

74-□

%'125 0Lf\*o□

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5W6

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B2A (B)itDBLBOB)BBNA□ EU B.BBBN CEIOPSB74B2#)\*/B□

Committee of European Insurance and Occupational Pensions SupervisorBB.BKBNBB-BxBB”BBr

B-BBxBB”BBrBBB.B”BB)AB B1N-BU%B-%BBLBAB+BDBBEB1B\*BBNABxBB”B□

BrBE2K EU B(B).B-BN-B\*BBNB1BBB-BLBA□ IAIS %|B14B-/BU0/BABBE

B1BEBBMA5|tB\*|HB1BBN&BBB.B-B&B)BBNB+ABRBOBNABAB#//B(B-P%|BEB□

wBBOB)BBNBEB1B1AγBRBE.BBBN;4|B1BBtBj%BU|BBNB\*AB|B1-P

B\*BBNB+.BBNA□

B2A □ CEIOPS B1BxBB”B BrB BUA Consultation Paper20B6 Quantitative Impact

Analysis3 Technical Specification BUB.A%B-%BBLBAB+BDBBEB1B\*BBMABxBB”BBrB□

B1|B.BBN4F4B1BpBB”B\_BB•BBBB\*BBNA□

† 2GG44G#A02,2##CBvBBzB47#w

E-Mail: d061a002@ynu.ac.jp

\* 2,2##CBvBBzB#n:w

E-Mail: yoko.shirasu@fsa.go.jp

B1k%iB.BBB&B)B2Ait&G&G1VB6eG&G1(2\*□

BBLB-BnBBBBUBBB#BBA!%BB)BBNA□

B-BAB2Ak%i(\*B1XqB--B\*BBMA2,B62,##CBvBBzBB1O□B\*B2B-BA□

iv 4

1. B2BBDB.
2. ;4-B1.N(□
  - 2-1. ;4+□
  - 2-2. ;4KB1(□
  - 2-3. 402□
3. 4□
  - 3-1. BxBB”BBRb:4□ (SCR)
  - 3-2. 4□
  - 3-3.:w BB1GB14P%
4. .On0□
  - 4-1. /B1.O□
  - 4-2. 402□
  - 4-3.:w B“BBs(BBtBjB+B“BBs(BBtBj
  - 4-4.:w BvBkBBBBBrBBB+□ (segmentation and diversification)
  - 4-5.:w )n0B1□ (measurement of best estimation)
  - 4-6.: w B B tB jB B B sB B ;B 1B B ’B B B □
5. /□
  - 5-1. BfBBoBB□ : tier BrBtBB□
  - 5-2. 4(□limitation)
  - 5-3. MCRBUBfBBBBN/B1t□
  - 5-4. 4BrBtBBB1-&B+A#)4PB1BnBBBBBBB”BB.BBN=□
  - 5-5. ;4□ tier3 /B.B’BB)B1□
6. BtBzBB{BBBBdBBBBB.BKBS(SCR)B1%□
  - 6-1. BtBzBB{BBBBdBBBBB1nN(□
  - 6-2.: w B B sB B B □1 g
  - 6-3.:wSCRBSBBBB1.%□
  - 6-4.:w 2)BBsBBtB1BMB□
  - 6-5.:wSCRop: w B eB •B B B rB B B B B tB j
  - 6-6.:wBSCR:w nBxBB”BBRb:4□
7. MCRB1%□
  - 7-1. MCRB1nN(□
  - 7-2. QIS3 B.BBBNMCRB1%□
  - 7-3. 2)B.BKBN□
  - 7-4. BBtBj
  - 7-5. ;4BBtBj
  - 7-6. n;4BBtBj
  - 7-7. B-BBtBjBn;4BBtBj
  - 7-8. &4□
8. IBBBB.BKBN SCR)B1.O□
  - 8-1. bKIBBB□
  - 8-2.:w 1IBBB□
9. &B6

1. B2BDB.

4#)B.BBBNBxBB”BBrBBBBsB□B2A□B1B+BBPA3□□B.BBBNBBBwB B1BK  
BB-R1bB1 4n0BB-B A & B BB+B. B-BN- B□BRBOB)BBNABBB A 4B. tG  
BBN4 BkBBB’B1 %1B.BKBMA 4B-& BB-n0BMB2□B+B-B&B)BBNA 4#)(\*  
B 1 4 4 P B \* B B NAIS( 4 4# ) ( \* 4 □□□ B □ International Association of Insurance  
Supervisors)B\*B2A KB.HB.BBBN 4R1b n0B1%w □B □□tDBLBOB)BBNABAB A 7%1B.  
BBB)B2IAISB1/□BU0/BABB B\*B B-4#)2B1- BB1tDBLBOB)BBNA B\*BEA □ EU  
B□CEIOPS (74B2#)(\* B □ Committee of European Insurance and Occupational  
Pensions Supervisor):w BU1bBB)/□BBOB)BBNBxBB”BBrB□BBxBB”BBrB BB2A KCC □  
B□B.B-BN- B\*BBNBDA □HB. BC& BBB+B-B&B)BBNB+ABRBOBNA 7A tB B. B □  
BBN4 □B1BBtBj% BGBxBB”BBrB □B1BBMB1 □BU-B BBBMA B’B1 □PB\*B □  
BNB+. BBNAB B#B A B#wBBOB)BBN.-5 A 5P%1BEBBMA B.BBBNyB1 B-BN□B □  
BBOB)BBNB+BBPB\*BBNA □

B2A □ EUB\*/□BBOB)BBNBxBB”BBrB B1BB’BBBB.B’BB)A □ CEIOPS B1Consultation  
Paper 20(□ CP20)B6 QIS3<sup>3</sup> Technical Specifications(□ QIS3) BU B.N-BBAB+BDBBE  
B1B\*BBNA □ABCEIOPSB1/□B.H BBN B1 B’B2A □ QISB+ mB3BOBNBtB BU1bBB) □  
B.BKBN 6BB-BBOA 5KB.BBBN 5- □HB U#(zBB)BBNBDB\*BBN<sup>4</sup> ABBBA □(B.A 5K  
B-- PB.2 PBU’BBBB)BBNB+B1 BEBBN<sup>5</sup> A □AB2 CEIOPSB1/□B.B2 □AB-5 PBB □  
BNBB+BU.z/BB)BBMA B1 B2A □ CEIOPSB1BB’BBBB1 BOB PBG 5 PBU BBNBB+B\*  
B2B-BA B1 B2ABBBAB\*BE %B1- PBBLA □ CEIOSPSB1BxBB”BBrB B1 BUBpBB”B\_  
BBNB+B.BBNA B.BBBN 4 □B10BBBB 0%1B1 zBU- B&BBRBB\*B2B-B PB2 □  
BBOBBA □

CEIOPSB1CP20 B.BKBN BUB BBN 4 □B2A BBBwB B\* BBOBB GBB’BBB □  
B BBOB)BBN<sup>6</sup> A %YB GB2 □2 □A %YB GB2 #) tGA %YB GB2 □6 □B+ 4 B\*B □

<sup>2</sup> BABA4P1jBBN/□B21@B1IAISB(CEIOPS B.BEA □ IAA(4BBjBBBBB B □ International Actuarial  
Association)BGASB(4 □n0zB □ International Accounting Standard Board) B-B,B1 B\*/□B BR  
BOB)BBNAISB1/□B.B’BB)B2A □: □□□□□ B6 □: □□□□ □ IAAB.BBBN/□B.4PBB)B2 □. (2005) BU  
□A □  
<sup>3</sup> Quantitative Impact Analysis 3 B1 A %YB □2 □2. □ABBOB2A 54B1BtBBU-BA □BB)BBN □  
□BB,B1 □w B\*BBNBBU BNBB+BU B+BB)BBNA □  
<sup>4</sup> R: □□□□□ B2A □□□B6: □□B1& BUBpBB”B\_BB)BBNA □w  
<sup>5</sup> □: □□□□□ B2A □ 4 □BtBjB □BABOB)BB-B PB.B’BB) B □BRBOB)BBNA □ :w  
<sup>6</sup> %B.ABBBwB B+ CEIOPSB16 P B6 □PBU1 @BBNA □G BB’BBBB1BBB.A tB1. □B2  
BB-1BBB-B ABBBwB B+6 BB)BBNA □A KB1. □B2 BB B-B&B)BBNAB B11 BB2A 4 □

BNABBOBLB1&GB 0B.-1bBBNBB+B\*A 00B-;4 0BB-BBOBNB+((BBLBOB)BBNA 0  
:wCEIOPS B.BBBN%YBGB1 0B.ABtBzBB {BBBdBBBBBBBNA BBOBCEIOPS B;4(\*B1  
0BBNBBtBjB12BU. 0BN00B-0B+BB)0%BB)BBNBE1B\*BBNABBBABB1 0B2A 0  
00B\*BBNB 0.A XAB1;4(\*B. 0B1 0K 0GBMB 0B.B'BB)0/NBB)BBNAB  
B1BBDA XAB1;4(\*B. 0B1 0K 0GB 0BA 00B- A 0BBL55BBOB3BBNBB,ABtBzBB {  
BBBdBBBBB.BKB&B)BBOBNBBtBjB1. 0B00B\*B2B-BB-BNA 0  
:w BB1BKB-1 0B\*B2B-B 0A 0B2A 00BB 0B 0BBLBOBNBB+B.BKBMA 0B BBOBNA 00B 0  
BB+B2A;4(\*)D0B.BKB&B)0%BB)BBOBNBE1B\*BBNBA (#) 0PB.BKBN 0zBB-BBOB3 0BBNB 0  
B+BB\*B2B-B7A 0

00BBB2A 0000BBB+mB3BOBNBtBzBB {BBBdBBBBB1 0BU 0BBEB1B+A 0  
K 0BBB+mB3BOBNKB)BU;4(\*B 0%BBEB1B.BBLBOB)BBNA (CEIOPS B2A 0K 0B•  
BBB1 0BU&BB)BBNBKB\*BBNABBOB2A 0B\*1@BBBKBB.ABtBzBB {BBBdBBBBBA XAB1  
;4(\*B. 0B1 0P)BU((&BB-BBBDB\*BPPBA 00B- 0BBLBOBBtBjB1. 0B2A 00B 0  
BNBB21 0B-/0B1%BU- 0BNABB1BKB-A 00B- 0BBLBOB/0B1%B2A 00B-  
5V2 0B1 00B+B-BNABB-BRBA 00BBBU 0BBNBB+B\*ABB1BKB-5V2 0BU 0BBN  
BB+B(0B+B-BNABB 0B\*A 00BBB1 0%B.B2A 0%)D 0B1BnBtBB+B+BEB.A 0%BBB 0  
BB11 0BU0BtBBNBBDB1BnBtBB 0BBNA 0

BABABBtBjB1. 0BU-B&BB+BB)BEA 00B- 0' 0KBG 00BB-BB)B2A;4 0B1 0  
BU1•BBNBB+B2(0B\*BBNABB-BRBA%YBB1GB.BBB)0DBLBOBN 00 0B6 00B 0  
B-BBOB3A%YBB1GBG%YBB1GB2B B1(0UBBBB+BB\*B2B-BB1B\*BBNA 0

0B\*B2A%YBB1GB. 0PUB)B). 0BU-B 0A%YBB1GB1 0B2A;4(\*B 0BBNBBtBjB.  
BB)A 0B-2 0BU(B&B)BBNBBUO 0BBNBBDB1 0BU 0BBNBB+AB\*BBNAB B1BBDA 0  
%YBB1GB2A;4(\*B 0BBNBBtBjB1O 0B62 0B1O 0B1 0BU(BB)BBNA2 0700  
B1O 0B1 0B2A 00 0B\*B BBLBOB)BBNBBwB B+B16 0B 0BBNABBB 0A;4BBt  
BjB1O 0B.B2A;4 0KB1H/B1BBD )DB1 0B 0BBLBOB)BBNA 0

0B\*B2A%YB%CB%B\* 0A 0BBtBjB1O 0B62 0B1O 0B.4PBNN(0B-. 0  
BUA%YB%B\* 0AB1BtBzBB {BBBdBBBBB.B'BB)A%YB%B\* 0000B.B'BB)A%YB%B\*  
0K 0BBB 0B61 00BBB1/0BU 0BBNAB-B 0A%YB%BBL%YBBB%BAB\*A%YBB 0  
B% 0B6%YB%B 0XCP20 BU 0B+BA 0BMB1%YBBB%BBL%YBBB% 0B6%YBBB%BBL&BRMBAB\*B2A 0  
QIS3 BU 0B+BB)N-BB)BBN 8 A 0

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KB+52B+BBA;4 0B+3 0B1 0KB1H/B 0BBB-BNBBDB.BBNABABA 000• :00000w B\*B2A 00A 0  
;4 0B6.=0B14FB\*B1#)B1 0GBBtBj% 0B11BB.B'BB).BB)BBNA 0w

<sup>7</sup> EU域内における内部モデルの利用実態は、白須、松山、森本（2008）に紹介されている。

<sup>8</sup> 2008 0 12 0 21 0B.A 0CEIOPSBHPB.QIS4 B1 0M 0BG/0%0B0-+BBOBBA 04B\*B2BnBpBB•  
BBrBBB.BBOB 0A 0B.1 BB 0BBMNB1B\*A 0B\*B2 QIS4 B.B'BB)B2. 0BB-B 0A 0

## 2. 図1. N

### 2-1. 図

図1は、技術的準備金、MCR及びSCRをカバーするための資産の構成を示している。図は縦長の矩形で、左側に「技術的準備金、MCR及びSCRをカバーするための資産」という縦書きのラベルがある。右側には「技術的準備金」というラベルがある。図は複数の水平線と垂直線によって分割されている。上部には「SCR」のラベルがあり、その下の領域は「MCR」のラベルで示されている。MCRの下には「リスクマージン」と「市場整合的な評価」というラベルがある。さらに下には「最良推定」というラベルがある。図の下部には「ヘッジ可能リスク」と「ヘッジ不可能リスク」というラベルがある。

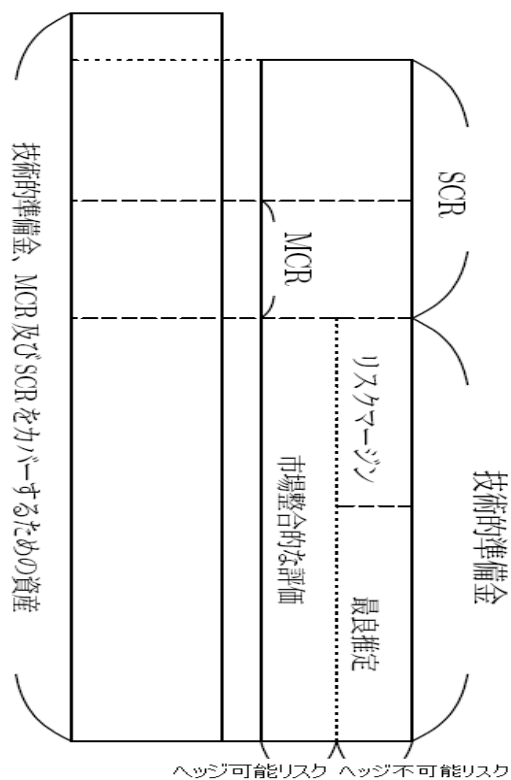


図 1 保険規制の概念図

図1は、技術的準備金、MCR及びSCRをカバーするための資産の構成を示している。図は縦長の矩形で、左側に「技術的準備金、MCR及びSCRをカバーするための資産」という縦書きのラベルがある。右側には「技術的準備金」というラベルがある。図は複数の水平線と垂直線によって分割されている。上部には「SCR」のラベルがあり、その下の領域は「MCR」のラベルで示されている。MCRの下には「リスクマージン」と「市場整合的な評価」というラベルがある。さらに下には「最良推定」というラベルがある。図の下部には「ヘッジ可能リスク」と「ヘッジ不可能リスク」というラベルがある。

<sup>9</sup> BBOBOP20 BBBkBB2.1=The overall objective of prudential regulation must be to ensure that an insurer maintains, at all times, financial resources which are adequate, both as to amount and quality, to ensure there is no significant risk that its liabilities cannot be met as they fall due.=qB.nB(BA

BBNB1B\*BBNA 4 KB.B'BB)A 4% B\*.fBB BBNA

2-2. 4 KB1 f&

4 KB.BBN02B2A B'B1-&BBLB-B&B)BBNA

- 技術的準備金 Technical Provision
- 要資本Solvency Capital RequirementASCRB
- 要資本(Minimum Capital RequirementAMCRB

02B2M BBOBN BUBfBBBBNBEB1B\*BBNA SCR B+MCR B2M BB-B  
 BUBfBBBBNB+BU(BB).36BBOBNBEB1B\*BBNA B2A 4 (\*B.2 B-MBB/BU  
 BBBNB+BU(B+B A 4 & (\*B.4 2 p BBB-BBOBNB+BB#BU BBN/ B10BU  
 1BBNBU B'A SCR B2A 0 B1 BU BBEB1B\*BBNABB-BRBA SCR B2A 4  
 (\*B1 KBHU KB A SCR B10B.BKB&B)A #) 4PB/ TB-B,B1-GBUB+BLBBNBKBB-/ 0  
 B10B\*BBNA

A MCR B2A & 1b TB+BB)B1 BU BBA BB1 0BU BNB+#) 4PB & B-  
 BUB+BLBBNBEB1B\*BBNA (\*B1 B11 BB1 B B2-Y B-B,B\*BBNB+B (B-- & B\*  
 fBBOB-BBOB3B-BLB-BABAB MCR B+SCR B1 BBLA SCR B2MCR BKBM BBA BB'QB'B10  
 B14FB. B-B B BBOB3B-BLB-BABBA QIS2 B1 & B\*B2A QB'B10 B14FB.B BO  
 BB, BB-BB3BBMB\*B2B-B MCR B SCR BKBM B7BB-BNB1BBtBEBB&B4. B A B B1BBDA  
 QIS2 B\*BBLBOB B\*B2A MCR B1 B1 BBLBOB)BB-BB+. BBNB\*BBPBA

2-3. 02

w 02B1% B2A B+ B..O BBNB+BB n B-(B B. BB)BBNA  
 02B1% B.BBBMABABAB“BBs(BBtBjB+B“BBs(BBtBjB. BB)(BBNA  
 B“BBs(BBtBjB1 A B BBOBN p B (B\*BBOB3ABB1 p B.BKB&B)  
 (mark to market)A 02B15 BU BNBB+BB\*BBNABB#B ABB1B+BB1 p B2A B.  
 yGHBBBMBB'1X HB1BBN B\*BLBOBBEB1B\*B-BB)B2B-BLB-BA  
 AB“BBs(BBtBjB1 AB“BBs(BBtBjB1BKBB. p BU BBNBB+B (B\*B  
 BNAB B1BBDA p B.BKBLB-B ABBB+ B-% (mark-to-model)B B+B-BNAB BB)A  
 B“BBs(BB-BBtBjB. BBN 02B2A )B.BBtBjBBBBsBBU BBNBEB1B+BB)%  
 BBOBNABABAB“BBs(BBtBjB\*B B&B)BEAB“BBs B yGHBG1X HB.B'BB)B15BU  
 BNB+BB.B2AB“BBs(BBtBjB1BKBB.A )B.BBtBjBBBBsBBU (B) BDBLBOBNBBB\*BBNA  
 BABAB“BBs(BBtBjB\*B B&BB+BB)BEAB B1B. B. yGHBBBMA 1X HB1BBN B\*  
 p BBBBOB)BBNB“BBs(BBtBjBBBBNB-BLB3A O B.BBB)B B1 p BU BBB+B (B\*  
 BBNA B B.B“BBs(BBtBjB.B'BB)A KB-B“BBs(B BBOB)BBN B2A KB  
 B-B“BBs B1 p B.A M BBOBN bKB-B“BBs B1 p B+B1 B1BBtBjB. BBNBhBBBzBBB  
 BBsB1 B#B BBNBB+B\*A 02B1.OBU-BBNA









3-2. [redacted]

CEIOPSB2A [redacted] MCRB1.3.B.[redacted]BBN<sup>23</sup> AMCRB1.3 [redacted]B.4PBB) [redacted]2B17B [redacted]  
BB+B2A [redacted]&B\*&B-.%A5 [redacted]HA [redacted]HABxBB”BBrB B;BtBBuB.[redacted]-B\*BBNBB+B\*BBNA [redacted]  
BBLB.CEIOPSB2ABtBj [redacted]A [redacted]B.BBN1 [redacted]A [redacted]BOBBBzB+ [redacted] [redacted]B+ [redacted]  
KB.B'BB)B1.O [redacted]0B+B1 [redacted]HB.B'BB)BE((BBNBKBB.[redacted]BBA [redacted] MCRB2 [redacted]BU.3 [redacted]BB [redacted]  
BB\*BBNA [redacted]

CEIOPS B2MCR BUBBjBzBB”BtBdBdBBBBB\*.%BBOBNBBB\*BBNB+BB)BBNA [redacted]B+B [redacted]  
B)ASCR B1BtBzBB{BBBdBdBBBBBU [redacted]BMCR BUt%BBKBB+BBABBB [redacted]QIS2 B1&ABB1BB’  
BBBB.BBNBBB'B1 [redacted]B [redacted]BBA [redacted] MCR B [redacted]SCR BU [redacted]BB [redacted]BN A [redacted]B/BB&B)BBAB&BB1  
B\*BB(QIS2 B.BKBN [redacted]MCR/SCR [redacted]B1&B.B'BB)B2A4: [redacted] A.1.BU [redacted] )ABBOB2A [redacted]BU [redacted]B [redacted]  
BNBB+B1B\*B [redacted]BN [redacted])B+A [redacted]4 B1 [redacted]B.BKBN [redacted] [redacted]B1 [redacted]B [redacted] SCR B.B2 [redacted]BBOBNBA [redacted]  
QIS2 B1 MCR B.[redacted]BOB-BBB+B [redacted]BB-[redacted]\*BBNB+((BBLBOB)BBNA [redacted]

B [redacted]BU [redacted]BOB3A [redacted]BtBzBB{BBBdBdBBBBB+BB [redacted]B [redacted]\* MCR BU.%BBNBB+B.BKB&  
B)AMCR B [redacted]SCR BUBB# [redacted]B.[redacted]BNBB+B+B-BNABBB [redacted]ABBOB\*B2B-BN [redacted]BB [redacted]BB)BBABABABA [redacted]  
BB1KBB-[redacted]B1B\*.BB [redacted] MCR BA [redacted]B-5 [redacted]HA [redacted]HA [redacted]O([redacted]61 [redacted]B.BB [redacted]  
BBN1 [redacted]HBU& [redacted]B\*BBNBB,BB [redacted]BRBBA [redacted]

BB11R0B1%BBN [redacted]B2A [redacted]SCR B+MCR B1BBqB\_B [redacted]0B155B.BBNA [redacted]B1%B\*A [redacted]MCR B1.% [redacted]  
B1 [redacted]B.B'BB)((&BBNB1B\*ABBB\*B2AMCR B1 [redacted]lgBU%B.1@BBNAMCR B2BtBzBB{BBBdB [redacted]  
BBBB1B [redacted]sBBBBB’BBBB.BKBN SCR B1.BU% [redacted] [redacted]BBEB1B\*ABxBB”BBrB [redacted] [redacted]B1  
[redacted]B+B-B&B)BBNABAB [redacted]MCR B2BoBB\_B [redacted]BkBBnBBpBBB+BBBeB [redacted]B1 [redacted]B1-[redacted]BU [redacted]BBBB\*B [redacted]  
BNAB B1BBD [redacted]A [redacted]MCR B2A [redacted]K.OB\*[redacted]BOB-B4BMBBBE [redacted]B•A [redacted]B\*/BBN1J [redacted]BU [redacted]  
BBNBBDB.A [redacted] [redacted]B-& [redacted]BU [redacted]BBNBBsBBBBU [redacted]BCB2BB\*BBNA [redacted]

3-3:w B B1GB14P%

6 [redacted]BBBxBB”BBrBB [redacted]BBBBBBjB2A [redacted] SCR BGMCR B+BB&B2 [redacted]B-[redacted]BU.-B [redacted]  
B#BB\*B21 [redacted]BBNBB+BB\*BB-B [redacted]A [redacted]4 [redacted]B1 [redacted]B2A %YBB1GB1B\*B1 [redacted]#)-GA %YBB1GB1 [redacted]  
B\*B1 [redacted]#) [redacted]BO4B1 [redacted] [redacted]B-BB\*1 [redacted]BBNBB+B2B\*BB-B [redacted]A %YBB1GB6%YBB1GB1 [redacted] [redacted]B-  
[redacted]B2 [redacted]B\*B2.BOB-BABBB [redacted] CEIOPS B2second wave answer B.BBB)AB-BNGB14FB\*B1  
[redacted] [redacted]B.%YBB1GB14 [redacted]BU1@BB)BBNA [redacted]

%YBB1GB.B'BB)A [redacted] [redacted]B2A [redacted] Amended Framework for Consultation B.BBB)A [redacted] [redacted]#)- [redacted]  
GB2A [redacted] [redacted]BBtBjB’BB [redacted]B\_BBU [redacted]BB [redacted]BBG [redacted]BB [redacted]BU/ [redacted]BBNBB+B.A [redacted] [redacted]SBBU [redacted] [redacted]BDBNBBB\*BBNAB+  
[redacted]BBA [redacted] SCR B2; [redacted]4 (\*B1-[redacted] [redacted]B1BBtBj [redacted]B-[redacted]2B\*BBNBB+BU [redacted] [redacted]BOB)BBNABBB [redacted] [redacted]  
B.BtBzBB{BBBdBdBBBBB\*B2A [redacted]XAB1 [redacted]4 [redacted]B.BKBNBBtBj [redacted]HB11BBU((&BB)BB-BABBOB2A [redacted]  
%YBB1GB2BBtBjB1O [redacted] [redacted]B.BB) [redacted] [redacted]x [redacted] [redacted] [redacted]BOBB [redacted] [redacted]BBBBBBjBU [redacted] [redacted]BB)BBNB.1BB-BBBLB\*BBNA [redacted]

<sup>23</sup> CfA 9 B.BBB)

B B1BBDACEIOPSB2 second wave answer B.BBB)ABBtBjB4 (marginal)B+((BBLBOBN A #A □  
 % BBOB 3 BBOB A #A □ BBOBBtBjB1 BMBB s- □ (practicable)B\*B-  
 B A #B\*B2ASCR % B14B1 0B- 3B)BBBOB-B XAB1B1BBtB.BBB)A%YBB1GB2A □  
 4(\*B1BBtBjB'BBBB\_BBU B. B #B\*B-B (HB BBN (HB U 0 BBA □  
 BB1BKBB- #A #) 4PB2A 4 B. BB) B BBBG1 B BBBBU BBB+BU BD  
 B)BBNA%YBB1GB\*B1 B2A XAB1 4(\*B1 B1 1BU(( &B. IBOBNBB\*BBNAB B1BBD  
 XAB1 4(\*B1- BBA B #)BBBB1 B B1 B+B-BNA #) 4PB1 BzB. nB(B □  
 B)A 4(\*B2%YBB1GB1B\*ASCR BU.%BBNBBDB. B BBBBU BBB+BB\*BBNA □  
 B BBB\*B2A 4(\*B1BBtBj% B + s)B.BBBNK(B)B1/ B- B +A B. B1B•  
 BBU.z.=B BBNBB+B1 n0BU B BB-BBOB3B-BLB-BAB BB)A B BBB.4PBB)A%YBB1  
 GB2 BB- BU BBA bK B BBB #) 4PB. BzBBOBB+B A B+B B)A IJ B  
 uBB\*BBNBBB\*BBNA □  
 %YBB1GB\*B2A 4(\*B1BBtBj% B1 GB-O BBE(B+BB)BBNA B 0 2B1 B 2A K  
 B1BBBeB 4FB. BBNKB)B1BBtBjB.B'BB)B1 KB)B1 BU BBBEB1B\*BBNA □ SCR B2A □  
 B1BzB\_BB-BB\_BuBB.BRBBNA) (emerging asset)BG KBtBjBU(( &BBNA%YBB1GB1 □  
 B\*B1 B 2B+ SCR B1O B2 BB B (B.B-BNB.BBBB&B)A B(BB)BBA □  
 CEIOPS B2A 4(\*B B\*B 2B- BG GBUM B BBN BU (B&B)BBNBB+BU □  
 BBNA □

4. .O n0

4-1. /B1.O w

BxBB”BBrB O B.BBB)A/B. BBNB’BBBBBBB-.O (prudential valuation rule) BU  
 B BBNBB+B2A #•'B1 o' BGA 4BOB 52BG/ B1 BBU((BB BxBB”BBrBB □  
 BBSBB1.% B6.5 B B 2B+ SCRBUBfBBB\*BBNBB,BBBU B BBNBBDB. B B □  
 BBB+BB\*BB-BACEIOPSB2/ B1BxBB”BBrB O B.B'BB)A A B+B B)A □ SCRBU.% B □  
 BNBBDB.A/B2 x B.BBB1BBBBBBB\*. BBOB)BEBKBA B. B\*BBNBBB1BBBB □  
 BBB B B-BB+BB.B2A B1 B BBOB-BBOB3B-BLB-BBABB1 B1 B2BBB1BBB1  
 B+ B\*BBNBBB\*BBNA AB+BB BU1 @BB)BBN <sup>24</sup> A B. BBOB)BB-B/B2A □  
 BBtBjA GHBBtBjBU B.(( &BB)B’BBBBBB..O BBOBN B BBNB#BPBA □

4-2. B 2 w

BxBB”BBrB B’BBSbbjBB. BB)A B B2A ABxBB”BBrB BBSBBB2A 4 B1

<sup>24</sup> CfA 10 B.BBN%uB.B)

/B+KB.BB)AB'BBBBBB-.O n0BU=BCBBB\*BBNAB+1@BB)BBNA 7 7 B2A □  
 AIAIS 4 #)B1 & BBB+2, F B1 oB. BBNBnBBBBtBBBB2A oBBNnBU □  
 BB)BBNAAB+((BB)BBNAIS 4 BnBB'BBBrB'BB2A 4 (\*B1 0 2 B2 B\*BMA □  
 5 HBBBMA 4 HBBBMA 4 (\*4FB\*0 0 B\*B-BBOB3B-BLB-BAAAB+BB)BBNABAB 7 □  
 7 B2A 0 2 B2A & /BU(( &BB)A B 4 & (\*BG 4 2 B.BBN (c) )  
 4 KBUBBBNBDB.A 3 oBBOBN B BBNA AB+1 @BB)BBNAB BOB.BB)A 0 0 □  
 2 B2AB'BBBBBB\*A 5 B\*B A 4 B\*A #NB-nB\*.O BBOBNBBB\*BMA 4 (\*B14FB\*  
 0 0 B\*B-BBOB3B-BLB-BAA B B)A 2 0 B 1 B+4 BBtBjB.B'BB)B1 )x B. □  
 (B-BBBzBU1 B. BABB'#fBB-BBKB.BB-BBOB3B-BLB-BABBLB.A )o. B+BBtBj  
 BBBsBB1 B\*BBNBBB+BB)BBNA □  
 7 7 B2A 4 KB1 oB1 oB1 o'BUA oB2A 4P1jBBNBtBjB BBB1B\_  
 BBBBfBBBU B A 5 BBOBN B. nB(BB)A B1BhBBBrBB BBB1 0 B.%lB □  
 BAAAB+1@BBABABABtBjBBBsBB.4PB)A 7 7 B2A A KB)B1BzB\_BB-BB\_BuBB.B'BB)A □  
 B1 KBhBBBrBB BBB+& B6B'BBtBjBUBfBBBNNBEB1AB+BB)BBNA □

4-3.:w B“BBs(BBtBjB+B“BBs(BBtBj: w

: w 4 KB1.O B. 5 BUBEB'QB'B1N (A B“BBs(BBtBjB+B“BBs(BBtBjB.B'BB)A □  
 CEIOPSB2B-BN BUBB A B“BBs(BBtBjB2A F BBBBBdBBE1 B\*BAcBjBtBBBsBB □  
 BA yGHB BMA 1X H B1BBN B.BBB)A B.B“BBsBBNBB+B1B\*BBNBBtBjB\*BBNAB B1 □  
 A B B\*BBN pBU (B)BBOBNA 5 B\*BBN pBB'BB)BBNB1B-BLA K  
 B1.O B2 pB+ B.% o (mark-to-market)BBOBNBBB\*BBNA (B.ABB1 pB1 □  
 GB1BBtBjB CRB. BBOBNBBB\*BBN <sup>25</sup> A □

4 K.O B1 B1BtBBB'B2AB“BBs(BBtBjB+B“BBs(BBtBjB. KBUBBNBB+B\*  
 BBNA u-Y oBU BBNBB+B (B\*BBNB-BLB3AB“BBs(BBtBjB1 KB2- F BBBBBdBBE  
 B1BBBIBB oB+%lBBB-BNB2BB\*BBNA □

B“BBs(BBtBjB2A 4 B1 KBhBBBrBB BBB+B“BBsBBBBdBBE1BhBBBrBB BBB □  
 B-BNBDBBNBEB1B\*BBNA #) 4PB1.O B2B“BBs(BBtBjB1BBDB. B\*BBNABB1  
 .OB11 B\*B2u-Y oB. nB(B BU1 B\*B B-BABB1PB.BBB)A □ CEIOPS B2A A7B y  
 GHB+1X H B1BBN B\*B“BBsBBOB-BABABB2A BBN B-BBtBjB-B,B1BBDB.A □  
 pB 5 BBOB-B O B.BBNB+BB2BB'B\*EBBtBjB2B“BBs(BBtBjB1BB)BBNA □

IAIS B22nd liabilities paper B.BBB)ABAB KB22 B+5V2 B1-&B. BAA B B)A 4B.  
 B BBOB)BBNB B BBOB)BB-BBBtBjB B\* BBNB+BB)BBNA B BBOBN  
 -& B1 A 2, F & B2A F BBOBN pBABB2/ O B BBB\* oBBOA B\*A5V  
 2, F & □ (4 B B A B e B • B B B r B B B □ )B2A 47 B- % B B B B \_ B B B K B U B B \_ B j B e B B □

<sup>25</sup> Groupe Consultatif B1 B+ □

BBNBDB. B\*BBP2B+BB)BBOBNB+BBB+B.nB(BB).O BBOBNB+BB)BBNA  
BBACEIOPS B2BtBjBB“Bs(B\*BN#2A)B.BtBjBBsBBU(BN  
B-.OBU1 BBBB\*BBNB+BB(BBU(B&B)BBNA2(BtBjBA7B)GH+1X(B1BBN  
B\*B“BsBBOB-BABAB2A(BN(B-BtBjB-B,B1BDB.A(BB)BBOB-B  
0B.BNB+BB2BB'B\*BEA2(BtBjBEAB“Bs(BBtBjB+BB)((&BBNB+B(B\*BBPBA  
(B1(B)4(\* )B;0BABABA(B14(BB (original undertakings)B.BKBN1(B-B  
BBeBrBBBeBU(BA(B.B1BBN(BU(B%BBNBDB.(B-B1BBs  
BBU(BDB-BBOB3B-BLB-BA  
)x(A(B12(BtBjB2B“Bs(B+((BBLBOBNA(B.4(B(BBtBjB2B“Bs(B+  
B2((BB.BBAB“Bs(B-BtBjB.B'BB)A(B+BB-.O B2)GH+1X(BBU(BB  
BU(B+BBB\*BBNA 4(B(BBtBjABeB•BBBrBBBtBjB2A2(BBLB2B1(BE  
(BLBOB-B(B&B+(BBLB(BSNA2(BKB15V2(B&BUB•BBB+BB(B-%  
Bmark-to-model(B\*B.OBBNB+BU(BBA

4-4.:w BvBkBBBBrBBB+(segmentation and diversification)

IAIS B12nd liability paper B2AA6(B1/v(A6(B1BBtBjB'BBB\_BB2A6(B1(BB.#B  
BBB\*BBNAB+BBB\_Bt(BA(BB)AA(B.BB).z/BBOBNB#BB\*BEA(B1(B.nB(  
BB 4(BBU(B(BB.BKBN(B+BABBBdBBe(B1BBtBjBzB\_B'B1(B(BBQB'  
B1-B2ABBBdBBe(B1BBtBjBU0BBNB+BB(BU(BCABBBABB1(BU(B2(BBA  
BABA 4(\*B.BKB&B)BBtBj(B12(B(B-BNBDA(BtBj0(B2(BB.(B1BEB1B+B-BNA  
B(BB)AIAIS B2A 4(BBU(B(BBNB+B+BBBdBBe(B1BBtBjBzB\_B'B1(B(BBLB1B  
BtBj0(B1(BA SCR(B1.OB.(BDBLBOBNBBB\*BBNAAB+1@BB)BBNA  
(B.BKBN(B2ABtBjBBsBBU((&BBN4B.(B\*BBNAB(B1BDBBtBjBBsBBU((B  
BNB.(B&B)((&BBB(B2A(B1 4(B\*B-B(A(B-BB(B(B (bidder)B1  
BBNBdBBe(B1BvBkBBBBrBBB+(B.BKBN(B\*B(BNA(B\*A(B.4  
&BU(BB 4(\*B.BKB&B)4(BB(BB.(BBOBN (full settlement)B+BB(BBLA(BtBj  
BBsBB2A 4(BU(B(BB(B1(BBNBBdBBe(B1BvBkBBBBrBBB+(B.BKBN(B  
BtBj0(B12(BU((&BBB+B(B(BEBNA  
BB(A(B.BKBN(BU(BB.(BDBNB+B2A(B1XAB1BBBj(B\*B1 4(B=0  
B1BrBBBeBU(B.(B=BB-BBB+B.B-B&B)BBAB(B1B(BS(B22nd liability paper B.BB)A  
A 4(BBU(B(BBNB+B\*BLBOBN(B(BBLB1(BU((&BBNBDB.A(BBNBBB•  
dBBe2A(B1(B(BKB-4(BB\*(BBOBNBBBdBBeBU.3(BBB\*BBNAAB+BB  
BB\_BtBB)BBNA  
6(B1BBtBjB\*(BBOBN(B-BkBBB'B.BB)B2A(B(B2(B(BBOBLBOBNA(B  
BB(B-BkBBB'GB-BN(B+B1.dB.B-BNB+(B\*BBNA(B(BB+ SCR-MCR(B1

B.B'BB)A ⊕BBvBkBBBBrBBBUBBNBB+BA (B\*1 B\*BBNBB,BBBU BDBNBDB.A □  
B-BN B EB\*BBNA □

□B-B“BBs (□BBtBjB1.O □B2A BtBBtB BBLBOB □A ⊕B.BBB)A □4 □KB1b  
K □A BABB2A □4 □KB1%Y (□\*B;B1 ⊖BU □=BBNBKBB..O BBNBEB1B\*BBNABKB&B)A □  
{2BU.z/BB-BBBB)BB+BB((BB1 CEIOPS BBBBEBBMA B\*A bKBABB21 B-A □  
□□2BU.5 BBNBB+BB\*BBNB+((BBN(\*BEBBNABBBBBdBBe4FB\*B1 □□□B □B\*B □  
BNB1B-BLB3A □B+□4 B14FB\*B1 □P □ (correlation measure)BA B.5 B\*1 B-□  
0B\* □BBOBNBBB\*BBNA □

4-5.:w □□□B1 □ (measurement of best estimation)

□4 □KB1 □□□B2A □BBL/BBNBhBBBrBBB1# □□B1 □□□B1 B.  
□B(BBEB1B\*BBNB+BB)□□□B1. % B1BBD.B2A/BBMBBN& B1% B. BBNBhBBBrBBB □  
BB1 M B □B+BBOBNA □□□B2A □B\*BBN □4 □□□B. □B(BB-BBOB3B-BLB-B A □  
B-BB+BEB □B1 B\*B)□□□BU BDB)AB B1BBBA BE1 B- □BBABB2A □B1&BB □  
BRBBBU □□□B1.O B. BBNBBB\*BBN 27 ABEB&B+BE1 B- □B+B2AB”BtBB’BBjBBBtB1BBj  
B†BBjB1 □B\*BBMA □KB1H/BU BEBKBB BBLBOBN □BU0BB)BBNABABA BhBBBrBBB1  
MB2A □□□BBOBNA □& □A □A □A □A □A & B11tBU □BBB\*BBNA □  
BABA □B-& □□BB-BB+BB.ABIBBtBB\_B1BBtBB’BBBB.BKB&B)□BBBNBB+BB\*BBNA □  
□AB\_BBBrBBBA □A □4 B6 □B1 □B2A B □R1bB1- PB\*BBNA □  
B.B'BB)A □CEIOPSB2A □KB+4P1jBBNBBtBjBBB\_BBBBBfBBBU BBNB+BBBB\_BtBB)BBNA □  
B\_BBBrBBB.4PB)A □B1B\_BBBrBBB.BBN □□B2A □BhBBBrBBB.&BB □  
BOBLBOBNBBB\*BBMABABA □4 □& (\*B1 □KBUp□BBBDB. □B\*BBN □B2A □□□□  
B. ⊖BDBLBOB)BEKKB+1@BB)BBNAB BB)A □4 B.B'BB)BE((&B.IBOBNBBB\*BBNB+BB)BBNA □  
□B1 □B.B'BB)A □B □□DB1 □B1 □B2((BB-BBEB1B+BBOB)BBN 28 A □  
□A □4 B. B1 □B\*BBN □b A43 BA □B1 □□B2A B-B&BBtBjBkBBB’B1  
BBDA □B)O □BBOBNBBB\*BBNABABA BOBLB1BBBBrBBB.B'BB)BEA □□B1.3 □B.B'BB)  
((&BBOBNBBB\*BBNA □B2 □B\*BBN1 B-s'c □ (discontinuance experience)BU BBNBB+B □  
B\*BBNBEBBOB-B A)D □Y2 B1BBN. & (B1 □B1 □□B2A (( & B1BrBBBeB.BBB) □□  
B.BDBLBOBNBBB\*BBN □A □  
BABA □w □K □=B+ □& □4F □B1 □4 □& (\*BeB’BrBBBU((BBNBB+B22 □B\*BBNA ⊕□B.A □  
B1& □□B1- □GB2A □BhBBBrBBB. □BBOBNBBB\*BBNA □□B\*B2ABBABBAB- A ⊕B.  
BBN-GBU((&BBB\*BBNA □

26 Cfa7.35 から  
27 B1 □B2A □ QIS3 B.BBB)0BBOB)BBN □B\*BBNA □ CP20 B\*B2ABBB'BB1 □B\*A □□□BU  
BDBNB+BB.AQB' □B1 □B\* BDBLBOBNB+BB.B2A BE7B □BU BBNB+BB)BBBA □w  
28 Cfa7.39 BKBM  
29 Cfa7.54 BKBM

BABA 4 (\*B;B1 BU DBDB) & BB1B 4 BBsBBtB. BBN  
 2B2A)x B. =BBOBN(B1)D EY2B1BBN (discretionary) (benefit) BU DBDB5  
 B.B-BNAB B1BBDA)D EY2B1BBN 2A B BB.BKBMBBBCBN BU EBBN BU(B'AB'  
 BABMABBN A+B\*B2 KB+BBBKMBEA /B+BB)B1 (BU(B'ABBBAB,B1 2BAB\*A B1)D  
 -Y2B1BBN BU 2B. DBDNBBB+BB)x B- SBBBNA CEIOPS B2A)D EY  
 2B1BBN) (profit sharing)B B1 BU EBBNBBDB.B,B1 2BRBOBNBB.B'BB)A  
 XAB1 B\*BRBOB)BBNA B1 A B- & B.BKB&B)A B1)D EY2  
 B1 BU yBBN 2A 4 & (\*B1)D EY2 B.B'BB)B1 B1 2A BABB B-B  
 A+B\*A BBOBN& GB1H/B+BBBKBB- B. BBNB+A Z/BB)BBNA  
 BABABBBBKB.BRBBN)BrBtBBB1 HBU((BB)A CEIOPS BBBB1 2A  
 BBBBpB\_B(one-size-fits-all)BB'BBBB\*A 2B1BxBB"BBR(B.O.B.)BUIBO  
 BNB1B B\*BBNB+B2AB&B)BB-BABBB\*A 4 6BBOB A+B\*B1BB BU EBBNBB+BB\*B  
 BN B1 & (\*2) (bonus)B1C3C4BfBBoBBBB+A S)x B- (BUBfBBBBNBBDB. B. BB  
 B+BB\*BBN B1 & (\*2) B 2C.CBfBBoBBBB. BB)((BBNABAB C.CBfBBoBBB2A  
 (/B+BB)BMBA 2B1 B+B2((BB-BABBB A 1C3C4BfBBoBBBU (7  
 B+BB)BM B1B21 B\*B2B-BBKBB. ABRBOBNAB B1BBDA 2B. 1C3C4BfBBoBBBU BD  
 B)A2C.CBfBBoBBB2 DBD-BBB+B B\*BBNBKB. ABRBOBNABB1((BB2A B1. B\*B2B-B A  
 B'BBBBBrBBB-. PB+BB)BBOBNBEB1B\*BBNABBB A B1 BU(B' CEIOPS BBBB  
 BEBBNA  
 B1/ (B+ B)B. A)x B-M B hBBBrBB BBBB'BBBB2ABB†BBBBBjBBsBBtB+B\_B  
 BBBjBtBBBjBBsBBtB. BB)BEA BBLBOBNBBB\*BBNA B2ABB†BBBBBjBB BBB  
 B-nB. nB(BB)k- BBNB+ 6B A & /A kb-)p2 A 4 (\*B B BN BU B8BBCA  
 BBL BBNKB)B1BhBBBrBB BBBU((&BBNA  
 BABA 4 B. B1 S+B+BB)B2A )o BU BBBDB. BBLBOBNBBB+BBBBBzB  
 BA X B1&6B. nB(BBB+B\*BBNA 6B11 B2A B1.% A & BEBBB2 4  
 B-BBB B1BjB†BjBU B+BNA % B2 S+B\*BBN B. nB(BB)B-BBOBNBBB\*BBNAB B  
 B)A B1&6B.4PBPN 6B2A X B11 B1&6BG B1 A+BBL BBOBNBBB\*BBNA  
 w B- #BB\*A B1BhBBBrBB BBB1 )o BU. O BBNBB+B2A 5BBBBEBBOB-BABB  
 BA B1 4 2B.B'BB)ABBB'BB1 BABB\*B. B\*B\*BBNA QIS1 B+  
 QIS2 B.BBB)ABEB&B+BER1bB1 B2BBb\_B BB C Bain Ladder)B+BBBB-B\_Bz BBBBgBxB  
 (Bornhuetter-Ferguson) B\*BBNB+((BBLBOB)BBNAB B1 A A B"BBjBzBB {BBenklander)A  
 BBBj (link ratio)ABlBB'BnBB(Cape Cod)AB BB)BkBBtBBB' (grossing up method)BEA  
 BBOB)BBNA

4-6.: w B B tB jB B B sB B ;B 1B B 'B B B w

BBtBjBBBsBB1. B.B'BB)A 7 2 B+B)A # B1 75 BBBvBBzB\_B

oBBL)oBUoBBEB1B1B+BB).%BBNB+B+A/BnBtBcBUoBBcB1QB'B1  
BU&zBB)BBNA/vB1B+IB-OB.BBNB'BBhBrBB+BB)A 75 BBBvBBB1oBB  
#oBUoBB)BBNBABB1oB.&B-nB2B-BA BBtjBBBsBB2A KB1#oB1  
 (o) )B+75 BBBvBBzB\_BoB1B+BB)BLBOBNBDA#oBU#nBLB-BBOB3B-BLB-BA  
#oBUoBNcB+BB)A BLBOBBBzBBLoBUoBDBNcB+A BBNB U  
B+BB)ABBBzBBL B1BBBBBzB BUoBBNB;BBBkBBNB BbMB1 B B  
BNA

/BnBtBcB2A oB1BnBBvB'BBU nB+BB)BBNABBOB2A cB- /B KBUB\_  
BjBeBBBBBNBDB.A oBU/ oBBNBEB1B+BB NB (B\*B BNA 4B.B2ABBtjBBBsBB2A  
4(\*BEBB2 B-BB\_BBBBBBeBBAB\*KBU;BBNB+B\*B BCBNA B-- /  
(SCR)B1BnBtBB1 oB\*B BNB+ oBBOBNA/BnBtBcBU BBNB.BB&BB&B)A B-/ B1  
o'A/BnBtBB1.3 oA (BBtjBU,B1 oBAB\*((&BBNB1 oB6 B12,Btj  
BUB,B1 oBAB\*((&BBNB1 oBU.3 oBBNB BBNNA QISBB\*B2A B+BB)AB'BBs  
BtjB.B'BB)A/BnBtBcBUoBB)BBtjBBBsBBU. BB)BBNAB1B+B/BnBtBB+BB)BBtj  
BBB.BBBU/BBoBUoBB)BBN 30 A

n4B.B'BB)A B. oBBBtBBtBBtBBUoBBNB-BNBB'BBBB((BBLBOB)BBNA  
PB.BDBBtBBtBBtBB\*B BtjBBBsBB12B oBBOBNA BtBBtBBtBB2ABBtjBBBsBB.4P  
ljBBNB)B1BBtjBBjzBB.B'BB)A BtBBtBrBBBeBU.3 oBBNA&BrBBBeB+&BBtjBBjzB  
B.B'BB)A cB2) oB1 BU.%BBNAB BB)AK B1BBtjBBBsBB2A 4PB BBBjBtBU  
BB)A oBUoBBNB+B\*B DBLBOBNA BB1BB'BBBB2ABBNB BBB1 B\* B.BrBBj  
B.(4BBLBOBN oB2B12BU)=BBNB1B\*BBNA

oBUoBBN1B.BBB)A B-#HB BBNAB3A BBN& B B  
B1.BMA oB1BBBzB B+B.BBB)B)B2BABNBAB+BB #HB\*B BNA BABA B-  
BBBzB./BBN oB1 #SHA B1BhBBBrBBBB1# B1 AB.B'BB)B1 #  
HABBLB.ABhBBBrBBBBB1 4FB.4PBBN #HB+A43 B1 #HB BBNABBOBLB1.  
.B2A cB.BKBLBA B.#BBN oB\*B BNA B BB)ABBOBLB1.(B2A oB.5BBNB+A  
BRBOBNB1B\*A oB.BB,B1KB B-BB'BBBBEA #B-) oB12BU BBN(CHB  
BBNA

BB1BBtjBBBsBB1 oB.BBBN #HBU B+BBNB+A oB.BBN#)O1 B2A  
& B1 HBU(B-4BM((&BB-BBOB3B-BLB-BA oBU)=BBNBDB.A #)  
4PB2ABBBzB1/B1 O (B/B1BBBzB2 oB. BU BBNBBDABBOB2A #) O B.B

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<sup>30</sup> CP20 B\*B2A B.BBN/BnBtBcB1 BBLBOB)BBNA B1BB'BBBB\*B2A B1BB+BU((&BB)B  
BNA  
BBBtjBBBsBB2.e BBNBBBBdBBeB1 B B1 B#BBU((&BBNA  
B B+ B\*A 4(\*B1/ B.BBN2,BtjB2 B+B+ oBBNA  
BBBtjBBBsBB1.%B.A & B1BBtjB2((BB-BA  
B/w K B1 A B.4B&BBLA (B-% B\*ABBtjB1 B/BBNB+ oBBOBNA  
B KB)B1 4(\*B. 6BB1:BBtjBBBBB/BBN:/BnBtBB oBBOBNA



BB)2EB\*BBN )A& QB11 B+w HB1 OA B1 ;4 BABB2 EB-QB1 OA □  
B'BBBBBtQB EB-0B1BBDB. oBDBLBOB% CO B+)LBB)BBNBB1O oBU- □  
BBBB\*BBNA #) 4PB2ABBB-BN EB\*BE OBBN% B\*B-BB)B2B-BLB-BB1B\*A% (#/B2A □  
EB. BBNBBB\*BBNA □

5. / □

:w

4 & (\*BU / BBNB+BB 4 #)B1 BU1 •BBNBDB.A 4 B. EB-/ B Bs  
BrBBBU, BBNBB+B EB\*BBNA /B1 EB-BB”BB2A 2) 4PB1 EBKB1BtBjBBL-MBN □  
BU EB BNBDB. EB+BBOBN OB\*BBNABBBBBrBBBBB BBB+BB)B1/ B1 (B2B B1 □  
HB. nB(BB) oBBOBNABB1 HB2A E& H(permanence) A s&& n0 (going concern)B+ □  
% n0(winding-up) B.BBBN EB1 E HA o2 A 2) A BABB2A B B1 B1 KB B-BB+  
BBH/AB1B'B1 n0B. nB(BB) oBBOBNA /B11 pHB2A B1 B'B1 n0BU)BB 2 □  
BB. EB B) oBBOBNA □

BBBBBB13 EB 4 OB\*B2A BhBBzB B1 n EB- oB2A BnBBhBBzB □ (tier 1;BBBwB □  
f) B+-1b BhBBzB □ (tier 2) B\*BBNABnBBhBBzB B2A B'B1 n0KB)BU)BBB)BBNBEB1B#  
BA 1b BhBBzB B2A B'B1 n0B1 B\*)BBB-BEB1BEBBNA BBOB2 oB1% BBA\*B A pB-  
BEB1B+BB)((BBLBOBNBKBB-BhBBzB BUBBB)BBN (Credit institution) B+ / EB. B □  
B)A EB1 BhBBzB B1 BfBoBB EBBOBN (tier 3)ABBOB2 oB1% B1 B\*A BBB1BBBt  
BjBUB fB B BNB BDB. EB BNB BEB BOB-B BEB1B\*B BNA 4 #)B. B B B)A B BN □  
(contingent capital) B2A 4BLBOB% B\*A BBBB BBB+BB)1 pB\*BBNB+((BBLBOBNAB B #B B □  
EB. B2 #) 4PB. BKBNPB. zB EB+B-BNA □

BBBwB B+BxBB”B BrB B1 #) EB11 B BG/ B1 2 EB1 B†B BuB2A BKBM. fBB □ □  
pHB1 n0BGBfBoBB EB BU EB+BB)BBNAB'BABMA /B11 pHB2A 4FBGB BO)D0B1 □  
B#BB\*B-BAB BOBBfBBBBN2) 4PB1 EBKB. BBBtBjB. BKBKB&B) 5BBOB)BBABBLLB\*BBNA □  
EA 4 B1 -% B+3 EB % BU EB+((BBNB BBB, BBB+BB EB. B'BB). NB/BB&B □ <sup>31</sup> A □  
CEIOPSB2A 3 EB 4 OB BU(( &B. IBOB)ABBBB \_BuBBBN EBUB+BNBB+BU zBB)BBNA □  
P sA 3 EB 4 OB 2/ BU EB'B1 BfBoBBB. BAB, B1KB B./ BU EB%B)B-BBOB3B-BL  
B-BBBU- oBBN 4 BrBtBBU#% BB)BBNABAB ACEIOPSB2/ B1 BfBoBB EB BUA 3 EB □  
B\* BRBOBN 47 fB. BA □ tier B+m B9BB+BU zBB)BBNAB B B A □ B tier2 B1 zB2 2B1 □  
B2BBNB 3 EB B1B BOB+6 BB)BBNA □

3 EB+ 4 B14FB\*B11 BB2ABAB A EBKB1BzB \_BBtB1BBB11 BB EBLLBOBNA 4 B1 KB43  
EB\*BBNBBLA 3 EB+ OBB)43 B1/ BU EB BBNBKBB. B-BNB#BB\*B-B A /B. B'BB)BE B-

<sup>31</sup> CfA19 BBL

BN- PB+B-BNA 3 EB\*B252 MBMB. BBN; B1BBDA/ B1 (HB.2BB) □  
 BBOA MB B1BB+BVB, B1 BU4 BB)BBNA BBBA 4 EB\*B2; 4 KB143 HB1B □  
 BDA MB BKBM B1BBNBBxBBtB\*BBNBB+BU @BBNA □  
 CEIOPS B BBBN 4 BrBtBBB2B1 n0B. nB(BA 4 EB 3 EB+B1. zBU0BA □  
 B-BA 4 BrBtBBB.B'BB)B2A MB1B+BBMABKBM.f&B-/ EB EB\*BBNA □

5-1. BfBBoBB : tier BrBtBB □

CEIOPSB2A/ B1% B.%BN#) 4PB1BB'B BBB.B'BB)A/ A/ v A MB □  
 BLB-BNA & 4 BBOBBBBBtBrBBN(B. nB(BBBEB1B\*BBNBBB#AB+1@BB)BBNA & 4 BBOB □  
 BBBBtBrBBN(B+A OB-%9NB1 BUBNB+BB CEIOPSB1 SBBU) LBBNBBDB.A/ B2 □  
 MB-.OB\*BBNBB □ <sup>32</sup> B\*BBMA KB2 MB+ & 4 BBOBBBBBtBrBBN(B1  
 B\* KB+BB) MB BBOB)BBNB B1 B1 KB14FB\*A MB-BBOBNBBB\*BBNA MB.  
 B'BB)B2ACEIOPSB2A MB1((B BU BBBxBB"BBR B O BU BBNBBDA/ B+ □  
 KB1 n0B 3 BBOB-BBOB3B-BLB-BB+BB)BBNA □  
 / MB1BBDB1 nB-B2A & B1 MB BKBOB3ABKBM7B □ tier B; 6BBOA & □  
 & n0B\*5V & MB □ (non-cumulative element) B2 & MB □ (cumulative elements) BKBM MB. □  
 MB BA & B-- & B2 MB 4 FB1- & KBMBE MB. MB BA B+BBBB+B\*BBNABB1 MB. nB(  
 BB)Atier1Atier2A 4 □ tier3 B1B-BN3 B'B1 tier B./ BU 6BBNBB+BU CEIOPS B2QBDB)BBNA □  
 B-BA tier3 B3 EB+ MB\*BAB&BB MB/ MB & B t(BBOB)BBNBBDA □ CEIOPS B2A 3 EB+; 4 □  
 B1 tier3 B11BBU MB.BBNBBDA tier 3 B hBBBzBB.BB)ABBLBBDBDB)BBB 4 BU BB □  
 B+BU MBQB)BBNA MB1 B2A/ B1 MB BU-+BBBEB1B\*BBNA □

tier 1	コア	
	非コア	非革新的 革新的
tier 2	上位 tier 2	
	下位 tier 2	
tier 3		

図 2 資本の分類

tier1 / B1 MB2ABEB&B+BE/ B17BBEB1B\*A MB. MBU MB A y BBB BB) MB.  
 MB\*BB-BBOB3B-BLB-BAB B1BBDA & & n0B+% n0B1 MB.BBB) MBU MB A & □  
 B\*BBNBB+AB BB)A MB MB.BBB)A 4 & (\*B+ABKBM MB2B17B/ v MB6 KB. MB □  
 BN10B.B'BB)A KB)B1 KB1B. MB(B ABLLB.A MBnBtBBB-BB+BBBKBB- HBUCB'B □

<sup>32</sup> CfA19.25 B.BBB)

BB\*BBNA □

BABABnBier1 /B+5VBnBB-tier1 /B.BBNBB+BU((BBLBOB)BBNABBLB.5VBnBBI BU  
5V5\_ □(non-innovative)B+5\_ □(innovative)B.BBN <sup>33</sup> ABnBB1tier1B+BB)A p BBB1/ □  
1b cA □□AB•B\_BBBB'B\_B†BrBB □ (paid-up initial) BABB2n2 □(foundation fund)A □n  
0B1B\*B1 □□02B1.OB+BxBB”BBrB □OB1B1B-B,BB BABOBN <sup>34</sup> ABBLB.A5V5\_ □  
Bltier1 B2A5V& □B- □5c/ □BG □%1B1 □□BU □BBNBE1A BB-BRB □n2 □  
(subordinate member’s account)BU □BCAier1 B1BKBB- □B- □□BU □BBN/ □& B.A □  
1B15\_ □B-3B1BjBBtBBU-BBB+B\*A □4 (\*BxBB”BBrB □BU)BBBBDB.A& □B.A □  
BKBM2 □B-/ □□BUBBNBB+BU.5BB)BBNABBB A □ tier1 B+BB)B1BBOBLB1 □B11 pHB2A □  
5\_ □B- tier1 B □ tier1 B.BDBN □ABABB2A5\_ □B- tier1 B tier1 B\$CRB.BDBN □B+BBQ  
B'B1oB1 □□AB1B,BBLBB\* & BBOBNBBB\*BBNA □

:wtier2 BhBBBzBB2Aier1 B.B2 □BNBA □K & & B p □□B %B1B,BBLB □B\*ABBN □B1  
□□B □□BDBNBE1B\*BBNABB1 tier 2 BUABBLB. □tier 2(upper tier 2) B+ □ tier 2(lower  
tier 2)B1QB'B.BBNA □(\*B2 & □B-H/BUBEB'BEB1B\*A BB+BB3 & □B-& □□cB □  
BABOBNA □A □(\*B2A □□B1BEB1B\*A □□B1 □B1/v B+ □□B1 □□cB □BABOBN

<sup>35</sup> A □

:w □B.A □4C4C) er3 BhBBBzBB2 □B1c □B1B+BB.B#B □BU □B1% □BU □BBN#BB1BEB1  
B\*BBNABBOB.B2A □□B □□BBB1c □BGn2 □ (foundation fund) B1 □BB11 □□AA □  
□□4 □(\*B.BKBNBpB’BBBBzBBBBBBBuBnBB □ (supplementary members’ calls)B-B,BB BABO  
BNA □

5-2. □(limitation) :w

CEIOPSB2Aier 2 B.B'BB)A tier 1 B\$CRB.BBN □B..3oBBBBBvBBBBsB1QB'B1oB1  
□B\* & BBNBB+BU □BB)BBN <sup>36</sup> ABBLBier 1 B tier 2 B1 □ABKB6A □SCRB.B □B.

<sup>33</sup> QIS3 B\*B2ABnBB+5VBnBBI BU(BB)BB-BAB BB)A □tier1 B+BB)A □B1BEB1B □BBBOBN:w  
B □□BBB □□1b c □□6n2 □w  
B □□BBB. □□1b c □□6n2 □w  
□□B1 □□□w  
/ □B+/v □B1 □□B1 □□OB+BxBB”BBrB □n0B\*B1 □w  
□□n2 □w  
□□BA □% □□YBGP □& & □□YB.BBB)A □□BU □□BA □□BB-BA □□BBN □\_BBvBBBBBBEB-BA □  
□□B- □% □□B1BBBLB-BB+BB □□/ □B1 □□v □□

<sup>34</sup> CfA.19.51

<sup>35</sup> tier1 B+ □□B.A □QIS3 B.BBB)B2A tier2 BUBBLB.BBNBB+BU(BB)BB-BAB BB)A □B2 B+BB)□B1BEB1B □□B □  
BOBNA □w

- 算 損 期 返 制的 取 用  
債
- EC 0B.BKB&B) □□BBOA □□BBOB)BBNA □□A B6 □= A
- Protection and Indemnity Association B1BBBBBBBLB11J □□B- □□2 □w
- 算 事業 損 期 返  
制的 取 用 付資本

<sup>36</sup> CfA19 B.BBN%uBB\*1@BBLBOB)BBN

BDBBBBvBBBBBsB1QB'B1oB1oB\* tier 3 BU&BBNBB+BUzBBABBB\*B2A□  
 .B+BB)A□B□oBBBBBvBBBBBsBU 50BB+□oBBN<sup>37</sup>ABBBABB1zB.BB)BBB'BB1  
 BBBNA□B'B2 tier 2Atier 3 B12B□tier 1 B12BU□./BB)BBABB+BBBB+B/BBMBBNAB+  
 BBBB+B\*BBNAQB'B1B2A□ tier 1 Btier 2 B1□B\* tier3 BU&BBNBB+B\*Atier3tier1 B1Q  
 BAB\*.5BA□□(BxBB"BBrBBBBsBB1/BU□(BBB)BBABA+BBBEB1B\*BBNABABA□  
 B1 tier1 B1B□ 4 B1□(BxBB"BBrBBBBsBBBNB+BBA7BBBBBs2BUBE  
 BBLBB)BBABB+B\*BBNABBOB.BB)A□tier 2 B1□B1 50BB\*tier3 BU&BBNB+BB□  
 zBzBBOBBABB1zB\*B2A□ tier3 B1BUBB&BBBB)BBABBDA□ABBB-B□B□  
 BB)BBABAABABAtier 2 /BA&B.BKB&B)BB%B)BLBOB-B□A□B\*BBNB.BEBBRBLBKBM/□  
 B1B□ tier3 /BB%B)BNBB+B2(B\*BBNAB+BBBB+B\*BBNA□  
 B BOB.BB)A□CEIOPS B2Atier 2 A□tier 3 B.AB.&BU'BBRBMB.A□ tier 2 A□tier 3 B1□  
 BUtier 1 B#BB\*&BBNBB+BUzBB)BBNABB1zB\*B2A□(B-BxBB"BBrBBBBsBB1□  
 B-BB+BBBB2 tier 1 B\*BBMA□B1BB↑BBBB"BBBNABABABB+BVB,B1B.BBB)A□  
 (BxBB"BBrBBBBsBB1□B+□B\*BBMA□B10B.BBOB)BBN4BrBtBBBB'  
 BBBBBB\*BBNBBB+BB□ B+BKBM□B\*BBNAB. tier 2 A□tier 3 B1□BU tier 1 B#BB\*□  
 &BA□B1□B1BKB.□(BxBB"BBrBBBBsBB1BBBvBBBBsB\*&BBNBB+BUBB-  
 BB1B\*A□(BxBB"BBrBBBBsBB1.%B.BBBNBBBABBUB1BBLBOA□%B\*.BBOB□  
 BKBBAtier 3 B2BAB#BB%B)B\*BBNBAtier 2 B2BB%B)B\*BB-BB+BB□A□BU4BBNAB BB)A□  
 B13□□B+BKBM.zB BOB)BBNA□  
 BBB\*□B1/□BU0/BABB4BU.\*B\*BBNB□B.BKBN□2%Y 5-4 %BU□BABA□  
 tier1 B2□B\*BBNBE7BzB\*BBNB1B\*4BU.3BB-BABBB5VBnB□ tier1 B BBB\*/BU□  
 {BBB-BBB+B+A□B-2B1 tier1 B□SCR BUBfBBBBNB1B.BRBOBNBB+BU□=BBNBDB.ABnB□  
 tier1 /B+ tier1 /KB.B'BB)B14B1BB"BBzBBOB)BBNABBOB2A□ tier 1 /B1□  
 B-BB+BBBBBnB□tier1 /B\*□BBOBNBB+A5\_□ tier1 B1□B.B'BB)B14BU.3BBNBB+□  
 B6□(B.BB) tier2 Btier3 B1'2BU&BBNBBDB.A□SCR B+MCR B1B-BB+B50%B□  
 tier1 /B\*fBBBBOB-BBOB3B-BLB-BB+BBzB\*BBNAB B1zB2 B13□□B+□  
 B\*BBNABABABB1 B1zB2A□BBBBBU□BBNB+B\*A□ SCR BU□BBNBB+BB\*BA□  
 (B. tier1 B14B1BB"BBEBLBBB+BB\*BBNA□  
 A□ MCR B2□BBBB1 B+B2 %B.□BBOBNBEB1B\*BBNB1B\*A□ MCR B150%BA□BE7□  
 B/B1/B1 B-2B1□BU□=BBN tier1 B1& B-□BU□BBNA□  
 BABCEIOPS B2Atier 2 A□tier 3 B1□BU tier 1 B#BB\*&BBNBB+B.BB)A□tier2 B.4PBB)BEA□  
 □ tier2 /B12BU tier1 /B1 50%BU/BB-BABB+BU□QB)BBNABB14BrBtBBB.BKB&  
 B)/B1/BU□=BBNB1B\*BBNA□  
 BBLB.A□)4PB.BKBN□z1 B2 tier3 /B1BABB2B.BBN1J B-&B+BB)BBB-B□

<sup>37</sup> BB1QB'B1&B2A4B1QB'B1B\*.-+BBNA□  
 tier2 ≤ max { tier1 , 0.5\*SCR } 、 tier3 ≤ max { tier1 + tier2 , 0.5\*SCR }

BB+BB\*BBNA□

5-3. MCR BUBfBBBBN/B1f□

CEIOPS B2A % □ A ⊕ B.BBB)B BOBLB p BRBOB-B □ BOBBBBNBDB. Atier3 B1 □ □ □  
& B2 MCR BUBfBBBBNBDB.1 p B\*B2B-BB+BB)BBNAB B1B MCR B2 tier1 B+tier2 B1 □ 2 □  
B1 □ □ BUBBNBB+B+B-BNABBLB.A □ (BxBB”B BrBBBBsBB1 B-BB+BE 50BB □ tier1 / □  
B\*f(BBOB-BBOB3B-BLB-BBBDA □ MCR B1 B-BB+BE 50BB □ tier1 / B\*BfBBBBOB-BBOB3B-  
BLB-BBB+B & BBOBNA □

:w

5-4. B BrBtBBB1-&B+A #) 4PB1BnBBBBBBB”BB.BBN □ □

B\*B2ABABA B BrBtBBBU B\*BAB+BDABB1 B BrBtBBB1BDB./BBNbnBBBBBBB”  
BB.BBN □ BUBAB+BDBNABAB □ p / B1 □ B2A □ tier1 + tier2 + tier3 ≥ SCR B\* & BBO  
B)BBNA 4B.tier1 / B+BnB □ tier1 / B1 □ B2A □ tier1 ≥ 1/2 \* SCRA B6 BnB tier1 ≥  
1/2 \* tier1 B\* & BBOB)BBNA 4B. MCR B1 & B1BDB./BBN tier1 / B+ tier2 / B1 □ □  
B1 □ B2 tier1 + tier2 ≥ MCR B+B-B&B)BBNAB B(B)A / B+ tier3 / B1 □ B.B'B □  
B)B1 & B2A tier2 + tier3 ≤ tier1 A B6A □ tier2 ≤ 1/2 \* tier1 B+BBBKBB-4P % B\* -+ BBN  
BB+BB\*BBNA □

:w

B-B A #) 4PB.BKBNbnBBBBB.B'BB)ABEBB f1 B+tier2 B1BBB SCR B+MCR BUBfBBBBN  
BDB1 □ (BxBB”B BrBBBBsBB. □ BDBNB-BLB3A B'B#B1BtBBBBB\_BqBBBB {B □  
(supervisory ladder)B\*B\*BBNABBBB A 4 □ tier3 / BU □ (BxBB”B BrBBBBsBB. □  
BDBN 4 □ B2A □ MCR BUBfBBBBNBDB. 4 □ tier3 / BU 4 BBNBDA #) 4PB1BnBBBB □  
B □ B.1J B-BvBBB □ B+B-BNABBOB2A □ tier3 BUBBN 4 □ B A □ SCR B2)BBB)BBNBA □  
MCR BU)BBB-BBB+BBBMBBNBDB\*BBNABB1 5B2 B. □ □ B\*/BBNBEBBOB-BABBO  
B.BBN(B-. % w B2A □ tier1 B+tier2 / B1 □ B+ MCR BU □ BBN #) 4PB1BnBBBBBBU  
□ BBNBB+BBEBBOB-BABBOB B A □ B+tier2 AB BB) 4 □ tier3 / B1 □ B+ SCR B1 □ □ (/ □  
B1 □ B2 SCR BU BNB B B\*B2B-B □) B+ A tier1 B+tier2 / B1 □ B+ MCR B1 □ □ (/ B1 □ B2  
MCR BU B & B) B2B-BLB-B) BU ⊕ (B.-BBKBB-B\*-BRBOBNBEBBOB-B A y □ CEIOPS B.BKBN □  
B1(( & B BBOB)BBNA □

5-5. 4 □ tier3 / B.B'BB)B1 □

4 □ tier3 / B11 p HB2 #) 4PB.BKBNPB1 □ zB.BKB&B) & BBOBN/ B\*BBNABBOB.B2A □  
BsBBBB\_BsBBk 2 (zillmerising amounts)ABBBBBuBnBB □ (member’s call)B1BKBB- □ □  
1 B □ B G n 2 B1 B □ & B1BKBB- □ □ A B6 □ AB1BKBB- □ □ B-B,BU  
□ BC<sup>38</sup> A □

<sup>38</sup> BB#BAQIS3 B\*B2A □  
• tier2 / B. □ BABOBNH/BU □ BB-B □ v □

6. BtBzBB{BBBBdBBBBB.BKISCR B1%□

6-1. BtBzBB{BBBBdBBBBB1nN(□

BB1%B\*B2ABtBzBB{BBBBdBBBBBUBB[SCR B1.%B1N(B+1BU1@BBNASCR B1%□  
B1nB+B-BN.%N(B2ABBsBBBBB'BBBB+mB3BOBNABBsBBBBB'BBBB2ABABABBtBj  
-&BUBBN[B1BfBoBBB.BB)A XAB1BBtBjB.BBNB'BhBrBB.BB)BhBBBzBBBB□  
BsBU%BBNAB BB)A XAB1BBtBjB.BBNBhBBBzBBBBBsBU!%BBNBB+SCRB1&B-  
&BUBNB+BB[B\*B\*BBNA□

BB1BsBBBBB'BBBB.B2A4B1BKBB-BBBBBBBBBBBBBBNABABBBBBB+BB)A#)4P  
B2ABBsBBBB1[B-σ'BUBBNBB+B\*A[4(\*B1 A+B.[BRBB#)4PB1-GBU(□  
B.BA[4(\*B1BcBjBtBBBsBBB.4PBBN/□B-[B.BBjBvBtBBNBB+BB\*BBNABABABBsBBB□  
B2A&BsBBBB.B'BB)B1.%B1U[BBBBNAB B1BBDABtBzBB{BBBBdBBBB)D[ttBU  
BBBGBBB+[(B.A[BBBB;B1[BU&BBB+B(B\*B\*BBNA□

[ABBBBBB+BB)A[B-BLB3BtBjB14P4P%BU&B-[B\*B2B+BLBB.BBB2BB\*BBNABA  
BAB BB)A[BBOBNBsBBB[lgBA XAB1[4(\*B1[KB1BGBMB+Z[B.B-B&B)BBN  
BBEBBOB-BAB B1BBDABnBB'BB\_BBtBnBtBB1[BG2[B-BtBjB1[0BU[BMεB)B)BBN(□  
HBBBNA□

:wSCR BU.%BBNBBDB1[BBBBBUt%BBN[B\*B2A[□%B1BBBBBBB1B1BBtB2[B.B-BNBB+  
BBBNA[BB1 CEIOPS BBBB2A[44.B'BB)B1 SCR BU.%BBN4B.ABsBBBBB'  
BBBBBU[BBNBB+B.[B)BB-BABBOBLB1BBBBB2A&[BrBBBeBB'B B(integrated  
scenario approach)BU[BB)BBNA□

:w

6-1-1. BtBzBB{BBBBdBBBBB\*B1.%□

QIS2 B\*B2A[BBBtBjB.BB)B-B&BBBB[BUBBtBBB'BB1B-BN[B1B\*A□  
[B.%B\*5[BBBBNBBDA&B- SCRB1.%B.BBLBOB[BUB'BBBtB-BB{BBB'  
BBBB+mBV[B\*BBNABB1BB'BBBB.BKBM#)4PB2A%BB+B[B.B.B,1[BtBj[  
BU 6 B.BB)BBNBB[B&BA[w BABQIS2 B1&[BBL%BB2[B-N(B.BBB-BB+BB2[  
-B-[B[BLOBAAB-BRB'BB'BB'BBBjBzBB''BBtBB'BBB[<sup>39</sup>BABrBBBeB''BBtBB'B□  
BB[<sup>40</sup>B.BB)%B\*BBNAB+BBBRBB\*B2B-BAB'B'BBBB1[B-%BB2ABBsBBtB1 H  
BGXAB1[B.[B1[B1[B.[BBNB1B\*BBNA□

• tier2 /B.[BABOBNH/BU[BB-B[  
<sup>39</sup> &BBBzB15[B.BBN%BU [BA&[B1&5[B.B BOBBO%BU(BB)/B[BRBBNBB+B\*  
BBN[A□  
<sup>40</sup> BBNBrBBBeBU[BAB B1BrBBBeB.BB)AB,B1[BtBjBBBBNBBU.[BBN[A□

B5B+B'B1 (HB+BB)A %B\*B2ABrBBBeB”BBtBB’BBBB.BKBM2BBU'BBEBBOB-BA BrB □  
BBE”BBtBB’BBBB2ABBN 2B2-5B#B % (B+BB BB BBNA BBB A BrBBBeB”BBt  
BB’BBBB2A □ HB1% (B+BB BU BB)BBNBDA (B+B2. BB-BA B1 (B+BB)ABE  
BBtBzBB {BBBdB BBBB A 4 (\*B1BBsBBtBU BBB “BBs- GB. BB\*BB-BB-BLB3A □  
4(\*B2A)DB1B BBBU BBB+BBNB#BPBA QIS2 B1 & B2A □B- 4 (\*B#BB\*B-BA BB1  
4 (\*B)DB1B BBBU4 BB NB\*B BPBB+BB BU BB)BBNA BBB A BB1 4 (\*BB BBB1  
4 B1B BDB1 BnBtBBU/v BBB+BU1 BBNBDA BtBzBB {BBBdB BBBB2A BB1 4 (\*B.B+B&B)1 □  
B\*BBN □BBNA □  
:wCEIOPSB BBBB1 BB2ABsBBBBB’BBBB.BBB)A & BBtBjBsBBBB.B'BB) AB1  
.% BUBBNBB+BU zBB)BBN <sup>41</sup> A B'B1BBtBjBsBBBB1.%B.BBB)A B'B1BB’BBB □  
B.BDBN □B2B-BB+BBB1B\*BBNA □ B-BN □B\*B&B)BEA B B1 B\*. %BBOBNBB+  
B □B\*B2BBNBB+B2. BBAB\*BEB-BA BBBABB OB2BB+VVB, B1BBBBB.BKB&B)B & BBOB)BBNA □  
B-BB-BLA □B1 □B\*. %BUBBNBB+BU.zDBB)BBABBB+B\*A & B1 B- □(HB1 □A □  
1 B1)B □#BBU1 B9BB+ (cherry picking)B1%43 B6#)BnBtBB1 B-B,B/BBNBBLB\*BBNA □  
B B1BDACEIOPSB2ABtBzBB {BBBdB BBBB1 & B-BBqB\_ BB.BBB)A & BBtBjBsBBBB.  
BBB)ABBABBAB- □BBLB5B+B'BU1 BBN □BBNA □

6-1-2.& □ (aggregation)

:w BBSBBBBnBBBBBBB.BB)BBtBj2BU% BBNB+B-BNB+AB,B1BKBB.XAB1BBSBBBB1BBt  
Bj2BU’%BB)AK B+BB)EB+BBOBN/2BBBOBNB1BB+BBBB+B BB+B-BNA B-BB+BEB □  
BtBjB □B.B&B)BB-BB1B\*A □4PB B j B † B B j B. □B-34BBBNBB+BUA □ CEIOPS B2  
.z/BB)BBNB A □K B.1 □BKBB1B\*A □4PB B j B † B B j B BBLBOBNA □  
BtBzBB {BBBdB BBBB.BBB)A □4PB B j B † B B j B1 □BU((BBNB1B25BBAB BB)A □  
BB1 4PB1 □B1.3 B.B2& B1HB □B\*BBNAB B1BBDA 4 (\*B.B2A □B BBBU B □  
B)A □2BUBKMBKB □OBBN. BBBNA □  
QIS2 B.BBB)ABBSBBB □gB.BBBjBB 4B1Q 4B1 □BU CEIOPS B21 BBABAB □  
4 B2A □BBSBBBfB oBBB.BBBtBjB & □BBOBNA □ BB3A □A/A2 □ABKB6 □  
QBtBjB2ABBB1BBBtBjK BU BB NB BDB. 4PB BBB B j B t B U □BBNA 4B.Q □  
4 B2ABBSBBBBtBj □BU 4PB BBB B j B t B U □B) & □BBNA & B-A □ SCR B2ABSCR (nBx  
BB”BBrB □/B □ Basic Solvency Capital Requirement)B+BeB•BBBrBBBBBtBjB1 □/BU  
/B □RBBBBEB1B-B1B\*A Q 4B\*B2A □ SCR BU BDBNBDB. □B-A □BSCR BU BDBNABB1BBDB.A □  
BBB1BBBBBtBjB2A B BBBtBjAB+BBtBjBU & □BB) BSCR BU BBNB1B\*BBNA □  
Q 4B1 □B\*B2A BBtBjB1 4P4P %BURBBN( B.4 BBBNAB B1BBDA □%B1Q 4B1  
□B.BB)A 4PB BBB B j B t B U □B)A 4B\*B B t B j B s B B B B U & □BBNB1BKB M □

<sup>41</sup> BB1BB+B-BBLA □% □B2A %YBB1GB\*.5 BBOBNBEB\*B-BB)B2B-BLB-BA □

B\*BBNB+BBEBEB&BABBACEIOPS B2A Q 4BB'BBBB\*B2BBBzB13dB 5B\*BBNB □  
 B+BU.z/BBB\*A Q 4B1 □BA 7BEB&B+BE 5B\*B\*BBNB+((BB)BBNABBOB2A 4 □BA □  
 BBtBjB1BBB □BG 4P4P %B.BKBM 5BBOBBBjB†BBjBU BBNG BU BBNB+B+B-BNBDB\*B □  
 BNA □  
 : w B tB zB B {B B B B dB 5CRB 2\*B-3AU □B..%BB-BBOB3B-BLB-BABABA B-  
 BNBBsBBBB.(BB) 7BB □B\*. %BB-BBOB3B-BLB-BABB1BDB1 BE □B- □B2A □  
 5 □BGBzB\_BB-BB\_BuBB-B,BUXAB1BBtBjB 5sBBBB; □□ BBNEB1B\*B\*BBNABB1 □B1  
 BBBBB+BB)A □%B. □B-#B-4P%BU BBNB+B+A 5#) 4PB. SCR K B1 tB+XA □  
 B1BBtBjBA K B1BBtBjB'BBBB\_BB.B,B1BKBB-5BU BBNB15M □#BU BBNB+B+A □ □  
 1BBBB1 BU&BB+BBBB+B BBLBOBNABB#BA □□B1 BB%B)BBBU1BBNBDB.A □  
 BBtBj4FB\*B1 □□BU BBNBEBBNA □  
 :w (B+BB)A & □B1BDB1BB'BBBEASCRB1. %B1 B+ □B\*B\*BBNB\*B\*BBNA □4P  
 BU BBNB+A 7B □2B1 □BGBtBjB1 4PB5V' B1 □B.BBB)A B □□B BOB)  
 BBABAEBBtBzBB {BBBBdB BBBB\*' 4PBUBBNB-BLA □4PB\*B2 B\*B\*BB-BBBtBj4FB1  
 □4P%B.HBU B&BBNB+B A B1BBBB □ (tail)B\*B1 □B- □BU □B. BBN 4P  
 %BU1 BBNB+B A tBBBt B1 B\* 4PB1 □□B1 □□HBU.O BBNB+B 2□B\*B\*BBN 42 AB  
 BB)ACEIOPS B2A □%B.BBBNB BBBcBBB. BBNBjB BrBBBU&BB1 BC □BBNBEBEBOB-  
 BAB+.z/BB)BBNA □

6-1-3. BBtBj0 □ (risk mitigation) <sup>43</sup>

BBtBj0 B.B'BB)B2 & B 5V & BBtBj □0 BU □BBA □□4 BG B1BBtBj0 B.  
 BBN □x BU#%BB □ <sup>44</sup> ABABASCRB1 □B.BBBMABBtBj0 B1 5BU.zDBDNBB+B2 □  
 /B\*B\*BBNB+BBBB+AB BB)A □□4 BBtBjB2A □□B.4PBBN □□B.4P%B-B □B. □  
 BMBRBOBNBBB\*B\*BBNB+BBBB+A B.ABfBB% B1 B-BNBtBjB1 HBU((&BBN □BB □  
 BNB+BBBB+B\*B\*BBNABEBEORSB2A 3□□47B.# (BU B)A BBtBj0 B. BBN1J B-  
 □BUBBBAB5B+B'B2ABBtBj0 □B2A □B. □2B\* □BBNB\*B\*BBMAB B1BBD  
 □4(\*B21 B-&BBUB+BLB-BBOB3B-BLB-BB+BBBB+ABEBB5B+B'B2ABBtBj0 □B2ABBt  
 Bj0 B-RRBOBNB+BB □=BU □BBB\*B\*BBNB+BBBB+B\*B\*BBNA □  
 : w □□B +B 5CRB2ABBtBj □0 □<sup>45</sup> BU1bBBBBtBj0 □BU((&BB)BBNA □QIS2 B1& ABt  
 BzBB {BBBBdB BBBB\*B\*BBtBj0 □BBNB+B □B&B ABBB A BtBzBB {BBBBdB BBBB1

<sup>42</sup> CfA10 に対する返答

<sup>43</sup> :w BBtBj0 B1 B.ABBB'BB"BB.BBBNBsBBBB □gB1BB'B1. B □BRBOBAB5B+B'B2A □4B. B □  
 BN: □□□B\*B\*BBNABBOB2A 4□4P□BBL □BBN □BBABB2 □BU((&BBEB1B\*B\*BBNABEBB5  
 B+B'B2 □4B.: □□□B\*B\*BBNABBOB2A □BU □DBDBBsBBtB. BB)ABBtBjBU □BBN B1 □  
 2)B1 (BU ((&BBEB1B\*B\*BBNA B1: □□□B\*B\*2A □□□%B.BBBN □4 B BB1BBtBjB2A M B\*  
 BB-B □B1BBBU □LB)BBNA □

<sup>44</sup> CfA12 への返答

<sup>45</sup> 再保険を考えたときの、再保険者のデフォルトリスクなどをさしている。



$$\begin{aligned}
 & \text{SCR} = \text{BSCR} + \text{SCR}_{\text{op}} \\
 & \text{BSCR} = \text{SCR}_{\text{nl}} + \text{SCR}_{\text{mkt}} + \text{SCR}_{\text{health}} + \text{SCR}_{\text{def}} + \text{SCR}_{\text{life}} \\
 & \text{SCR}_{\text{nl}} = \text{NL}_{\text{pr}} + \text{NL}_{\text{cat}} \\
 & \text{SCR}_{\text{mkt}} = \text{Mkt}_{\text{fx}} + \text{Mkt}_{\text{prop}} + \text{Mkt}_{\text{int}} + \text{Mkt}_{\text{eq}} + \text{Mkt}_{\text{sp}} \\
 & \text{SCR}_{\text{health}} = \text{Health}_{\text{exp}} + \text{Health}_{\text{cl}} + \text{Health}_{\text{ac}} \\
 & \text{SCR}_{\text{def}} = \text{Life}_{\text{mort}} + \text{Life}_{\text{japse}} + \text{Life}_{\text{long}} + \text{Life}_{\text{exp}} + \text{Life}_{\text{cat}} + \text{Life}_{\text{dis}} + \text{Life}_{\text{rev}}
 \end{aligned}$$

6-2.: w B B sB B B □1 g

$$\begin{aligned}
 & \text{SCR} = \text{BSCR} + \text{SCR}_{\text{op}} \\
 & \text{BSCR} = \text{SCR}_{\text{nl}} + \text{SCR}_{\text{mkt}} + \text{SCR}_{\text{health}} + \text{SCR}_{\text{def}} + \text{SCR}_{\text{life}} \\
 & \text{SCR}_{\text{nl}} = \text{NL}_{\text{pr}} + \text{NL}_{\text{cat}} \\
 & \text{SCR}_{\text{mkt}} = \text{Mkt}_{\text{fx}} + \text{Mkt}_{\text{prop}} + \text{Mkt}_{\text{int}} + \text{Mkt}_{\text{eq}} + \text{Mkt}_{\text{sp}} \\
 & \text{SCR}_{\text{health}} = \text{Health}_{\text{exp}} + \text{Health}_{\text{cl}} + \text{Health}_{\text{ac}} \\
 & \text{SCR}_{\text{def}} = \text{Life}_{\text{mort}} + \text{Life}_{\text{japse}} + \text{Life}_{\text{long}} + \text{Life}_{\text{exp}} + \text{Life}_{\text{cat}} + \text{Life}_{\text{dis}} + \text{Life}_{\text{rev}}
 \end{aligned}$$

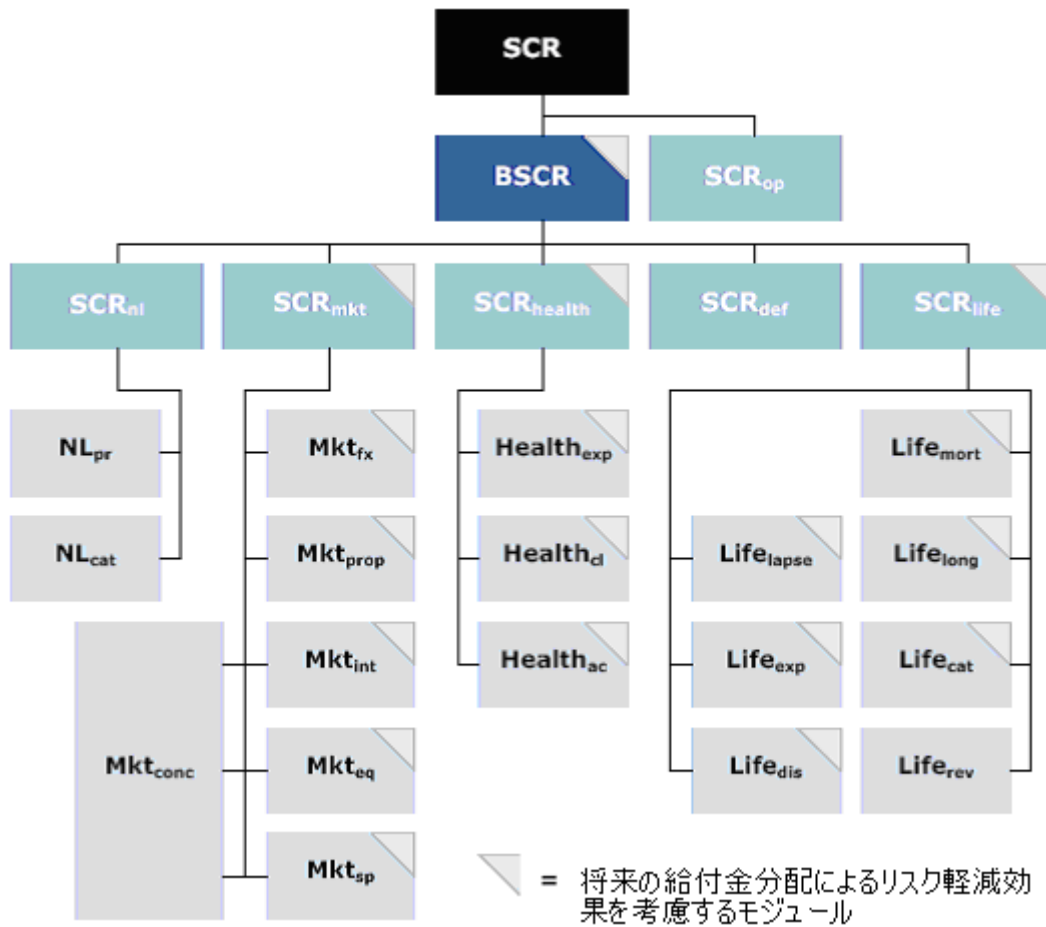


図 3 スタンダードフォーミュラSCRのモジュラ 構造<sup>46</sup>

BAi4E...

■i

&BBSBBBB2B1&BBtBjBBSBBBBBU-+BB)BBNA □

<sup>46</sup> BBSBBBB□g)DB□□□□B+:□BB\*B2B-B&B)BBNA □B.B2A □□4B.BBB)□BBtBjBBSBBBB□BR&BBB+AB BB)ABBB'BB"BB.BBBNA □4B1 □'BB□BBB1BBSBBBBB-BB-B&BBB+B\*BBNABABA□:□□□B.BBB)ABtB•BrBBB+BB)BM(BRBOB)BBBBsBBBBtBjB11 □BA □4BBSBBBB+BB)((&BBOB)BBNA □

$$\begin{aligned}
SCR_{op} &= BeB \cdot BBBrBBBBBtBj \\
BSCR &= \bar{n} BxBB''BBrB \quad \text{(Basic Solvency Capital Requirement)} \\
SCR_{mkt} &= BBBIBBBBBtBj \\
SCR_{def} &= BfBaBBzBBBBBdB BBBBtBj \\
SCR_{life} &= \bar{n} \bar{4} BBtBj \\
SCR_{health} &= \bar{n} \bar{4} BBtBj \\
SCR_{nl} &= \bar{4} BBtBj \\
Mkt_{int} &= 2 BBtBj \quad \text{(Interest rate risk)} \\
Mkt_{eq} &= \bar{c} BBtBj \quad \text{(Equity risk)} \\
Mkt_{prop} &= \bar{G} BBtBj \quad \text{(Property risk)} \\
Mkt_{sp} &= BtB'BBBBBtBj \quad \text{(Spread risk)} \\
Mkt_{conc} &= 4 BBtBj \quad \text{(Risk concentrations)} \\
Mkt_{fx} &= Q BBtBj \quad \text{(Currency risk)} \\
NL_{pr} &= \bar{4} B \bar{0} \bar{2} BBtBj \\
NL_{cat} &= BfBzBtBBBBBtBj \\
Health_{exp} &= \& / BBtBj \\
Health_{cl} &= . B kbB \& BBtBjB \quad \text{claim/mortality/cancellation} \\
Health_{ac} &= \bar{4} BBtBj \quad \text{(epidemic/accumulation)} \\
Life_{long} &= 43 BBBtBj \quad \text{(Longevity risk)} \\
Life_{dis} &= 4 \square / BBtBj \quad \text{(Disability/Morbidity risk)} \\
Life_{exp} &= \& / BBtBj \quad \text{(Expense risk)} \\
Life_{mort} &= kb BBtBj \quad \text{(mortality risk)} \\
Life_{lapse} &= . \& BBtBj \quad \text{(Lapse risk)} \\
Life_{rev} &= \bar{B} BBtBjB \square \text{ revision risk} \square \\
Life_{CAT} &= BfBzBtBBBBBtBj \quad \text{(CAT risk)}
\end{aligned}$$

$$B^*B2A \& B \bar{s} BBBB1. \% BU \& \bar{z} BNA \square$$

6-3. wSCR B \bar{s} BBBB1. \% \square

$$\begin{aligned}
&SCR B \bar{s} BBBB2A \& B - BxBB''BBrB \bar{v} / BU BBBsBBBB^*BBNABB1. \% B. B2 \square \\
&B1BB'B1BBBzBU BBN(QISB1 \& \bar{A} \square SCR B1BBtBjB1 \square B. B'BB)B2A4 \cdot \square \quad A.2. BU \square )^{47} A \square
\end{aligned}$$

$$\begin{aligned}
SCR_{op} &= BeB \cdot BBBrBBBBBtBj \\
BSCR &= \bar{n} BxBB''BBrB \bar{v} / \square \quad \text{(Basic Solvency Capital Requirement)} \\
:wBSCR &= \bar{B} BBtBjB1 \bar{v} / B \bar{B} BBtBjB1 \bar{v} / B \bar{n} \bar{4} B1 \bar{v} / B \square \\
&\bar{n} \bar{4} B1 \bar{v} / B \bar{4} B1 \bar{v} / B j \bar{2} ) \% 1B. BKBNBBtBj \square
\end{aligned}$$

<sup>47</sup> CP20 B^\*B2A B1QB'B1BBBzB. (BB)A \bar{4} B1 \bar{B} B1BBBzBU (BB)BBA \bar{v}

BBOBLB1BBBzBUBB)A4B1BKBB..%BBNA

$$SCR = BSCR + SCR_{op}$$

:w BeB•BBBrBBBBBtBjB2ABBBzB1/B.BKBMA1BBtBjB+B14PB B\*BBMBB+ABABA  
 BBBBB\*BeB•BBBrBBBBBtBjBU&BB'5 B.B+BMBB'BBBBDB.A BSCR+B2B.B  
 BOBNf1gB+BB)BMBRBOBNA

6-4.:w )BBsBBtB1BMB

n4B.BBBN B1BBBsBBtB.BB)A BxBB”BBrB B2B B1BBtBjBfBU((B  
 BNB1B B\*BBNABBBAB12BU4B. QIS2B\*.BB4B.BBB'BB15BBBBBA  
 BAAQIS2B1 BU% B.. BBNA QIS2B\*BKB BzBBB’BBBB+mB3BOBN BB+BLBOBA  
 BBOB2A B1)D EY2B1BBN B1.OB.A 0BBUB14FB1 KBUB BRBBEB1BUABasic  
 SCRBLBBB+BB\*BBNB+BBEB1B\*BBNABBBB B BABOBN BB,BOBBLB  
 B1EB.BBNBBU-+BBEB1B\*BBNAB1BKBB-BB’BBBBUBB& /vB1 SCRUBA KB B  
 BzBB1 B.B HBBBMA SCR B1 B.2 B-5BBBNBB+B B&BABABA 4 & (\*B1 B.  
 BKBNA BU((BB-BB+A XAB1BBtBjB sBBBB.BBNhBBBzBBBBBsB B+B-BNB+B  
 B5PB BBA BBOBLB15BU BBNBBDB.A BB-. BU((BBLBOBA  
 BB B\*B2A XAB1 SCRBBtBjBB”BB1. B.BKB&B)- BRBOBNABB1. B2A 4B1  
 4B15BU0/BVB\*- BRBOBNABABA%Y 4B+BB)ABB' B1 B\*A XAB1BBtBjB. BBN E/  
 BU.%BBNA (B+BB)2 BBtBjB1BsBBBBUBMBB)BBNA ) B5B+B'B1 B2A 4 (\*BB  
 BtBBBNBrBBBjB. BB) B1 & (\*BB (bonus rate)B1 BU BBLBOBN (nMktint)A  
 BEBB5B+B'B1 B2A (\*BBtBBBNBrBBBjB. BB) B1 & (\*BB B1 BU B  
 BLBOB-B (gMktint)B\*BBNAB1QB'B1.%B1BU KC(KCint)B+BBNABB-BRBAK=C= nMktint  
 - gMktint:wB\*BBNAB B#BAB1.% BU% BBNBBDB.BB1B2 0B+((BB)BEBKBB+BB)BBNA 4  
 B.AQ 4B+BB)A4P1jBBN4PB B B B B j B t B U B B ) K C B U & B B N A B ' B A B M A 2 B B t B j B G Q B  
 B t B j B - B , K C B U 4 P B B B B j B t B \* & B B N B B + B \* A B B t B j B . B B N K C B U B D B N <sup>48</sup> A B . A  
 4 B 1 & B t B B B ' B 2 A 4 P B B B B j B t B U B B ) B B s B B B B t B j B f B B o B B B U B B k B B m B \_ B B B N A B B -  
 B R B A S C R \_ m k B U S C R \_ l i f e B G B 1 B B t B j B f B B o B B B + & B B B N A & B . K C B E A B B s B B B f B B o B B B .  
 B ' B B ) 4 P B B B B j B t B U B B ) & B B N A B B B A & B B K C B U & B B B B t B j 2 B B L B B + B B  
 B 1 5 B \* - B A B B 1 4 B 1 2 B 2 A n B x B B ” B B r B B 1 B f B B o B B B \* - B R B O B ) B

<sup>48</sup> Q 4 B 2 A CP20 B+BBB-B&B)BBNACP20 B\*B2A Q 4 B \* B 2 A & B B E / E C' SCRmkt: BBLAB  
 BtBjBsBBBB1B\*BEB&B+BE BB B B B B \* B 2 A B E B B B 2 B B t B j B . B K B N B E B 1 B + ( ( B B ) B B N A f w B U B A f w  
 :w nSCRmkt = gSCRmkt - KCint  
 4 B 1 & B t B B B ' B 2 A 4 P B B B B j B t B U B B ) B B s B B B B t B j B f B B o B B B U B B k B B m B \_ B B B N A B B - B R B A S C R \_ m k : w  
 B U S C R \_ l i f e B G B 1 B B t B j B f B B o B B B + & B B B N A & B + B B ) B L B O B B E B 1 B B L B E B & B K C E B B B A B + B B  
 B 1 5 B \* - B A

BNA □

6-5.:wSCR<sub>op</sub>: w B eB •B B B rB B B B B tB j

BeB•BBBrBBBBtBjB2A □B1B'BBvBtABrBtBB □B6q4FB1 □BBG□BBL□BBN □

□ABABB2 □B1B\_ B”BBBBL □BBN □B1BBtBjBU □BB)BBNABeB•BBBrBBBBtBjB.B □

BN □B1.3 □B2 □BB-BBOB)BBNABBBABeB•BBBrBBBBtBjB.BKBN □BU □BA □B2 □

□BBNBDBB1#%BBOB □BB-BABBOB2A □B-BBBzBU □BLBOB-BBB+B □B+B-B&B)BBNB □

BDB\*BBNABBB\*B2A □B1BKBB-□4 B+0□B1 □B1((B BU BMIBOBBEB1BU □BBNA □

BeB•BBBrBBBBtBjB2A □B1BKBB.BDBNA □

$$SCR_{op} = \left\{ \min \{ Op_{load} * BSCR ; \max \left\{ \begin{array}{l} 0.03 Earn_{life} + 0.02 Earn_{nl} + 0.02 Earn_h ; \\ 0.003 TP_{life} + 0.02 TP_{nl} + 0.002 TP_h \end{array} \right\} \right\}$$

B BOBBOB1.% □B1 □B2B BOBBOA □B1BKBB.B-B&B)BBNA □

*Earn<sub>life</sub>* = ' & □□□□4 □(Total earned life premium)

*Earn<sub>nl</sub>* = ' & □□□□4 □(Total earned non-life premium)

*Earn<sub>h</sub>* = ' & □□□□4 □(Total earned health premium)

*TP<sub>life</sub>* = □□□4 B1' □□□□2 □

*TP<sub>nl</sub>* = □□□4' □□□□2 □

*TP<sub>h</sub>* = □□□4' □□□□2 □

*BSCR* = *w* □BxBBBBrB □□□

*Op<sub>load</sub>* = 1BKBMBBBBBLBBBBDBDB% □ (QIS3B\*B30B □)

: w B UB B OB B O- +B B )B B NA □

*Op<sub>load</sub>*BABeBBBrBBBBtBB) □ SCR□B1 □BU□DB-BBKBB.BBNBB+BU □BB)BBBOB)B•

BBjBzBB\*BBNACEIO□B2ABB1BBjBzBB1BB'BBBB.2B-□BBBNBB+BUA □z/BB)BBNA □

CEIOPSB2ABB1BBjBzBBU □□B.25BB □50BB14FB..3 □BBNBB+BU □BB)BBNA QISBB.B □

BB)B2A30BB+BB □B □BBOBA □

6-6.:wBSCR:w □BxBB”BBrB □□

BSCRBBsBBBB2□B'B1BBsBBBBtBjBfBBoBBB1'□& B\*BBN<sup>49</sup> A □

*SCR<sub>mkt</sub>* = BBB1BBBBtBj

*SCR<sub>def</sub>* = BfBaBBzBBBBBBBdB BBBtBj

*SCR<sub>life</sub>* = □□□4 BBtBj

*SCR<sub>nl</sub>* = □□□4 BBtBj

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<sup>49</sup> CP20 B\*B2A □B'B1BBsBBBBtBjBfBBoBBB\*BBMABABABBtBj0 □B.B'BB)BEA □BM□BQIS3 B+B2BB □

B-BNA □w

$$SCR_{health} = \sqrt{w_{health} \cdot \sum_{i=1}^n \sigma_i^2}$$

$$FDB = \sum_{i=1}^n \sigma_i \cdot \sigma_{NA} \cdot \rho_{i,NA}$$

$$KC_{life} = \sqrt{w_{life} \cdot \sum_{i=1}^n \sigma_i^2}$$

$$KC_{health} = w_{health} \cdot \sqrt{w_{health} \cdot \sum_{i=1}^n \sigma_i^2}$$

$$KC_{mkt} = w_{mkt} \cdot \sqrt{w_{mkt} \cdot \sum_{i=1}^n \sigma_i^2}$$

$$BBOBLB1BBBzBUBB)A \cdot \sigma_{NA}$$

$$BSCR = \sqrt{\sum_{r,c} CorrSCR_{r,c} \cdot SCR_r \cdot SCR_c} - \min(\sqrt{\sum_{r,c} CorrSCR_{r,c} \cdot KC_r \cdot KC_c}, FDB)$$

BB#BA

$$CorrSCR_{r,c} = \rho_{r,c} \cdot \sigma_r \cdot \sigma_c$$

$$SCR_r, SCR_c = \rho_{r,c} \cdot \sigma_r \cdot \sigma_c \cdot \sqrt{w_{r,c} \cdot \sum_{i=1}^n \sigma_i^2}$$

$$KC_r, KC_c = \sigma_r \cdot \sigma_c \cdot \sqrt{w_{r,c} \cdot \sum_{i=1}^n \sigma_i^2}$$

CorrSCR=	SCR <sub>mkt</sub>	SCR <sub>def</sub>	SCR <sub>life</sub>	SCR <sub>health</sub>	SCR <sub>nl</sub>
SCR <sub>mkt</sub>	1				
SCR <sub>def</sub>	0.25	1			
SCR <sub>life</sub>	0.25	0.25	1		
SCR <sub>health</sub>	0.25	0.25	0.25	1	
SCR <sub>nl</sub>	0.25	0.5	0	0	1

表 1 SCR の相関マトリックス

### 6-6-1. SCR<sub>mkt</sub>: w<sub>mkt</sub> · ∑<sub>i=1</sub><sup>n</sup> σ<sub>i</sub><sup>2</sup>

BBBIBBBBtBjB2A · ρ<sub>mkt,i</sub> · σ<sub>i</sub> · σ<sub>mkt</sub> · √(w<sub>mkt</sub> · ∑<sub>i=1</sub><sup>n</sup> σ<sub>i</sub><sup>2</sup>) · σ<sub>NA</sub> (QIS2B.BKBNABB) · ∑<sub>i=1</sub><sup>n</sup> σ<sub>i</sub> · σ<sub>NA</sub> · ρ<sub>i,NA</sub>

$$Mkt_{int} = 2 \cdot \sigma_{int} \cdot \sigma_{mkt}$$

$$Mkt_{eq} = \sigma_{eq} \cdot \sigma_{mkt}$$

$$Mkt_{prop} = \sigma_{prop} \cdot \sigma_{mkt}$$

$$Mkt_{sp} = \sigma_{sp} \cdot \sigma_{mkt}$$

$$Mkt_{conc} = 4 \cdot \sigma_{conc} \cdot \sigma_{mkt}$$

$$Mkt_{fx} = \sigma_{fx} \cdot \sigma_{mkt}$$

∑<sub>i=1</sub><sup>n</sup> σ<sub>i</sub> · σ<sub>NA</sub> · ρ<sub>i,NA</sub> · √(w<sub>mkt</sub> · ∑<sub>i=1</sub><sup>n</sup> σ<sub>i</sub><sup>2</sup>) · σ<sub>NA</sub> (KC<sub>mkt</sub>) · ∑<sub>i=1</sub><sup>n</sup> σ<sub>i</sub> · σ<sub>NA</sub> · ρ<sub>i,NA</sub>

$$KC_{eq} = \sigma_{eq} \cdot \sigma_{mkt}$$

$$\begin{aligned}
KC_{prop} &= \sqrt{B^2 \sigma_{BtBj}^2 + B^2 \sigma_{BN}^2 + B^2 \sigma_{BtBj0}^2} \\
KC_{fx} &= \sqrt{Q^2 \sigma_{BtBj}^2 + Q^2 \sigma_{BN}^2 + Q^2 \sigma_{BtBj0}^2} \\
KC_{int} &= \sqrt{2^2 \sigma_{BtBj}^2 + 2^2 \sigma_{BN}^2 + 2^2 \sigma_{BtBj0}^2} \\
KC_{sp} &= \sqrt{B^2 \sigma_{BtBj}^2 + B^2 \sigma_{BN}^2 + B^2 \sigma_{BtBj0}^2}
\end{aligned}$$

SCR<sub>mkt</sub> B24B1BKBB..%BBOBNA□

$$SCR_{mkt} = \sqrt{\sum_{rxc} CorrMkt_{r,c} \cdot Mkt_r \cdot Mkt_c}$$

B BB)AKC<sub>mkt</sub>B24B1BKBB..%BBOBNA□

$$KC_{mkt} = \sqrt{\sum_{rxc} CorrMkt_{r,c} \cdot KC_r \cdot KC_c}$$

BB#BA□

$$CorrMkt_{r,c} = \frac{Cov(B_t, B_{t+c})}{\sigma_{B_t} \sigma_{B_{t+c}}}$$

$$Mkt_r, Mkt_c = \frac{Cov(B_t, B_{t+c})}{\sigma_{B_t} \sigma_{B_{t+c}}} \cdot \sigma_{B_t} \sigma_{B_{t+c}}$$

BBBs

CorrMkt	Mkt <sub>int</sub>	Mkt <sub>eq</sub>	Mkt <sub>prop</sub>	Mkt <sub>sp</sub>	Mkt <sub>conc</sub>	Mkt <sub>fx</sub>
Mkt <sub>int</sub>	1					
Mkt <sub>eq</sub>	0	1				
Mkt <sub>prop</sub>	0.5	0.75	1			
Mkt <sub>sp</sub>	0.25	0.25	0.25	1		
Mkt <sub>conc</sub>	0	0	0	0	1	
Mkt <sub>fx</sub>	0.25	0.25	0.25	0.25	0	1

表 2 マーケットリスクの相関マトリックス

6-6-1-1. Mkt<sub>int</sub> : w<sub>2</sub> □ B B tB j: w

$$2 \sigma_{BtBj}^2 + 2 \sigma_{BN}^2 + 2 \sigma_{BtBj0}^2 + 2 \sigma_{BtBj} \sigma_{BN} + 2 \sigma_{BtBj} \sigma_{BtBj0} + 2 \sigma_{BN} \sigma_{BtBj0}$$

$$B^2 \sigma_{BtBj}^2 + B^2 \sigma_{BN}^2 + B^2 \sigma_{BtBj0}^2 + 2 B \sigma_{BtBj} \sigma_{BN} + 2 B \sigma_{BtBj} \sigma_{BtBj0} + 2 B \sigma_{BN} \sigma_{BtBj0}$$

$$2 \sigma_{BtBj}^2 + 2 \sigma_{BN}^2 + 2 \sigma_{BtBj0}^2 + 2 \sigma_{BtBj} \sigma_{BN} + 2 \sigma_{BtBj} \sigma_{BtBj0} + 2 \sigma_{BN} \sigma_{BtBj0} \quad ^{50} A \square$$

<sup>50</sup> このリスクを測るにあたってQIS2では、ファクターベースとシナリオベースの両方を用いた。プレーンホルダーアプローチとして使われる、シナリオベースにおいて、ストレスファクターは、5つの満期期間に応じて、次の表のように定められた。

Maturity n in years	1-3	4-6	7-12	13-18	18+
relative change S <sub>up</sub> (n)	0.75	0.5	0.4	0.35	0.3
relative change S <sub>down</sub> (n)	-0.4	-0.35	-0.3	-0.25	-0.2

Maturity t (years)	1	2	3	4	5	6	7
relative change $s^{up}(t)$	0,94	0,77	0,69	0,62	0,56	0,52	0,49
relative change $s^{down}(t)$	-0,51	-0,47	-0,44	-0,42	-0,40	-0,38	-0,37

Maturity t (years)	8	9	10	11	12	13	14
relative change $s^{up}(t)$	0,46	0,44	0,42	0,42	0,42	0,42	0,42
relative change $s^{down}(t)$	-0,35	-0,34	-0,34	-0,34	-0,34	-0,34	-0,34

Maturity t (years)	15	16	17	18	19	20+
relative change $s^{up}(t)$	0,42	0,41	0,40	0,39	0,38	0,37
relative change $s^{down}(t)$	-0,34	-0,33	-0,33	-0,32	-0,31	-0,31

表 3 満期までの期間と想定するショックパラメーター

$$Mkt_{int} = \max \left\{ \begin{array}{l} 0 \\ \Delta NAV | upwardshock \\ \Delta NAV | downwardshock \end{array} \right\}$$

$$Mkt_{eq} = w \left[ \sum_{j=1}^n B_j t_j \right]$$

6-6-1-2 Mkt<sub>eq</sub>: w [c B B t B j

$$c B B t B j 2 A c B . B B N c p B 1 0 B + G B B L B B N B E B 1 B U 0 B \quad ^{51} A \square$$

<sup>51</sup> CP20 B\*B2AQB'B1EBBBOBA'B'B1EB2A□ QIS2 B\*BBB'B'BBBB.CBUBBBEB1B\*BBNABE  
 B'B'B1EB2A□ QIS2 B\*BBLBOBEB+B2B-BNABEB1B\*BBNAEW  
 B'B1BB'BBBB2B1BKBB-BEB1B\*BBNAEW  

$$Mkt_{eq} = (\Delta eq | eqfall) - (\Delta eq_{link} | eqfall)$$

ただし、eq = cBcBjBtBBBsBBKB1w

Global Index  
Other Index

No.	Index
1	Global
2	Other

Global Index & Other Index

$$Mkt_{eq,i} = \max\{\Delta NAV | equity shock_i; 0\}$$

Equity Shock

$$equity shock_i = \alpha + \beta \cdot \Delta NAV_{i-1} + \gamma \cdot \Delta NAV_{i-2} + \dots$$

$$Mkt_{eq,i} = \alpha + \beta \cdot equity shock_i + \gamma \cdot \Delta NAV_{i-1} + \dots$$

Global Index & Other Index

	Global	Other
equity shock <sub>i</sub>	32%	45%

表 4 各市場のショックパラメーター

Global Index & Other Index

$$Mkt_{eq} = \sqrt{\sum_{rx} CorrIndex_{rx} \cdot Mkt_r \cdot Mkt_c}$$

Global Index & Other Index

$$Mkt_{eq} = Eq_{load} \cdot \rho EqVaR$$

定 次 定 年 加

Eq <sub>load</sub>		Equities as a proportion of policyholder liabilities <sup>99</sup>		
		15-25%	25-40%	40%+
Expected holding period	Less than 2 years	1.00	1.00	1.00
	2 - 5 years	0.70	0.80	0.90
	More than 5 years	0.60	0.70	0.80



BB#BA□

$$CorrIndex_{rx} = \frac{1}{4} P_{BBBBBj} B_t B_1 \% \square$$

$$Mkt_r, Mkt_c = \frac{1}{2} B_{BBBBj} B_t B_1 B_h B_{Bz} B_{BBBBs}$$

$$\frac{1}{4} P_{BBBBBj} B_t B_2 B_{BB1} B_{KBB} \cdot \frac{1}{2} B_{BOB} B_{BNA} \square$$

CorrIndex=	Global	Other
Global	1	
Other	0.75	1

表 5 市場の相関関係

$$\frac{1}{2} (K C_{eq}) B_2 A B_r B_{BBj} B_{BB} A \& (* B B \square \cdot \frac{1}{4} P_{BBN} \frac{1}{2} B_1 \square B_{z} B_{DBLBO} B_{NBB} + B * B_{BN} M_{kteq} B_1 B_2 B_{UBNA} \square$$

6-6-1-3.  $Mkt_{prop} : w \square G \square B \square B \square t B \square j : w$

$$G B B_t B_j B_2 A G B_1 \square B_1 \square B + G B B L B B N B B_t B_j B U_0 B B) B_{BNA} B B_1 B B_t B_j B_2 B_2 A \square$$

$$G B_r B_{BBj} B_{BB} N \& \frac{1}{2} B_1 G B * B_{NA} \square$$

$$Mkt_{prop} = (\Delta NAV | propertysh ock)$$

$$QIS3 B_{BB} A G B_r B_{BBj} B_1 \square B U \quad 20 B B + B B) B_{BNA} B B_1 G B_r B_{BBj} B_1 \square B_2 A \square \frac{1}{4} (* B_1 \square$$

$$\frac{1}{2} \% w (B \text{“} B B_s B_{BBBBs} B_{BBBBG} B_i B_{BBBBk} B_{BB} U ((\& B B) \% B_{BN} \text{”} \text{ } ^{52} A \square$$

<sup>52</sup>:  $\frac{1}{2} B * B_2 A \frac{1}{4} B_1 B_{KBB} \cdot \frac{1}{2} G B B_t B_j B_1 \% B U - B B B + B U \square B B) B_{BNA} \frac{1}{2} G B B_t B_j B_1 \square B B N B B D B_1 A B_r B B B e B \text{”}$   
 $B B_t B_1 B_t B B B_t B B B_j B_z B B U B D B N Q B \text{’} B_1 \square B U \& B B B N A B \text{’} B_2 A \square \frac{1}{2} B * B B L B O B \square B \cdot C B U ((B B B E B_1$   
 $B * B B N A B E B \text{’} B_2 A \square B_1 : \square \square \square B B B B B \cdot \frac{1}{2} B B O B N \square B * B B N A \square w \text{’} B_1 \square B_2 A \square \frac{1}{4} B_1 B B B z B B L A \square$   
 $: \bullet \text{’} B \square \square \square B B L B B O B N B_r B B B_j B U B_t B B B_t B B B_j B_z B B + B B) B_{BNA} \frac{1}{4} B_1 - + B_2 A \square \frac{1}{4} B_1 B B B z B B L B B B_t B B \square$   
 $B u B B f B \dagger B u B B U \square B) B D B L B O B \square \frac{1}{2} B + B_r B B B_j B_1 \square B * B B N A \square w \text{’} B B_1 B B B B_1 B_t B B B_t B B B_j B_z B B U B B A \square w$

Country	Mean	Standard deviation		99.5% shock
		Smoothed	Unsmoothed	
France	10.5%	3.4%	7.6%	8.92%
Germany	3.6%	1.7%	9.3%	20.36%
Netherlands	9.4%	5.1%	8.4%	12.20%
Sweden	9.9%	7.2%	11.4%	19.40%
United Kingdom	12.4%	10.3%	16.0%	28.87%

$B B L B \cdot A \square \% B_1 B B + B_{BB} A B B B B B B B \_ B B_1 C \text{’} A \text{’} 5 V \bar{y} G H B_1 C \text{’} A B B z B B B_1 \square B) \cdot B_1 C \text{’} A \text{’} B_6 B_r B B \square$   
 $B e B \text{”} B B_t B + B B B_j B_z B B \text{”} B B_t 1 - B_{BKBN} \& B_{14 F B} * B_1 \cdot B + B B B B_1 C B U B B N B B + B U ((B B) B B N A \square \square \square \square B_2 A \square$   
 $B_{14 F B} * B_1 \square B B N B_1 B * A \text{’} B_1 B_k B B B B B_r B B B_j B U \square B N B B + B U ((B B - B B O B 3 B - B L B - B A B B B A \text{’} B B + B \cdot$   
 $\text{’} A B_1 B B B_j B_z B B U B B N B \cdot B_2 A \square K B - \text{’} B B B A \square w$   
 $B E B \text{’} B_1 \square B_2 A \square G B B_t B_j B_r B B B_j B_1 - B U A \square \frac{1}{4} (* B_1 \square K B_1 \square B - B B B B B_r B B B + G B \cdot B B N \square \square$   
 $B_{14} \square B \cdot \square B B B N B E B_1 B * B B N A \frac{1}{4} B_1 - + B_2 A B B_1 ((B B U \square B B \square + B + B \cdot B \& B) B B N A B B \# B A \square + B_1 \& \square B_2 B B O B B L$   
 $- B R B O B N : \square \square B * w) B B) B B \square B B N A \square$

$$Mkt_{fx} = \frac{(\Delta NAV)_{fxshock}}{NAV} = \frac{(\Delta NAV)_{fxshock}}{NAV} \cdot \frac{NAV}{NAV} = \frac{(\Delta NAV)_{fxshock}}{NAV} \cdot \frac{NAV}{NAV} = \frac{(\Delta NAV)_{fxshock}}{NAV}$$

6-6-1-4.  $Mkt_{fx} : w$

$$Mkt_{fx} = \frac{(\Delta NAV)_{fxshock}}{NAV} = \frac{(\Delta NAV)_{fxshock}}{NAV} \cdot \frac{NAV}{NAV} = \frac{(\Delta NAV)_{fxshock}}{NAV}$$

$$Mkt_{fx} = (\Delta NAV)_{fxshock}$$

$$Mkt_{fx} = \frac{(\Delta NAV)_{fxshock}}{NAV}$$

Propfall		Property as a proportion of policyholder liabilities <sup>103</sup>			
		<15%	15-25%	25-40%	40%+
Avg. duration of liabilities (yrs)	1	20%	20%	20%	50%
	2	14.5%	14.5%	20%	50%
	3	11%	11%	20%	50%
	4	8%	10%	20%	50%
	5	7%	10%	20%	50%
	6	6%	10%	20%	50%
	7	5.5%	10%	20%	50%
	8	5%	10%	20%	50%
	9	4.5%	10%	20%	50%
	10+	4%	10%	20%	50%

<sup>53</sup> CP20 では以下のような方法を紹介している。QIS2 で用いられたものに、若干の修正を加えたものを提示する。QIS2 のシナリオベースアプローチでは、25%のストレスを用いて計測された。ブレースホルダーアプローチでは、ベースとする通貨以外の全ての通貨の価値が 25%上昇または下落したシナリオを考える。

ストレスの値のカリブレーションは、次のような現実のデータから得られるものである。まず、アメリカドル(USD)35%、イギリスポンド(GBP)24%、アルゼンチンペソ(ARP)13%、日本円(JPY)8%、スウェーデンクローネ(SEK)7%、スイスフラン(CHF)7%、オーストラリアドル 6%、という通貨バスケットを考える。アルゼンチンペソの割合が高すぎるように感じられるが、これはアルゼンチンペソ自身の価値だけでなく、新興市場全体を代表するものとして、アルゼンチンペソが用いられているためである。

次の表はユーロを元に、計算したものである。ブレトンウッズ合意の期間を除くと、99.5%信頼水準の値は 70%である

Euro vs.	USD	GBP	ARP	JPY	SEK	CHF	AUD	Basket
$\sigma$	9%	7%	37%	9%	6%	6%	11%	7%
99.5% shock	22%	18%	95%	23%	15%	14%	28%	17%

$$Mkt_{fx} = \frac{(\Delta NAV)_{fxshock}}{NAV} = \frac{(\Delta NAV)_{fxshock}}{NAV} \cdot \frac{NAV}{NAV} = \frac{(\Delta NAV)_{fxshock}}{NAV}$$

GBP vs.	USD	EUR	ARP	JPY	SEK	CHF	AUD	Basket
$\sigma$	9%	7%	37%	10%	8%	9%	14%	8%
99.5% shock	23%	18%	96%	26%	21%	23%	37%	21%

$$Mkt_{fx} = \frac{(\Delta NAV)_{fxshock}}{NAV} = \frac{(\Delta NAV)_{fxshock}}{NAV} \cdot \frac{NAV}{NAV} = \frac{(\Delta NAV)_{fxshock}}{NAV}$$

Basket vs. Euro	No change	USD		GBP		ARP	
		more	less	more	less	more	less
Weight	-	50%	0%	50%	0%	20%	0%
$\sigma$	7%	7%	8%	6%	8%	9%	5%
99.5% shock	17%	17%	20%	15%	21%	23%	12%

$$Mkt_{fx} = \frac{(\Delta NAV)_{fxshock}}{NAV} = \frac{(\Delta NAV)_{fxshock}}{NAV} \cdot \frac{NAV}{NAV} = \frac{(\Delta NAV)_{fxshock}}{NAV}$$



Rating <sub>i</sub>	F(Rating <sub>i</sub> )
AAA	0.25%
AA	0.25%
A	1.03%
BBB	1.25%
BB	3.39%
B	5.60%
CCC	11.20%
Unrated <sup>29</sup>	2.00%

表 6 格付けとリスクウェイト

①C (dur<sub>i</sub>) B B B K B B B B O B B N A ① <sup>54</sup>

$$m(dur_i) = \left. \begin{cases} \min(dur_i; 8) & \text{rating} = \text{BB または格付けされていない場合} \\ \min(dur_i; 6) & \text{rating} = \text{B の場合} \\ \min(dur_i; 4) & \text{rating} = \text{CCC の場合} \\ dur_i & \text{上記以外の場合} \end{cases} \right\}$$

: w B B L B . A B B 1 B B t B j B B s B B t B j B B B B (K C<sub>sp</sub>) B 2 A B r B B B j B . B B ) A & ( \* B B B . 4 P B B N B 1 B B B D B L B O B N B B + B \* B B N M k t<sub>sp</sub> B 1 2 B U B B N A ①

6-6-1-6. Mkt<sub>conc</sub>: w 4 B B t B j

4 B B t B j B 2 A 4 B B B B B B d B B e B . B K B N 1 J B - G B G A ④ ( \* B 1 B B B d B B B . B K B & B ) / B B N 1 B K ) x B - & B 1 B B D B . B B N A ① B - B B t B j B U 0 B B ) B B N A % ① B 1 B B D A B B f B a B B z B B B B B B . B B N B c B j B t B B B s B B B 1 & B . 4 B A B - B G B \* B 1 4 B - B , B 1 A B 1 B z B \_ B ' B 1 4 B 2 ( ( B B - B A ① Q I S 2 B \* B 2 A B B 1 B B t B j B . 4 P B B ) A ① B . B 2 ( ( B B ) B B - B B & B A B B B A B B 1 C C C B B \* B 1 B M B B 2 A ① S C R B 1 A B ) B B O B N ④ P B ① / v B ② B \* B B N B t B j B U B f B B B B N A B + B B ( ( B B + A ⑤ V B \* B B & B A ① 4 B B t B j B U . B B N B D B . A ① B 1 4 B + B B ) A B ' B 1 B f B a B B z B B B B B B . B B N A ① B B B B 1 B c B j B t B B B s B B B U - B B N B B B N A B B k B B B ' ( B B # B A ④ ( \* ) D 0 B 1 B k B B ① B ' B 2 4 B B N ) B . B B N K B ) B 1 % B 2 A B ' B 1 B f B a B B z B B B B B B + B B ) ( ( B B N <sup>55</sup> A B ' B 1 B f B a B B z B B B B B B . B B N B B B c B j B t B B B s B B B 2 A ② B + B 1 / B j B B t B \* B B O B N <sup>56</sup> A B B O B 2 4 B 1 B K B B - A Q ④ B \* . % B B O B N A B A B A ④ A B B B d B B ( B 1 B c B j B t B B B s B B ①

<sup>54</sup> B B 1 4 P ① m B 2 Q I S 3 B \* B D B ) ① B B O B A ①  
<sup>55</sup> : w A B B # B A B U B E B & B ) B 5 B + B ' B 1 B f B a B B z B B B B B B + - B - B B B + B B B k B B B ' B 1 ① B . 4 P B B ) A B - B N ( ( & B ① - B + B B O B N A A B + : B \* 1 @ B B L B O B ) B B M A B B \* B E A # B . B k B B B ' B 2 ① B B O B ) B B - B A ① w  
<sup>56</sup> : B \* B 2 A A K B ) B 1 / B 1 B j B B t B . B & B ) B B B B c B j B t B B B s B B B U ① B B B E B 1 B \* B B N A A B + B B O B ) B B N A ①

$E_i = \sum_k W_k \cdot \sum_j EAD_{i,j,k}$  <sup>57</sup>  
 $Assets_{xl} = \sum_i (g_0 + g_1 \cdot XS_i) \cdot Assets_{xl}$   
 $CT = 4 \cdot B14c \circ$  (the concentration threshold)

$XS_i = \max \left\{ 0; \frac{E_i}{Assets_{xl}} - CT \right\}$   
 $Assets_{xl} = \sum_i (g_0 + g_1 \cdot XS_i) \cdot Assets_{xl}$   
 $CT = 4 \cdot B14c \circ$  (the concentration threshold)

$$XS_i = \max \left\{ 0; \frac{E_i}{Assets_{xl}} - CT \right\}$$

BB#BA□

$$Assets_{xl} = \sum_i (g_0 + g_1 \cdot XS_i) \cdot Assets_{xl}$$

$$CT = 4 \cdot B14c \circ$$
 (the concentration threshold)

B-BNCTB2ABfBaBBzBBBBBBB1pBB.BBBB&B)1BBNA4B14cB2A#B1KBB.  
 pBB.BB)BDB)BBNA□

rating <sub>i</sub>	CT
AA-AAA	5%
A	5%
BBB	3%
BB or lower	3%

表 7 格付けと集中の閾値

4 4 )

iB.4B□

BNBB+B.BKBN#B24cBU/BBN/1BcBjBtBBBsBBB14PB+BBBB\*BBNA(B+BB)A□

$$Conc_i = Assets_{xl} \cdot XS_i \cdot (g_0 + g_1 \cdot XS_i)$$

BB#BA□g<sub>0</sub> g<sub>1</sub> B2ABBBBBzBB\*4B1-+B1KBB.6BDBLBOB)BBNA□

<sup>57</sup> B\*B2QB'B1BrBkB□%□B1B□w :□w B+-+BBOB)BBBACBBA□

<sup>58</sup> BB1-+B2BAB#BKB-BEB1B\*BBNA□

rating <sub>i</sub>	Credit Quality Step	g <sub>0</sub>	g <sub>1</sub>
AAA	1	0.1840	0.0401
AA			
A	2	0.2684	-0.0163
BBB	3	0.3862	-0.0416
BB or lower, unrated	4 - 6, -	0.9227	-0.4314

表 8 格付けと集中リスクパラメーター

4.2.4.2

4.2.4.2

$$Mkt_{conc} = \sqrt{\sum_i Conc_i^2}$$

B+BB)A4BBtBjB. BBN/B %BBOBNA

:w B1/4(\*B. BBNBBtBj4 B12B.B'BB)B2A 2B-7B+7% B1B\_BBBjB

BU1 BBNBB+BU((BBN/B BBNNA B1/4(\*B2 B.4 2B7BB-BMBGBBABBBA4

BBtBjBsBBBB2A 4(\*B. BBNBrBtBBBBjB-1J B-7BGA B ;

BcBjBtBBBsBBBU & BBNAB+BBBB+BU(BB)B2BB-BA

:w BABABB1BBtBjBfB oBBB\*B2BBtBj0 BU((&BB)BB-BA

6-6-2. SCR<sub>def</sub>: w B fB aB B zB B B B B B B B dB B B B tB j

:w BfBaBBzBBBBBBBBBdB BBBtBjB2A 4BG2 w B1BKBB-BBtBjBU0 BBN&B.

B'BB)ABfBaBBzBBBBBBBBBdB BBBNBB+B./ BBNBBtBjB\*BBNA w BfBaBBzBBBBBB

B1BBBBdB BB+ABtBj0 BDB1BB'BB\_BtBBBBnBtBB2A B1 4PBU B'BB+B(BBNg way

riskB+mB)ABfBaBBzBBBBBBBBBdB BBBtBjBU. %BBN(B+BB)ABtBzBB{BBBBdB BBBB

B. BBB)A fBtBj0 B. bKB- zBU BB-BB\*A & c;4 B;B1BrBBjB12BU. %BBN A

s;4(\*B1BBBBdB BBU(B+BB)A BU. %BBN A c;4 BGA2 w B1

wrong way riskBU((&BB)ABBBdB BBBtBjB+B1BBsBBBBtBjBfB oBBBBLB1/BU' B

BBN(B+BB) B'BB1(B BBNABBB\*B23 B1(BUBNBEB1B+BB)ABfBaBBzB BBBB

BBBBdB BBBtBjB1. BU1@BBNA

:w 3 47B. BBNBBBBdB BBBtBjB1 BMBB+ B. ABsBBBB2A BBBdB BB1#

(Probability of default ;PD) B+ABfBaBBzBBBBBBBB1BBBBdB BBU(B+BB)ABcBjBtBBBs

BBB1BB'BB\_BtBBBBnBtBB1BBBzBU BBNAB2A 4B1BBBBB1BKBB- B1 pBBBL

B BBOBNA

Rating <sub>i</sub>	Credit Quality Step	PD <sub>i</sub>
AAA	1	0.002%
AA		0.01%
A	2	0.05%
BBB	3	0.24%
BB	4	1.20%
B	5	6.04%
CCC or lower, unrated	6, -	30.41%

表 9 格付けとデフォルトリスクのパラメーター

$$RC = \sum_{i=1}^6 (w_i \cdot PD_i)$$

$$w_i = \frac{1}{n} \cdot \frac{1}{PD_i} \cdot \frac{1}{\sum_{j=1}^6 \frac{1}{PD_j}}$$

class6(BCCCB+BB)BMBAxBB”B  
BrB(BB.&BBOB)BBNBEB1B2 class3(BBB)B+BB)BMB<sup>59</sup>A  
.B.BBB&B)B2A(B1BKBB-4B\*.%BBOBN<sup>60</sup>ABABA(B+BB)ABBBB{

<sup>59</sup> : (B\*B2A(B1KBB.:BUDBNBB+BU(BB)BAw  
(B1(BU)BBB)BBN(B\*B1:(BfBBBsBBrBeBL(BBB+BB\*BBNB\*BBPBAw  
BfBaBzBBBBBBB2ABxBB”BBrB(B.#)B.&BBOBN(B\*B\*BBNAw  
B(B\*BAB-BB+BE(B”BtB\*:B+B+BU.%BBNAw  
BABABfBaBzBBBBBBB(BBBBU(BBN(B\*B-BLB3A(B2(BBNAw  
(BfBaBzBBBBBBB;B1BcBjBtBBsBBB2A(B-B,B1BtBj0(B1(BBU((&BBB\*BBNAw  
(BpBBBOB)BBNABAB2:(BfBBBsBBrBeBL:(BUDBLBOBNB+BB.B2A(B1(B\*:w  
BBxBB”BBrB(B-B\*&BBOBA(BpBBBOB)B-B(B2:(B+B+BB)BAw  
<sup>60</sup> CP20 B\*B2(B1KBB..BBOBNABcBjBtBBsB(BiB.BBNABfBaBzBBBBBBBdB(BBtBjB1(B  
B2ABBrBbBj(B (Vasicek distribution)BU(B+BBNABB1(B2A(B1:(BtBjOB1(B  
B\*BBNABEBA(B\*(B(BA(B%B1(B-BLB3A(B1KBB..%BBNA

$$Def_i = RC \cdot \left[ N[(1-R)^{-0.5} \cdot G(PD)] + \sqrt{\frac{R}{1-R}} \cdot G(0.995)] \right]$$

(B”:w(B1&(Pw  
(B”:w(B1&(P(B11R4Pw  
(B”:w(BP%w  
:w:(B2ABfBaBzBBBBBBB1BBdB(BBU(B+BB)ABcBjBtBBsBBB1BB’BB\_BtBBBnBtBB1(B-B(B  
B\*BBNA(BA(BBG.zBDBLBOB(B1BtBj0(B.BKBN.(UBB(B(B+&(B(B1B\*  
BDBLBOBNAw  
4PB1(B.(B&B)BBNA(BP%B2A(B1(B(B;B1BtBjBcBjBtBBsBBB1(B.(BBNBEB1B\*BBNA(B(B  
BU(B+BB)A(B1KBB.(BBBOBNAw  
R = 0.5 + 0.5 · H  
RR#RA(BRBRBRBR{BB(B\*BBNAw  

$$H = \sum_i w_i^2$$

wi(B2A(B(BcBjBtBBsBBB.(BBNA(B(B\*(B;B1BcBjBtBBsBBB1(BBU+(BAw  
2(BtBBB’B1KBB-2(B(BU/(B+BBNBfBaBzBBBBBBBdB(BBtBjB.B2A(BfBaBzBBB(B  
BBBBBBdB(BBtBjB+6(B(B6(BPB(BNAw  
6(B+B)ABfBaBzBBBBBBBdB(BB+BB’BB\_BtBBBnBtBB1(B1(BPBUB’(HBGA(B(B+B)BE  
(B1BfBaBzBBBBBBBU1(BBN(BBBNAw  
(B(B+B)ABB’BB\_BtBBBnBtBB1B’BBhBrBB+BB)B1(BB1(BHBGA(B1BB’BB\_BtBBB(B  
BnBtBB(B\*B&BB+BB)BEAB(B1(B2(BfB1BzB\_BB-BB\_BuBB\*B2(BBEBOB-BB+BBB+BBNABB1(B

BB0B\* c[4B+BBBBBBB14 BU.%BBNA □

$$H_{re} = \frac{\sum_{i \in Re} RC_i^2}{\left( \sum_{i \in Re} RC_i \right)^2}$$

BB#BARCiB2ABfBaBBzBBBBBBB iBBBBdBBBBB+BB1 c[4BBBBBBB1BB'BB\_ BtBBBBnBtBB\*BBNABABBA2A c[4B. BBNBBBBBBB {BB0BU-+BB)BBNABBBB• BBB. BBNBBBBBBB {BB0B □ HraBBE c[4B+ B B1 B\*% BBNABABA c[4B1B\_ BB'BBrBBB-4P% BU BDBNA □

$$R_{re} = 0.5 + 0.5 \cdot H_{re}$$

BBBBBBB.B'BB)BEBAB&BB B B \* BDBNA □

4B1Q 4B2A & BfBaBzBBBBBBB.B'BB) B B % BBNABB1% B2AB\_

BB'BBrBBB-4P% B. B BNA □

:w 4P% B □ 0.5B1B+BB2ABrBbBj BU n B+BNA □

$$Def_i = RC_i \cdot N \left[ (1-R)^{-0.5} \cdot G(PD_i) + \sqrt{\frac{R}{1-R}} \cdot G(0.995) \right]$$

BB#BA □

$$N = 0.0001 \& 4P □$$

$$G = 0.0001 \& 4P B11R4P □$$

$$R = 4P \% □$$

BABA 4P% B □ 1B1(B.B2A □

$$Def_i = RC_i \cdot \min(100 \cdot PD_i; 1)$$

B BB)A 4P% B □ 0.5BBLB14FB1(B.B2A B\*QB'B1 BU-14FB BNA B.KB)B1BfBaB □ BzBBBBBBB1 B/BU/B (BRBB)& B BNA □

6-6-3. SCR<sub>life:w</sub> B BtBj:w

:w QIS3B\*B2A 4B BtBjB+ B BtBjBU B'B1BBsBBBB+BB).%BBNBB+BUA □ CEIOPSB2 B

BB)BBNABABA CEIOPSB2A B BBN CATBBtBjBU BB(CATBBtBjBBsBBBB. B BD

BNBMBB.B'BB)BE B B)BBNA □

SCR<sub>life</sub> B24B1BBsBBBB1 B BBL B BBOBNA □

$$Life_{rev} = B BtBj \quad (\text{revision risk})$$

$$Life_{mort} = kb B BtBj \quad (\text{Mortality risk})$$

B2A B B B BNA □ expected positive exposure(EPE):w method:w B+ B B K B B. B B B+BU- B B N B B E B B O B-BA w B B B A B B B \* B 2 A B B B B s B B r B e B 1 B B z B B \* B B- B P B U 4 B B) A c[4 B+ B B. B M B A B A B B B B B B B { B B 0 B 2 A c[4 B c B j B t B B B s B B B + A 2 [ w B c B j B t B B B s B B B \* B M 5 B B). % B B N B E B 1 B+ B B BNA w



- $Life_{long} = 43 \text{ BBBtBj}$  (Longevity risk)
- $Life_{dis} = 4 \square / \text{BBtBj}$  (Disability/Morbidity risk)
- $Life_{exp} = \& / \text{BBtBj}$  (Expense risk)
- $Life_{lapse} = . \& \text{BBtBj}$  (Lapse risk)
- $Life_{CAT} = \text{BfBzBtBBBBBt(B)AT risk}$

BABA (B1 (2))B.BKBNBBtBj0 (2)B2A (BBtBj)B1 6B'B1BpBBBtBjBBL. B (BOBNA (

(4)BBtBjB. BBNBhBBzBBBBBsBUA (B1BKBB.!'%BBNA (

$$SCR_{life} = \sqrt{\sum_{rxc} CorrLife_{r,c} \cdot Life_r \cdot Life_c}$$

BB#BA (

$$SCR_{life} = (4)BBtBjB. BBN(7/7)$$

$$CorrLife_{r,c} = (4)PBBBBBjBtA (CorrLifeABr-(c)B1BvBA ($$

$$Life_r, Life_c = (4)PBBBBBjBtB1-(row)B+(column)B.4PBBN \times B1 (4)BpBB (BtBjB. BBN(7/7)A ($$

(4)PBBBBBjBt CorrLife (BKBB(2)BOBNA (

CorrLife=	$Life_{mort}$	$Life_{long}$	$Life_{dis}$	$Life_{lapse}$	$Life_{exp}$	$Life_{rev}$	$Life_{CAT}$
$Life_{mort}$	1						
$Life_{long}$	0	1					
$Life_{dis}$	0.5	0	1				
$Life_{lapse}$	0	0.25	0	1			
$Life_{exp}$	0.25	0.25	0.5	0.5	1		
$Life_{rev}$	0	0.25	0	0	0.25	1	
$Life_{CAT}$	0	0	0	0	0	0	1

表 10 生命保険リスクの相関マトリックス

(2) (2) (2) (2) (2) (2) (2) (2)

$$KC_{life} = \sqrt{\sum_{rxc} CorrLife_{r,c} \cdot KC_r \cdot KC_c}$$

B\*. %BBOBNA (

:w (4)B1 & BpBBBtBjB. BBN(7/7)B. B'(BB)A (B\*. fBB (BBNA (

6-6-3-1.  $Life_{mort}$  kb BBtBj:w

$\kappa_B B_{tj} B_{2A} \kappa_B B_{1t} (B_{LBNB} B_{tj} + BB) \sigma' B_{BOBNA} B_{1t} B_{tj} . B_{BN} \square$   
 $B_{2A} \kappa_B B . B_{BNBr} B_{Bj} . B_{KBN} \& \{4 \& B_{1t} / \sigma B_{1t} (BU' B_{BBEB} 1B * BD$   
 $BLBOB) B_{BB} - BR_{BA} \square$

$$Life_{mort} = \sum_t (\Delta NAV | mortshock)$$

$B_{B#} A_{iB} 2 \& B_{1t} p_{tB} \kappa_B B_{tj} B_{tj} + B - B \& B) B_{BN} \& \{4 \& B_{UBBB} B_{BN} A_{BABA} \square$  mortshock  
 $B_{2A} \& B_{1t} \kappa_B B_{B} \& B . B \square$   $10 B_{BN} B + B_{BBr} B_{BBE} B * B_{BNA} \square$   
 $B_{BB} A_{B} B_{1t} B_{tj} B_{Bs} B_{BB} B * B_{1t} \square$   $B . B_{KBN} B_{tj} 0 \square$   $(K C_{mort}) B_{2A} B_{r} B_{Bj} . B_{B} A \square$   
 $B_{1t} \& B_{1t} \square B_{1t} \square B_{B} \square B_{DLBOB} N_{BB} + B * B * B_{BN} B_{tj} 2 B * B_{BNA} \square$

:w

6-6-3-2. Life<sub>long</sub>: w<sub>43</sub> B<sub>BBtj</sub>

$:w_{43} B_{BBtj} B_{2A} B_{BN} B_{tj} + B_{B} B_{M} B_{tj} + B - B_{N} \& B . B_{B} A_{B} - \kappa_B B_{1t} \square$   
 $BL (B_{BN} B_{tj} + BB) \sigma' B_{BOBNA} B_{1t} B_{tj} B_{Bs} B_{BB} B_{2A} \kappa_B B_{tj} + B_{B} . A_{B} \square B_{2A} \square$   
 $\kappa_B B . B_{BNBr} B_{Bj} . B_{KBN} \& \{4 \& B_{1t} / \sigma B_{1t} (BU' B_{BBEB} 1B * BD) BLBOB$

<sup>61</sup>:w A B<sub>BB</sub>\*B<sub>2A</sub> B<sub>1</sub> B<sub>KBB</sub> - B<sub>M</sub> B<sub>B</sub> B<sub>BOB</sub>) B<sub>BN</sub> A  $\square$   
 $\kappa_B B_{tj} B_{1t} B_{M} B_{B} B_{2A} B_{BB} B_{BB} B_{tj} + B_{B} B_{tj} B_{1t} B_{tj} B_{n} B_{BB} B_{B} B . B_{BN} A_{B} B_{1t} B_{BB} B_{BB} B_{B} \square$   
 $B_{tj} + B_{B} B_{tj} B_{1t} Q B' B_{1n} B_{BB} B_{B} B . B_{BN} B_{B} B_{2A} 43 B_{BBtj} : \square w_{43} B_{Btj} B_{1t} B_{B} B_{BB} B * B E$   
 $B_{BB} B_{BNA} B_{BB} B_{BB} B_{Btj} B_{2A} B_{x} B_{BB} " B_{Br} B_{Bz} B_{BB} - B_{BB} _ B_{u} B_{14} F B . A_{B} B_{1t} \kappa_B B_{1t} B_{B} B * B_{1t}$   
 $- B_{B} \sigma' B_{BOBNA} B_{B} B_{tj} B_{2A} \kappa_B B_{u} \sigma B_{BN} B_{DB} . B_{BN} B_{BB} B_{1t} . B \& B_{B} \square B_{AB} B_{B} B_{2A} B_{B} \square$   
 $B_{1t} B_{BB} B_{z} B_{1t} . \square \sigma B_{1t} B_{tj} + BB) \sigma' B_{BOBNA} B_{B} A_{B} B_{tj} \square g B (4 F B U_{1t} B B) B_{BN} B_{tj} B_{GA} B_{1t}$   
 $B_{1t} \# \square H : B_{B} + B_{B} 3 A_{B} B_{1t} \& \square B_{1t} B_{KBB} - B_{B} - 0 y_{1t} : B + B_{B} B_{KBB} - B_{tj} B_{B} B C A B B \# B_{A} \kappa_B B_{tj} 0 B_{2A} \square$   
 $\square \square B * B_{RBOB} - B \% B * A_{BB} B_{BB} B_{tj} + B_{B} B_{tj} B_{u} B_{LBN} B_{DB} B_{1t} B_{B} 1 B * B_{BNA} \square$   
 $:w : \square B * B_{2A} B_{Bj} B_{z} B_{BB} " B_{tj} + B_{r} B_{BB} B_{B} " B_{tj} B_{1t} B * \% B_{BOB} A_{B} B_{Bj} B_{z} B_{BB} " B_{tj} B_{B} " B_{BB} B_{A} B_{B} B_{tj} - B \square$   
 $B_{B} (B_{BB} B_{BB} + B_{BOA} \square \square B_{1t} B_{Bj} B_{z} B_{BB} " B_{tj} B_{B} " B_{BB} B . B_{B}) A_{BB} B_{BB} B_{tj} B_{2A} \square \square B . B_{BN}$   
 $0 \square B_{1t} \square B_{LBN} B_{BOBNA} B_{1t} \square B . B_{2A} B_{B} - \kappa_B \# B + B_{BB} B_{dB} B_{E} B . B_{BN} \& B_{UB} _ B_{B} " B_{BB} \square$   
 $B_{Bz} B_{B} + B_{B}) B_{BNA} B_{B} B_{tj} B . B_{BNA} B_{B} B_{tj} - B_{B} (B_{Bh} B_{Bz} B_{B} B_{Bs} B_{2A} \square \square B . \square \square$   
 $B_{1t} B_{tj} B_{Bj} B_{z} B_{B} B_{u} 6 B B 5 B + B_{B}) B_{BOBNA} \square$   
 $: \square \square w B * B_{2A} B_{r} B_{BB} B_{E} " B_{tj} B_{1t} B_{M} B_{B} B_{E} B_{tj} B_{B} B_{BB} A_{B} B_{tj} B_{Bj} B_{z} B_{B} + B_{B}) A_{BB} B_{BB} B_{BB} B_{tj} B_{2}$   
 $: \square \square \square \square \square \square \square \square B_{1t} B_{u} \square B_{A} \# B_{B} B_{tj} B_{2} : \square \square \square \square \square \square \square \square B_{1t} B_{u} \square B_{B}) B_{B} A_{B} \square \square B . B_{BB} A_{B} \square$   
 $B_{BB} B_{BB} B_{BB} B_{tj} B_{1t} B_{BB} . B_{BB} B_{1t} B_{u} B_{BN} A_{B} B_{Bj} B_{z} B_{BB} " B_{tj} B_{B} " B_{BB} B * B_{2A} \{4 \& B_{B} 5 B_{1t} \square$   
 $B . B_{KBN} B_{B} / B_{BN} A_{BB} B_{BB} B_{BB} B_{1t} B_{u} B_{BN} A_{B} B_{Bj} B_{z} B_{BB} " B_{tj} B_{B} " B_{BB} B * B_{2A} \{4 \& B_{B} 5 B_{1t} \square$   
 $\square \square B_{1t} B_{Bj} B_{z} B_{BB} * B_{BB} B * B_{BNA} \% \square B_{1t} B_{DB} . A_{B} \#) (* B_{2A} B_{B} - \kappa_B \# B . B' B_{B}) B_{1t} \square B_{UB} B \square$   
 $B_{BB} B * B_{BNA} B_{B} 6 A_{BB} B_{BB} B_{dB} B_{E} B_{p} _ B_{u} B + B_{B} A \& B * B_{2B} - B_{A} \{4 \& (* B_{1t} \square B_{u} B_{BN} B_{BB} B * B_{BN} B + B_{B} B_{u}$   
 $(( \& B_{BNA} \kappa_B \# B_{1t} B_{1t} \square B_{2B} B_{BB} B_{dB} B_{E} B_{p} _ B_{u} B_{1t} \square B . B_{A} \square \square B . B_{B} + B_{VB} , \square B_{u} B_{B} - B_{B} + B \square$   
 $B_{BB} + B_{CCC} \square B . B_{BB}) - BLBOB_{BB} + B_{u} B_{BB} B_{E} 1 B * B_{BNA} \square$   
 $B_{r} B_{BB} B_{B} " B_{tj} B_{B} " B_{BB} B_{2A} B_{Bj} B_{z} B_{BB} " B_{tj} B_{B} " B_{BB} B_{1t} B * B_{1t} \kappa_B B_{tj} B . B' B_{B}) B_{1t} \square B . B_{BB} N_{B}$   
 $\square B_{1t} \square B . B_{BN} B_{KBB} . A_{B} B_{BB} B_{E} . B_{BB} N_{r} B_{BBj} B_{u} \square$   $B_{BN} B_{B} + B * A_{B} B_{Bj} B_{z} B_{BB} " B_{tj} B_{B} " B_{BB} B + B_{KBM} \square B \square$   
 $B_{BN} B_{BB} B_{BNA} \square$   
 $: \square \square B_{1t} \& B_{UB} B_{B}) A_{B} \square \square \square \square B_{2A} \square \square B * \# B_{B} B_{tj} B_{1t} B_{BB} B ; B_{BB} B_{1t} B_{u} \square B_{B} B_{B} B_{B} A_{B} B_{A} B_{B} B_{j} B_{z}$   
 $B_{B} " B_{tj} B_{B} " B_{BB} B . B_{BB}) A_{B} B_{tj} B_{1t} \square B . B_{KBN} B_{B} ) . \% B_{BOB} N_{B} B_{A} \& B_{u} B_{B} \square B_{1t} \square \square \square F B . B_{BB} A \square$   
 $A_{B} B_{1t} B_{B} B_{B} B_{j} B_{Bt} B_{BB} B_{NA} \& B_{B} B_{B} . A_{B} B_{1t} B_{BBj} B_{z} B_{B} B_{u} \square B_{BN} B + B_{B} \square) B_{B} - B_{BOBNA} \square$   
 $\# B_{B} B_{tj} B . B' B_{B}) A_{B} B_{r} B_{BB} B_{E} " B_{tj} B_{B} " B_{BB} B . B_{BB} N_{r} B_{BBj} B_{1t} B_{p} _ B_{u} B + B_{BBj} B_{z} B_{BB} " B_{tj} B . B_{BB} N_{B} B_{BB} B_{z} B_{B}$   
 $B_{1t} B_{14} F B . A_{B} B_{B} - 4 P \% B_{B} - B_{A} B_{1t} B_{BDA} Q B' B_{1t} B " B_{BB} B_{u} \square B_{BB} N_{1t} B_{25} B_{B} A_{B} \square B_{BB} B_{BB} B_{B} B_{tj} B_{B}$   
 $\# B_{B} B_{tj} B_{1t} \square / B_{BLA} Q B' B \% B * B_{BN} B_{B} + B_{u} \square \square B_{B} A \kappa_B B_{tj} B . B_{BN} \square / B_{u} B_{1t} B_{KBB} . \% \square$   
<sup>w</sup>

$$Life_{mort} = \sqrt{Life_{mort,vol}^2 + Life_{mort,unc}^2}$$

B<sub>BNA</sub> □

62 A□

$$Life_{long} = \sum_i (\Delta NAV | longevityshock)$$

: w B B # longevityshock B2A & B1 kb BB & B.B □ 25B BBNBrBBBeBU((BBNA □  
 :w BBtBj0 □ B.B'BB)BEA kb BBtBjBsBBBB+ # B\*ABB1BBtBjBsBBBB\*B1 □  
 B.BKBNBBtBj0 □ (KClong)B2A BrBBBjB. (BB)A B1 & B1 □ BU □ BBBLBOBNBB+B\*A □  
 & # B1 GBU BBBLBOBN2B\*BBNA □

6-6-3-3. Lifedis:w 4 B BBtBj:w

4 B BBtBjB2A BBfBBBBB1# □ BEB8BBD4B B1 □ BBBL □ BBNBBtBjB+o' BUB □  
 BNABB15 B2A %B.BBBBBBBtBjB+BBBBBzBBtBjB+BB # □ HBtBjBU BBBNBB+BU □  
 BB)BBNA4B BBtBjBEA kb BBtBjB+ # B.BMB □ 63 A□

$$Life_{dis} = \sum_i (\Delta NAV | disshock)$$

BB#BAdisshockB2A (B14 □ B1 35B B+A (□ B14 □ B1 ( & B- ) 25BB1 □  
 B1BrBBBeB\*BBNA □  
 BBtBj0 □ B.B'BB)BEA kb BBtBjBsBBBB+ # B\*ABB1BBtBjBsBBBB\*B1 □  
 2)B.BKBNBBtBj0 □ (KCdis)B2A BrBBBjB. (BB)A B1 & B1 □ BU □ BBBLBOBNBB+  
 B\*A & # B1 GBU BBBLBOBN2B\*BBNA □

6-6-3-4. Life lapse: w . & B B tB j: w

. & BBtBjB+B2A □ & □ (policy lapse) A & ) □ A □ & B □ ( □ p BB1 □ )  
 B1MBB-B □ (BAB2 \* - ) B1BBtBjB+o' BBOBNA □  
 QIS2B.BBB)A □ & BBtBjB. BBNB'BBtB-BB {BBhBBBzBBBBBsB2A BBBjBzBB" B □  
 BtBB'BBBB\*. BBOBABB1BB'BBBB\*B2A □ □ B+A □ & (\*B+ □ & □

62 : BBB\*B2A B1BKBB.43 BBtBjB((BBLBOB)BBNA43 BBtBjBEA kb BBtBjB+ # B.ABBBBBBBB □  
 BtBjB+ # BBtBjB1BBtBjBnBBBBBB. BBNA43 BBtBjB.4PBB)A □ BBOBN B1 kb B1 w B.B □  
 BBNABBBBB1. □ BBBL □ BBNBBtBjB2AB+BMBRB2 □ B\*BBNA43 BBtBjBEA □ □ B\*BRBOB-B% □  
 B\*ABBBB BBBBtBjB+ # BBtBjBU BLBBNBE1B\*BBNABB1BBtBjB.4PBB): □ B1 □ BBLABrBBBeB □  
 B'BBBB.BBB)A □ BMB1 & B-kb B1 □ BKMBEA □ B B1 w B1 □ B1BBBBKBM1 B\*BBNAB+  
 BB0BB-BBOBA # BBtBjB. BBNB BBjBzBB"BBtBB'BBBB.BBB)A & B A B B1 w B B F  
 B.BB)A B1BBIBB.BjBBtBBBOBNA B BB)A B1BBIBB.BBB)A B1BBjBzBBUBB)BhBBBzB □  
 BBBBsUBABrBBBeB"BBtBB'BBBB.BBB)A B#BB\*BBB)B1 B.BBB)A kb B & B. □  
 BBNB1B\*B2B-BA4B143 BBBBjBzBWBUB □ BBNA w

$$\lambda_{x,t} = -\ln\left(\frac{q_{x,t+1}}{q_{x,t}}\right)$$

qx,tは年齢 x とカレンダーイヤー t に依存すると仮定する。さらなる技術的な課題として、λ が実行可能  
 で、よりリスク感応的な取り扱いとなるかどうかを評価する必要がある。

63 : □ □ B.BBB)BE4 B BBtBjB2A kb BBtBjB+ # B.BMBRBOBNA BBBB BBBBtBjB+ # BBtBjB1B □  
 BtBjBnBBBBBB. BBNA kb BBtBjB+ # B.ABBjBzBB"BBtBB'BBBB.BBB)A & BU B B1  
 w B B B)A B1BBIBB.BjBBtBBBOA B1BBIBB.BBB)A B1BBjBzBBUBBNA □

B. BBN. B1'5BU BBABABA □ QIS2B\*B2ABrBBBeB”BtBB’BBBBEBtBBBOBA □  
 □ 3BB1 BU(B+BB)A & w = 4FB.B'BB)A □BBOB □& □B1 50B BABB2 50B □  
 B1BrBBjBUO BBNNBB+BU- BBABB1 BMBB.A □(B2ABrBBBeB #B\*B-BB □  
 B+BGA& B-4B1.3 BB11 BB-B,B1 BU BBBB)BBNA □

QIS3B\*B2A kb BtBjB+ B ABrBBjB. BBN& B1 B\*BtBjBUBNA □

$$Life_{lapse} = \sum_i (\Delta NAV | lapseshock)$$

BB#BAiB2& 4 & BU BB)BBNAB BB)A □& BrBBjB □ lapseshockBB2AQ'B1BrBBBeB1  
 BBABKMBB-& B1 BU BEBLBBBrBBBeB\*BBNA B'B2A □BBOB)BBN.& □B1 50B □  
 ABEB B'B2A □& B B B BU B & B)BBN#B2& B\* □ 3BB1 A □& □  
 B B B BU B N#B2 □BBOB □& □B1 50BB1 B\*BBNA □  
 BtBj0 B.B'BB)BEA kb BtBjB BsBBBB+ B B\*ABB1BtBjB BsBBBB\*B1 □  
 2)B.BKBNBtBj0 □ (KClapse)B2ABrBBjB. BB)A B1& B1 BU BBBLBOBNBB+  
 B\*A& B1 BU BBBLBOBN2B\*BBNA □

6-6-3-5. Life<sub>exp</sub>: w & B B tB j: w

& /BtBjB2A 4 & BG 4 B B K B.4P1jBBN& /B B KBMBE7BB-BNBBtBjB\*B □  
 BNQIS2B.BBB)& /BtBjB1B'BBBtB-BB {BBhBBBzBBBBBsB2ABBBjBzBB”BtBB’B □  
 BBB\*. BBOBABB1BB’BBBB\*B2ABBBBBBBBsBBB+BB)A B BB1 □/ B1 □  
 4F25BU BBA □ QIS2B.BBB)ABrBBBeB”BtBB’BBBBEBtBBBOAB BB\*B2 B1& /B □  
 B KBMA B1BBB)B1& /B □ 10B7BB-BMAB BB)A B B B KBMBE □ 15B □  
 BBNB+BBBrBBBeBU((BBA □

□ QISBB\*B2A kb BtBjB+ B B.ABrBBjB. BBN& B1 B\*B BLBOBN 64 A □

$$Life_{exp} = (\Delta NAV | expshock)$$

: w B B #B shockB2AKB)B1& /BB”BtBBcBtBBBB\_ B1M BKMBE B B ABBLB. □  
 B M BKMBE □ 1B BBN#BU BB)BBNABBBABBSBtBzBBBBBBBBk B1 4 □  
 & B.B'BB)B2A U /B1 75BBU 4 B. BM BBB+B (B\*BBNAB+BBBrBBBeB\*B □  
 BNA w

BtBj0 B.B'BB)BE kb BtBjB+ B B\*A& B1 BU B\*B BBN#B1BrBBjB. BBN

64 : B\*B2A& /BtBjB. BBNBhBBBzBBBBBsB2AB1BKBB. BDBLBOBNA w

$$Life_{exp} = 0.1 \cdot f_{fixed} \cdot E_{fixed} + 0.025 \cdot f_{adj} \cdot E_{adj}$$

f<sub>fixed</sub> B+f<sub>adj</sub> B2 5 BABB2. B.4PBBN B 4 BBSBtB1 B BB1 B- B KB1 w = 4FBU  
 BB)BBNA w

E<sub>fixed</sub> B+E<sub>adj</sub> B2 5 BAB B.4PBBNBSBtB1 4FB\*B1 & /5BUBBLBRBA □

E = E<sub>fixed</sub> + E<sub>adj</sub> B2BSBtB.B'BB)B1 4FB\*B1' & /5BUBBLBRBA w

次

以内

考

& / B1 B1 B\*BBNA

6-6-3-6. Life<sub>rev</sub> BtBj

:ww BtBjB2A MBB-B 42p BB1 B.BKBNA pB KB11R OB;B1 GB1BBtBj  
B\*BBNABB#BABBB1BBtBjB2A B.B&B)ACRlifeB1BBSBBBB..BBN5V&0B1.B.B  
B)l BBNA w QIS3B\*BDB)BBtBBBOBNBBtBjBBjBzBB\*BBNABB1BBtBjBBjBzBB.BBNhBB•  
BzBBBBBsBEABrBBBjBrBBBeB.BBN& / B1 B\* .BBNA

$$Life_{rev} = (\Delta NAV|_{revshock})$$

BB#BArevshockB2A BtBjB.BBLBBOB)BBNp 25B1 B BB1BU((BBNABABBB1BrBB  
BjB2ABBBEBFBU((&BB)%BBBOBNABABBB1BBtBjBBjBzBB\*B2ABBBtBj0 B2((BB-  
BA

:w

6-6-3-7. Life<sub>CAT</sub>: w B fB zB tB B B B tB j: w

:wCATBtBjB2ABB\_BeBBBBBjBtBjA & BtBjB6&/BtBjB\*B.BLBBNBB+B1B\*BB-B  
BcBjBtBBBqBABBB2B\_BBIBBBB\_B”BBB.BBNBBtBjB\*BBNABB0B2AB%5B- A B.BKBN  
4BMB1BrBBjB.BKBNBEB1B\*BBNABB+BB3A BGY- B1BKBB-A & AB1 Xq4FB\*B1  
%HB1 BU 2B.BBN A BU0BB)BBNA kbBABB24 B.BB)pB 4 & B2A  
B4B'B1BBBzB.nB(BB).BBOBN 65 A

$$TP_i = \& \& \quad iB1 \& BU((\&BB \& A$$

$$SA_i = \& \& \quad B1 kbBABB24 B;B1B \& BU((\&BBB pBB1 A  
B-BBOB0A$$

$$AB_i = \& \& \quad B1 kbBABB24 B;B1B \& BU((\&BBB B*B-B pBB1$$

<sup>65</sup>: BBB\*B2ABfzBtBBBtBjB.BBNhBBzBBBBBsB.B'BB)AN(B-BB+BU1@BB)BBNA B1 :BB\*  
/BBMBNBFzBtBBBtBU((BBNA iww BBBBsB2A&/B.BB- BU B/BB BB1BrBBEB&/  
B.BBA B-UBUBBLRBA w  
BrBBBe:w  
BfBzBtBBBBrBBBeB2#) 4PB.BKB&B)zBBBOBNABB0B2A BBB1BB\_B”BBBU+BBKBB+BB)BBNABB-BRBA  
1 B 4FB\*BEB&B+BE BB\_B”BBB\*B1BnBtBB1 BB3 :BBB BB\*BBNA w  
BfBzBtBBBBrBBBeB1B.B2ABB\_BeBBBBBjBtBjB.4PBNNfzBtBBB•BB+BB3y- BGA BBN KB.1  
BU B' B”BB pB1 B1 BGB\_BBB B1 B-B; ;B1 HBE BDBNA w  
. % w  
:w &BrBBBeB.BBNBBBBBsB2A &BBsBBtB1 HBU((&B.IBOB)AB B1BU.OBBOBNBB+B.BKB&B)A 4 (\*  
B. BOBONNA 4 (\*B2ABBB1BBBtBtB'BBBB.BKB&B)A B1BrBBBeB1B\_BBBjBBU BOBBN BU B'A  
BBB1BBBtBtB'BBBB+B2A B B1BrBBBeB1 KB1 BU BOBA % B. B1BhBBzBBBBBsBUA %  
B1 B. KB1 BU6BBNBB+B\*A B BB\*BBNA w  
:BBB1BBDB.A BBBB2ABrBBBeB”BBtB1 BMBBU1tBBNAB B1BBDB.A B1BB+B BB\*BBPBA w  
BBBLBOBNBrBBBeBU B BBNA w  
B BBBB KB B1BhBBzBBBBBsBU BBDB.A &BrBBBeB.BBNhBBzBBBBBsBUAB,B1BKBB. !%BBN  
BBU B BBNA w  
:BBB\*BtBBBOBA kbBBtBjB BtBjB.BBNBfzBtBBBtBjBU BB+BB)ABBBjBzBB”BBtBB'BBBB1  
/BU1tDBLBOB)BBABABA B 4 B+ 4 B1 :BBtBjBUB5B+B'1BBSBBBB+BB)BM BBB+BA BB\*  
BBNBB+BBB.B'BB)BE((&BBB\*BBNA w

□AB-BBOB3 0A□

Annuity\_factor = □B-2B□BjBzB□

BBLB.. & BABB2□2B/BBMBBNBBBj□4 & B\*B2A□

$$Surrender\_strain\_linked = \frac{\frac{4}{100} \cdot (B \cdot BB) \cdot \frac{p}{100} (B-5B+\frac{100}{100})}{2B1B1}$$

BBOBLB1 (BUBB)ABfBzBtBBB□BtBjB. BBNhBBBzBBBBBs (Life<sub>CAT</sub>)B+BBtBj0 □

□ (K<sub>CAT</sub>)B1QB'B1□BUBA□

$$Life_{CAT} = \sqrt{Life^2_{mort+dis,CAT} + Life^2_{lapse,CAT}}$$

BB#B□

$$Life_{mort+dis,CAT} = kbB+4 BfBzBtBBB□BtBjB. BBN\% B1 \& \square$$

$$Life_{lapse,CAT} = . \& BfBzBtBBB□BtBjB. BBN\% B1 \& \square$$

kbB+4 BfBzBtBBB□BtBjB2A □B1KB□. % BBOBNA □

$$Life_{mort+dis,CAT} = \sum_i 0.0015 \cdot Capital\_at\_Risk$$

BB#BAiB2kbBABB24 B & B+B-BN□4 & BU-+BB)BBNABB1 B\*B2A & □4 □

& B1 □□2BU/BBNBBtBj2BU & □A kbB+4 BfBzBtBBB□BtBjB. BBBBNhBBBz  
BBBBBsBU. (BB)BBNA & □4 & B1 □□2BU/BBNBBtBj2B2A □

$$Capital\_at\_Risk = \sum_i (SA_i + AB_i \cdot Annuity\_factor - TP_i)$$

B\*. BBNABB1 B\*B2A □4 & B. BBNpB+□□2B1 B\*A □□2BU/□

BBNBBtBjB12BU. (BB)BBNA □

□A □ & BfBzBtBBB□BtBjB1% B2A □

$$Life_{lapse,CAT} = 0.75 \cdot Surrender\_strain\_linked$$

B\*-BRBOBNABB1% B2A □4 & B. BB) □pB (B-5B+□□2B1 B1

B\* B & B□4 & B1. & B. BBN□2B1 □B. BBNBBN □B\*A □ & BfBzBtBBB□  
BtBjB. BBNhBBBzBBBBBsBU. (BB)BBNA □

B BB)ABBtBj0 □□ (K<sub>CAT</sub>)B2ABfBzBtBBB□\_B”BBB. (BB)A □B1 B□B□;B1  
□□BU □□B-(A BhBBBzBBBBBsB1 □B\* BLBOBNA □

6-6-4.:wSCR<sub>health</sub> □□4BBtBj

~~XXXXXXXXXXXXXXXXXXXX~~

~~XXXXXXXXXXXXXXXXXXXX~~

QIS3B\*BDB)BBtBBBOBNBBsBBBB\*BBNA □

:w BB1BBtBjBsBBBB\*B2A B'B1BpBBBtBjBsBBBB1BhBBBzBBBBBsB+BBtBj0 □BUB □

$Health_{exp} = \sum_{i=1}^n \lambda_i \cdot Health_{ci} \cdot Health_{ac}$

$$SCR_{health} = \sqrt{\sum_{rxc} CorrHealth^{rxc} \cdot Health_r \cdot Health_c}$$

$Health_{exp}$

$$CorrHealth^{rxc} = \frac{Cov(Health_r, Health_c)}{\sigma_r \sigma_c}$$

$Health_{ac}$

$CorrHealth =$	$Health_{exp}$	$Health_{cl}$	$Health_{ac}$
$Health_{exp}$	1		
$Health_{cl}$	0.5	1	
$Health_{ac}$	0	0	1

表 11 医療保険リスクの相関マトリックス

$Health_{exp}$

$$KC_{health} = \sqrt{\sum_{rxc} CorrHealth^{rxc} \cdot KC_r \cdot KC_c}$$

#### 6-6-4-1. $Health_{exp}$ の算出

$Health_{exp} = \sum_{i=1}^n \lambda_i \cdot Health_{ci} \cdot Health_{ac}$

$$\sigma_{h_{exp}} = \sqrt{\sum_{i=1}^n \lambda_i^2 \cdot \sigma_{h_{ci}}^2 \cdot Health_{ac}^2}$$

$$P_{ay} = \sum_{i=1}^n \lambda_i \cdot P_{ay_i}$$

$Health_{exp}$

$$Health_{exp} = \lambda_{exp} \cdot \sigma_{h_{exp}} \cdot P_{ay}$$

$\lambda_{exp} = \frac{Health_{exp}}{\sigma_{h_{exp}} \cdot P_{ay}}$

$$Health_{exp} = \sum_{i=1}^n \lambda_i \cdot Health_{ci} \cdot Health_{ac}$$

$Health_{exp}$

#### 6-6-4-2. $Health_{cl}$ の算出

$Health_{cl} = \sum_{i=1}^n \lambda_i \cdot Health_{ci} \cdot Health_{ac}$

$$\sigma_{h_{cl}} = \sqrt{\sum_{i=1}^n \lambda_i^2 \cdot \sigma_{h_{ci}}^2 \cdot Health_{ac}^2}$$

$$P_{ay} = \sum_{i=1}^n \lambda_i \cdot P_{ay_i}$$

B & 4B.BKBMA 64B1/2BA 13 . B1 10BKBMBE BB-BNBBtBj

BB1BBtBjB.BBNB.BBNBhBBBzBBBBBs (Health<sub>cl</sub>)B+BBtBj0 20 (KC<sub>cl</sub>)B2A 4B1QB'  
B1BBBzBUBBNA

$$\sigma_{h_{cl}} = 1 10 B1 . B kbB 1 & BBtBjB * 10BB)BBNBBtBjB.BKBNpBB1 10 .$$

$$P_{ay} = :w 11BB14$$

BB1BBBzBUBB)ABhBBBzBBBBBsBU%BBNA

$$Health_{cl} = \lambda_{cl} \cdot \sigma_{h_{cl}} \cdot P_{ay}$$

BB#BA 1<sub>cl</sub> BA 1Var99.5% 10B+ 10B-BBBjzBB\*A 2.58B..3 6BBNA

BABABB1BBtBjBBSBBBB.BBNBBtBj0 20 (KC<sub>cl</sub>)B2A200B.BB1 114B1. 10  
bBBhBBBvBB1B\_B”BBB. (BB)A 11& 11 10BU 11BBNBB+B\*A 11BBNBB+B1B\*B  
BNBhBBBzBBBBBsB12B\*BLBOBNA

6-6-4-3.:wHealth<sub>ac</sub> 4BBtBj

:w BB1BBtBjBBSBBBB2A %-B- 4BBL 11BBNBBtBjBUBfBBBBNBEB1B\*BBNA 4B1 10  
B2X 14FB\* %B+BB 10B2BM%BB-BBBDA& BBtBjBU BA 1w BB1BBtBjBBSBBBB;B1Bh  
BBzBBBBBs (Health<sub>ac</sub>)B2A 4B1 B'B1BBBzBBL%BBNA

$$claims_{ay} = 114 B . BBBN 1142pB$$

$$P_{ay} = :w 11BB14$$

$$MP_{ay} = w 31 31 11 11 4 1/2$$

B BB)ABhBBBzBBBBBsB2 4B1B\*BLBOBNA

$$Health_{ac} = \lambda_{ac} \cdot claims_{ay} \cdot \frac{P_{ay}}{MP_{ay}}$$

BB#BA 1<sub>ac</sub> BBBtBBBBBzBB 16.5% B..3 6BBNA

B BB)A 1w BB1BBtBjBBSBBBB.BBNBBtBj0 20 (KC<sub>ac</sub>)B2A200B.BB1 11B\_B”BBB.  
(BB)A 11& 11 10BU 11BBNBB+B\*A 11BBNBB+B1B\*B BNBhBBBzBBBBBsB12  
B\*BLBOBNA

6-6-5. SCR<sub>nl</sub> 4BBtBj:w

BB1 4BBtBjBnBBBBBBB2A 12B B.BRBB&B)/BBMBBN/ 11UBfBBBBNBB+  
BU (BBOB)BBNA/ 11B2A B BB.BKBN BU/BBN 1ABABB2A 11B. 10

10B 13B-B BU 10BB)BBNA B BBtBjB2A B BB1& B.B'BB)B1 # 11HB.4P

1jBBNBEB1B\*BBNABB-BRBA 142pBB1/BBNBzB\_BBBkB+5A 14 & B12B+ 10

B1B'BBBBBBBBBA 16 14 KBUBfBBBBNBBDB. 1B-B'BBBBBBBBB1 # 11HB./ 10

BBNBEB1B\*BBN SCR<sub>nl</sub>B2A 4B1 4PB BBBBjBtBU BB)A 1NL<sub>pr</sub>B. 4B1 CATBBtBjBU& 10



BBEB1B\*BBNA □

$$SCR_{nl} = \sqrt{\sum_{ixc} CorrNL^{ixc} \cdot NL_r \cdot NL_c}$$

BB#BA □

CorrNL<sup>ixc</sup> B4PB BBBBjBtB1% □

NL<sub>r</sub>, NL<sub>c</sub> BBpBBBtBjB1BhBBBzBBBBBs

BBNA BBBBtBA □

CorrNL =	NL <sub>pr</sub>	NL <sub>CAT</sub>
NL <sub>pr</sub>	1	
NL <sub>CAT</sub>	0	1

表 12 損害保険リスクの相関マトリックス

□□□ 41 □□□□□□□□□□□□□□□□

6-6-5-1. NL<sub>pr</sub>:w 4 B 0 2 BBtBj:w

BB1BsBBBB2A 4 BBtBjBsBBB B60 2 BBtBjBsBBBB+BB □ QIS2B.BB □  
 BNQB'B1BB\_BBBtBjBsBBBBU& BBEB1B\*BBNA 4 BBtBjB2ABxBB"BBrBO 6 B1BzB\_  
 BB-BB\_BuBBAB\*B14FB.BBN B1. B.4P1jBBNBEB1B\*BBMA&/B. 4 2 B1 5 BU  
 /BBEB1BA BBN 4 BU BN TABBOBBtBjB\*BBNA A 0 2 BBtBjB2A QB'  
 B1 BBLB-BNA B'B2A p 0 2 B & 0 B\*. 6 BBOB)BBNBEBBOB-BBB+B\*  
 BBNA QB'B2A B1 p B B1# B-H/B1BBDA 4 B1 p BB# 6 BB-BB □  
 B+B\*BBNA □

QIS3B\*B1A 4 BBtBjB+0 2 BBtBjB. BBNBhBBBzBBBBBsBU% BU-BNA □ NL<sub>pr</sub>  
 B1BhBBBzBBBBBsB2A 4 B1BKBB..% BBOBNA □

$$NL_{pr} = \square (\square) = \sqrt{V}$$

BBB □

$$V = BBBBBBBBsBB □$$

$$\sigma = B BBBtBjBBB_BBB1 0. □$$

$$\rho(\sigma) = 0. B 14 P □$$

:w4P □ ρ(σ) BA BBKBB 6 BBOBNA □

$$\rho(\sigma) = \frac{\exp\left(N_{0.995} \cdot \sqrt{\log(\sigma^2 + 1)}\right)}{\sqrt{\sigma^2 + 1}} - 1$$

BB#BA N<sub>0.995</sub> B2A 0 B1 99.5B B\*BBNABB14PB2ABhBBBzBBBBBsBU

Var99.5BB+ B+B-BNBKBB..3 6 BBOB)BBNABBBKB ρ(σ) □ 3σ

:w BBBBBSBBB+ 0B2A 4B1Q 4B\*% BBOBNABABA 4A & KB line

of business;LoBBB.B'BBA 0B+BBBBBSBBBU 0BBNAB BB)Q 4B.A  
& KB1 0B+BBBBBSBBBU & BA KB1BBBBBSBB (V)+0  
(ρ(σ))BUBA

fBB (BUB)BB A (B+BB)A (B+BBBB) BBBBBBzBU  
KBBBB) BDBNA

$$V_{(prem,lob)} = 4 BBtBjB. BBNBBBBBSBB$$

$$V_{(res,lob)} = 0 2 BBtBjB. BBNBBBBBSBB$$

$$\sigma_{(prem,lob)} = 4 BBtBjB. BBN 0$$

$$\sigma_{(res,lob)} = 0 2 BBtBjB. BBN 0$$

0 2 BBtBjB. BBNBBBBBSBB2

$$:w V_{(res,lob)} = PCO_{lob}$$

BB#BA PCO\_{lob} B2A & KB1 B/v B. BBNBBB1 0 2 B\*BBNA

BBtBB BBNBBBBBSBBBA

$$V_{(prem,lob)} = \max(P_{lob}^{t,written}; P_{lob}^{t,earned}; 1.05 \bullet P_{lob}^{t-1,written})$$

B\* BLBOBNABB#BA

$$P_{lob}^{t,written} = \& KB1 (B. BBNBBB1. 4 B1 0)$$

$$P_{lob}^{t,earned} = \& KB1 (B. BBNBBB1 & 1 4 B1 0)$$

$$P_{lob}^{t-1,written} = \& KB1 B. BBNBBB1. 4 B1 0$$

0 2 BBtBjB. BBN 0 B2BBB1 P [BB\_BBB+B. 4B1BKBB. BDBLBOB)BBN 66 A

66 : B1 P [BB\_BB2A B1KKB BBLBOB)BBNA

- Accident and health – workers' compensation: 4 4
- Accident and health – health insurance: 4 4
- Accident and health – others/default(B B1 BBBdBB)
- Motor, third-party liability(D G0 4 4)
- Motor, other classes(B B1 B1)DG0 4 )
- Marine, aviation and transport(B)v B0IM )
- Fire and other property damage(PBGB B1 B1 )
- Third-party liability( 4 4)
- Credit and suretyship(B+ = & )
- Legal expenses( 0/ )
- Assistance(R )
- Miscellaneous non-life insurance(. 4 )
- reinsurance - property business(G 4 B.4PBBN 4 )
- reinsurance - casualty business(4 4 B.4PBBN 4 )
- reinsurance - marine, aviation and transport business(B)v B0IM 4 B.4PBBN 4 )

LOB =	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
$\sigma_{(res,lob)}$	15%	7,5%	15%	12,5%	7,5%	15%	10%	15%	10%	10%	10%	15%	15%	20%	20%

表 13 各ビジネスラインの標準偏差

4 100 2 100 0 100 100 0 100 100

$$\sigma_{(prem,lob)} = \sqrt{c_{lob} \cdot \sigma_{(U,prem,lob)}^2 + (1 - c_{lob}) \cdot \sigma_{(M,prem,lob)}^2}$$

BB#BA

$$c_{lob} = \frac{1}{n_{lob} + k_{lob}}$$

$$\sigma_{(U,prem,lob)} = \sqrt{\frac{1}{n_{lob} - 1} \cdot V_{(prem,lob)} \cdot \sum_y P_{lob}^y \cdot (LR_{lob}^y - \mu_{lob})^2}$$

$$\sigma_{(M,prem,lob)} = \sqrt{\frac{1}{n_{lob} - 1} \cdot V_{(prem,lob)} \cdot \sum_y P_{lob}^y \cdot (LR_{lob}^y - \mu_{lob})^2}$$

5 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100

$$c_{lob} = \begin{cases} \frac{n_{lob}}{n_{lob} + k_{lob}} & n_{lob} \geq 7 \text{ の場合} \\ 0 & \text{それ以外の場合} \end{cases}$$

BB#BA

$$n_{lob} = 3 \cdot 100 = 300$$

$$k_{lob} = 4.0 \cdot 300 = 1200$$

4 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100

$$\sigma_{(U,prem,lob)} = \sqrt{\frac{1}{(n_{lob} - 1) \cdot V_{(prem,lob)}} \cdot \sum_y P_{lob}^y \cdot (LR_{lob}^y - \mu_{lob})^2}$$

BB#BA

$$LR_{lob}^y = \text{LR}_{lob}^y \quad y = t-1, t-2, \dots, t-n$$

$$P_{lob}^{y, earned} = \text{P}_{lob}^{y, earned} \quad y = t-1, t-2, \dots, t-n$$

B BB)A  $\mu_{lob}$  B2A & 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100

2 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100

$$\mu_{lob} = \frac{\sum_y P_{lob}^y \cdot LR_{lob}^y}{\sum_y P_{lob}^y}$$

4B.Q 4B\*A KB1BBBBBBsBBB24B1B\*%BBNA□

$$V = \sum_{lob} (V_{(prem,lob)} + V_{(res,lob)})$$

KB10B2A 4B1B\*%BBNA□

$$\sigma = \sqrt{\frac{1}{V^2} \cdot \left( \sum_{rzc} CorrLob^{rzc} \cdot a_r \cdot a_c \cdot V_r \cdot V_c \right)}$$

BB#BA□

$$r, c = (prem,lob)BABB(res,lob)B1KB\_BBBBjBt$$

$$CorrLob^{rzc} = 4PB BBBBjBtB1-\& \square$$

$$V_r, V_c = \& \square KB1BBBBBBsBB \square$$

$$a_r = \begin{cases} \sigma_{(prem,lob)} & r = (prem,lob) \text{ の場合} \\ \sigma_{(res,lob)} & r = (res,lob) \text{ の場合} \end{cases}$$

4PB BBBBjBtB2A□

$$CorrLob = \begin{pmatrix} CorrLob_{pr} & \alpha \cdot CorrLob_{pr} \\ \alpha \cdot CorrLob_{pr} & CorrLob_{pr} \end{pmatrix}$$

B\*BBNABB#BαB2A 4B+02BBtBjB14FB1BBBjBzBB+BB)A 50BB..3 6BBNABABA□

CorrLob<sub>pr</sub> B24B1BKBB..3 6BBOBNA□

CorrLob <sub>pr</sub> =	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1: A (workers' comp)	1														
2: A (health)	0,5	1													
3:A (other)H	0,5	0,5	1												
4: M (3 <sup>rd</sup> party)	0,25	0,25	0,25	1											
5: M (other)	0,25	0,25	0,25	0,5	1										
6: MAT	0,25	0,25	0,25	0,5	0,25	1									
7: Fire	0,25	0,25	0,25	0,25	0,25	0,25	1								
8: 3 <sup>rd</sup> party liab	0,5	0,25	0,25	0,5	0,25	0,25	0,25	1							
9: credit	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,5	1						
10: legal exp.	0,5	0,25	0,5	0,5	0,5	0,25	0,25	0,5	0,5	1					
11: assistance	0,25	0,25	0,25	0,25	0,5	0,5	0,5	0,25	0,25	0,25	1				
12: misc.	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	1			
13: reins. (prop)	0,25	0,25	0,25	0,25	0,25	0,25	0,5	0,25	0,25	0,25	0,5	0,25	1		
14: reins. (cas)	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,5	0,5	0,5	0,25	0,25	0,25	1	
15: reins. (MAT)	0,25	0,25	0,25	0,25	0,25	0,5	0,5	0,25	0,25	0,25	0,25	0,5	0,25	0,25	1

表 14 各ビジネスライン間の相関マトリックス

6-6-5-2. NL<sub>cat</sub>: w B fB zB tB B B B B tB j

BfBzBtBBBBBtBjB2A [4 B+0]2BBtBjB. BBNBBBBsB\*B2 [B. BLBBBOB-BABc

BjBtBBBBBABB2B\_BBIBBBB\_B”BBBBLBBNBE1B\*BNA □

BfBzBtBBBBrBBBeB2A #) 4P [zBBOBNABBOBLB200B1 1B1B\_B”BBB. BBN [ + □

B-BrBBBeB\*BNNBB+BU [BBOB)BBNA [□00B1BEB&B+BE [B\_B”BBB1 [BnBtB(BB-BR

BA TailVaR)B+BB)ABfBzBtBBBBBtBjB1BhBBBzBBBBBsBU((BBNABfBzBtBBBBBsBBBB\*

B2A 6 [B. BKBND [4B+qQ [4B1 [B [B BABOBNA qQ [4B2A 6’- [B [A □

- [B- [4A 0 [P [A [B 6 [B -/B [BOB. BKBN& [A [B AB\*BNA [w BBLB. A □

[B BBN [KB. 1 [2 [BU [B’A [p [B1 [B1 [BABB2B\_BB [B [B [A [KB. □

5BBNM [BB-B [h [A [BBtB”BtB [M [B. BBN. [B1 [B-B, [BBNA □

BBOBLB1BfBzBtBBBB1BrBBBeB2A & [B [B #) 4PB. BKB&B) [B BABNAQIS3B. BBB)A □

BeBtBBB [ABBBBjAB [BBBtABB\_B [A [B\_B [BB [ABBBaBbB\_A [BBBBB [ABBBB [gB [ABtBaBb

BBB [AB [BB)B\_B [BiBtB. BBN [4 [B1 [B [BBLBOB)BBNABBB\*B2AB\_B [iBtB1 [BU [B [AB\_B [i

BBtB. BBNBfBzBtBBBBrBBBeB2A [BhBrBn’ [B\*B1 [x 6 [B. BKBN [4 [B [B. BBNBBBB [BB □

B1 [B+BB [rBBBeB [GABBBB. BBNB [B [BuB1 [ [B. BKBN [4 [B [B. BBN 150 [B □

BBB1 [B+BB [rBBBeB [BBLBOB)BBNA □

[x [B. A [BrBBBeB1. 3 [B. BBB) [B-B [BaBBB\_B [BU [B’ [BBN [B [BBNABABA [4 (\*

BA [B [B1BfBzBtBBBBrBBBeB. 4 [BBOBB+B [A [X [AB1 [BtBjBBBBsB1’ [B [KBMB2 [B [B- [□ □

B [KBMBE [BBB-BNB\*B [BPBA [B [B1 [rBBBeB1 ([H [B. BKB&B)A [4 (\* [B [AB, B1 [BKBB. 5 [BBOBNB □

B2A [B [4 B’ [B [kBBBG& [BrBBBeB1 [BnBtB [B1 # [□ [B. [B [B [BNA [ [B-B [BBBsBU □

B [BBNBB+BU-1 [BBNBBDB. A [BzB\_B’ [B1BfBzBtBBBB. B’ [BB)A [BrBBBeBU [ [BBNBBB □

B [B [B+B- [NA [4 (\* [B. B+B&B)1 [B- [rBBBeBU [ [BBN [B [B2A [BfBzBtBBBBBtBjB; B1 [B □

4 [B’ [B [kBBB1 [2 [BU. O [B\*B [NNBB+A [B [BB)A #) 4 [PB # [BU [B) [BNB+B [BBB+B\*B [BNA □

B\*((BB [KB [B. [B [B1BfBzBtBBBBrBBBeBU. 3 [B\*B [B-B [A [4 [B1 [BKBB- [B\*B [A [B [AB- [Br

BBBeB. BBN [Bh [BBBz [BBBBBsBU’ [ [BBNA □

$$NL_{CAT} = \sqrt{\sum CAT_i^2}$$

BB # [BA [iB2 [B [rBBBeBU [0 [BB) [B [M [A [Ti [□ 25 [BB1 [ [B [B+ [BLBOBNAB [ABBB1. % [B. BBB)A □

& [BrBBBeB2 % [B\*B [NNBB+B [ [B [BOB)BBNA □

: w : w : w

## 7. MCR B1% □

### 7-1. MCR B1 [B [N [□

MCR [B2A #) [B1 [B [ [B [B+BB) [B1 [B [BU [B [B [ABBB1 [ [BU [B [NB+#) 4 [PB [B [B- [□

[BUB+B [N [BE1 [B\*B [BNA [B [B [B2A [Y [B\*B [NNBBDB. A [ [SCR [B [KBMBE [B [B\*5 [B- [B\*B\*% [B [BO

BNABABA BBBrBtBBB;B14BU&BBBDB.A% B-B- B\*t% BBOA MCRB2& B14  
(Absolute MCR(AMCR))BU(BA BM BRBOBNBtBjBZA(International Actuarial Association)B\*  
BDBLBBOBBtBj BU nB..3. BBOB)BBNACEIOPSB2A MCRB2A & A 5 BB' t B-  
B\*BNNBBB\*BNN(A) MCRB2A B.1 BBNB B j Bz BB"BBtBB'BBBB+A (H  
H <sup>67</sup> BUBEB A 12B. & B-BBBz- B\*A% BBOBNBBB\*BNA MCRB2& BU BDBNBB  
B\*BNA AB+BBBB\_BtBB) <sup>68</sup> BNAB ACEIOPSB2A B B j Bz BB"BBtB.BKBN% B B MCRB.1 BB)  
BBNBB+A B-BvBBB BBBB BU BBNBBDB. MCRB1% B2 B BBBB1 5 BU BB-B  
BB+B+BB)BBNA

7 B.BKB&B).3 BBOBBBqB\_BB'BB\_BeBBB.BB)A CEIOPS B2ABBtBj 2A  
B;B11 HA BBOBBBzABABB2 (HBU B'BBzB#BB1 A B6/B+  
/v B1.O nOB+A SCR B1% B+B1 HB+BB BU((&BN HBU BBA B BtBj B+  
& B B14FB1BBBBBeB BBNB BD ACEIOPS B2A SCR B2B BtBj B.B'B B) B BBOA  
MCR B2 & B.B'B B) B BBOBNA AB+1 @BB)BBNA

QIS2 B.BBB)ABtBzBB {BBBdBBBBB.BKBN SCR B1% B+AMCR B1% B2ABB+BVB, BB\*B  
BNABBB A %BBN1 BB2A B1 2)BGA 4 B1 M B B1 BtBj (B.BBN  
. B2- BRB-B PA BBOBBBzABABB2 (B-BBBzB#BB1 B.BKBNA B B j Bz BB"  
BBtBB'BBBB A & B s BBBB.BBB) B t B BBOBN PA BeB•BBBrBBBBBtBj.BBNBBBBs  
BUBB-B EA KB)B1 4 PB1 B2- BBOB)BBN PB\*BNA

:w MCR B SCR BU B & BB B Bt B B B N B + B B QIS2 B1 & B2 A SCR B A B B MCR B E B B B 2 B B1  
B.A g B- 5 B B N B B + B U B B) B B N A B B1 B B D A CEIOPS B2 A QIS2 B1 B B' B B B A s  
B-((B B\*-BRBOB)BBMA & B- MCR B.B2A 4 4 FB1 (HBU B'BBDA HB1 B  
BNBB'BBBB B+BBOBNBB+BUA Z/BB)BBNA

:w MCR B1% BUBtBzBB {BBBdBBBBB.1-B(BABKMB B B B\*. %BBNBB+B2A%  
B1-5BB.BKBN Bn Bt B B B N B A B B1 B B + B. B MCR B SCR BU B N (HBU B L B B N A B B B A  
MCR B1% B U S C R B. B K B M 1 - B ( B N B U B N B B + B 2 A M C R B 1 O B B L 5 5 B B) B B A B  
B-BzB\_BBBk MCR B.BKBN- GB BLBOB-BBB+BGABKBM B- 4 (\*BU B B) t% BBOBNBB D  
5\_ B A B B 2 B † B B B - 4 (\*B.BB)A B B1 5 B B U B B B) B B A B B B + B / B B M B B N B + ((B L B O  
B N A B B L B S C R B1% B. B B B B U B B N 4 (\*B2A BtBzBB {BBBdBBBBB+ B B1 Bn Bt B B  
B B B N M C R B1% B + B B B B 1 B1 B r B t B B B U & B B N B n B t B B B B B & B) B B A B A

7-2. QIS3 B.BBBN MCR B1%

: w B 1 B B t B j B s B M C R B U . B B N A

<sup>67</sup>:w (HBU B'BBzB+B2A BLBB1.=B\*#zBBNBB+B1 (B-BBBzB1BB+AC auditabilityB.BBN.6.†:w  
<sup>68</sup> CfA9

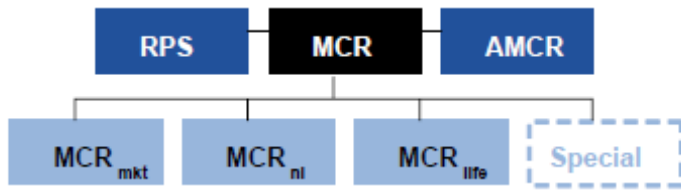


図 4 MCR のモジュラー構造

$MCR_{mkt} = \beta \sum_j B_j$

$$MCR_{mkt} = \beta \sum_j B_j$$

$$MCR_{nl} = \beta \sum_j B_j$$

$$MCR_{life} = \beta \sum_j B_j$$

$$MCR_{health} = \beta \sum_j B_j \frac{A_j + B_j}{A_j + B_j} = \beta \sum_j B_j$$

$$RPS = \beta \sum_j B_j \frac{K_j}{N_j} \quad \text{Reduction for Profit Sharing}$$

$$AMCR = \beta \sum_j B_j \quad \text{Absolute minimum capital requirement}$$

$$MCR_i = \beta \sum_j B_j \text{Corr}(MCR_i, MCR_j) \quad \text{for } i, j = 1, \dots, n$$

$$MCR = \beta \sum_j B_j \text{Corr}(MCR, MCR_j) \quad \text{for } j = 1, \dots, n$$

$$MCR = \beta \sum_j B_j \text{Corr}(MCR, MCR_j) \quad \text{for } j = 1, \dots, n$$

$$MCR = \sqrt{\sum_{r,c} \text{Corr}(MCR_r, MCR_c) \cdot MCR_r \cdot MCR_c} - RPS$$

$$MCR = \beta \sum_j B_j \text{Corr}(MCR, MCR_j) \quad \text{for } j = 1, \dots, n$$

$$MCR = \beta \sum_j B_j \text{Corr}(MCR, MCR_j) \quad \text{for } j = 1, \dots, n$$

$\text{Corr}(MCR_r, MCR_c) =$	$MCR_{mkt}$	$MCR_{life}$	$MCR_{nl}$	$MCR_{health}$
$MCR_{mkt}$	1			
$MCR_{life}$	0.25	1		
$MCR_{nl}$	0.25	0	1	
$MCR_{health}$	0.25	0.25	0	1

表 15 MCR の相関マトリックス

$$MCR = \beta \sum_j B_j \text{Corr}(MCR, MCR_j) \quad \text{for } j = 1, \dots, n$$

$$MCR|_{AMCR} = \max\{MCR, AMCR\}$$

7-3. B.BKBN

$$TP_{wp,i} = \dots$$

$$TP_{surrender,i} = \dots$$

$$TP_{benefits,i} = \dots$$

BBOBLBBLA B1BKBB.%BU-BA

$$RPS = \sum_i \min \left[ \max (TP_{wp,i} - TP_{surrender,i} ; 0), TP_{benefits,i} \right]$$

7-4. BtBj

$$EQU = \dots$$

$$RE = \dots$$

$$FIL = \dots$$

$$FINL = \dots$$

$$FI = \dots$$

$$FI^* = \dots$$

$$TP = \dots$$

$$DFI = \dots$$

$$DTP = \dots$$

$$r(t) = \dots$$

BBOBLBU(BB)4B1Q1bBMB1 B\*%BU-BA

B'B1 B2A

$$MCR_{mkt1} = \sqrt{(0.12 \cdot EQU + 0.08 \cdot RE)^2 + (0.054 \cdot FI_L + 0.027 \cdot FI_{NL})^2}$$

QB'B1 B2

<sup>69</sup> Undertakings for Collective Investment in Transferable Securities B1ABB0B2AEU B1 UCITS0 (85/611/EEC)B+mB3BOBNBEB1B BBOB)BBN z77NB\*BBNA



$$MCR_{mkt2} = \sqrt{(MCR_{eq} + MCR_{prop})^2 + MCR_{spread}^2 + MCR_{int}^2}$$

BB#BA□

$$MCR_{eq} = 0.12 \cdot EQU$$

$$MCR_{prop} = 0.08 \cdot RE$$

$$MCR_{spread} = 0.025FI^*$$

$$MCR_{int} = \max \left\{ \begin{array}{l} 0 \\ FI \cdot D_{FI}^{mod} \cdot r(D_{FI}^{mod}) \cdot S^{up} - TP \cdot D_{TP}^{mod} \cdot r(D_{TP}^{mod}) \cdot S^{up} \\ FI \cdot D_{FI}^{mod} \cdot r(D_{FI}^{mod}) \cdot S^{down} - TP \cdot D_{TP}^{mod} \cdot r(D_{TP}^{mod}) \cdot S^{down} \end{array} \right\}$$

$$D_C^{mod} = \frac{1}{1 + r(D_{FI}^{mod})} D_C^{mod}$$

$$S^{up} = 0.18$$

$$S^{down} = -0.20$$

7-5. □4BBtBj

:w □4BBtBjB.B'BB)B2A □B1BBBzBBL% □BU-BA □

$$PCO_i = \square K \quad iB.B'BB)A \square □4BU(( \&BB \square \square B.BBN' \square \square \square$$

$$P_i = \square B14FB.BBBNA \square □4BU(( \&BB \square \square \quad iB.B'BB)B1 \& \square \square \square$$

:w BBOBLB1BBBzBUBA □B1B\*% □BU-BA □

$$MCR_{NL} = \max(\sqrt{H_p}; 0.65) \cdot \left[ \sum_i a_i \cdot P_i \right] + \max(\sqrt{H_{PCO}}; 0.65) \cdot \left[ \sum_i \beta_i \cdot PCO_i \right]$$

BB#BAHPCO B+Hp B2B BOBBO□□□B+□4B.BBNBBBBBBB{BB□B\*BBNA □

$$H_{PCO} = \frac{\sum_i PCO_i^2}{(\sum_i PCO_i)^2}; \quad H_p = \frac{\sum_i P_i^2}{(\sum_i P_i)^2}$$

□iB βi B1B BOBBOB1BBBBBzBB2□□B1P□BB\_BB. □B1KBB.3□BBOB)BBNA □

LOB	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
$a_i$	10%	4%	6.5%	13%	13%	16.5%	13%	13%	16.5%	6.5%	10%	16.5%	19.5%	19.5%	19.5%
$\beta_i$	19.5%	10%	19.5%	16.5%	10%	19.5%	13%	19.5%	13%	13%	13%	19.5%	19.5%	26.5%	26.5%

表 16 各事業ラインのパラメーター

7-6.  $\mu_{4BtBj}$

:w  $\mu_{4BtBj} B^2 B^1 B' B^1 B B B z B B L A \% B U - B A$

$$TP_{long} = B p B B' B B t B U \square B B B N B K B B - \& B U 4 B B A B B B B 1 \square \square 0 2 B 1 \square \square$$

$$CAR = B B B B d B B e B . B B B N c \square 4 B U (( \& B B B h B B B z B B B B B t B j B 1 \square \square$$

$$TP_{UL} = B B \dagger B B B B j B B s B B t B . 4 P B B N A c \square 4 B U (( \& B B \square \square 0 2 B 1 \square \square$$

B B 1 B B B z B B L A 4 B 1 B \* B h B B B z B B B B B s B 1 \% B U - B A

$$:w MCR_{life} = \sqrt{MCR_{long}^2 + MCR_{mort}^2} + MCR_{UL}$$

B B # B A

$$MCR_{mort} = 0.00025 \cdot CAR$$

$$MCR_{long} = 0.0015 \cdot TP_{long}$$

$$MCR_{UL} = 0.12 \cdot TP_{UL}$$

7-7.  $B - B B t B j B \mu_{4BtBj}$

:w B B 1 B B t B j B B s B B B B \* B 2 A 4 B 1 Q B' B 1 B B B z B U B B N A

$$N_{health} = \mu_{4B1} \& (*$$

$$BE = B k B B t B 1 \& \& \& B + \mu_{4B} . 4 P B B N \& B 1 \& / B 1 \square \square$$

B B 1 B B B z B U B E B B B ) A 4 B 1 B \* \% B B N A

$$MCR_{health} = 1.28 \cdot \frac{\rho}{\sqrt{N_{health}}} \cdot BE,$$

$$\rho = 5$$

:w

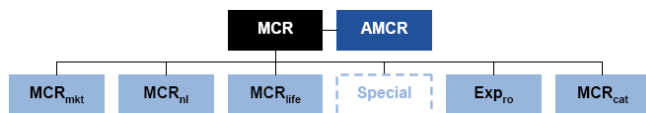
7-8.  $\& \square \square / \square \square$

:w B' B B B t B - B B { B B B' B B B B + B B ) A B . 100 B B B B U . 3 \square B B N A B . 200 B B B A \square 300

B B B B 1 Q B' B 1 1 \square B U . 3 \square B B N A B B # B A B B O B L B 1 \square B 2 A \square B . \square B B B \& B ) . 3 \square B B O B B E B 1

B \* B 2 B - B \square A

<sup>70</sup> : \square \square \square B \* B 2 A \square \square B 1 \square B + B B ) A B B B \_ B u B B B s B B B B B' B B B A B n B B B j B B' B B B B q B B B' B B B A B B \square B ) A B B B s B B r B B B B B B B s B B B B 1 B' B 1 \square B U \square B B A B B 1 \square B U \% B . - B N A B B B \_ B u B B B s B B B B B' B \square B B \square w



. \% B B N B B D B 1 \square B B B z B + B B ) A B 1 B E B 1 B U B B N A \square w

: \square \square : \square \square w : \square \square w B B B 1 B B B B t B j A \square \square \square w : \square \square w \mu\_{4BtBj} A \square \square \square \square \square \square w : \square \square w B f B z B t B B B B B t B j : w

: \square \square \square \square w : \square \square w B B B e B \& / A \square \square \square \square w : \square \square w \& B - \square \square / \square \square B B O B 2 \square \square . \square \square B B N A \square \square w

B B B ) A \& P \square B 1 P ) B U B M B A \square 'special treatments,' B E B B N A \square \square \square B t B z B B { B B B B d B B B B B L A B j B B s B B B \square

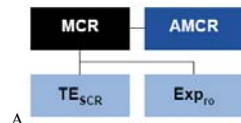
B t B j B + B e B . B B B r B B B B B t B j B 1 Q B' B 1 B B \_ B B B t B j B f B B o B B B A \square \square \square B \* B 2 B - B B - B \& B ) B B N B B + B . B B N A B B s B B B \square

B B' B B B B . B B B ) A \square \square \square B 2 4 B 1 B K B B . \% B B O B N A \square w

$$MCR = \max \{ AMCR; \sqrt{MCR_{assets}^2 + MCR_{liabilities}^2} + Exp_{ro} \} : w$$

$BB\#BAMCR\ assets = MCR\ mkt\ A - MCR\ liabilities = MCR\ nl + MCR\ life + MCR\ CAT;w\ B * BBNA\ BB)BB1.\%B.BB$   
 $B)A / BBtBjB + KBtBjB2\ \%BB)BBNA\ KBtBjB2A\ KBtBjB1\ f\&\#B\ B\ KB.\ 4PB)BBN:\ 4P$   
 $\%BBB\ AB + BBB + BU\ oBB)BBNA\ w$   
 $CCCC\ w\ CCCB2ACCB1\ 4BU + B5\ B * BBNA\ w$   
 $MCR\ mkt\ BBB\ BBBtBj:w\ :w\ BBB\ BBBtBj\ BBBsB24B1BrBB'BB - B * %\ BBOBNA\ w$   
 $MCR\ mkt:w\ (\alpha \cdot EQU) + (\beta \cdot RE) + (\gamma \cdot FI) :w$   
 $BB\#BA\ f\w\ :w\ \&B\ xB + :w\ BcBjBtBBsBBB1\ \&A\ f\w\ :w\ \&BcBjBtBBsBBB1\ \&:w$   
 $: :w\ :w\ B1\ \&ABAB\ M: w\ N: w\ :w\ O: w\ B2\ oBB\ \%B * BBNA\ w$   
 $MCR\ nl:w\ 4BBtBj:w\ :w\ 4BBtBjBBsB1.\%B + BB)ABxBB'BBrB\ B + \#BBKB - BBjBz\ BB'BBt$   
 $B1B\ BBBOBA\ 4B1KB.. \%BBOBNA\ w$   
 $MCR\ nl = \max\{\beta \cdot TPNL ; \gamma \cdot PNL ; \delta \cdot XNL\}$   
 $BB\#BATPNL:w\ :w\ 4\ \&B.\ nB(BBBB\ BBsBA\ PNL:w\ :w\ 4\ \&B.\ nB(BBBB\ BBsB$   
 $BA\ XNL:w\ :w\ 1\ B1\ \&B.\ nB(BBBB\ BBsBABA\ \&B\ \beta\ \gamma\ \delta\ B2\ oB * BBNA\ w$   
 $B1B\ BOBBOB1BBB\ BBsBBB1\ \#B - o' B1BDB.\ B2ABKB\ \#B - \&B + B - BNA\ w$   
 $MCR\ life:w\ 4BBtBj:w\ :w\ 4BBtBjBBsB1.\%B + BB)ABxBB'BBrB\ B + \#BBKB - BBjBz\ BB'BBt$   
 $B1B\ BBBOBA\ \%B24B1KB.. - BRBOBNA\ w$   
 $MCR_{life} = \alpha \cdot TP_{0L} + \beta_1 \cdot TP_{1L} + \beta_2 \cdot TP_{2L} + \delta \cdot CAR :w$   
 $BB\#BA\ f\w\ :w\ :w\ 4\ \&(*B.BKB\ \&B)(4BBLBOBN\ BBtBjB1\ 4\ \&B\ :w\ :w\ 43\ BBtBjB.\ \&B$   
 $BOBN\ 4\ BB\ dBBeB.\ 4P1jBBN\ 4\ (\&BB\ \&A\ :w\ :w\ 43\ BBtBjB.\ \&BBOB - B$   
 $4\ BB\ dBBeB.\ 4P1jBBN\ 4\ (\&BB\ \&A\ f\w\ :w\ 4\ BB\ dBBeB1\ \&B.\ 4$   
 $B - A.B.BBN\ 4\ (\&BB / \&BAB\ \alpha\ \beta_1\ \beta_2\ A\ \delta$

$MCR\ CAT:w\ BfBzBtBBBtBj:w\ :w\ B2A\ BfBzBtBBBtBjB + c\ 4\ B10\ BU\ BBBNBB * BBNA\ BB\ B$   
 $BOBLBU((BBNB + B.BKB\ \&B)A\ BBtBjB2A\ BB\ B'BB5\ B * B * BB)\ \&B * BBNB + BBH / BU\ BB - B$   
 $B - BNA\ BABA\ BBtBjB\ sBBB1\ \%BA\ BB + B1\ \&BUBIBDBNB - B,\ B1A\ BBBNB\ BBBOB - BA\ w\ BB1$   
 $5B2 : \&B1\ \&BU - B) \&B6((BBN\ BBNA\ BB1 : BBtBjB2A\ 4B1KB - \&B - \&B * . BBBOBNA\ w$   
 $MCR_{CAT} = X_{PMLA} \&B$   
 $X_{PML:w} :w\ 4\ (*B\ BBLOBN\ B1\ 4\ B1BBBBfBBN\ (B - 4BM\ B1\ (the\ probable\ maximum$   
 $loss\ (PML))B1'BBtB\ w$   
 $:w\ B1BB'BBB + BB)ACCBtBzBB\ {BBdB\ BB1AQB'B1BfBzBtBBB\ sBBBU\ nB.BBN\ BU\ NB$   
 $B + BB * BBNA\ w$   
 $:w\ BBB\ \&B\ f\w\ CCCB2\ \%n\ 0B1 - \&BU\ BB)BBNB + \#(B.AC\ CB2\ \&\ \&n\ 0B1 - \&BU\ BB)BBNA$   
 $:w\ B1\ \%n\ 0B1 - \&B1BDB.A\ BB1BBsBBB2BB\ \&B\ /B.BBN\ BM\ BU\ BBNA\ BB\ \&$   
 $2B2B * B.BBB\ \&B / B1\ BU\ BVB * BBNA\ BOB2A\ \&B\ 4\ \&(*B.BBN\ KB1\ \%BU$   
 $B.\ 4\ BBNB\ DB1\ B1\ %\ Bn\ tBU\ BVB * BBNB\ DB * BBNA\ BOB.BE4PBRBLB\ BB1BBsBBB * BB\ \&B /$   
 $B.4PB\ NB\ MB)BU((BBNB1B2A\ BB1B\ sBBB2A\ BB\ \&B / B.BBN / B21J\ B - MB)BB - B\ \&B1$   
 $pBB.BBN\ BU\ BB)BBNB\ DB * BBNA\ w\ CCCB.BBN\ BB\ \&B / B24B1KB.. \%BBNA\ w$   
 $Exp_{ro} = h \cdot Exp \cdot Dur_{TP} :w$   
 $BB\#BA\ Expt-1 = w\ \&B.\ \&BU\ BB\ (PB.BBN : B.\ 0\ oBB - BB + A\ B1\ \&B1\ \&B$   
 $BBNBsBBtBU\ \&BBNBDB.\ BBBOBN\ BE1B + BBtB.B.4P1jBBN\ KB)B1Bn\ tBU\ B\ CA\ \&B1BDB1 / BU$   
 $BC\ B1' \&B\ MB / \&B\ Dur_{TP} = MCR\ B1\ \%PB.BBN\ \&B1\ oBB\ \&B\ \&FABA$   
 $BA\ f\w\ B2\ oB * BBNA\ w$   
 $:w$   
 $BnBBjBB'BBBBqBBB'BBB\ w$   
 $BB1BB'BBBB2A\ BB1CCCCCBBB.BKB\ \&B)p\ BB\ BBNA\ BB\ BBnBBjBB'BBBBqBB * BDBLBO$   
 $BCCCBA\ v\ BB\ BBB + BB)B1\ BBG\ Bq\ _BB1\ n\ 0B + \#f\ BBNB + BB\ \&B * A\ BB1CCCCCBBB\ \&$   
 $BL\ BB\ BB)BBNA\ w$   
 $f\ g:w :w$   
 $BB1BB'BBBB24B1KB - f\ g\ BU\ B\ \&B)BBN:w$



CCCB24B1BBBzBU)A)BDBNA w

AMCR = & B / A w

Exp<sub>ro</sub> = :w BBcB&/tBB\_BuBBsBBBBB'BBBBU :w

TE<sub>SCR</sub> = BzB\_BBBkCcBB :w

.% B2A B1BKBB.BBOBNA :w

$$MCR = \max\{AMCR; TE_{SCR}; Exp_{ro}\} :w$$

TE<sub>SCR</sub>:w BzB\_BBBkCcBB :w BzB\_BBBkCcBBB.BB)A B.1J B-BBBBBB(BM)BLBOBNABzB\_B

BBkCcBBB+B2A 4 (\*B+#) 4PB BBNBDB.A B.1fB B11 BABB2 BU

B \*B B-B B+B B B B t j B \*B B N A B B O B U B N B B D B . B t B z B B { B B B d B B B B B 1 B \* . % B B O B A B - B 1 : w

SCR(SCR<sub>t-1</sub>)B1BBBzB B+B-BNABzB\_BBBkCcBBB.BBN B24B1 & B-4P B1& B+BB) BDBN:w

$$TE_{SCR} = g \cdot SCR_{t-1} :w$$

BB#B :w B2 : B1BBLBBDDBDB B \*B B N A :w

BBBBsBBrBBBBBBBBsBBB :w

: B2A BxBB"BBrB B;BtBBBuB-B-BU-BBBDDB.A B-B.BBB)A B1: B1.% BU((BBNBB+

B2B \*B B N B + A B B) B B N A B 14 F A B 1 B \* A B 1 B x B B " B B r B B B B s B B & B B O B N B B + B B B O

B)BBNA MCR<sub>trans</sub> = max { α MCR ; β RSM}

RSM = :w BxBB"BBrB B \* B O B A B x B B " B B r B B B B s B B :w

α = B B) B B % :w

β = :w B B) B B % :w

: B B L A B 2 A B A B 1 B K B B . N B U . 3 B B N B B + B U B B) B B N A :w

:w MCR<sub>trans</sub> = 0.5BRSM

B1: B1& B.BKB&B)B2ABB1B B j B z B B U . B B N B B B N B B E B B O B - B A :w

<sup>71</sup> CfA11.14-16

<sup>72</sup> CfA11.54 B.BKBNA

<sup>73</sup> CP20 B1(7.12)BU

8. 内部リスク管理 SCR の計算

$$B_t = \frac{B_{t-1} + (B_{t-1} - SCR_{t-1}) \cdot \alpha + \Delta B_{t-1}}{1 + \beta}$$
 (full internal model)

$$B_t = \frac{B_{t-1} + (B_{t-1} - SCR_{t-1}) \cdot \alpha + \Delta B_{t-1}}{1 + \beta} + \frac{SCR_{t-1} - B_{t-1}}{1 + \beta}$$
 (partial internal model)

8-1. 内部リスク管理

$$B_t = \frac{B_{t-1} + (B_{t-1} - SCR_{t-1}) \cdot \alpha + \Delta B_{t-1}}{1 + \beta} + \frac{SCR_{t-1} - B_{t-1}}{1 + \beta}$$
 (use test)

$$B_t = \frac{B_{t-1} + (B_{t-1} - SCR_{t-1}) \cdot \alpha + \Delta B_{t-1}}{1 + \beta} + \frac{SCR_{t-1} - B_{t-1}}{1 + \beta}$$
 (statistical quality test)

8-1-1. 内部リスク管理

$$B_t = \frac{B_{t-1} + (B_{t-1} - SCR_{t-1}) \cdot \alpha + \Delta B_{t-1}}{1 + \beta} + \frac{SCR_{t-1} - B_{t-1}}{1 + \beta}$$
 (use test)

$$B_t = \frac{B_{t-1} + (B_{t-1} - SCR_{t-1}) \cdot \alpha + \Delta B_{t-1}}{1 + \beta} + \frac{SCR_{t-1} - B_{t-1}}{1 + \beta}$$
 (statistical quality test)

内部リスク管理	規制上の必要資本
ユーズテスト: 保険数理モデルが、 リスク管理に関連し、また、 使用することができるか。	カリブレーションテスト: 企業によって計算された SCR が、 共通の SCR 目標基準で測られたリスクの、 公平でバイアスのない推定であるか。
基本方法論・“保険数理モデル”	
統計的品質テスト: 内部利用と規制上の利用の基である、データと方法論が、 理にかなって、十分に信頼できるか。	

図 5 監督機関によるテストの概要

$$B_t = \frac{B_{t-1} + (B_{t-1} - SCR_{t-1}) \cdot \alpha + \Delta B_{t-1}}{1 + \beta} + \frac{SCR_{t-1} - B_{t-1}}{1 + \beta}$$
 (internal model in a wider risk management sense)

BNA

~~SECRET~~

SCRB10(HB(BOBNBA b B1& 6BU/BBNB\_B”BBB\*o’BBOBNA  
 SCRB1BB\_BBtBU.OBBNBA tBBBA sB\*A sB\*BB)A AB1 KB. s4B. B\*B  
 BNBBUAB,B1BKBB.OBBNBA uBBB1w HB#zBBNBDA #) 4PB+;4 B1  
 B. EB+BBON/BUAB,B1BKBB. BBBNBAB+BB PB.%uBBNBDB\*BNA  
 3 EB+;4 B1 BBBB11 B. BNB B26(BB)BBNABBA BB-  
 1BBEBNA B’B1 BB2ABBtBjBbsBBB11 BB\*BBNA sEB\*B2A VArB BBLBOBNABBA  
 ;4 EB\*B2 B-BBtBjBbsBBB BBLBOBNA BB3A TailVaRBG6B’B VaR(VaR with a  
 multiplier)B-B,B\*BBNA 6B’B VArB+B2A Ib BIVaRB\* BDB/B12B.A 6UBBBBEB1B\*B  
 BNA 6UBB..3 6BA 99B sOB\*BDB VArB12B2AQB1 100B. B1B\_B”BBBUBfB  
 BBBN/B12B\*BBNA QB’B11 BB2ABBBzB1 s (frequency)B1 B\*BBNA BU.%  
 BNB1B.A sEB2(BBBzBU BNB+BB\*BBNABBA ;4 B\*B2A B. BBBzB\*AB  
 BBB BBBzBU BNBAB B1BBDABxBB”BBrB IIBU%BBBDB.B2A sEB+bKB. B-BNB  
 BBjBtBB EB+B-BNAB BB)A B’B11 BB2A sEB.BBBN%YBB1GB+%YBB1GB1 B+A  
 ;4 EB.BBBN%YBB1GB+%YBB1GB1 B11 BB\*BBNA sEB1BBBwB B1%YBB1GB\*B2A  
 2 BBtBjB1BKBB-. 2(BBtBjBU BMBRB-BA  
 ;4 B2A sEB\* BMBBtBjB. BB)A ;4 BBtBjBU(( &BB-BBOB3B-BLB-BA ;4 BBtBj  
 B2ABBB1BBBtBjBG BBtBjKBMBE.OBBKBM sB- OB.BBNBBDABxBB”BBrB B\* BBO  
 BN BBBB1’ B- EB A sEB1 BtBjBBB1 EBKBMBE5 BBABB1 sB. B  
 BKEIOPSB1%uBB2A%YBB1GB+%YBB1GB1-BU&BB’RBB)A BBtBj% BUBBqB\_BBBNAB+  
 BBEB1B\*BBNABBOB.BKB&B)A Bx B-%YBB1GB1-B+BBBB11BBUB\*BBN4BMB-BBB1B\*  
 BBNA  
 BBtBjB1.OB+/B1.OB2A s(B\*BBNBBA 62 B1BBB-BLB 6HB\*BEBBNBB  
 B\*BBNA 6H OB(B\*BBOB3A%YBB1GB1 #)B’BvBtB. BB)A BB BBBBuBBtB  
 B1BBDB11J B-EB2 EB+BB-BB#BPBA

8-1-2. O(H

BBBB.BBN- B.B2AB,B1BKBB.A ;4(\*B. BBNB B B150 HB+A O  
 HB1BBBtBU1 BBNBAB+BB sBBBNA O(HB.B2A 62 B-- P (%YBB1B)+6H  
 B--P( %YBB1)BBBNA 62 B-- PB.B’BB)B2A pB 4PB1 B((B+B-BNA O  
 HB. EB-62 B-- B2A & P/NB1 6EB+B B1P/NB1 #B1 #B-. B. 6B\*B  
 BNA

BBBB6BtBzBB {BBBdB BBBB\*B1 O(HB+ B}B.A BBBB.BKBN-  
 /B1 O(HB2A EB.BKB&B)BfBBBBBrBBBtBBU-BBB+B\*1 BBOBNA SCRB10

(HBUI#BNBDB.ABfBBBBBrBBBtBB1- B.B2A SCR.2B-5BU BBN5B. BBN#)- BU#BDBN#BBBNA #B#BB11 B150HB+0(HB15B.BBN CEIOPSB1%uBB2A #B#BB150HBUI#BNBDB1B'BBBrBBB"BBtB1- B+A#B1 #B.BBBN0(HBU1#BNBDB1-% #BUA H#B#BNB+BBEB1B\*BBNAB B1QB'BU#BNBB+B\*A #B#BB150HB+0(HB1 BU#B'BBDB1 #BU- B B B+BB)BBNB1B\*BBNA B-BA #\*A #BBBtBjBBsBBUBBB)B1% B#BNBB+B\*BrBtB#B#BBjBBtBjB#BBN B+BB#BEBBNA

8-1-3. B'B1B#tB

BBB\*B2A& #B#BtBA ABfBBBBBrBBBtBA BBBuB#tBB1 B'B1B#tBB1 BU1@BBNA B#zBG#B11 #BU#N& #B#BtBA #B#BB1& B11 #BU#NfBBBBBrB B#tBA #B#BBUBBtBj% B.#BNBB+B11 #BU#NBBB#uB#tBB\*BBNA BABA& #B#BtBB.B'BB)AA& #B#BtBB1 B2A SCR.1 #BBtBj% B+B B1 SCR.1.%BU-c BBNBDA #B1 #B#BB.#B-&V2B+5HBBB#NBB+BUA#B BNBB+B\*BBNAB+1@BBLBOB)BBNA& #B#BtBBU-BBB+B\*A #B2A #) #PB.B#BB1 1BU#B#BNBB+BB\*BBNB\*B#PB# BfBBBBBrBBBtBB.B'BB)B2A ABfBBBBBrBBBtBB1 B2AB#B#BL BBO B[SCRBA #B-B'BBBBBB1 #BB,BBBUA[O BBNBB+B\*BBNA #B#BB1.%B1/v BU/vBA #) #PB& BU#BBN' KBU/vBA #AB-#HB1BBDAB'BBBBBB1 #B2A B-BN#B.1BB-BBEBBOB-BAB BOB\*BEA #B#BB\*BBOB SCRBA #B4#B\*0 (BB,BBBU# #zBBNB1B2A #B\*BBNA AB+1@BBLBOB)BBNA B BB)ABBBuB#tBB.B'BB)A ABBBuB#tBB1 B2AB#tBj% B.4PB#N g (control loop)B #B.#B)BBNBBUA[O BBNBB+B\*BBNA #B2A #B#BBA #B.B#tBj% B+4P1jB #B\*BBNB+BUABxBB"BBBrBB1 #B.#B&B)A #B-BBOB3B-BLB-BABBLB.A #B2A B#BB2 #\*A (4FBU1bBB) #B.1 BBOBNBDB.A #B-BBsB#tB'BBvBtB#% BBOB BB+BE#B-BBOB3B-BLB-B#AB+1@BBLBOB)BBNA

8-1-4. #zB'BBvBtB1/#&

#B2 (bKBABB21 )#B#BBU#BNBB+BB\*BBNA #B2A #) #PB.BK B#B1 #zBU&B#\*#B#BBU#%BBNA #)m B2A #zB'BBvBtKB.#B#NK/# BU,B'ABB1/#2%Y(\*B.#B\*BB-B#BABAB#BBB2A(4F& #B+B+BEB.A&#B11tB.#B&B)A #B-BEB1B\*BBNB\*BBNBB\*BBNABABA #zBUB#B#BBB.#B-#BU BBNB+BB.B2A #B1 #zBUBNBBB\*BBNABB1B+B# #B2A #)m B.A #B#BB B#B#B#tBA ABfBBBBBrBBBtBA B BB)A& #B#BtBBU)BBB)BBNBB+BU B#BU #)m B;#BBB\*BBNAB BOB.#B)A #)m B2A #B#BB1 #BU#BBMA #B.

BBB1w)BG BBBBB1& B.1J/B1 6BB+BB B\* CBBN4BU(B'ABEB  
BBBB. B1B BjBBBsBBU(BB)BBNB- BLB3A BBBB1 C/B11 B2A #) 4P  
B.BB1 BB BjBBBsBB1O BU BCA  
%YBB1GB11J/B capital add-onBBU.3 BBNBB+B\*A BBBB1BBBBcBBB. BBN  
-1BU BLBOA J/B1 6BB1 B\* BBBBU CBBNBB+B.BKBNA BBBB;  
B1BtBBBuB- BU&BA fBkBBB' #)B.BBB)A BBBB1BkBBB' #)B.BKBN CBU  
BBLBOBBA J/B B-BDB.A B1 #) 4PB.BKBN BBBBE BB-BBOB3B-  
BLB-BB+BBQB'B1BBBB1 BBN A BU B\* B ABBLB.A (4FB1& BGA M&AB1&  
A B1H/B BB BRB&BB+BB1A 4 & (\*B. BBN /BU-BB+BBBBBBBBBNA

8-2.:w 1 BBB

1 BBBBU BBNBBBBB2A BtBzBB {BBBdBBBBBBL bK BBBB;B1-  
BU B.B A BBNBBsBBt5 B;AB\_BB"BBrBBB+BtB•BrBBB\_BwBBrBBBU BBB A B  
B- B\*BQB'B1 B1 BKBB- 5 BU BMBBNBB+B\*BBNA B.BKBN1 BBBB1  
IB2A BBBB1 & A 4B.B'BB)B1 B-. A B BB)BBtBj% B+B14P1jBU BLBB.  
BBNBKBB.A f&BB'ZBB B\*. BBOBNBBB\*BBNA

BEBA B 5 B. bK BBBB. B-BNBDB'BBBU BBB-BLB3A BBBB1  
1 B2ABBBBsBBrBBBAB+mB3BOBNAB BB\*B-BB+BB.B2ABBBBsBBrBBBAB+mB3BO  
BNABBBBsBBrBBB'BBB2#) 4PB; BBOBNBBB\*BBNA

BBBBB11 B2A B.A SCR BtBzBB {BBBdBBBBB+B1 HBUS B+  
BBNA BBBB1 B2ABtBzBB {BBBdBBBBB1B,B1BnBBBBBBB. (BU BB)BBN  
BBU#B. BBNBB+B2 B\*B BMA BBBB.BKBNBsBBBB1'B BBA BMB1BtBzBB {  
BBBdBBBBB.B,B1BKBB- BUBBNBBU BBN BBNAB BB)AB,B1BKBB.A HB+  
5 B& BBOBNBBUBBBB+BU(( &BN BEBBNA

4B1-+B2ABtBjB1 BU-+BBEB1B\*BBNABB1 B2A (%B1P)BU BBN1 BB  
BB1 B.A BBB+B1B\*B B-BEB1B\*BBNABBOB2ABtBjBcBjBtBBBsBBB1BfBoBB(B)B+A  
P BB\_B (-)BUN(B.BB)BBNA



Portfolio subdivision		SCR standard formula categories				
		SCR <sub>mkt</sub>	SCR <sub>def</sub>	SCR <sub>op</sub>	SCR <sub>nl</sub>	...
Controlling Units	Accident					
	Sickness					
	Aircraft					
	Motor					
	Marine					
	General liability					
	Credit					
	...					

図 6 部分内部モデルにおけるリスク区分

$$SCR_{BBS} = \sum_{i=1}^n (SCR_{mkt} + SCR_{def} + SCR_{op} + SCR_{nl} + \dots) \times \text{Weight}_i$$

The following table shows the breakdown of risk categories for different portfolio subdivisions:

Portfolio Subdivision	SCR <sub>mkt</sub>	SCR <sub>def</sub>	SCR <sub>op</sub>	SCR <sub>nl</sub>	...
Accident					
Sickness					
Aircraft					
Motor					
Marine					
General liability					
Credit					
...					

The text below discusses the calculation of SCR for various risk categories, including the use of different formulas for different types of risks (e.g., credit, general liability, etc.).

9. & B6

%B-%BBLABAB+BDBBBpBB”B\_BB•BBBB\*BBNA□  
B\*B2A%B+BB)ABtBzBB{BBBBdBBBBB.√PBUB)B).□BB)BBABBBOB2A□ CEIOPSB1  
B'B1 B2A)BBtBzBB{BBBBdBBBBBU BMBBNBB+B.BBNB+((BBLBOBNBBLB\*BBNABBBAA□  
CEIOPSB1((BBNBxBB”BBrB.B.BBB)B2ABtBzBB{BBBBdBBBBB#BB1n0B\*4#)BU-□  
BB+B2((BB)BB-BABCBBPABtBzBB{BBBBdBBBBBKMBEA5BBOB)BBMA4(\*B1 A#B.!BR  
BB=BU(B.BBN□BBBBUBB)4□B=BRBOBNBB+BU(B+BB)A/B%B□  
BOB)BBNAB B1BDDABtBzBB{BBBBdBBBBB\*BBOB)BBNBsBBBBB’BBBB2HB.ōB□  
BNB+BBNAB-BB-BLABBsBBBBB’BBBB1B.BKB&B)ABsBBBB1□BU□BBNBB+B\*□  
4(\*B1 A#B.!BRBBNBB+B(B+B-BNA□□BBBBUA□(B.BBNBDB\*BBNABBLB.A□  
1□BBBB+BBBtBBB’BU’BBB+BA bKB-□BBBB;B1□-B.BBBN4BU□BBN  
BEBBBBDB\*BBNABBBAB,B1BKB.B.□BBBB%BBO1 BBOB)BBBB.B’BB)B1□  
□5B2BB)BB-BA□  
BABA□□OB.nB(BB4#)BU1tBDBNB.BBBMA B1B&B B22□B-□B\*BBNA□  
4□B1BBtBj% B1nB2A 4□B14#B6;4 KBUB,B1BKB..OBNNBB+B□  
BBB+B\*BBNAB BB)A4 KBG/ B1.OBB-BBOBNB.BB&BB&B)A yGHB15YB-B,B\*5B1B-  
BA 5BBBBN B1BB1□(\*B.BKB&B).OBBOBN□B.BKBMA 4 KBG/ B1.O  
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B.BBB) B1□B□BNA B+BB)A& KB B- B1(B.B2A yGHB□  
/BA/B1nBU□BBN□(HBNNABBB1B+BA□KB.B.-2B14B BBBOB-B□  
B-BN□(HBNNABBA & KB B-b#B1(A yGHB B.B.BBNB+BB)BEA□□  
B BB=BRBOB-B□(HBNNABBB1(A#B1/□OB.1 B-2BKMBEBB14 KBU.B□  
/vBBB+B.BKBMA B1BBBdBBBBtBjBU7BDBN□(HBNNABBA (\*RB.A□B-BnBtBB+BB)((B□  
BLBOBNA□  
□%B1B\*B2A/B□OB1BBB\*B2B-B4 KB1.OB.B’BB)BEABBN□% B\*BBNA2□□  
w B1 B1BKB B-ABNB14 BBtBjB1 B=BRBOBN B BBNB+((BABBOLBL1  
B\*4 KB□BBNBB21 B-.OB/BBN□(HBU((BBNBB+B\*A/B+B+BB)B.A□  
B1□B/BBNB+BBBB+BU% BBNBB+B(B\*BBNA□  
BABA B B BB-BB1BBtB\*B2A 4(\*B)DBLB1 KB+/ B1.OBU-BRB-BBOB3B-BLB-B□  
B+BBBnBtBBBAB BB)A B(B.#)4PB.B+B&B)BEA□OB□B.-BRBOB)BBNBB+BU□=BBN  
BBDB1BnBtBBBBBNB\*BBPBA B B1BDDAB B1/ B KB B.BBB).OB B-BBOBNBB+B\*A□  
□%B1BnBtBBU□BBNBB+BE(B\*BBPBA□  
B B1BDDA 4#)B.BBB)A□AB-/ BG4 KB.4P1jBBN B.BBBN□%wBE2 B-  
-&B+B-BNAB BB)A□(B.BBB) B.2 B+B-BNBB+B M BBOBNBB+BGA B1 B.BKBNNnBt

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Artzner, Philippe, Freddy Delbaen, Jean-Marc Eber, David Heath (1999). “Coherent Measures of Risk” *Mathematical Finance*, Vol. 9, No. 3, pp203-228

CEIOPS web page; <http://www.ceiops.org/>

CEIOPS (2006) “Consultation Paper No.20 - Draft Advice to the European Commission in the Framework of the Solvency II Project on Pillar I Issues - Further Advice”

<http://www.ceiops.org/content/view/14/18/#CP20>

CEIOPS (2006): Quantitative Impact Study 2-Summary Report Summary Report =q

<http://www.ceiops.org/media/files/consultations/QIS/QIS2-SummaryReport.pdf>

CEIOPS (2007): QIS3 Technical Specification Part 1=q

<http://www.ceiops.org/media/files/consultations/QIS/QIS3/QIS3TechnicalSpecificationsPart1.PDF>

CEIOPS (2007): QIS3 Technical Specification - Part 2=q

<http://www.ceiops.org/media/files/consultations/QIS/QIS3/QIS3TechnicalSpecificationsPart2.PDF>

CEIOPS (2007a) QIS3 Technical Specification Part 1 =q A 4 & A %Y75 pp.48-71

CEIOPS (2007b) QIS3 Technical Specification Part 2 =q A 4 & A %Y75 %Y6 pp.50-77

CEIOPS (2007) QIS3 Technical Specification Part 3 =q A 4 & A %Y75 %Y4 pp.3-21

CEIOPS (2007) QIS3 Technical Specification Part 4 =q A 4 & A %Y69 %Y3 pp.127-145

CEIOPS (2005) QIS3 Technical Specification Part 5 =q A 4 & A %Y1 pp.53-69

CEIOPS (2005) QIS3 Technical Specification Part 6 =q A 4 & A %Y1 :w :w

A. 4.°

■:■QIS2-Summary Report

BBLABBB'BB1 QIS2 B1&BU&zBBNA□

A.1. MCR/SCR □□

4B1B2A□QISBB1&■LBOBA□MCR B+SCR B1B.B'BB)BBEB1B\*BBNA□

MCR/SCR BU-+BB)BBNBEB1B\*BBNB(BU/BB)BBNB+B2MCR B□SCR BU(B&B)BBNB□  
B+BU(BB)BBNA□

:w3 BfB.BBB)B2■B1%■B1

MCR/SCR □B□ 75BBU(B&B)BBNB+BBBB+B\*BB&

BABBBABBfBBLA■B1%■B1

SCR/MCR □B□ 75%BU/BB)BBNB+B1□BBB&BA□

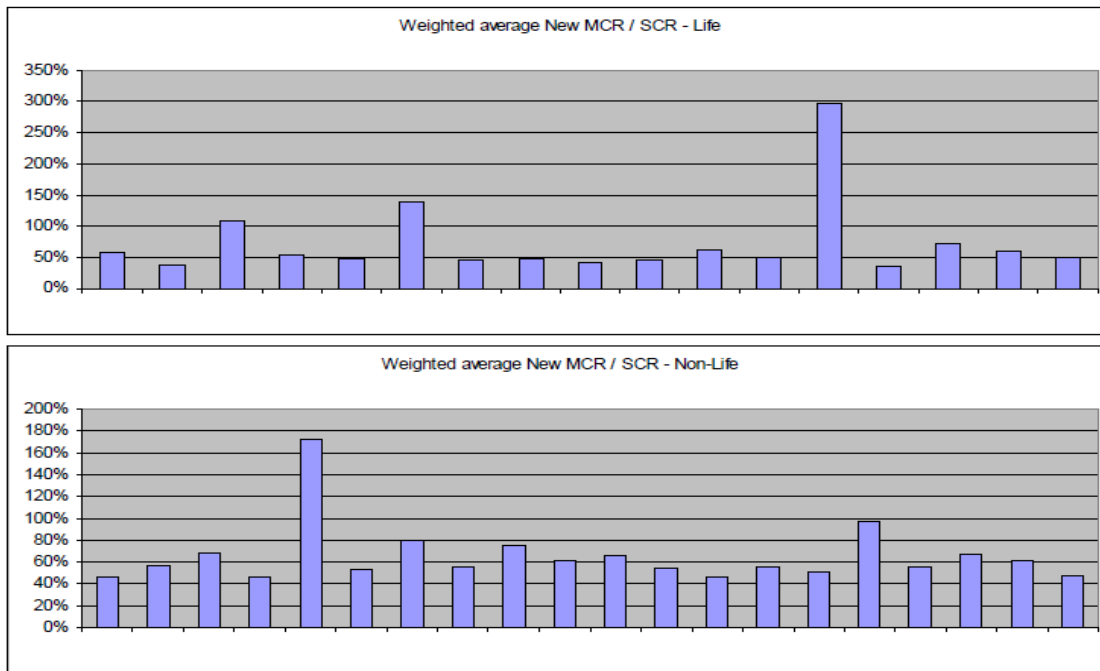


图 7 MCR/SCR 比率

A.2. SCR B1BBtBjt□□

: w 4B 1□QIS2□B1&■LBOBA■n;4■B+■4■B.BBBNBtBjB1t□BU-+  
BBEB1B\*BBNA□

:w ■4■B.BBB)ABBBIBBBBtBj (Market)BABBtBjB1BBUBDB)BBNB+BRRBBNA□  
BBtBj(Credit)A■BBtBj (U/W)ABBB)BeB•BBBrBBBBBtBj(Oper) B1B'B1BBtBjB1B,BOBB□  
BBIBBBBtBjB14B.■BU(BDBNB2BRBBLB-B A■A■4■B.BBB)B2A■BBtBj  
(U/W)BBUBDB)BBNB+BRRBBNAB B14B.BBBIBBBBtBj(Market)BBUBDB)BBNB+B□  
BBNA□

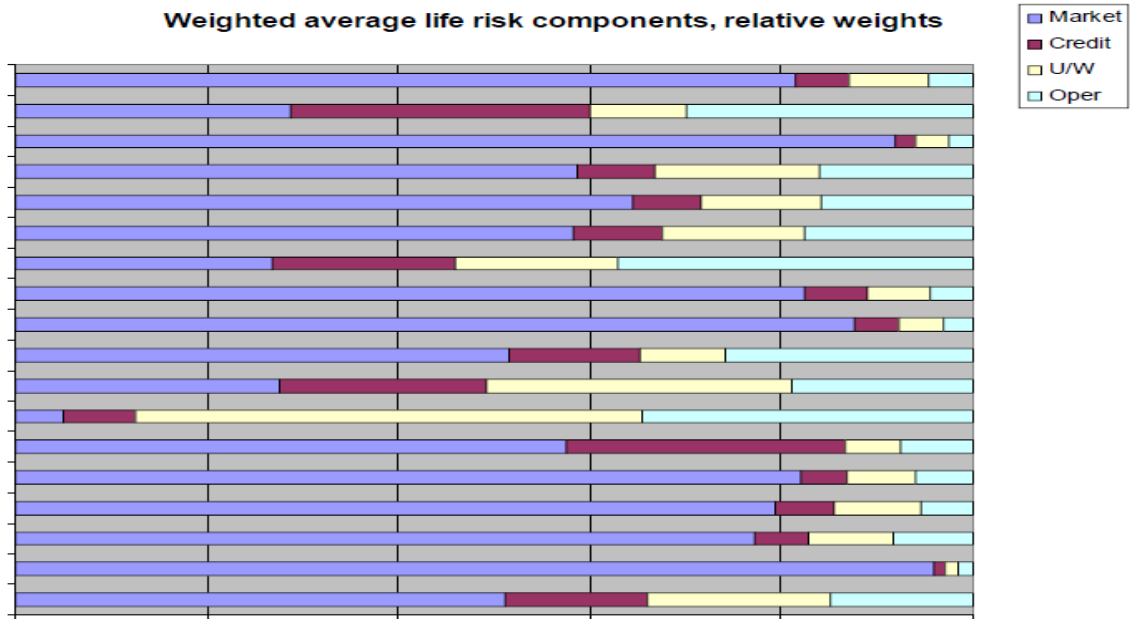


図 8 各リスクの SCR に占める比率(生命保険会社の場合)

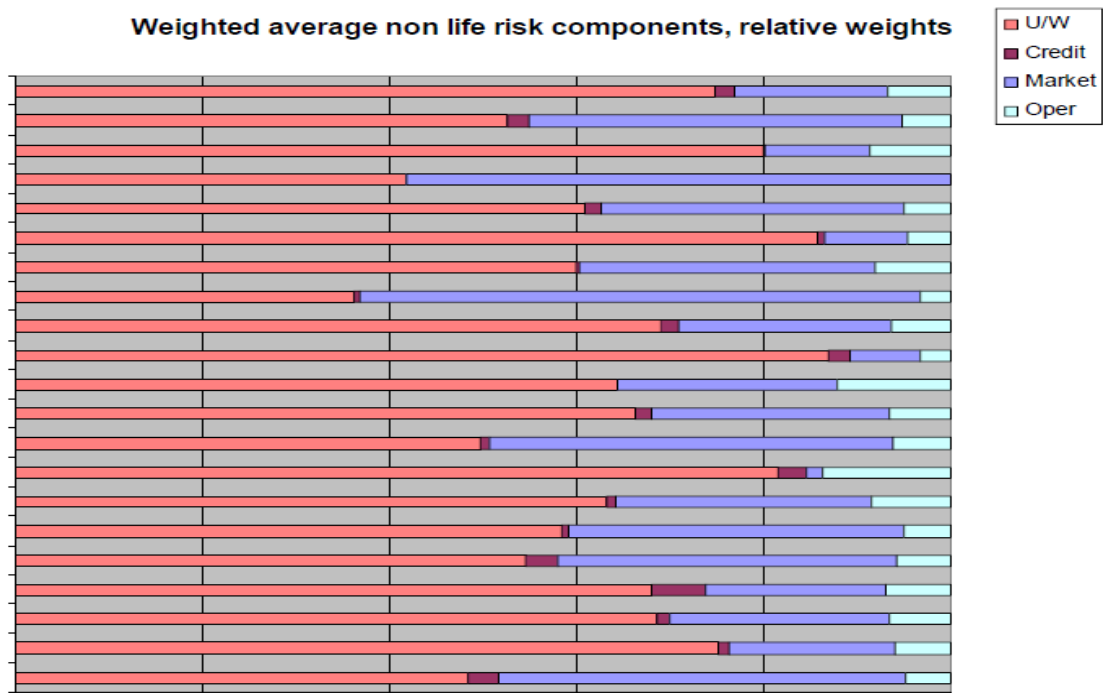


図 9 各リスクの SCR に占める比率(非生命保険会社の場合)

A.3.  $\frac{B_{11} + B_{12} + B_{13} + B_{14} + B_{15} + B_{16} + B_{17} + B_{18} + B_{19} + B_{20}}{B_{11} + B_{12} + B_{13} + B_{14} + B_{15} + B_{16} + B_{17} + B_{18} + B_{19} + B_{20}}$

:  $w = \frac{B_{11} + B_{12} + B_{13} + B_{14} + B_{15} + B_{16} + B_{17} + B_{18} + B_{19} + B_{20}}{B_{11} + B_{12} + B_{13} + B_{14} + B_{15} + B_{16} + B_{17} + B_{18} + B_{19} + B_{20}}$

:  $w = \frac{B_{11} + B_{12} + B_{13} + B_{14} + B_{15} + B_{16} + B_{17} + B_{18} + B_{19} + B_{20}}{B_{11} + B_{12} + B_{13} + B_{14} + B_{15} + B_{16} + B_{17} + B_{18} + B_{19} + B_{20}}$

Weighted average life market risk components, relative weights

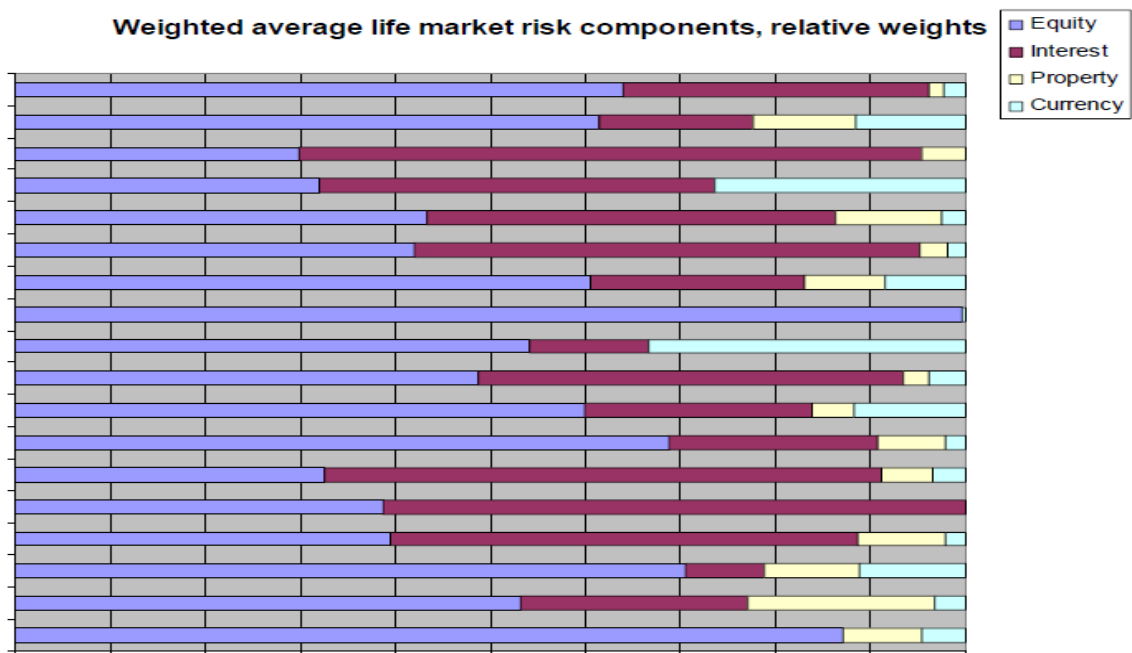


図 10 マーケットリスクの構成比