



REINSURANCE CONTRIBUTION UNDER SOLVENCY II **STANDARD APPROACH** (RISA)

Athens, 19 May 2011 & Nicosia, 20 May 2011

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Solvency Consulting, Integrated Risk Management



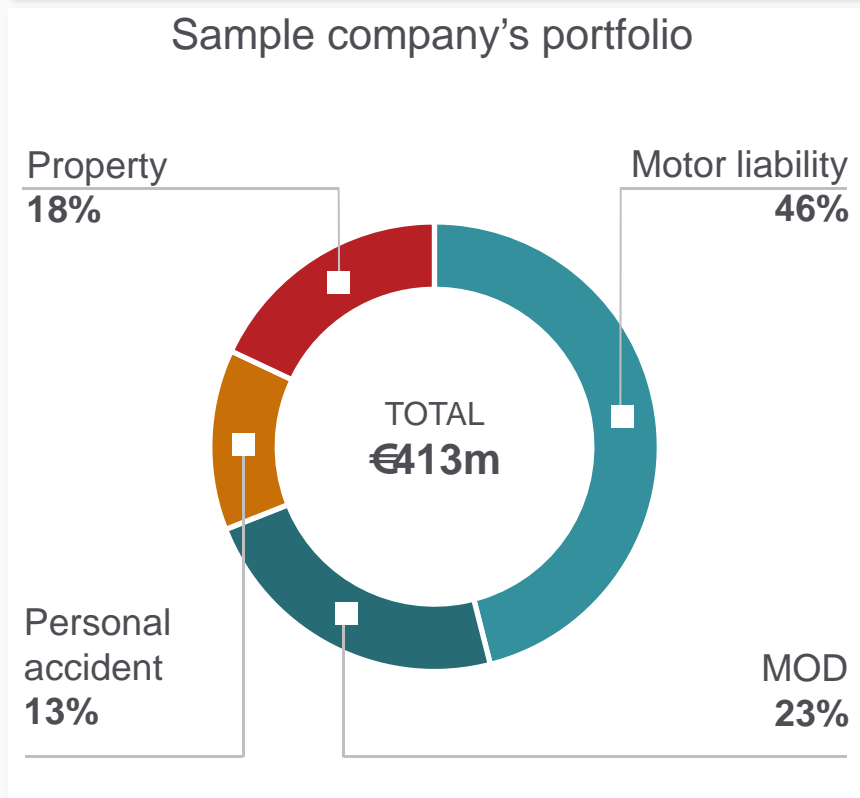
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1. Quantitative case study:
Impact of reinsurance on typical non-life insurer
 2. Munich Re's RISA:
Ways to control the standard approach in SCR non-life
 3. Solvency Consulting:
Munich Re – NOT IF, BUT HOW!

QUANTITATIVE CASE STUDY:
IMPACT OF REINSURANCE
ON TYPICAL NON-LIFE INSURER



Underwriting figures for our sample company

Sample company's portfolio



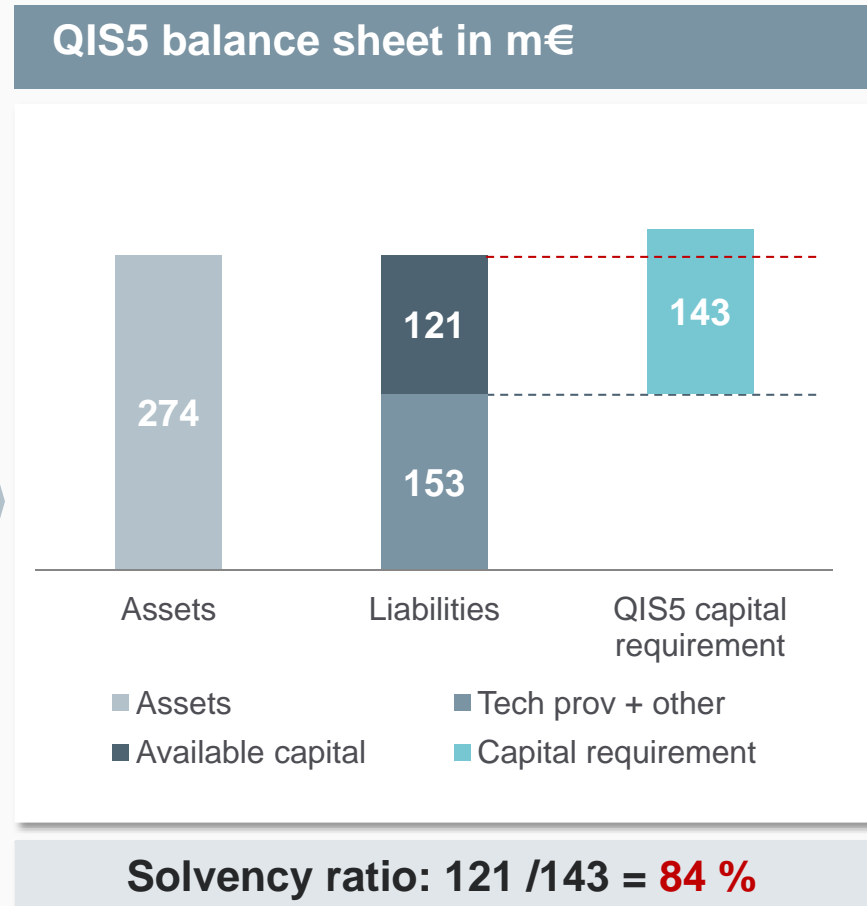
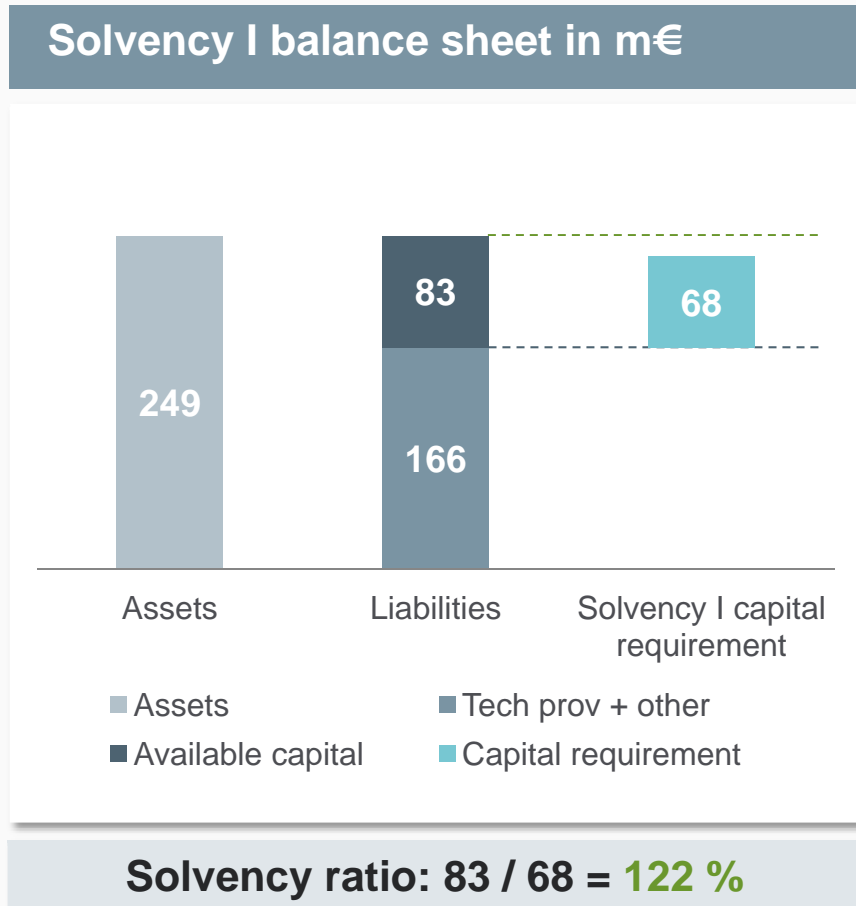
- **Total premium:** €413m
 - Motor liability €189m
 - MOD €97m
 - Personal accident €54m
 - Property €73m

- **Combined ratio:** 99.95%

in m€

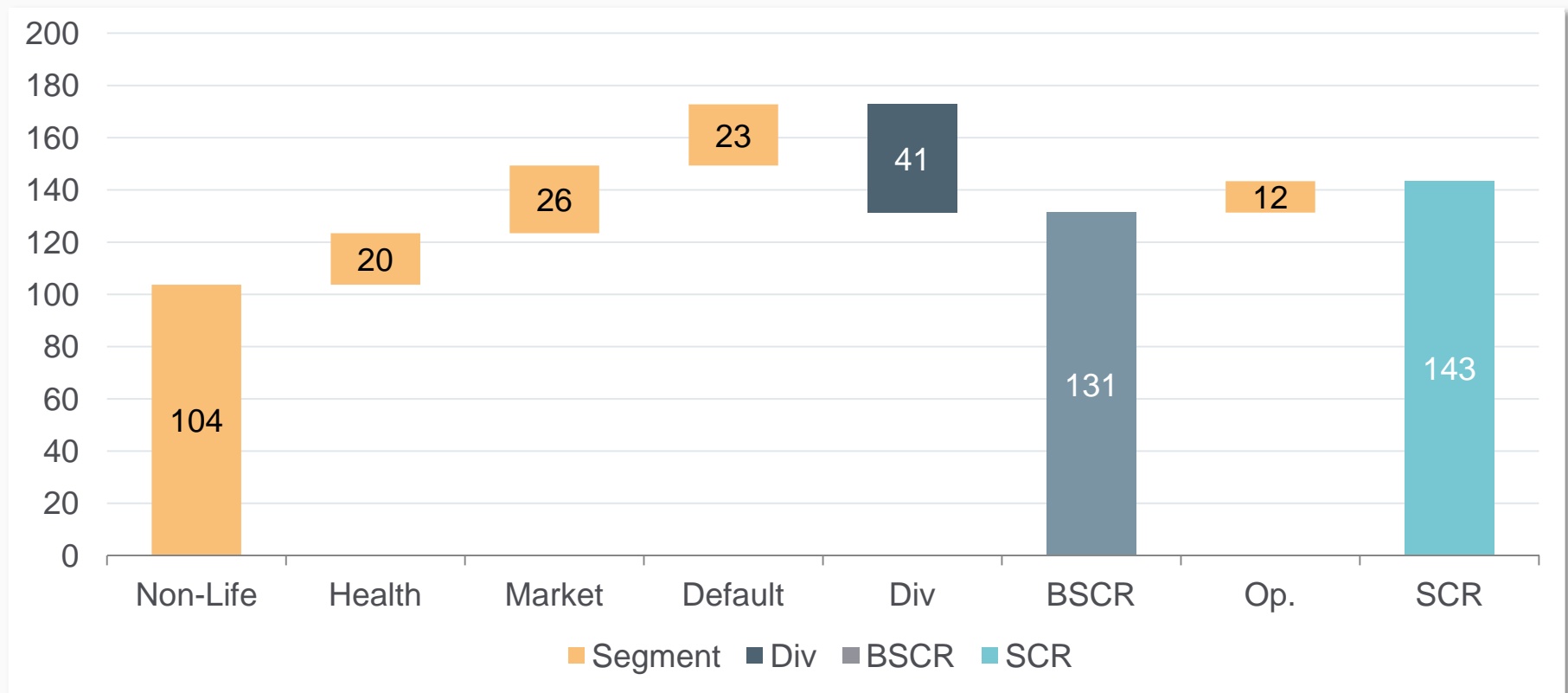
| | Solvency I | QIS5 valuation |
|--------------------|------------|----------------|
| Assets | 249 | 274 |
| Investments | 248 | 272 |
| Reinsurance | 0 | 1 |
| Other assets | 1 | 2 |
| Liabilities | 166 | 153 |
| TP Best Estimate | | 142 |
| Risk Margin | | 12 |
| Other liabilities | | 0 |
| Own funds | 83 | 121 |
| Share capital | | 121 |

Available capital in Solvency I and QIS5



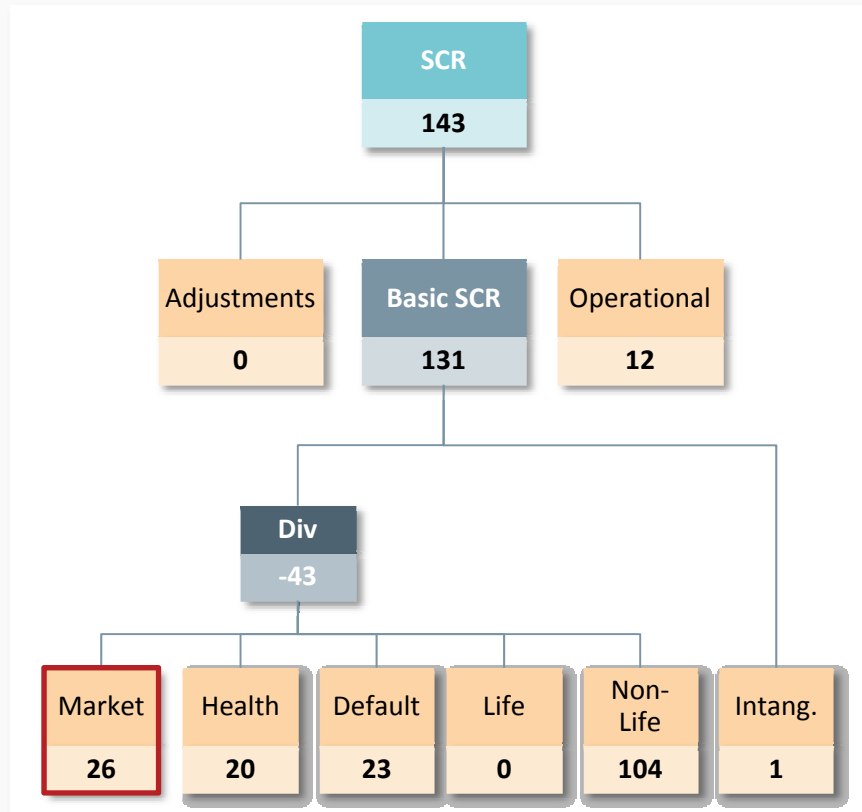
Increase of available capital is mainly driven by valuation of investments and technical provision.

SCR in QIS5 split in risk categories in m€

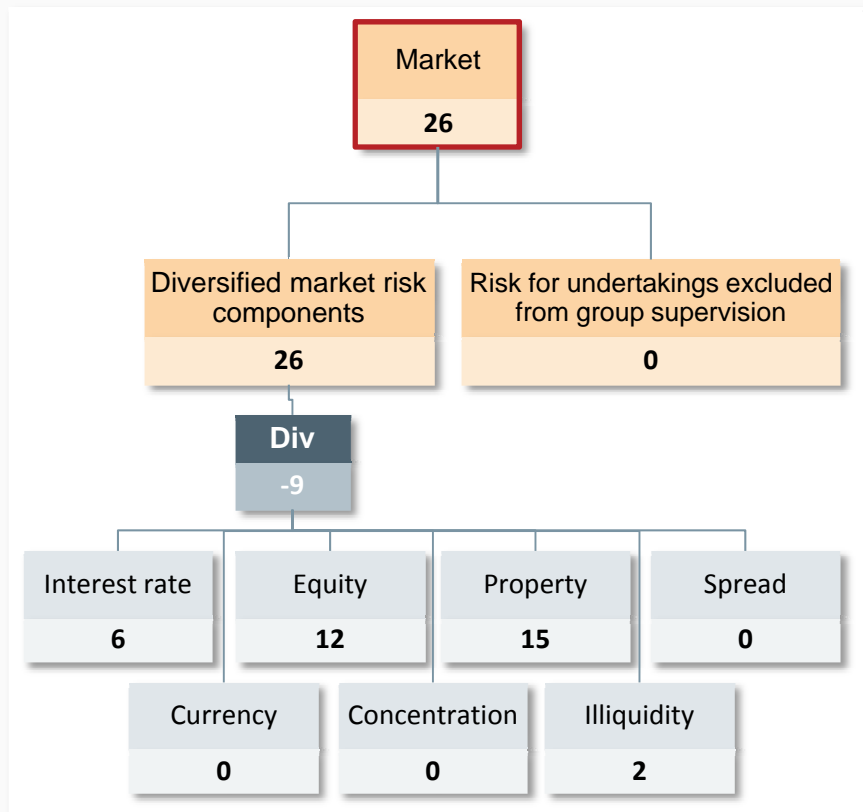


Non-Life UW risk dominates SCR.

Solvency Capital Requirement in m€

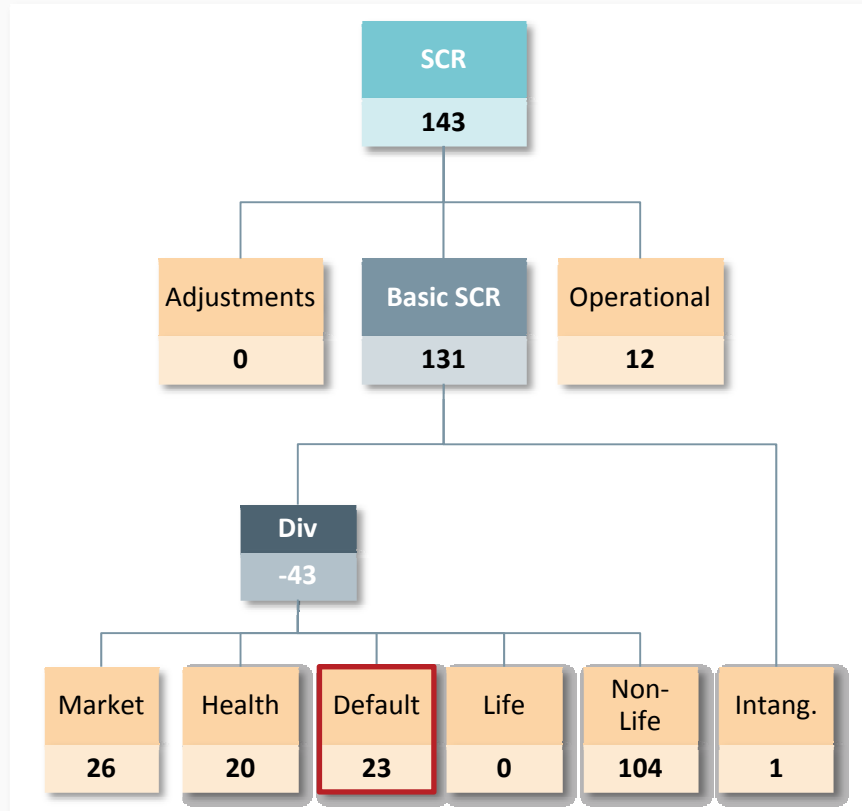


Market risk component in m€

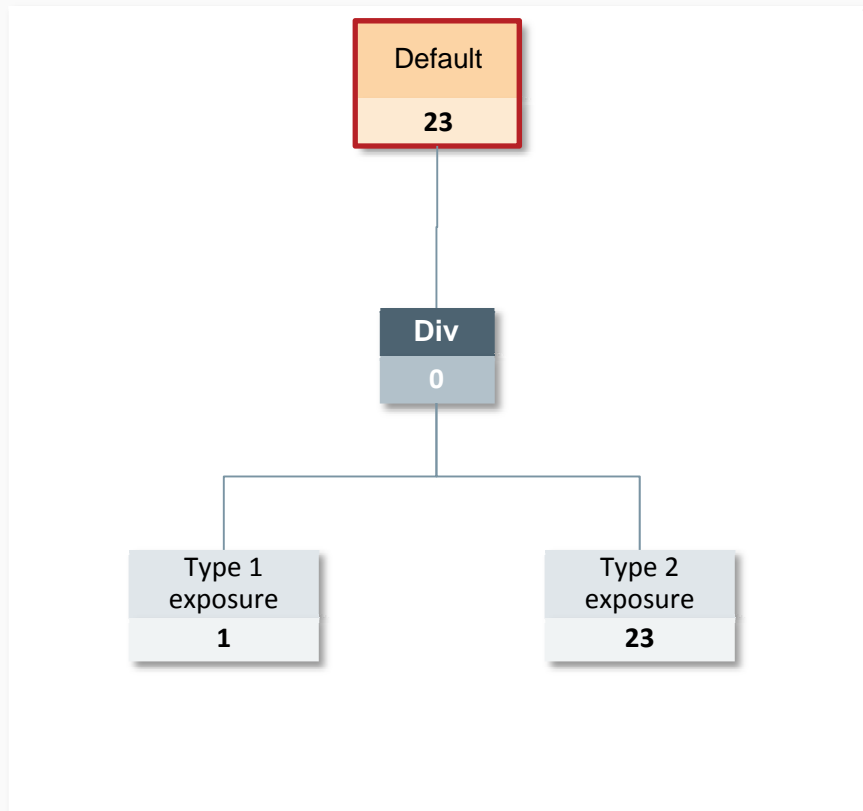


The main drivers in market risk are property risk & equity risk

Solvency Capital Requirement in m€



Counterparty risk component in m€

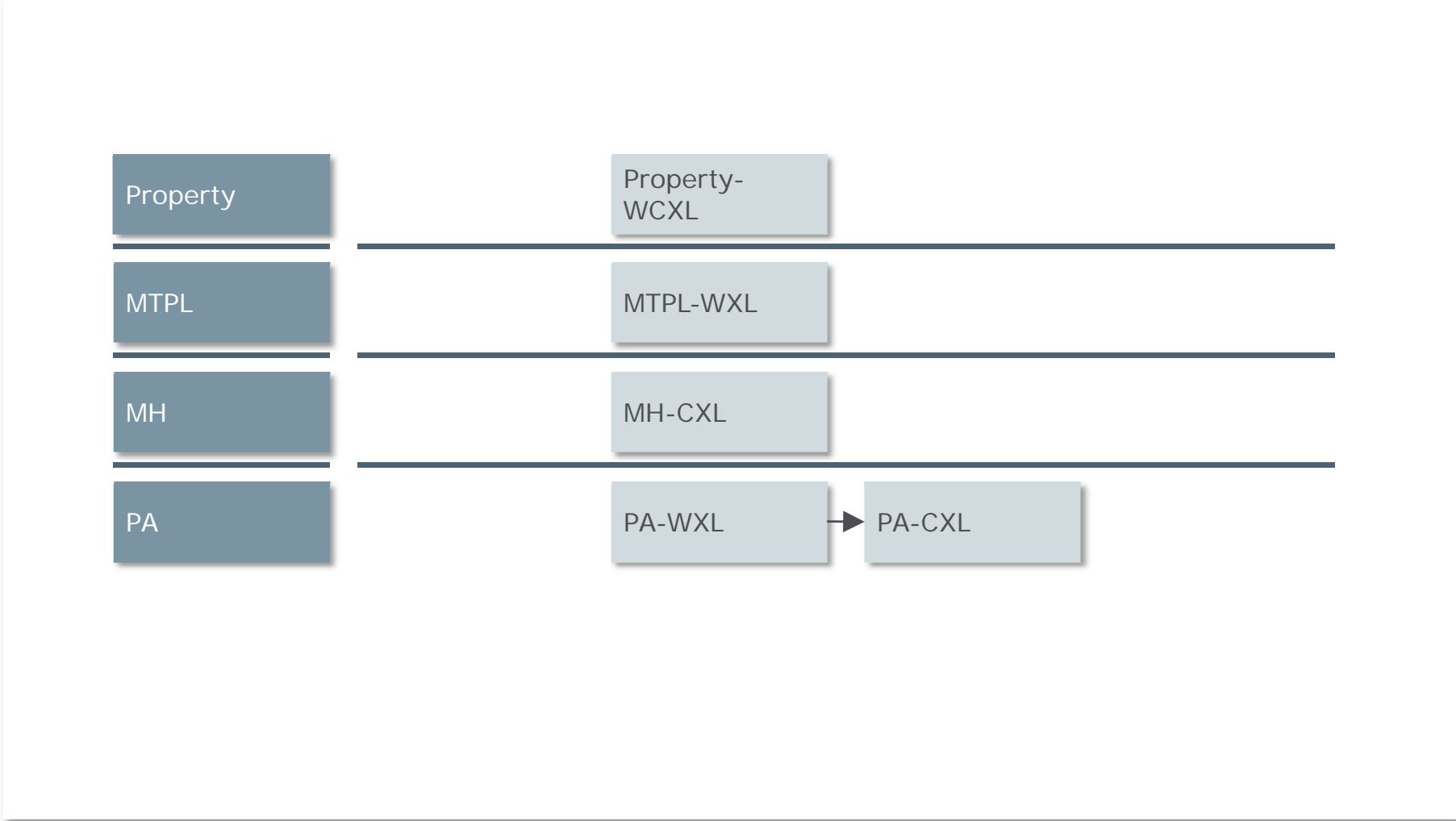


The main driver in default risk ist Type 2 exposure.

MUNICH RE'S RISA:
WAYS TO CONTROL THE STANDARD
APPROACH IN SCR NON-LIFE

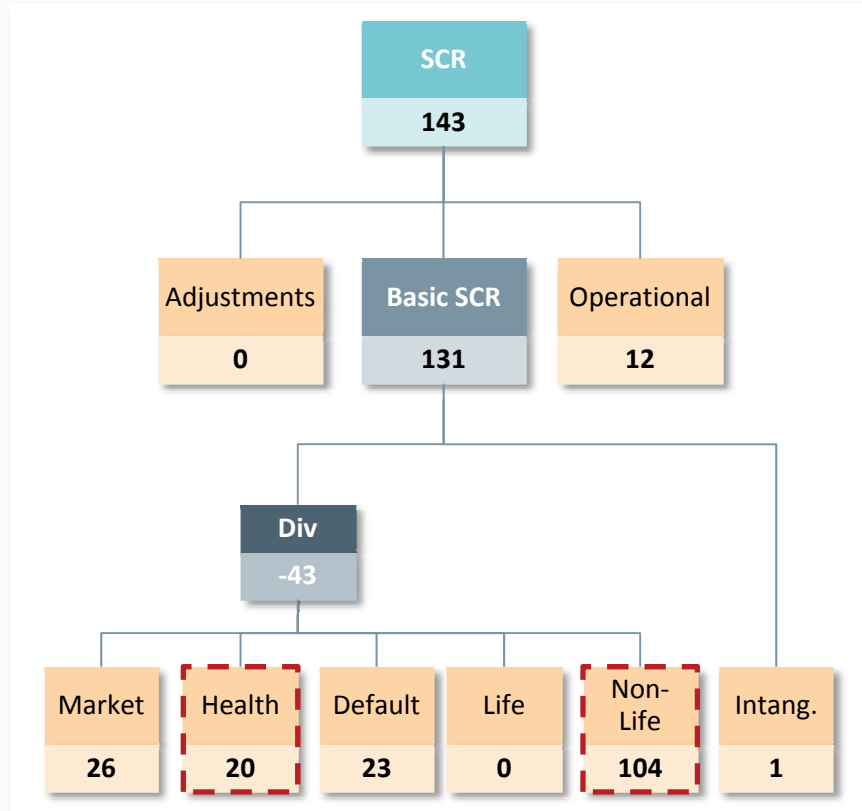


Original R/I programme

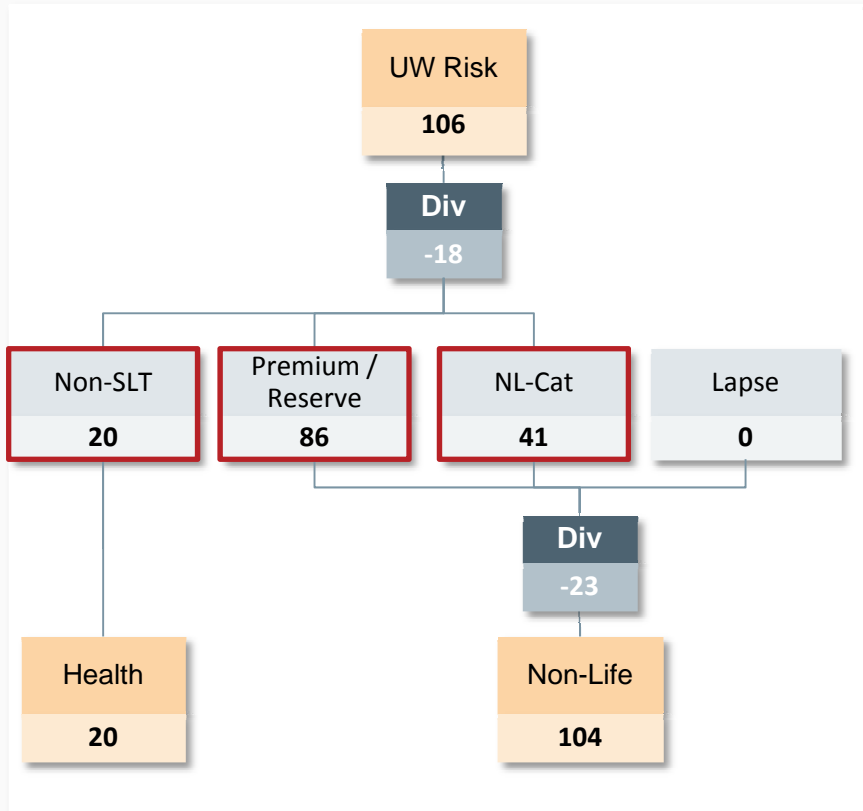


SCR for Non-Life & Health UW risk Original

Solvency Capital Requirement in m€



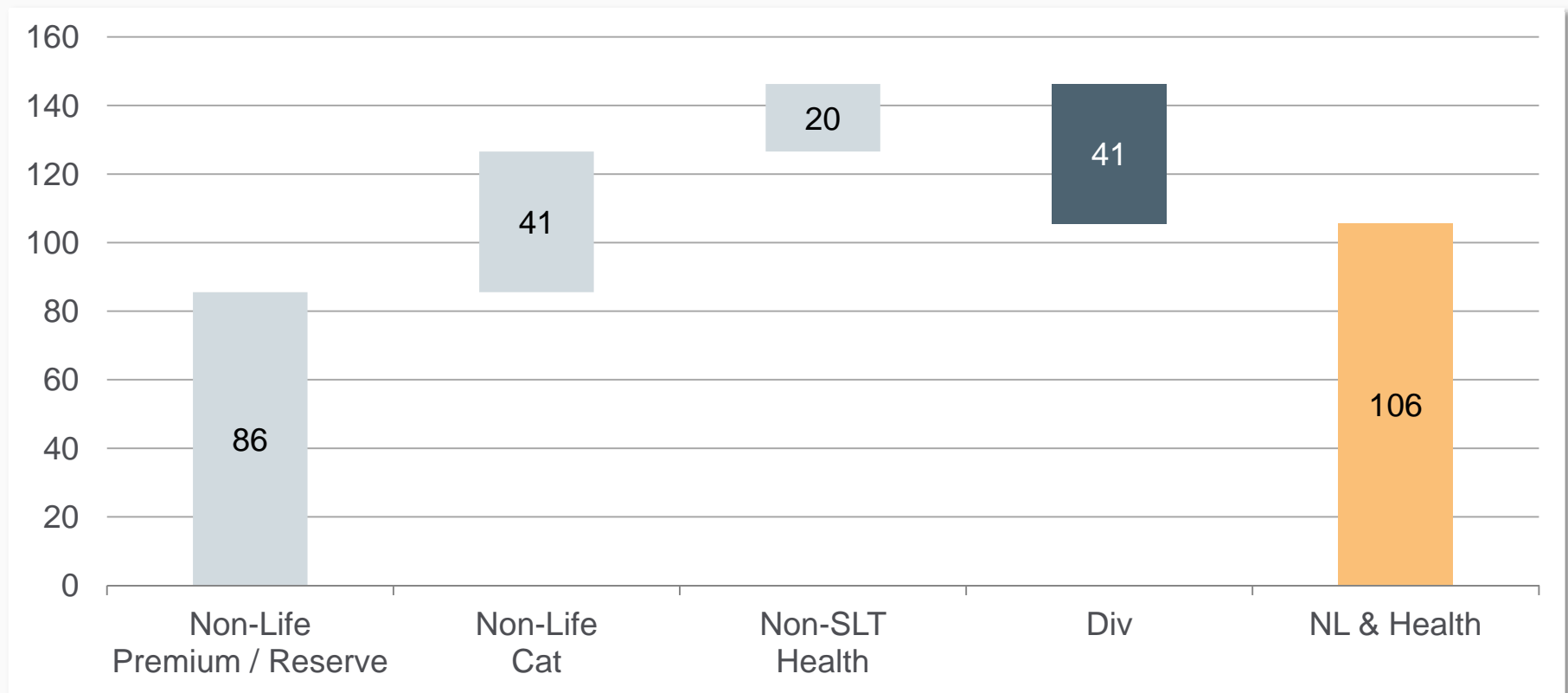
Total UW risk in m€



Non-Life premium and reserve risk dominates the UW risk.

SCR split for Non-Life & Health UW risk Original

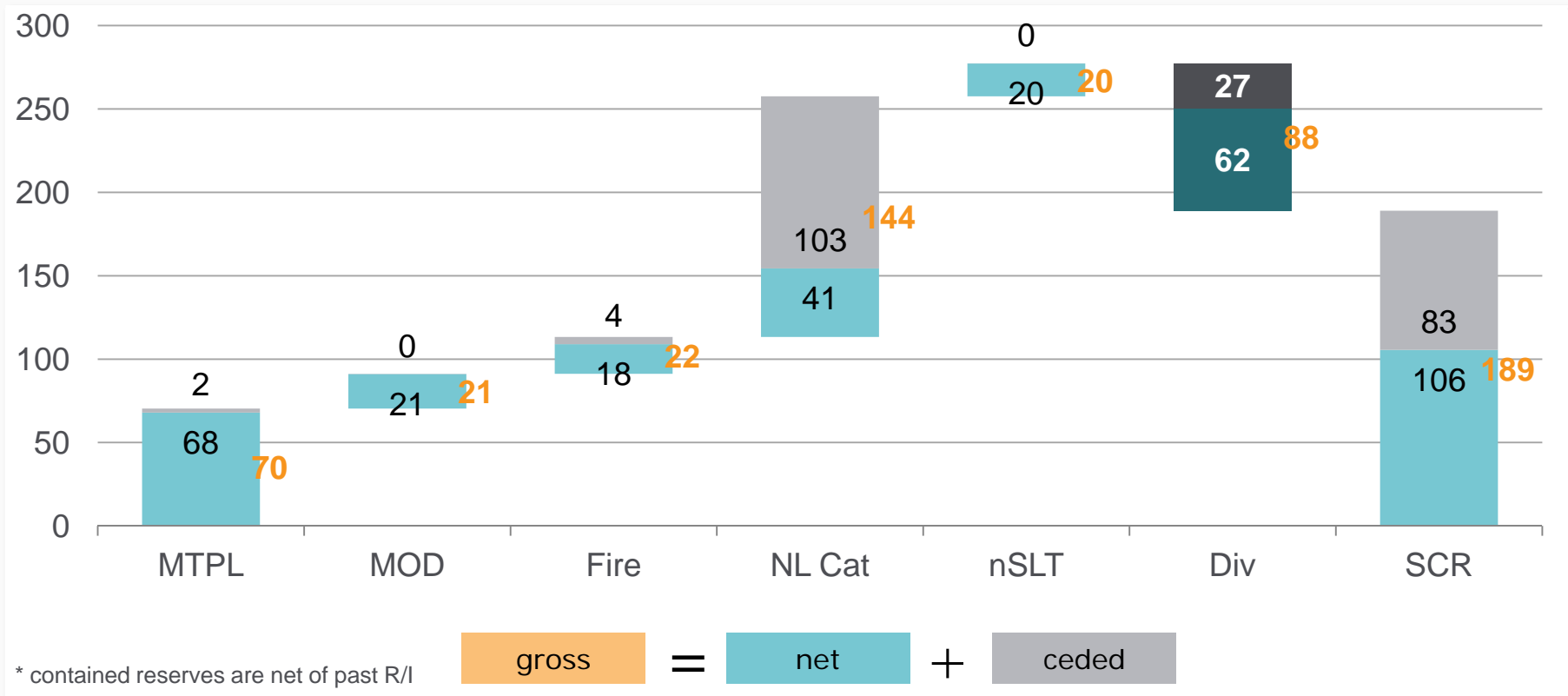
SCR split for underwriting risk in m€



Improve diversification by reducing Non-Life premium and reserve risk.

Risk capital per UW-LoB gross* vs net (original)

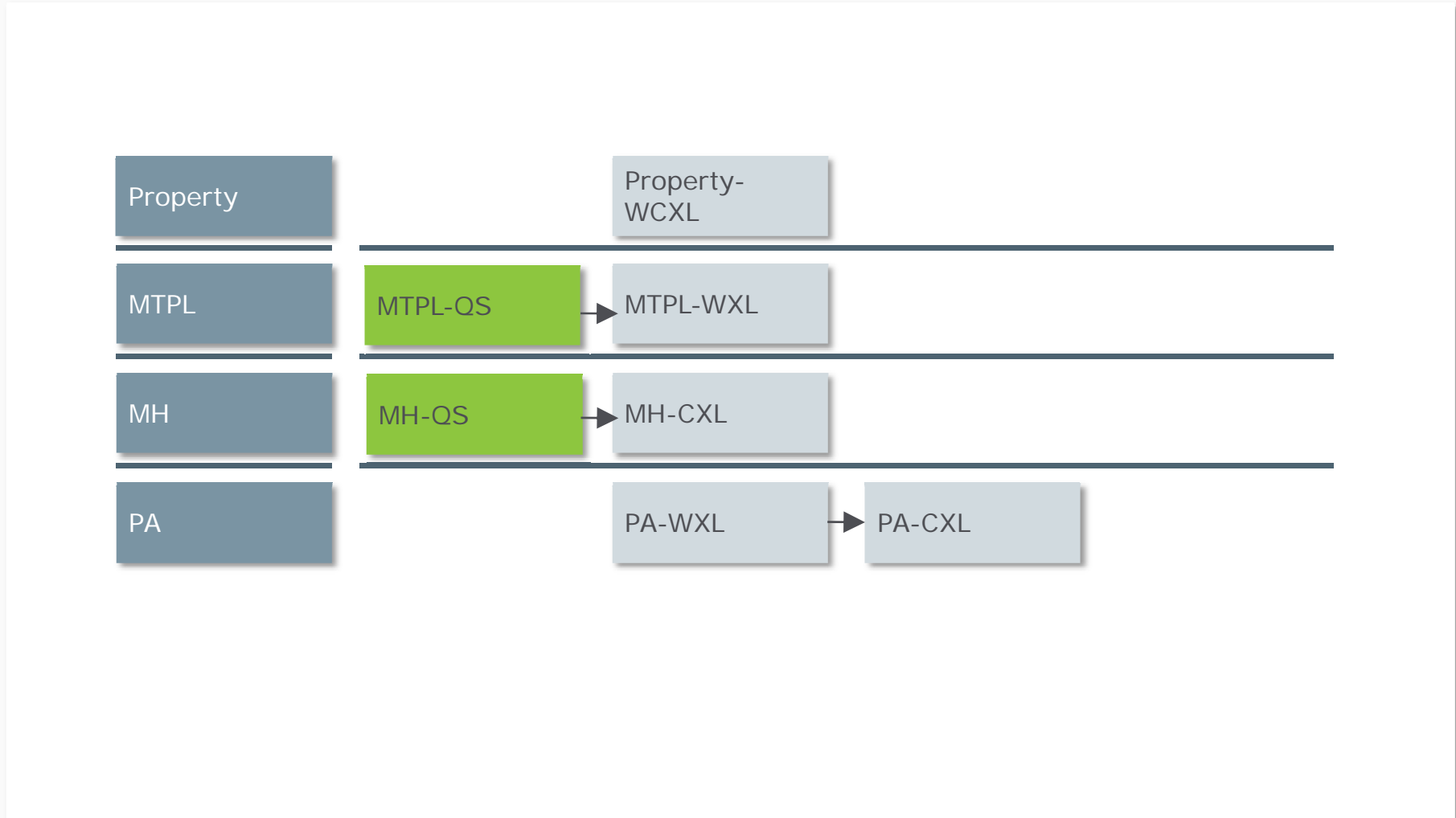
Risk capital per UW-LoB, gross* vs net (original) in m€



Main risk driver in UW risk is Motor.

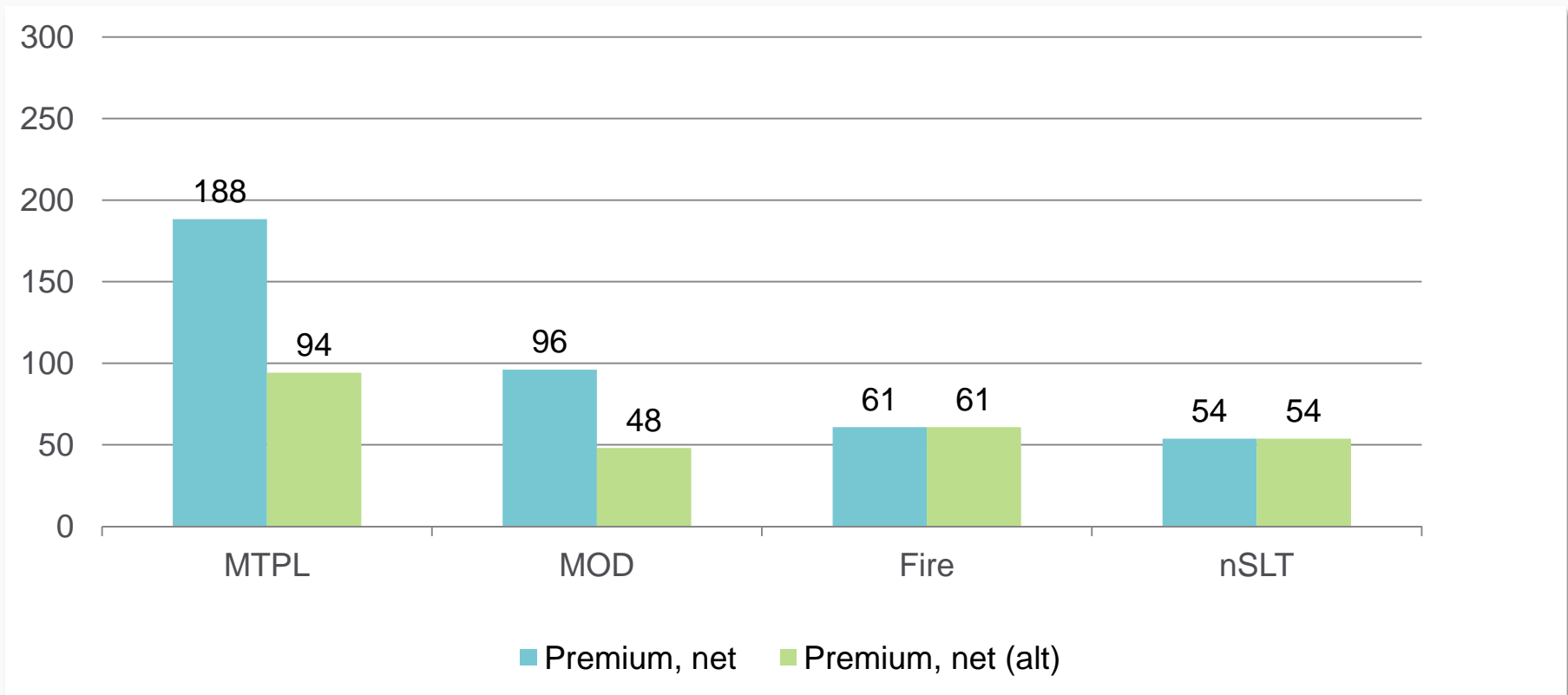
Alternative R/I program

Original with Motor-Quota-Share in 2011



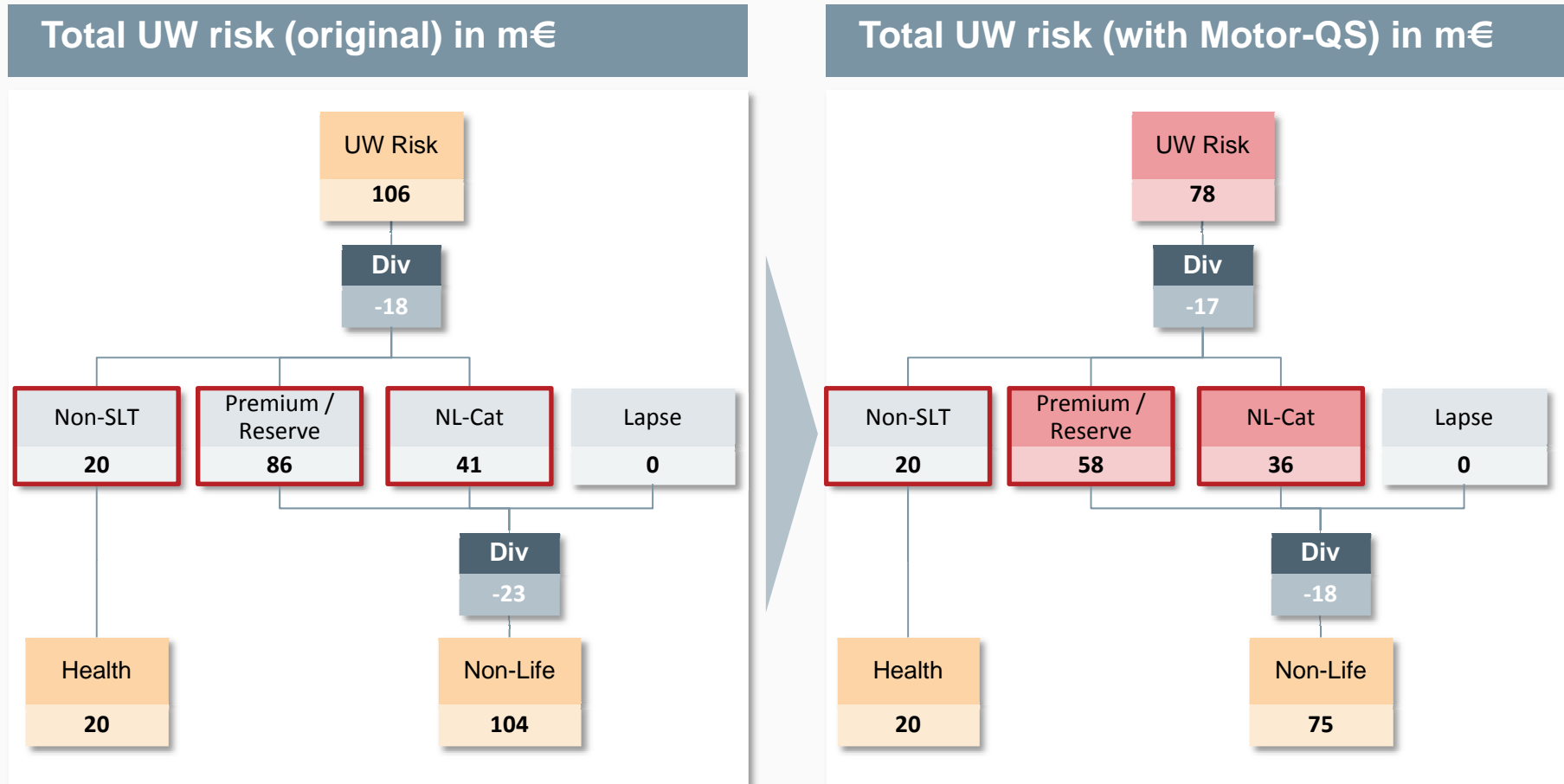
Premium and NP Adj Net (original) vs. net (with Motor-QS)

SCR split for market risk in m€



Reduction of net premium in Motor leads to a new premium split.

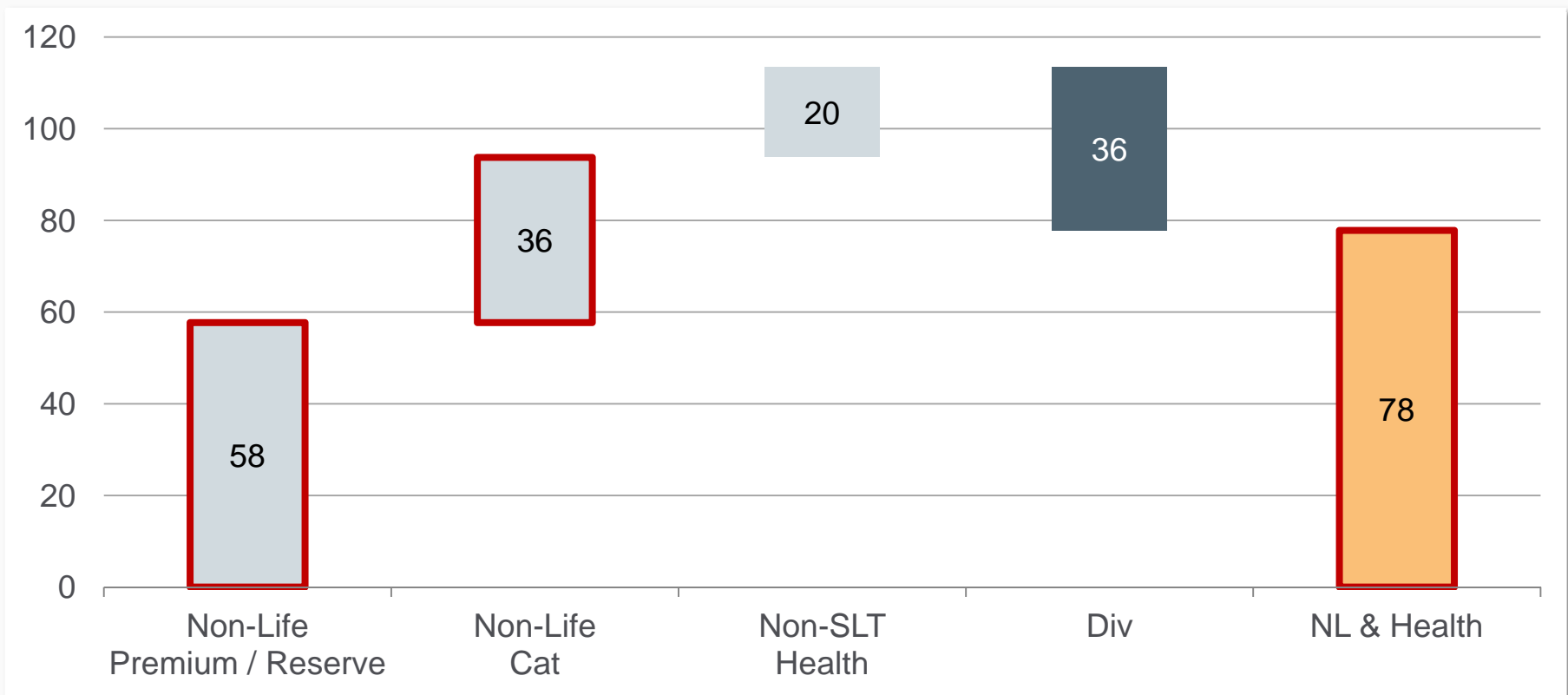
SCR for Non-Life & Health UW risk net (original) vs net (with Motor-Quota-Share)



Premium/reserve risk reduced significantly by Motor-Quota-Share.

SCR split for Non-Life & Health UW risk net with Motor-Quota-Share

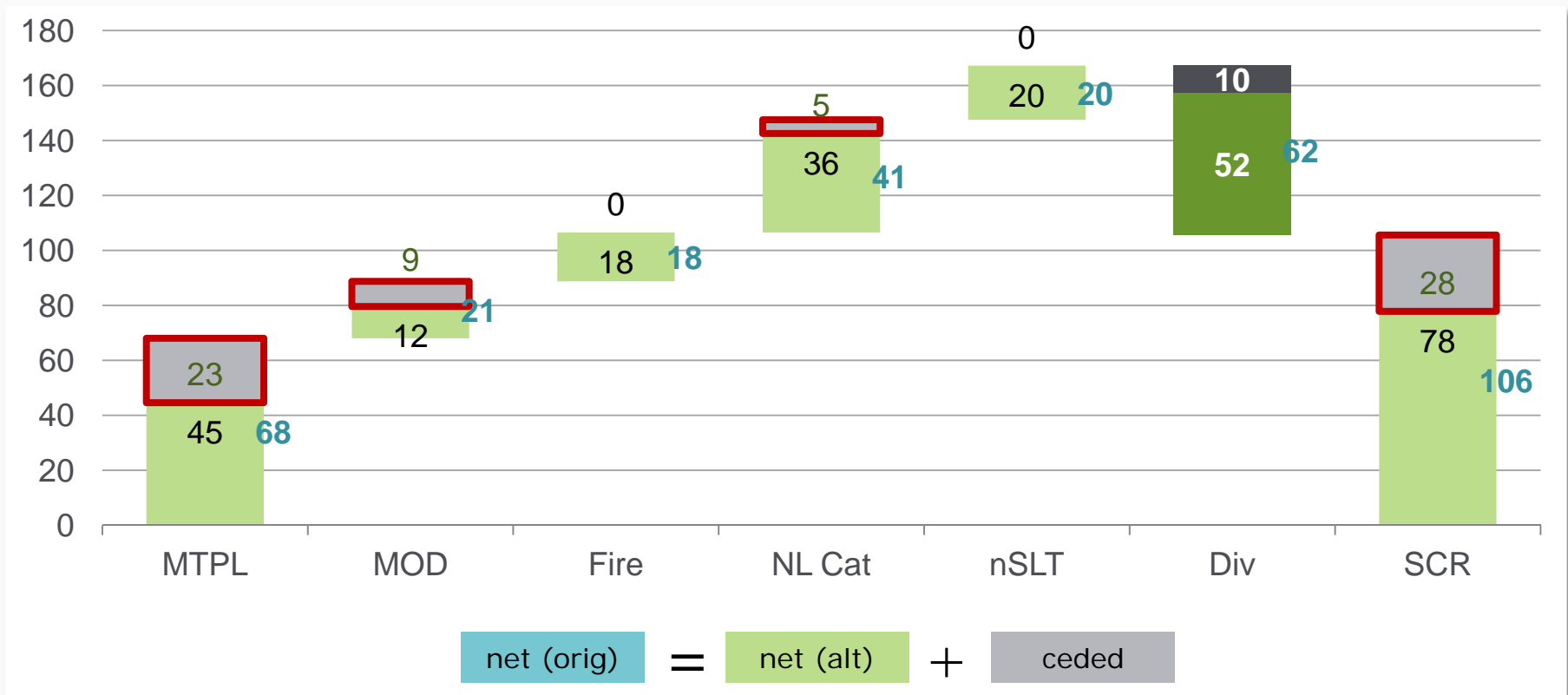
SCR split for underwriting risk in m€



Reduction of premium/reserve risk decreased NL & Health UW risk.

Risk capital per UW-LoB net (original) vs net (with Motor-Quota-Share)

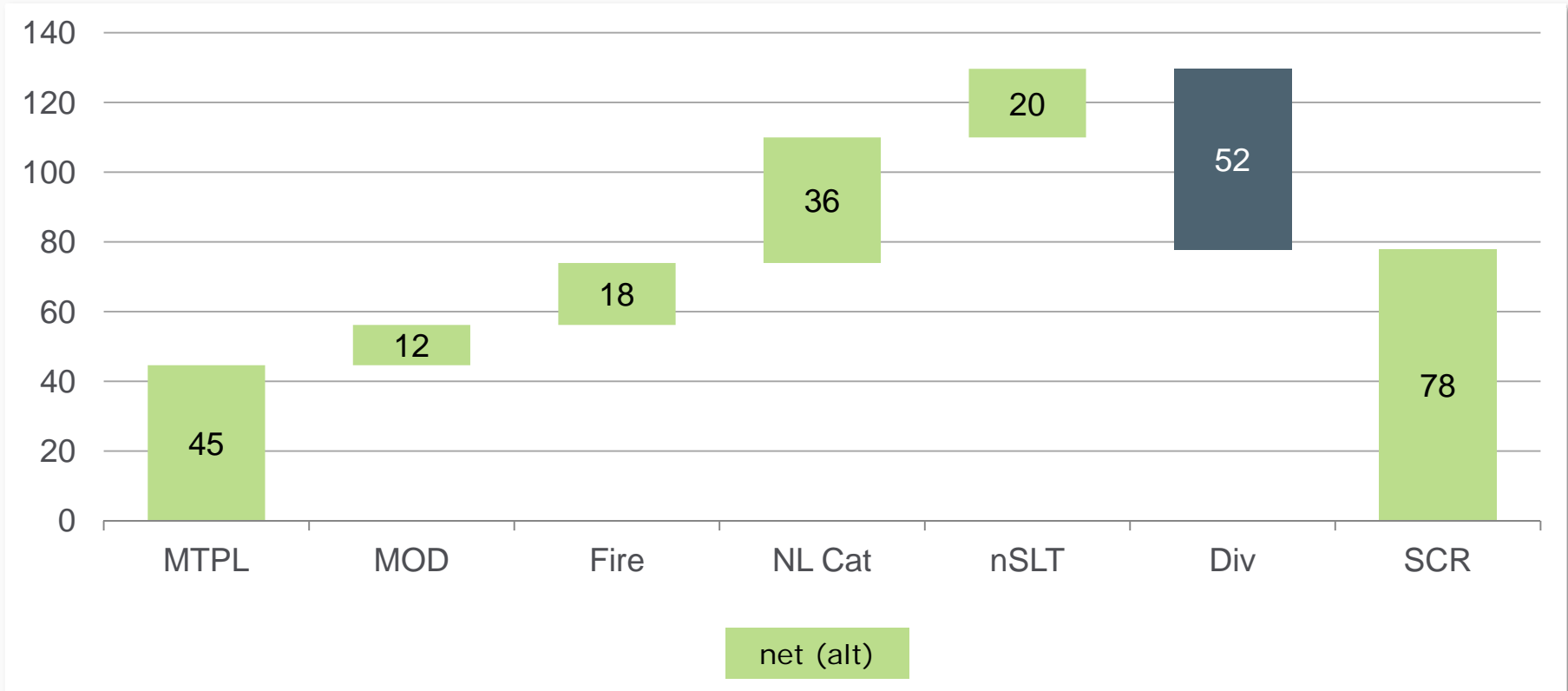
Risk capital per UW-LoB, net (original) vs net (with Motor-QS) in m€



Most reduction in SCR is in MTPL premium/reserve risk.

Risk capital per UW-LoB net with Motor-Quota-Share

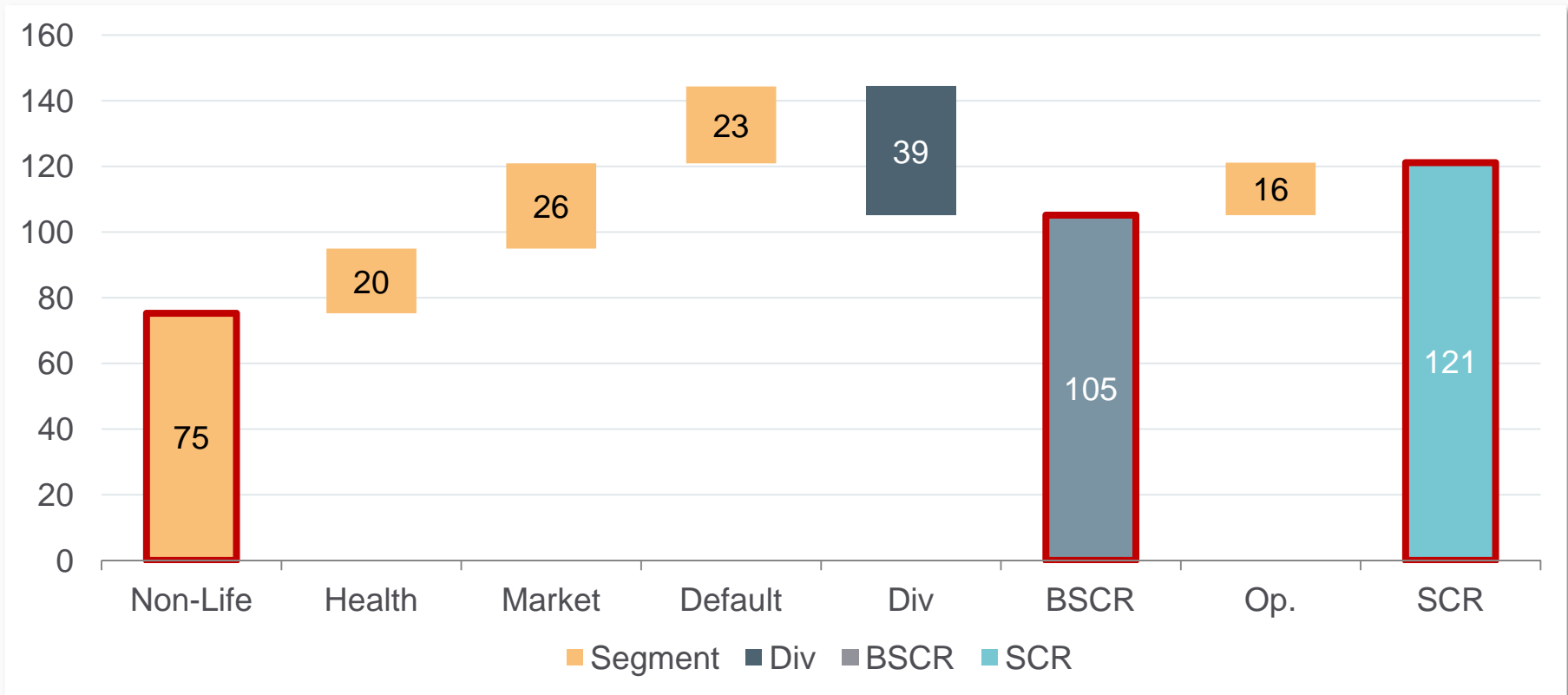
Risk capital per LoB, net with Motor-QS in m€



Reduction of premium/reserve risk improves diversification.

SCR in QIS5 split in risk categories net with Motor-Quota-Share

SCR in QIS5 split in risk categories in m€

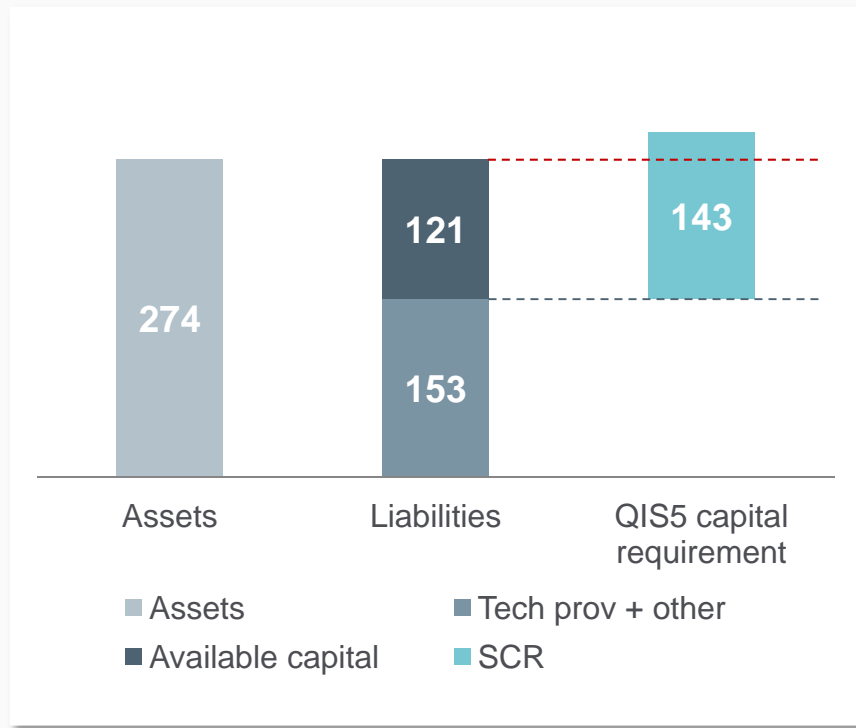


Reduction of premium/reserve risk decreased SCR.

Available capital

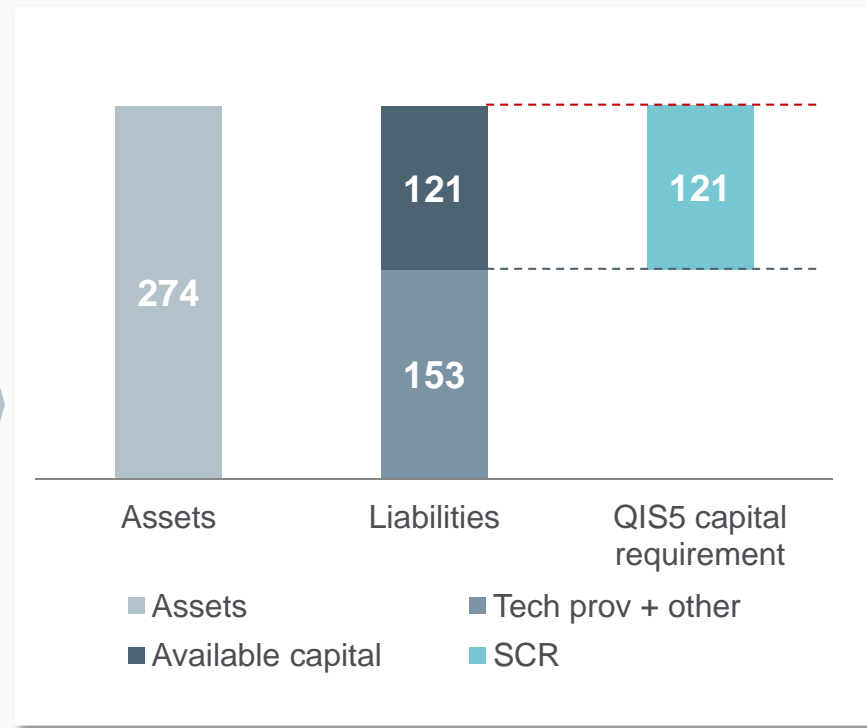
Original and alternative (with Motor-QS) R/I

QIS 5 original R/I in m€



Solvency ratio: $121/143 = 84\%$

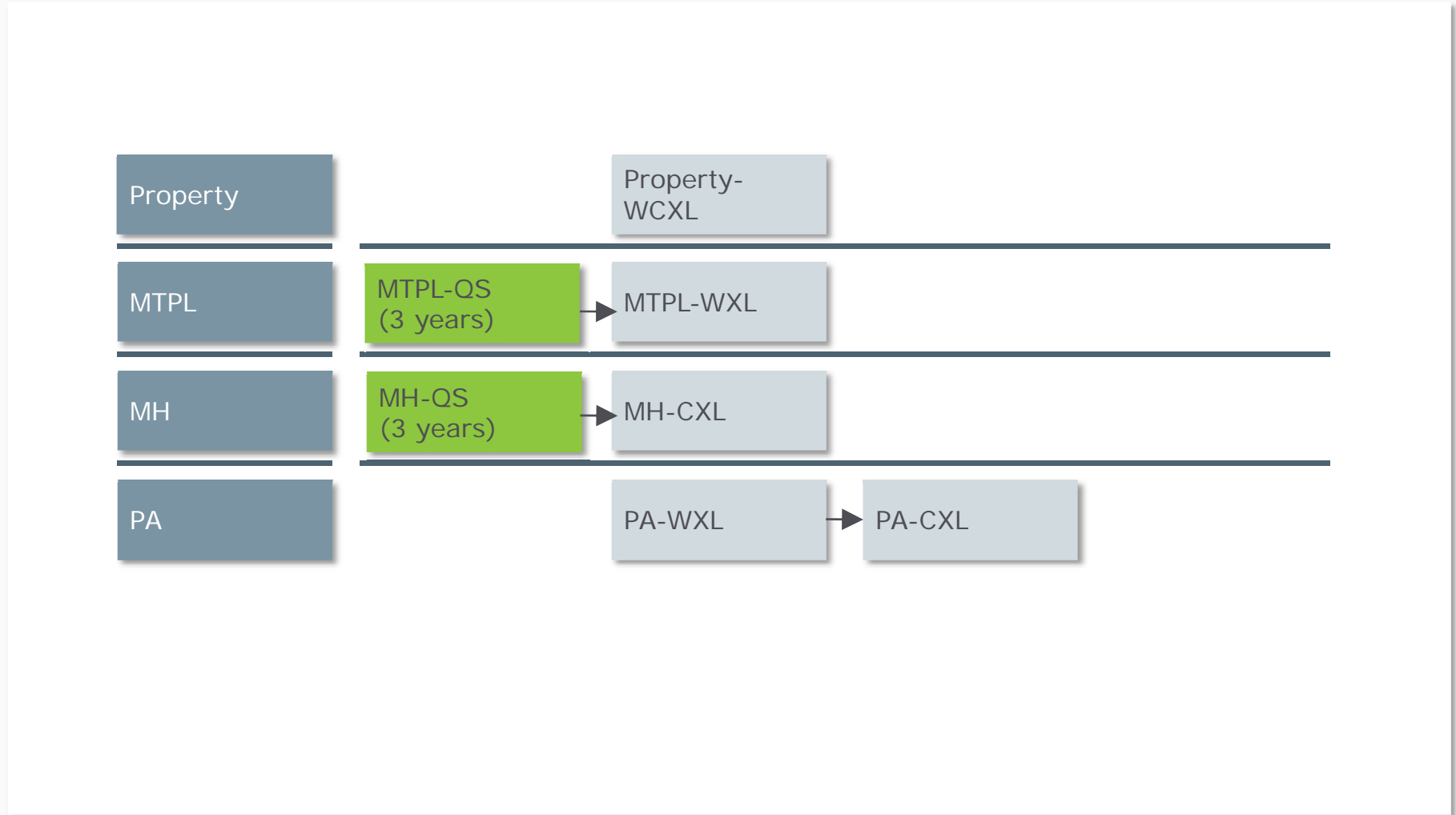
QIS 5 with Motor-QS in m€



Solvency ratio: $121/121 = 99\%$

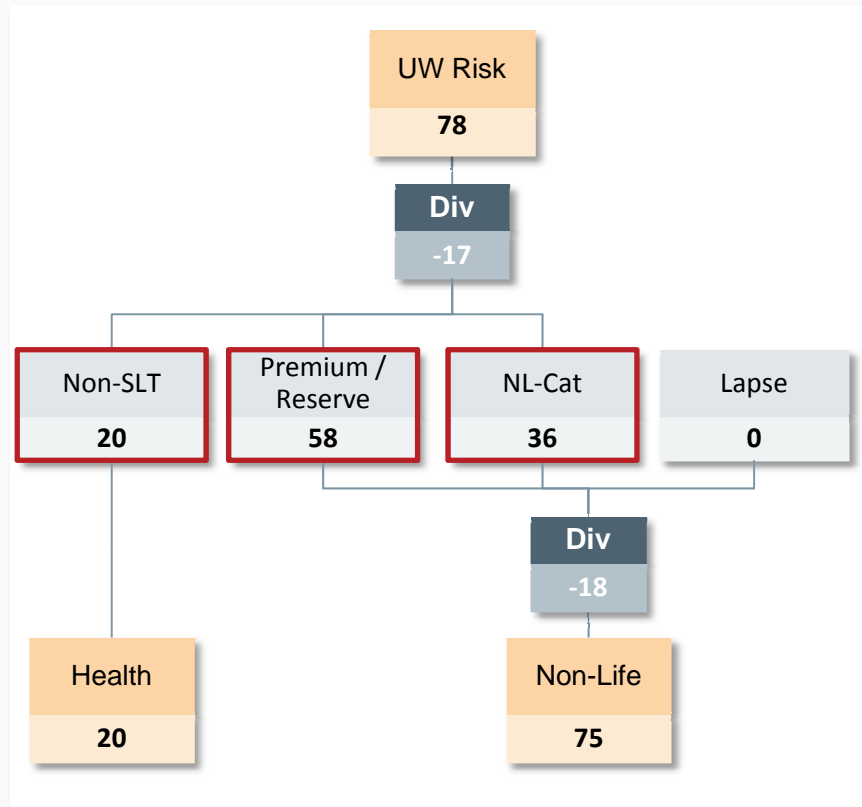
Decrease of SCR improves the Solvency II ratio in 2011 by 15 %.

Alternative R/I program to 2013 with Motor-Quota-Share (from 2011 to 2013)

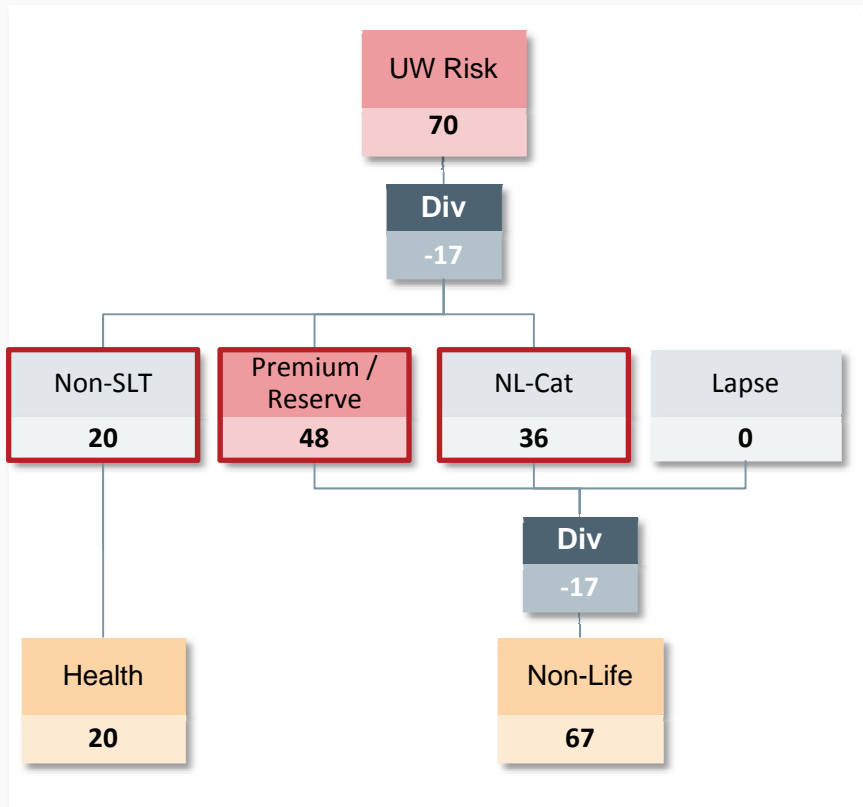


SCR for Non-Life & Health UW risk with Motor-Quota-Share 2011 vs 2013

Total UW risk (2011) in m€



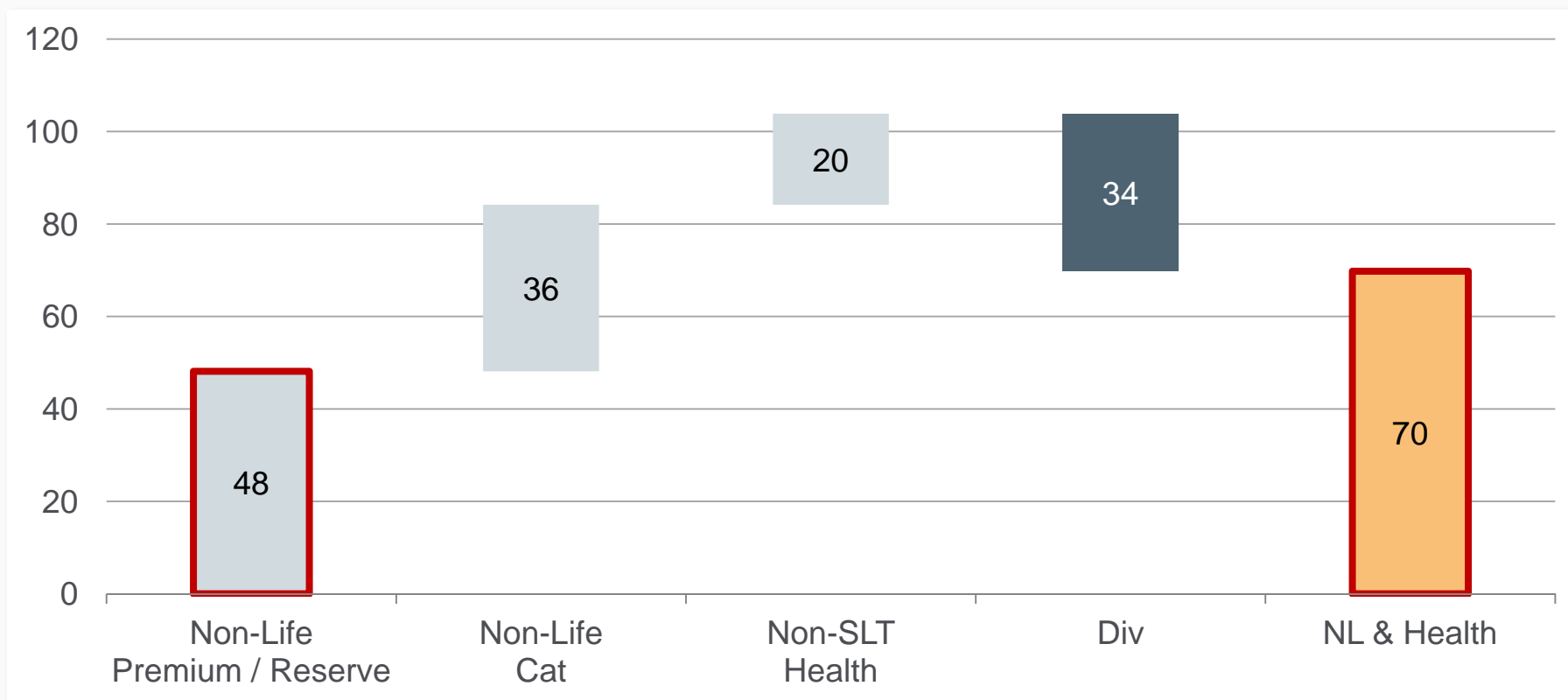
Total UW risk (2013) in m€



Premium/reserve risk reduced significantly by Motor-Quota-Share.

SCR split for Non-Life & Health UW risk net with Motor-Quota-Share in 2013

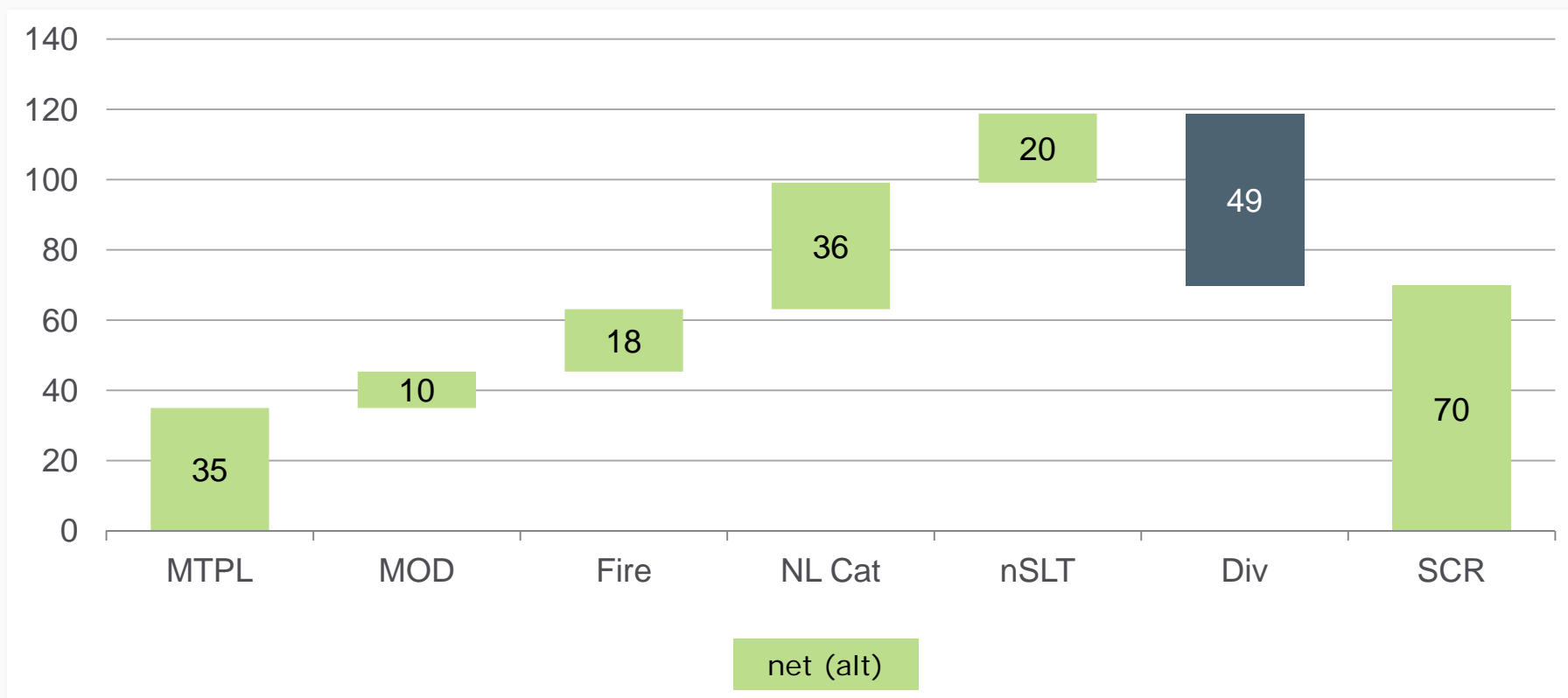
SCR split for underwriting risk in m€



In 2013 the Non-Life reserve risk reduced significantly.

Risk capital per UW-LoB net with Motor-Quota-Share in 2013

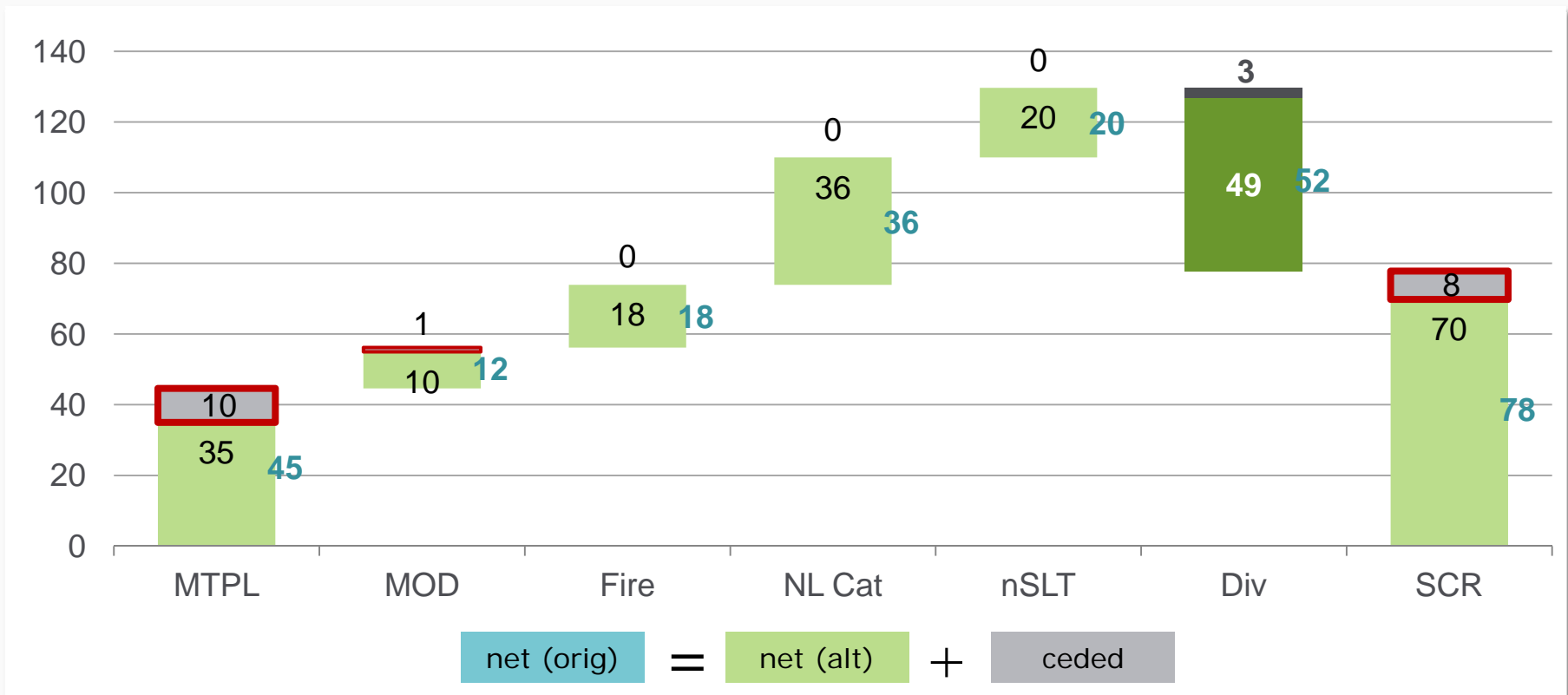
Risk capital per LoB, net with Motor-QS in 2013 in m€



Excellent diversification with Motor-Quota-Share in SCR_UW.

Risk capital per UW-LoB net with Motor-Quota-Share in 2011 vs in 2013

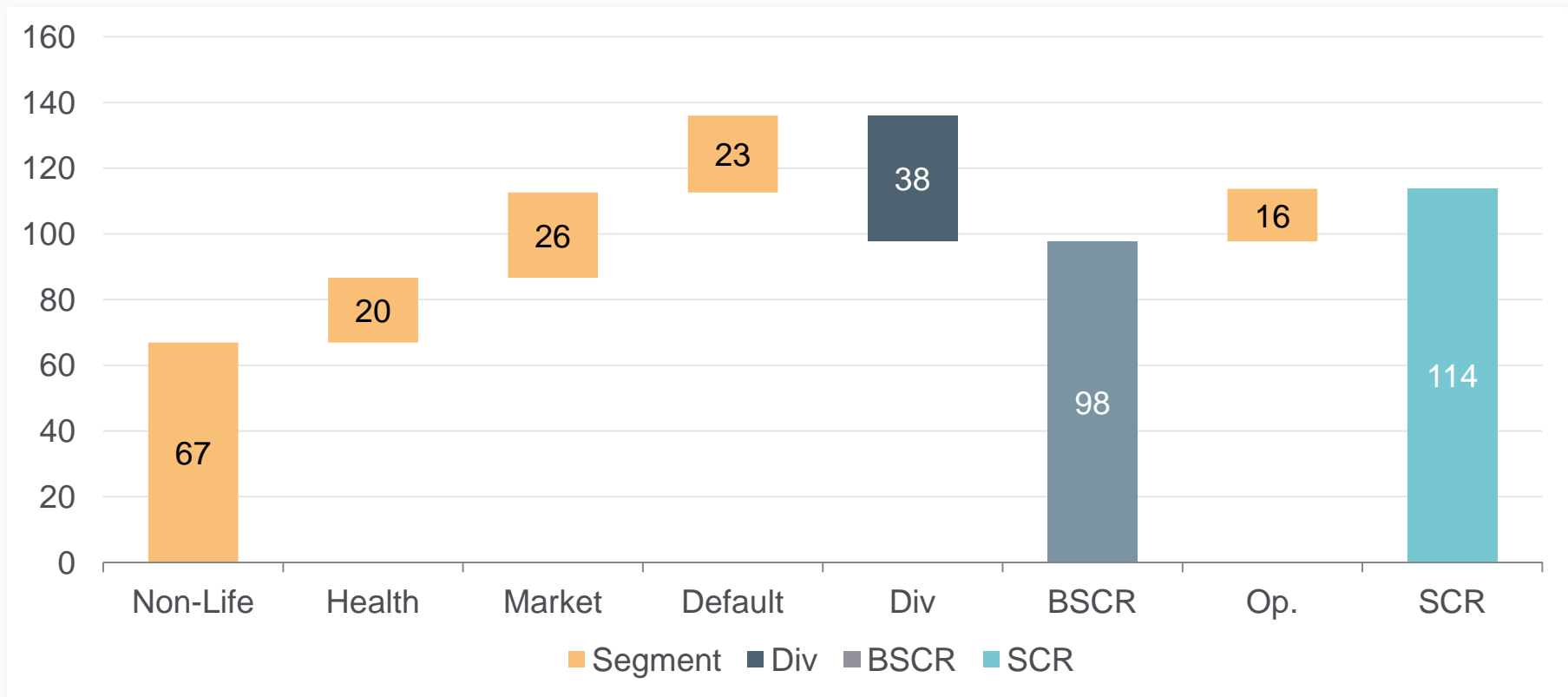
Risk capital per UW-LoB, net (2011) vs net (2013) in m€



Reduction with Motor-Quota-Share in 2013 is very good.

SCR in QIS5 split in risk categories net with Motor-Quota-Share in 2013

SCR in QIS5 split in risk categories in m€

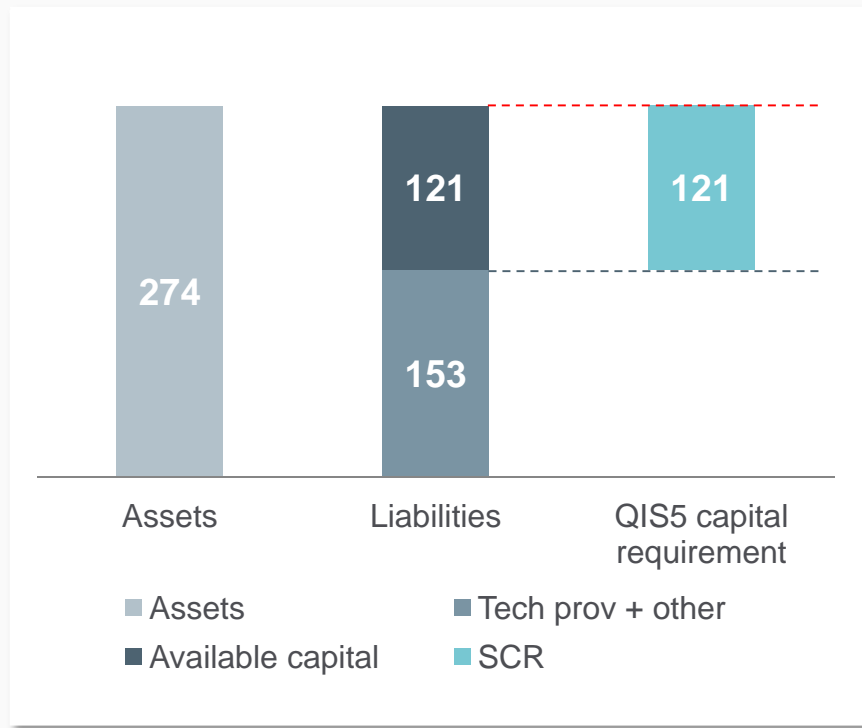


Reduction of premium/reserve risk decreased SCR.

Available capital

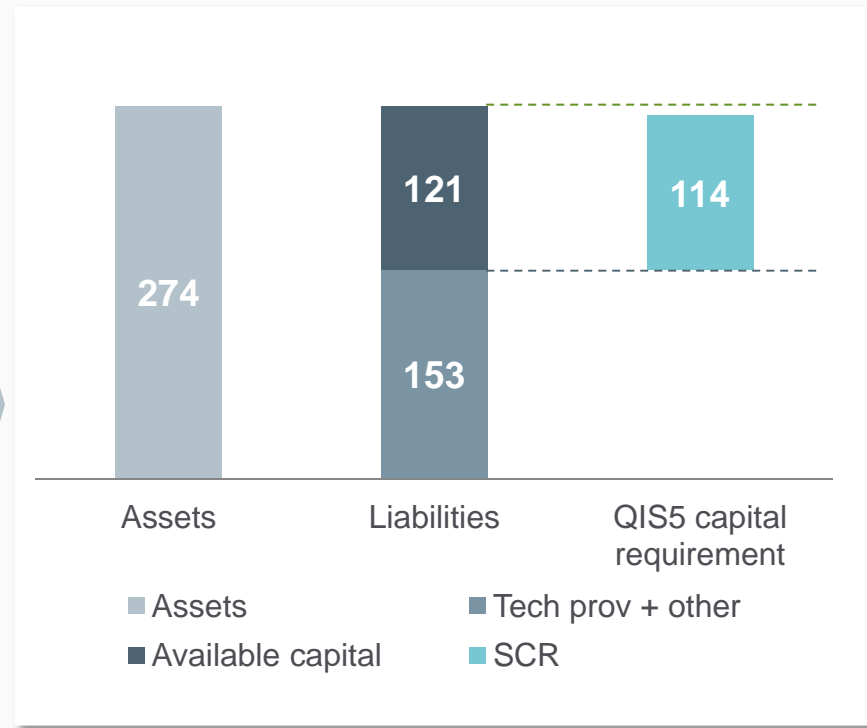
Alternative R/I with Motor-QS in 2011 and 2013

QIS 5 with Motor-QS in 2011 in m€



Solvency ratio: 121/121 = 99%

QIS 5 with Motor-QS in 2013 in m€



Solvency ratio: 121/114 = 106%

In 2013 the Solvency II ratio can be over at 106 %.

Reinsurance under Standard Approach (RISA) – Conclusion

- **Possible further improvements with Reinsurance**
 - ✓ Property: Reduction of premium/reserve risk with a Quota Share
 - ✓ Property: Reduction of (Nat) Cat risk by reduction of retention in Nat Cat XL

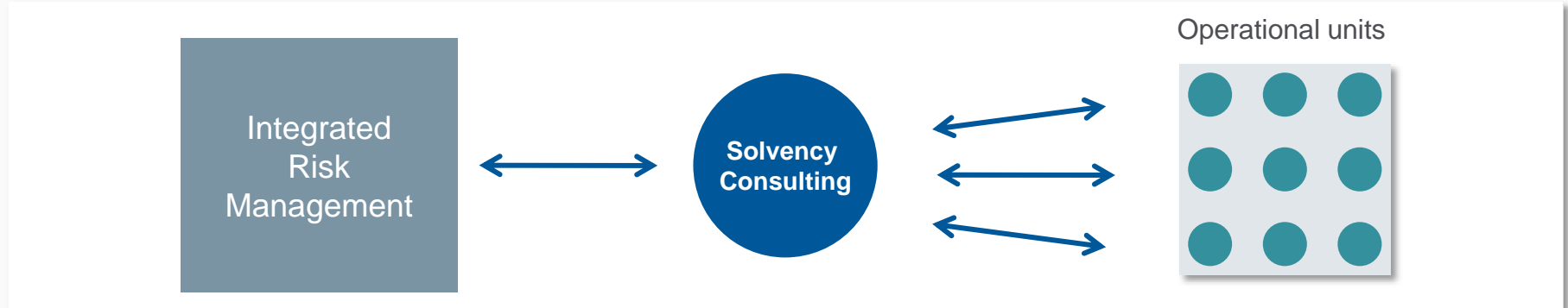
- **Reduction of Solvency Capital Requirement (SCR) with Reinsurance**
 - ✓ Reinsurance is the simplest and most flexible way of managing an economic balance sheet
 - ✓ For long-tail business' reserve risk: START NOW!
 - ✓ For short-tail business: Beginning to think now!

**Solvency II will start on 1 January 2013 -
NOW start preparing your RI structure!**

SOLVENCY CONSULTING:
MUNICH RE – NOT IF, BUT HOW!



Munich Re offers tools that help clients meet Solvency II requirements and generate new business

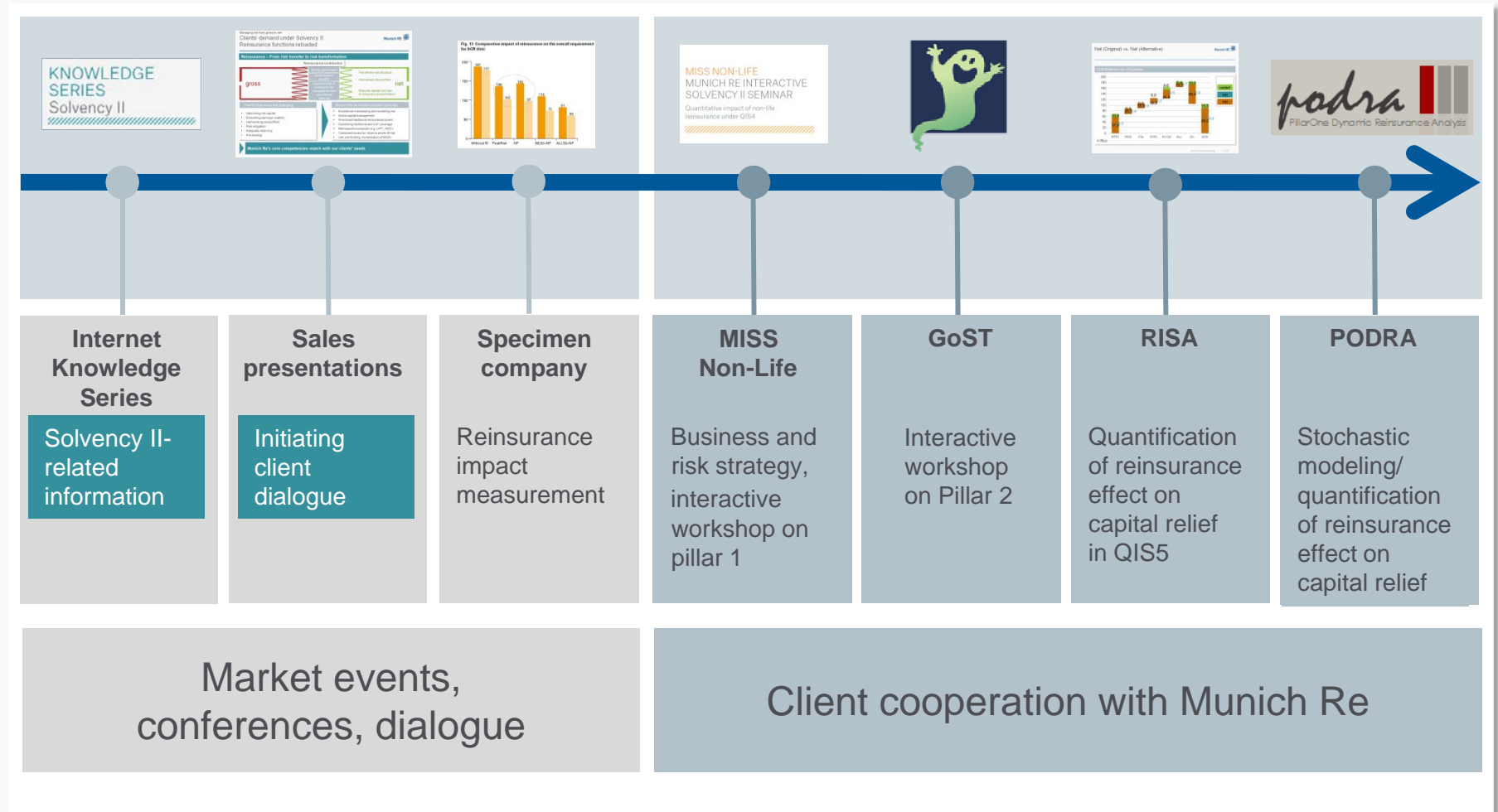


Solvency Consulting is a subdivision of Munich Re's Integrated Risk Management:

- Preparing Munich Re's operational units for the "new world": risk modelling, ERM, ...
- Transparent modelling services, such as PODRA
- In-depth market and industry expertise helps to compensate for any lack of client data
- Expertise from own Solvency II preparations (from QIS5 to sophisticated modelling on a group basis)
- Service products: client-oriented through ongoing contact with operational units
- Combined set-up for life, health and non-life business

Solvency Consulting

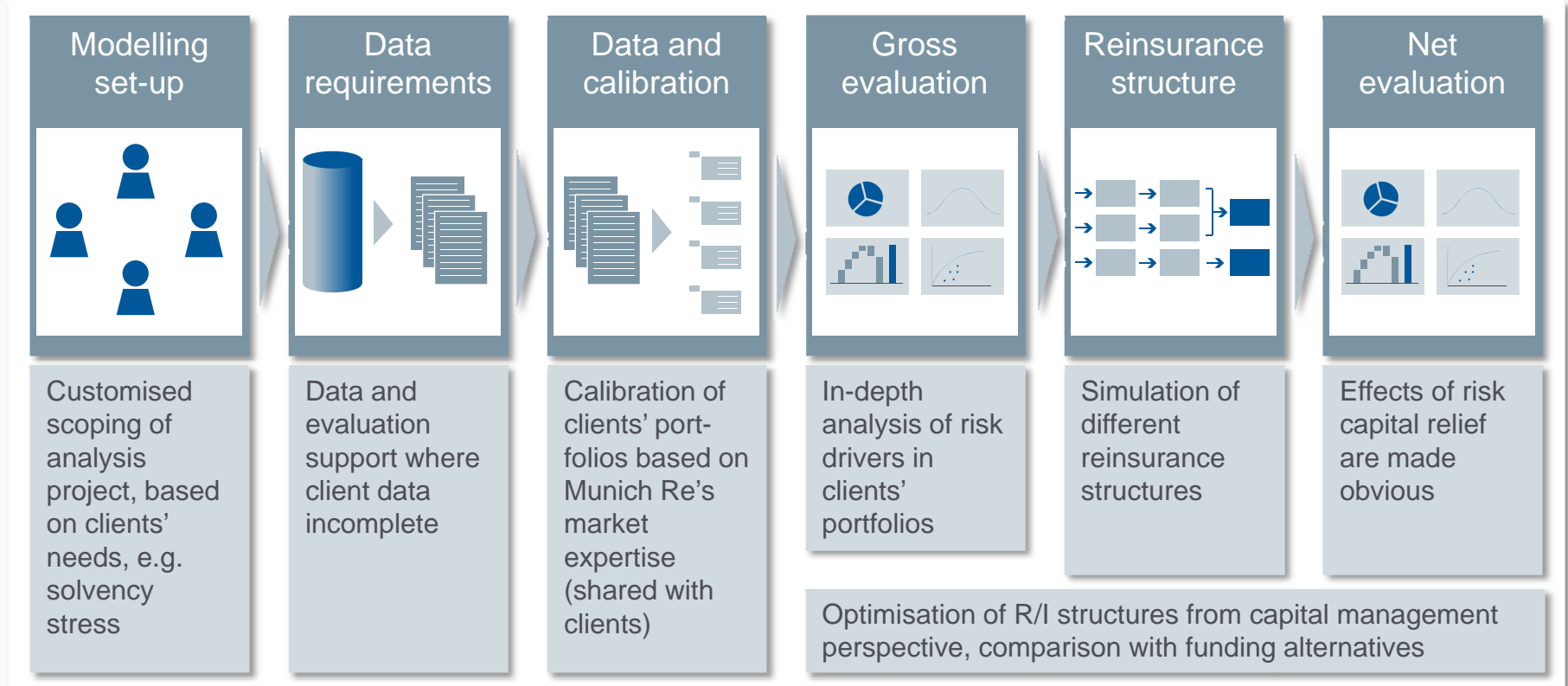
Non-life products and services



PODRA – PillarOne Dynamic Reinsurance Analysis based on open source software www.pillarone.org

- “Whole account” perspective
- Includes correlation assumptions
- Diversification effects
- Gross and net perspective (after R/I)

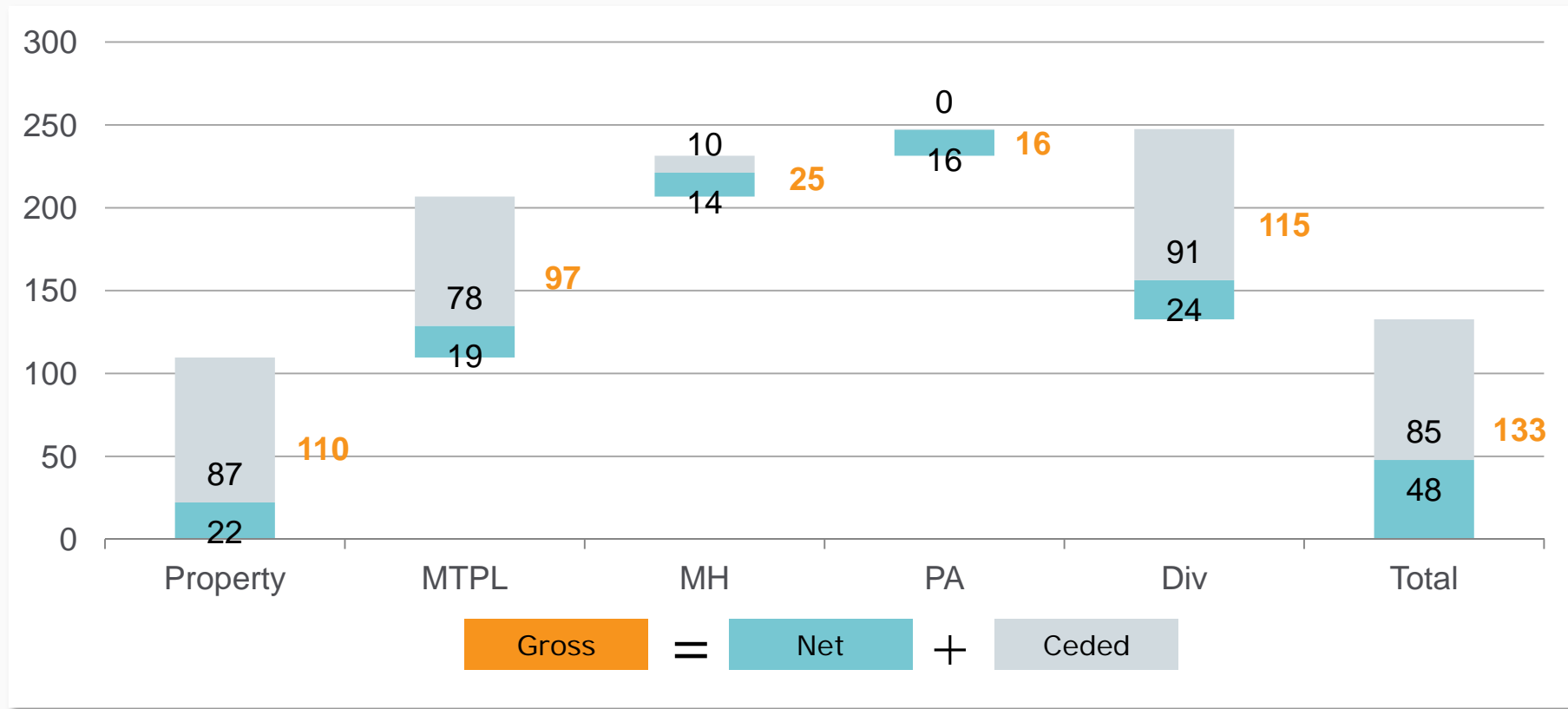
} Segment: SCR non-life



PODRA: Risk mitigation effect of reinsurance

Risk drivers and risk capital relief options

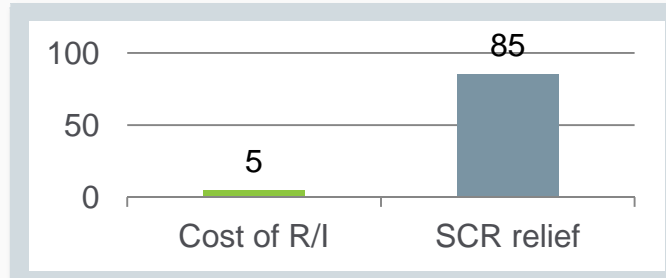
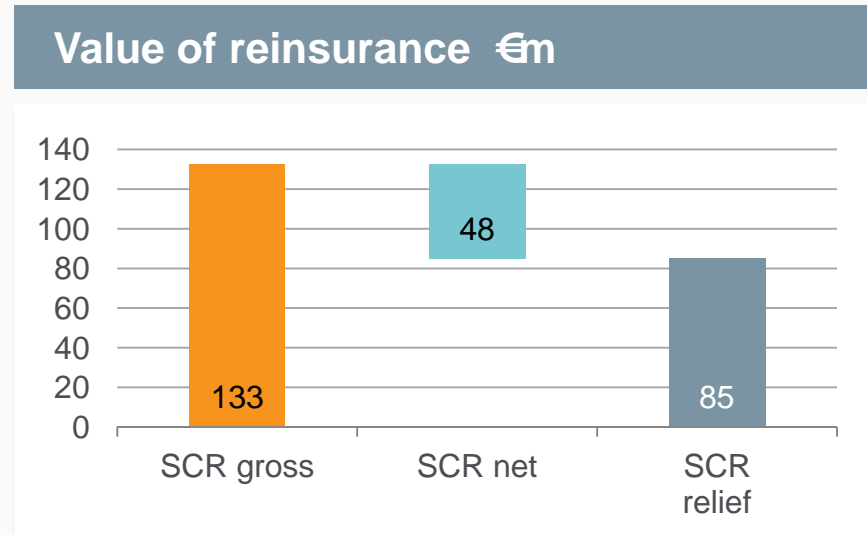
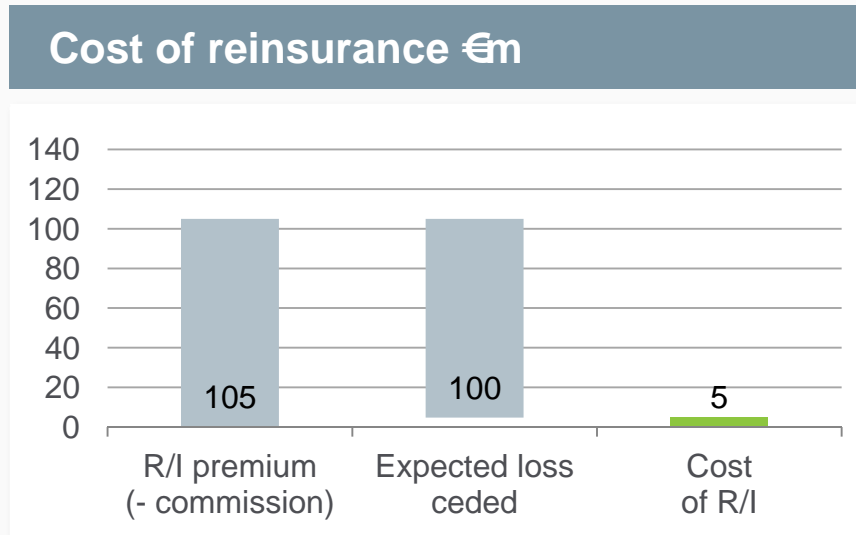
SCR by line of business, gross vs. net in €m



The effects of reinsurance are fully reflected

PODRA: Cost of reinsurance

More or less than a funding alternative?



Capital cost ratio* = $\frac{\text{Cost of R/I}}{\text{SCR relief}} = 6\%$

* No diversification impact from other risks assumed (e.g. ALM)

Compare this ratio with other financial instruments



THANK YOU FOR YOUR ATTENTION.



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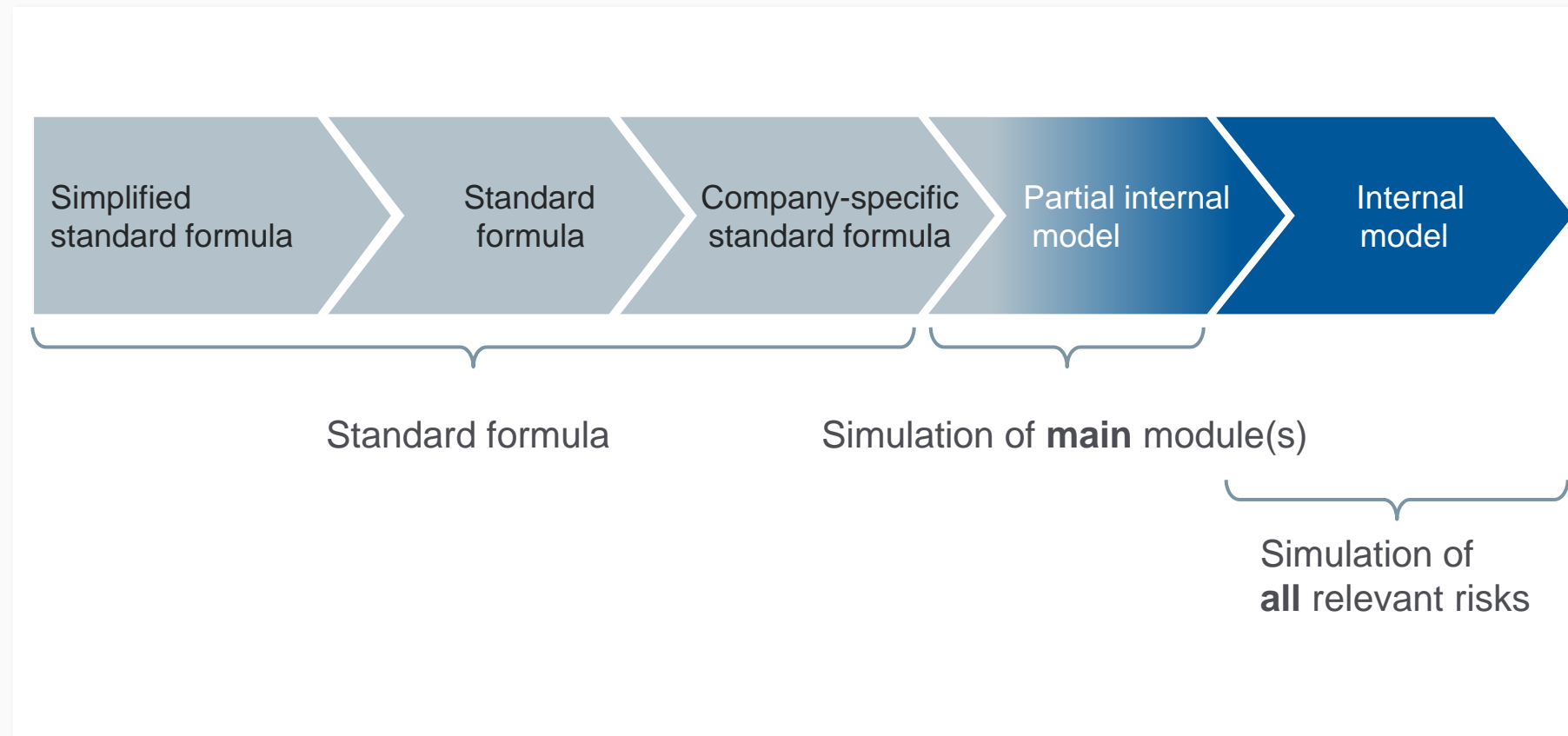
E-mail: nkuschel@munichre.com

Munich RE 

APPENDIX:
Standard formula or (partial) internal model?
Approach determines reinsurance effect



The insurer's model approach follows its business complexity



What happens when reinsurance is to be considered?

Effects of common reinsurance types? Depending on modelling approach

| R/I contract type | Standard formula (QIS5) | (Partial) internal model |
|-------------------------------|---|--|
| Traditional QS/Surplus | <ul style="list-style-type: none"> Reducing SCR for NL_{PR} via “premium volume” High capital relief effect | ● |
| Risk XL | <ul style="list-style-type: none"> Reducing SCR for NL_{PR} via “risk measure” AAL/AAD not directly reflected in QIS5 ● | <ul style="list-style-type: none"> Effect of reinsurance structure (incl. AAL/AAD) is risk-adequately reflected ● |
| Cat XL | <ul style="list-style-type: none"> Reducing SCR for NL_{CAT} ● Risk limiting effects of AAL should be taken into account ● | |
| Stop Loss/Agg. XL | <ul style="list-style-type: none"> NL_{PR}: not reflected directly in QIS5 ● NL_{CAT}: similar to Cat XL ● | |

Relief: ● Low/not recognised ● Medium/partially recognised ● High/fully recognised

Proportional reinsurance: High solvency relief effect
Non-proportional reinsurance: Cannot be directly reflected in QIS5

Effects of specialised reinsurance types? Depending on regulator’s recognition

| R/I contract type | Standard formula (QIS5) | (Partial) internal model |
|---------------------------|--|--|
| Structured QS | <ul style="list-style-type: none"> Recognition as insurance risk mitigation except finite and similar reinsurance As long as recognised, structural elements not reflected directly in QIS5 | <ul style="list-style-type: none"> No general restriction on structural elements Modelling approach must adequately reflect risk-limiting structural elements. |
| Pre-/Post funding | <ul style="list-style-type: none"> Usually categorised as FinRe, therefore no allowance as insurance risk mitigation according to current draft of IM | <ul style="list-style-type: none"> Modelling approach must adequately reflect risk-limiting structural elements. |
| Parametric trigger | <ul style="list-style-type: none"> Recognition as insurance risk mitigation as long as basis risk not “material” Even if “material”, still recognised as long as basis risk is captured in SCR | <ul style="list-style-type: none"> Basis risk should be captured in risk modelling. |

Relief: ● Low/not recognised ● Medium/partially recognised ● High/fully recognised

Standard formula: Finite Re not recognised as insurance risk mitigation
Internal model: Structural elements risk-adequately modelled

Effects of retrospective reinsurance? Depending on regulator's recognition

| R/I contract type | Standard formula (QIS5) | (Partial) internal model |
|-----------------------------------|--|--------------------------|
| Traditional LPT | <ul style="list-style-type: none"> Reducing SCR for NL_{PR} via "reserve volume" | ● |
| Structured LPT | <ul style="list-style-type: none"> Recognition as insurance risk mitigation as long as no "finite" As far as recognised, structural elements not reflected in QIS5 → full solvency relief as traditional LPT | ● |
| Traditional/Structured ADC | <ul style="list-style-type: none"> No reflection in QIS5 unless USP | ● |

Relief: ● Low/not recognised ● Medium/partially recognised ● High/fully recognised

Retrospective covers: Steering the economic balance sheet