

June 2006

Learning to live within a Risk Budget

Jeremy Stone
Chairman WHSmith Pension Fund

ROTHSCHILD

FRANKLIN TEMPLER

The examination paper

1. What is a deficit?
2. Defining risk tolerance for a pension fund
3. Do sponsor companies and trustees have different objectives?
4. Role of the sponsor covenant in pension risk management. Can this be quantified?
5. Constructing a matching portfolio
6. Recidivism revisited. How much risk should be re-imported into the matched portfolio?
7. How does life change for companies and trustees in a post-LDI world?

What is a deficit? 1: The landscape (starting from 2003)

FTSE 100	Discount rate											
	6.25%	6.00%	5.75%	5.50%	5.25%	5.00%	4.75%	4.50%	4.25%	4.00%	3.75%	3.50%
7,250	70.0	57.0	43.4	29.1	14.1	(1.7)	(18.3)	(35.7)	(54.0)	(71.5)	(88.9)	(106.3)
7,000	62.1	49.1	35.5	21.3	6.2	(9.6)	(28.2)	(43.6)	(62.0)	(79.4)	(96.8)	(114.2)
6,750	54.2	41.2	27.6	13.4	(1.7)	(17.5)	(34.0)	(51.5)	(69.8)	(87.3)	(104.7)	(122.1)
6,500	46.3	33.4	19.8	5.5	(9.6)	(25.3)	(41.9)	(59.4)	(77.7)	(95.2)	(112.6)	(130.0)
6,250	38.7	26.8	15.2	0.9	(14.1)	(29.9)	(46.3)	(63.9)	(82.3)	(103.1)	(120.5)	(137.9)
6,000	38.4	25.5	11.9	(2.4)	(17.5)	(33.2)	(49.8)	(67.3)	(85.6)	(111.0)	(128.4)	(145.8)
5,750	30.5	17.6	4.0	(10.3)	(25.3)	(41.1)	(57.7)	(75.2)	(93.5)	(118.9)	(136.3)	(153.7)
5,500	22.6	9.7	(3.9)	(15.2)	(33.2)	(49.0)	(66.6)	(83.1)	(101.6)	(126.8)	(144.2)	(161.6)
5,250	14.7	1.8	(11.8)	(26.1)	(41.1)	(56.9)	(73.5)	(91.0)	(109.3)	(134.7)	(152.1)	(169.5)
5,000	6.8	(6.1)	(19.7)	(34.0)	(49.0)	(64.8)	(81.4)	(98.9)	(117.2)	(142.6)	(160.0)	(177.4)
4,750	(1.0)	(14.0)	(27.6)	(41.9)	(56.9)	(72.7)	(89.3)	(106.8)	(125.1)	(155.5)	(167.9)	(185.3)
4,500	(9.0)	(21.9)	(35.5)	(49.8)	(64.8)	(80.6)	(97.2)	(114.7)	(133.0)	(158.4)	(175.8)	(193.2)
4,250	(16.9)	(29.8)	(43.4)	(59.7)	(72.7)	(88.5)	(105.1)	(122.6)	(140.9)	(166.3)	(183.7)	(201.1)
4,000	(24.8)	(37.7)	(51.3)	(68.6)	(80.6)	(96.4)	(113.0)	(130.5)	(148.8)	(174.2)	(191.6)	(209.0)
3,750	(32.7)	(45.6)	(59.2)	(73.5)	(88.5)	(104.3)	(120.9)	(138.4)	(156.7)	(182.1)	(199.5)	(216.9)
3,500	(40.6)	(53.5)	(67.1)	(81.4)	(96.4)	(112.2)	(128.8)	(146.3)	(164.6)	(190.0)	(207.4)	(224.8)

What is a deficit? 2: The landscape 2004

FTSE 100	Discount rate											
	6.25%	6.00%	5.75%	5.50%	5.25%	5.00%	4.75%	4.50%	4.25%	4.00%	3.75%	3.50%
7.250	70.0	57.0	43.4	29.1	14.1	(1.7)	(18.3)	(35.7)	(54.1)	(71.5)	(88.9)	(106.3)
7.000	62.1	49.1	35.5	21.3	6.2	(9.6)	(28.2)	(43.6)	(62.0)	(79.4)	(96.9)	(114.2)
6.750	54.2	41.2	27.6	13.4	(1.7)	(17.5)	(34.0)	(51.5)	(69.0)	(87.3)	(104.7)	(122.1)
6.500	46.3	33.4	19.8	5.5	(9.6)	(25.3)	(41.9)	(59.4)	(77.7)	(95.2)	(112.6)	(130.0)
6.250	41.7	28.8	15.2	0.9	(14.1)	(29.9)	(46.5)	(63.9)	(82.3)	(103.1)	(123.5)	(137.9)
6.000	38.4	25.5	11.9	(2.4)	(17.5)	(33.2)	(49.8)	(67.3)	(85.6)	(111.0)	(128.4)	(145.8)
5.750	30.5	17.6	4.0	(10.3)	(25.3)	(41.1)	(57.7)	(75.2)	(93.5)	(118.9)	(136.3)	(153.7)
5.500	22.6	9.7	(3.9)	(18.2)	(33.2)	(49.0)	(65.6)	(83.1)	(101.4)	(126.8)	(144.2)	(161.6)
5.250	14.7	1.8	(11.8)	(26.1)	(41.1)	(56.9)	(73.5)	(91.0)	(109.3)	(134.7)	(152.1)	(169.5)
5.000	6.8	(6.1)	(19.7)	(34.0)	(49.0)	(64.8)	(81.4)	(98.9)	(117.2)	(142.6)	(160.0)	(177.4)
4.750	(1.1)	(14.0)	(27.6)	(41.9)	(56.9)	(72.7)	(89.3)	(106.8)	(125.1)	(150.5)	(167.9)	(185.3)
4.500	(9.0)	(21.9)	(35.5)	(49.8)	(64.8)	(80.6)	(97.2)	(114.7)	(133.0)	(158.4)	(175.8)	(193.2)
4.250	(16.9)	(29.8)	(43.4)	(58.4)	(72.7)	(88.3)	(105.1)	(122.6)	(140.9)	(166.3)	(183.7)	(201.1)
4.000	(24.8)	(37.7)	(51.3)	(65.6)	(80.6)	(96.4)	(113.0)	(130.5)	(148.8)	(174.2)	(191.6)	(209.0)
3.750	(32.7)	(45.6)	(59.2)	(73.5)	(88.5)	(104.3)	(120.9)	(138.4)	(156.7)	(182.1)	(199.5)	(216.9)
3.500	(40.6)	(53.5)	(67.1)	(81.4)	(96.4)	(112.2)	(128.8)	(146.3)	(164.6)	(190.0)	(207.4)	(224.8)

What is a deficit? 3: The landscape 2005

FTSE 100	Discount rate											
	6.25%	6.00%	5.75%	5.50%	5.25%	5.00%	4.75%	4.50%	4.25%	4.00%	3.75%	3.50%
7.250	70.0	57.0	43.4	29.1	14.1	(1.7)	(18.3)	(35.7)	(54.1)	(71.5)	(88.9)	(106.3)
7.000	62.1	49.1	35.5	21.3	6.2	(9.6)	(28.2)	(43.6)	(62.0)	(79.4)	(96.9)	(114.2)
6.750	54.2	41.2	27.6	13.4	(1.7)	(17.5)	(34.0)	(51.5)	(69.0)	(87.3)	(104.7)	(122.1)
6.500	46.3	33.4	19.8	5.5	(9.6)	(25.3)	(41.9)	(59.4)	(77.7)	(95.2)	(112.6)	(130.0)
6.250	41.7	28.8	15.2	0.9	(14.1)	(29.9)	(46.5)	(63.9)	(82.3)	(103.1)	(123.5)	(137.9)
6.000	38.4	25.5	11.9	(2.4)	(17.5)	(33.2)	(49.8)	(67.3)	(85.6)	(111.0)	(128.4)	(145.8)
5.750	30.5	17.6	4.0	(10.3)	(25.3)	(41.1)	(57.7)	(75.2)	(93.5)	(118.9)	(136.3)	(153.7)
5.500	22.6	9.7	(3.9)	(18.2)	(33.2)	(49.0)	(65.6)	(83.1)	(101.4)	(126.8)	(144.2)	(161.6)
5.250	14.7	1.8	(11.8)	(26.1)	(41.1)	(56.9)	(73.5)	(91.0)	(109.3)	(134.7)	(152.1)	(169.5)
5.000	6.8	(6.1)	(19.7)	(34.0)	(49.0)	(64.8)	(81.4)	(98.9)	(117.2)	(142.6)	(160.0)	(177.4)
4.750	(1.1)	(14.0)	(27.6)	(41.9)	(56.9)	(72.7)	(89.3)	(106.8)	(125.1)	(150.5)	(167.9)	(185.3)
4.500	(9.0)	(21.9)	(35.5)	(49.8)	(64.8)	(80.6)	(97.2)	(114.7)	(133.0)	(158.4)	(175.8)	(193.2)
4.250	(16.9)	(29.8)	(43.4)	(58.4)	(72.7)	(88.3)	(105.1)	(122.6)	(140.9)	(166.3)	(183.7)	(201.1)
4.000	(24.8)	(37.7)	(51.3)	(65.6)	(80.6)	(96.4)	(113.0)	(130.5)	(148.8)	(174.2)	(191.6)	(209.0)
3.750	(32.7)	(45.6)	(59.2)	(73.5)	(88.5)	(104.3)	(120.9)	(138.4)	(156.7)	(182.1)	(199.5)	(216.9)
3.500	(40.6)	(53.5)	(67.1)	(81.4)	(96.4)	(112.2)	(128.8)	(146.3)	(164.6)	(190.0)	(207.4)	(224.8)

What is a deficit? 4: The landscape 2006

FTSE 100	Discount rate											
	6.25%	6.00%	5.75%	5.50%	5.25%	5.00%	4.75%	4.50%	4.25%	4.00%	3.75%	3.50%
7.250	70.0	57.0	43.4	29.1	14.1	(1.7)	(18.3)	(35.7)	(54.1)	(71.5)	(88.9)	(106.3)
7.000	62.1	49.1	35.5	21.3	6.2	(9.6)	(28.2)	(43.6)	(62.0)	(79.4)	(96.9)	(114.2)
6.750	54.2	41.2	27.6	13.4	(1.7)	(17.5)	(34.0)	(51.5)	(69.0)	(87.3)	(104.7)	(122.1)
6.500	46.3	33.4	19.8	5.5	(9.6)	(25.3)	(41.9)	(59.4)	(77.7)	(95.2)	(112.6)	(130.0)
6.250	41.7	28.8	15.2	0.9	(14.1)	(29.9)	(46.5)	(63.9)	(82.3)	(103.1)	(123.5)	(137.9)
6.000	38.4	25.5	11.9	(2.4)	(17.5)	(33.2)	(49.8)	(67.3)	(85.6)	(111.0)	(128.4)	(145.8)
5.750	30.5	17.6	4.0	(10.3)	(25.3)	(41.1)	(57.7)	(75.2)	(93.5)	(118.9)	(136.3)	(153.7)
5.500	22.6	9.7	(3.9)	(18.2)	(33.2)	(49.0)	(65.6)	(83.1)	(101.4)	(126.8)	(144.2)	(161.6)
5.250	14.7	1.8	(11.8)	(26.1)	(41.1)	(56.9)	(73.5)	(91.0)	(109.3)	(134.7)	(152.1)	(169.5)
5.000	6.8	(6.1)	(19.7)	(34.0)	(49.0)	(64.8)	(81.4)	(98.9)	(117.2)	(142.6)	(160.0)	(177.4)
4.750	(1.1)	(14.0)	(27.6)	(41.9)	(56.9)	(72.7)	(89.3)	(106.8)	(125.1)	(150.5)	(167.9)	(185.3)
4.500	(9.0)	(21.9)	(35.5)	(49.8)	(64.8)	(80.6)	(97.2)	(114.7)	(133.0)	(158.4)	(175.8)	(193.2)
4.250	(16.9)	(29.8)	(43.4)	(58.4)	(72.7)	(88.3)	(105.1)	(122.6)	(140.9)	(166.3)	(183.7)	(201.1)
4.000	(24.8)	(37.7)	(51.3)	(65.6)	(80.6)	(96.4)	(113.0)	(130.5)	(148.8)	(174.2)	(191.6)	(209.0)
3.750	(32.7)	(45.6)	(59.2)	(73.5)	(88.5)	(104.3)	(120.9)	(138.4)	(156.7)	(182.1)	(199.5)	(216.9)
3.500	(40.6)	(53.5)	(67.1)	(81.4)	(96.4)	(112.2)	(128.8)	(146.3)	(164.6)	(190.0)	(207.4)	(224.8)

What is a deficit? 5: The landscape later in 2006

FTSE 100	Discount rate											
	6.25%	6.00%	5.75%	5.50%	5.25%	5.00%	4.75%	4.50%	4.25%	4.00%	3.75%	3.50%
7,250	70.0	57.0	43.4	29.1	14.1	(1.7)	(18.3)	(35.7)	(54.1)	(71.5)	(88.9)	(106.3)
7,000	62.1	49.1	35.5	21.3	6.2	(9.6)	(28.2)	(43.6)	(62.0)	(79.4)	(96.8)	(114.2)
6,750	54.2	41.2	27.6	13.4	(1.7)	(17.5)	(34.0)	(51.5)	(69.0)	(87.3)	(104.7)	(122.1)
6,500	46.3	33.4	19.8	5.5	(9.6)	(25.3)	(41.9)	(59.4)	(77.7)	(95.2)	(112.6)	(130.0)
6,250	41.7	28.8	15.2	0.9	(14.4)	(29.9)	(46.5)	(63.9)	(82.3)	(103.1)	(123.5)	(137.9)
6,000	38.4	25.5	11.9	(2.4)	(17.5)	(33.2)	(49.8)	(67.3)	(85.6)	(111.0)	(128.4)	(145.8)
5,750	30.5	17.6	4.0	(10.3)	(25.3)	(44.1)	(57.7)	(75.2)	(93.5)	(118.9)	(136.3)	(153.7)
5,500	22.6	9.7	(3.9)	(18.2)	(33.2)	(49.0)	(65.8)	(83.1)	(101.4)	(126.8)	(144.2)	(161.6)
5,250	14.7	1.8	(11.8)	(26.1)	(41.1)	(56.9)	(73.5)	(91.0)	(109.3)	(134.7)	(152.1)	(169.5)
5,000	6.8	(6.1)	(19.7)	(34.0)	(49.0)	(64.8)	(81.4)	(98.9)	(117.2)	(142.6)	(160.0)	(177.4)
4,750	(1.1)	(14.0)	(27.6)	(41.9)	(56.9)	(72.7)	(89.3)	(106.8)	(125.1)	(150.5)	(167.9)	(185.3)
4,500	(9.0)	(21.9)	(35.5)	(49.8)	(64.8)	(80.6)	(97.2)	(114.7)	(133.0)	(158.4)	(175.8)	(193.2)
4,250	(16.9)	(29.8)	(43.4)	(58.2)	(72.7)	(88.5)	(105.1)	(122.6)	(140.9)	(166.3)	(183.7)	(201.1)
4,000	(24.8)	(37.7)	(51.3)	(65.4)	(80.6)	(96.4)	(113.0)	(130.5)	(148.8)	(174.2)	(191.6)	(209.0)
3,750	(32.7)	(45.4)	(59.2)	(73.5)	(88.5)	(104.3)	(120.9)	(138.4)	(156.7)	(182.1)	(199.5)	(216.9)
3,500	(40.6)	(53.5)	(67.1)	(81.4)	(96.4)	(112.2)	(128.8)	(146.3)	(164.6)	(190.0)	(207.4)	(224.8)

What is a deficit? 6: Sunlit uplands (rather narrow)

FTSE 100	Discount rate											
	6.25%	6.00%	5.75%	5.50%	5.25%	5.00%	4.75%	4.50%	4.25%	4.00%	3.75%	3.50%
7,250	70.0	57.0	43.4	29.1	14.1	(1.7)	(18.3)	(35.7)	(54.1)	(71.5)	(88.9)	(106.3)
7,000	62.1	49.1	35.5	21.3	6.2	(9.6)	(28.2)	(43.6)	(62.0)	(79.4)	(96.8)	(114.2)
6,750	54.2	41.2	27.6	13.4	(1.7)	(17.5)	(34.0)	(51.5)	(69.0)	(87.3)	(104.7)	(122.1)
6,500	46.3	33.4	19.8	5.5	(9.6)	(25.3)	(41.9)	(59.4)	(77.7)	(95.2)	(112.6)	(130.0)
6,250	41.7	28.8	15.2	0.9	(14.4)	(29.9)	(46.5)	(63.9)	(82.3)	(103.1)	(123.5)	(137.9)
6,000	38.4	25.5	11.9	(2.4)	(17.5)	(33.2)	(49.8)	(67.3)	(85.6)	(111.0)	(128.4)	(145.8)
5,750	30.5	17.6	4.0	(10.3)	(25.3)	(44.1)	(57.7)	(75.2)	(93.5)	(118.9)	(136.3)	(153.7)
5,500	22.6	9.7	(3.9)	(18.2)	(33.2)	(49.0)	(65.8)	(83.1)	(101.4)	(126.8)	(144.2)	(161.6)
5,250	14.7	1.8	(11.8)	(26.1)	(41.1)	(56.9)	(73.5)	(91.0)	(109.3)	(134.7)	(152.1)	(169.5)
5,000	6.8	(6.1)	(19.7)	(34.0)	(49.0)	(64.8)	(81.4)	(98.9)	(117.2)	(142.6)	(160.0)	(177.4)
4,750	(1.1)	(14.0)	(27.6)	(41.9)	(56.9)	(72.7)	(89.3)	(106.8)	(125.1)	(150.5)	(167.9)	(185.3)
4,500	(9.0)	(21.9)	(35.5)	(49.8)	(64.8)	(80.6)	(97.2)	(114.7)	(133.0)	(158.4)	(175.8)	(193.2)
4,250	(16.9)	(29.8)	(43.4)	(58.2)	(72.7)	(88.5)	(105.1)	(122.6)	(140.9)	(166.3)	(183.7)	(201.1)
4,000	(24.8)	(37.7)	(51.3)	(65.4)	(80.6)	(96.4)	(113.0)	(130.5)	(148.8)	(174.2)	(191.6)	(209.0)
3,750	(32.7)	(45.4)	(59.2)	(73.5)	(88.5)	(104.3)	(120.9)	(138.4)	(156.7)	(182.1)	(199.5)	(216.9)
3,500	(40.6)	(53.5)	(67.1)	(81.4)	(96.4)	(112.2)	(128.8)	(146.3)	(164.6)	(190.0)	(207.4)	(224.8)

What is a deficit? 7: Where we are now

FTSE 100	Discount rate											
	6.25%	6.00%	5.75%	5.50%	5.25%	5.00%	4.75%	4.50%	4.25%	4.00%	3.75%	3.50%
7,250	70.0	57.0	43.4	29.1	14.1	(1.7)	(18.3)	(35.7)	(54.1)	(71.5)	(88.9)	(106.3)
7,000	62.1	49.1	35.5	21.3	6.2	(9.6)	(28.2)	(43.6)	(62.0)	(79.4)	(96.8)	(114.2)
6,750	54.2	41.2	27.6	13.4	(1.7)	(17.5)	(34.0)	(51.5)	(69.0)	(87.3)	(104.7)	(122.1)
6,500	46.3	33.4	19.8	5.5	(9.6)	(25.3)	(41.9)	(59.4)	(77.7)	(95.2)	(112.6)	(130.0)
6,250	41.7	28.8	15.2	0.9	(14.4)	(29.9)	(46.5)	(63.9)	(82.3)	(103.1)	(123.5)	(137.9)
6,000	38.4	25.5	11.9	(2.4)	(17.5)	(33.2)	(49.8)	(67.3)	(85.6)	(111.0)	(128.4)	(145.8)
5,750	30.5	17.6	4.0	(10.3)	(25.3)	(44.1)	(57.7)	(75.2)	(93.5)	(118.9)	(136.3)	(153.7)
5,500	22.6	9.7	(3.9)	(18.2)	(33.2)	(49.0)	(65.8)	(83.1)	(101.4)	(126.8)	(144.2)	(161.6)
5,250	14.7	1.8	(11.8)	(26.1)	(41.1)	(56.9)	(73.5)	(91.0)	(109.3)	(134.7)	(152.1)	(169.5)
5,000	6.8	(6.1)	(19.7)	(34.0)	(49.0)	(64.8)	(81.4)	(98.9)	(117.2)	(142.6)	(160.0)	(177.4)
4,750	(1.1)	(14.0)	(27.6)	(41.9)	(56.9)	(72.7)	(89.3)	(106.8)	(125.1)	(150.5)	(167.9)	(185.3)
4,500	(9.0)	(21.9)	(35.5)	(49.8)	(64.8)	(80.6)	(97.2)	(114.7)	(133.0)	(158.4)	(175.8)	(193.2)
4,250	(16.9)	(29.8)	(43.4)	(58.2)	(72.7)	(88.5)	(105.1)	(122.6)	(140.9)	(166.3)	(183.7)	(201.1)
4,000	(24.8)	(37.7)	(51.3)	(65.4)	(80.6)	(96.4)	(113.0)	(130.5)	(148.8)	(174.2)	(191.6)	(209.0)
3,750	(32.7)	(45.4)	(59.2)	(73.5)	(88.5)	(104.3)	(120.9)	(138.4)	(156.7)	(182.1)	(199.5)	(216.9)
3,500	(40.6)	(53.5)	(67.1)	(81.4)	(96.4)	(112.2)	(128.8)	(146.3)	(164.6)	(190.0)	(207.4)	(224.8)

What is a deficit? 8: Credit 101

FTSE 100	Discount rate											
	6.25%	6.00%	5.75%	5.50%	5.25%	5.00%	4.75%	4.50%	4.25%	4.00%	3.75%	3.50%
7.250	70.0	57.0	43.4	29.1	14.1	(1.7)	(18.3)	(35.7)	(54.1)	(71.5)	(88.9)	(106.3)
7.000	62.1	49.1	35.5	21.3	6.2	(9.6)	(28.2)	(43.6)	(62.0)	(79.4)	(96.9)	(114.2)
6.750	54.2	41.2	27.6	13.4	(1.7)	(17.5)	(34.0)	(51.5)	(69.0)	(87.3)	(104.7)	(122.1)
6.500	46.3	33.4	19.8	5.5	(9.6)	(25.3)	(41.9)	(59.4)	(77.7)	(95.2)	(112.6)	(130.0)
6.250	41.7	28.8	15.2	0.9	(14.1)	(29.9)	(46.5)	(63.9)	(82.3)	(103.1)	(123.5)	(137.9)
6.000	38.4	25.5	11.9	(2.4)	(17.5)	(33.2)	(49.8)	(67.3)	(85.6)	(111.0)	(128.4)	(145.8)
5.750	30.5	17.6	4.0	(10.3)	(25.3)	(41.1)	(57.7)	(75.2)	(93.5)	(118.9)	(136.3)	(153.7)
5.500	22.6	9.7	(3.9)	(18.2)	(33.2)	(49.0)	(65.6)	(83.1)	(101.4)	(126.8)	(144.2)	(161.6)
5.250	14.7	1.8	(11.8)	(26.1)	(41.1)	(56.9)	(73.5)	(91.0)	(109.3)	(134.7)	(152.1)	(169.5)
5.000	6.8	(6.1)	(19.7)	(34.0)	(49.0)	(64.8)	(81.4)	(98.9)	(117.2)	(142.6)	(160.0)	(177.4)
4.750	(1.1)	(14.0)	(27.6)	(41.9)	(56.9)	(72.7)	(89.3)	(106.8)	(125.1)	(150.5)	(167.9)	(185.3)
4.500	(9.0)	(21.9)	(35.5)	(49.8)	(64.8)	(80.6)	(97.2)	(114.7)	(133.0)	(158.4)	(175.8)	(193.2)
4.250	(16.9)	(29.8)	(43.4)	(57.7)	(72.7)	(88.3)	(105.1)	(122.6)	(140.9)	(166.3)	(183.7)	(201.1)
4.000	(24.8)	(37.7)	(51.3)	(65.6)	(80.6)	(96.4)	(113.0)	(130.5)	(148.8)	(174.2)	(191.6)	(209.0)
3.750	(32.7)	(45.6)	(59.2)	(73.5)	(88.3)	(104.3)	(120.9)	(138.4)	(156.7)	(182.1)	(199.5)	(216.9)
3.500	(40.6)	(53.5)	(67.1)	(81.4)	(96.4)	(112.2)	(128.8)	(146.3)	(164.6)	(190.0)	(207.4)	(224.8)

10



What is a deficit? 9: Gilt-collateralised

FTSE 100	Discount rate											
	6.25%	6.00%	5.75%	5.50%	5.25%	5.00%	4.75%	4.50%	4.25%	4.00%	3.75%	3.50%
7.250	70.0	57.0	43.4	29.1	14.1	(1.7)	(18.3)	(35.7)	(54.1)	(71.5)	(88.9)	(106.3)
7.000	62.1	49.1	35.5	21.3	6.2	(9.6)	(28.2)	(43.6)	(62.0)	(79.4)	(96.9)	(114.2)
6.750	54.2	41.2	27.6	13.4	(1.7)	(17.5)	(34.0)	(51.5)	(69.0)	(87.3)	(104.7)	(122.1)
6.500	46.3	33.4	19.8	5.5	(9.6)	(25.3)	(41.9)	(59.4)	(77.7)	(95.2)	(112.6)	(130.0)
6.250	41.7	28.8	15.2	0.9	(14.1)	(29.9)	(46.5)	(63.9)	(82.3)	(103.1)	(123.5)	(137.9)
6.000	38.4	25.5	11.9	(2.4)	(17.5)	(33.2)	(49.8)	(67.3)	(85.6)	(111.0)	(128.4)	(145.8)
5.750	30.5	17.6	4.0	(10.3)	(25.3)	(41.1)	(57.7)	(75.2)	(93.5)	(118.9)	(136.3)	(153.7)
5.500	22.6	9.7	(3.9)	(18.2)	(33.2)	(49.0)	(65.6)	(83.1)	(101.4)	(126.8)	(144.2)	(161.6)
5.250	14.7	1.8	(11.8)	(26.1)	(41.1)	(56.9)	(73.5)	(91.0)	(109.3)	(134.7)	(152.1)	(169.5)
5.000	6.8	(6.1)	(19.7)	(34.0)	(49.0)	(64.8)	(81.4)	(98.9)	(117.2)	(142.6)	(160.0)	(177.4)
4.750	(1.1)	(14.0)	(27.6)	(41.9)	(56.9)	(72.7)	(89.3)	(106.8)	(125.1)	(150.5)	(167.9)	(185.3)
4.500	(9.0)	(21.9)	(35.5)	(49.8)	(64.8)	(80.6)	(97.2)	(114.7)	(133.0)	(158.4)	(175.8)	(193.2)
4.250	(16.9)	(29.8)	(43.4)	(57.7)	(72.7)	(88.3)	(105.1)	(122.6)	(140.9)	(166.3)	(183.7)	(201.1)
4.000	(24.8)	(37.7)	(51.3)	(65.6)	(80.6)	(96.4)	(113.0)	(130.5)	(148.8)	(174.2)	(191.6)	(209.0)
3.750	(32.7)	(45.6)	(59.2)	(73.5)	(88.3)	(104.3)	(120.9)	(138.4)	(156.7)	(182.1)	(199.5)	(216.9)
3.500	(40.6)	(53.5)	(67.1)	(81.4)	(96.4)	(112.2)	(128.8)	(146.3)	(164.6)	(190.0)	(207.4)	(224.8)

11



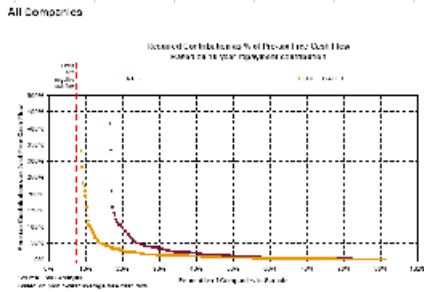
What is a deficit? 10: Credit-adjusted to BB

FTSE 100	Discount rate											
	6.25%	6.00%	5.75%	5.50%	5.25%	5.00%	4.75%	4.50%	4.25%	4.00%	3.75%	3.50%
7.250	70.0	57.0	43.4	29.1	14.1	(1.7)	(18.3)	(35.7)	(54.1)	(71.5)	(88.9)	(106.3)
7.000	62.1	49.1	35.5	21.3	6.2	(9.6)	(28.2)	(43.6)	(62.0)	(79.4)	(96.9)	(114.2)
6.750	54.2	41.2	27.6	13.4	(1.7)	(17.5)	(34.0)	(51.5)	(69.0)	(87.3)	(104.7)	(122.1)
6.500	46.3	33.4	19.8	5.5	(9.6)	(25.3)	(41.9)	(59.4)	(77.7)	(95.2)	(112.6)	(130.0)
6.250	41.7	28.8	15.2	0.9	(14.1)	(29.9)	(46.5)	(63.9)	(82.3)	(103.1)	(123.5)	(137.9)
6.000	38.4	25.5	11.9	(2.4)	(17.5)	(33.2)	(49.8)	(67.3)	(85.6)	(111.0)	(128.4)	(145.8)
5.750	30.5	17.6	4.0	(10.3)	(25.3)	(41.1)	(57.7)	(75.2)	(93.5)	(118.9)	(136.3)	(153.7)
5.500	22.6	9.7	(3.9)	(18.2)	(33.2)	(49.0)	(65.6)	(83.1)	(101.4)	(126.8)	(144.2)	(161.6)
5.250	14.7	1.8	(11.8)	(26.1)	(41.1)	(56.9)	(73.5)	(91.0)	(109.3)	(134.7)	(152.1)	(169.5)
5.000	6.8	(6.1)	(19.7)	(34.0)	(49.0)	(64.8)	(81.4)	(98.9)	(117.2)	(142.6)	(160.0)	(177.4)
4.750	(1.1)	(14.0)	(27.6)	(41.9)	(56.9)	(72.7)	(89.3)	(106.8)	(125.1)	(150.5)	(167.9)	(185.3)
4.500	(9.0)	(21.9)	(35.5)	(49.8)	(64.8)	(80.6)	(97.2)	(114.7)	(133.0)	(158.4)	(175.8)	(193.2)
4.250	(16.9)	(29.8)	(43.4)	(57.7)	(72.7)	(88.3)	(105.1)	(122.6)	(140.9)	(166.3)	(183.7)	(201.1)
4.000	(24.8)	(37.7)	(51.3)	(65.6)	(80.6)	(96.4)	(113.0)	(130.5)	(148.8)	(174.2)	(191.6)	(209.0)
3.750	(32.7)	(45.6)	(59.2)	(73.5)	(88.3)	(104.3)	(120.9)	(138.4)	(156.7)	(182.1)	(199.5)	(216.9)
3.500	(40.6)	(53.5)	(67.1)	(81.4)	(96.4)	(112.2)	(128.8)	(146.3)	(164.6)	(190.0)	(207.4)	(224.8)

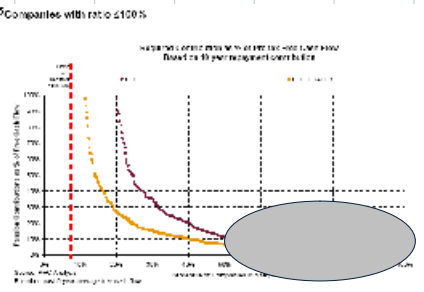
12



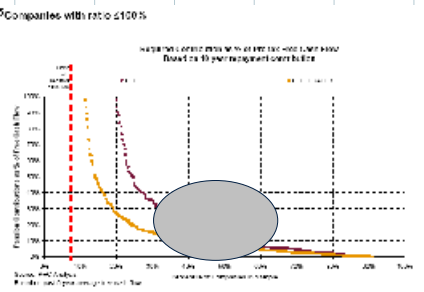
The aggregate Risk Profile: A long tail



The aggregate Risk Profile: (2) Relative comfort

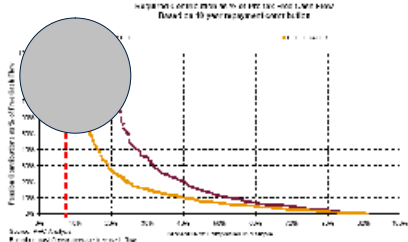


The aggregate Risk Profile: (3) Nervous equilibrium



The aggregate Risk Profile: (4) Desperation

Companies with ratio $\leq 100\%$

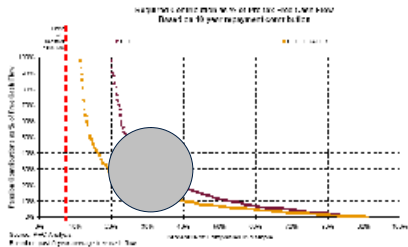


16

ROTI SCI ILO

The aggregate Risk Profile: (5) Discomfort zone

Companies with ratio $\leq 100\%$



17

ROTI SCI ILO

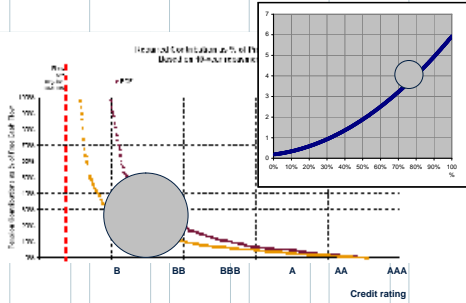
Discomfort zone: (1) Credit circle

Horizontal line graph showing the aggregate risk profile for 'Discomfort zone: (1) Credit circle' with a ratio $\leq 100\%$. The y-axis represents the 'Fraction of companies as % of the total' (0 to 1700), and the x-axis represents the 'Credit rating' (AAA to D). A large grey circle highlights the region between BB and B. A legend indicates 'PFR = 0.0000'.

18

ROTI SCI ILO

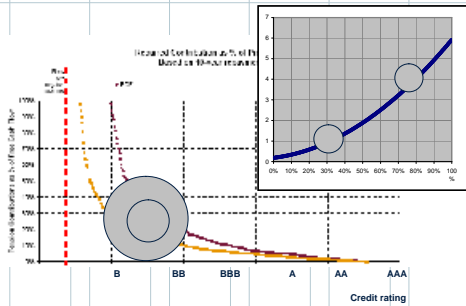
Discomfort zone: (2) Cash Visibility



19

ROTHSCHILD

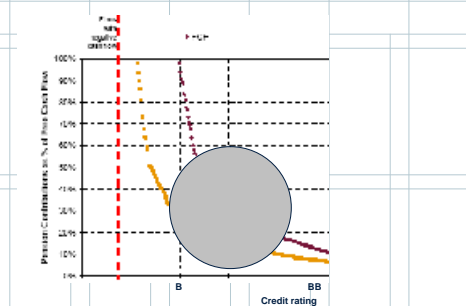
Individual Risk Profile: (3) Less Cash Visibility



20

ROTHSCHILD

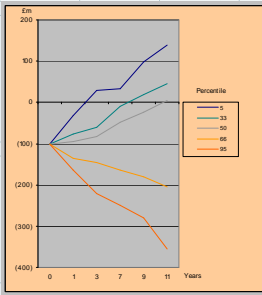
Individual Risk Profile: (4) Non-linearity: slippery slope



21

ROTHSCHILD

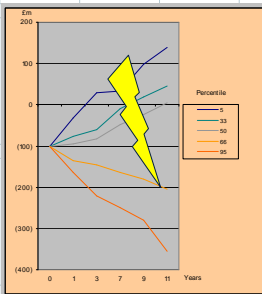
Why the discomfort zone is dangerous (1)



22

ROTI SCI IUD

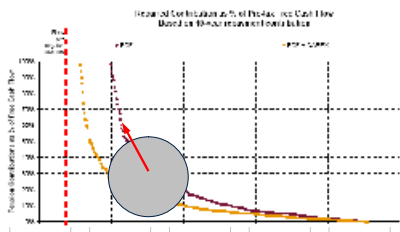
Why the discomfort zone is dangerous (2)



23

ROTI SCI IUD

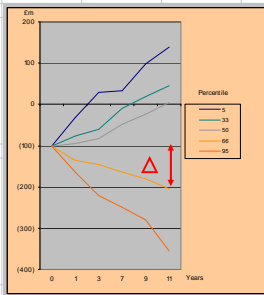
From discomfort to desperation



24

ROTI SCI IUD

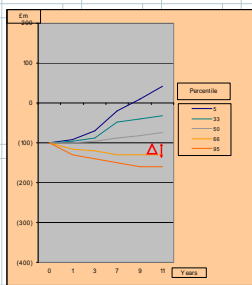
The effect of LDI: (1) Typical balanced portfolio



25

ROTHSCHILD

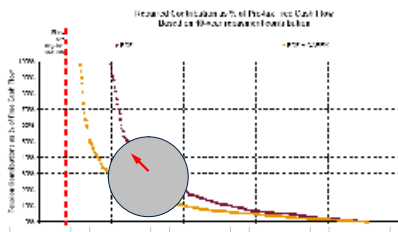
The effect of LDI: (2) Matched portfolio



26

ROTHSCHILD

From discomfort to greater discomfort



27

ROTHSCHILD
