OIC RBC 2 development

Parameters and market testing

A presentation to and discussion with the Non-Life insurance industry

By the Office of Insurance Commission and Towers Watson

31 March 2014

OIC

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Agenda for today's meeting

- Introduction
- Proposed changes to the RBC framework
- Asset and non-life insurance parameters
- Initial impact assessment (Non-life insurance only)
- Overview of market testing
- Q & A and next steps

Introduction

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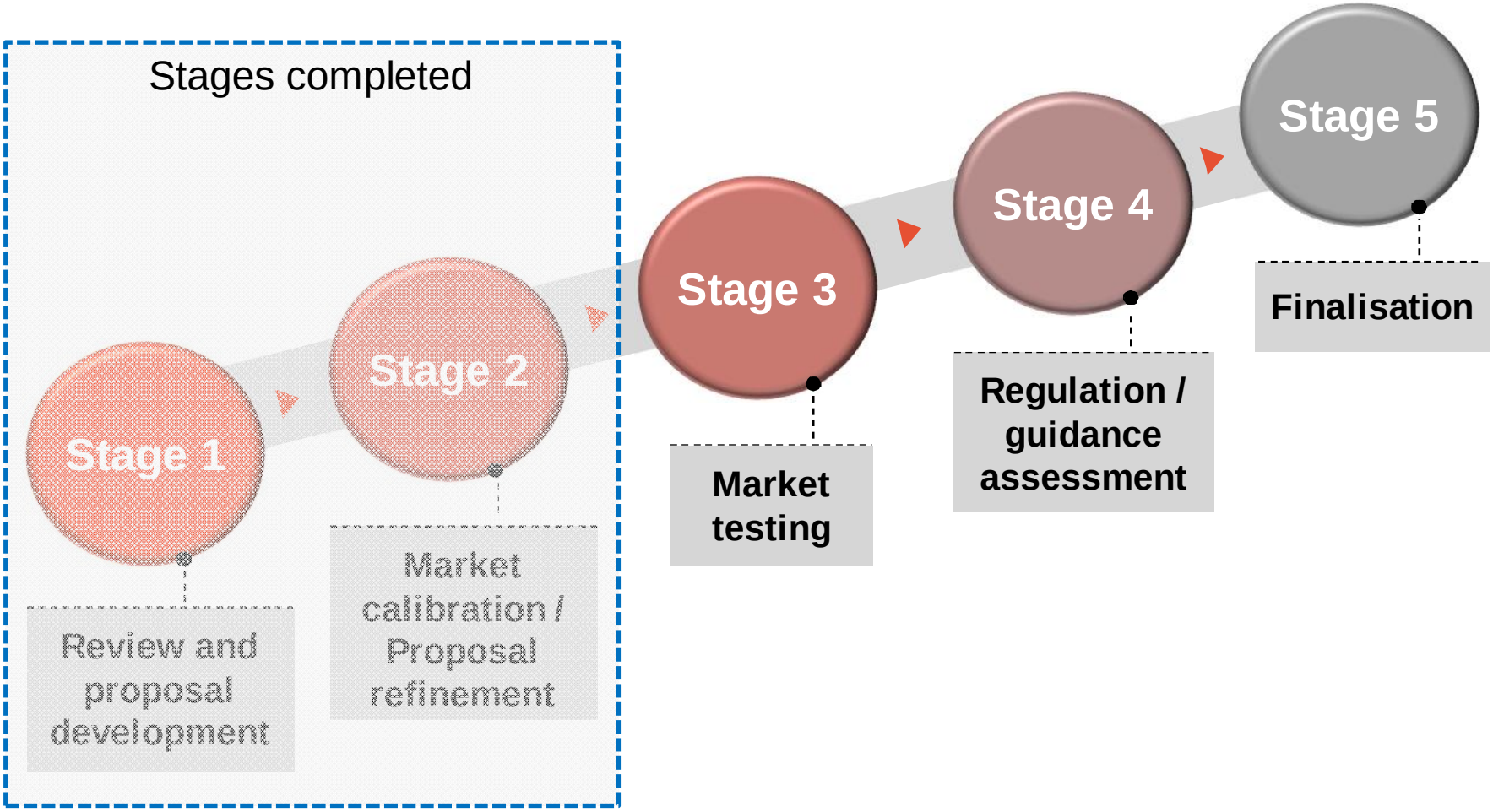
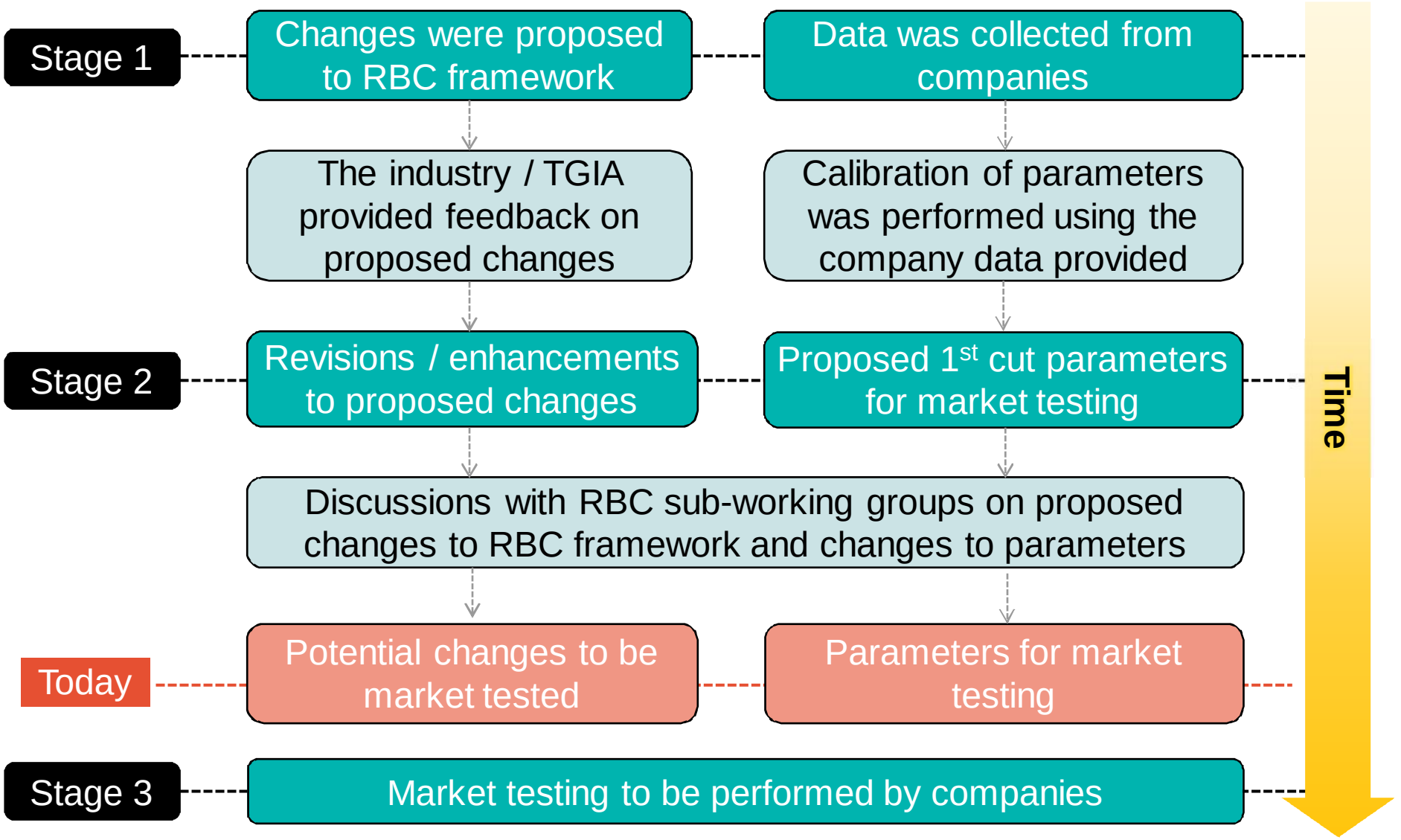
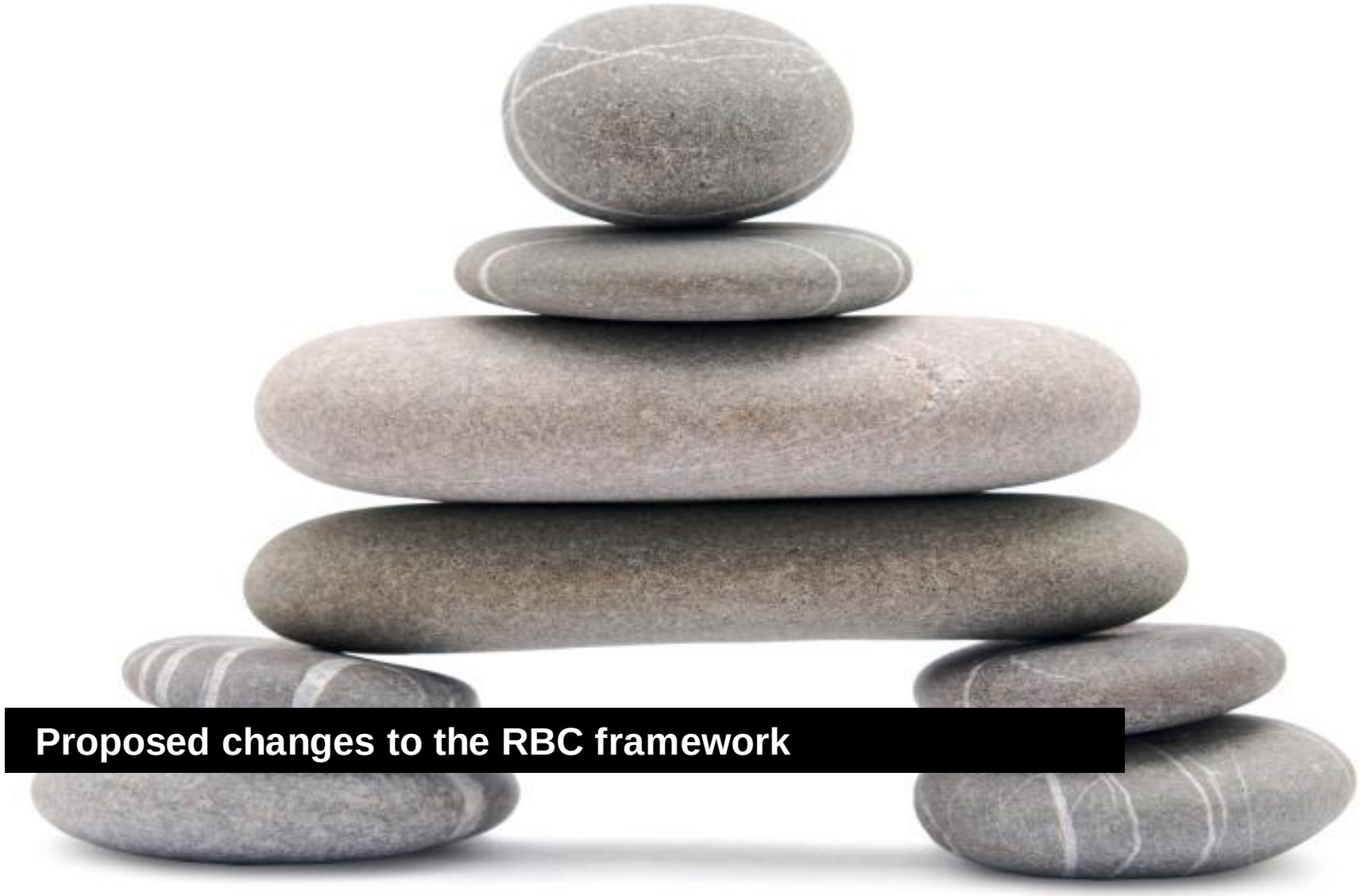
RBC Phase 2 project stages



Brief recap of the project to date





Proposed changes to the RBC framework

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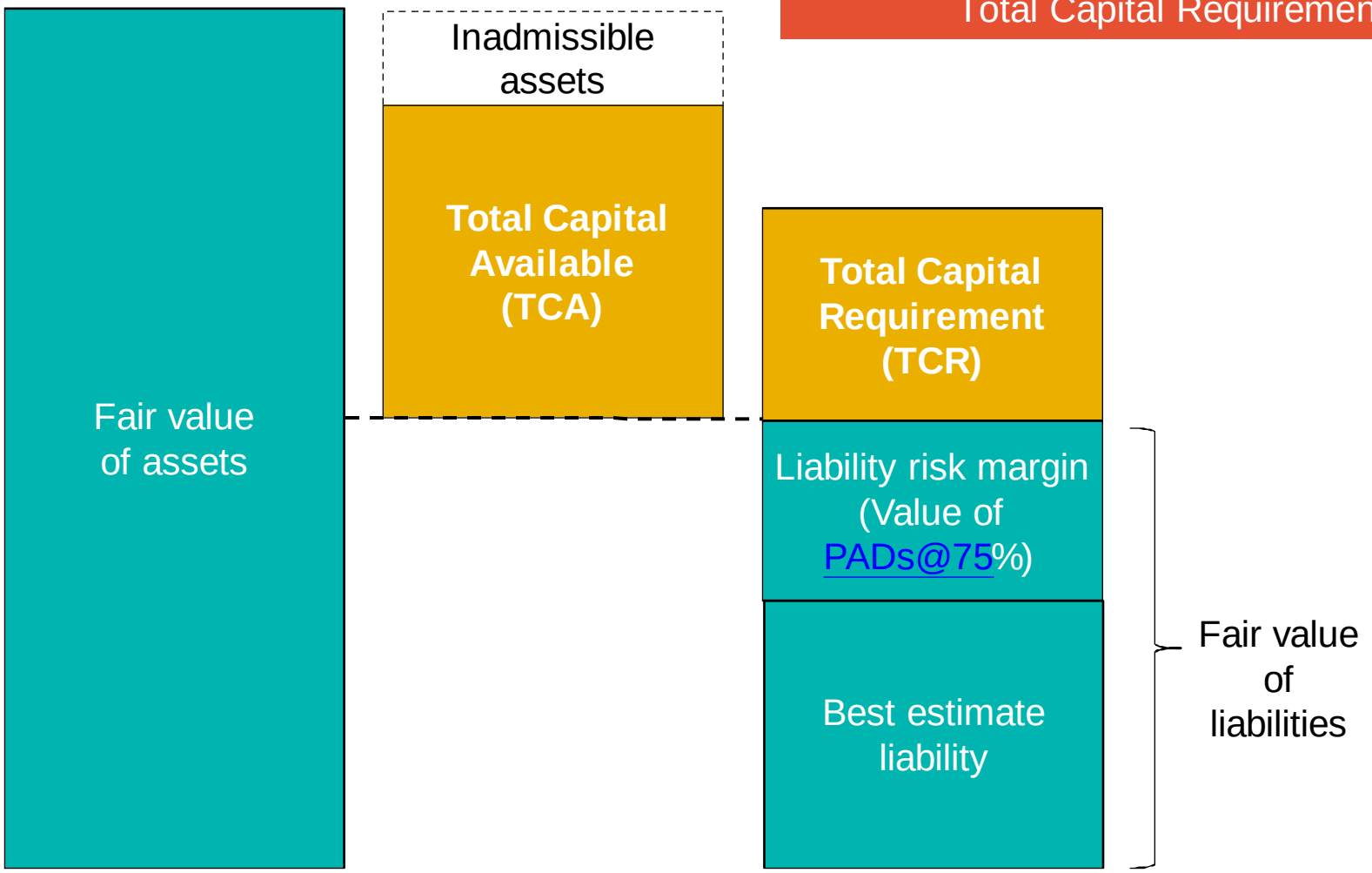
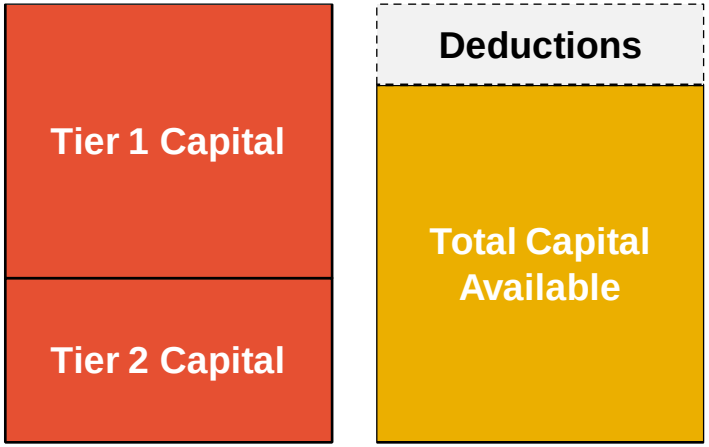
Overview of the RBC framework

$$CAR = \frac{\text{Total Capital Available ("TCA")}}{\text{Total Capital Requirement ("TCR")}}$$

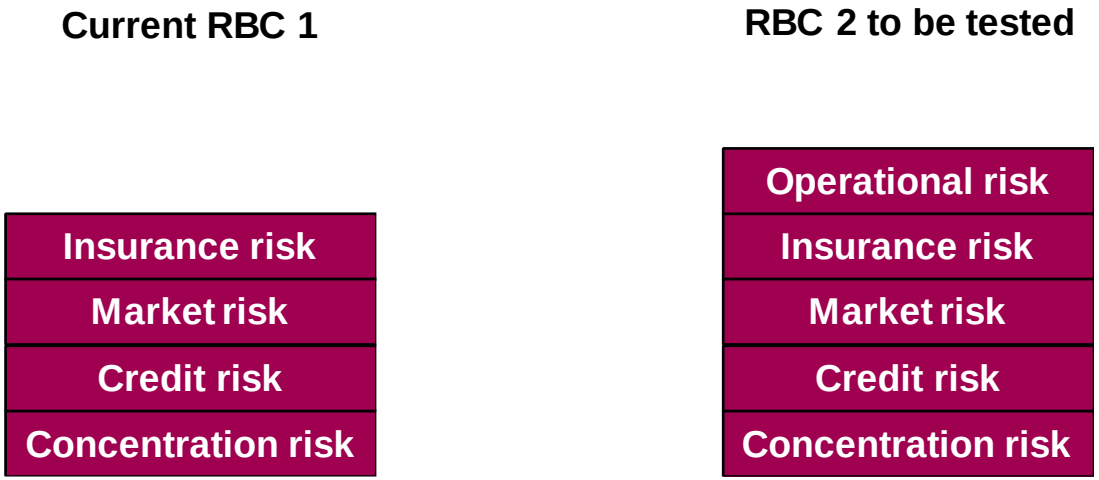


Overview of the RBC framework – TCA and TCR

TCA



TCR



Proposed (potential) changes to RBC framework to be market tested

- This section briefly outlines the key proposed potential changes to the RBC framework to be market tested, namely:

ID	Proposed changes to the RBC framework
1	Calculation of insurance risk and new risk charges
2	Testing insurance (premium) risk under two premium liability bases
3	Inclusion of diversification between lines of business for non-life liabilities
4	Inclusion of catastrophe risk charge
5	Inclusion of investments in associates and subsidiaries in TCA
6	Calculation of exchange rate risk
7	Inclusion of an operational risk charge
8	Inclusion of diversification between asset, insurance and operational risks

Potential changes to RBC framework – ID 1: Calculation of short-term reserves and risk charges

- The market testing will include calculation of the short-term reserves on both of the following approaches:
  - Current RBC 1 approach (i.e. using URR as the driver for risk charges); and
  - Proposed RBC 2 approach (i.e. using UPR as the driver for risk charges)

Formula for short-term reserves and risk charges		
	Current RBC 1	**Proposed RBC 2**
Short-term reserve calculation		
Premium	Max{UPR, **URR** x (1 + PAD $_{premium}$ @75%)}	Max{UPR, URR + **UPR** x PAD $_{premium}$ @75%}
Claims	Unpaid claims x (1 + PAD $_{claims}$ @75%)	*(no change)*
Short-term premium and catastrophe risk charge calculation		
Premium	Max{ 0, **URR** x (PAD $_{premium}$ @95% - PAD $_{premium}$ @75%) – Max{ 0, UPR – Premium reserve} }	Max{ 0, **UPR** x (PAD $_{premium}$ @95% - PAD $_{premium}$ @75%) – Max{ 0, UPR – Premium reserve} }
Claims	Unpaid claims x (PAD $_{claims}$ @95% - PAD $_{claims}$ @75%)	*(no change)*
Catastrophe	n/a	**UPR** x PAD $_{catastrophe}$@95%

Potential changes to RBC framework – ID 2: Testing insurance (premium) risk under two premium liability bases

- As part of the marketing testing exercise, we shall also test the RBC figures with Proposed RBC 2 approach but URR as a measure for Premium risk charge.

Formula for short-term reserves and risk charges		
	Current RBC 1	**Proposed RBC 2 (URR basis)**
Short-term reserve calculation		
Premium	Max{UPR, **URR** x (1 + $PAD_{premium}$ @75%)}	Max{UPR, **URR** x (1 + $PAD_{premium}$ @75%)}
Claims	Unpaid claims x (1 + PAD_{claims} @75%)	*(no change)*
Short-term premium and catastrophe risk charge calculation		
Premium	Max{ 0, **URR** x ($PAD_{premium}$ @95% - $PAD_{premium}$ @75%) – Max{ 0, UPR – Premium reserve} }	Max{ 0, **URR** x ($PAD_{premium}$ @95% - $PAD_{premium}$ @75%) – Max{ 0, UPR – Premium reserve} }
Claims	Unpaid claims x (PAD_{claims} @95% - PAD_{claims} @75%)	*(no change)*
Catastrophe	n/a	**URR** x $PAD_{catastrophe}$@95%

Potential changes to RBC framework – ID 3: Diversification between lines of business for Non-life liabilities

- It is proposed that a diversification benefit between lines of business be included for the non-life short-term business.
- This diversification benefit is calculated by applying a correlation matrix to reflect the expected correlations between lines of business.

Class	Fire	Marine Hull	Marine Cargo	Compulsory Motor	Compulsory Motorcycle	Voluntary Motor	Industrial All Risks	Liability	Engineering	Aviation	PA and Health	Property	Financial Lines	Travel Insurance	Other Classes
Fire															
Marine Hull	50%														
Marine Cargo	50%	75%													
Compulsory Motor	25%	25%	25%												
Compulsory Motorcy	25%	25%	25%	75%											
Voluntary Motor	25%	25%	50%	75%	75%										
Industrial All Risks	50%	50%	50%	25%	25%	25%									
Liability	15%	15%	15%	15%	15%	15%	15%								
Engineering	50%	50%	25%	25%	25%	25%	75%	25%							
Aviation	25%	50%	50%	25%	25%	25%	25%	25%	25%						
paand Health	15%	15%	15%	50%	50%	50%	15%	15%	15%	15%					
Property	75%	25%	25%	25%	25%	25%	75%	25%	75%	50%	15%				
Financial Lines	15%	15%	15%	15%	15%	15%	15%	75%	15%	15%	15%	25%			
Travel Insurance	25%	25%	25%	50%	50%	50%	25%	25%	25%	50%	50%	50%	25%		
Other Classes	25%	25%	25%	25%	25%	25%	25%	50%	25%	25%	25%	25%	50%	25%	

Potential changes to RBC framework – ID 4: Inclusion of catastrophe risk charge

- The market testing will include catastrophe risk charge using the following approaches:
  - Current RBC 1 approach does not include catastrophe risk charge; and
  - Proposed RBC 2 approach (i.e. using UPR and URR as the driver for risk charges)

Formula for short-term reserves and risk charges		
	Current RBC 1	**Proposed RBC 2**
Catastrophe risk charge calculation (UPR and URR bases)		
Catastrophe	n/a	**UPR** x PAD $_{catastrophe}$@95%
Catastrophe	n/a	**URR** x PAD $_{catastrophe}$@95%

Potential changes to RBC framework – ID 5: Investments in subsidiaries and associates

- It is proposed that the total capital available ("TCA") recognises the value of investments in associates and subsidiaries.
- The value of the investment will be subject to the following deductions:
  - Intangibles
  - Minimum required regulatory capital

- "Intangibles" = same definition as under RBC 1
- "Minimum regulatory capital" = 140% x TCR

Potential changes to RBC framework – ID 6: Calculation of exchange rate risk

- It is proposed that the calculation of exchange rate risk be changed to be based on the (absolute) net exposure of each currency.
- An example is shown below:

	Exposure			Calculation details
Currency	**Long position**	**Short position**	**Net (absolute)**	
USD	1,000	300	700	*= 1,000 - 300*
SGD	200	700	500	*= abs {200 - 700}*
MYR	500	500	0	*= 500 - 500*
Total			**1,200**	
Risk charge applicable			10%	
Risk charge amount			**120**	*= 1,200 x 10%*

Potential changes to RBC framework – ID 7: Inclusion of operational risk charge

- It is proposed that the impact of including an operational risk charge be assessed. The operational risk charge calculations to be tested are based on simplified versions of the Solvency II and Australian approaches.

Market test approach 1: Based on simplified Solvency II approach:

$$Risk\ charge = Max\{Premium\ charge, Reserve\ charge\}$$

Where:

$$Premium\ charge = 4\% \times Earned\ premium\ for\ 12\ months$$
$$Reserve\ charge = 0.45\% \times Max\{0, Reserve_{Total}\}$$

Market test approach 2: Based on simplified Australia approach:

$$Operational\ risk\ charge = 3\% \times \mathrm{Max}\{Earned\ premium, Reserves\}$$

Potential changes to RBC framework – ID 8: Inclusion of diversification between asset, insurance and operational risks

- The following correlation matrix between asset, insurance and operational risks is proposed for market testing for all target sufficiency levels:

Correlation matrix for asset, insurance and operational risks			
	Asset risk	**Insurance risk**	**Operational risk**
Asset risk	100%	25%	25%
Insurance risk	25%	100%	25%
Operational risk	25%	25%	100%

Proposed parameters for asset and non-life insurance risks

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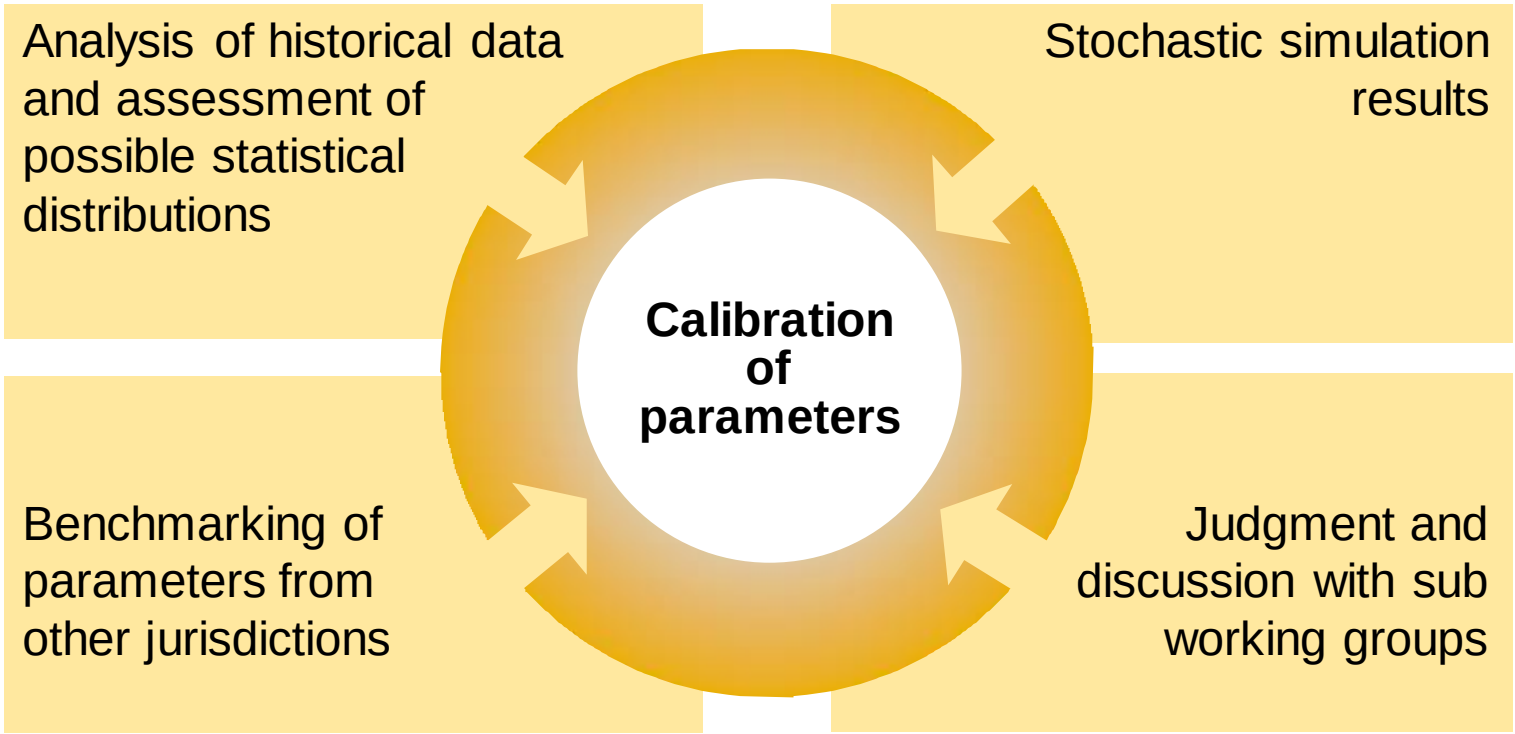
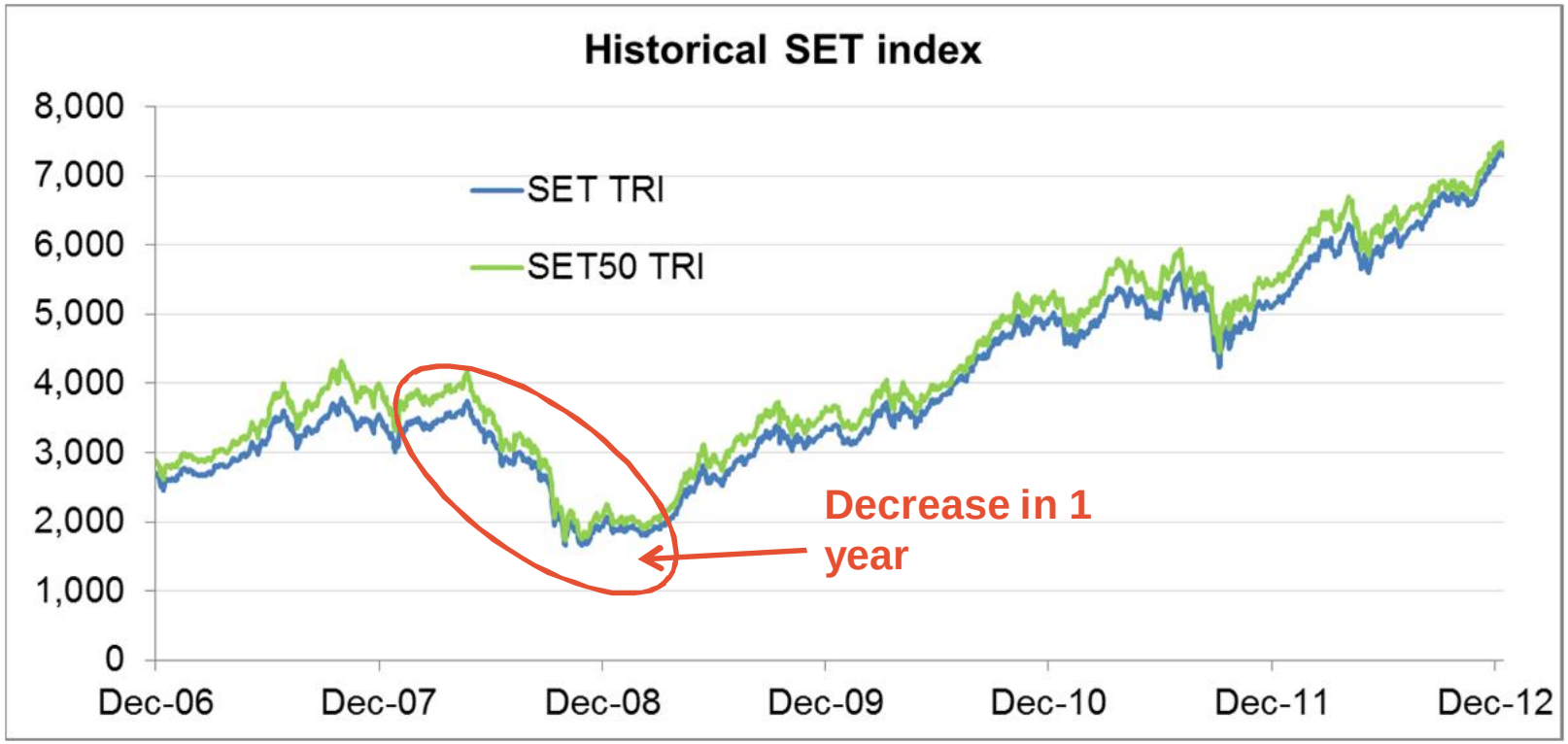
Calibration of proposed parameters

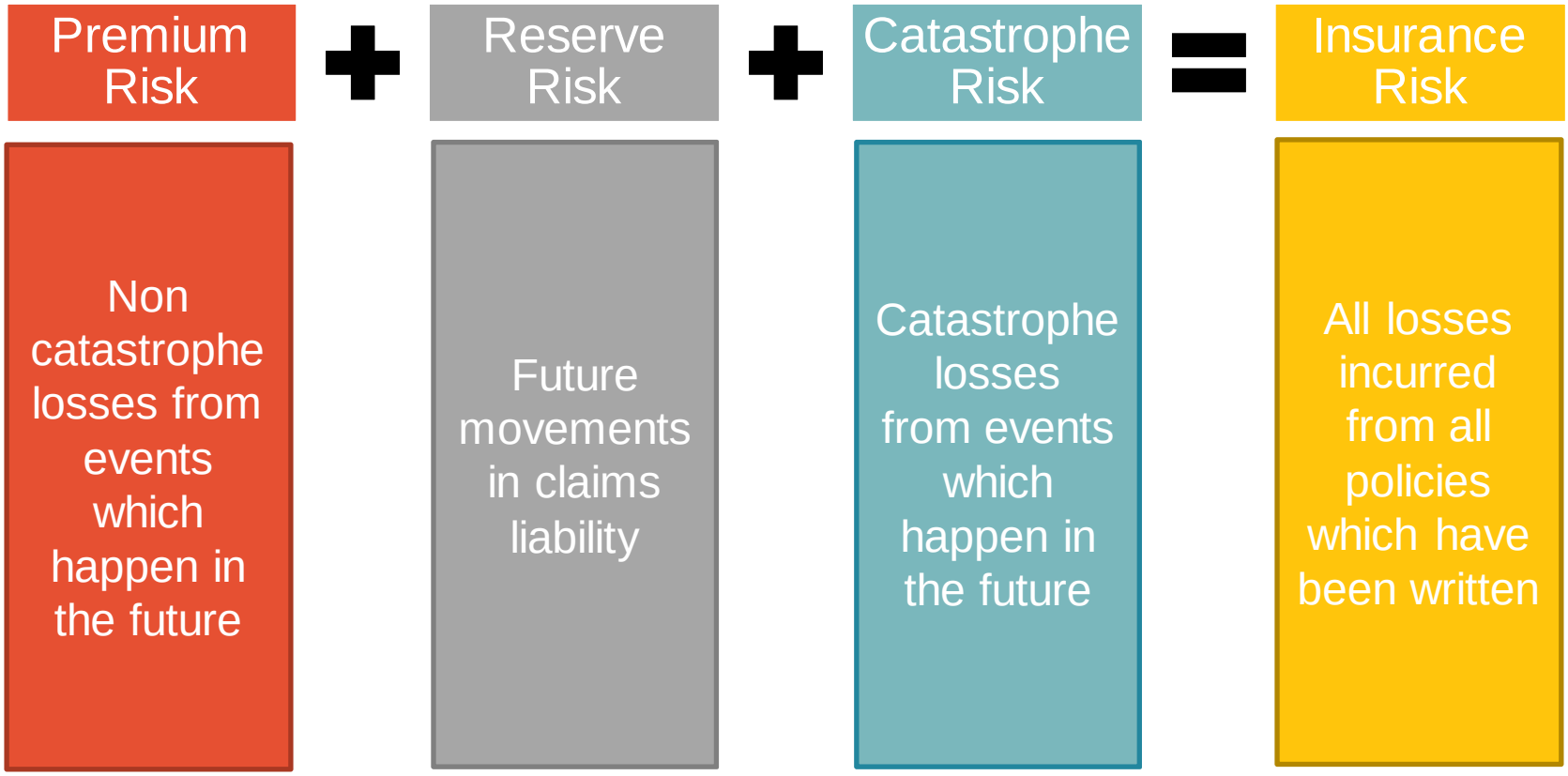


Calibration of proposed parameters – Asset risks

- The calibration of asset risks has been based on **historical data** and **stochastic simulations** of market movements over a **one-year** time period.
- An **example** of the historical equity market movement is shown below:



Calibration of proposed parameters – Insurance Risks

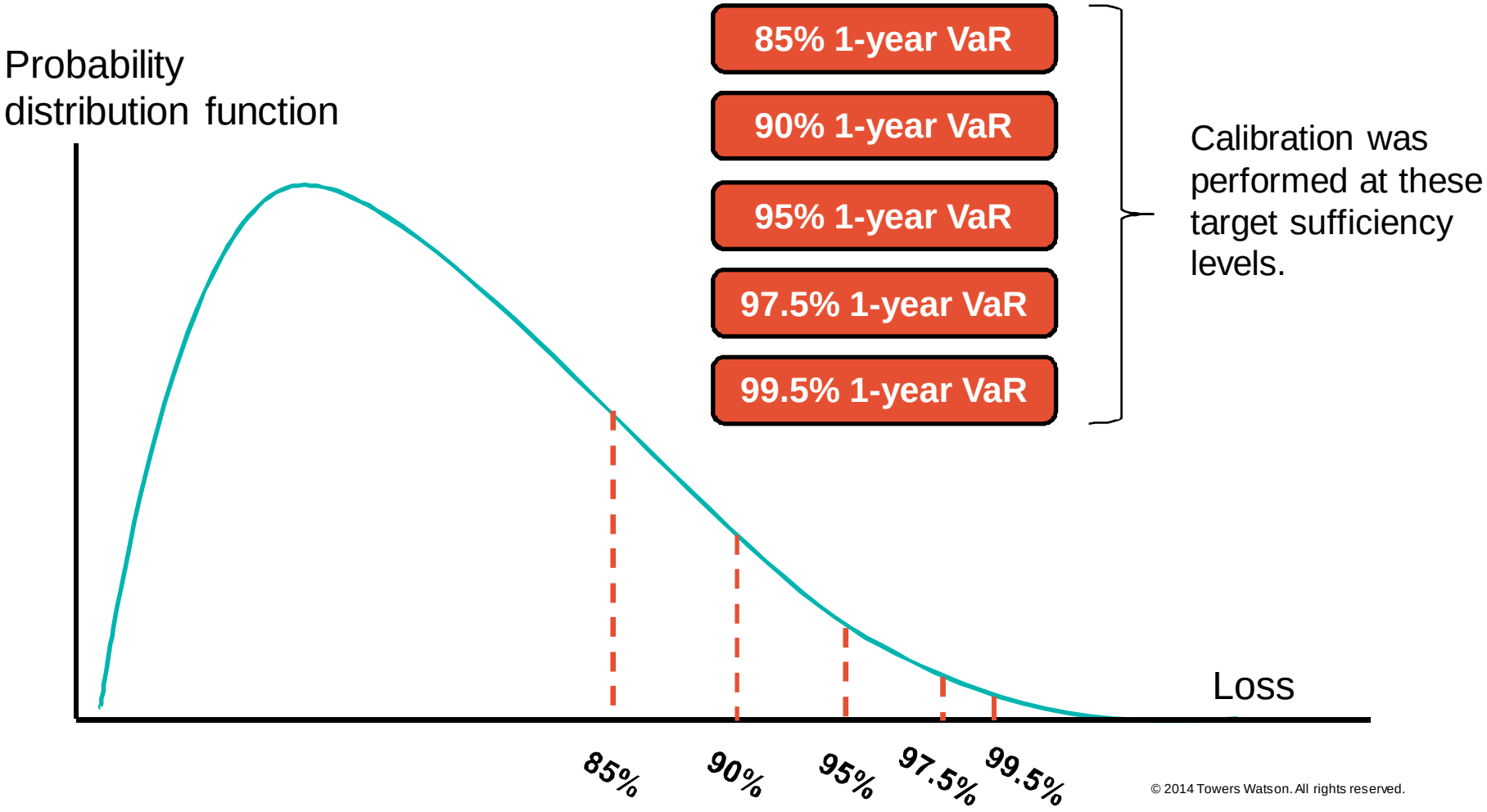


Calibration of proposed parameters – Insurance Risks

Risk	Calibration Approach	Data Used
Premium	Measurement of the variability in the historical annual ultimate loss ratios by accident year	RBC2 submissions from individual companies
Reserve	Measurement of the variability in the historical claims liability changes by calendar year	RBC1 triangles from individual companies / RBC2 submission
Catastrophe	Simple single catastrophe event scenario	October 2011 flood losses

Calibration of proposed parameters – Target sufficiency levels

- The parameters for market testing have been calibrated under a range of target sufficiency levels:



Proposed parameters

- Some examples of the proposed parameters are shown in the next three slides.
- A summary of parameters can also be found in the appendices to this document.

Examples of proposed parameters – Market risk charges / stresses

Parameters for market testing (Equity risk)							
	Risk category	Current RBC 1	Proposed				
			@85%	@90%	@95%	@97.5%	@99.5%
(1)	Listed on the Thai stock exchanges SET and MAI	16%	20%	25%	35%	45%	50%
(2)	Listed on the main board of other approved stock exchanges	16%	20%	25%	35%	45%	50%
(3)	Equity investments in subsidiaries and associates, except (4) below	0%	25%	30%	40%	50%	55%
(4)	Investment in subsidiaries or associates licensed to conduct insurance business	20%	25%	30%	40%	50%	55%
(5)	Other equity not included in (1)-(4)	20%	25%	30%	40%	50%	55%

Examples of proposed parameters – Interest risk charges / stresses

Proposed interest rate charges (for Non-Life insurance only)						
Term to maturity (TTM)	RBC1	Proposed (at various sufficiency levels)				
		85%	90%	95%	97.5%	99.5%
TTM <= 1 month	0.00%	0.0%	0.0%	0.0%	0.0%	0.0%
1 month < TTM <= 6 months	0.25%	0.1%	0.1%	0.2%	0.2%	0.3%
6 months < TTM <= 1 year	0.50%	0.3%	0.3%	0.4%	0.5%	0.7%
1 year < TTM <= 2 years	1.00%	0.6%	0.7%	0.9%	1.0%	1.3%
2 years < TTM <= 3 years	1.85%	1.6%	1.8%	2.4%	2.9%	3.6%
3 years < TTM <= 5 years	3.00%	3.0%	3.5%	4.6%	5.6%	6.9%
5 years < TTM <= 10 years	4.50%	5.0%	6.0%	7.9%	9.8%	11.5%
10 years < TTM <= 15 years	6.00%	6.4%	8.0%	11.0%	13.3%	14.7%
15 years < TTM <= 20 years	7.00%	7.2%	8.7%	12.5%	14.3%	15.5%
TTM > 20 years	8.00%	7.7%	8.9%	13.9%	15.6%	17.7%

Examples of proposed parameters – Non-Life insurance Risk charge (UPR basis)

Business class	Risk	Current		Proposed (at various sufficiency levels)					
		75%	95%	75%	85%	90%	95%	97.5%	99.5%
Fire	Premium	25%	72%	15%	25%	33%	45%	55%	75%
	Claims	25%	72%	15%	25%	33%	45%	55%	75%
	Catastrophe	n/a	n/a	9%	15%	20%	27%	33%	45%
Marine Hull	Premium	30%	89%	12%	20%	26%	36%	44%	60%
	Claims	30%	89%	12%	20%	26%	36%	44%	60%
Marine Cargo	Premium	20%	56%	12%	20%	26%	36%	44%	60%
	Claims	20%	56%	12%	20%	26%	36%	44%	60%
Compulsory Motor	Premium	15%	41%	11%	18%	23%	32%	39%	53%
	Claims	15%	41%	12%	20%	26%	36%	44%	60%
Compulsory Motorcycle	Premium	8%	21%	8%	14%	18%	24%	30%	41%
	Claims	8%	21%	8%	13%	17%	23%	29%	39%
Voluntary Motor	Premium	8%	21%	8%	14%	18%	24%	30%	41%
	Claims	8%	21%	8%	13%	17%	23%	29%	39%
Industrial All Risks	Premium	25%	72%	24%	40%	52%	72%	88%	120%
	Claims	25%	72%	21%	35%	46%	63%	77%	105%
	Catastrophe	n/a	n/a	15%	25%	33%	45%	55%	75%

Initial impact assessment

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Initial impact assessment – Overview

- Based on the RBC forms, an initial impact assessment has been performed on the proposed parameters at various target sufficiency levels.
- The impact testing results for four example non-life insurance companies are presented in this section, distinguished primarily by their business mix.
- Note that the impact assessments aim to capture the key impact changes at a high-level, however specific changes may vary between individual companies.

Initial impact assessment – Changes assessed

- The following proposed changes to the framework were assessed:
  - Changes to insurance risk parameters
  - Inclusion of catastrophe risk
  - Changes to market risk parameters (based on 100% cash holding)
  - Inclusion of an operational risk charge
- The following proposed changes to parameters were assessed:
  - Market risk charges
  - Credit risk charges
  - Asset correlation
  - Insurance risk charges
  - Diversification between business classes
  - Diversification between asset, insurance and operational risk charges.

Summary of Initial Impact Testing Results

Step	Testing scenario	Company Description			
		A Motor	B Property	C Liability	D Fire and Motor
1	**RBC1 95%ile**	**556%**	**358%**	**340%**	**456%**
2	RBC Risk Parameters	707%	563%	592%	804%
3	Include Catastrophe risk	707%	356%	556%	613%
4	Include Other risks	548%	311%	454%	490%
5	RBC2 95%Ile	734%	367%	580%	639%
6	RBC2 97.5%ile	559%	276%	417%	484%
7	**RBC2 99.5%ile**	**375%**	**183%**	**265%**	**323%**

Results of four generic companies with different business mixes

Breakdown of impacts - Company A (Motor business)

Step #	Description	Premium	Reserve	Cat	Credit	Market	Operational	Total Risk Charges	Financial Resources	CAR
1	**RBC1 95%ile**	**202**	**240**	**0**	**36**	**62**	**0**	**540**	**3,000**	**556%**
2	RBC2 Risk Parameters	155	186	0	25	62	0	428	3,025	**707%**
3	Include Catastrophe risk	155	186	0	25	62	0	428	3,025	**707%**
4	Include Other risks	155	186	0	25	86	35	552	3,025	**548%**
5	RBC2 95%Ile	155	186	0	25	86	35	412	3,025	**734%**
6	RBC2 97.5%ile	227	249	0	29	86	60	541	3,025	**559%**
7	**RBC2 99.5%ile**	**370**	**373**	**0**	**61**	**86**	**100**	**807**	**3,025**	**375%**

Step Impact	**#1 -> #2**	-23%	-22%	0%	-31%	0%	0%	-21%	1%	27%
	#2 -> #3	0%	0%	0%	0%	0%	0%	0%	0%	0%
	#3 -> #4	0%	0%	0%	0%	39%	0%	29%	0%	-23%
	#4 -> #5	0%	0%	0%	0%	0%	0%	-25%	0%	34%
	#5 -> #6	46%	33%	0%	19%	0%	71%	31%	0%	-24%
	#6 -> #7	63%	50%	0%	108%	0%	67%	49%	0%	-33%

Business Split	
Fire (%)	0%
Marine and cargo (%)	0%
Automobile (%)	90%
Miscellaneous (%)	10%

Company financials	
Net earned premium	2,500
Total UPR	1,250
Total URR	1,063
Unpaid claims	1,000

- Premium risk and reserve risk smaller in RBC2 than RBC1
- Overall, the CAR increases at 95%ile with move to RBC2

Note: RBC2 premium risk is calculated using UPR as an exposure measure

Breakdown of impacts - Company B (Property business)

Step #	Description	Premium	Reserve	Cat	Credit	Market	Operational	Total Risk Charges	Financial Resources	CAR
1	**RBC1 95%ile**	**274**	**467**	**0**	**36**	**62**	**0**	**839**	**3,000**	**358%**
2	RBC2 Risk Parameters	181	283	0	25	62	0	550	3,096	**563%**
3	Include Catastrophe risk	181	283	321	25	62	0	870	3,096	**356%**
4	Include Other risks	181	283	321	25	86	35	994	3,096	**311%**
5	RBC2 95%Ile	181	283	321	25	86	35	843	3,096	**367%**
6	RBC2 97.5%ile	298	377	392	29	86	60	1,124	3,096	**276%**
7	**RBC2 99.5%ile**	**534**	**565**	**534**	**61**	**86**	**100**	**1,691**	**3,096**	**183%**

Step Impact	**#1 -> #2**	-34%	-40%	0%	-31%	0%	0%	-34%	3%	57%
	#2 -> #3	0%	0%	0%	0%	0%	0%	58%	0%	-37%
	#3 -> #4	0%	0%	0%	0%	39%	0%	14%	0%	-13%
	#4 -> #5	0%	0%	0%	0%	0%	0%	-15%	0%	18%
	#5 -> #6	65%	33%	22%	19%	0%	71%	33%	0%	-25%
	#6 -> #7	79%	50%	36%	108%	0%	67%	51%	0%	-34%

Business Split	
Fire (%)	90%
Marine and cargo (%)	0%
Automobile (%)	0%
Miscellaneous (%)	10%

Company financials	
Net earned premium	2,500
Total UPR	1,250
Total URR	888
Unpaid claims	1,000

- Introduction of catastrophe risk significant for property
- Overall, the CAR is relatively flat at 95%ile with move to RBC2

Note: RBC2 premium risk is calculated using UPR as an exposure measure

Breakdown of impacts - Company C (Liability business)

Step #	Description	Premium	Reserve	Cat	Credit	Market	Operational	Total Risk Charges	Financial Resources	CAR
1	**RBC1 95%ile**	**278**	**508**	**0**	**36**	**62**	**0**	**884**	**3,000**	**340%**
2	RBC2 Risk Parameters	141	292	0	25	62	0	519	3,073	**592%**
3	Include Catastrophe risk	141	292	34	25	62	0	553	3,073	**556%**
4	Include Other risks	141	292	34	25	86	35	677	3,073	**454%**
5	RBC2 95%Ile	141	292	34	25	86	35	530	3,073	**580%**
6	RBC2 97.5%ile	247	389	41	29	86	60	737	3,073	**417%**
7	**RBC2 99.5%ile**	**460**	**583**	**56**	**61**	**86**	**100**	**1,159**	**3,073**	**265%**

Step Impact	**#1 -> #2**	-49%	-43%	0%	-31%	0%	0%	-41%	2%	74%
	#2 -> #3	0%	0%	0%	0%	0%	0%	7%	0%	-6%
	#3 -> #4	0%	0%	0%	0%	39%	0%	22%	0%	-18%
	#4 -> #5	0%	0%	0%	0%	0%	0%	-22%	0%	28%
	#5 -> #6	75%	33%	22%	19%	0%	71%	39%	0%	-28%
	#6 -> #7	86%	50%	36%	108%	0%	67%	57%	0%	-36%

Business Split	
Fire (%)	10%
Marine and cargo (%)	0%
Automobile (%)	0%
Miscellaneous (%)	90%

Company financials	
Net earned premium	2,500
Total UPR	1,250
Total URR	863
Unpaid claims	1,000

- Large drops in the premium risk and reserve risk in RBC1 and RBC2
- RBC1 CAR is lower than 97.5%ile RBC2 CAR

Note: RBC2 premium risk is calculated using UPR as an exposure measure

Breakdown of impacts - Company D (Fire & Motor business)

Step #	Description	Premium	Reserve	Cat	Credit	Market	Operational	Total Risk Charges	Financial Resources	CAR
1	**RBC1 95%ile**	**232**	**329**	**0**	**36**	**62**	**0**	**658**	**3,000**	**456%**
2	RBC2 Risk Parameters	116	178	0	25	62	0	379	3,049	**804%**
3	Include Catastrophe risk	116	178	118	25	62	0	498	3,049	**613%**
4	Include Other risks	116	178	118	25	86	35	622	3,049	**490%**
5	RBC2 95%Ile	116	178	118	25	86	35	477	3,049	**639%**
6	RBC2 97.5%ile	187	237	144	29	86	60	630	3,049	**484%**
7	**RBC2 99.5%ile**	**329**	**355**	**197**	**61**	**86**	**100**	**943**	**3,049**	**323%**

Step Impact	**#1 -> #2**	-50%	-46%	0%	-31%	0%	0%	-42%	2%	76%
	#2 -> #3	0%	0%	0%	0%	0%	0%	31%	0%	-24%
	#3 -> #4	0%	0%	0%	0%	39%	0%	25%	0%	-20%
	#4 -> #5	0%	0%	0%	0%	0%	0%	-23%	0%	30%
	#5 -> #6	62%	33%	22%	19%	0%	71%	32%	0%	-24%
	#6 -> #7	76%	50%	36%	108%	0%	67%	50%	0%	-33%

Business Split	
Fire (%)	30%
Marine and cargo (%)	0%
Automobile (%)	47%
Miscellaneous (%)	23%

Company financials	
Net earned premium	2,500
Total UPR	1,250
Total URR	996
Unpaid claims	1,000

- Mix of Company A and Company B
- RBC1 CAR is similar to 97.5%ile RBC2 CAR

Note: RBC2 premium risk is calculated using UPR as an exposure measure

Overview of market testing

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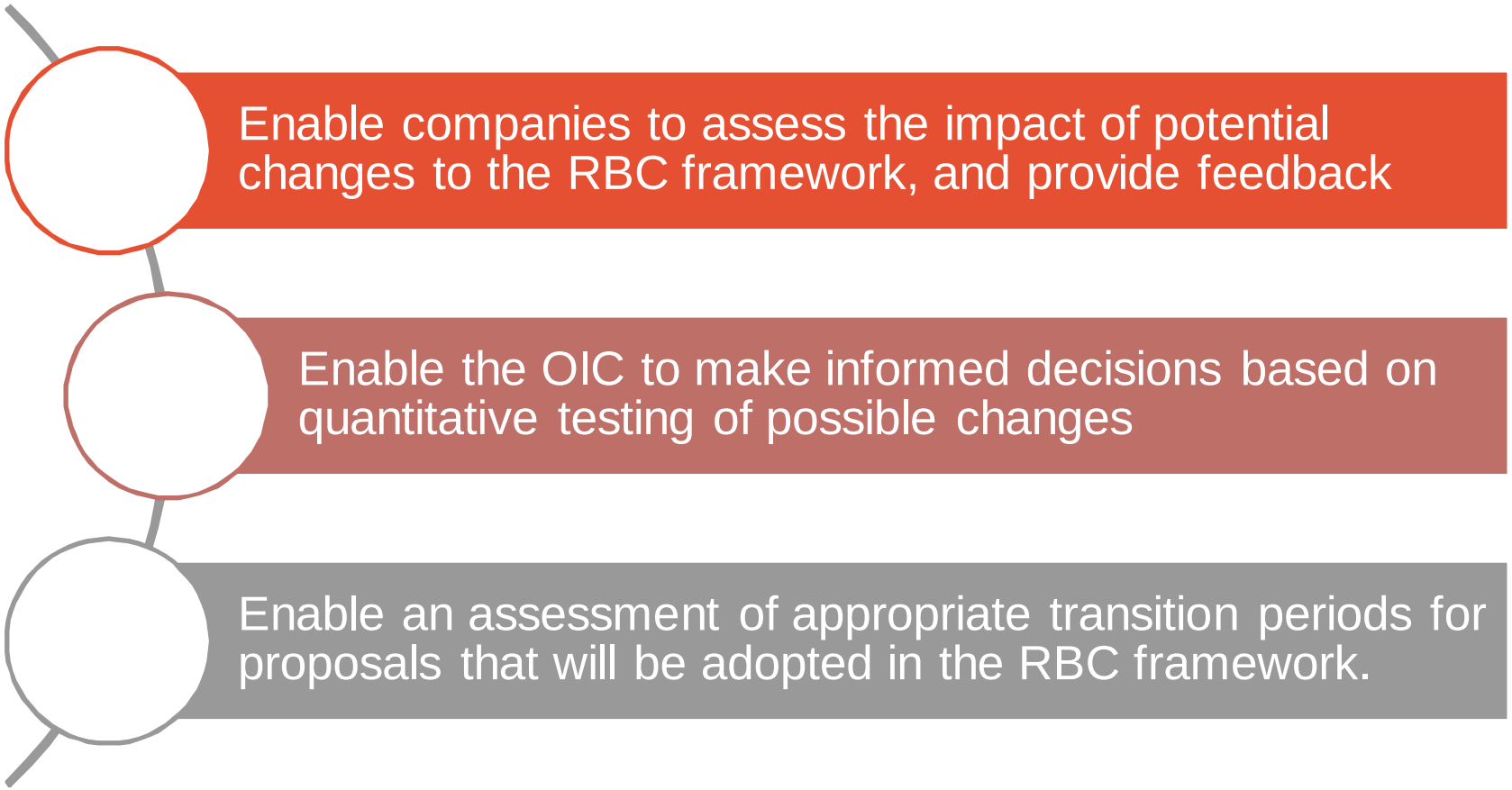
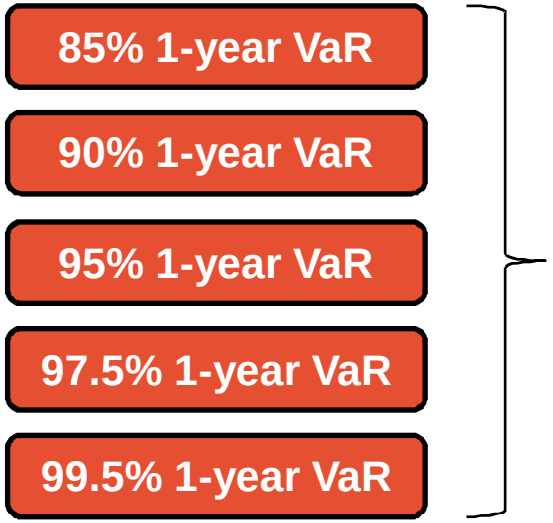
Aims and objectives of market testing



Market testing –
Key aspects to be assessed

Market testing – Target sufficiency levels

- Market testing will be performed at the following target sufficiency levels:



Target sufficiency levels to be tested.

These target sufficiency levels will apply to both asset and liability risks.

Market testing – Templates

- Market testing templates will be distributed to companies. The templates will contain the following:
  - Parameters at all the target sufficiency levels that are to be tested
  - A macro to help companies copy data from existing RBC forms to the template
  - A summary page containing the results at all target sufficiency levels
- Note that a macro is intended to help companies, and reduce work. However, companies may choose to input data manually if preferred.
- A set of guidance notes will be provided together with the market testing templates.

Market testing – Example of template format

- The market testing template will be based on the existing RBC 1 template, with additions / modifications to reflect the items tested.
- An **example** of the format of the market testing template is shown below.

RBC 2

ตารางที่ 4.1 เงินกองทุนสำหรับความเสี่ยงจากภาระผูกพันสำหรับสัญญาประกันภัยระยะสั้น - เงินกองทุนสำหรับความเสี่ยงจากสำรองค่าสินไหมทดแทน

ลำดับที่	ประเภทการรับประกันภัย (class of business)			ค่าเผื่อความผันผวนมาตรฐาน ณ ระดับความเชื่อมั่นเปอร์เซ็นต์ไทล์ที่ 75 (PAD @75%)	รวมค่าประมาณการที่ดีที่สุดสำหรับค่าสินไหมทดแทนค้างจ่าย (total best estimate of outstanding		มูลค่ายุติธรรมของสำรองค่าสินไหมทดแทนรวม (fair value of claim liability)		ค่าความเสี่ยง (risk charge)				
					ก่อนการประกันภัยต่อ (gross of reinsurance)	หลังการประกันภัยต่อ (net of reinsurance)	ก่อนการประกันภัยต่อ (gross of reinsurance)	หลังการประกันภัยต่อ (net of reinsurance)	@ 85%	@ 90%	@ 95%	@ 97.5%	@ 99.5%
1	การประกันอัคคีภัย (fire)			15%	-	-	-	-	25%	33%	45%	55%	75%
2	การประกันภัยทางทะเลและ	ตัวเรือ (hull)		12%	-	-	-	-	20%	26%	36%	44%	60%
		สินค้า (cargo)		12%	-	-	-	-	20%	26%	36%	44%	60%
3	การประกันภัยรถยนต์ (Automobile)	ภาคบังคับ (compulsory)	รถยนต์ (automobile)	12%	-	-	-	-	20%	26%	36%	44%	60%
			รถจักรยานยนต์ (motorcycle)	8%	-	-	-	-	13%	17%	23%	29%	39%
		ภาคสมัครใจ (voluntary)		8%	-	-	-	-	13%	17%	23%	29%	39%
4	การประกันภัยเบ็ดเตล็ด (miscellaneous)	ความเสี่ยงภัยทุกชนิด (IAR)		21%	-	-	-	-	35%	46%	63%	77%	105%
		ความรับผิด (liability)		24%	-	-	-	-	40%	52%	72%	88%	120%
		วิศวกรรม (engineer)		21%	-	-	-	-	35%	46%	63%	77%	105%
		การบิน (aviation)		12%	-	-	-	-	20%	26%	36%	44%	60%
		อุบัติเหตุส่วนบุคคลและสุขภาพ		12%	-	-	-	-	20%	26%	36%	44%	60%
		ทรัพย์สิน (property)		21%	-	-	-	-	35%	46%	63%	77%	105%
		การเงิน (financial)		21%	-	-	-	-	35%	46%	63%	77%	105%
		การเดินทาง (travel)		12%	-	-	-	-	20%	26%	36%	44%	60%
		อื่นๆ (other)		21%	-	-	-	-	35%	46%	63%	77%	105%
5	รวม (total)				-	-	-	-					

Market testing – Submission requirements and materiality

- Market testing is to be performed at the **31 December 2013** valuation date.
- Market testing results are to be **submitted to the OIC**, who will then anonymise the results.
- There is **no requirement** for market testing submissions to be certified by auditors.

Note that one of the objectives of market testing is for companies to assess and understand the impact of potential changes and **provide feedback**.

It is therefore important that companies perform the market testing on a **"best efforts"** basis.

Market testing – Key dates for Non-Life insurance companies

Item	Date
Guidance notes and market testing template to be distributed to Non-life insurance companies	4 April 2014
Workshop on market testing template	9 April 2014
Submission of market testing results to the OIC (latest submission date)	6 June 2014

Market testing – Questions and answers

- Questions may be submitted via the following email address:

oic.rbc2@towerswatson.com

- Answers to frequently answered questions ("FAQs") will be combined and distributed once a week to the industry.

Q & A

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Wrap-up

Thank you…

For your attention

THANK YOU

This presentation has been prepared by Towers Watson for the purposes of the RBC phase 2 project only.

The information and opinions contained within are to be considered together with the full technical paper.

Judgement as to the information contained in the technical paper should be made only after studying the technical paper in its entirety, as conclusions reached by review of a section or sections on an isolated basis may be inappropriate.

Appendices – Details of parameters / framework changes

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Appendices – Details of parameters

- Details of the proposed parameters / framework changes are contained in these appendices. These details are not intended to be discussed during the meeting, but are included here for easy reference if necessary.

Appendix	Description
A	Market risk charges
B	Credit risk charges
C	Asset correlation
D	Non-life insurance risk charges
E	Diversification between asset and insurance risks
F	IFRS principles for contract recognition and boundaries

Appendix A: Market risk charges – Equity risk charges

Parameters for market testing (Equity risk)							
	Risk category	Current RBC 1	Proposed				
			85%	90%	95%	97.5%	99.5%
(1)	Listed on the Thai stock exchanges SET and MAI	16%	20%	25%	35%	45%	50%
(2)	Listed on the main board of other approved stock exchanges	16%	20%	25%	35%	45%	50%
(3)	Equity investments in subsidiaries and associates, except (4) below	0%	25%	30%	40%	50%	55%
(4)	Investment in subsidiaries or associates licensed to conduct insurance business	20%	25%	30%	40%	50%	55%
(5)	Other equity not included in (1)-(4)	20%	25%	30%	40%	50%	55%

Appendix A: Market risk charges – Property risk charges

Parameters for market testing (Property risk)							
	Risk category	Current RBC 1	Proposed				
			85%	90%	95%	97.5%	99.5%
(1)	Owner occupied	4%	14%	16%	19%	22%	25%
(2)	Operating assets, such as equipment	16%	14%	16%	19%	22%	25%
(3)	Other property not included in (1)-(2)	16%	14%	16%	19%	22%	25%

Appendix A: Market risk charges – Exchange rate risk charges

Parameters for market testing (Exchange rate risk)						
	RBC1	Proposed				
		85%	90%	95%	97.5%	99.5%
Exchange rate risk charge	8%	8%	10%	14%	17%	22%

Appendix A: Market risk charges – Interest rate risk stresses

Proposed interest rate charges (for Non-Life insurance only)						
Term to maturity (TTM)	RBC1	Proposed (at various sufficiency levels)				
		85%	90%	95%	97.5%	99.5%
TTM <= 1 month	0.00%	0.0%	0.0%	0.0%	0.0%	0.0%
1 month < TTM <= 6 months	0.25%	0.1%	0.1%	0.2%	0.2%	0.3%
6 months < TTM <= 1 year	0.50%	0.3%	0.3%	0.4%	0.5%	0.7%
1 year < TTM <= 2 years	1.00%	0.6%	0.7%	0.9%	1.0%	1.3%
2 years < TTM <= 3 years	1.85%	1.6%	1.8%	2.4%	2.9%	3.6%
3 years < TTM <= 5 years	3.00%	3.0%	3.5%	4.6%	5.6%	6.9%
5 years < TTM <= 10 years	4.50%	5.0%	6.0%	7.9%	9.8%	11.5%
10 years < TTM <= 15 years	6.00%	6.4%	8.0%	11.0%	13.3%	14.7%
15 years < TTM <= 20 years	7.00%	7.2%	8.7%	12.5%	14.3%	15.5%
TTM > 20 years	8.00%	7.7%	8.9%	13.9%	15.6%	17.7%

Appendix B – Credit risk charges

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Appendix B: Credit risk charges – Debt securities

Proposed credit risk charges (debt securities)							
Bond term to maturity (T)	Risk level						
	1	2	3	4	5	6	Unrated
At 85% target sufficiency level							
T < 1 year	0.2%	0.2%	0.7%	1.6%	3.4%	23.0%	31.0%
1 year ≤ T < 5 years	1.2%	1.5%	2.5%	3.8%	6.1%	29.0%	38.0%
5 years ≤ T < 10 years	2.4%	3.0%	4.6%	6.5%	9.3%	36.0%	40.0%
T ≥ 10 years	4.0%	5.0%	7.4%	10.0%	14.0%	40.0%	40.0%
At 90% target sufficiency level							
T < 1 year	0.2%	0.3%	1.0%	1.9%	3.8%	24.0%	32.0%
1 year ≤ T < 5 years	1.5%	1.8%	3.2%	4.8%	7.5%	31.0%	41.0%
5 years ≤ T < 10 years	3.0%	3.6%	5.9%	8.4%	12.0%	40.0%	45.0%
T ≥ 10 years	5.0%	6.0%	9.5%	13.0%	18.0%	45.0%	45.0%
At 95% target sufficiency level							
T < 1 year	0.3%	0.4%	1.3%	2.4%	4.4%	25.0%	32.0%
1 year ≤ T < 5 years	1.8%	2.4%	4.3%	6.6%	9.2%	34.0%	44.0%
5 years ≤ T < 10 years	3.6%	4.8%	7.8%	12.0%	15.0%	46.0%	50.0%
T ≥ 10 years	6.0%	8.0%	13.0%	18.0%	23.0%	50.0%	50.0%

Appendix B: Credit risk charges – Debt securities (continued)

Proposed credit risk charges (debt securities)							
Bond term to maturity (T)	Risk level						
	1	2	3	4	5	6	Unrated
At 97.5% target sufficiency level							
T ≤ 1 year	0.4%	0.6%	1.6%	2.7%	4.9%	26.0%	33.0%
1 year < T ≤ 5 years	2.4%	2.8%	5.3%	7.6%	11.0%	37.0%	47.0%
5 years < T ≤ 10 years	4.8%	5.5%	9.8%	14.0%	18.0%	51.0%	55.0%
T > 10 years	8.0%	9.1%	16.0%	21.0%	28.0%	55.0%	55.0%
At 99.5% target sufficiency level							
T ≤ 1 year	0.7%	1.2%	2.2%	4.4%	7.6%	27.0%	34.0%
1 year < T ≤ 5 years	3.5%	4.5%	7.4%	11.0%	16.0%	42.0%	54.0%
5 years < T ≤ 10 years	6.8%	8.4%	14.0%	20.0%	26.0%	60.0%	65.0%
T > 10 years	11.0%	14.0%	22.0%	31.0%	39.0%	65.0%	65.0%

Appendix B: Credit risk charges – Reinsurance credit risk: Reinsurers with credit ratings

Proposed reinsurance credit risk charges (for reinsurers with credit ratings)						
Risk level	Current RBC 1	Proposed				
		85%	90%	95%	97.5%	99.5%
1	1.6%	0.2%	0.2%	0.4%	0.5%	1%
2	2.8%	0.2%	0.3%	0.5%	0.7%	1.5%
3	4%	0.7%	1%	1.4%	1.8%	3%
4	8%	1.7%	2%	2.5%	3%	6%
5	12%	3.6%	4%	5%	6%	15%
6	12%	15.0%	17.5%	20%	22.5%	25%

Appendix B: Credit risk charges – Reinsurance credit risk: Risk categories

Counterparty grade				
Rating	**S & P**	**Moody's**	**Fitch**	**A.M. Best**
1	AAA	Aaa	AAA	A++
2	AA+ AA AA-	Aa1 Aa2 Aa3	AA+ AA AA-	A+
3	A+ A A-	A1 A2 A3	A+ A A-	A A-
4	BBB+ BBB BBB-	Baa1 Baa2 Baa3	BBB+ BBB BBB-	B++ B+
5	BB+ BB BB-	Ba1 Ba2 Ba3	BB+ BB BB-	B B-
6	B+ or below	B1 or below	B+ or below	C++ or below

Appendix B: Credit risk charges – Reinsurance credit risk: Unrated Thai reinsurers

Proposed reinsurance credit risk charges (for reinsurers that have no credit ratings)						
CAR ratio (X)	Current RBC1	Proposed				
		85%	90%	95%	97.5%	99.5%
X > 375%	1.6%	0.2%	0.2%	0.4%	0.5%	1%
350% < X ≤ 375%	1.6%	0.2%	0.3%	0.5%	0.7%	1.5%
300% < X ≤ 350%	1.6%	0.7%	1%	1.4%	1.8%	3%
250% < X ≤ 300%	2.8%	1.7%	2%	2.5%	3%	6%
150% < X ≤ 250%	4%	3.6%	4%	5%	6%	15%
X ≤ 150%	8%	15.0%	17.5%	20%	22.5%	25%

Appendix B: Credit risk charges – Other loans

Proposed credit risk charges (other loans)						
	Current RBC 1	Proposed				
		85%	90%	95%	97.5%	99.5%
Lease / hire purchase	8%	1.7%	2%	2.5%	3%	6%
Employee loans	4%	0.7%	1%	1.4%	1.8%	3%
Other individuals (except policy loans)	8%	1.7%	2%	2.5%	3%	6%
Policy loans	0%	0%	0%	0%	0%	0%
Other loans	8%	1.7%	2%	2.5%	3%	6%

Appendix C – Asset correlation matrix

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Appendix C: Asset correlation matrix

Proposed correlation matrix for market testing						
	Interest rate	Equity	Property	Credit	Concentration	Currency
Interest rate	100%	0%/50% (1)	0%/50% (1)	0%/50% (1)	0%	25%
Equity	0%/50% (1)	100%	75%	75%	0%	25%
Property	0%/50% (1)	75%	100%	50%	0%	25%
Credit	0%/50% (1)	75%	50%	100%	0%	25%
Concentration	0%	0%	0%	0%	100%	0%
Currency	25%	25%	25%	25%	0%	100%

(1) For correlations to interest rate risk, the correlation factor should be 0% if the "interest up" scenario is biting; or 50% if the "interest down" scenario is biting.

Appendix D – Non-life insurance risk charge

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Insurance risk charges – On UPR basis

Business class	Risk	Current		Proposed (at various sufficiency levels)					
		75%	95%	75%	85%	90%	95%	97.5%	99.5%
Fire	Premium	25%	72%	15%	25%	33%	45%	55%	75%
	Claims	25%	72%	15%	25%	33%	45%	55%	75%
	Catastrophe	n/a	n/a	9%	15%	20%	27%	33%	45%
Marine Hull	Premium	30%	89%	12%	20%	26%	36%	44%	60%
	Claims	30%	89%	12%	20%	26%	36%	44%	60%
Marine Cargo	Premium	20%	56%	12%	20%	26%	36%	44%	60%
	Claims	20%	56%	12%	20%	26%	36%	44%	60%
Compulsory Motor	Premium	15%	41%	11%	18%	23%	32%	39%	53%
	Claims	15%	41%	12%	20%	26%	36%	44%	60%
Compulsory Motorcycle	Premium	8%	21%	8%	14%	18%	24%	30%	41%
	Claims	8%	21%	8%	13%	17%	23%	29%	39%
Voluntary Motor	Premium	8%	21%	8%	14%	18%	24%	30%	41%
	Claims	8%	21%	8%	13%	17%	23%	29%	39%
Industrial All Risks	Premium	25%	72%	24%	40%	52%	72%	88%	120%
	Claims	25%	72%	21%	35%	46%	63%	77%	105%
	Catastrophe	n/a	n/a	15%	25%	33%	45%	55%	75%

Insurance risk charges – On UPR basis (continued)

Business class	Risk	Current		Proposed (at various sufficiency levels)					
		75%	95%	75%	85%	90%	95%	97.5%	99.5%
Liability	Premium	30%	89%	21%	35%	46%	63%	77%	105%
	Claims	30%	89%	24%	40%	52%	72%	88%	120%
Engineering	Premium	20%	56%	24%	40%	52%	72%	88%	120%
	Claims	20%	56%	21%	35%	46%	63%	77%	105%
	Catastrophe	n/a	n/a	15%	25%	33%	45%	55%	75%
Aviation	Premium	30%	89%	12%	20%	26%	36%	44%	60%
	Claims	30%	89%	12%	20%	26%	36%	44%	60%
PA and Health	Premium	15%	41%	9%	15%	20%	27%	33%	45%
	Claims	15%	41%	12%	20%	26%	36%	44%	60%
Property	Premium	20%	56%	15%	25%	33%	45%	55%	75%
	Claims	20%	56%	21%	35%	46%	63%	77%	105%
	Catastrophe	n/a	n/a	9%	15%	20%	27%	33%	45%
Financial Lines	Premium	30%	89%	21%	35%	46%	63%	77%	105%
	Claims	30%	89%	21%	35%	46%	63%	77%	105%
Travel Insurance	Premium	15%	41%	9%	15%	20%	27%	33%	45%
	Claims	15%	41%	12%	20%	26%	36%	44%	60%
Other Classes	Premium	30%	89%	18%	30%	39%	54%	66%	90%
	Claims	30%	89%	21%	35%	46%	63%	77%	105%

Insurance risk charges – On URR basis

Business class	Risk	Current		Proposed (at various sufficiency levels)					
		75%	95%	75%	85%	90%	95%	97.5%	99.5%
Fire	Premium	25%	72%	35%	58%	75%	104%	128%	174%
	Catastrophe	n/a	n/a	21%	35%	46%	63%	77%	105%
Marine Hull	Premium	30%	89%	21%	35%	46%	63%	77%	105%
Marine Cargo	Premium	20%	56%	24%	40%	52%	72%	88%	120%
Compulsory Motor	Premium	15%	41%	19%	31%	40%	56%	68%	93%
Compulsory Motorcycle	Premium	8%	21%	8%	14%	18%	25%	31%	42%
Voluntary Motor	Premium	8%	21%	10%	16%	21%	29%	35%	48%
Industrial All Risks	Premium	25%	72%	27%	45%	59%	81%	99%	135%
	Catastrophe	n/a	n/a	17%	28%	36%	50%	62%	84%

Insurance risk charges – On URR basis (continued)

Business class	Risk	Current		Proposed (at various sufficiency levels)					
		75%	95%	75%	85%	90%	95%	97.5%	99.5%
Liability	Premium	30%	89%	32%	53%	69%	95%	117%	159%
Engineering	Premium	20%	56%	32%	54%	70%	97%	119%	162%
	Catastrophe	n/a	n/a	20%	34%	44%	61%	75%	102%
Aviation	Premium	30%	89%	24%	40%	52%	72%	88%	120%
PA and Health	Premium	15%	41%	13%	21%	27%	38%	46%	63%
Property	Premium	20%	56%	22%	36%	47%	65%	79%	108%
	Catastrophe	n/a	n/a	13%	22%	29%	40%	48%	66%
Financial Lines	Premium	30%	89%	16%	27%	35%	49%	59%	81%
Travel Insurance	Premium	15%	41%	14%	23%	30%	41%	51%	69%
Other Classes	Premium	30%	89%	22%	37%	48%	67%	81%	111%

Appendix E – Diversification

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Appendix E: Diversification between asset, insurance, operational risks

	Asset risk	Insurance risk	Operational risk
Asset risk	100%	25%	25%
Insurance risk	25%	100%	25%
Operational risk	25%	25%	100%

Appendix F – Contract recognition and boundaries

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Appendix F: IFRS principles for contract recognition and boundaries (1/2)

Definition:

Cash flows are within the boundary of an insurance contract when the entity can compel the policyholder to pay the premiums or has a substantive obligation to provide the policyholder with coverage or other services.

A substantive obligation to provide coverage or other services ends when:

the entity has the right or the practical ability to reassess the risks of the particular policyholder and, as a result, can set a price or level of benefits that fully reflects those risks; or

both of the following criteria are satisfied:

- the entity has the right or the practical ability to reassess the risk of the portfolio of insurance contracts that contains the contract and, as a result, can set a price or level of benefits that fully reflects the risk of that portfolio; and
- the pricing of the premiums for coverage up to the date when the risks are reassessed does not take into account the risks that relate to future periods.

An entity shall determine the boundary of an insurance contract by considering all of the substantive rights that are held by the policyholder, whether they arise from a contract, law or regulation. However, an entity shall ignore restrictions that have no commercial substance (i.e. no discernible effect on the economics of the contract).

Appendix F: IFRS principles for contract recognition and boundaries (2/2)

Guidance:

The paragraph above refers to an entity's right or practical ability to set a price at a future date (a renewal date) that fully reflects the risks in the contract or portfolio from that date. An entity has that right or practical ability when there are no constraints to prevent it from setting the same price as it would for a new contract that is issued on that date, or if it can amend the benefits to be consistent with those that it would provide for the price that it will charge.

Similarly, an entity has that right or practical ability when it can re-price an existing contract so that the price reflects overall changes in the risks in the portfolio, even if the price set for each individual policyholder does not reflect the change in risk for that specific policyholder. When assessing whether the entity has the right or practical ability to set a price that fully reflects the risks in the contract or portfolio, it should consider all the risks that it would consider when underwriting equivalent contracts on the renewal date for the remaining coverage.