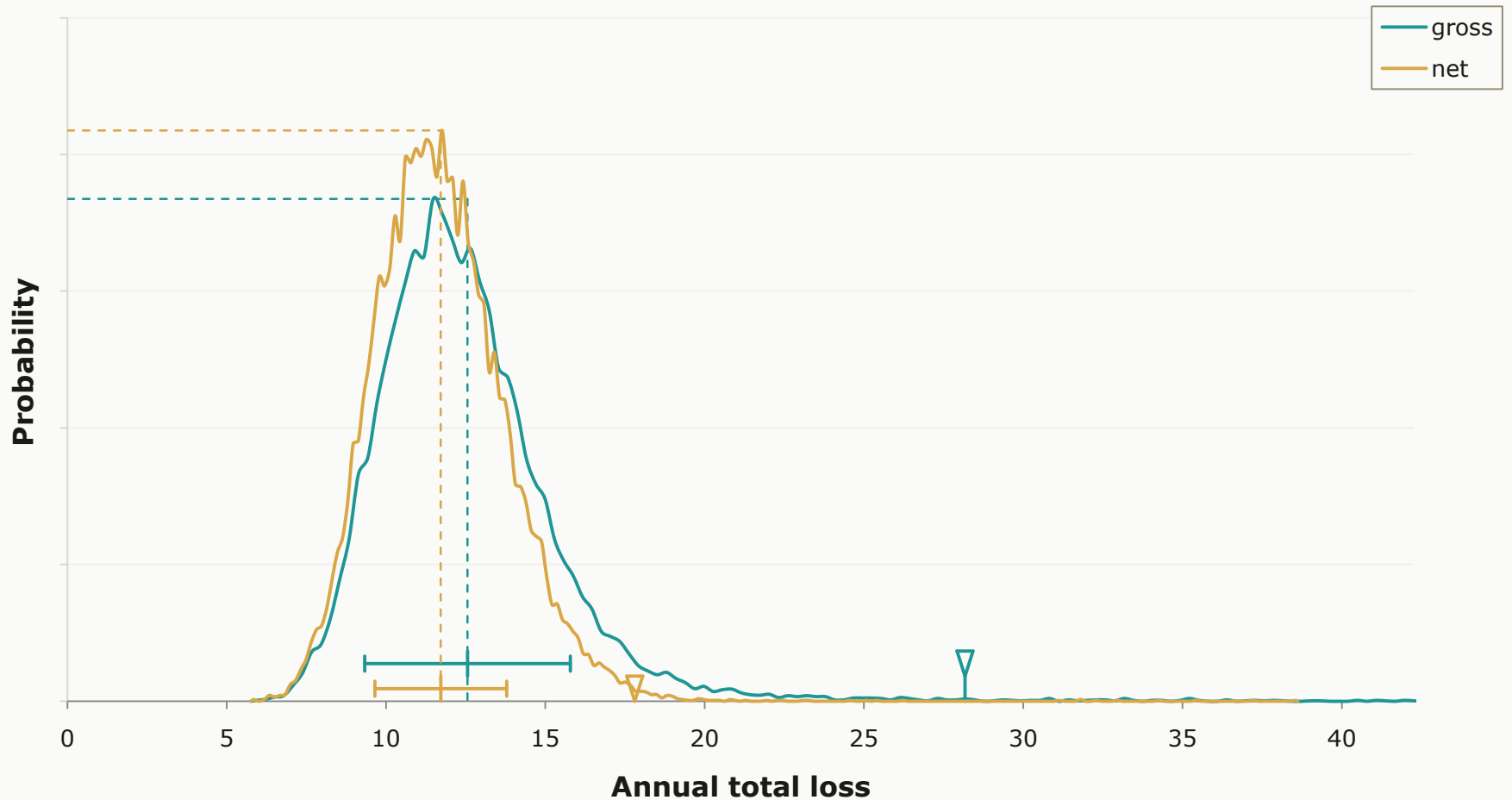
# Sixth step



We integrate reinsurance

# Annual total loss Gross vs net

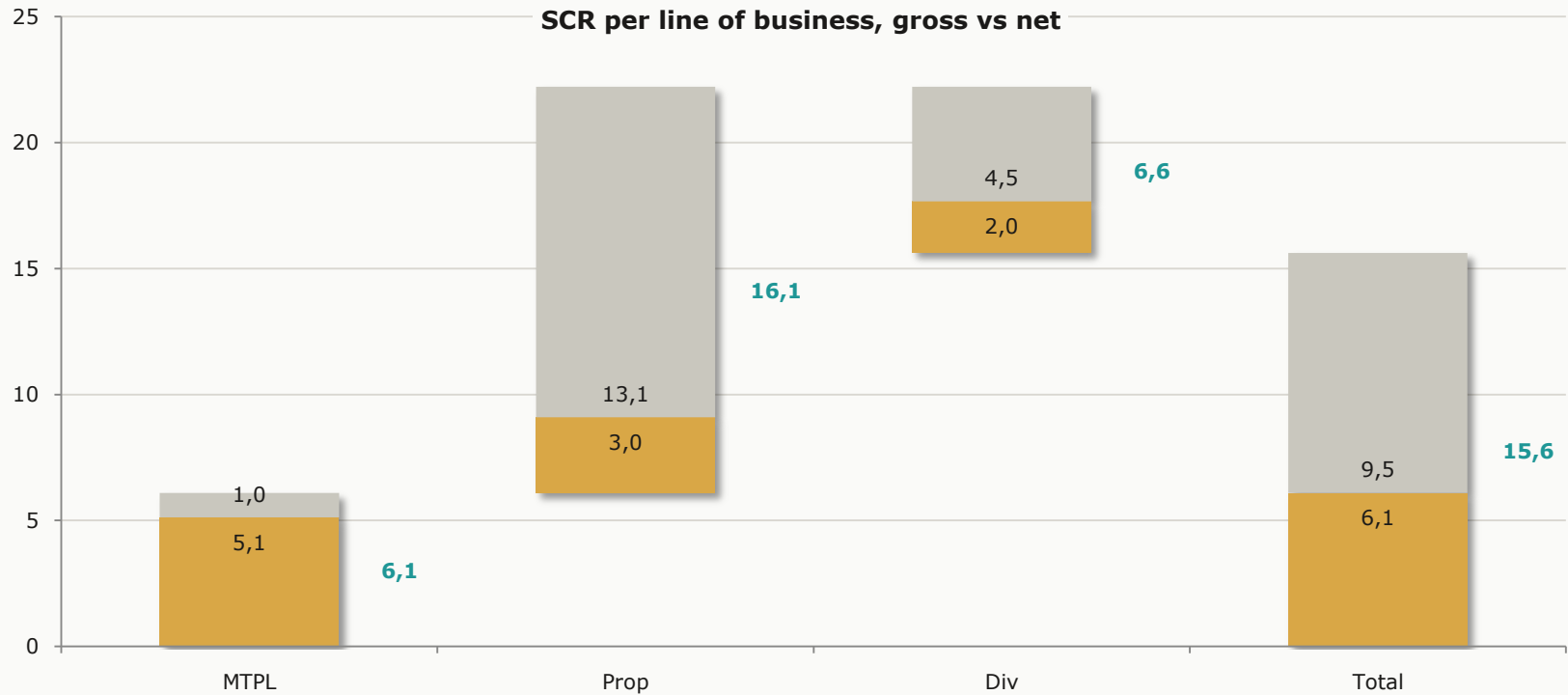
## Balloon: Annual total loss distribution



in m€

# Net evaluation

## All lines of business, gross vs net



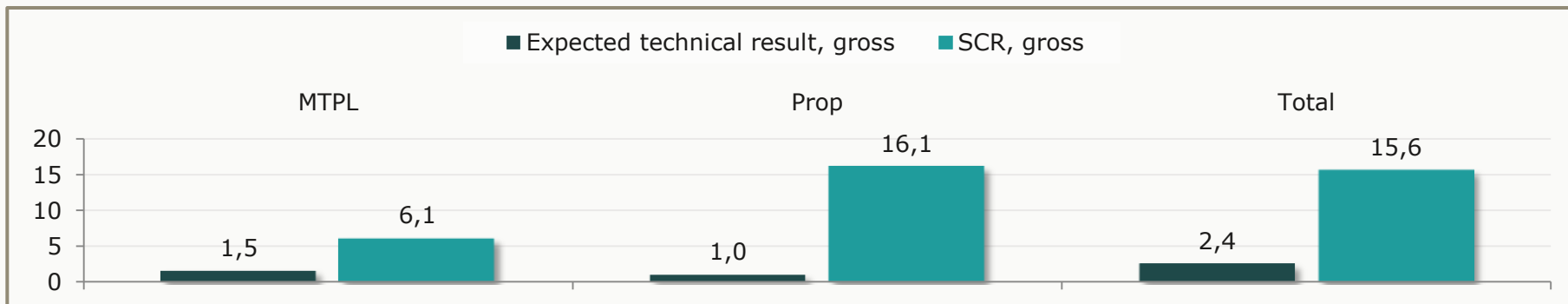
gross = net + ceded

in m€

The effects of reinsurance are made obvious

# Risk measures gross

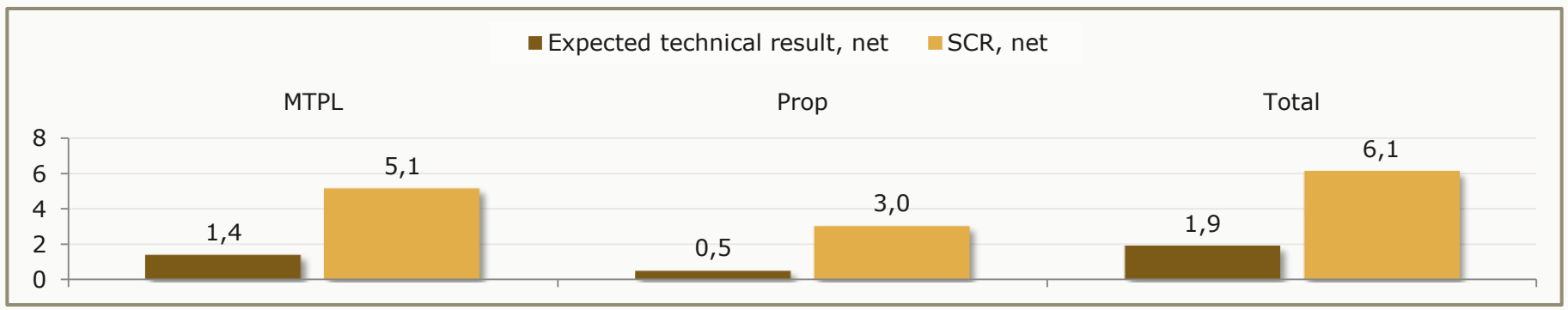
Gross						
	Premium	Expected loss	Expected techn. result	Loss ratio	Standard deviation	SCR
Motor third party liability	10.0	8.5	1.5	85.1%	1.9	6.1
Property	5.0	4.0	1.0	81.0%	2.6	16.1
Simple sum	<b>15.0</b>	<b>12.6</b>	<b>2.4</b>		<b>4.4</b>	<b>22.2</b>
Diversification					1.2	6.6
Total	<b>15.0</b>	<b>12.6</b>	<b>2.4</b>	<b>83.7%</b>	<b>3.2</b>	<b>15.6</b>



in m€

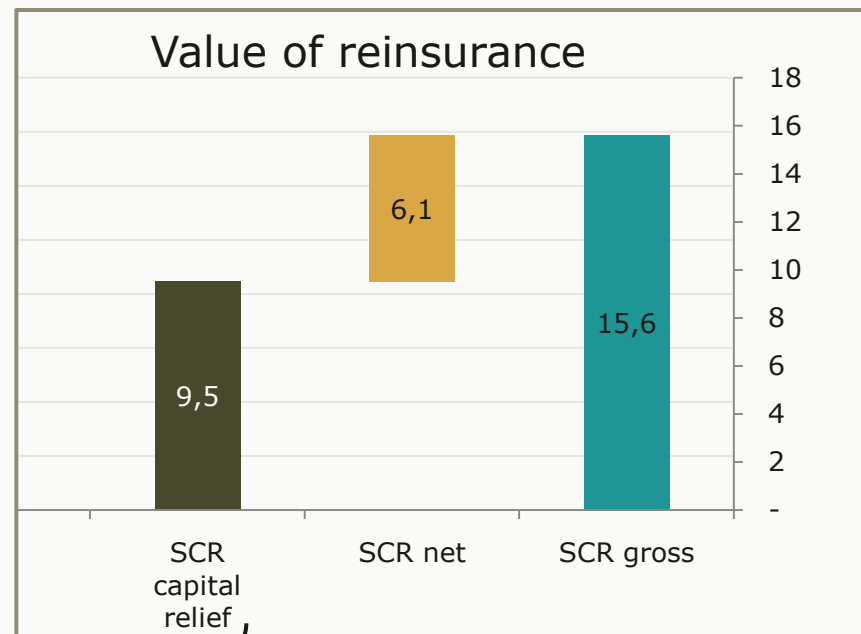
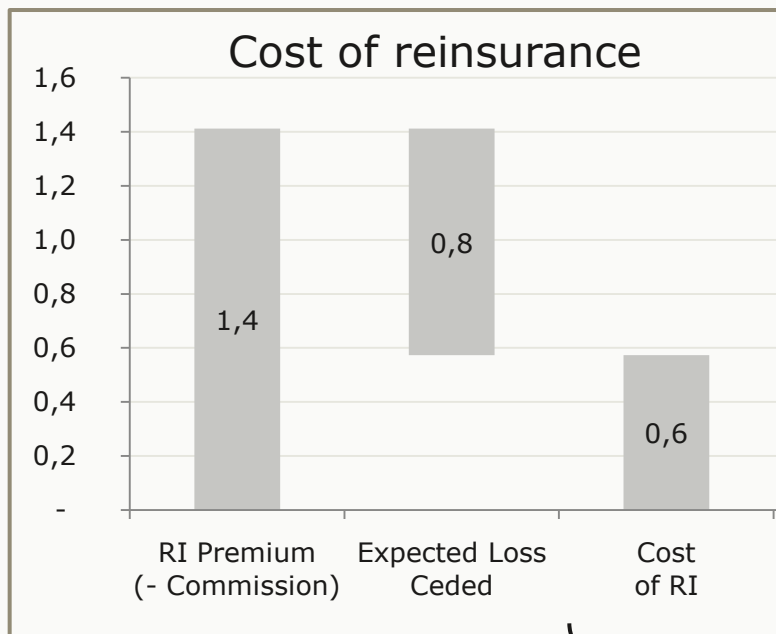
# Risk measures net

Net after RI						
	Premium + RI commission	Expected loss	Expected techn. result	Loss ratio	Standard deviation	SCR
Motor third party liability	9.6	8.2	1.4	85.7%	1.7	5.1
Property	4.0	3.5	0.5	87.6%	1.1	3.0
Simple sum	<b>13.6</b>	<b>11.7</b>	<b>1.9</b>		<b>2.7</b>	<b>8.1</b>
Diversification					0.7	2.0
Total	<b>13.6</b>	<b>11.7</b>	<b>1.9</b>	<b>86.2%</b>	<b>2.1</b>	<b>6.1</b>



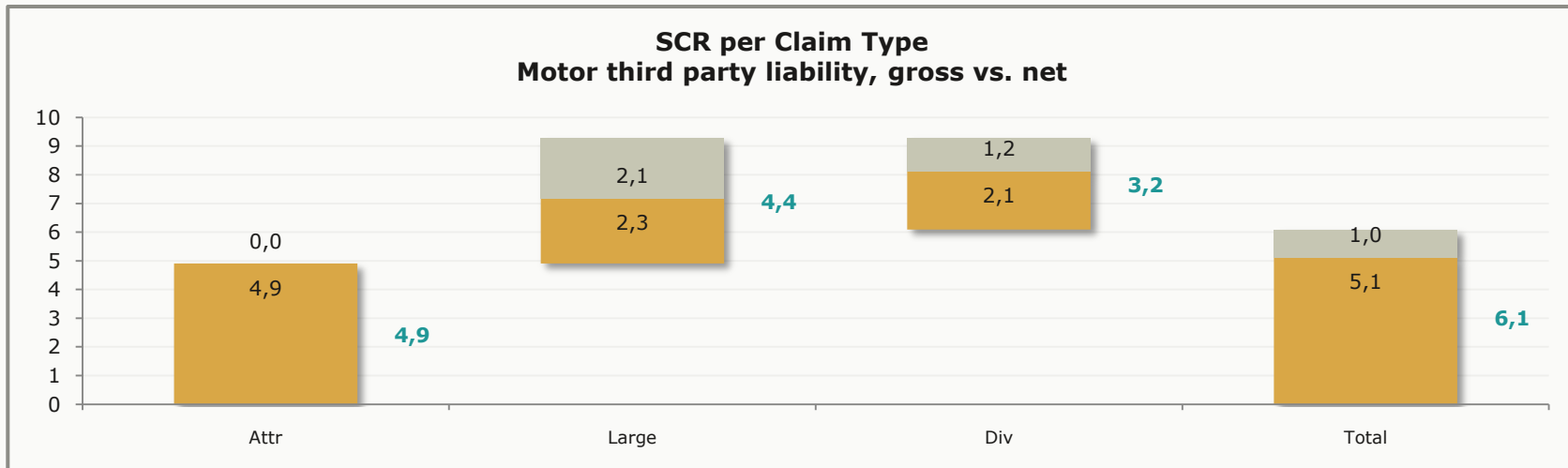
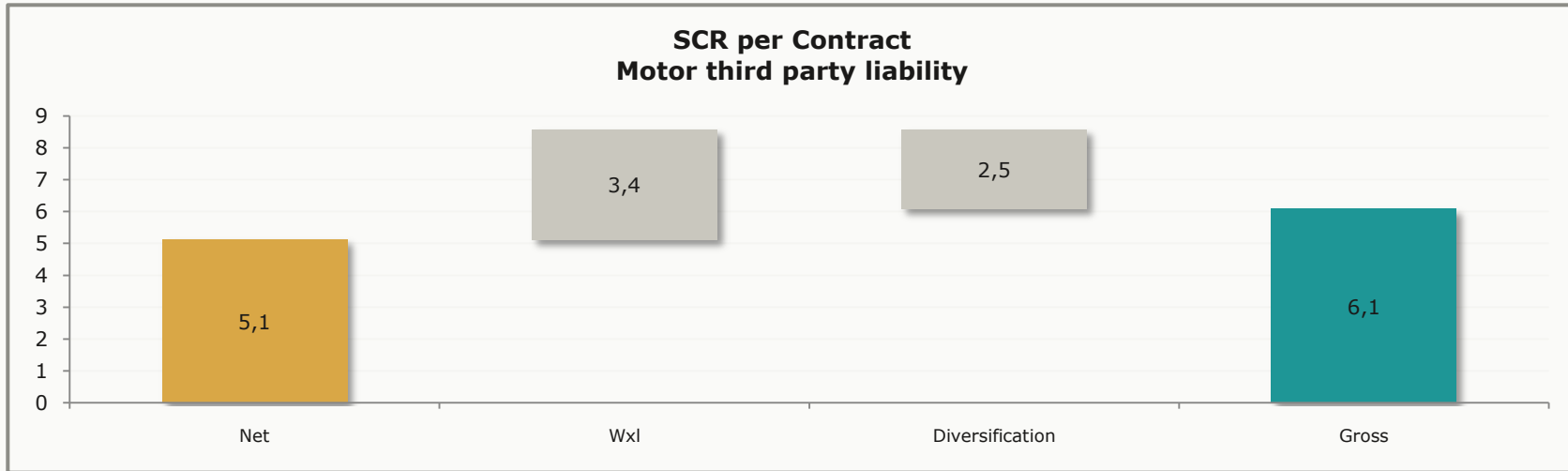
in m€

# Capital Cost Ratio of reinsurance programme



Compare this ratio with other financial instruments

# Motor third party liability gross vs net

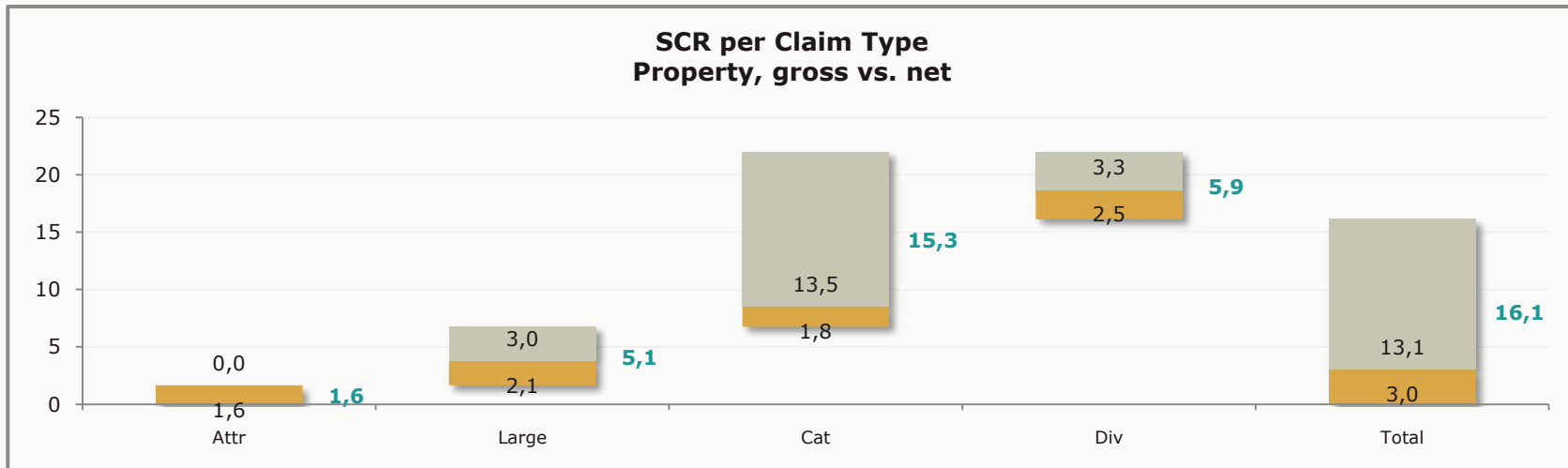
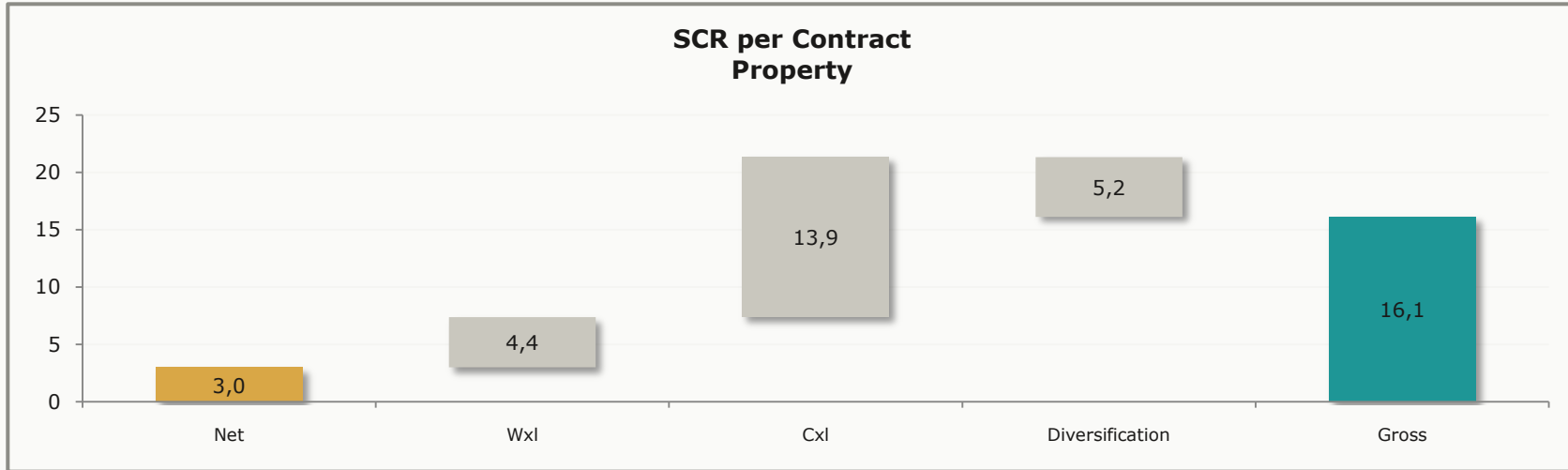


in m€

# Motor third party liability gross vs net

Motor third party liability						
	Premium + RI commission	Expected loss	Expected techn. result	Standard deviation	Solvency Capital Requirement (SCR)	
Net	9.6	8.2	1.4	1.7	5.1	
Wxl	0.4	0.3	0.1	0.6	3.4	
Simple sum	<b>10.0</b>	<b>8.5</b>	<b>1.5</b>	<b>2.3</b>	<b>8.6</b>	
Diversification				0.4	2.5	
Gross	<b>10.0</b>	<b>8.5</b>	<b>1.5</b>	<b>1.9</b>	<b>6.1</b>	

# Property gross vs net



in m€

# Property gross vs net

Property						
	Premium + RI commission	Expected loss	Expected techn. result	Standard deviation	Solvency Capital Requirement (SCR)	
Net	4.0	3.5	0.5	1.1	3.0	
Wxl	0.4	0.3	0.2	0.7	4.4	
Cxl	0.6	0.3	0.3	1.8	13.9	
Simple sum	<b>5.0</b>	<b>4.0</b>	<b>1.0</b>	<b>3.6</b>	<b>21.3</b>	
Diversification				1.0	5.2	
Gross	<b>5.0</b>	<b>4.0</b>	<b>1.0</b>	<b>2.6</b>	<b>16.1</b>	