



17TH EAST ASIAN ACTUARIAL CONFERENCE  
15 -18 October 2013  
Resorts World Sentosa, Singapore

## Actuarial Models for Takaful

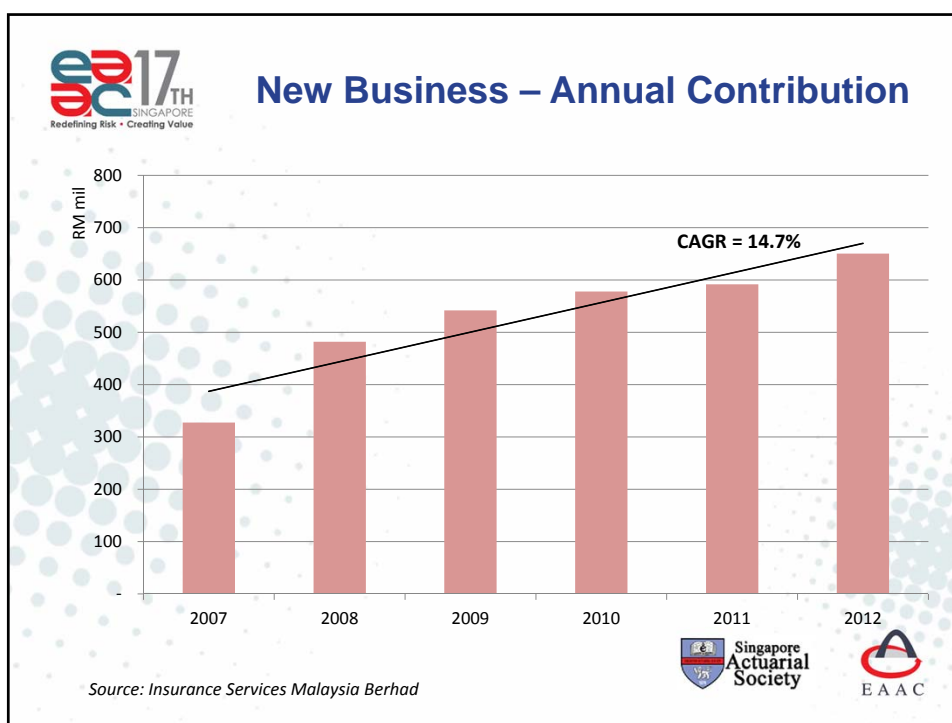
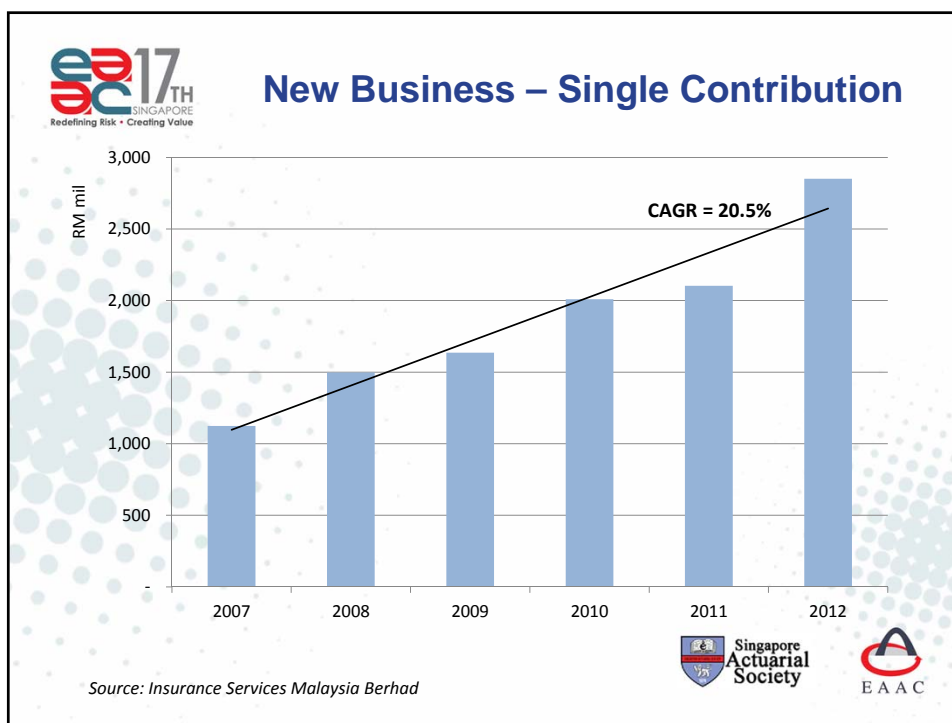
Ching Ing Chian  
Seow Fan Chong

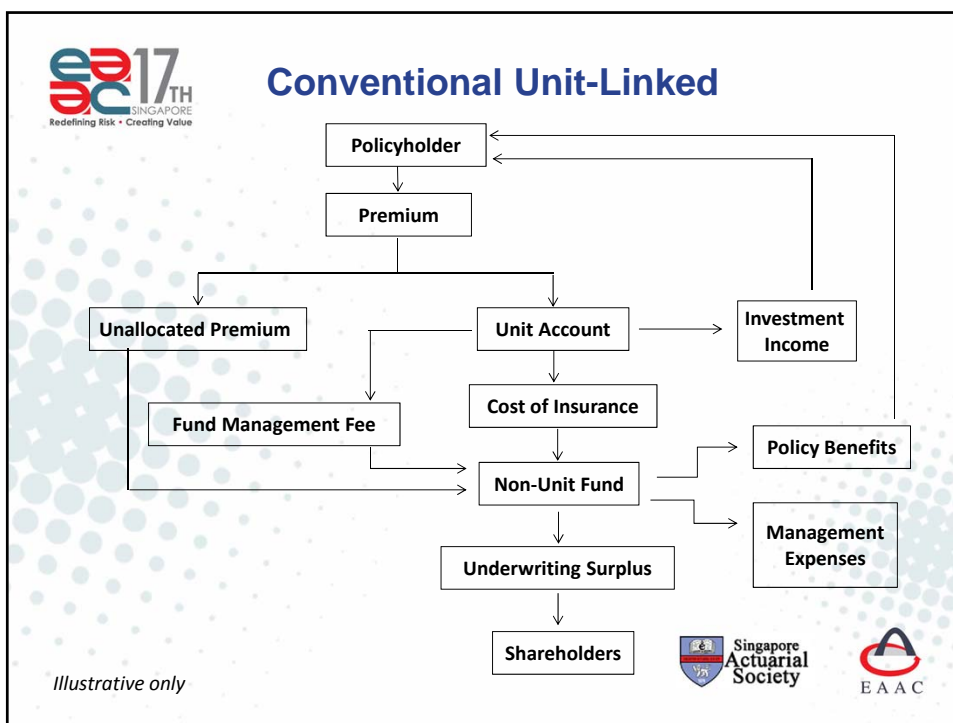
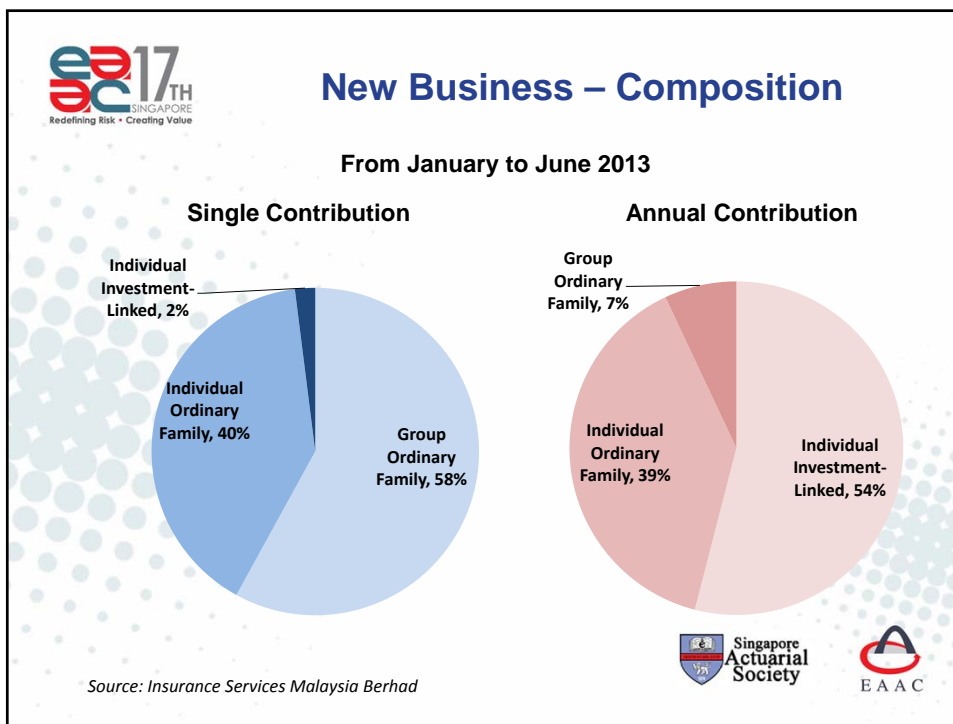


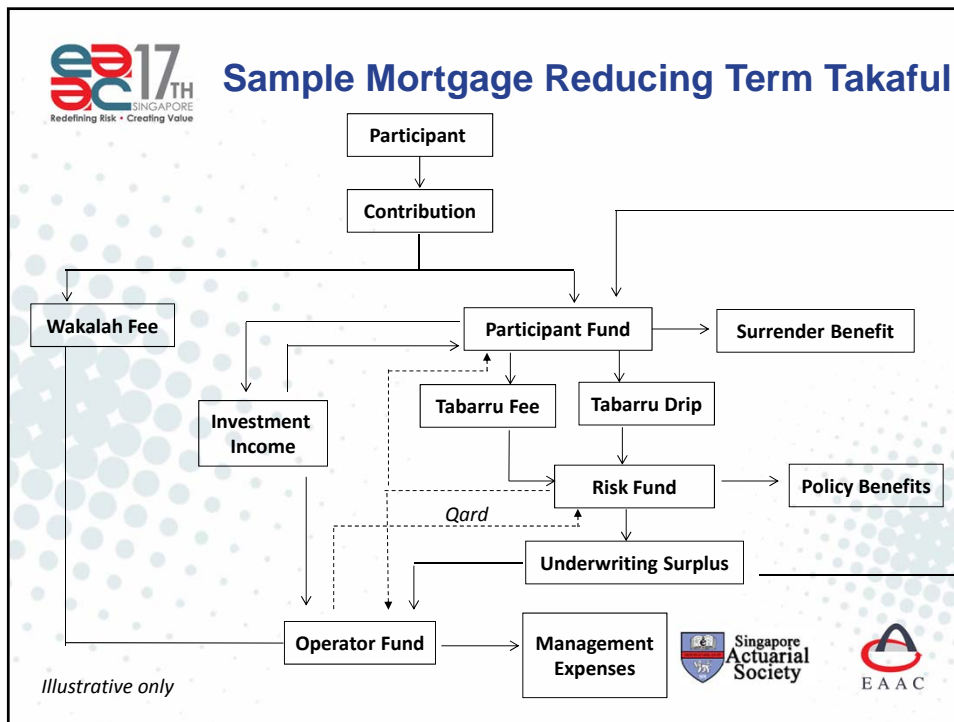
## Agenda

- Market Landscape
- Takaful Operational Model
- Takaful Funds
- Actuarial Valuation Approach for Takaful









**Takaful Operational Model**

- Who pay for the expenses incurred?
- Who is liable for the losses?
- How are the profit shared? Investment profit?  
Underwriting profit?

Logos for Singapore Actuarial Society and E A A C are present at the bottom right.



## Takaful Funds

- Three Funds
  - Participants' risk fund
  - Participants' investment fund / Participants' account
  - Operator fund
- All three funds are related and the interaction of the funds should be modeled



## Participants' Risk Fund

- Fund to pool tabarru to meet claims on risk covered
- Ownership of the funds belongs to the pool of participants
- Usually short in duration and invest in liquid assets





## Participants' Investment Fund

- PIF / PA are long in duration
- Important for the takaful operator to ensure that the investment return on PIF / PA meets the pricing assumption
- Depending on the operating model, the surrender value is usually the PIF / PA



## Operator Fund

- Funds to run the business of managing the risk fund
- Qard, if any is paid from operator fund
- Sources of income
  - Wakalah fees
  - Remuneration from PRF
  - Remuneration from PIF / PA
  - Remuneration via Fee on Tabarru





## Example: Mortgage Reducing Term Takaful

- Non-linked takaful plan
- Implicit guarantees in the plan
- Sample policy
  - Age: 25 years
  - Term: 30 years



## Valuation Approach – Risk Fund

- Acceptable to use GPV valuation approach for non-linked plans
- $PV$  of Benefits less  $PV$  of Tabarru Drips
- For the MRTT plan, in the event that Participant Accounts' is in deficit, the risk coverage is still in-force





## Valuation Approach – Operator Fund

- Valuation approach for the Operator Fund has to be consistent with the Participants' Risk Fund, hence GPV for expense liabilities
- Surplus sharing from the risk fund can be recognized as an income to the risk fund only when the Appointed Actuary is “reasonably” certain about surplus distributable from the risk fund and meeting capital requirements in the risk fund
- Provision for expense overrun, if the Operator has yet to achieve critical mass



## Valuation Approach – PRAD

- The scenarios that result in the highest provision for the PRF and OF individually as the value of the liabilities
- Four scenarios were calculated
  - High mortality / High lapse
  - High mortality / Low lapse
  - Low mortality / High lapse
  - Low mortality / Low lapse



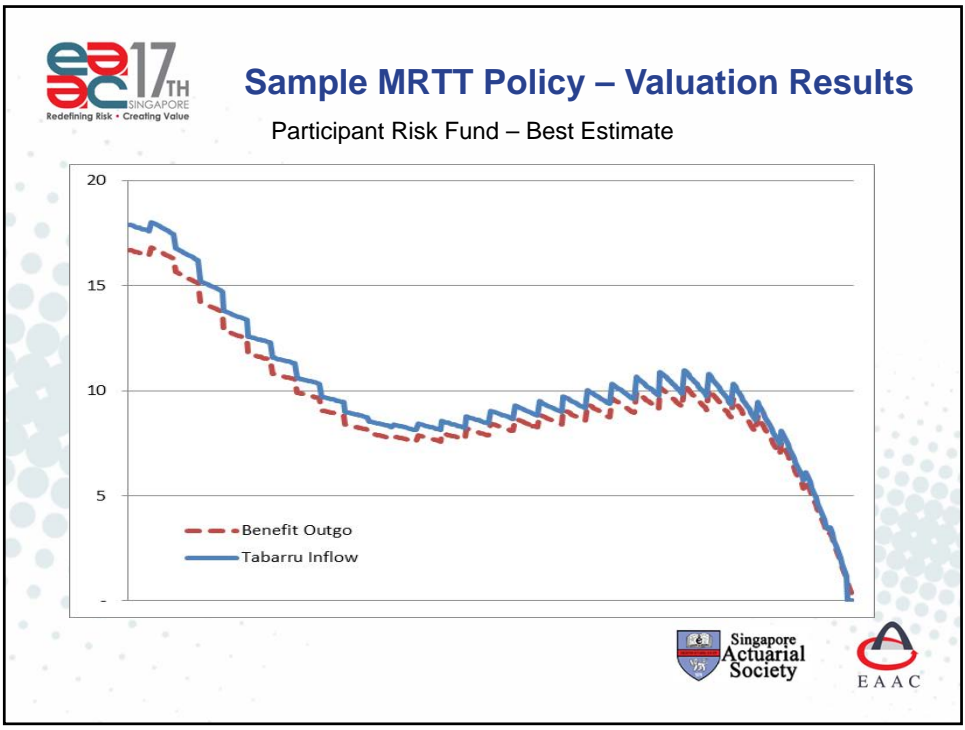


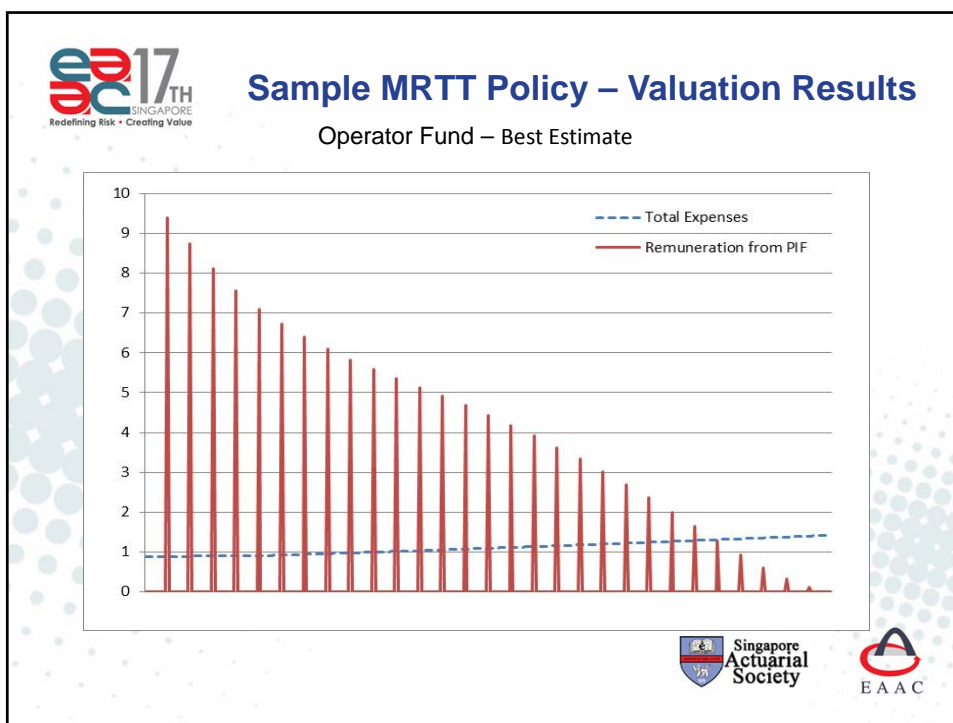
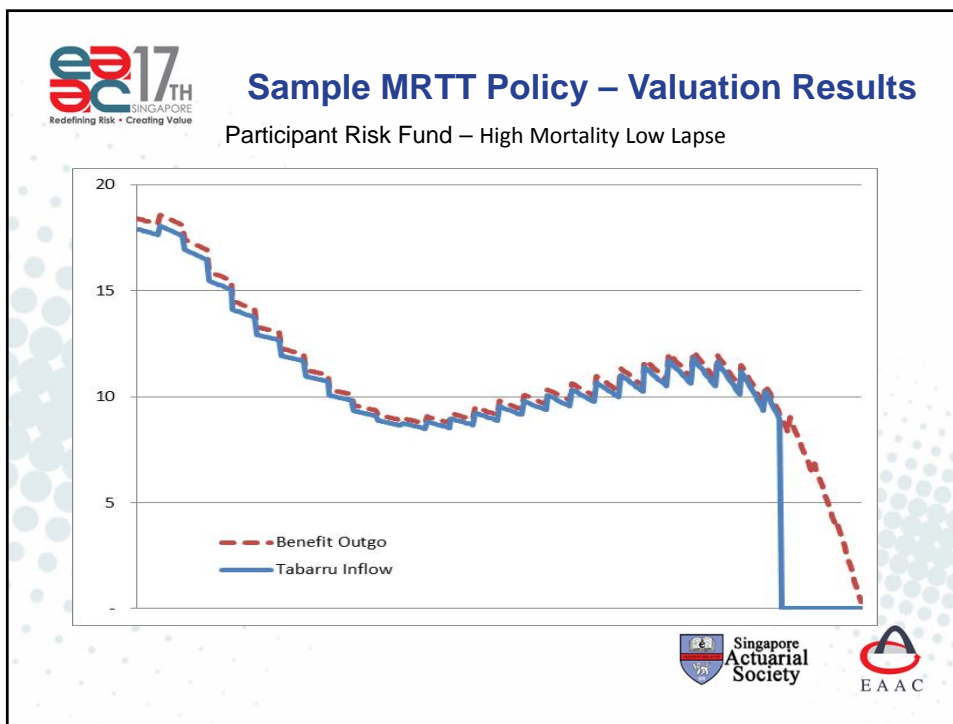
**eaac 17<sup>TH</sup> SINGAPORE**  
Redefining Risk • Creating Value

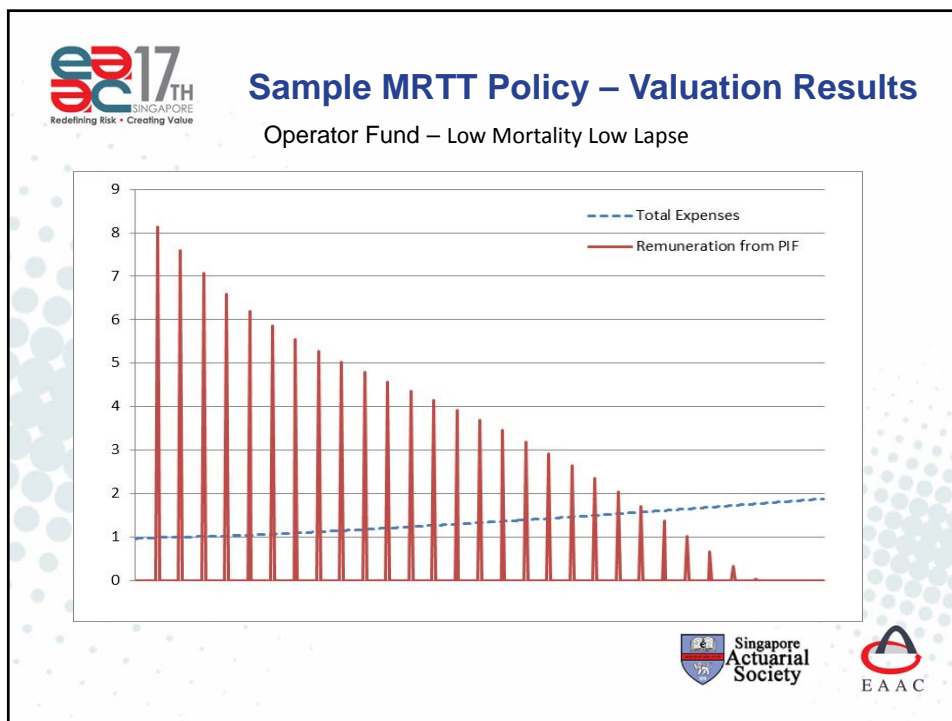
### Sample MRTT Policy – Valuation Results

	Risk Fund	Operator Fund
BE	(161)	137
HMHL	121	175
HMLL	137	196
LMHL	(310)	176
LMLL	(327)	197

Singapore Actuarial Society E A A C








**Sample MRTT Policy – Valuation Results**




Baseline		Decrease in PIF Investment Return	
<b>Risk Fund</b>			
PV Benefit	2,195	PV Benefit	2,195
PV Tabarru	2,356	PV Tabarru	2,226
Reserve	(161)	Reserve	(31)
<b>Operator Fund</b>			
PV Expenses	226	PV Expenses	226
PV PIF Remuneration	89	PV PIF Remuneration	57
Reserve	137	Reserve	169

Singapore Actuarial Society | E A A C





### Sample MRTT Policy – Valuation Results


Baseline		Decrease in Yield Curve	
Risk Fund		Risk Fund	
PV Benefit	2,195	PV Benefit	2,306
PV Tabarru	2,356	PV Tabarru	2,474
Reserve	(161)	Reserve	(168)
Operator Fund		Operator Fund	
PV Expenses	226	PV Expenses	241
PV PIF Remuneration	89	PV PIF Remuneration	93
Reserve	137	Reserve	148

### Sample MRTT Policy – Valuation Results




Baseline		Increase in Lapse Rates	
Risk Fund		Risk Fund	
PV Benefit	2,195	PV Benefit	1,990
PV Tabarru	2,356	PV Tabarru	2,135
Reserve	(161)	Reserve	(145)
Operator Fund		Operator Fund	
PV Expenses	226	PV Expenses	198
PV PIF Remuneration	89	PV PIF Remuneration	82
Reserve	137	Reserve	116



## Sample MRTT Policy – Valuation Results

Baseline		Increase in Mortality Rates	
Risk Fund		Risk Fund	
PV Benefit	2,195	PV Benefit	2,413
PV Tabarru	2,356	PV Tabarru	2,354
Reserve	(161)	Reserve	59
Operator Fund		Operator Fund	
PV Expenses	226	PV Expenses	226
PV PIF Remuneration	89	PV PIF Remuneration	89
Reserve	137	Reserve	137

## Conclusion

- Challenging but exciting time for the takaful industry with up-coming regulatory changes in reserving, accounting, and solvency issues.

