

The committee exhibit: four readings of one balance sheet

Chapters 1, 24 and 27. Four defensible capital ratios for the same bank on the same day, on the same page, with the bridge between them. It belongs at the front of every asset and liability committee pack.

Bank		Prepared by	
Reporting date		Date	

Reading	Numerator	Denominator	Sagebrook	Your bank
1. Published CET1	639,600, AOCI filtered	risk-weighted assets 5,610,000	11.40%	
2. CET1, AFS mark recognised	485,765	risk-weighted assets	8.66%	
3. Tangible common equity	156,890, both marks	tangible assets 7,496,890	2.09%	
4. Economic value of equity	278,809, franchise included	tangible assets marked 7,177,347	3.88%	
Distance, reading 1 less reading 3			9.31 points	

All four on tangible assets	Sagebrook	Your bank
Reading 1	8.53%	
Reading 2	6.48%	
Reading 3	2.09%	
Reading 4	3.72%	
Risk-weight density	74.83%	

The bridge, step by step	Sagebrook	Your bank
Reading 1, published CET1	639,600	
plus the AFS mark, net of tax	-153,835	
plus the HTM mark, net of tax	-328,875	
plus the fixed-rate loan mark, net of tax	-319,543	
plus the time deposits, net of tax	6,369	
plus the deposit franchise, net of tax	435,094	
Reading 4, by the bridge (must equal the line above)	278,809	

Put all four on the first page. A pack that shows one of them has told the committee which answer to reach. The bridge must close to the dollar; if it does not, one of the marks has been taken twice or not at all.

The marks, portfolio by portfolio

Chapters 2 and 9. What a 425 basis point rise does to the price of everything the bank owns and owes, by duration and convexity, gross and net of tax. Only the first line reaches published capital, and only if the filter is off.

Bank		Prepared by	
Reporting date		Date	

Portfolio	Balance	Dur.	Con v.	Price change	Mark, gross	Mark, net	Your balance	Your mark, net
Available for sale	1,180,000	4.6	24	-17.38%	-205,114	-153,835		
Held to maturity	1,640,000	7.8	71	-26.74%	-438,500	-328,875		
Fixed-rate loans	2,850,000	3.9	18	-14.95%	-426,057	-319,543		
Time deposits (beta 85%)	1,480,000	0.9				6,369		
Deposit franchise (beta 35%, 4.2 years)	5,000,000	4.2				435,094		

Question for the owner of each mark	Sagebrook	Your answer
Where do the durations come from, and on what date were they measured?	Inputs, one figure per portfolio	
Is convexity measured or assumed? Its term is worth how much here?	105,160 on the HTM book	
Which marks reach published capital, and through which line?	AFS through AOCI, filtered out of CET1; HTM never	
Which marks reach nothing until a sale?	HTM and the loans: 648,418 net	
Which mark is a gain, and whose behaviour does it rest on?	Time deposits and franchise: the betas and the life	

The franchise line is not a price anyone can observe. It is the product of three judgments: the beta, the life and the shock. The Surface sheet of workbook 3 shows what it does when the first two move.

The margin before and after the shock

Chapter 3. Every line of interest income and expense in the year before the shock and the year of it, so that the move can be read line by line: the asset side rises by 86,275, the liability side by 128,010.

Bank		Prepared by	
Reporting date		Date	

Line	Balance	Rate, year 0	Rate, year 1	Year 0	Year 1	Your year 1
Cash	420,000	1.55%	5.80%	6,510	24,360	
Available for sale	1,180,000	1.72%	1.72%	20,296	20,296	
Held to maturity	1,640,000	1.94%	1.94%	31,816	31,816	
Fixed-rate loans	2,850,000	4.35%	4.35%	123,975	123,975	
Floating-rate loans	1,610,000	3.95%	8.20%	63,595	132,020	
Savings deposits (beta 35%)	3,240,000	0.18%	1.67%	-5,832	-54,027	
Time deposits (beta 85%)	1,480,000	0.85%	4.46%	-12,580	-66,045	
FHLB advances	620,000	1.35%	5.60%	-8,370	-34,720	
Subordinated debt	150,000	5.25%	5.25%	-7,875	-7,875	
Net interest income				211,535	169,800	
Net interest margin, on 7,700,000 earning				2.75%	2.21%	
Pre-tax income, after fees 41,000, expenses 148,000, provision 26,000					36,800	
Net income, after tax at 25%					27,600	

Two lines decide the answer: the savings rate, which moves by the beta, and the floating loans, which the model reprices in full. Chapter 8 prices the second; chapter 6 and case three of the archive the first. The non-interest-bearing 1,760,000 costs nothing in either year.

Who earns the margin: the transfer-pricing statement

Chapter 4. Each business charged or credited at an internal curve of the same duration: 1.55 per cent at zero, plus 25 basis points a year of duration, flat beyond five years. The three books add to the margin by construction.

Bank		Prepared by	
Reporting date		Date	

Business	Balance	Duration, years	Internal rate	Margin, year 0	Your bank
Cash	420,000	0.0	1.550%	0	
Available for sale	1,180,000	4.6	2.700%	-11,564	
Held to maturity	1,640,000	7.8 (flat beyond 5)	2.800%	-14,104	
Fixed-rate loans	2,850,000	3.9	2.525%	52,012	
Floating-rate loans	1,610,000	index	1.550%	38,640	
Lending and investment, total				64,984	
Non-interest-bearing deposits	1,760,000	4.2 (assumed life)	2.600%	45,760	
Savings deposits	3,240,000	4.2 (assumed life)	2.600%	78,408	
Time deposits	1,480,000	0.9	1.775%	13,690	
FHLB advances	620,000	0.25	1.6125%	1,628	
Subordinated debt	150,000	5.0	2.800%	-3,675	
Deposit gathering and funding, total				135,810	
Treasury book, the remainder				10,740	
Share earned by gathering deposits				64.2%	

Two thirds of the margin is earned by the deposits, and the figure rests on the assumed 4.2-year life: at a life of 2 years the internal rate on non-maturity deposits falls to 2.05 per cent and their credit falls by 27,500. The curve is a policy; the table should say whose.

The loaded cost of a deposit

Chapter 5. What a deposit costs once the branches, the people and the systems that gather it are charged to it, beside the interest. The comparison is with the wholesale money the bank could borrow instead.

Bank		Prepared by	
Reporting date		Date	

Line	Sagebrook, year 0	Sagebrook, year 1	Your bank
Operating expenses	148,000	148,000	
Share charged to deposit gathering	80%	80%	
Expenses charged to deposits	118,400	118,400	
Interest on savings and time deposits	18,412	120,072	
Deposits, all three kinds	6,480,000	6,480,000	
Fully loaded cost of deposits	2.11%	3.68%	
FHLB advances, for comparison	1.35%	5.60%	
Cost-to-income ratio	58.61%		

Question	Sagebrook	Your answer
Which expenses are charged to deposit gathering, and by what key?	80 per cent of all expenses, by assumption	
Is the loaded cost below wholesale funding in both years?	Year 0: no, 2.11 against 1.35. Year 1: yes, 3.68 against 5.60	
At what rate does the loaded cost equal wholesale funding?	Between the two years; say which	

In year 0 the deposits cost more than the advances once loaded; in the shock year they cost 1.92 points less. The franchise is a rate-rise asset, which is why it is worth most in exactly the conditions in which depositors are most likely to leave.

The deposit beta, stated with its denominator

Chapter 6. A beta is a share of a rate move passed to depositors, and it is only a number once the base it is measured on is stated. The same behaviour can be 35 per cent or 54 per cent, and a margin can charge 22.68.

Bank		Prepared by	
Reporting date		Date	

Statement	Denominator	Sagebrook	Your bank	Your denominator
Beta on all non-maturity deposits (chapter 6, the franchise)	5,000,000	35.00%		
The same, on the interest-bearing book alone	3,240,000	54.01%		
What the margin charges, on all non-maturity deposits (revised)	5,000,000	22.68%		
Break-even beta, savings book	3,240,000	61.72%		
Break-even beta, all non-maturity deposits (revised)	5,000,000	40.00%		
Pre-tax income at a 62 per cent savings beta		-379		
Pre-tax income, 35 per cent read across all non-maturity deposits		10,620		

Before quoting a beta	Answered?	Note
Which deposits are in the base, and do the non-interest-bearing ones count?		
Over which rate cycle, and cumulative or quarter by quarter?		
Is it the beta the margin model charges, or the one the franchise uses?		
How far is the break-even, measured on the same base?		

At Sagebrook the break-even is the same number of dollars on every reading: 84,995 of pre-tax room before savings reprice. It is 17.32 points away on one reading and 5.00 on the other. Case three of the archive runs both.

The repricing gap, weighted by behaviour

Chapter 7. What reprices within the year, weighted by how much of a rate move it actually passes on, rather than by contract. Multiplied by the shock, it is the move in the margin to the dollar.

Bank		Prepared by	
Reporting date		Date	

Line	Contract balance	Weight	Weighted	Your balance	Your weight
Cash	420,000	100%	420,000		
Floating-rate loans	1,610,000	100% (before floors)	1,610,000		
Assets that reprice	2,030,000		2,030,000		
FHLB advances	620,000	100%	620,000		
Time deposits	1,480,000	85%	1,258,000		
Savings deposits	3,240,000	35%	1,134,000		
Non-interest-bearing deposits	1,760,000	0%	0		
Liabilities that reprice			3,012,000		
Weighted gap			-982,000		
Times the 425 basis point shock			-41,735		
The margin actually moved by			-41,735		
Weighted gap with floors and reset lags (chapter 8)			-1,335,944		

A contractual gap puts the 3,240,000 of savings at 100 per cent: minus 3,310,000, 3.37 times the weighted gap. A gap weighted by a beta nobody has measured is no better; state the weights beside the gap, every time.

The floating book as written

Chapter 8. The model reprices the floating book in full. The loan documents do not: some loans carry floors, some reset once a year, and the difference is a number the loan tape can produce.

Bank		Prepared by	
Reporting date		Date	

From the loan tape	Sagebrook	Your book
Floating-rate loans	1,610,000	
Index plus spread, year 0	3.95%	
Share carrying a floor	42%	
Average floor	4.50%	
Share resetting once a year	35%	
Average lag to the next reset, years	0.5	

What it does to the year	Sagebrook	Your book
Gain the model assumes	68,425	
Gain on the floored loans, from 4.50%	25,019	
Gain on the unfloored loans	39,686	
Removed by the reset lag	-11,324	
Gain actually earned	53,382	
Effective beta of the floating book	78.02%	
Floor income the model leaves out of year 0	3,719	
Pre-tax income, corrected: the lag only (revised)	25,476	
The lag's cost after tax, share of net income (revised)	30.77%	

Floors lower the move in the margin by raising the starting point: in the money at a 3.95 per cent index, they earn 3,719 in year 0 that the margin sheet does not count. They do not lower the shock year. Only the reset lag does that, 11,324 before tax.

The surface, not the point

Chapter 9. Economic value of equity as a function of the two assumptions that produce it: how long non-maturity deposits stay, and how much of a rate rise they are paid. Report the grid, and mark the cell your models use.

Bank		Prepared by	
Reporting date		Date	

Deposit life	Beta 20%	Beta 35%	Beta 50%	Beta 62%	Beta 65%
Sagebrook: the case is 4.2 years and 35 per cent, 278,809					
2.0 years	98,716	50,903	3,091	-35,159	-44,722
3.0 years	226,216	154,497	82,778	25,403	11,059
4.2 years	379,216	278,809	178,403	98,078	77,997
5.0 years	481,216	361,684	242,153	146,528	122,622
6.0 years	608,716	465,278	321,841	207,091	178,403

Deposit life	Beta 20%	Beta 35%	Beta 50%	Beta 62%	Beta 65%
Your bank					
2.0 years					
3.0 years					
4.2 years					
5.0 years					
6.0 years					

Reading the surface	Sagebrook	Your bank
Franchise at the generous corner, and at the severe one	765,000 and 111,563	
The one over the other	6.86x	
Economic equity, generous corner less severe	653,438	
Cells below nought	2 of 25	
Deposit life your core system supports, and its source		
Beta your repricing history shows, and its base		

If you cannot source the row or the column, that is the finding. The corners are equally defensible; at the severe one Sagebrook is economically insolvent.

Two horizons: earnings beside value

Chapter 11. The same rate moves, measured on the year's net interest income and on the economic value of equity. They answer different questions, and a bank that reports one has chosen which half of its exposure to disclose.

Bank		Prepared by	
Reporting date		Date	

Rate move	Earnings, before tax	Earnings, after tax	Value, after tax	Ratio as printed	Ratio, same basis	Your earnings	Your value
-100 bp	9,820	7,365	123,491	12.58x	16.77x		
+100 bp	-9,820	-7,365	-108,787	11.08x	14.77x		
+200 bp	-19,640	-14,730	-202,869	10.33x	13.77x		
+300 bp	-29,460	-22,095	-282,247	9.58x	12.77x		
+400 bp	-39,280	-29,460	-346,920	8.83x	11.78x		

Test	Sagebrook	Your bank
Four times the 100 basis point value figure, against the 400 point answer	-435,147 against -346,920	
Overstatement from scaling	25.4%	
Are both columns on the same tax basis?	Printed: no. Column 6: yes	
Which of the two does the board limit?		

The earnings column is a gap times a rate and exactly linear; the value column carries convexity. Set after-tax value against before-tax earnings and the factor reads eleven; on one basis it is 14.77.

What a buyer would pay

Chapters 14 and 16. A buyer prices the fourth reading: every asset and liability marked, the franchise included, and pays for the franchise with an intangible it must then amortize against earnings.

Bank		Prepared by	
Reporting date		Date	

Line	Sagebrook	Your bank
The price, being the fourth reading	278,809	
Core deposit intangible, share of core deposits	8.70%	
Multiple of tangible common equity	1.78x	
Discount to published capital of 639,600	56.41%	
Discount to book equity of 533,765	47.77%	
Annual amortization of the intangible, ten years	43,509	
That amortization against the year's net income	1.58x	

Before the price is agreed	Seller	Buyer
Deposit life and beta behind the franchise	4.2 years, 35%	
Where on the surface the price sits	the case cell	
Outflow at which the franchise premium is gone (chapter 25)	28.02% of non-maturity deposits	
Marks the buyer will accrete back through income	loans 319,543; HTM 328,875; AFS 153,835, net	

The buyer pays 278,809 for a bank that publishes 639,600 of capital, and more than all of the price is franchise. The franchise is also the first thing a run takes: case one of the archive shows it gone before the liquidity is.

Liquidity sources and the two coverage figures

Chapters 15 and 17. What can be turned into cash, at market and after haircut, against the deposits that are most likely to leave. Two coverage figures follow, and only one of them usually reaches the board.

Bank		Prepared by	
Reporting date		Date	

Source	At market	Haircut	Raised	Your bank
Cash and equivalents	420,000		420,000	
AFS securities	974,886	2%	955,389	
Immediately available			1,375,389	
Unused FHLB capacity	360,000		360,000	
HTM securities, pledged or sold	1,201,500	3%	1,165,455	
Total mobilizable			2,900,844	

Coverage	Sagebrook	Your bank
Uninsured deposits, 46% of 6,480,000	2,980,800	
Coverage, total	97.32%	
Share of the HTM book sellable before 6.5% CET1	83.60%	
Published ratio if all of it is sold	5.54%	
Liquidity reachable without breaching the ratio	2,709,746	
Coverage without breaching the ratio	90.91%	
Uninsured deposits per dollar of capital	3.68	
Which of the two coverage figures reaches the board?		
Who decided, and when?		

The 6.41 points between the two figures are 191,098: six hours of a 25 per cent run, and 53,925 of equity to close (case two). It is a capital decision, and it has to be taken before the run.

The run: days, thresholds and the order they fall

Chapters 17 and 25. Days to exhaustion at a constant outflow, the three thresholds on one clock, and the sequence of decisions agreed before the first day rather than during it.

Bank		Prepared by	
Reporting date		Date	

Outflow a day	Days, total	Days, within the ratio	Your days, total	Your days, within
1%	97.32	90.91		
2%	48.66	45.45		
5%	19.46	18.18		
10%	9.73	9.09		
15%	6.49	6.06		
20%	4.87	4.55		
25%	3.89	3.64		
35%	2.78	2.60		

Threshold (share of the uninsured base)	At 2% a day	At 25% a day	2%, growing by half a day	Your bank
Franchise premium gone (60.92%)	30.46	2.44	6.85	
Published ratio breaks (90.91%)	45.45	3.64	7.78	
Liquidity runs out (97.32%)	48.66	3.89	7.96	

Decision agreed in advance	Trigger	Owner	Done
Draw the unused FHLB capacity			
Pledge or sell the HTM book, and how far past the ratio			
Tell the supervisor			
Stop the dividend			

The days are exactly inversely proportional to a constant rate, which is the one shape a run does not have. The accelerating column uses a growth of half a day, ADDED in case one; the franchise, most of what the bank is worth, is gone before the cash.