American Academy of Actuaries
Health Insurance Rate Filing Task Force
Model Documentation

(Version 5.2)

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General Notes

- This version of the documentation reflects the version of the model posted to the American Academy of Actuaries web site on May 19, 2004.
- Throughout the spreadsheets, "healthy" and "standard" are used interchangeably; in this documentation "standard" is used exclusively.
- Throughout the documentation, x represents duration, y represents issue year, and z represents projection year. The relationship among these three parameters is $x = z - y + 1$.
- Throughout the documentation, b represents block number.
- The documentation does not necessarily represent a given formula identically to how it is represented in the spreadsheet. Occasionally, the formula has been simplified or otherwise modified (e.g., by changing the order of calculations) to improve readability. However, in all cases the documentation and the spreadsheet produce mathematically identical results.
- average(), max(), min(), NPV(), int(), and type() represent the Microsoft Excel average, maximum, minimum, net present value, integer, and type worksheet functions, respectively.
- When a parameter in a formula is obtained from a different tab of the spreadsheet, the specific tab and cells are indicated below the formula. When a parameter in a formula is obtained from the same tab, no indication is shown.
- Here is an example of how IF statements in the Excel spreadsheets are represented in the documentation, using the formula in Current Market Assumptions!D19 of the Current Market spreadsheet:

  In the spreadsheet, the formula is: =IF(A19<=$E$14,+'Global Assumptions'!$E$43,0)

  In the documentation, this is represented as:

  $$= \begin{cases} \mu_x, & x \leq DDLP \\ 0, & x > DDLP \end{cases}$$

  The brace signifies that the formula contains an IF statement. The interpretation is as follows: If $x \leq DDLP$, then the formula returns the value μ_x; if instead $x > DDLP$, then the formula returns the value 0. This is the standard way that these types of formulas are represented in mathematical textbooks.

  Here, x is equivalent to A19, DDLP is equivalent to $E$14, and μ_x is equivalent to $E$43. It can now be seen that the Excel formula and the formula in the documentation are equivalent.

Disclaimer

The actuarial model to which this document refers is for the exclusive use of the American Academy of Actuaries Health Insurance Rate Filing Task Force. It is intended solely as a tool to assist the task force in comparing potential financial outcomes of various scenarios and is not intended for any other use. The model should not be used for any other purpose nor by anyone other than the members of the task force. The assumptions in the model were chosen to represent general conditions; they are not necessarily appropriate to any particular company nor to any particular regulatory environment. The model complies with applicable Actuarial Standards of Practice.

Model User's Guide

The steps involved in using the model are as follows:

- **Prepare to use the model.**
  - Ensure that all six spreadsheets are saved to the same directory or folder of your hard drive.
  - It is advisable to have open only one of the spreadsheets Current Market.xls, Pre-Funding.xls, Individual Market Pool.xls, and Interblock Subsidy.xls at any time. Trying to open a second spreadsheet may result in a memory full error.
  - Do not open multiple copies of Exhibits.xls, even if you save one with a different filename. This may cause errors with the links between spreadsheets.
  - Ensure that you have Excel set up to calculate automatically. With any spreadsheet open, click on Tools on the menu bar, then click on Options and Calculation. If not already selected, click on Automatic, then click the OK button. If you do not do this, it will be necessary to recalculate manually (by hitting the F9 key) whenever "Calculate" appears at the bottom left of the screen.
  - Throughout the model, any hardcoded number can be changed, but formulas must not be changed.
  - Reasonable values should be used for all parameters. Using values that are mathematically impossible or actuarially unsound will invalidate the model output.
  - After making any changes in the Global Assumptions tab of the Global spreadsheet or in the Rate Compression Assumptions tab of the Interblock subsidy spreadsheet, run the "Set Profit Difference % to Zero" macro in Rate Compression Assumptions (see below).

- **Set the general assumptions applicable to all models.**
  - Open the Global spreadsheet.
  - Set the general assumptions applicable to all models in the Global Assumptions tab of the Global spreadsheet.
  - Although it appears that any sales pattern can be used by block and projection year, certain formulas within the model assume that block 1 sales occur <u>only</u> in years 1-3, block 2 sales occur <u>only</u> in years 4-6, etc. Consequently, the values in cells D7:D11 of Global Assumptions <u>must</u> be set equal to zero. Using any other value will invalidate the model output.
  - Save and close the Global spreadsheet.

- **Set the assumptions applicable only to the Current Market model.**
  - Open the Current Market spreadsheet.
  - Click on the "Yes" button to update links. If you do not do this, the changes that you made in Global will not be reflected in Current Market.
  - Do not make any changes to the Global Assumptions tab of Current Market. These assumptions are obtained automatically from the Global Assumptions tab of the Global spreadsheet.

  - Set the assumptions applicable only to the Current Market model in the Current Market Assumptions tab.
  - Ensure that the value of the Expected Premium in Current Market Assumptions!E15 is reasonably close to the first-year Company New Business Rate in CM-1!W12. If necessary, manually change the value of the Expected Premium.
  - Review the results in the Current Market-Summary tab.
  - Save and close the Current Market spreadsheet.

- **Set the assumptions applicable only to the Pre-Funding model.**
  - Open the Pre-Funding spreadsheet.
  - Click on the “Yes” button to update links. If you do not do this, the changes that you made in Global will not be reflected in Pre-Funding.
  - Do not make any changes to the Global Assumptions tab of Pre-Funding. These assumptions are obtained automatically from the Global Assumptions tab of the Global spreadsheet.
  - Set the assumptions applicable only to the Pre-Funding model in the DBPR Assumptions tab.
  - Ensure that the value of the Expected Premium in DBPR Assumptions!E10 is reasonably close to the first-year Company New Business Rate in DBPR-1!W12. If necessary, manually change the value of the Expected Premium.
  - Review the results in the Crude DBPR - Global tab.
  - Save and close the Pre-Funding spreadsheet.

- **Set the assumptions applicable only to the Individual Market Pool model.**
  - Open the Individual Market Pool spreadsheet.
  - Click on the “Yes” button to update links. If you do not do this, the changes that you made in Global will not be reflected in Individual Market Pool.
  - Do not make any changes to the Global Assumptions tab of Individual Market Pool. These assumptions are obtained automatically from the Global Assumptions tab of the Global spreadsheet.
  - Set the assumptions applicable only to the Individual Market Pool model in the IMP Assumptions tab.
  - Ensure that the value of the Expected Premium in IMP Assumptions!R43 is reasonably close to the first-year Company New Business Rate in IMP-1!W12. If necessary, manually change the value of the Expected Premium.
  - Review the results in the IMP – Global tab.
  - Save and close the Individual Market Pool spreadsheet.

Model User’s Guide

- **Set the assumptions applicable only to the Interblock Subsidy model.**
  - Note that the Interblock Subsidy spreadsheet contains four models: (1) a copy of the Current Market model; (2) a calendar-year pooling model; (3) a durational pooling model; and (4) a rate compression model. Each has its own assumptions tab and summary tab.
  - Open the Interblock Subsidy spreadsheet.
  - Click on the “Enable Macros” button to allow the macro in the Rate Compression model to be executed.
  - Click on the “Yes” button to update links. If you do not do this, the changes that you made in Global will not be reflected in Interblock Subsidy.
  - Do not make any changes to the Global Assumptions tab of Interblock Subsidy. These assumptions are obtained automatically from the Global Assumptions tab of the Global spreadsheet.
  - The Interblock Subsidy spreadsheet contains a copy of the Current Market model. This was used only for testing purposes when the Interblock Subsidy model was being developed. If desired, set the assumptions applicable only to the Current Market model in the Current Market Assump 5 blocks tab, again ensuring that all values are reasonable. The same assumptions as were used in the Current Market spreadsheet should be used here.
  - Review the Current Market results in the Current Market Summary 5 blocks tab.
  - Set the assumptions applicable only to calendar-year pooling in the IBS Assump CY pooling tab, ensuring that the Expected Premium at cell M15 is reasonable in relation to the first-year Company New Business Rate at IBS-1P!W12.
  - Review the calendar-year pooling results in the IBS CY Pooling Summary tab.
  - Set the assumptions applicable only to durational pooling in the IBS Assump DUR pooling tab, ensuring that the Expected Premium at cell M15 is reasonable in relation to the first-year Company New Business Rate at IBS-1D!W12.
  - Review the durational pooling results in the IBS DUR pooling Summary tab.
  - Set the assumptions applicable only to rate compression in the Rate Compression Assumptions tab.
  - Click on the “Set Profit Difference % to Zero” button to execute the macro, then wait until the macro has finished running (this may take over one minute). Note that if you did not click on the “Enable Macros” button when you opened the Interblock Subsidy spreadsheet, the macro will not execute and the rate compression results will not be valid. If you did not enable macros, save and close the spreadsheet and then re-open the spreadsheet, ensuring that you click on the “Enable Macros” button.
  - Review the rate compression results in the IBS Compression Summary tab.
  - Save and close the Interblock Subsidy spreadsheet.

- **View comparative results and graphs in the Exhibits spreadsheet.**
  - Open the Exhibits spreadsheet.
  - Click on the “Yes” button to update links. If you do not do this, the changes that you made in the other spreadsheets will not be reflected in Exhibits.
  - Click on the Global Summary tab. This tab contains results of 24 key parameters from the Current Market, Individual Market Pool, and Pre-Funding models, as well as from the durational pooling and rate compression models found in the Interblock Subsidy spreadsheet. Numerical values are presented in columns B:F, and values as a percentage of the Current Market value for the given projection year are presented in columns G:J. A graph of each parameter is also presented. Clicking on File and then Print will print the results, with one page for each of the 24 parameters.
  - Click on the Input tab. This tab presents the global assumptions and each model’s model-specific assumptions.
  - The last five tabs contain the results of each model. Except for the rate increases, these values were calculated in the spreadsheets Current Market, Pre-Funding, Individual Market Pool, and Interblock Subsidy.
  - Save and close the Exhibits spreadsheet.

Global.xls – Global Assumptions

Parameter Name and Symbol	**Cell(s)**	**Description**	**Value(s)**	**Source and Rationale**
Baseline New Sales ($BaseSales_x$)	D4:D11	Annual baseline new sales rates	Year 1: 3,000 Year 2: 3,000 Year 3: 3,000 Year 4: 0 Year 5: 0 Years 6-10: 0 Years 11-15: 0 Years 16-20: 0	This pattern represents that of a typical commercial carrier that has the ability to cancel policy forms and force subscribers to roll to new forms that have a longer horizon.
Market Price Sensitivity (MktPriceSens)	D14	Change in the tendency of consumers to stay in the market due to a change in the prevailing market new business rate	-0.4	Example: If in a given issue year, the market rate is 20% above the reference rate, baseline sales will be reduced by 8%.
Company Price Sensitivity (ComPriceSens)	D15	Change in the tendency of consumers to stay with the company due to a change in the company's new business rate relative to the market new business rate	-1.5	Example: If in a given issue year, the company's new business rate is 10% above the market new business rate, baseline sales will be reduced by 15%.
Base Trend (BaseTrend)	D18	Annual claim trend rate; excludes impact of leveraging, benefit changes, duration and aging	10.00%	
Leveraging Trend (LevTrend)	D19	Annual claim trend due to deductible leveraging	3.00%	

Global.xls – Global Assumptions

Parameter Name and Symbol	**Cell(s)**	**Description**	**Value(s)**	**Source and Rationale**
Benefit Buydown Trend (BenTrend)	D20	Annual claim trend due to tendency of policyholders to reduce benefits to partially offset rate increases.	-1.15%	The subgroup decided this was the simplest way to reflect this impact. Alternate methods were considered – using larger discount factor or adjusting per policy expenses.
Combined Trend (Trend)	D21	Annual claim trend due to the combined effect of base trend, leveraging trend and benefit changes	= [(1+BaseTrend)* (1+LevTrend) * (1+BenTrend)] -1	
Aging Trend (AgingTrend)	C22	Annual claim trend rate due solely to the impact of aging	3%	
Initial Reference Premium (InitRefPrem)	C24	Initial market new business rate; based on standard lives; excludes impact of duration	$135 PMPM	Premium roughly based on 65% lifetime loss ratio for Current Market model.
Premium Growth with Age (PremGrowthAge)	C25	Annual premium rate increase due solely to the impact of aging	3%	Assumed to be equal to Aging Trend.
Discount at Introduction (Disc@Intro)	D26	Percentage by which company's new business rate is less than Reference Premium in projection year 1 (i.e., at product introduction)	0%	

Global.xls – Global Assumptions

Parameter Name and Symbol	Cell(s)	Description	Value(s)	Source and Rationale
Base Standard Lives Lapse Rates ($Baseq_{x(st)}$)	D29:D33	Annual base lapse rates for standard lives	Year 1: 35% Year 2: 31% Year 3: 26% Year 4: 23% Years 5-30: 20%	
Base Standard Lives Lapse Rates Used in Pricing ($Baseq_{x(st, pr)}$)	E29:E33	Pricing assumption of annual base lapse rates for standard lives	Year 1: 35% Year 2: 31% Year 3: 26% Year 4: 23% Years 5-30: 20%	
Standard Lives Lapse Rate Adjustment due to Trend ($LapseAdjTrend_{st}$)	D36	Change in lapse rate of standard lives due to a premium rate increase in excess of claim trend	50%	Example: If in a given projection year for a given issue year the renewal rate increase exceeds claim trend by 4%, standard life lapses will be 2% greater than they otherwise would have been.
Standard Lives Lapse Rate Adjustment due to Market Conditions ($LapseAdjMkt_{st}$)	D37	Change in lapse rate of standard lives due to renewal rates exceeding market new business rates	25%	Example: If in a given projection year for a given issue year the company's renewal rate exceeds the market new business rate by 10%, standard life lapses will be 2.5% greater than they otherwise would have been.

Global.xls – Global Assumptions

Parameter Name and Symbol	**Cell(s)**	**Description**	**Value(s)**	**Source and Rationale**
Standard Lives Lapse Rate Adjustment due to Mix of Sales ($LapseAdjSale_{st}$)	D38	Change in lapse rate of standard lives due to impact of new business rates exceeding reference premiums, which affects the mix of purchasers expecting to need coverage for the short term rather than the long term	7%	Example: If in a given projection year for a given issue year the company's new business rate exceeds the reference rate by 10%, standard life lapses will be 0.7% greater than they otherwise would have been.
Maximum Standard Lives Lapse Rate ($q_{max(st)}$)	D39	Maximum annual lapse rate of standard lives	80%	
Minimum Standard Lives Lapse Rate ($q_{min(st)}$)	D40	Minimum annual lapse rate of standard lives	15%	
Probability of Becoming Impaired (μ_x)	E43:E47	Annual rate at which standard lives become impaired	Year 1: 0.40% Year 2: 0.80% Year 3: 1.20% Year 4: 1.60% Years 5-30: 1.80%	
Initial Reference Claim Cost for Standard Lives ($InitRefClaims_{st}$)	D49	Claim cost for standard lives in projection year 1	$90 PMPM	

Global.xls – Global Assumptions

Parameter Name and Symbol	**Cell(s)**	**Description**	**Value(s)**	**Source and Rationale**
Morbidity Adjustment due to Mix of Sales ($MorbAdj_{st}$)	D51	Change in claim cost for standard lives due to impact of the company's new business rates exceeding reference premiums, which is assumed to result in slightly older, less healthy purchasers	25%	Example: If in a given projection year the company's new business rate exceeds the reference premium by 4%, standard life claim costs will be 1% greater than they otherwise would have been.
Base Impaired Lives Lapse Rate ($Baseq_{im}$)	C54	Annual base lapse rate for impaired lives	12%	
Base Impaired Lives Lapse Rate Used in Pricing ($Baseq_{im(pr)}$)	D54	Pricing assumption of annual base lapse rate for impaired lives	12%	
Impaired Lives Lapse Rate Adjustment due to Trend ($LapseAdjTrend_{im}$)	D56	Change in lapse rate of impaired lives due to a premium rate increase in excess of claim trend	25%	See example under Standard Lives Lapse Rate Adjustment due to Trend, above.
Maximum Impaired Lives Lapse Rate ($q_{max(im)}$)	D57	Maximum annual lapse rate of impaired lives	50%	
Minimum Impaired Lives Lapse Rate ($q_{min(im)}$)	D58	Minimum annual lapse rate of impaired lives	5%	

Global.xls – Global Assumptions

Parameter Name and Symbol	**Cell(s)**	**Description**	**Value(s)**	**Source and Rationale**
Initial Reference Claim Cost for Impaired Lives ($InitRefClaims_{im}$)	D60	Claim cost for impaired lives in projection year 1	$375 PMPM	
Interest (int)	B63	Annual interest rate; used in present value calculations	5%	
Inflation (Inflation)	B64	Annual inflation rate; used in per policy expense calculations	4%	
Per Policy Expense Rate (Exp_{Pol})	B70:B74	Policy expenses PMPM	Year 1: $28.00 Year 2: 3.50 Year 3: 3.50 Year 4: 3.50 Years 5-30: 3.50	
Percentage-of-Claims Expense Rate ($Exp_{\%C}$)	C70:C74	Expense rate as a percentage of claims	Year 1: 7.0% Year 2: 7.0% Year 3: 6.5% Year 4: 6.0% Years 5-30: 5.0%	
Base Commission Rate ($Comm_B$)	D70:D74	Commission rate as a percentage of base premium (i.e., premium at time of initial sale)	Year 1: 30.0% Year 2: 12.0% Year 3: 12.0% Year 4: 12.0% Years 5-30: 7.5%	

Global.xls – Global Assumptions

Parameter Name and Symbol	Cell(s)	Description	Value(s)	Source and Rationale
Renewal Commission Rate ($Comm_R$)	E70:E74	Commission rate as a percentage of renewal rate increase	Year 1: 0.0% Year 2: 0.0% Year 3: 0.0% Year 4: 0.0% Years 5-30: 0.0%	Common practice is to pay commission on base amounts only, not on renewal increases.
Other Premium-Related Expense Rate ($Exp_{Oth\%P}$)	F70:F74	Expense rate as a percentage of premium	Year 1: 7.5% Year 2: 7.5% Year 3: 7.5% Year 4: 7.5% Years 5-30: 7.5%	Includes 2.5% premium tax and 5.0% overhead.
Duration Factors (DF)	B77:B81	Factor applied to claim cost to reflect the impact of duration	Year 1: 0.65 Year 2: 0.80 Year 3: 0.90 Year 4: 1.00 Years 5-30: 1.00	
Allocated Capital as Percentage of Premiums (RBC%)	D83	Allocated capital as a percentage of premium	24.00%	
Opportunity Cost of Capital (OCC%)	D84	Spread representing lost earnings on allocated capital	5.00%	

Global.xls – Global Assumptions

Parameter Name and Symbol	Cell(s)	Description	Value(s)	Source and Rationale
Regulatory Dampening of Rate Increases (RegDamp)	D90:D99	Factor applied to rate increases to reflect the impact of the regulatory approval process	Requested Rate Increase Range / Dampening Factor 0% to 10%: 100.0% 10% to 20%: 95.0% 20% to 30%: 85.0% 30% to 40%: 80.0% 40% to 50%: 75.0% 50% to 60%: 70.0% 60% to 70%: 65.0% 70% to 80%: 60.0% 80% to 90%: 55.0% 90% or greater: 50.0%	For a requested rate increase at the boundary of two ranges, the lower of the two dampening factors is used. For example, for a requested rate increase of exactly 20%, the dampening factor used is 85% rather than 95%. Note that the calculations in cells F90:F99 are extraneous.
Maximum Rate Increase (MaxRateInc)	D100	Maximum rate increase that will receive regulatory approval	50%	
Trend Scenario Number (TrendScen)	C102	Parameter to indicate which of the ten predefined trend patterns is to be used	1	Scenario 1 is the default scenario and reflects a flat 12% annual trend.
Trend Scenario Name	B105	Name of the selected trend scenario	From the appropriate cell in Trend Scenarios!B8:K8	

Global.xls – Global Assumptions

Parameter Name and Symbol	Cell(s)	Description	Value(s)	Source and Rationale
Actual Trend ($ActTrend_z$)	B106: B135	Actual trend by projection year, normalized to the value of Combined Trend from cell D21	= Trend / 12% * $ScenTrend_z$ $ScenTrend_z$ is from the appropriate cell of Trend Scenarios!B9:K38	Several different trend patterns are shown in the Trend Scenarios tab. These were developed assuming a base trend of 12%. If it is determined that the base trend assumption should be changed to something other than 12%, these scenario trend values will be rescaled accordingly by this formula.
Year of Introduction ($IntroYr_b$)	Q7:Q11	First year of issue for the given block	Block 1: 1 Block 2: 4 Block 3: 7 Block 4: 10 Block 5: 13	
Baseline New Sales ($BaseSales_x$)	O15:O44	Annual baseline new sales rate	For projection years 1-20, from the appropriate cell of D4:D11. For projection years 21-30, hardcoded as 0.	
Base Sales by Projection Year by Block ($BaseSales_{z,b}$)	P15:T44	Annual baseline new sales rate in a given projection year for a given block	$= \begin{cases} 0, & z < IntroYr_b \\ BaseSales_{z-IntroYr(b)+1}, & z \geq IntroYr_b \end{cases}$	

Global.xls – Duration

Cells	Description	Formula	Comments
B7: B36	Base Lapse Rate for Standard Lives ($Baseq_{x(st)}$)	From the appropriate cell of Global Assumptions!D29:D33	In cells B7:M36, rows represent durations x = 1, 2, 3, …, 30.
C7:C36	Base Lapse Rate for Impaired Lives ($Baseq_{x(im)}$)	From Global Assumptions!C54	
D7:D36	Rate of Impairment (μ_x)	From the appropriate cell of Global Assumptions!E43:E47	
E7:E36	Number of Standard Lives ($l_{x(st)}$)	= 10,000, x = 1 $l_{x-1(st)} * (1-\mu_{x-1}) * (1 - Baseq_{x-1(st)})$, x = 2, 3, 4, …, 30 μ_{x-1} is from the appropriate cell of Global Assumptions!E43:E47	
F7:F36	Number of Impaired Lives ($l_{x(im)}$)	= 0, x = 1 $[l_{x-1(im)} * (1-Baseq_{x-1(im)})] + (l_{x-1(st)} * \mu_{x-1})$, x = 2, 3, 4, …, 30	
G7:G36	Total Number of Lives (l_x)	$= l_{x(st)} + l_{x(im)}$	
H7:H36	Total Base Lapse Rate	$= 1 - (l_{x+1} / l_x)$	
I7:I36	Duration Factors (DF_x)	From the appropriate cell of Global Assumptions!B77:B81	

Global.xls – Duration

Cells	Description	Formula	Comments
J7:J36	Annual Claim Costs of Standard Lives ($C_{x(st)}$)	= $InitRefClaims_{st}$ * DF_x $InitRefClaims_{st}$ is from Global Assumptions!D49	
K7:K36	Annual Claim Costs of Impaired Lives ($C_{x(im)}$)	= $InitRefClaims_{im}$ $InitRefClaims_{im}$ from Global Assumptions!D60	
L7:L36	Weighted Average Annual Claim Costs ($C_{x(avg)}$)	= $[(l_{x(st)} * C_{x(st)}) + (l_{x(im)} * C_{x(im)})] / l_x$	
M7:M36	Relative Claim Cost ($C_{x(rel)}$)	= $C_{x(avg)}$ / $InitRefClaims_{st}$ $InitRefClaims_{st}$ is from Global Assumptions!D49	Shows combined impact of duration and lapsation.
O7:O36	Relative Claim Cost as a Percentage of First-Year Relative Claim Cost	= $C_{x(rel)} / C_{1(rel)}$	
P7:P36	Relative Claim Cost as a Percentage of Third-Year Relative Claim Cost	= $C_{x(rel)} / C_{3(rel)}$	

Global.xls – Trend Scenarios

Year	Medium	High	Low	Jump	Drop	Peak	Valley	CyclicA	CyclicB	Medical CPI + 5% History
1	12.0%	18.0%	6.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	9.6%
2	12.0%	18.0%	6.0%	12.0%	12.0%	13.0%	11.0%	15.0%	9.0%	8.3%
3	12.0%	18.0%	6.0%	12.0%	12.0%	14.0%	10.0%	18.0%	6.0%	10.3%
4	12.0%	18.0%	6.0%	12.0%	12.0%	15.0%	9.0%	15.0%	9.0%	17.6%
5	12.0%	18.0%	6.0%	12.0%	12.0%	16.0%	8.0%	12.0%	12.0%	14.8%
6	12.0%	18.0%	6.0%	18.0%	6.0%	17.0%	7.0%	9.0%	15.0%	15.0%
7	12.0%	18.0%	6.0%	18.0%	6.0%	18.0%	6.0%	12.0%	12.0%	13.9%
8	12.0%	18.0%	6.0%	18.0%	6.0%	19.0%	5.0%	15.0%	9.0%	13.8%
9	12.0%	18.0%	6.0%	18.0%	6.0%	20.0%	4.0%	18.0%	6.0%	15.1%
10	12.0%	18.0%	6.0%	18.0%	6.0%	19.0%	5.0%	15.0%	9.0%	14.9%
11	12.0%	18.0%	6.0%	18.0%	6.0%	18.0%	6.0%	12.0%	12.0%	17.5%
12	12.0%	18.0%	6.0%	18.0%	6.0%	17.0%	7.0%	9.0%	15.0%	16.0%
13	12.0%	18.0%	6.0%	18.0%	6.0%	16.0%	8.0%	12.0%	12.0%	11.4%
14	12.0%	18.0%	6.0%	18.0%	6.0%	15.0%	9.0%	15.0%	9.0%	11.1%
15	12.0%	18.0%	6.0%	18.0%	6.0%	14.0%	10.0%	18.0%	6.0%	11.8%
16	12.0%	18.0%	6.0%	18.0%	6.0%	13.0%	11.0%	15.0%	9.0%	12.7%
17	12.0%	18.0%	6.0%	18.0%	6.0%	12.0%	12.0%	12.0%	12.0%	10.8%
18	12.0%	18.0%	6.0%	18.0%	6.0%	12.0%	12.0%	9.0%	15.0%	11.9%
19	12.0%	18.0%	6.0%	18.0%	6.0%	12.0%	12.0%	12.0%	12.0%	13.5%
20	12.0%	18.0%	6.0%	18.0%	6.0%	12.0%	12.0%	15.0%	9.0%	14.6%
21	12.0%	18.0%	6.0%	18.0%	6.0%	12.0%	12.0%	18.0%	6.0%	12.9%
22	12.0%	18.0%	6.0%	18.0%	6.0%	12.0%	12.0%	15.0%	9.0%	11.6%
23	12.0%	18.0%	6.0%	18.0%	6.0%	12.0%	12.0%	12.0%	12.0%	10.4%
24	12.0%	18.0%	6.0%	18.0%	6.0%	12.0%	12.0%	9.0%	15.0%	9.9%
25	12.0%	18.0%	6.0%	18.0%	6.0%	12.0%	12.0%	12.0%	12.0%	8.9%
26	12.0%	18.0%	6.0%	18.0%	6.0%	12.0%	12.0%	15.0%	9.0%	8.0%
27	12.0%	18.0%	6.0%	18.0%	6.0%	12.0%	12.0%	18.0%	6.0%	7.8%
28	12.0%	18.0%	6.0%	18.0%	6.0%	12.0%	12.0%	15.0%	9.0%	8.4%
29	12.0%	18.0%	6.0%	18.0%	6.0%	12.0%	12.0%	12.0%	12.0%	8.7%
30	12.0%	18.0%	6.0%	18.0%	6.0%	12.0%	12.0%	9.0%	15.0%	9.2%

Current Market.xls – Global Assumptions

The Global Assumptions tab within the Current Markets spreadsheet is an exact copy of the analogous tab in the Global spreadsheet. The field names, cell numbers, and values are identical. If a change is made in the Global Assumptions tab of the Global spreadsheet, the Global Assumptions tabs of all other spreadsheets in the model will be updated automatically the next time they are opened.

Current Market.xls – Current Market Assumptions

Cells	**Description**	**Formula**	**Comments**
E4	Target Lifetime Loss Ratio (TargetLR)	= 65.0%	Hardcoded value
E5	Maximum Allowable Loss Ratio (MaxLR)	= 200.0%	Hardcoded value
J6:J10	Durational Rate Increase (DRI_x)	Renewal 1 (x = 2): 5% Renewal 2 (x = 3): 5% Renewal 3 (x = 4): 5% Renewal 4 (x = 5): 5% Renewals 5-29 (x = 6, 7, 8, …, 30): 0%	Hardcoded values; represents the additional rate increase needed each year due to anticipated wearoff of underwriting
D7	Flag to Include Trend (TrendFlag)	= 1	Hardcoded value; value of 1 means to include trend in projections, value of 0 means to exclude trend.
D11	Initial Reference Claim Cost for Standard Lives ($InitRefClaims_{st}$)	From Global Assumptions!D49	Best estimate of starting claim costs for standard lives

Current Market.xls – Current Market Assumptions

Cells	**Description**	**Formula**	**Comments**
F11	Pricing Assumption of Initial Reference Claim Cost for Standard Lives ($InitRefClaims_{st(pr)}$)	$= InitRefClaims_{st}$	Standard lives starting claim costs used in initial pricing; the model provides the flexibility to adjust the baseline claims for use in pricing, but the model currently does not make any such adjustment.
D12	Initial Reference Claim Cost for Impaired Lives ($InitRefClaims_{im}$)	From Global Assumptions!D60	Best estimate of starting claim costs for impaired lives
F12	Pricing Assumption of Initial Reference Claim Cost for Impaired Lives ($InitRefClaims_{im(pr)}$)	$= InitRefClaims_{im}$	Impaired lives starting claim costs used in initial pricing; the model provides the flexibility to adjust the baseline claims for use in pricing, but the model currently does not make any such adjustment.

Current Market.xls – Current Market Assumptions

Cells	Description	Formula	Comments
E14	Durational Deterioration Limitation Period (DDLP)	= 5	Hardcoded value; period during which the probability of a standard life becoming impaired is assumed to be greater than zero for pricing purposes
E15	Expected Premium Rate (ExpPrem)	= $126	Hardcoded value; this represents the company's targeted new business rate.
B19:B48	Standard Lives Base Lapse Rates Used in Pricing ($q_{x(st, pr)}$)	= max{$q_{min(st)}$, min[$q_{max(st)}$, Base$q_{x(st)}$ + (((PAF_{x+1} / PAF_x * $AccumDRI_{x+1}$ / $AccumDRI_x$) – 1) * $LapseAdjTrend_{st}$) + (($AccumDRI_{x+1}$ -1) * $LapseAdjMkt_{st}$)]} $q_{min(st)}$ is from Global Assumptions!D40 $q_{max(st)}$ is from Global Assumptions!D39 Base$q_{x(st, pr)}$ is from the appropriate cell of Global Assumptions!E29:E33 $LapseAdjTrend_{st}$ is from Global Assumptions!D36 $LapseAdjMkt_{st}$ is from Global Assumptions!D37	Baseline standard lives lapse rates adjusted to reflect higher anticipated lapses due to rate increases exceeding claim trend and renewal rates exceeding the market new business rate

Current Market.xls – Current Market Assumptions

Cells	Description	Formula	Comments
C19:C48	Impaired Lives Base Lapse Rates Used in Pricing ($q_{x(im, pr)}$)	= $\max\{q_{min(im)}, \min[q_{max(im)}, Baseq_{x(im)} + (DRI_{x+1} * LapseAdjTrend_{im}),$ $x \leq DDLP$ $q_{x(st, pr)},$ $x > DDLP$ $q_{min(im)}$ is from Global Assumptions!D58 $q_{max(im)}$ is from Global Assumptions!D57 $Baseq_{x(im)}$ is from Global Assumptions!C54 $LapseAdjTrend_{im}$ is from Global Assumptions!D56	Baseline impaired lives lapse rates adjusted to reflect higher anticipated lapses due to rate increases exceeding claim trend during durational deterioration limitation period; beyond DDLP, impaired lives lapse rates are equal to standard lives lapse rates.
D19:D48	Probability of Becoming Impaired Used in Pricing ($\mu_{x(pr)}$)	= $\mu_x,$ $x \leq DDLP$ $0,$ $x > DDLP$ μ_x is from the appropriate cell of Global Assumptions!E43:E47	
E19:E48	Number of Standard Lives ($l_{x(st)}$)	= $1,$ $x = 1$ $l_{x-1(st)} * (1 - \mu_{x-1(pr)}) * (1 - q_{x-1(st, pr)}),$ $x = 2, 3, 4, \ldots, 30$	The values in columns E, F, and G represent proportions of the number of first-year standard lives.
F19:F48	Number of Impaired Lives ($l_{x(im)}$)	= $0,$ $x = 1$ $[l_{x-1(im)} * (1 - q_{x-1(im, pr)})] + (l_{x-1(st)} * \mu_{x-1(pr)}),$ $x = 2, 3, 4, \ldots, 30$	

Current Market.xls – Current Market Assumptions

Cells	**Description**	**Formula**	**Comments**
G19:G48	Number of Total Lives (l_x)	$= l_{x(st)} + l_{x(im)}$	
H19:H48	Accumulated Trend ($AccumTrend_x$)	$=$ 1, $x = 1$ $AccumTrend_{x-1}$ * [1 + (Trend * TrendFlag)], $x = 2, 3, 4, \ldots, 30$ Trend is from Global Assumptions!D21	
I19:I48	Discount Factor (v_x)	$=$ 1, $x = 1$ $v_{x-1}/(1 + int)$, $x = 2, 3, 4, \ldots, 30$	
J19:J48	Premium Age Factor (PAF)	$=$ 1, $x = 1$ PAF_{x-1} * (1 + PremGrowthAge), $x = 2, 3, 4, \ldots, 30$ PremGrowthAge is from Global Assumptions!C25	A 31^{st}-year value is needed for the calculation of $q_{30(st,\ pr)}$.

Current Market.xls – Current Market Assumptions

Cells	Description	Formula	Comments
K19:K48	Pricing Claims ($C_{x(pr)}$)	$= \{[\text{InitRefClaims}_{st(pr)} * (1 + ((\text{ExpPrem} / \text{InitRefPrem}) - 1) * \text{MorbAdj}_{st}) * DF_x * l_{x(st)})] + (\text{InitRefClaims}_{im(pr)} * l_{x(im)})\} * PAF_x * \text{AccumTrend}_x, \quad x \leq DDLP$ $\{[\text{InitRefClaims}_{st(pr)} * (1 + ((\text{ExpPrem} / \text{InitRefPrem}) - 1) * \text{MorbAdj}_{st}) * l_{x(st)})] + (\text{InitRefClaims}_{im(pr)} * l_{x(im)})\} * PAF_x * \text{AccumTrend}_x, \quad x > DDLP$ InitRefPrem is from Global Assumptions!C24 MorbAdj_{st} is from Global Assumptions!D51 DF_x is from the appropriate cell of CM-1!D12:D41	Standard lives' claims are adjusted each year for morbidity, duration (within the DDLP), aging, and trend. Impaired lives' claims are adjusted each year for aging and trend.
L19:L48	Annual Durational Rate Increase ($ADRI_x$)	$= 0, \quad x = 1$ $DRI_x, \quad x = 2, 3, 4, \ldots, 30$	
M19:M49	Accumulated Durational Rate Increase Factor (AccumDRI_x)	$= 1, \quad x = 1$ $\text{AccumDRI}_{x-1} * (1 + ADRI_x), \quad x = 2, 3, 4, \ldots, 31$	A 31st-year value is needed for the calculation of $q_{30(st,\, pr)}$.
N19:N48	Pricing Premium ($P_{x(pr)}$)	$= l_1 * \sum_{i=1}^{30} (C_{i(pr)} * v_i) / \sum_{j=1}^{30} (l_j * PAF_j * \text{AccumTrend}_j * v_j * \text{AccumDRI}_j) / \text{TargetLR}, \quad x = 1$ $P_{1(pr)} / l_1 * PAF_x * l_x * \text{AccumTrend}_x * ADRI_x / ADRI_1, \quad x = 2, 3, 4, \ldots, 30$	

Current Market.xls – Current Market Assumptions

Cells	Description	Formula	Comments
O19:O48	Pricing Loss Ratio ($LR_{x(pr)}$)	$= C_{x(pr)} / P_{x(pr)}$	
P19:P48	Pricing Expenses ($Exp_{x(pr)}$)	$= l_x * Exp_{Pol(x)} * (1 + \text{Inflation})^{x-1}$ $+ Exp_{\%C(x)} * C_{x(pr)}$ $+ Comm_{B(x)} * P_{1(pr)} / l_1 * l_x$ $+ Comm_{R(x)} * [P_{x(pr)} - (P_{1(pr)} / l_1 * l_x)]$ $+ Exp_{Oth\%P(x)} * P_{x(pr)}$ $Exp_{Pol(x)}$ is from the appropriate cell of CM-1!E12:E41 Inflation is from Global Assumptions!B64 $Exp_{\%C(x)}$ is from the appropriate cell of CM-1!F12:F41 $Comm_{B(x)}$ is from the appropriate cell of CM-1!G12:G41 $Comm_{R(x)}$ is from the appropriate cell of CM-1!H12:H41 $Exp_{Oth\%P(x)}$ is from the appropriate cell of CM-1!I12:I41	
Q19:Q48	Pricing Expense as a Percentage of Pricing Premium	$= Exp_{x(pr)} / P_{x(pr)}$	
R19:R48	Pricing Operating Gain ($Gain_{x(pr)}$)	$= P_{x(pr)} - C_{x(pr)} - Exp_{x(pr)}$	

Current Market.xls – Current Market Assumptions

Cells	Description	Formula	Comments
S19:S48	Pricing Gain as a Percentage of Pricing Premium	$= Gain_{x(pr)} / P_{x(pr)}$	
K50	Simple Sum of Pricing Claims (SumClaims)	$= \sum_{x=1}^{30} C_{x(pr)}$	
N50	Simple Sum of Pricing Premiums (SumPrem)	$= \sum_{x=1}^{30} P_{x(pr)}$	
O50	Pricing Loss Ratio, Using Simple Sums	= SumClaims / SumPrem	
P50	Simple Sum of Pricing Expenses (SumExp)	$= \sum_{x=1}^{30} Exp_{x(pr)}$	
Q50	Pricing Expense Ratio, Using Simple Sums	= SumExp / SumPrem	
R50	Simple Sum of Pricing Gains (SumGain)	$= \sum_{x=1}^{30} Gain_{x(pr)}$	

Current Market.xls – Current Market Assumptions

Cells	Description	Formula	Comments
S50	Pricing Gain Ratio, Using Simple Sums	= SumGain / SumPrem	
K51	Present Value of Pricing Claims over 10 Years ($PVClaims_{10}$)	$= NPV_{int}(C_{x(pr)}) * \sqrt{1+\text{int}}$, where NPV is taken over x = 1, 2, 3, ….10	
N51	Present Value of Pricing Premiums over 10 Years ($PVPrem_{10}$)	$= NPV_{int}(P_{x(pr)}) * \sqrt{1+\text{int}}$, where NPV is taken over x = 1, 2, 3, ….10	
O51	Pricing Loss Ratio, Using 10-Year NPVs	$= PVClaims_{10} / PVPrem_{10}$	
P51	Present Value of Pricing Expenses over 10 Years ($PVExp_{10}$)	$= NPV_{int}(Exp_{x(pr)}) * \sqrt{1+\text{int}}$, where NPV is taken over x = 1, 2, 3, ….10	
Q51	Pricing Expense Ratio, Using 10-Year NPVs	$= PVExp_{10} / PVPrem_{10}$	
R51	Present Value of Pricing Gains over 10 Years ($PVGain_{10}$)	$= NPV_{int}(Gain_{x(pr)}) * \sqrt{1+\text{int}}$, where NPV is taken over x = 1, 2, 3, ….10	
S51	Pricing Gain Ratio, Using 10-Year NPVs	$= PVGain_{10} / PVPrem_{10}$	

Current Market.xls – Current Market Assumptions

Cells	**Description**	**Formula**	**Comments**
K52	Present Value of Pricing Claims over 30 Years ($PVClaims_{30}$)	$= NPV_{int}\ (C_{x(pr)}) * \sqrt{1+int}$, where NPV is taken over x = 1, 2, 3, ….30	
N52	Present Value of Pricing Premiums over 30 Years ($PVPrem_{30}$)	$= NPV_{int}\ (P_{x(pr)}) * \sqrt{1+int}$, where NPV is taken over x = 1, 2, 3, ….30	
O52	Pricing Loss Ratio, Using 30-Year NPVs	$= PVClaims_{30}\ /\ PVPrem_{30}$	
P52	Present Value of Pricing Expenses over 30 Years ($PVExp_{30}$)	$= NPV_{int}\ (Exp_{x(pr)}) * \sqrt{1+int}$, where NPV is taken over x = 1, 2, 3, ….30	
Q52	Pricing Expense Ratio, Using 30-Year NPVs	$= PVExp_{30}\ /\ PVPrem_{30}$	
R52	Present Value of Gains over 30 Years ($PVGain_{30}$)	$= NPV_{int}\ (Gain_{x(pr)}) * \sqrt{1+int}$, where NPV is taken over x = 1, 2, 3, ….30	
S52	Pricing Gain Ratio, Using 30-Year NPVs	$= PVGain_{30}\ /\ PVPrem_{30}$	

Current Market.xls – Current Market Assumptions

Cells	**Description**	**Formula**	**Comments**
K53	PV of Pricing Claims as a Percentage of PV of Pricing Premium	$= PVClaims_{30} / PVPrem_{30}$	Model calculations produce a stream of premiums such that this is equal to the target lifetime loss ratio.
N53	PV of Pricing Premium as a Percentage of PV of Pricing Premium	$= PVPrem_{30} / PVPrem_{30}$	Identically equal to 1.000.
P53	PV of Pricing Expenses as a Percentage of PV of Pricing Premium	$= PVExp_{30} / PVPrem_{30}$	
R53	PV of Pricing Gain as a Percentage of PV of Pricing Premium	$= PVGain_{30} / PVPrem_{30}$	
G54	Interest (int)	From Global Assumptions!B63	
V19:Z48	Composite Expected Loss Ratio by Block by Projection Year ($ExpectedLR_{z,b}$)	= the z^{th} value in the array of composite loss ratios for the b^{th} block, where z is the projection year and b is the block number; the arrays of composite loss ratio are found in cells AB51:BE51, BG51:CJ51, CL51:DO51, DQ51:ET51, and EV51:FY51 for blocks 1, 2, 3, 4, and 5, respectively.	

Current Market.xls – Current Market Assumptions

Cells	Description	Formula	Comments
AB19:BE48	Expected Premium Inforce at Age Adjusted Premium Rates by Cohort for Block 1 ($ExpInforce_{z,x,1}$)	$= \begin{cases} 0, & y < 1 \text{ or } y > 20 \\ AgeAdjPremRate_{z,y,1} * (l_{z,y,1(st)} + l_{z,y,1(im)}), & \text{otherwise} \end{cases}$ $AgeAdjPremRate_{z,y,1}$ is from the appropriate cell CM-1!BT89:CM118 $l_{z,y,1(st)}$ is from the appropriate cell of CM-1!AA51:AU80 $l_{z,y,1(im)}$ is from the appropriate cell of CM-1!AA89:AU118	Note that in this table, columns represent projection years, rows represent durations, and diagonals represent issue years.
AB51:BE51	Composite Expected Loss Ratio by Projection Year for Block 1	$= \begin{cases} 0, & \sum_{x=1}^{30} ExpInforce_{z,x,1} = 0 \\ (\sum_{i=1}^{30} ExpInforce_{z,i,1} * LR_{i(pr)}) / \sum_{j=1}^{30} ExpInforce_{z,j,1}, & \text{otherwise} \end{cases}$	

Analogous calculations are performed for blocks 2-5 in cells BG19:FY51.

Current Market.xls – Current Market-Summary

Cells	Description	Formula	Comments
D6	Initial Reference Premium	From Global Assumptions!C24	
D7	Initial Reference Claim Cost for Standard Lives	From Global Assumptions!D49	
D8	Initial Reference Claim Cost for Impaired Lives	From Global Assumptions!D60	
B12:B41	Base Lapse Rates for Standard Lives	From the appropriate cell of Global Assumptions!D29:D33	
C12:C41	Base Lapse Rates for Impaired Lives	From Global Assumptions!C54	
D12:D41	Duration Factor	From the appropriate cell of Global Assumptions!D77:D81	
E12:E41	Per Policy Expense Rates	From the appropriate cell of Global Assumptions!B70:B74	
F12:F41	Percentage-of-Claims Expense Rates	From the appropriate cell of Global Assumptions!C70:C74	
G12:G41	Base Commission Rates	From the appropriate cell of Global Assumptions!D70:D74	
H12:H41	Renewal Commission Rates	From the appropriate cell of Global Assumptions!E70:E74	
I12:I41	Other Premium-Related Expense Rate	From the appropriate cell of Global Assumptions!F70:F74	

Current Market.xls – Current Market-Summary

Cells	**Description**	**Formula**	**Comments**
J12:J41	Premium Age Factor (PAF_x)	$= 1$, $x = 1$ PAF_{x-1} * (1 + PremGrowthAge), $x = 2, 3, 4, \ldots, 30$ PremGrowthAge is from Global Assumptions!C25	
K12:K41	Rate of Impairment	From the appropriate cell of Global Assumptions!E43:E47	
L12:L41	Durational Rate Increase	From the appropriate cell of Current Market Assumptions!L19:L48	
O12:O41	Actual Trend ($ActTrend_z$)	From the appropriate cell of Global Assumptions!B106:B135	
P12:P41	Market New Business Rate ($MarketRate_z$)	$= P_{1(pr)} / l_1$, $z = 1$ $MarketRate_{z-1}$ * (1 + $ActTrend_{z-1}$), $z = 2, 3, 4, \ldots, 30$ $P_{1(pr)}$ is from Current Market Assumptions!N19 l_1 is from Current Market Assumptions!G19	
Q12:Q41	Company New Business Rate	$= \sum_{b=1}^{5} ComNewBusnRate_{z,b}$ Note: In this and subsequent formulas on the Current Market-Summary tab, whenever a sum is taken over the five blocks, the values are taken from tab CM-1 for the first block, from tab CM-2 for the second block, etc.	Sum of premium for projection year z across all five blocks; this and other aggregations of premium rates and lapse rates across blocks implicitly assume that the blocks do not overlap.

Current Market.xls – Current Market-Summary

Cells	Description	Formula	Comments
T12:AM41	Aggregate New Business Sales by Cohort ($AggSales_{z,y}$)	$= \sum_{b=1}^{5} Sales_{z,y,b}$	
T42:AM42	Aggregate New Business Sales for Issue Year y	$= \sum_{z=1}^{30} AggSales_{z,y}$	
AP12:BI41	Aggregate Actual Lapse Rates for Standard Lives by Cohort	$= \sum_{b=1}^{5} q_{z,y,b(st)}$	
BL12:CE41	Aggregate Newly Impaired Lives by Cohort ($AggNewImpLives_{z,y}$)	$= \sum_{b=1}^{5} NewImpLives_{z,y,b}$	
BL42:CE42	Aggregate Newly Impaired Lives for Issue Year y	$= \sum_{z=1}^{30} AggNewImpLives_{z,y}$	
T51:AM80	Aggregate Enrollment of Standard Lives by Cohort ($Aggl_{z,y(st)}$)	$= \sum_{b=1}^{5} l_{z,y,b(st)}$	
T81:AM81	Aggregate Enrollment of Standard Lives for Issue Year y	$= \sum_{z=1}^{30} l_{z,y(st)}$	

Current Market.xls – Current Market-Summary

Cells	Description	Formula	Comments
AP51:BI80	Aggregate Actual Lapse Rates of Impaired Lives by Cohort	$= \sum_{b=1}^{5} q_{z,y,b(im)}$	
BL51:CE80	Aggregate Combined Actual Lapse Rates by Cohort	$= \sum_{b=1}^{5} q_{z,y,b}$	
T89:AM118	Aggregate Enrollment of Impaired Lives by Cohort ($l_{z,y(im)}$)	$= \sum_{b=1}^{5} l_{z,y,b(im)}$	
T119:AM119	Aggregate Enrollment of Impaired Lives for Issue Year y	$= \sum_{z=1}^{30} l_{z,y(im)}$	
AP89:BI118	Aggregate Premium Rates after Durational Adjustment but Before Age Adjustment, by Cohort	$= \sum_{b=1}^{5} \text{DurAdjPremRate}_{z,y,b}$	
BL89:CE118	Aggregate Age-Adjusted Premium Rates by Cohort ($\text{AggAgeDurAdjPrem}_{z,y}$)	$= \sum_{b=1}^{5} \text{AgeDurAdjPrem}_{z,y,b}$	
T126:AM155	Aggregate Age-Adjusted Market New Business Premium Rates by Cohort	$= \sum_{b=1}^{5} \text{AgeAdjMktNewBusnRate}_{z,y,b}$	

Current Market.xls – Current Market-Summary

Cells	Description	Formula	Comments
AP126:BI155	Aggregate Standard Lives Claim Levels by Cohort ($AggClaims_{z,y(st)}$)	$= \sum_{b=1}^{5} C_{z,y,b(st)}$	
BL126:CE126	Aggregate Impaired Lives Claim Levels by Cohort ($AggClaims_{z,y(im)}$)	$= \sum_{b=1}^{5} C_{z,y,b(im)}$	
T164:AM193	Aggregate Standard Lives Expense Levels by Cohort ($AggExp_{z,y(st)}$)	$= \sum_{b=1}^{5} Exp_{z,y,b(st)}$	
AP164:BI193	Aggregate Impaired Lives Expense Levels by Cohort ($AggExp_{z,y(im)}$)	$= \sum_{b=1}^{5} Exp_{z,y,b(im)}$	
BL164:CE193	Aggregate Average Expense Levels by Cohort	$= \sum_{b=1}^{5} Exp_{z,y,b}$	
CH164:CH193	Aggregate Enrollment of Standard Lives by Projection Year ($Aggl_{z(st)}$)	$= \sum_{y=1}^{20} Aggl_{z,y(st)}$	
CH194	Aggregate Enrollment of Standard Lives	$= \sum_{z=1}^{30} Aggl_{z(st)}$	

Current Market.xls – Current Market-Summary

Cells	Description	Formula	Comments
CI164:CI193	Aggregate Premium of Standard Lives by Projection Year ($AggPremium_{z(st)}$)	$= \sum_{y=1}^{20} (Aggl_{z,y(st)} * AggAgeDurAdjPrem_{z,y} * 12)$	
CI194	Aggregate Premium of Standard Lives ($AggPremium_{st}$)	$= \sum_{z=1}^{30} AggPremium_{z(st)}$	
CJ164:CJ193	Aggregate Claims of Standard Lives by Projection Year ($AggClaims_{z(st)}$)	$= \sum_{y=1}^{20} (Aggl_{z,y(st)} * AggClaims_{z,y(st)} * 12)$	
CJ194	Aggregate Claims of Standard Lives ($AggClaims_{st}$)	$= \sum_{z=1}^{30} AggClaims_{z(st)}$	
CK164:CK193	Aggregate Loss Ratio by Projection Year for Standard Lives	$= AggClaims_{z(st)} / AggPremium_{z(st)}$	
CK194	Aggregate Loss Ratio for Standard Lives	$= AggClaims_{st} / AggPremium_{st}$	

Current Market.xls – Current Market-Summary

Cells	Description	Formula	Comments
CN164:CN193	Aggregate Enrollment of Impaired Lives by Projection Year ($Aggl_{z(im)}$)	$= \sum_{y=1}^{20} Aggl_{z,y(im)}$	
CN194	Aggregate Enrollment of Impaired Lives	$= \sum_{z=1}^{30} Aggl_{z(im)}$	
CO164:CO193	Aggregate Premium of Impaired Lives by Projection Year ($AggPremium_{z(im)}$)	$= \sum_{y=1}^{20} (Aggl_{z,y(im)} * AggAgeDurAdjPrem_{z,y} * 12)$	
CO194	Aggregate Premium of Impaired Lives ($AggPremium_{im}$)	$= \sum_{z=1}^{30} AggPremium_{z(im)}$	
CP164:CP193	Aggregate Claims of Impaired Lives by Projection Year ($AggClaims_{z(im)}$)	$= \sum_{y=1}^{20} (Aggl_{z,y(im)} * AggClaims_{z,y(im)} * 12)$	
CP194	Aggregate Claims of Impaired Lives ($AggClaims_{im}$)	$= \sum_{z=1}^{30} AggClaims_{z(im)}$	

Current Market.xls – Current Market-Summary

Cells	Description	Formula	Comments
CQ164:CQ193	Aggregate Loss Ratio by Projection Year for Impaired Lives	$= AggClaims_{z(im)} / AggPremium_{z(im)}$	
CQ194	Aggregate Loss Ratio for Impaired Lives	$= AggClaims_{im} / AggPremium_{im}$	
CS164:CS193	Aggregate Enrollment by Projection Year ($Aggl_z$)	$= Aggl_{z(st)} + Aggl_{z(im)}$	
CS194	Aggregate Enrollment	$= \sum_{z=1}^{30} Aggl_z$	
CT164:CT193	Aggregate Premium by Projection Year ($AggPremium_z$)	$= AggPremium_{z(st)} + AggPremium_{z(im)}$	
CT194	Aggregate Premium (AggPremium)	$= \sum_{z=1}^{30} AggPremium_z$	
CU164:CU193	Aggregate Claims by Projection Year ($AggClaims_z$)	$= AggClaims_{z(st)} + AggClaims_{z(im)}$	

Current Market.xls – Current Market-Summary

Cells	Description	Formula	Comments
CU194	Aggregate Claims (AggClaims)	$= \sum_{z=1}^{30} AggClaims_z$	
CV164:CV193	Aggregate Claims PMPM by Projection Year	$= AggClaims_z / AggI_z / 12$	
CV194	Aggregate Claims PMPM	$= AggClaims / AggI / 12$	
CW164:CW193	Aggregate Loss Ratio by Projection Year ($AggLR_z$)	$= AggClaims_z / AggPremium_z$	
CW194	Aggregate Loss Ratio	$= AggClaims / AggPremium$	
CX164:CX193	Aggregate Expected Loss Ratio by Projection Year ($AggExpectedLR_z$)	$= ExpectedLR_{z,1}$ $ExpectedLR_{z,1}$ is from the appropriate cell of Current Market Assumptions!V19:V48	Since this uses the expected LRs for block one only, it does not represent the aggregate expected LR.
CY164:CY193	Aggregate Actual to Expected Loss Ratio by Projection Year	$= AggLR_z / AggExpectedLR_z$	

Current Market.xls – Current Market-Summary

Cells	Description	Formula	Comments
CZ164:CZ193	Aggregate Rolling Two-Year Loss Ratio	$AggClaims_1 / AggPremium_1$, $z = 1$ $= (AggClaims_{z-1} + AggClaims_z) / (AggPremium_{z-1} + AggPremium_z)$, $z = 2, 3, 4, \ldots, 30$	
DA164:DA193	Aggregate Premium Less Aggregate Claims by Projection Year ($AggPminusAggC_z$)	$= AggPremium_z – AggClaims_z$	
DA194	Aggregate Premium Less Aggregate Claims	= AggPremium – AggClaims	
DB164:DB193	Aggregate Expenses by Projection Year ($AggExp_z$)	$= \sum_{y=1}^{20} [(AggI_{z,y(st)} * AggExp_{z,y(st)}) + (AggI_{z,y(im)} * AggExp_{z,y(im)})] * 12$	
DB194	Aggregate Expenses (AggExp)	$= \sum_{z=1}^{30} AggExp_z$	
DC164:DC193	Aggregate Expense Ratio by Projection Year	$= AggExp_z / AggPremium_z$	
DC194	Aggregate Expense Ratio	= AggExp / AggPremium	

Current Market.xls – Current Market-Summary

Cells	Description	Formula	Comments
DD164:DD193	Aggregate Gain by Projection Year ($AggGain_z$)	$= AggPremium_z - AggClaims_z - AggExp_z$	
DD194	Aggregate Gain (AggGain)	= AggPremium – AggClaims – AggExp	
DE164:DE193	Aggregate Gain as a Percentage of Aggregate Premium by Projection Year	$= AggGain_z / AggPremium_z$	
DE194	Aggregate Gain as a Percentage of Aggregate Premium	= AggGain / AggPremium	
DF164:DF193	Aggregate Risk-Based Capital by Projection Year ($AggRBC_z$)	$= AggPremium_z * RBC\%$ RBC% is from Global Assumptions!D83	
DG164:DG193	Aggregate Opportunity Cost of Capital by Projection Year ($AggOCC_z$)	$= -AggRBC_z * OCC\%$ OCC% is from Global Assumptions!D84	
DG194	Aggregate Opportunity Cost of Capital	$= \sum_{z=1}^{30} AggOCC_z$	

Current Market.xls – Current Market-Summary

Cells	Description	Formula	Comments
DH164:DH193	Aggregate Economic Gain by Projection Year ($AggEconGain_z$)	$= AggGain_z + OCC_z$	
DH194	Aggregate Economic Gain	$= \sum_{z=1}^{30} AggEconGain_z$	
CT197	Present Value of Aggregate Premium (PVAggPremium)	$= NPV_{int}\,(AggPremium_z) * \sqrt{1+\text{int}}$	For all of the following present value calculations, int is from Global Assumptions !B63, and the present values are taken over z = 1, 2, 3, …, 30.
CU197	Present Value of Aggregate Claims (PVAggClaims)	$= NPV_{int}\,(AggClaims_z) * \sqrt{1+\text{int}}$	
DA197	Present Value of Aggregate Premium Less Aggregate Claims (PVAggPminusAggC)	$= NPV_{int}\,(AggPminusAggC_z) * \sqrt{1+\text{int}}$	
DB197	Present Value of Aggregate Expenses (PVAggExp)	$= NPV_{int}\,(AggExp_z) * \sqrt{1+\text{int}}$	

Current Market.xls – Current Market-Summary

Cells	Description	Formula	Comments
DD197	Present Value of Aggregate Gain (PVAggGain)	= NPV_{int} ($AggGain_z$) * $\sqrt{1+\text{int}}$	
DE197	Present Value of Aggregate Gain as a Percentage of Present Value of Aggregate Premium	= PVAggGain / PVAggPremium	
DG197	Present Value of Aggregate Opportunity Cost of Capital (PVAggOCC)	= NPV_{int} ($AggOCC_z$) * $\sqrt{1+\text{int}}$	
DH197	Present Value of Aggregate Economic Gain (PVAggEconGain)	= NPV_{int} ($AggEconGain_z$) * $\sqrt{1+\text{int}}$	
CT198	Present Value of Aggregate Premium as a Percentage of Present Value of Aggregate Premium	= PVAggPremium / PVAggPremium	Identically equal to 100%.
CU198	Present Value of Aggregate Claims as a Percentage of Present Value of Aggregate Premium	= PVAggClaims / PVAggPremium	

Current Market.xls – Current Market-Summary

Cells	Description	Formula	Comments
DA198	Present Value of Aggregate Premium Less Aggregate Claims as a Percentage of Present Value of Aggregate Premium	= PVAggPminusAggC / PVAggPremium	
DB198	Present Value of Aggregate Expenses as a Percentage of Present Value of Aggregate Premium	= PVAggExp / PVAggPremium	
DD198	Present Value of Aggregate Gain as a Percentage of Present Value of Aggregate Premium	= PVAggGain / PVAggPremium	
DG198	Present Value of Aggregate Opportunity Cost of Capital as a Percentage of Present Value of Aggregate Premium	= PVAggOCC / PVAggPremium	
DH198	Present Value of Aggregate Economic Gain as a Percentage of Present Value of Aggregate Premium	= PVAggEconGain / PVAggPremium	

Current Market.xls – CM-1, CM-2, CM-3, CM-4, CM-5

Cells	**Description**	**Formula**	**Comments**
D4	Block Number (b)	Hardcoded value equal to the block number; i.e., 1 for CM-1, 2 for CM-2, etc.	Subscript b applies to each variable in CM-1, CM-2, etc. but is omitted from documentation.
D5	Year Introduced (IntroYr)	From the appropriate cell of Global Assumptions!Q7:Q11	Equals 1, 4, 7, 10, 13 for blocks 1, 2, 3, 4, and 5, respectively.
D6	Initial Reference Premium (InitRefPrem)	From Global Assumptions!C24	
D7	Initial Reference Claim Cost for Standard Lives ($InitRefClaims_{st}$)	From Global Assumptions!D49	
D8	Initial Reference Claim Cost for Impaired Lives ($InitRefClaims_{im}$)	From Global Assumptions!D60	
B12:B41	Base Lapse Rate for Standard Lives ($Baseq_{x(st)}$)	From the appropriate cell of Global Assumptions!D29:D33	
C12:C41	Base Lapse Rate for Impaired Lives ($Baseq_{x(im)}$)	From Global Assumptions!C54	

Current Market.xls – CM-1, CM-2, CM-3, CM-4, CM-5

Cells	Description	Formula	Comments
D12:D41	Duration Factor (DF_x)	From the appropriate cell of Global Assumptions!B77:B81	
E12:E41	Per Policy Expense Rates ($Exp_{Pol(x)}$)	From the appropriate cell of Global Assumptions!B70:B74	
F12:F41	Percentage-of-Claims Expense Rates ($Exp_{\%C(x)}$)	From the appropriate cell of Global Assumptions!C70:C74	
G12:G41	Base Commission Rates ($Comm_{B(x)}$)	From the appropriate cell of Global Assumptions!D70:D74	
H12:H41	Renewal Commission Rates ($Comm_{R(x)}$)	From the appropriate cell of Global Assumptions!E70:E74	
I12:I41	Other Premium-Related Expense Rates ($Exp_{Oth\%P(x)}$)	From the appropriate cell of Global Assumptions!F70:F74	
J12:J41	Premium Age Factor (PAF_x)	= 1, $\quad x = 1$ PAF_{x-1} * (1 + PremGrowthAge), $\quad x = 2, 3, 4, \ldots, 30$ PremGrowthAge is from Global Assumptions!C25	

Current Market.xls – CM-1, CM-2, CM-3, CM-4, CM-5

Cells	**Description**	**Formula**	**Comments**
K12:K41	Rate of Impairment (μ_x)	From the appropriate cell of Global Assumptions!E43:E47	
L12:L41	Durational Rate Increase (DRI_x)	From the appropriate cell of Current Market Assumptions!L19:L48	
O12:O41	Reference Premium ($RefPrem_z$)	= InitRefPrem, z = 1 $RefPrem_{z-1} * (1 + ActTrend_{z-1})$, z = 2, 3, 4, …, 30	Note that columns B:L are based on duration (subscript = x), but columns O:Y are based on projection year (subscript = z)
P12:P41	Baseline New Sales ($BaseSales_z$)	From the appropriate cell of Global Assumptions!P15:T44	
Q12:Q41	Standard Lives Reference Claims ($RefClaims_{z(st)}$)	= $InitRefClaims_{st}$, z = 1 $RefClaims_{z-1(st)} * (1 + ActTrend_{z-1})$, z = 2, 3, 4, …, 30	
R12:R41	Impaired Lives Reference Claims ($RefClaims_{z(im)}$)	= $InitRefClaims_{im}$, z = 1 $RefClaims_{z-1(im)} * (1 + ActTrend_{z-1})$, z = 2, 3, 4, …, 30	
S12:S41	Actual Trend ($ActTrend_z$)	From appropriate cell of Global Assumptions!B106:B135	

Current Market.xls – CM-1, CM-2, CM-3, CM-4, CM-5

Cells	Description	Formula	Comments
T13:T41	Implemented Rate Increase for New Business (ImpRateIncNew$_z$)	= min(MaxRateInc, RegDamp * ReqRateIncNew$_z$), MaxRateInc is from Global Assumptions!D100 RegDamp is from the appropriate cell of Global Assumptions!D90:D99, based on the value of ReqRateIncNew$_z$	Formula only applies for z = 2, 3, 4, …, 30.
U13:U41	Implemented Rate Increase for Renewal Business (ImpRateIncRen$_z$)	= ImpRateIncNew$_z$	Formula only applies for z = 2, 3, 4, …, 30.
V12:V41	Market New Business Rate (MarketRate$_z$)	= $P_{1(pr)} / l_1$, z = 1 MarketRate$_{z-1}$ * (1 + ActTrend$_{z-1}$), z = 2, 3, 4, …, 30 $P_{1(pr)}$ is from Current Market Assumptions l_1 is from Current Market Assumptions	
W12:W41	Company New Business Rate (ComNewBusnRate$_z$)	= 0, BaseSales$_z$ = 0 MarketRate$_z$ * (1 – Disc@Intro), BaseSales$_z$ ≠ 0 and z = IntroYr ComNewBusnRate$_{z-1}$ * (1 + ImpRateIncNew$_z$), BaseSales$_z$ ≠ 0 and z > IntroYr Disc@Intro is from Global Assumptions!D26	

Current Market.xls – CM-1, CM-2, CM-3, CM-4, CM-5

Cells	Description	Formula	Comments
X13:X41	Requested Rate Increase for New Business (ReqRateIncNew$_z$)	$= \begin{cases} 0, & z \le \text{IntroYr} \\ \text{ActTrend}_{z-1}, & z = \text{IntroYr} + 1 \\ \max\{0, [\text{ActualPaidLR}_{z-2} / \text{ExpectedLR}_{z-2} * (1 + \text{ActTrend}_{z-2})^2 / (1 + \text{ImpRateIncNew}_{z-1}) - 1], [\text{ActualPaidLR}_{z-2} / \text{MaxLR} * (1 + \text{ActTrend}_{z-2})^2 / (1 + \text{ImpRateIncNew}_{z-1})]\}, & \text{otherwise} \end{cases}$ ExpectedLR$_{z-2}$ is from the appropriate cell of Current Market Assumptions!V19:Z48, based on the block and projection year MaxLR is from Current Market Assumptions!E5	Formula only applies for z = 2, 3, 4, …, 30.
Y13:Y41	Requested Rate Increase for Renewal Business (ReqRateIncRen$_z$)	= ReqRateIncNew$_z$	Formula only applies for z = 2, 3, 4, …, 30.

Current Market.xls – CM-1, CM-2, CM-3, CM-4, CM-5

Cells	Description	Formula	Comments
AB12:AU41	New Business Sales by Cohort ($NewSales_{z,y}$)	0, $x \neq 1$ = max {0, $BaseSales_z$ * [1 + MktPriceSens * (($MarketRate_z$ / $RefPrem_z$) – 1)] * [1 + ComPriceSens * (($ComNewBusnRate_z$ / $MarketRate_z$) – 1)], otherwise MktPriceSens is from Global Assumptions!D14 ComPriceSens is from Global Assumptions!D15	
AB42:AU42	Total New Business Sales for Issue Year y	$= \sum_{z=1}^{30} NewSales_{z,y}$	

Current Market.xls – CM-1, CM-2, CM-3, CM-4, CM-5

Cells	Description	Formula	Comments
AX12:BQ41	Actual Lapse Rates for Standard Lives by Cohort ($q_{z,y(st)}$)	$= \begin{cases} 0, & x \le 1 \text{ or } BaseSales_y = 0 \\ \max\{q_{min(st)}, \min[q_{max(st)}, Baseq_{x-1(st)} + ((AgeAdjPremRate_{z,y} / AgeAdjPremRate_{z-1,y}) - 1 - ActTrend_z) * LapseAdjTrend_{st} * (((AgeAdjPremRate_{z,y} / AgeAdjMktNewBusnRate_{z,y}) - 1) * LapseAdjMkt_{st} + 1) - (((ComNewBusnRate_y / RefPrem_y) - 1) * LapseAdjSale_{st})]\}, & x = 2, 3, \text{ or } 4 \text{ and } BaseSales_y \ne 0 \\ \max\{q_{min(st)}, \min[q_{max(st)}, Baseq_{x-1(st)} + ((AgeAdjPremRate_{z,y} / AgeAdjPremRate_{z-1,y}) - 1 - ActTrend_z) * LapseAdjTrend_{st} * (((AgeAdjPremRate_{z,y} / AgeAdjMktNewBusnRate_{z,y}) - 1) * LapseAdjMkt_{st} + 1)]\}, & \text{otherwise} \end{cases}$ $q_{min(st)}$ is from Global Assumptions!D40 $q_{max(st)}$ is from Global Assumptions!D39 $LapseAdjTrend_{st}$ is from Global Assumptions!D36 $LapseAdjMkt_{st}$ is from Global Assumptions!D37 $LapseAdjSale_{st}$ is from Global Assumptions!!D38	
BT12:CM41	Newly Impaired Lives by Cohort ($NewImpLives_{z,y}$)	$= \begin{cases} 0, & x \le 1 \text{ or } BaseSales_y = 0 \\ l_{z-1,y(st)} * \mu_{x-1} * (1 - q_{z,y(im)}), & \text{otherwise} \end{cases}$	
AB51:AU80	Enrollment of Standard Lives by Cohort ($l_{z,y(st)}$)	$= \begin{cases} 0, & x < 1 \\ NewSales_{z,y}, & x = 1 \\ NewSales_{z,y} + l_{z-1,y(st)} * (1 - \mu_{x-1}) * (1 - q_{z,y(st)}), & x > 1 \end{cases}$	

Current Market.xls – CM-1, CM-2, CM-3, CM-4, CM-5

Cells	Description	Formula	Comments
AB81:AU81	Total Enrollment of Standard Lives by Issue Year	$= \sum_{z=1}^{30} l_{z,y(st)}$	
AX51:BQ80	Actual Lapse Rates for Impaired Lives by Cohort ($q_{z,y(im)}$)	$= \begin{cases} 0, & x \le 1 \text{ or } BaseSales_y = 0 \\ \max\{q_{min(im)}, \min[q_{max(im)}, Baseq_{x-1(im)} + ((AgeAdjPremRate_{z,y} / AgeAdjPremRate_{z-1,y}) - 1 - ActTrend_z) * LapseAdjTrend_{im}]\}, & \text{otherwise} \end{cases}$ $q_{min(im)}$ is from Global Assumptions!D58 $q_{max(im)}$ is from Global Assumptions!D57 $LapseAdjTrend_{im}$ is from Global Assumptions!D56	
BT51:CM80	Actual Combined Lapse Rates by Cohort ($q_{z,y}$)	$= \begin{cases} 0, & l_{z,y(st)} + l_{z,y(im)} = 0 \\ [(l_{z,y(st)} * q_{z,y(st)}) + (l_{z,y(im)} * q_{z,y(im)})] / (l_{z,y(st)} + l_{z,y(im)}), & \text{otherwise} \end{cases}$	
AB89:AU118	Enrollment of Impaired Lives by Cohort ($l_{z,y(im)}$)	$= \begin{cases} 0, & x = 1 \\ NewImpLives_{z,y} + [l_{z-1,y(im)} * (1 - q_{z,y(im)})], & x > 1 \end{cases}$	
AB119:AU119	Total Enrollment of Impaired Lives by Issue Year	$= \sum_{z=1}^{30} l_{z,y(im)}$	

Current Market.xls – CM-1, CM-2, CM-3, CM-4, CM-5

Cells	Description	Formula	Comments
AX89:BQ118	Premium Rates after Durational Adjustment but Before Age Adjustment, by Cohort (DurAdjPremRate$_{z,y}$)	$= \begin{cases} 0, & BaseSales_y = 0 \\ ComNewBusnRate_z, & BaseSales_y \neq 0 \text{ and } x = 1 \\ DurAdjPremRate_{z-1,y} * (1 + ImpRateIncRen_z) * (1 + DRI_x), & \text{otherwise} \end{cases}$	
BT89:CM118	Premium Rates Adjusted for both Duration and Age (AgeAdjPremRate$_{z,y}$)	$= DurAdjPremRate_{z,y} * PAF_x$	
AB126:AU155	Age-Adjusted Market-Level New Business Premium Rates by Cohort (AgeAdjMktNew BusnRate$_{z,y}$)	$= \begin{cases} 0, & x < 1 \text{ or } BaseSales_y = 0 \\ MarketRate_z * PAF_x, & \text{otherwise} \end{cases}$	

Current Market.xls – CM-1, CM-2, CM-3, CM-4, CM-5

Cells	**Description**	**Formula**	**Comments**
AX126:BQ155	Standard Lives Claim Levels by Cohort ($C_{z,y(st)}$)	0, $BaseSales_y = 0$ = $RefClaims_{z(st)} * DF_x * [1 + (ComNewBusnRate_y / RefPrem_y - 1) * MorbAdj_{st}]$, $BaseSales_y \neq 0$ and $x = 1$ $C_{z-1,y(st)} * DF_x / DF_{x-1} * (1 + ActTrend_{z-1}) * (1 + AgingTrend)$, otherwise $MorbAdj_{st}$ is from Global Assumptions!D51 AgingTrend is from Global Assumptions!C22	
BT126:CM155	Impaired Lives Claim Levels by Cohort ($C_{z,y(im)}$)	0, $BaseSales_y = 0$ = $RefClaims_{z(im)}$, $BaseSales_y \neq 0$ and $x = 1$ $C_{z-1,y(im)} * (1 + ActTrend_{z-1}) * (1 + AgingTrend)$, otherwise AgingTrend is from Global Assumptions!C22	
AB164:AU193	Standard Lives Expense Levels by Cohort ($Exp_{z,y(st)}$)	0, $BaseSales_y = 0$ or $x < 1$ = $Exp_{Pol(x)} * (1 + Inflation)^{z-1}$ $+ C_{z,y(st)} * Exp_{\%C(x)}$ $+ ComNewBusnRate_y * Comm_{B(x)}$ $+ (AgeAdjPremRate_{z,y} - ComNewBusnRate_y) * Comm_{R(x)}$ $+ AgeAdjPremRate_{z,y} * Exp_{Oth\%P(x)}$, otherwise Inflation is from Global Assumptions!B64	

Current Market.xls – CM-1, CM-2, CM-3, CM-4, CM-5

Cells	Description	Formula	Comments
AX164:BQ193	Impaired Lives Expense Levels by Cohort ($Exp_{z,y(im)}$)	0, $BaseSales_y = 0$ or $x < 1$ = $Exp_{Pol(x)} * (1 + Inflation)^{z-1}$ $+ C_{z,y(im)} * Exp_{\%C(x)}$ $+ ComNewBusnRate_y * Comm_{B(x)}$ $+ (AgeAdjPremRate_{z,y} – ComNewBusnRate_y) * Comm_{R(x)}$ $+ AgeAdjPremRate_{z,y} * Exp_{Oth\%P(x)}$, otherwise Inflation is from Global Assumptions!B64	
BT164:CM193	Average Expense Levels by Cohort ($Exp_{z,y}$)	0, $l_{z,y(st)} + l_{z,y(im)} = 0$ = $[(l_{z,y(st)} * Exp_{z,y(st)}) + (l_{z,y(im)} * Exp_{z,y(im)})] / (l_{z,y(st)} + l_{z,y(im)})$, otherwise	
CP164:CP193	Standard Lives Enrollment by Projection Year ($l_{z(st)}$)	$= \sum_{y=1}^{20} l_{z,y(st)}$	
CP194	Total Standard Lives Exposure	$= \sum_{z=1}^{30} l_{z(st)}$	"Total" refers to the sum over all 30 projection years.
CQ164:CQ193	Standard Lives Premium by Projection Year ($P_{z(st)}$)	$= \sum_{y=1}^{20} l_{z,y(st)} * AgeAdjPremRate_{z,y} * 12$	

Current Market.xls – CM-1, CM-2, CM-3, CM-4, CM-5

Cells	**Description**	**Formula**	**Comments**
CQ194	Total Standard Lives Premium (P_{st})	$= \sum_{z=1}^{30} P_{z(st)}$	
CR164:CR193	Standard Lives Claims by Projection Year ($C_{z(st)}$)	$= \sum_{y=1}^{20} l_{z,y(st)} * C_{z,y(st)} * 12$	
CR194	Total Standard Lives Claims (C_{st})	$= \sum_{z=1}^{30} C_{z(st)}$	
CS164:CS193	Standard Lives Loss Ratio by Projection Year	$= \begin{cases} 0, & P_{z(st)} = 0 \\ C_{z(st)} / P_{z(st)}, & \text{otherwise} \end{cases}$	
CS194	Standard Lives Loss Ratio	$= \begin{cases} 0, & P_{st} = 0 \\ C_{st} / P_{st}, & \text{otherwise} \end{cases}$	
CV164:CV193	Impaired Lives Enrollment by Projection Year ($l_{z(im)}$)	$= \sum_{y=1}^{20} l_{z,y(im)}$	
CV194	Total Impaired Lives Exposure	$= \sum_{z=1}^{30} l_{z(im)}$	

Current Market.xls – CM-1, CM-2, CM-3, CM-4, CM-5

Cells	Description	Formula	Comments
CW164:CW193	Impaired Lives Premium by Projection Year ($P_{z(im)}$)	$= \sum_{y=1}^{20} l_{z,y(im)} * AgeAdjPremRate_{z,y} * 12$	
CW194	Total Impaired Lives Premium (P_{im})	$= \sum_{z=1}^{30} P_{z(im)}$	
CX164:CX193	Impaired Lives Claims by Projection Year ($C_{z(im)}$)	$= \sum_{y=1}^{20} l_{z,y(im)} * C_{z,y(im)} * 12$	
CX194	Total Impaired Lives Claims (C_{im})	$= \sum_{z=1}^{30} C_{z(im)}$	
CY164:CY193	Impaired Lives Loss Ratio by Projection Year	$= \begin{cases} 0, & P_{z(im)} = 0 \\ C_{z(im)} / P_{z(im)}, & \text{otherwise} \end{cases}$	
CY194	Impaired Lives Loss Ratio	$= \begin{cases} 0, & P_{im} = 0 \\ C_{im} / P_{im}, & \text{otherwise} \end{cases}$	
DA164:DA193	Combined Enrollment by Projection Year (l_z)	$= l_{z(st)} + l_{z(im)}$	“Combined” refers to the combination of standard and impaired.

Current Market.xls – CM-1, CM-2, CM-3, CM-4, CM-5

Cells	**Description**	**Formula**	**Comments**
DA194	Total Combined Exposure (l)	$= \sum_{z=1}^{30} l_z$	
DB164:DB193	Combined Premium by Projection Year (P_z)	$= P_{z(st)} + P_{z(im)}$	
DB194	Total Combined Premium (P)	$= \sum_{z=1}^{30} P_z$	
DC164:DC193	Combined Claims by Projection Year (C_z)	$= C_{z(st)} + C_{z(im)}$	
DC194	Total Combined Claims (C)	$= \sum_{z=1}^{30} C_z$	
DD164:DD193	Combined Claims PMPM by Projection Year	$= \begin{cases} 0, & l_z = 0 \\ C_z / l_z /12, & \text{otherwise} \end{cases}$	
DD194	Total Combined Claims PMPM	$= \begin{cases} 0, & l = 0 \\ C / l /12, & \text{otherwise} \end{cases}$	

Current Market.xls – CM-1, CM-2, CM-3, CM-4, CM-5

Cells	Description	Formula	Comments
DE164:DE193	Combined Loss Ratio by Projection Year (LR_z)	= 0, $P_z = 0$ C_z / P_z, otherwise	
DE194	Total Combined Loss Ratio	= 0, $P = 0$ C / P, otherwise	
DF164:DF193	Combined Expected Loss Ratio by Projection Year ($ExpectedLR_z$)	From the appropriate cell of Current Market Assumptions!V19:Z48, based on the block and projection year	
DG164:DG193	Actual-to-Expected Combined Loss Ratio by Projection Year	= 0, $ExpectedLR_z = 0$ $LR_z / ExpectedLR_z$, otherwise	
DH164:DH193	Rolling Two-Year Combined Loss Ratio by Projection Year	0, $(z = 1 \text{ and } P_z = 0)$ or $(z > 1 \text{ and } P_{z-1} + P_z = 0)$ = C_z / P_z, $z = 1 \text{ and } P_z \neq 0$ $(C_{z-1} + C_z) / (P_{z-1} + P_z)$, otherwise	
DI164:DI193	Combined Premium Less Claims by Projection Year ($PminusC_z$)	$= P_z – C_z$	
DI194	Total Combined Premium Less Claims	$= P – C$	

Current Market.xls – CM-1, CM-2, CM-3, CM-4, CM-5

Cells	Description	Formula	Comments
DJ164:DJ193	Combined Expenses by Projection Year (Exp_z)	$= 12 * [\sum_{y=1}^{20} (l_{z,y(st)} * Exp_{z,y(st)}) + \sum_{y=1}^{20} (l_{z,y(im)} * Exp_{z,y(im)})]$	
DJ194	Total Combined Expenses (Exp)	$= \sum_{z=1}^{30} Exp_z$	
DK164:DK193	Combined Expense Ratio by Projection Year	$= \begin{cases} 0, & P_z = 0 \\ Exp_z / P_z, & \text{otherwise} \end{cases}$	
DK194	Total Combined Expense Ratio	$= \begin{cases} 0, & P = 0 \\ Exp / P, & \text{otherwise} \end{cases}$	
DL164:DL193	Combined Gain by Projection Year ($Gain_z$)	$= P_z – C_z – Exp_z$	
DL194	Total Combined Gain ($Gain$)	$= P – C – Exp$	
DM164:DM193	Combined Gain as a Percentage of Combined Premium by Projection Year	$= \begin{cases} 0, & P_z = 0 \\ Gain_z / P_z, & \text{otherwise} \end{cases}$	
DM194	Total Combined Gain as a Percentage of Combined Premium	$= \begin{cases} 0, & P = 0 \\ Gain / P, & \text{otherwise} \end{cases}$	

Current Market.xls – CM-1, CM-2, CM-3, CM-4, CM-5

Cells	**Description**	**Formula**	**Comments**
DN164:DN193	Risk-Based Capital by Projection Year (RBC_z)	$= P_z * RBC\%$ RBC% is from Global Assumptions!D83	Uses a predefined percentage of premium as a proxy for risk-based capital requirement.
DO164:DO193	Opportunity Cost of Capital by Projection Year (OCC_z)	$= -RBC_z * OCC\%$ OCC% is from Global Assumptions!D84	
DO194	Total Opportunity Cost of Capital	$= \sum_{z=1}^{30} OCC_z$	
DP164:DP193	Economic Gain by Projection Year ($EconGain_z$)	$= Gain_z + OCC_z$	
DP194	Total Economic Gain	$= \sum_{z=1}^{30} EconGain_z$	
DB197	Present Value of Combined Premium (PVPremium)	$= NPV_{int}\,(P_z) * \sqrt{1+\text{int}}$	All present values in this section are taken over all 30 projection years, and int is from Global Assumptions!B63.

Current Market.xls – CM-1, CM-2, CM-3, CM-4, CM-5

Cells	Description	Formula	Comments
DC197	Present Value of Combined Claims (PVClaims)	$= NPV_{int}(C_z) * \sqrt{1+int}$	
DI197	Present Value of Combined Premium Less Combined Claims (PVPminusC)	$= NPV_{int}(PminusC_z) * \sqrt{1+int}$	
DJ197	Present Value of Combined Expenses (PVExp)	$= NPV_{int}(Exp_z) * \sqrt{1+int}$	
DL197	Present Value of Combined Gain (PVGain)	$= NPV_{int}(Gain_z) * \sqrt{1+int}$	
DO197	Present Value of Opportunity Cost of Capital (PVOCC)	$= NPV_{int}(OCC_z) * \sqrt{1+int}$	
DP197	Present Value of Economic Gain (PVEconGain)	$= NPV_{int}(EconGain_z) * \sqrt{1+int}$	

Current Market.xls – CM-1, CM-2, CM-3, CM-4, CM-5

Cells	Description	Formula	Comments
DB198	Present Value of Combined Premium as a Percentage of Present Value of Combined Premium	= PVPremium / PVPremium	Identically equal to 100%.
DC198	Present Value of Combined Claims as a Percentage of Present Value of Combined Premium	= PVClaims / PVPremium	
DI198	Present Value of Combined Premium Less Combined Claims as a Percentage of Present Value of Combined Premium	= PVPminusC / PVPremium	
DJ198	Present Value of Combined Expenses as a Percentage of Present Value of Combined Premium	= PVExp / PVPremium	
DL198	Present Value of Combined Gain as a Percentage of Present Value of Combined Premium	= PVGain / PVPremium	

Current Market.xls – CM-1, CM-2, CM-3, CM-4, CM-5

Cells	**Description**	**Formula**	**Comments**
DO198	Present Value of Opportunity Cost of Capital as a Percentage of Present Value of Combined Premium	= PVOCC / PVPremium	
DP198	Present Value of Economic Gain as a Percentage of Present Value of Combined Premium	= PVEconGain / PVPremium	

Pre-Funding.xls – Global Assumptions

The Global Assumptions tab within the Pre-Funding spreadsheet is an exact copy of the analogous tab in the Global spreadsheet. The field names, cell numbers, and values are identical. If a change is made in the Global Assumptions tab of the Global spreadsheet, the Global Assumptions tabs of all other spreadsheets in the model will be updated automatically the next time they are opened.

Pre-Funding.xls – DBPR Assumptions

Cells	Description	Formula	Comments
E5	Initial Reference Claim Cost for Standard Lives ($InitRefClaims_{st}$)	From Global Assumptions!D49	
E6	Initial Reference Claim Cost for Impaired Lives ($InitRefClaims_{im}$)	From Global Assumptions!D60	
E7	Reserve Discount Rate (RsvDiscRate)	= 3.5%	Hardcoded value; this and subsequent hardcoded values may be modified by the user to analyze different scenarios or test sensitivity.
E8	Earnings on Reserves (Return%)	= 5.0%	Hardcoded value
F9	Durational Deterioration Limitation Period (DDLP)	= 30	Hardcoded value; period during which the probability of a standard life becoming impaired is assumed to be greater than zero for pricing purposes

Pre-Funding.xls – DBPR Assumptions

Cells	Description	Formula	Comments
E10	Expected Monthly Premium Rate (ExpPrem)	= $167	Hardcoded value
F11	Excess of Premium Trend over Claim Trend (ExcessPremTrend)	= 2.0%	Hardcoded value
L5	Preliminary Term Period (PrelimTerm)	= 1	Hardcoded value
L6	Required Reserve Margin (ReqRsvMargin)	= 10.0%	Hardcoded value
L7	Per Policy Profit Charge Assumption ($AssumProfChg_{Pol}$)	= $1.50	Hardcoded value
L8	Percentage-of-Claims Profit Charge Assumption ($AssumProfChg_{\%C}$)	= 1.00%	Hardcoded value
L9	Percentage-of-Premium Profit Charge Assumption ($AssumProfChg_{\%P}$)	= 4.00%	Hardcoded value

Pre-Funding.xls – DBPR Assumptions

Cells	Description	Formula	Comments
P6:P10	Durational Rate Increase Assumptions ($DRAssump_x$)	= 0.0%, x = 2 0.0%, x = 3 0.0%, x = 4 0.0%, x = 5 0.0%, x = 6, 7, 8, …, 30	Hardcoded values; note that the indices shown in cells O6:O10 refer to renewal number, which is one less than duration (x).
V5	Minimum Annual Antiselection Factor (minAST)	= 50.0%	Hardcoded value; represents floor on annual adjustment for adverse selection
V6	Minimum Cumulative Antiselection Factor (minCAST)	= 100.0%	Hardcoded value; represents floor on cumulative adjustment for adverse selection
V7	Reserve Retained on Unanticipated Lapses (RsvRetUnantLapse)	= 75%	Hardcoded value

Pre-Funding.xls – DBPR Assumptions

Cells	Description	Formula	Comments
B14:B43	Standard Lives Base Lapse Rates Used in Pricing ($q_{x(st, pr)}$)	$= \max\{q_{min(st)}, \min[q_{max(st)}, Baseq_{x(st, pr)} + ((LapseAdjTrend_{st} * AccumDRI_{x+1} / AccumDRI_{x} * PAF_{x+1} / PAF_{x}) * (1 + ExcessPremTrend) - 1) * (LapseAdjMkt_{st} * (AccumDRI_{x+1} - 1) + 1) - (((ExpectedPrem / InitRefPrem) - 1) * LapseAdjSale_{st})]\},$ x = 1, 2, or 3 $\max\{q_{min(st)}, \min[q_{max(st)}, Baseq_{x(st, pr)} + ((LapseAdjTrend_{st} * AccumDRI_{x+1} / AccumDRI_{x} * PAF_{x+1} / PAF_{x}) * (1 + ExcessPremTrend) - 1) * (LapseAdjMkt_{st} * (AccumDRI_{x+1} - 1) + 1)]\},$ x = 4, 5, 6, …, 30 $q_{min(st)}$ is from Global Assumptions!D40 $q_{max(st)}$ is from Global Assumptions!D39 $Baseq_{x(st, pr)}$ is from the appropriate cell of Global Assumptions!E29:E33 $LapseAdjTrend_{st}$ is from Global Assumptions!D36 $LapseAdjMkt_{st}$ is from Global Assumptions!D37 InitRefPrem is from Global Assumptions!C24 $LapseAdjSale_{st}$ is from Global Assumptions!D38	Baseline standard lives lapse rates adjusted to reflect higher anticipated lapses due to rate increases exceeding claim trend and renewal rates exceeding the market new business rate

Pre-Funding.xls – DBPR Assumptions

Cells	Description	Formula	Comments
C14:C43	Impaired Lives Base Lapse Rates used in Pricing ($q_{x(im, pr)}$)	$= \max\{q_{min(im)}, \min[q_{max(im)}, Baseq_{im(pr)} + (AccumDRI_{x+1} / AccumDRI_x * PAF_{x+1} / PAF_x * (1 + ExcessPremTrend - 1)) * LapseAdjTrend_{im},$ $x \le DDLP$ $q_{x(st, pr)},$ $x > DDLP$ $q_{min(im)}$ is from Global Assumptions!D58 $q_{max(im)}$ is from Global Assumptions!D57 $Baseq_{im(pr)}$ is from Global Assumptions!D54 $LapseAdjTrend_{im}$ is from Global Assumptions!D56	
D14:D43	Probability of Becoming Impaired Used in Pricing ($\mu_{x(pr)}$)	$= \mu_x,$ $x \le DDLP$ $0,$ $x > DDLP$ μ_x is from the appropriate cell of Global Assumptions!E43:E47	
E14:E44	Number of Standard Lives ($l_{x(st)}$)	$= 3{,}000,$ $x = 1$ $l_{x-1(st)} * (1 - \mu_{x-1(pr)}) * (1 - q_{x-1(st, pr)}),$ $x = 2, 3, 4, \ldots, 31$	The 3,000 value for duration one is hardcoded and has no impact on the results calculated in the Crude DBPR – Global tab. Values for duration 31 are calculated in order to calculate the lapse rate at duration 30.

Pre-Funding.xls – DBPR Assumptions

Cells	Description	Formula	Comments
E45	Standard Lives Lifetime Exposure	$= \sum_{x=1}^{30} l_{x(st)}$	
F14:F44	Number of Impaired Lives ($l_{x(im)}$)	$= 0, \quad x = 1$ $[l_{x-1(im)} * (1 - q_{x-1(im, pr)})] + [l_{x-1(st)} * \mu_{x-1(pr)}], \quad x = 2, 3, 4, \ldots, 31$	
F45	Impaired Lives Lifetime Exposure	$= \sum_{x=1}^{30} l_{x(im)}$	
G14:G44	Number of Total Lives (l_x)	$= l_{x(st)} + l_{x(im)}$	
G45	Total Lives Lifetime Exposure (l)	$= \sum_{x=1}^{30} l_x$	
H14:H43	Total Lapse Rate Used in Pricing ($q_{x(pr)}$)	$= 1 – (l_{x+1} / l_x)$	
I14:I43	Duration Factor (DF_x)	= From the appropriate cell of Global Assumptions!B77:B81, $x \leq DDLP$ 1, $x > DDLP$	

Pre-Funding.xls – DBPR Assumptions

Cells	Description	Formula	Comments
J14:J43	Accumulated Trend ($AccumTrend_x$)	$= \begin{cases} 1, & x = 1 \\ AccumTrend_{x-1} * (1 + Trend + ExcessPremTrend), & x = 2, 3, 4, \ldots, 30 \end{cases}$ Trend is from Global Assumptions!D21	
K14:K43	Discount Factor (v_x)	$= 1 / (1 + RsvDiscRate)^x$	
L14:L44	Premium Age Factor (PAF_x)	$= \begin{cases} 1, & x = 1 \\ PAF_{x-1} * (1 + PremGrowthAge), & x = 2, 3, 4, \ldots, 30 \end{cases}$ PremGrowthAge is from Global Assumptions!C25	
M14:M43	Standard Lives Pricing Claims ($C_{x(st, pr)}$)	$= \begin{cases} InitRefClaims_{st} * \{1 + [(ExpPrem / InitRefPrem) - 1] * MorbAdj_{st}\} * DF_x * (1 + Trend)^{x-1} * PAF_x * 12, & x \leq DDLP \\ InitRefClaims_{st} * \{1 + [(ExpPrem / InitRefPrem) - 1] * MorbAdj_{st}\} * (1 + Trend)^{x-1} * PAF_x * 12, & x > DDLP \end{cases}$ InitRefPrem is from Global Assumptions!C24 $MorbAdj_{st}$ is from Global Assumptions!D51 Trend is from Global Assumptions!D21	Note that this is per member per year rather than per member per month.

Pre-Funding.xls – DBPR Assumptions

Cells	Description	Formula	Comments
M45	Standard Lives Lifetime Pricing Claims	$= \sum_{x=1}^{30} C_{x(st,\ pr)}$	
N14:N43	Impaired Lives Pricing Claims ($C_{x(im,\ pr)}$)	$= InitRefClaims_{im} * (1 + Trend)^{x-1} * PAF_x * 12$ Trend is from Global Assumptions!D21	
N45	Impaired Lives Lifetime Pricing Claims	$= \sum_{x=1}^{30} C_{x(im,\ pr)}$	
O14:O43	Weighted Average Pricing Claims ($C_{x(pr)}$)	$= [(l_{x(st)} * C_{x(st)}) + (l_{x(im)} * C_{x(im)})] / l_x$	
O45	Lifetime Weighted Average Pricing Claims	$= \sum_{x=1}^{30} C_{x(pr)}$	
O46	Lifetime Discounted Pricing Claims	$= \sum_{x=1}^{30} l_x * C_{x(pr)} * v_x$	
P14:P43	Durational Rate Increase (DRI_x)	$= \begin{cases} 0, & x = 1 \\ DRAssump_x, & x = 2, 3, 4, \ldots, 30 \end{cases}$	

Pre-Funding.xls – DBPR Assumptions

Cells	Description	Formula	Comments
Q14:Q44	Accumulated Durational Rate Increase ($AccumDRI_x$)	$= 1, \quad x = 1$ $AccumDRI_{x-1} * (1 + DRI_x), \quad x = 2, 3, 4, \ldots, 31$	
R14:R43	Pricing Net Premium ($P_{x(pr)}$)	$C_{x(pr)}, \quad x \leq PrelimTerm$ $= (\sum_{i=x}^{30} C_{i(pr)} * l_i * v_i / \sum_{j=x}^{30} l_j * AccumTrend_j * PAF_j$ $* v_j * AccumDRI_j) * AccumTrend_x * PAF_x$ $* AccumDRI_x, \quad x = PrelimTerm + 1$ $P_{x-1(pr)} * AccumTrend_x / AccumTrend_{x-1} * PAF_x$ $/ PAF_{x-1} * AccumDRI_x / AccumDRI_{x-1}, \quad x > PrelimTerm + 1$	
R45	Lifetime Discounted Pricing Net Premium	$= \sum_{x=1}^{30} l_x * P_{x(pr)} * v_x$	Should equal Lifetime Discounted Pricing Claims
S14:S43	Weighted Average Pricing Claims Less Pricing Net Premium ($CminusP_{x(pr)}$)	$= C_{x(pr)} – P_{x(pr)}$	

Pre-Funding.xls – DBPR Assumptions

Cells	Description	Formula	Comments
T14:T43	Claim Reserve (SV_x)	$= \begin{cases} 0, & x = 30 \\ [(l_{x+1} * CminusP_{x+1(pr)}) + SV_{x+1}] / (1 + RsvDiscRate), & x = 1, 2, 3, \ldots, 29 \end{cases}$	
U14:U43	Claim Reserve as a Percentage of Pricing Claims ($\%SV_x$)	$= SV_x / l_x / C_{x(pr)}$	
V14:V43	Change in Reserve as a Percentage of Pricing Claims ($\Delta\%SV_x$)	$= \begin{cases} \%SV_x, & x = 1 \\ (SV_x – SV_{x-1}) / l_x / C_{x(pr)}, & x = 2, 3, 4, \ldots, 30 \end{cases}$	
W14:W43	Change in Reserve as a Percentage of Pricing Claims, Adjusting for Interest at the Reserve Discount Rate	$= \begin{cases} \%SV_x, & x = 1 \\ \{SV_x – [(1 + RsvDiscRate) * SV_{x-1}]\} / l_x / C_{x(pr)}, & x = 2, 3, 4, \ldots, 30 \end{cases}$	
X14:X43	Change in Reserve as a Percentage of Pricing Claims, Adjusting for Interest at the Reserve Earnings Rate	$= \begin{cases} \%SV_x, & x = 1 \\ \{SV_x – [(1 + Return\%) * SV_{x-1}]\} / l_x / C_{x(pr)}, & x = 2, 3, 4, \ldots, 30 \end{cases}$	

Pre-Funding.xls – DBPR Assumptions

Cells	Description	Formula	Comments
Y14:Y43	Per Policy Expense Rate ($Exp_{Pol(x)}$)	From the appropriate cell of Global Assumptions!:B70:B74	
Y45	Lifetime Average Per Policy Expense Rate	$= (\sum_{x=1}^{30} l_x * Exp_{Pol(x)}) / l$	
Y46	Lifetime Per Policy Expenses as a Percentage of Lifetime Pricing Net Premiums, Applied to First-Duration Pricing Net Premium	$= [(\sum_{i=1}^{30} l_i * Exp_{Pol(i)}) / (\sum_{j=1}^{30} l_j * P_{j(pr)})] * P_{1(pr)}$	
Z14:Z43	Percentage-of-Claims Expense Rate ($Exp_{\%C(x)}$)	From the appropriate cell of Global Assumptions!C70:C74	
Z45	Lifetime Average Percentage-of-Claims Expense Rate	$= (\sum_{i=1}^{30} l_i * Exp_{\%C(i)} * C_{i(pr)}) / (\sum_{j=1}^{30} l_j * C_{j(pr)})$	Weighted by claims.

Pre-Funding.xls – DBPR Assumptions

Cells	Description	Formula	Comments
Z46	Lifetime Claim-Based Expenses as a Percentage of Lifetime Pricing Net Premiums, Applied to the Ratio of First-Duration Pricing Net Premium to First-Duration Pricing Claims	$= [(\sum_{i=1}^{30} l_i * Exp_{\%C(i)} * C_{i(pr)}) / (\sum_{j=1}^{30} l_j * P_{j(pr)})] * P_{1(pr)} / C_{1(pr)}$	
AA14:AA43	Base Commission Rate ($Comm_{B(x)}$)	From the appropriate cell of Global Assumptions!D70:D74	
AA45	Lifetime Average Base Commission Rate	$= (\sum_{x=1}^{30} l_x * Comm_{B(x)}) / l$	Weighted by enrollment.
AB14:AB43	Renewal Commission Rate ($Comm_{R(x)}$)	From the appropriate cell of Global Assumptions!E70:E74	
AB45	Lifetime Average Renewal Commission Rate	$= (\sum_{i=1}^{30} l_i * Comm_{R(i)} * P_{i(pr)}) / (\sum_{j=1}^{30} l_j * P_{j(pr)})$	Weighted by pricing net premium.
AC14:AC43	Other Premium-Related Expense Rate ($Exp_{Oth\%P(x)}$)	From the appropriate cell of Global Assumptions!F70:F74	

Pre-Funding.xls – DBPR Assumptions

Cells	Description	Formula	Comments
AC45	Lifetime Average Other Premium-Related Expense Rate	$= (\sum_{i=1}^{30} l_i * Exp_{Oth\%P(i)} * P_{i(pr)}) / (\sum_{j=1}^{30} l_j * P_{j(pr)})$	Weighted by pricing net premium.
AD14:AD43	Total Premium-Related Expense Rate as a Percentage of Pricing Gross Premium ($Exp_{Tot\%P(x)}$)	$= \{(Comm_{B(x)} * AccumTrend_1 * PAF_1)$ $+ [Comm_{R(x)} * ((AccumTrend_x * PAF_x) – (AccumTrend_1 * PAF_1))]$ $+ (Exp_{Oth\%P(x)} * AccumTrend_x * PAF_x)\}$ $/ AccumTrend_x / PAF_x$	Trend and aging adjustments are needed to convert from net to gross.
AD45	Lifetime Average Total Premium-Related Expense Rate as a Percentage of Pricing Gross Premium	$= (\sum_{i=1}^{30} l_i * Exp_{Tot\%P(i)} * P_{i(pr)}) / (\sum_{j=1}^{30} l_j * P_{j(pr)})$	Weighted by pricing net premium.
AE14:AE43	Per Policy Profit Charge ($ProfChg_{Pol(x)}$)	$= AssumProfChg_{Pol}$	
AE45	Lifetime Average Per Policy Profit Charge, Weighted by Enrollment	$= (\sum_{x=1}^{30} l_x * ProfChg_{Pol(x)}) / l$	
AE46	Lifetime Per Policy Profit Charges as a Percentage of Lifetime Pricing Net Premiums, Applied to First-Duration Pricing Net Premium	$= [(\sum_{i=1}^{30} l_i * ProfChg_{Pol(i)}) / (\sum_{j=1}^{30} l_j * P_{j(pr)})] * P_{1(pr)}$	

Pre-Funding.xls – DBPR Assumptions

Cells	Description	Formula	Comments
AF14:AF43	Percentage-of-Claims Profit Charge ($ProfChg_{\%C(x)}$)	$= AssumProfChg_{\%C}$	
AF45	Lifetime Average Percentage-of-Claims Profit Charge, Weighted by Pricing Claims	$= (\sum_{i=1}^{30} l_i * ProfChg_{\%C(i)} * C_{i(pr)}) / (\sum_{j=1}^{30} l_j * C_{j(pr)})$	
AF46	Lifetime Claim-Based Profit Charges as a Percentage of Lifetime Pricing Net Premiums, Applied to the Ratio of First-Duration Pricing Net Premium to First-Duration Pricing Claims	$= [(\sum_{i=1}^{30} l_i * ProfChg_{\%C(i)} * C_{i(pr)}) / (\sum_{j=1}^{30} l_j * P_{j(pr)})] * P_{1(pr)} / C_{1(pr)}$	
AG14:AG43	Percentage-of-Premium Profit Charge ($ProfChg_{\%P(x)}$)	$= AssumProfChg_{\%P}$	
AG45	Lifetime Average Percentage-of-Premium Profit Charge	$= (\sum_{i=1}^{30} l_i * ProfChg_{\%P(i)} * P_{i(pr)}) / (\sum_{j=1}^{30} l_j * P_{j(pr)})$	

Pre-Funding.xls – DBPR Assumptions

Cells	Description	Formula	Comments
AH14:AH43	Pricing Gross Premium ($GP_{x(pr)}$)	$= \dfrac{\{\sum_{i=1}^{30} [C_{i(pr)} * (1 + Exp_{\%C(i)} + ProfChg_{\%C(i)}) * l_i * v_i] + \sum_{j=1}^{30} [(Exp_{Pol(j)} + ProfChg_{Pol(j)}) * l_j * v_j * 12]\}}{\sum_{k=1}^{30} [(1 - Exp_{Tot\%P(k)} - ProfChg_{\%P(k)}) * l_k * AccumTrend_k * PAF_k * v_k}$, $x = 1$ $GP_{x-1(pr)} * AccumTrend_x * PAF_x$, $x = 2, 3, 4, \ldots, 30$	
AH45	Lifetime Pricing Gross Premium	$= \sum_{x=1}^{30} GP_{x(pr)}$	
AI14:AI43	Paid Loss Ratio ($PaidLR_x$)	$= C_{x(pr)} / GP_{x(pr)}$	
AJ14:AJ43	Incurred Loss Ratio ($IncLR_x$)	$= [C_{x(pr)} + (\Delta\%SV_x * C_{x(pr)})] / GP_{x(pr)}$	
AM14:AM43	Total Pricing Net Premium ($P_{Tot,x(pr)}$)	$= l_x * P_{x(pr)}$	

Pre-Funding.xls – DBPR Assumptions

Cells	Description	Formula	Comments
AN14:AN43	Total Pricing Claims ($C_{Tot,x(pr)}$)	$= l_x * C_{x(pr)}$	
AO14:AO43	Total Reserve ($SV_{Tot,x}$)	$= \%SV_x * C_{Tot,x(pr)}$	Note that this is identically equal to Claim Reserve calculated in cells T14:T43.
AP14:AP43	Change in Total Reserve ($\Delta SV_{Tot,x}$)	$= \begin{cases} SV_{Tot,x}, & x = 1 \\ SV_{Tot,x} - SV_{Tot,x-1}, & x = 2, 3, 4, \ldots, 30 \end{cases}$	
AQ14:AQ43	Interest on Total Reserve ($RsvInt_{Tot,x}$)	$= \begin{cases} 0, & x = 1 \\ SV_{Tot,x-1} * RsvDiscRate, & x = 2, 3, 4, \ldots, 30 \end{cases}$	
AR14:AR43	Total Net Pricing Gain	$= P_{Tot,x(pr)} - C_{Tot,x(pr)} - \Delta SV_{Tot,x} + RsvInt_{Tot,x}$	
AS14:AS43	Paid Pricing Loss Ratio	$= C_{Tot,x(pr)} / P_{Tot,x(pr)}$	
AT14:AT43	Adjusted Pricing Loss Ratio	$= (C_{Tot,x(pr)} + \Delta SV_{Tot,x}) / P_{Tot,x(pr)}$	
AU14:AU43	Adjusted Pricing Loss Ratio with Interest	$= (C_{Tot,x(pr)} + \Delta SV_{Tot,x} - RsvInt_{Tot,x}) / P_{Tot,x(pr)}$	
AM45	Lifetime Total Pricing Net Premium ($P_{Tot(pr)}$)	$= \sum_{x=1}^{30} P_{Tot,x(pr)}$	

Pre-Funding.xls – DBPR Assumptions

Cells	Description	Formula	Comments
AN45	Lifetime Total Pricing Claims ($C_{Tot(pr)}$)	$= \sum_{x=1}^{30} C_{Tot,x(pr)}$	
AO45	Lifetime Total Reserve	$= \sum_{x=1}^{30} SV_{Tot,x}$	
AP45	Lifetime Total Change in Reserve (ΔSV_{Tot})	$= \sum_{x=1}^{30} \Delta SV_{Tot,x}$	
AQ45	Lifetime Total Interest on Reserve ($RsvInt_{Tot}$)	$= \sum_{x=1}^{30} RsvInt_{Tot,x}$	
AR45	Lifetime Total Net Pricing Gain	$= P_{Tot(pr)} – C_{Tot(pr)} – \Delta SV_{Tot} + RsvInt_{Tot}$	If all of the formulas are set up correctly, this will equal zero.
AS45	Lifetime Paid Pricing Loss Ratio	$= C_{Tot(pr)} / P_{Tot(pr)}$	
AT45	Lifetime Adjusted Pricing Loss Ratio	$= (C_{Tot(pr)} + \Delta SV_{Tot}) / P_{Tot(pr)}$	
AU45	Lifetime Adjusted Pricing Loss Ratio with Interest	$= (C_{Tot(pr)} + \Delta SV_{Tot} – RsvInt_{Tot}) / P_{Tot(pr)}$	

Pre-Funding.xls – DBPR Assumptions

Cells	Description	Formula	Comments
AM46	Present Value of Total Pricing Net Premiums (PVNetPrem)	$= NPV_{RsvDiscRate} (P_{Tot,x(pr)})$, where NPV is taken over x = 1, 2, 3, …, 30	In other places in the model, present values are adjusted for one-half of one year's interest. This is not done here because this section only tests for accuracy of formulas.
AN46	Present Value of Total Pricing Claims (PVClaims)	$= NPV_{RsvDiscRate} (C_{Tot,x(pr)})$, where NPV is taken over x = 1, 2, 3, …, 30	
AO46	Present Value of Total Reserves	$= NPV_{RsvDiscRate} (SV_{Tot,x})$, where NPV is taken over x = 1, 2, 3, …, 30	
AP46	Present Value of Change in Total Reserves (PVΔRsv)	$= NPV_{RsvDiscRate} (\Delta SV_{Tot,x})$, where NPV is taken over x = 1, 2, 3, …, 30	
AQ46	Present Value of Interest on Total Reserves (PVRsvInt)	$= NPV_{RsvDiscRate} (RsvInt_{Tot,x})$, where NPV is taken over x = 1, 2, 3, …, 30	
AR46	Present Value of Total Net Pricing Gains	= PVNetPrem – PVClaims – PVΔRsv + PVRsvInt	

Pre-Funding.xls – DBPR Assumptions

Cells	Description	Formula	Comments
AS46	Present Value of Lifetime Paid Pricing Loss Ratio	= PVClaims / PVNetPrem	
AT46	Present Value of Lifetime Adjusted Pricing Loss Ratio	= (PVClaims + PVΔRsv) / PVNetPrem	
AU46	Present Value of Lifetime Adjusted Pricing Loss Ratio with Interest	= (PVClaims + PVΔRsv – PVRsvInt) / PVNetPrem	
AX14:AX43	Total Pricing Gross Premium ($GP_{Tot,x(pr)}$)	$= l_x * GP_{x(pr)}$	
AY14:AY43	Total Pricing Claims ($C_{Tot,x(pr)}$)	$= l_x * C_{x(pr)}$	Identically equal to the values in cells AO14:AO43
AZ14:AZ43	Total Net Reserve ($NetSV_{Tot,x}$)	$= \%SV_x * C_{Tot,x(pr)}$	Identically equal to the values in cells AP14:AP43
BA14:BA43	Total Reserve with Margin ($SV_{Tot,x}$)	$= NetSV_{Tot,x} * (1 + ReqRsvMargin)$	
BB14:BB43	Total Per Policy Expenses ($Exp_{TotPol,x}$)	$= 12 * l_x * Exp_{Pol(x)}$	

Pre-Funding.xls – DBPR Assumptions

Cells	Description	Formula	Comments
BC14:BC43	Total Percentage-of-Claims Expenses ($Exp_{Tot\%C,x}$)	$= C_{Tot,x(pr)} * Exp_{\%C(x)}$	
BD14:BD43	Total Percentage-of-Premium Expenses ($Exp_{Tot\%P,x}$)	$= (GP_{1(pr)} * l_x * Comm_{B(x)}) + [(GP_{x(pr)} – GP_{1(pr)}) * l_x * Comm_{R(x)}]$ $+ (GP_{x(pr)} * l_x * Exp_{Oth\%P(x)})$	
BE14:BE43	Total Expenses ($Exp_{Tot,x}$)	$= Exp_{TotPol,x} + Exp_{Tot\%C,x} + Exp_{Tot\%P,x}$	
BF14:BF43	Change in Total Reserve ($\Delta SV_{Tot,x}$)	= $SV_{Tot,x}$, x = 1 $SV_{Tot,x} – SV_{Tot,x-1}$, x = 2, 3, 4, …, 30	
BG14:BG43	Interest on Total Reserve ($RsvInt_{Tot,x}$)	= 0, x = 1 $SV_{Tot,x-1}$ * RsvDiscRate, x = 2, 3, 4, …, 30	
BH14:BH43	Total Gross Pricing Gain ($Gain_{Tot,x}$)	$= GP_{Tot,x(pr)} – C_{Tot,x(pr)} – Exp_{Tot,x} - \Delta SV_{Tot,x} + RsvInt_{Tot,x}$	
BI14:BIJ43	Total Gross Pricing Margin	$= Gain_{Tot,x} / GP_{Tot,x(pr)}$	
BJ14:BJ43	Total Interest Spread ($IntSpread_{Tot,x}$)	= 0, x = 1 $SV_{Tot,x-1}$ * (Return% - RsvDiscRate), x = 2, 3, 4, …, 30	

Pre-Funding.xls – DBPR Assumptions

Cells	Description	Formula	Comments
BK14:BK43	Total Gross Pricing Gain with Interest Spread ($GainWithSpread_{Tot,x}$)	$= Gain_{Tot,x} + IntSpread_{Tot,x}$	
BL14:BL43	Total Per Policy Profit Charges ($ProfChg_{TotPol,x}$)	$= l_x * ProfChg_{Pol(x)} * 12$	
BM14:BM43	Total Percentage-of-Claims Profit Charges ($ProfChg_{Tot\%C,x}$)	$= C_{Tot,x(pr)} * ProfChg_{\%C(x)}$	
BN14:BN43	Total Percentage-of-Premium Profit Charges ($ProfChg_{Tot\%P,x)}$)	$= GP_{Tot,x(pr)} * ProfChg_{\%P(x)}$	
BO14:BO43	Total Profit Charges ($ProfChg_{Tot,x}$)	$= ProfChg_{TotPol,x} + ProfChg_{Tot\%C,x} + ProfChg_{Tot\%P,x}$	
BP14:BP43	Total Profit Charges as a Percentage of Total Pricing Gross Premium	$= ProfChg_{Tot,x} / GP_{Tot,x(pr)}$	
BQ14:BQ43	Total Gross Pricing Gain Less Total Profit Charges ($GainLessProfChg_{Tot,x}$)	$= NetGain_{Tot,x} + IntSpread_{Tot,x}$	

Pre-Funding.xls – DBPR Assumptions

Cells	Description	Formula	Comments
BR14:BR43	Total Gross Pricing Gain Less Total Profit Charges as a Percentage of Total Pricing Gross Premium	$= GainLessProfChg_{Tot,x} / GP_{Tot,x(pr)}$	
BS14:BS43	Total Pricing Gain Net of Profit Charges and Interest Spread ($NetGain_{Tot,x}$)	$= Gain_{Tot,x} – ProfChg_{TotPol,x} – ProfChg_{Tot\%C,x} – ProfChg_{Tot\%P,x}$	
BT14:BT43	Pricing Margin Net of Profit Charges	$= NetGain_{Tot,x} / GP_{Tot,x(pr)}$	
BU14:BU43	Paid Gross Loss Ratio	$= C_{Tot,x(pr)} / GP_{Tot,x(pr)}$	
BV14:BV43	Adjusted Gross Loss Ratio	$= (C_{Tot,x(pr)} + \Delta SV_{Tot,x}) / GP_{Tot,x(pr)}$	
BW14:BW43	Adjusted Gross Loss Ratio with Interest	$= (C_{Tot,x(pr)} + \Delta SV_{Tot,x} – RsvInt_{Tot,x}) / GP_{Tot,x(pr)}$	
AX45	Lifetime Total Pricing Gross Premium ($GP_{Tot(pr)}$)	$= \sum_{x=1}^{30} GP_{Tot,x(pr)}$	
AY45	Lifetime Total Pricing Claims ($C_{Tot(pr)}$)	$= \sum_{x=1}^{30} C_{Tot,x(pr)}$	

Pre-Funding.xls – DBPR Assumptions

Cells	Description	Formula	Comments
BB45	Lifetime Total Per Policy Expenses (Exp_{TotPol})	$= \sum_{x=1}^{30} Exp_{TotPol,x}$	
BC45	Lifetime Total Percentage-of-Claims Expenses ($Exp_{Tot\%C}$)	$= \sum_{x=1}^{30} Exp_{Tot\%C,x}$	
BD45	Lifetime Total Percentage-of-Premium Expenses ($Exp_{Tot\%P}$)	$= \sum_{x=1}^{30} Exp_{Tot\%P,x}$	
BE45	Lifetime Total Expenses (Exp_{Tot})	$= \sum_{x=1}^{30} Exp_{Tot,x}$	
BF45	Lifetime Change in Total Reserve (ΔSV_{Tot})	$= \sum_{x=1}^{30} \Delta SV_{Tot,x}$	Should equal zero.
BG45	Lifetime Interest on Total Reserve ($RsvInt_{Tot}$)	$= \sum_{x=1}^{30} RsvInt_{Tot,x}$	
BH45	Lifetime Total Gross Pricing Gain ($Gain_{Tot}$)	$= \sum_{x=1}^{30} Gain_{Tot,x}$	

Pre-Funding.xls – DBPR Assumptions

Cells	Description	Formula	Comments
BI45	Lifetime Total Gross Pricing Margin	$= Gain_{Tot} / GP_{Tot(pr)}$	
BJ45	Lifetime Total Interest Spread	$= \sum_{x=1}^{30} IntSpread_{Tot,x}$	
BK45	Lifetime Total Gross Pricing Gain with Interest Spread	$= \sum_{x=1}^{30} GainWithSpread_{Tot,x}$	
BL45	Lifetime Total Per Policy Profit Charges ($ProfChg_{TotPol}$)	$= \sum_{x=1}^{30} ProfChg_{TotPol,x}$	
BM45	Lifetime Total Percentage-of-Claims Profit Charges ($ProfChg_{Tot\%C}$)	$= \sum_{x=1}^{30} ProfChg_{Tot\%C,x}$	
BN45	Lifetime Total Percentage-of-Premium Profit Charges ($ProfChg_{Tot\%P}$)	$= \sum_{x=1}^{30} ProfChg_{Tot\%P,x}$	
BO45	Lifetime Total Profit Charges ($ProfChg_{Tot}$)	$= \sum_{x=1}^{30} ProfChg_{Tot,x}$	

Pre-Funding.xls – DBPR Assumptions

Cells	Description	Formula	Comments
BP45	Lifetime Total Profit Charges as a Percentage of Total Pricing Gross Premium	$= ProfChg_{Tot} / GP_{Tot(pr)}$	
BQ45	Lifetime Total Gross Pricing Gain Less Total Profit Charges ($GainLessProfChg_{Tot}$)	$= \sum_{x=1}^{30} GainLessProfChg_{Tot,x}$	
BR45	Lifetime Total Gross Pricing Gain Less Total Profit Charges, as a Percentage of Total Pricing Gross Premium	$= GainLessProfChg_{Tot} / GP_{Tot(pr)}$	
BS45	Lifetime Total Pricing Gain Net of Profit Charges ($ExcessGain_{Tot}$)	$= Gain_{Tot} – ProfChg_{TotPol} – ProfChg_{Tot\%C} – ProfChg_{Tot\%P}$	
BT45	Lifetime Pricing Margin Net of Profit Charges	$= NetGain_{Tot} / GP_{Tot(pr)}$	
BU45	Lifetime Paid Gross Loss Ratio	$= C_{Tot(pr)} / GP_{Tot(pr)}$	
BV45	Lifetime Adjusted Gross Loss Ratio	$= (C_{Tot(pr)} + \Delta SV_{Tot}) / GP_{Tot(pr)}$	

Pre-Funding.xls – DBPR Assumptions

Cells	Description	Formula	Comments
BW45	Lifetime Adjusted Gross Loss Ratio with Interest	$= (C_{Tot(pr)} + \Delta SV_{Tot} - RsvInt_{Tot}) / GP_{Tot(pr)}$	
AX46	Present Value of Total Pricing Gross Premium (PVGrossPrem)	$= NPV_{RsvDiscRate} (GP_{Tot,x(pr)})$, where NPV is taken over x = 1, 2, 3, …, 30	
AY46	Present Value of Total Pricing Claims (PVClaims)	$= NPV_{RsvDiscRate} (C_{Tot,x(pr)})$, where NPV is taken over x = 1, 2, 3, …, 30	
BB46	Present Value of Total Per Policy Expenses ($PVExp_{Pol}$)	$= NPV_{RsvDiscRate} (Exp_{TotPol,x})$, where NPV is taken over x = 1, 2, 3, …, 30	
BC46	Present Value of Total Percentage-of-Claims Expenses ($PVExp_{\%C}$)	$= NPV_{RsvDiscRate} (Exp_{Tot\%C,x})$, where NPV is taken over x = 1, 2, 3, …, 30	
BD46	Present Value of Total Percentage-of-Premium Expenses ($PVExp_{\%P}$)	$= NPV_{RsvDiscRate} (Exp_{Tot\%P,x})$, where NPV is taken over x = 1, 2, 3, …, 30	

Pre-Funding.xls – DBPR Assumptions

Cells	Description	Formula	Comments
BE46	Present Value of Total Expenses ($PVExp_{Tot}$)	$= NPV_{RsvDiscRate} (Exp_{Tot,x})$, where NPV is taken over x = 1, 2, 3, …, 30	
BF46	Present Value of Change in Total Reserve ($PV\Delta SV$)	$= NPV_{RsvDiscRate} (\Delta SV_{Tot,x})$, where NPV is taken over x = 1, 2, 3, …, 30	
BG46	Present Value of Interest on Total Reserve (PVRsvInt)	$= NPV_{RsvDiscRate} (RsvInt_{Tot,x})$, where NPV is taken over x = 1, 2, 3, …, 30	
BH46	Present Value of Total Gross Pricing Gain (PVGain)	$= PVGrossPrem – PVClaims – PVExp_{Pol} – PVExp_{\%C} – PVExp_{\%P}$ $– PV\Delta SV + PVRsvInt$	
BI46	Present Value of Total Gross Pricing Margin	= PVGain / PVGrossPrem	
BJ46	Present Value of Total Interest Spread (PVIntSpread)	$= NPV_{RsvDiscRate} (IntSpread_{Tot,x})$, where NPV is taken over x = 1, 2, 3, …, 30	
BK46	Present Value of Total Gross Pricing Gain with Interest Spread (PVGainWithSpread)	$= NPV_{RsvDiscRate} (GainWithSpread_{Tot,x})$, where NPV is taken over x = 1, 2, 3, …, 30	

Pre-Funding.xls – DBPR Assumptions

Cells	Description	Formula	Comments
BL46	Present Value of Total Per Policy Profit Charges ($ProfChg_{Pol}$)	= $NPV_{RsvDiscRate}$ ($ProfChg_{TotPol,x}$), where NPV is taken over x = 1, 2, 3, …, 30	
BM46	Present Value of Total Percentage-of-Claims Profit Charges ($ProfChg_{\%C}$)	= $NPV_{RsvDiscRate}$ ($ProfChg_{Tot\%C,x}$), where NPV is taken over x = 1, 2, 3, …, 30	
BN46	Present Value of Total Percentage-of-Premium Profit Charges ($ProfChg_{\%P}$)	= $NPV_{RsvDiscRate}$ ($ProfChg_{Tot\%P,x}$), where NPV is taken over x = 1, 2, 3, …, 30	
BO46	Present Value of Total Profit Charges (PVProfChg)	= $NPV_{RsvDiscRate}$ ($ProfChg_{Tot,x}$), where NPV is taken over x = 1, 2, 3, …, 30	
BP46	Present Value of Total Profit Charges as a Percentage of Present Value of Total Pricing Gross Premium	= PVProfChg / PVGrossPrem	
BQ46	Present Value of Total Gross Pricing Gain Less Total Profit Charges (PVGainLessProfChg)	= $NPV_{RsvDiscRate}$ ($GainLessProfChg_{Tot,x}$), where NPV is taken over x = 1, 2, 3, …, 30	

Pre-Funding.xls – DBPR Assumptions

Cells	Description	Formula	Comments
BR46	Present Value of Total Gross Pricing Gain Less Total Profit Charges, as a Percentage of Present Value of Total Pricing Gross Premium	= PVGainLessProfChg / PVGrossPrem	
BS46	Present Value of Total Pricing Gain Net of Profit Charges (PVExcessGain)	= PVGain – $\text{PVProfChg}_{\text{Pol}}$ – $\text{PVProfChg}_{\text{\%C}}$ – $\text{PVProfChg}_{\text{\%P}}$	
BT46	Present Value of Pricing Margin Net of Profit Charges	= PVNetGain / PVGrossPrem	
BU46	Lifetime Paid Gross Loss Ratio on a Present Value Basis	= PVClaims / PVGrossPrem	
BV46	Lifetime Adjusted Gross Loss Ratio on a Present Value Basis	= (PVClaims + PVΔSV) / PVGrossPrem	
BW46	Lifetime Adjusted Gross Loss Ratio with Interest, on a Present Value Basis	= (PVClaims + PVΔSV – PVRsvInt) / PVGrossPrem	

Pre-Funding.xls – DBPR Assumptions

Cells	Description	Formula	Comments
BJ47	Present Value of Total Interest Spread as a Percentage of Present Value of Total Pricing Gross Premium	= PVIntSpread / PVGrossPrem	
BK47	Present Value of Total Gross Pricing Gain with Interest Spread, as a Percentage of Present Value of Total Pricing Gross Premium	= PVGainWithSpread / PVGrossPrem	
BZ14:CD43	Composite Expected Paid Loss Ratio (ExpectedPaidLR$_{z,b}$)	= the zth value in the array of composite paid loss ratios for the bth block, where z is the appropriate projection year from BY14:BY43 and b is the appropriate block number from BZ13:CD13; the arrays of composite paid loss ratios are found in cells CK46:DN46, DP46:ES46, EU46:FX46, FZ46:HC46, and HE46:IH46, respectively.	
CE14:CI43	Composite Expected Incurred Loss Ratio (ExpectedIncLR$_{z,b}$)	= the zth value in the array of composite incurred loss ratios for the bth block, where z is the appropriate projection year from BY14:BY43 and b is the appropriate block number from BZ13:CD13; the arrays of composite incurred loss ratios are found in cells CK47:DN47, DP47:ES47, EU47:FX47, FZ47:HC47, and HE47:IH47, respectively.	

Pre-Funding.xls – DBPR Assumptions

Cells	Description	Formula	Comments
CK14:DN43	Premium by Cohort for Block 1 ($P_{z,x,1}$)	$= \begin{cases} 0, & x > z \text{ or } z - x > 19 \\ AgeAdjPremRate_{z,y} * (l_{z,y,1(st)} + l_{z,y,1(im)}), & \text{otherwise} \end{cases}$ $AgeAdjPremRate_{z,y}$ is from the appropriate cell of DBPR-1!AX126:BQ155 $l_{z,y,1(st)}$ is from the appropriate cell of DBPR-1!AB51:AU80 $l_{z,y,1(im)}$ is from the appropriate cell of DBPR-1!BT51:CM80	The condition x > z is equivalent to y < 1, and the condition z - x > 19 is equivalent to y > 20.
CK46:DN46	Composite Paid Loss Ratio by Projection Year for Block 1	$= \begin{cases} 0, & \sum_{x=1}^{30} P_{z,x,1} = 0 \\ (\sum_{x=1}^{30} P_{z,x,1} * PaidLR_x) / \sum_{x=1}^{30} P_{z,x,1}, & \text{otherwise} \end{cases}$	As long as the composite premium for the given projection year is nonzero, the composite paid loss ratio for that year is a weighted average of the paid loss ratios over all durations, where the weights are premiums.
CK47:DN47	Composite Incurred Loss Ratio by Projection Year for Block 1	$= \begin{cases} 0, & \sum_{x=1}^{30} P_{z,x,1} = 0 \\ (\sum_{x=1}^{30} P_{z,x,1} * IncLR_x) / \sum_{x=1}^{30} P_{z,x,1}, & \text{otherwise} \end{cases}$	As long as the composite premium for the given projection year is nonzero, the composite incurred loss ratio for that year is a weighted average of the incurred loss ratios over all durations, where the weights are premiums.

Pre-Funding.xls – DBPR Assumptions

Cells	Description	Formula	Comments
CK48:DN48	Lifetime Actual Premium for Block 1	$= 12 * \sum_{x=1}^{30} P_{z,x,1}$	

Analogous calculations are performed for blocks 2-5 in cells DP14:ES48, EU14:FX48, FZ14:HC48, and HE14:IH48, respectively.

Pre-Funding.xls – Crude DBPR - Global

Cells	**Description**	**Formula**	**Comments**
D6	Initial Reference Premium	From Global Assumptions!C24	
D7	Initial Reference Claim Cost for Standard Lives	From Global Assumptions!D49	
D8	Initial Reference Claim Cost for Impaired Lives	From Global Assumptions!D60	
B12:B41	Base Lapse Rates for Standard Lives	From the appropriate cell of Global Assumptions!D29:D33	
C12:C41	Base Lapse Rates for Impaired Lives	From Global Assumptions!C54	
D12:D41	Duration Factor	From the appropriate cell of Global Assumptions!B77:B81	
E12:E41	Per Policy Expense Rates	From the appropriate cell of Global Assumptions!B70:B74	
F12:F41	Percentage-of-Claims Expense Rates	From the appropriate cell of Global Assumptions!C70:C74	
G12:G41	Base Commission Rates	From the appropriate cell of Global Assumptions!D70:D74	
H12:H41	Renewal Commission Rates	From the appropriate cell of Global Assumptions!E70:E74	
I12:I41	Other Premium-Related Expense Rates	From the appropriate cell of Global Assumptions!F70:F74	

Pre-Funding.xls – Crude DBPR - Global

Cells	Description	Formula	Comments
J12:J41	Premium Age Factor (PAF_x)	$= 1, \quad x = 1$ $PAF_{x-1} * (1 + PremGrowthAge) \quad x = 2, 3, 4, \ldots, 30$ PremGrowthAge is from Global Assumptions!C25	
K12:K41	Rate of Impairment	From the appropriate cell of Global Assumptions!E43:E47	
L12:L41	Durational Rate Increase	From the appropriate cell of DBPR Assumptions!P14:P43	
O12:O41	Actual Trend ($ActTrend_z$)	From the appropriate cell of Global Assumptions!B106:B135	
P12:P41	Market New Business Rate ($MarketRate_z$)	$= GP_{1(pr)} / 12, \quad z = 1$ $MarketRate_{z-1} * (1 + ActTrend_{z-1}), \quad z = 2, 3, 4, \ldots, 30$ $GP_{1(pr)}$ is from DBPR Assumptions!AH14	
Q12:Q41	Company New Business Rate	$= \sum_{b=1}^{5} ComNewBusnRate_{z,b}$ Note: In this and subsequent formulas on the Crude DBPR-Global tab, whenever a sum is taken over the five blocks, the values are taken from tab DBPR-1 for the first block, from tab DBPR-2 for the second block, etc.	Sum of new business premium rate for projection year z across all five blocks; this and other aggregations of premium rates and lapse rates across blocks implicitly assume that the blocks do not overlap.

Pre-Funding.xls – Crude DBPR - Global

Cells	Description	Formula	Comments
T12:AM41	Aggregate New Business Sales by Cohort ($AggSales_{z,y}$)	$= \sum_{b=1}^{5} Sales_{z,y,b}$	
T42:AM42	Aggregate New Business Sales for Issue Year y	$= \sum_{z=1}^{30} AggSales_{z,y}$	
AP12:BI41	Aggregate Actual Lapse Rates for Standard Lives by Cohort	$= \sum_{b=1}^{5} q_{z,y,b(st)}$	
BL12:CE41	Aggregate Newly Impaired Lives by Cohort ($AggNewImpLives_{z,y}$)	$= \sum_{b=1}^{5} NewImpLives_{z,y,b}$	
BL42:CE42	Aggregate Newly Impaired Lives for Issue Year y	$= \sum_{z=1}^{30} AggNewImpLives_{z,y}$	
T51:AM80	Aggregate Enrollment of Standard Lives by Cohort ($Aggl_{z,y(st)}$)	$= \sum_{b=1}^{5} l_{z,y,b(st)}$	
T81:AM81	Aggregate Exposure of Standard Lives for Issue Year y	$= \sum_{z=1}^{30} l_{z,y(st)}$	

Pre-Funding.xls – Crude DBPR - Global

Cells	Description	Formula	Comments
AP51:BI80	Aggregate Actual Lapse Rates of Impaired Lives by Cohort	$= \sum_{b=1}^{5} q_{z,y,b(im)}$	
BL51:CE80	Aggregate Enrollment of Impaired Lives by Cohort ($l_{z,y(im)}$)	$= \sum_{b=1}^{5} l_{z,y,b(im)}$	
BT81:CM81	Aggregate Exposure of Impaired Lives for Issue Year y	$= \sum_{z=1}^{30} l_{z,y(im)}$	
T89:AM118	Aggregate Standard Lives Claim Levels by Cohort ($AggClaims_{z,y(st)}$)	$= \sum_{b=1}^{5} C_{z,y,b(st)}$	This and the next two tables are duplicates of those at cells T163:CE192.
AP89:BI118	Aggregate Impaired Lives Claim Levels by Cohort ($AggClaims_{z,y(im)}$)	$= \sum_{b=1}^{5} C_{z,y,b(im)}$	
BL89:CL118	Aggregate Average Claim Levels by Cohort	$= \sum_{b=1}^{5} C_{z,y,b}$	
T126:AM155	Aggregate Premium Rates after Durational Adjustment but Before Age Adjustment, by Cohort	$= \sum_{b=1}^{5} DurAdjPremRate_{z,y,b}$	

Pre-Funding.xls – Crude DBPR - Global

Cells	Description	Formula	Comments
AP126:BI155	Aggregate Age-Adjusted Premium Rates by Cohort ($AggAgeAdjPremRate_{z,y}$)	$= \sum_{b=1}^{5} AgeAdjPremRate_{z,y,b}$	
BL126:CE155	Aggregate Age-Adjusted Market New Business Premium Rates by Cohort	$= \sum_{b=1}^{5} AgeAdjMktNewBusnRate_{z,y,b}$	
T163:AM192	Aggregate Standard Lives Claim Levels by Cohort ($AggClaims_{z,y(st)}$)	$= \sum_{b=1}^{5} C_{z,y,b(st)}$	
AP163:BI192	Aggregate Impaired Lives Claim Levels by Cohort ($AggClaims_{z,y(im)}$)	$= \sum_{b=1}^{5} C_{z,y,b(im)}$	
BL163:CE192	Aggregate Average Claim Levels by Cohort	$= \sum_{b=1}^{5} C_{z,y,b}$	
T200:AM229	Aggregate Combined Actual Lapse Rates by Cohort	$= \sum_{b=1}^{5} q_{z,y,b}$	
AP200:BI229	Aggregate Antiselection Factors by Cohort	$= \sum_{b=1}^{5} AST_{z,y,b}$	

Pre-Funding.xls – Crude DBPR - Global

Cells	Description	Formula	Comments
BL200:CE229	Aggregate Cumulative Antiselection Factors by Cohort	$= \sum_{b=1}^{5} CAST_{z,y,b}$	
T237:AM256	Aggregate Adjusted Reserve Factor by Cohort	$= \sum_{b=1}^{5} AdjSV_{z,y,b}$	
AP237:BI256	Aggregate Per Policy Reserve by Cohort	$= \sum_{b=1}^{5} PolV_{z,y,b}$	
BL237:CE256	Pre-Funding Reserve by Cohort ($AggPreFundV_{z,y}$)	$= \sum_{b=1}^{5} PreFundV_{z,y,b}$	
T274:AM303	Aggregate Standard Lives Expense Levels by Cohort ($AggExp_{z,y(st)}$)	$= \sum_{b=1}^{5} Exp_{z,y,b(st)}$	
AP274:BI303	Aggregate Impaired Lives Expense Levels by Cohort ($AggExp_{z,y(im)}$)	$= \sum_{b=1}^{5} Exp_{z,y,b(im)}$	
BL274:CE303	Aggregate Average Expense Levels by Cohort	$= \sum_{b=1}^{5} Exp_{z,y,b}$	

Pre-Funding.xls – Crude DBPR - Global

Cells	Description	Formula	Comments
CH274:CH303	Aggregate Enrollment of Standard Lives by Projection Year ($Aggl_{z(st)}$)	$= \sum_{y=1}^{20} Aggl_{z,y(st)}$	
CH304	Aggregate Exposure of Standard Lives	$= \sum_{z=1}^{30} Aggl_{z(st)}$	
CI274:CI303	Aggregate Premium of Standard Lives by Projection Year ($AggPremium_{z(st)}$)	$= \sum_{y=1}^{20} (Aggl_{z,y(st)} * AggAgeAdjPremRate_{z,y} * 12)$	
CI304	Aggregate Premium of Standard Lives ($AggPremium_{st}$)	$= \sum_{z=1}^{30} AggPremium_{z(st)}$	
CJ274:CJ303	Aggregate Paid Claims of Standard Lives by Projection Year ($AggPaidClaims_{z(st)}$)	$= \sum_{y=1}^{20} (Aggl_{z,y(st)} * AggClaims_{z,y(st)} * 12)$	
CJ304	Aggregate Paid Claims of Standard Lives ($AggPaidClaims_{st}$)	$= \sum_{z=1}^{30} AggPaidClaims_{z(st)}$	

Pre-Funding.xls – Crude DBPR - Global

Cells	**Description**	**Formula**	**Comments**
CK274:CK303	Aggregate Loss Ratio for Standard Lives by Projection Year	$= AggClaims_{z(st)} / AggPremium_{z(st)}$	
CK304	Aggregate Paid Loss Ratio for Standard Lives	$= AggClaims_{st} / AggPremium_{st}$	
CN274:CN303	Aggregate Enrollment of Impaired Lives by Projection Year ($AggI_{z(im)}$)	$= \sum_{y=1}^{20} AggI_{z,y(im)}$	
CN304	Aggregate Exposure of Impaired Lives	$= \sum_{z=1}^{30} AggI_{z(im)}$	
CO274:CO303	Aggregate Premium of Impaired Lives by Projection Year ($AggPremium_{z(im)}$)	$= \sum_{y=1}^{20} (AggI_{z,y(im)} * AggAgeAdjPremRate_{z,y} * 12)$	
CO304	Aggregate Premium of Impaired Lives ($AggPremium_{im}$)	$= \sum_{z=1}^{30} AggPremium_{z(im)}$	

Pre-Funding.xls – Crude DBPR - Global

Cells	Description	Formula	Comments
CP274:CP303	Aggregate Paid Claims of Impaired Lives by Projection Year ($AggPaidClaims_{z(im)}$)	$= \sum_{y=1}^{20} (Aggl_{z,y(im)} * AggClaims_{z,y(im)} * 12)$	
CP304	Aggregate Paid Claims of Impaired Lives ($AggPaidClaims_{im}$)	$= \sum_{z=1}^{30} AggPaidClaims_{z(im)}$	
CQ274:CQ303	Aggregate Loss Ratio for Impaired Lives by Projection Year	$= AggPaidClaims_{z(im)} / AggPremium_{z(im)}$	Formula applies only for z = 2, 3, 4, …, 30.
CQ304	Aggregate Paid Loss Ratio for Impaired Lives	$= AggPaidClaims_{im} / AggPremium_{im}$	
CS274:CS303	Aggregate Enrollment by Projection Year ($Aggl_z$)	$= Aggl_{z(st)} + Aggl_{z(im)}$	
CS304	Aggregate Exposure	$= \sum_{z=1}^{30} Aggl_z$	
CT274:CT303	Aggregate Premium by Projection Year ($AggPremium_z$)	$= AggPremium_{z(st)} + AggPremium_{z(im)}$	

Pre-Funding.xls – Crude DBPR - Global

Cells	Description	Formula	Comments
CT304	Aggregate Premium (AggPremium)	$= \sum_{z=1}^{30} AggPremium_z$	
CU274:CU303	Aggregate Paid Claims by Projection Year ($AggPaidClaims_z$)	$= AggPaidClaims_{z(st)} + AggPaidClaims_{z(im)}$	
CU304	Aggregate Paid Claims (AggClaims)	$= \sum_{z=1}^{30} AggPaidClaims_z$	
CV274:CV303	Aggregate Paid Claims PMPM by Projection Year	$= AggPaidClaims_z / AggI_z / 12$	
CV304	Aggregate Paid Claims PMPM	= AggPaidClaims / AggI / 12	
CW274:CW303	Aggregate Reserve by Projection Year ($AggV_z$)	$= \sum_{y=1}^{20} AggPreFundV_{z,y}$	
CX274:CX303	Change in Aggregate Reserve ($\Delta AggV_z$)	$= \begin{cases} AggV_z, & z = 1 \\ AggV_z - AggV_{z-1}, & z = 2, 3, 4, \ldots, 30 \end{cases}$	

Pre-Funding.xls – Crude DBPR - Global

Cells	Description	Formula	Comments
CX304	Lifetime Change in Aggregate Reserve (AggV)	$= \sum_{z=1}^{30} \Delta AggV_z$	
CY274:CY303	Aggregate Incurred Claims by Projection Year ($AggIncClaims_z$)	$= AggPaidClaims_z + \Delta AggV_z$	
CY304	Aggregate Incurred Claims (AggIncClaims)	$= AggPaidClaims_z + AggV$	
CZ274:CZ303	Aggregate Paid Loss Ratio by Projection Year ($AggPaidLR_z$)	$= AggPaidClaims_z / AggPremium_z$	
CZ304	Aggregate Paid Loss Ratio	= AggPaidClaims / AggPremium	
DA274:DA303	Aggregate Incurred Loss Ratio by Projection Year ($AggIncLR_z$)	$= AggIncClaims_z / AggPremium_z$	
DA304	Aggregate Incurred Loss Ratio	= AggIncClaims / AggPremium	

Pre-Funding.xls – Crude DBPR - Global

Cells	Description	Formula	Comments
DB274:DB303	Actual-to-Expected Paid Loss Ratio by Projection Year	$= AggPaidLR_z / ExpectedPaidLR_{z,1}$ $ExpectedPaidLR_{z,1}$ is from the appropriate cell of DBPR Assumptions!BZ14:BZ43	Note that the expected paid loss ratio is the value for block 1.
DC274:DC303	Actual-to-Expected Incurred Loss Ratio by Projection Year	$= AggIncLR_z / ExpectedIncLR_{z,1}$ $ExpectedIncLR_{z,1}$ is from the appropriate cell of DBPR Assumptions!CE14:CE43	Note that the expected incurred loss ratio is the value for block 1.
DD274:DD303	Aggregate Earnings on Reserves by Projection Year ($AggReturn_z$)	$= \begin{cases} 0, & z = 1 \\ AggV_{z-1} * Return\%, & z = 2, 3, 4, \ldots, 30 \end{cases}$ Return% is from DBPR Assumptions!E8	
DD304	Aggregate Earnings on Reserves (AggReturn)	$= \sum_{z=1}^{30} AggReturn_z$	
DE274:DE303	Aggregate Loss Ratio with Interest by Projection Year	$= \begin{cases} 0, & AggPremium_z = 0 \\ (AggPaidClaims_z + \Delta AggV_z - AggReturn_z) / AggPremium_z, & AggPremium_z \neq 0 \end{cases}$	
DE304	Aggregate Loss Ratio with Interest	$= (AggPaidClaims + \Delta AggV - AggReturn) / AggPremium$	

Pre-Funding.xls – Crude DBPR - Global

Cells	Description	Formula	Comments
DF274:DF303	Aggregate Expenses by Projection Year ($AggExp_z$)	$= 12 * \sum_{y=1}^{20} [(AggI_{z,y(st)} * AggExp_{z,y(st)}) + (AggI_{z,y(im)} * AggExp_{z,y(im)})]$	
DF304	Aggregate Expenses	$= \sum_{z=1}^{30} AggExp_z$	
DG274:DG303	Aggregate Gain by Projection Year ($AggGain_z$)	$= AggPremium_z – AggPaidClaims_z – \Delta AggV_z + AggReturn_z – AggExpense_z$	
DG304	Aggregate Gain	= AggPremium – AggPaidClaims – ΔAggV + AggReturn – AggExpense	
DH274:DH303	Aggregate Gain as a Percentage of Aggregate Premium by Projection Year	$= AggGain_z / AggPremium_z$	
DH304	Aggregate Gain as a Percentage of Aggregate Premium	= AggGain / AggPremium	
DI274:DI303	Aggregate Risk-Based Capital by Projection Year ($AggRBC_z$)	$= AggPremium_z * RBC\%$ RBC% is from Global Assumptions!D83	

Pre-Funding.xls – Crude DBPR - Global

Cells	Description	Formula	Comments
DJ274:DJ303	Aggregate Opportunity Cost of Capital by Projection Year ($AggOCC_z$)	$= -AggRBC_z * OCC\%$ OCC% is from Global Assumptions!D84	
DJ304	Aggregate Opportunity Cost of Capital	$= \sum_{z=1}^{30} AggOCC_z$	
DK274: DK303	Aggregate Reserve Margin by Projection Year ($AggRsvMargin_z$)	$= \{1 – [1 / (1 + ReqRsvMargin)]\} * AggV_z * OCC\%$ ReqRsvMargin is from DBPR Assumptions!L6 OCC% is from Global Assumptions!D84	
DK304	Aggregate Reserve Margin	$= \sum_{z=1}^{30} AggRsvMargin_z$	
DL274:DL303	Aggregate Economic Gain by Projection Year ($AggEconGain_z$)	$= AggGain_z + AggOCC_z + AggRsvMargin_z$	
DL304	Aggregate Economic Gain	$= \sum_{z=1}^{30} AggEconGain_z$	

Pre-Funding.xls – Crude DBPR - Global

Cells	**Description**	**Formula**	**Comments**
CT307	Present Value of Aggregate Premium (PVAggPremium)	$= NPV_{int}\ (AggPremium_z) * \sqrt{1+int}$	For all of the following present value calculations, int is from Global Assumptions!B63, and the present values are taken over z = 1, 2, 3, …, 30.
CU307	Present Value of Aggregate Paid Claims (PVAggPaidClaims)	$= NPV_{int}\ (AggPaidClaims_z) * \sqrt{1+int}$	
CY307	Present Value of Aggregate Incurred Claims (PVAggIncClaims)	$= NPV_{int}\ (AggIncClaims_z) * \sqrt{1+int}$	
DD307	Present Value of Aggregate Earnings on Reserves (PVAggReturn)	$= NPV_{int}\ (AggReturn_z) * \sqrt{1+int}$	
DF307	Present Value of Aggregate Expenses (PVAggExp)	$= NPV_{int}\ (AggExp_z) * \sqrt{1+int}$	
DG307	Present Value of Aggregate Gains (PVAggGain)	$= NPV_{int}\ (AggGain_z) * \sqrt{1+int}$	

Pre-Funding.xls – Crude DBPR - Global

Cells	**Description**	**Formula**	**Comments**
DH307	Present Value of Aggregate Gain as a Percentage of Present Value of Aggregate Premium	= PVAggGain / PVAggPremium	
DJ307	Present Value of Aggregate Opportunity Cost of Capital (PVAggOCC)	$= NPV_{int} (AggOCC_{z}) * \sqrt{1+int}$	
DK307	Present Value of Aggregate Reserve Margin (PVAggRsvMargin)	$= NPV_{int} (AggRsvMargin_{z}) * \sqrt{1+int}$	
DL307	Present Value of Aggregate Economic Gain (PVAggEconGain)	$= NPV_{int} (AggEconGain_{z}) * \sqrt{1+int}$	
CT308	Present Value of Aggregate Premium as a Percentage of Present Value of Aggregate Premium	= PVAggPremium / PVAggPremium	Identically equal to 100%.
CU308	Present Value of Aggregate Paid Claims as a Percentage of Present Value of Aggregate Premium	= PVAggPaidClaims / PVAggPremium	

Pre-Funding.xls – Crude DBPR - Global

Cells	**Description**	**Formula**	**Comments**
CY308	Present Value of Aggregate Incurred Claims as a Percentage of Present Value of Aggregate Premium	= PVAggIncClaims / PVAggPremium	
DD308	Present Value of Aggregate Earnings on Reserves as a Percentage of Present Value of Aggregate Premium	= PVAggReturn / PVAggPremium	
DF308	Present Value of Aggregate Expenses as a Percentage of Present Value of Aggregate Premium	= PVAggExp / PVAggPremium	
DG308	Present Value of Aggregate Gain as a Percentage of Present Value of Aggregate Premium	= PVAggGain / PVAggPremium	
DJ308	Present Value of Aggregate Opportunity Cost of Capital as a Percentage of Present Value of Aggregate Premium	= PVAggOCC / PVAggPremium	

Pre-Funding.xls – Crude DBPR - Global

Cells	Description	Formula	Comments
DK308	Present Value of Aggregate Reserve Margin as a Percentage of Present Value of Aggregate Premium	= PVAggRsvMargin / PVAggPremium	
DL308	Present Value of Aggregate Economic Gain as a Percentage of Present Value of Aggregate Premium	= PVAggEconGain / PVAggPremium	

Pre-Funding.xls – DBPR-1, DBPR-2, DBPR-3, DBPR-4, DBPR-5

Cells	**Description**	**Formula**	**Comments**
D4	Block Number (b)	Hardcoded value equal to the block number; i.e., 1 for DBPR-1, 2 for DBPR-2, etc.	Subscript b applies to each variable in DBPR-1, DBPR-2, etc. but is omitted from documentation.
D5	Year Introduced (IntroYr)	From the appropriate cell of Global Assumptions!Q7:Q11	Equals 1, 4, 7, 10, 13 for blocks 1, 2, 3, 4, and 5, respectively.
D6	Initial Reference Premium (InitRefPrem)	From Global Assumptions!C24	
D7	Initial Reference Claim Cost for Standard Lives ($\text{InitRefClaims}_{st}$)	From Global Assumptions!D49	
D8	Initial Reference Claim Cost for Impaired Lives ($\text{InitRefClaims}_{im}$)	From Global Assumptions!D60	
B12:B41	Base Lapse Rate for Standard Lives ($\text{Baseq}_{x(st)}$)	From the appropriate cell of Global Assumptions!D29:D33	
C12:C41	Base Lapse Rate for Impaired Lives ($\text{Baseq}_{x(im)}$)	From Global Assumptions!C54	

Pre-Funding.xls – DBPR-1, DBPR-2, DBPR-3, DBPR-4, DBPR-5

Cells	Description	Formula	Comments
D12:D41	Duration Factor (DF_x)	From the appropriate cell of Global Assumptions!B77:B81	
E12:E41	Per Policy Expense Rates ($Exp_{Pol(x)}$)	From the appropriate cell of Global Assumptions!B70:B74	
F12:F41	Percentage-of-Claims Expense Rates ($Exp_{\%C(x)}$)	From the appropriate cell of Global Assumptions!C70:C74	
G12:G41	Base Commission Rates ($Comm_{B(x)}$)	From the appropriate cell of Global Assumptions!D70:D74	
H12:H41	Renewal Commission Rates ($Comm_{R(x)}$)	From the appropriate cell of Global Assumptions!E70:E74	
I12:I41	Other Premium-Related Expense Rates ($Exp_{Oth\%P(x)}$)	From the appropriate cell of Global Assumptions!F70:F74	
J12:J41	Premium Age Factor (PAF_x)	$= \begin{cases} 1, & x = 1 \\ PAF_{x-1} * (1 + PremGrowthAge), & x = 2, 3, 4, \ldots, 30 \end{cases}$ PremGrowthAge is from Global Assumptions!C25	

Pre-Funding.xls – DBPR-1, DBPR-2, DBPR-3, DBPR-4, DBPR-5

Cells	Description	Formula	Comments
K12:K41	Rate of Impairment (μ_x)	From the appropriate cell of Global Assumptions!E43:E47	
L12:L41	Durational Rate Increase (DRI_x)	From the appropriate cell of DBPR Assumptions!P14:P43	
O12:O41	Reference Premium ($RefPrem_z$)	= InitRefPrem, z = 1 $RefPrem_{z-1}$ * (1 + $ActTrend_{z-1}$), z = 2, 3, 4, …, 30	Note that columns B:L are based on duration (subscript = x), but columns O:Y are based on projection year (subscript = z)
P12:P41	Baseline New Sales ($BaseSales_z$)	From the appropriate cell of Global Assumptions!P15:T44	
Q12:Q41	Standard Lives Reference Claims ($RefClaims_{z(st)}$)	= $InitRefClaims_{st}$, z = 1 $C_{z-1(st)}$ * (1 + $ActTrend_{z-1}$), z = 2, 3, 4, …, 30	
R12:R41	Impaired Lives Reference Claims ($RefClaims_{z(im)}$)	= $InitRefClaims_{im}$, z = 1 $C_{z-1(im)}$ * (1 + $ActTrend_{z-1}$), z = 2, 3, 4, …, 30	
S12:S41	Actual Trend ($ActTrend_z$)	From appropriate cell of Global Assumptions!B106:B135	

Pre-Funding.xls – DBPR-1, DBPR-2, DBPR-3, DBPR-4, DBPR-5

Cells	Description	Formula	Comments
T13:T41	Implemented Rate Increase for New Business (ImpRateIncNew$_z$)	= min(MaxRateInc, RegDamp * ReqRateIncNew$_z$) MaxRateInc is from Global Assumptions!D100 RegDamp is from the appropriate cell of Global Assumptions!D90:D99, based on the value of ReqRateIncNew$_z$	Formula only applies for z = 2, 3, 4, …, 30.
U13:U41	Implemented Rate Increase for Renewal Business (ImpRateIncRen$_z$)	= min(MaxRateInc, RegDamp * ReqRateIncRen$_z$) MaxRateInc is from Global Assumptions!D100 RegDamp is from the appropriate cell of Global Assumptions!D90:D99, based on the value of ReqRateIncNew$_z$	Formula only applies for z = 2, 3, 4, …, 30.
V12:V41	Market New Business Rate (MarketRate$_z$)	= GP$_{z(pr)}$ / 12, z = 1 MarketRate$_{z-1}$ * (1 + ActTrend$_{z-1}$), z = 2, 3, 4, …, 30 GP$_{z(pr)}$ is from DBPR Assumptions!AH14	
W12:W41	Company New Business Rate (ComNewBusnRate$_z$)	0, BaseSales$_z$ = 0 = MarketRate$_z$ * (1 – Disc@Intro), BaseSales$_z$ ≠ 0 and z = IntroYr ComNewBusnRate$_{z-1}$ * (1 + ImpRateIncNew$_z$), BaseSales$_z$ ≠ 0 and z > IntroYr Disc@Intro is from Global Assumptions!D26	

Pre-Funding.xls – DBPR-1, DBPR-2, DBPR-3, DBPR-4, DBPR-5

Cells	Description	Formula	Comments
X13:X41	Requested Rate Increase for New Business ($ReqRateIncNew_z$)	$0,$ $z \le IntroYr$ $= ActTrend_{z-1},$ $z = IntroYr + 1$ $\max\{0, [PaidLR_{z-2} / ExpectedPaidLR_{z-2} * (1 + ActTrend_{z-2})^2 / (1 + ImpRateIncNew_{z-1}) - 1]\},$ otherwise $ExpectedPaidLR_{z-2}$ is from the appropriate cell of DBPR Assumptions!BZ14:CD43, based on the block and projection year	Formula only applies for z = 2, 3, 4, …, 30.
Y13:Y41	Requested Rate Increase for Renewal Business ($ReqRateIncRen_z$)	$= 0,$ $z \le IntroYr$ $ReqRateIncNew_z,$ $z > IntroYr$	Formula only applies for z = 2, 3, 4, …, 30.
AB12:AU41	New Business Sales by Cohort ($NewSales_{z,y}$)	$0,$ $x \ne 1$ $= \max(0, BaseSales_z * [1 + MktPriceSens * (MarketRate_z / RefPrem_z - 1)] * [1 + ComPriceSens * (ComNewBusnRate_z / MarketRate_z - 1)],$ otherwise MktPriceSens is from Global Assumptions!D14 ComPriceSens is from Global Assumptions!D15	
AB42:AU42	Total New Business Sales for Issue Year y	$= \sum_{z=1}^{30} NewSales_{z,y}$	

Pre-Funding.xls – DBPR-1, DBPR-2, DBPR-3, DBPR-4, DBPR-5

Cells	Description	Formula	Comments
AX12:BQ41	Actual Lapse Rates for Standard Lives by Cohort ($q_{z,y(st)}$)	$= \begin{cases} 0, & x \le 1 \text{ or } BaseSales_y = 0 \\ \max\{q_{min(st)}, \min[q_{max(st)}, Baseq_{x-1(st)} + ((AgeAdjPremRate_{z,y} / AgeAdjPremRate_{z-1,y}) - 1 - ActTrend_z) * LapseAdjTrend_{st} * (((AgeAdjPremRate_{z,y} / AgeAdjMktNewBusnRate_{z,y}) - 1) * LapseAdjMkt_{st} + 1) - (((ComNewBusnRate_y / RefPrem_y) - 1) * LapseAdjSale_{st})]\}, & x = 2, 3, \text{ or } 4 \text{ and } BaseSales_y \ne 0 \\ \max\{q_{min(st)}, \min[q_{max(st)}, Baseq_{x-1(st)} + ((AgeAdjPremRate_{z,y} / AgeAdjPremRate_{z-1,y}) - 1 - ActTrend_z) * LapseAdjTrend_{st} * (((AgeAdjPremRate_{z,y} / AgeAdjMktNewBusnRate_{z,y}) - 1) * LapseAdjMkt_{st} + 1)]\}, & \text{otherwise} \end{cases}$ $q_{min(st)}$ is from Global Assumptions!D40 $q_{max(st)}$ is from Global Assumptions!D39 AgingTrend is from Global Assumptions!C22 $LapseAdjTrend_{st}$ is from Global Assumptions!D36 $LapseAdjMkt_{st}$ is from Global Assumptions!D37 $LapseAdjSale_{st}$ is from Global Assumptions!D38	Ratio of premiums should be divided by (1 + AgingTrend) to be consistent with Current Markets model.
BT12:CM41	Newly Impaired Lives by Cohort ($NewImpLives_{z,y}$)	$= \begin{cases} 0, & x \le 1 \\ l_{z-1,y(st)} * \mu_{x-1} * (1 - q_{z,y(im)}), & x > 1 \end{cases}$	

Pre-Funding.xls – DBPR-1, DBPR-2, DBPR-3, DBPR-4, DBPR-5

Cells	Description	Formula	Comments
AB51:AU80	Enrollment of Standard Lives by Cohort ($l_{z,y(st)}$)	$= \begin{cases} 0, & x < 1 \\ NewSales_{z,y}, & x = 1 \\ NewSales_{z,y} + l_{z-1,y(st)} * (1 - \mu_{x-1}) * (1 - q_{z,y(st)}), & x > 1 \end{cases}$	
AB81:AU81	Total Enrollment of Standard Lives by Issue Year	$= \sum_{z=1}^{30} l_{z,y(st)}$	
AX51:BQ80	Actual Lapse Rates for Impaired Lives by Cohort ($q_{z,y(im)}$)	$= \begin{cases} 0, & x \leq 1 \text{ or } BaseSales_y = 0 \\ \max\{q_{min(im)}, \min[q_{max(im)}, Baseq_{x-1(im)} + ((AgeAdjPremRate_{z,y} / AgeAdjPremRate_{z-1,y}) - 1 - ActTrend_z) * LapseAdjTrend_{im}]\}, & \text{otherwise} \end{cases}$ $q_{min(im)}$ is from Global Assumptions!D58 $q_{max(im)}$ is from Global Assumptions!D57 $LapseAdjTrend_{im}$ is from Global Assumptions!D56	Ratio of premiums should be divided by (1 + AgingTrend) to be consistent with Current Markets model.
BT51:CM80	Enrollment of Impaired Lives by Cohort ($l_{z,y(im)}$)	$= \begin{cases} 0, & x = 1 \\ NewImpLives_{z,y} + l_{z-1,y(im)} * q_{z,y(im)}, & x > 1 \end{cases}$	
BT81:CM81	Total Enrollment of Impaired Lives by Issue Year	$= \sum_{z=1}^{30} l_{z,y(im)}$	

Pre-Funding.xls – DBPR-1, DBPR-2, DBPR-3, DBPR-4, DBPR-5

Cells	Description	Formula	Comments
AB89:AU118	Projected Standard Lives Pricing Claim Levels by Cohort ($C_{z,y(st, pr)}$)	$= \begin{cases} 0, & BaseSales_y = 0 \\ RefClaims_{z(st)} * DF_x * [1 + (ComNewBusnRate_y / RefPrem_y - 1) * MorbAdj_{st}], & BaseSales_y \neq 0 \text{ and } x = 1 \\ C_{z-1,y(st)} * DF_x / DF_{x-1} * (1 + ActTrend_{z-1}) * (1 + AgingTrend), & \text{otherwise} \end{cases}$ $MorbAdj_{st}$ is from Global Assumptions!D51 AgingTrend is from Global Assumptions!C22	
AX89:BQ118	Projected Impaired Lives Claim Levels by Cohort ($C_{z,y(st, pr)}$)	$= \begin{cases} 0, & BaseSales_y = 0 \\ RefClaims_{z(im)}, & BaseSales_y \neq 0 \text{ and } x = 1 \\ C_{z-1,y(im)} * (1 + ActTrend_z) * (1 + AgingTrend), & \text{otherwise} \end{cases}$	Should use $ActTrend_{z-1}$ to be consistent with other parts of the model.
BT89:CM118	Projected Average Claim Levels by Cohort ($C_{z,y(pr)}$)	$= \begin{cases} 0, & x < 1 \\ [(l_{x(st)} * C_{z,y(st, pr)}) + (l_{x(im)} * C_{z,y(im, pr)})]/l_x, & x = 1 \\ \max\{C_{z-1,y(pr)} * (1 + ActTrend_x) * (1 + AgingTrend), [(l_{x(st)} * C_{z,y(st, pr)}) + (l_{x(im)} * C_{z,y(im, pr)})]/l_x\}, & x > 1 \end{cases}$ $l_{x(st)}$ is from the appropriate cell of DBPR Assumptions!E14:E43 $l_{x(im)}$ is from the appropriate cell of DBPR Assumptions!F14:F43 l_x is from the appropriate cell of DBPR Assumptions!G14:G43 AgingTrend is from Global Assumptions!C22	Should use $ActTrend_{x-1}$ to be consistent with other parts of the model.

Pre-Funding.xls – DBPR-1, DBPR-2, DBPR-3, DBPR-4, DBPR-5

Cells	Description	Formula	Comments
AB126:AU155	Premium Rates after Durational Adjustment but Before Age Adjustment, by Cohort ($DurAdjPremRate_{z,y}$)	$= \begin{cases} 0, & BaseSales_y = 0 \\ ComNewBusnRate_z, & BaseSales_y \neq 0 \text{ and } x = 1 \\ DurAdjPremRate_{z-1,y} * (1 + ImpRateIncRen_z) * (1 + DRI_x), & \text{otherwise} \end{cases}$	
AX126:BQ126	Premium Rates Adjusted for both Duration and Age ($AgeAdjPremRate_{z,y}$)	$= \begin{cases} DurAdjPremRate_{z,y}, & x < 1 \\ DurAdjPremRate_{z,y} * PAF_x, & x = 2, 3, 4, \ldots, 30 \end{cases}$	
BT126:CM155	Age-Adjusted Market-Level New Business Premium Rates by Cohort ($AgeAdjMktNewBusnRate_{z,y}$)	$= \begin{cases} 0, & x < 1 \text{ or } BaseSales_y = 0 \\ MarketRate_z * PAF_x, & \text{otherwise} \end{cases}$	

Pre-Funding.xls – DBPR-1, DBPR-2, DBPR-3, DBPR-4, DBPR-5

Cells	Description	Formula	Comments
AB163:AU192	Standard Lives Actual Claim Levels by Cohort ($C_{z,y(st)}$)	0, $BaseSales_y = 0$ = $RefClaims_{z(st)} * DF_x * [1 + (ComNewBusnRate_y / RefPrem_y – 1) * MorbAdj_{st}]$, $BaseSales_y \neq 0$ and $x = 1$ $C_{z-1,y(st)} * DF_x / DF_{x-1} * (1 + ActTrend_z) * (1 + AgingTrend)$, otherwise $MorbAdj_{st}$ is from Global Assumptions!D51 AgingTrend is from Global Assumptions!C22	Should use $ActTrend_{z-1}$ to be consistent with other parts of the model.
AX163:BQ192	Impaired Lives Actual Claim Levels by Cohort ($C_{z,y(im)}$)	0, $BaseSales_y = 0$ = $RefClaims_{z(im)}$, $BaseSales_y \neq 0$ and $x = 1$ $C_{z-1,y(im)} * (1 + ActTrend_{z-1}) * (1 + AgingTrend)$, $BaseSales_y \neq 0$ and $x = 1$ AgingTrend is from Global Assumptions!C22	
BT163:CM192	Average Actual Claim Levels by Cohort ($C_{z,y}$)	= 0, $l_{z,y} = 0$ $[(l_{z,y(st)} * C_{z,y(st, pr)}) + (l_{z,y(im)} * C_{z,y(im, pr)})]/l_{z,y}$, $l_{z,y} > 0$	

Pre-Funding.xls – DBPR-1, DBPR-2, DBPR-3, DBPR-4, DBPR-5

Cells	Description	Formula	Comments
AB200:AU229	Actual Combined Lapse Rates by Cohort ($q_{z,y}$)	= 0, $l_{z-1,y(st)} + l_{z-1,y(im)} = 0$ $(l_{z-1,y(st)} * q_{z,y(st)} + l_{z-1,y(im)} * q_{z,y(im)}) / (l_{z-1,y(st)} + l_{z-1,y(im)})$, otherwise	Enrollment should be for projection year z rather than z-1 to be consistent with other parts of the model.
AX200:BQ229	Antiselection Factors by Cohort ($AST_{z,y}$)	0, $BaseSales_y = 0$ = 1, $BaseSales_y \neq 0$ and $x = 1$ max{[RsvRetUnantLapse * (1 – $q_{x-1(pr)}$) / (1 – $q_{z,y}$)] + (1 – RsvRetUnantLapse), minAST}, $BaseSales_y \neq 0$ and $x > 1$ RsvRetUnantLapse is from DBPR Assumptions!V7 $q_{x-1(pr)}$ is from the appropriate cell of DBPR Assumptions!H14:H43 minAST is from DBPR Assumptions!V5	
BT200:CM229	Cumulative Antiselection Factors by Cohort ($CAST_{z,y}$)	0, $BaseSales_y = 0$ = max($AST_{z,y}$, minCAST), $BaseSales_y \neq 0$ and $z = 1$ max($AST_{z,y} * CAST_{z-1,y}$, minCAST), $BaseSales_y \neq 0$ and $z > 1$ minCAST is from DBPR Assumptions!V6	

Pre-Funding.xls – DBPR-1, DBPR-2, DBPR-3, DBPR-4, DBPR-5

Cells	Description	Formula	Comments
AB237:AU266	Adjusted Reserve Factor by Cohort ($Adj\%SV_{z,y}$)	= 0, $y \le IntroYr$ $\%SV_x * (1 + ReqRsvMargin)$, $y > IntroYr$, $x = 1$, and $z < 30$ $\%SV_x$, $y > IntroYr$, $x = 1$, and $z = 30$ $\%SV_x * CAST_{z-1,y} * (1 + ReqRsvMargin)$, $y > IntroYr$, $x > 1$, and $z < 30$ $\%SV_x * CAST_{z-1,y}$, $y > IntroYr$, $x > 1$, and $z = 30$ $\%SV_x$ is from the appropriate cell of DBPR Assumptions!U14:U43 ReqRsvMargin is from DBPR Assumptions!L6	
AX237:BQ266	Per Policy Reserve by Cohort ($PolV_{z,y}$)	$= Adj\%SV_{z,y} * C_{z,y} * 12$	
BT237:CM266	Pre-Funding Reserve by Cohort ($PreFundV_{z,y}$)	$= PolV_{z,y} * (l_{z,y(st)} + l_{z,y(im)})$	

Pre-Funding.xls – DBPR-1, DBPR-2, DBPR-3, DBPR-4, DBPR-5

Cells	Description	Formula	Comments
AB274:AU303	Standard Lives Expense Levels by Cohort ($Exp_{z,y(st)}$)	0, $BaseSales_y = 0$ or $x < 1$ $= Exp_{Pol(x)} * (1 + Inflation)^{z-1}$ $+ C_{z,y(st)} * Exp_{\%C(x)}$ $+ ComNewBusnRate_y * Comm_{B(x)}$ $+ (AgeAdjPremRate_{z,y} – ComNewBusnRate_y) * Comm_{R(x)}$ $+ AgeAdjPremRate_{z,y} * Exp_{Oth\%P(x)}$, otherwise Inflation is from Global Assumptions!B64	
AX274:BQ303	Impaired Lives Expense Levels by Cohort ($Exp_{z,y(im)}$)	0, $BaseSales_y = 0$ or $x < 1$ $= Exp_{Pol(x)} * (1 + Inflation)^{z-1}$ $+ C_{z,y(im)} * Exp_{\%C(x)}$ $+ ComNewBusnRate_y * Comm_{B(x)}$ $+ (AgeAdjPremRate_{z,y} – ComNewBusnRate_y) * Comm_{R(x)}$ $+ AgeAdjPremRate_{z,y} * Exp_{Oth\%P(x)}$, otherwise Inflation is from Global Assumptions!B64	
BT274:CM303	Average Expense Levels by Cohort ($Exp_{z,y}$)	0, $l_{z,y(st)} + l_{z,y(im)} \leq 0$ $= [(l_{z,y(st)} * Exp_{z,y(st)}) + (l_{z,y(im)} * Exp_{z,y(im)})] / (l_{z,y(st)} + l_{z,y(im)})$, otherwise	

Pre-Funding.xls – DBPR-1, DBPR-2, DBPR-3, DBPR-4, DBPR-5

Cells	Description	Formula	Comments
CP274:CP303	Standard Lives Enrollment by Projection Year ($l_{z(st)}$)	$= \sum_{y=1}^{20} l_{z,y(st)}$	
CP304	Total Standard Lives Exposure	$= \sum_{z=1}^{30} l_{z(st)}$	"Total" refers to the sum over all 30 projection years.
CQ274:CQ303	Standard Lives Premium by Projection Year ($P_{z(st)}$)	$= \sum_{y=1}^{20} l_{z,y(st)} * AgeAdjPremRate_{z,y(st)} * 12$	
CQ304	Total Standard Lives Premium (P_{st})	$= \sum_{z=1}^{30} P_{z(st)}$	
CR274:CR303	Standard Lives Paid Claims by Projection Year ($C_{z(st)}$)	$= \sum_{y=1}^{20} l_{z,y(st)} * C_{z,y(st)} * 12$	
CR304	Total Standard Lives Paid Claims (C_{st})	$= \sum_{z=1}^{30} C_{z(st)}$	
CS274:CS303	Standard Lives Paid Loss Ratio by Projection Year	$= \begin{cases} 0, & P_{z(st)} = 0 \\ C_{z(st)} / P_{z(st)}, & \text{otherwise} \end{cases}$	

Pre-Funding.xls – DBPR-1, DBPR-2, DBPR-3, DBPR-4, DBPR-5

Cells	Description	Formula	Comments
CS304	Standard Lives Paid Loss Ratio	$= C_{st} / P_{st}$	
CV274:CV303	Impaired Lives Enrollment by Projection Year ($l_{z(im)}$)	$= \sum_{y=1}^{20} l_{z,y(im)}$	
CV304	Total Impaired Lives Exposure	$= \sum_{z=1}^{30} l_{z(im)}$	
CW274:CW303	Impaired Lives Premium by Projection Year ($P_{z(im)}$)	$= \sum_{y=1}^{20} l_{z,y(im)} * AgeAdjPremRate_{z,y(im)} * 12$	
CW304	Total Impaired Lives Premium (P_{im})	$= \sum_{z=1}^{30} P_{z(im)}$	
CX274:CX303	Impaired Lives Paid Claims by Projection Year ($C_{z(im)}$)	$= \sum_{y=1}^{20} l_{z,y(im)} * C_{z,y(im)} * 12$	
CX304	Total Impaired Lives Paid Claims (C_{im})	$= \sum_{z=1}^{30} C_{z(im)}$	

Pre-Funding.xls – DBPR-1, DBPR-2, DBPR-3, DBPR-4, DBPR-5

Cells	Description	Formula	Comments
CY274:CY303	Impaired Lives Paid Loss Ratio by Projection Year	$= \begin{cases} 0, & P_{z(im)} = 0 \\ C_{z(im)} / P_{z(im)}, & \text{otherwise} \end{cases}$	
CY304	Impaired Lives Paid Loss Ratio	$= \begin{cases} 0, & P_{im} = 0 \\ C_{im} / P_{im}, & \text{otherwise} \end{cases}$	
DA274:DA303	Combined Enrollment by Projection Year (l_z)	$= l_{z(st)} + l_{z(im)}$	
DA304	Total Combined Exposure (l)	$= \sum_{z=1}^{30} l_z$	
DB274:DB303	Combined Premium by Projection Year (P_z)	$= P_{z(st)} + P_{z(im)}$	
DB304	Total Combined Premium (P)	$= \sum_{z=1}^{30} P_z$	
DC274:DC303	Combined Paid Claims by Projection Year ($PaidClaims_z$)	$= C_{z(st)} + C_{z(im)}$	

Pre-Funding.xls – DBPR-1, DBPR-2, DBPR-3, DBPR-4, DBPR-5

Cells	Description	Formula	Comments
DC304	Total Combined Paid Claims (PaidClaims)	$= \sum_{z=1}^{30} PaidClaims_z$	
DD274:DD303	Combined Paid Claims PMPM by Projection Year	$= \begin{cases} 0, & l_z = 0 \\ PaidClaims_z \,/\, l_z \,/12, & \text{otherwise} \end{cases}$	
DD304	Total Combined Paid Claims PMPM	$= \begin{cases} 0, & l = 0 \\ PaidClaims \,/\, l \,/12, & \text{otherwise} \end{cases}$	
DE274:DE303	Reserve by Projection Year (V_z)	$= \sum_{y=1}^{20} PreFundV_{z,y}$	
DF274:DF303	Change in Reserve by Projection Year (ΔV_z)	$= \begin{cases} V_z, & z = 1 \\ V_z - V_{z-1}, & z = 2, 3, 4, \ldots, 30 \end{cases}$	
DF304	Total Change in Reserve (ΔV)	$= \sum_{z=1}^{30} \Delta V_z$	
DG274:DG303	Incurred Claims by Projection Year ($IncClaims_z$)	$= PaidClaims_z + \Delta V_z$	

Pre-Funding.xls – DBPR-1, DBPR-2, DBPR-3, DBPR-4, DBPR-5

Cells	Description	Formula	Comments
DG304	Total Incurred Claims (IncClaims)	= PaidClaims + ΔV	
DH274:DH303	Paid Loss Ratio by Projection Year ($PaidLR_z$)	= 0, z < IntroYr $PaidClaims_z$ / P_z, otherwise	
DH304	Paid Loss Ratio	= PaidClaims / P	
DI274:303	Incurred Loss Ratio by Projection Year ($IncLR_z$)	= 0, z < IntroYr $IncClaims_z$ / P_z, otherwise	
DI304	Incurred Loss Ratio	= IncClaims / P	
DJ274:DJ303	Actual-to-Expected Paid Loss Ratio by Projection Year	= 0, z < IntroYr $PaidLR_z$ / $ExpectedPaidLR_{z,b}$, otherwise $ExpectedPaidLR_{z,b}$ is from the appropriate cell of DBPR Assumptions!BZ14:CD43, based on the projection year and block number	
DK274:DK303	Actual-to-Expected Incurred Loss Ratio by Projection Year	= 0, z < IntroYr $IncLR_z$ / $ExpectedIncLR_{z,b}$, otherwise $ExpectedIncLR_{z,b}$ is from the appropriate cell of DBPR Assumptions!CE14:CI43, based on the projection year and block number	

Pre-Funding.xls – DBPR-1, DBPR-2, DBPR-3, DBPR-4, DBPR-5

Cells	Description	Formula	Comments
DL274:DL303	Earnings on Reserves by Projection Year ($Return_z$)	= 0, $z = 1$ V_{z-1} * Return%, $z = 2, 3, 4, \ldots, 30$ Return% is from DBPR Assumptions!E8	
DL304	Earnings on Reserves (Return)	$= \sum_{z=1}^{30} Return_z$	
DM274:DM303	Loss Ratio with Interest by Projection Year	= 0, $P_z = 0$ and $z < 30$ $(PaidClaims_z + \Delta V_z - Return_z) / P_z$, otherwise	
DN274:DN303	Expenses by Projection Year (Exp_z)	$= 12 * \sum_{y=1}^{20} [(l_{z,y(st)} * Exp_{z,y(st)}) + (l_{z,y(im)} * Exp_{z,y(im)})]$	
DN304	Expenses (Exp)	$= \sum_{z=1}^{30} Exp_z$	
DO274:DO303	Gain by Projection Year ($Gain_z$)	$= P_z - PaidClaims_z - \Delta V_z + Return_z - Exp_z$	
DO304	Gain (Gain)	= P – PaidClaims – ΔV + Return – Exp	

Pre-Funding.xls – DBPR-1, DBPR-2, DBPR-3, DBPR-4, DBPR-5

Cells	Description	Formula	Comments
DP274:DP303	Gain as a Percentage of Premium, by Projection Year	$= \begin{cases} 0, & P_z = 0 \\ Gain_z / P_z, & P_z \neq 0 \end{cases}$	
DP304	Gain as a Percentage of Premium	$= \begin{cases} 0, & P = 0 \\ Gain / P, & P \neq 0 \end{cases}$	
DQ274:DQ303	Risk-Based Capital by Projection Year (RBC_z)	$= P_z * RBC\%$ RBC% is from Global Assumptions!D83	Uses a predefined percentage of premium as a proxy for risk-based capital requirement.
DR274:DR303	Opportunity Cost of Capital by Projection Year (OCC_z)	$= -RBC_z * OCC\%$ OCC% is from Global Assumptions!D84	
DS274:DS303	Reserve Margin by Projection Year ($RsvMargin_z$)	$= -\{1 - [1 / (1 + ReqRsvMargin)]\} * V_z * OCC\%$ ReqRsvMargin is from DBPR Assumptions!L6 OCC% is from Global Assumptions!D84	
DS304	Reserve Margin (RsvMargin)	$= \sum_{z=1}^{30} RsvMargin_z$	

Pre-Funding.xls – DBPR-1, DBPR-2, DBPR-3, DBPR-4, DBPR-5

Cells	**Description**	**Formula**	**Comments**
DT274:DT303	Economic Gain by Projection Year ($EconGain_z$)	$= Gain_z + OCC_z + RsvMargin_z$	
DT304	Total Economic Gain	$= \sum_{z=1}^{30} EconGain_z$	
DB307	Present Value of Combined Premium (PVPremium)	$= NPV_{int} (P_z) * \sqrt{1+int}$	For all of the present value calculations, int is from Global Assumptions!B63 and the present values are taken over z = 1, 2, 3, …, 30.
DC307	Present Value of Combined Paid Claims (PVPaidClaims)	$= NPV_{int} (PaidClaims_z) * \sqrt{1+int}$	
DG307	Present Value of Combined Incurred Claims (PVIncClaims)	$= NPV_{int} (IncClaims_z) * \sqrt{1+int}$	
DL307	Present Value of Earnings on Reserves (PVReturn)	$= NPV_{int} (Return_z) * \sqrt{1+int}$	

Pre-Funding.xls – DBPR-1, DBPR-2, DBPR-3, DBPR-4, DBPR-5

Cells	Description	Formula	Comments
DN307	Present Value of Combined Expenses (PVExp)	$= NPV_{int} (Exp_z) * \sqrt{1+int}$	
DO307	Present Value of Gain (PVGain)	$= NPV_{int} (Gain_z) * \sqrt{1+int}$	
DR307	Present Value of Opportunity Cost of Capital (PVOCC)	$= NPV_{int} (OCC_z) * \sqrt{1+int}$	
DS307	Present Value of Reserve Margin (PVRsvMargin)	$= NPV_{int} (RsvMargin_z) * \sqrt{1+int}$	
DT307	Present Value of Economic Gain (PVEconGain)	$= NPV_{int} (EconGain_z) * \sqrt{1+int}$	
DB308	Present Value of Combined Premium as a Percentage of Present Value of Combined Premium	= PVPremium / PVPremium	Identically equal to 100%.
DC308	Present Value of Combined Paid Claims as a Percentage of Present Value of Combined Premium	= PVPaidClaims / PVPremium	

Pre-Funding.xls – DBPR-1, DBPR-2, DBPR-3, DBPR-4, DBPR-5

Cells	Description	Formula	Comments
DG308	Present Value of Incurred Claims as a Percentage of Present Value of Combined Premium	= PVIncClaims / PVPremium	
DL308	Present Value of Earnings on Reserves as a Percentage of Present Value of Combined Premium	= PVReturn / PVPremium	
DN308	Present Value of Combined Expenses as a Percentage of Present Value of Combined Premium	= PVExp / PVPremium	
DO308	Present Value of Gain as a Percentage of Present Value of Combined Premium	= PVGain / PVPremium	
DR308	Present Value of Opportunity Cost of Capital as a Percentage of Present Value of Combined Premium	= PVOCC / PVPremium	
DS308	Present Value of Reserve Margin as a Percentage of Present Value of Combined Premium	= PVRsvMargin / PVPremium	

Pre-Funding.xls – DBPR-1, DBPR-2, DBPR-3, DBPR-4, DBPR-5

Cells	**Description**	**Formula**	**Comments**
DT308	Present Value of Economic Gain as a Percentage of Present Value of Combined Premium	= PVEconGain / PVPremium	

Individual Market Pool.xls – Global Assumptions

The Global Assumptions tab within the Individual Market Pool spreadsheet is an exact copy of the analogous tab in the Global spreadsheet. The field names, cell numbers, and values are identical. If a change is made in the Global Assumptions tab of the Global spreadsheet, the Global Assumptions tabs of all other spreadsheets in the model will be updated automatically the next time they are opened.

Individual Market Pool.xls – IMP Assumptions

Cells	Description	Formula	Comments
E9	Eligibility Waiting Period (WaitPd)	= 5	Hardcoded value; represents number of years policy must be held before becoming eligible for high-risk pool.
E11	Threshold Premium Percentage (ThreshPrem%)	= 150%	Hardcoded value; the insured's renewal rate must be at or above this percentage of the market new business rate to be considered impaired.
K9	Percentage-of-Premium Pool Expenses ($PoolExp_{\%P}$)	= 5.0%	Hardcoded value
K10	Percentage-of-Claims Pool Expenses ($PoolExp_{\%C}$)	= 5.0%	Hardcoded value
K11	Per Policy Pool Expenses PMPM ($PoolExp_{Pol}$)	= $3.50	Hardcoded value

Individual Market Pool.xls – IMP Assumptions

Cells	Description	Formula	Comments
E15	Pool Premium Percentage (PoolP%)	= 150%	Relativity of the pool premium to the market new business rate
D18	Minimum Pool Assessment (MinAssess%)	= 0.00%	Hardcoded value
D19	Maximum Pool Assessment (MaxAssess%)	= 50.00%	Hardcoded value
E23	Migration Sensitivity to Renewal Premium Rate (MigrSensPrem)	= 100.0%	Hardcoded value; “migration” refers to movement into the high-risk pool.
F25	Bend Point	= 120.0%	Hardcoded value; represents percentage of pool rate at which renewal premium is large enough to cause impaired lives to lapse at an accelerated rate
F26	Migration Sensitivity to Trend, Low Value ($MigrSensTrend_{lo}$)	= 15.0%	Hardcoded value

Individual Market Pool.xls – IMP Assumptions

Cells	Description	Formula	Comments
F27	Migration Sensitivity to Trend, High Value ($MigrSensTrend_{hi}$)	= 50.0%	Hardcoded value
E28	Maximum Migration Rate (λ_{max})	= 80%	Hardcoded value
E29	Minimum Migration Rate (λ_{min})	= 0%	Hardcoded value
D30	Pool Lapse Rate (q_{pool})	= 25.0%	Hardcoded value
D38:D47	Year of Introduction ($IntroYr_b$)	From the appropriate cell of Global Assumptions!Q7:Q11 for blocks 1-5; hardcoded values for blocks 6-10	Blocks 6-10 are unique to the Individual Market Pool model. Their purpose is to follow results of the model for a longer period of time. To turn off these blocks, set their IntroYr values to a number greater than 30.
B51:B80	Baseline New Sales ($BaseSales_x$)	From the appropriate cell of Global Assumptions!D4:D11	

Individual Market Pool.xls – IMP Assumptions

Cells	Description	Formula	Comments
C51:L80	Base Sales by Projection Year by Block ($BaseSales_{z,b}$)	$= \begin{cases} 0, & z < IntroYr_b \\ BaseSales_{z-IntroYr(b)+1}, & z \geq IntroYr_b \end{cases}$	
R34	Target Lifetime Loss Ratio (TargetLR)	= 65.0%	Hardcoded value
R35	Maximum Allowable Loss Ratio (MaxLR)	= 200.0%	Hardcoded value
Q36	Flag to Include Trend (TrendFlag)	= 1	Hardcoded value; value of 1 means to include trend in projections, value of 0 means to exclude trend.
Q40	Initial Reference Claim Cost for Standard Lives ($InitRefClaims_{st}$)	From Global Assumptions!D49	Best estimate of starting claim costs for standard lives

Individual Market Pool.xls – IMP Assumptions

Cells	Description	Formula	Comments
S40	Pricing Assumption of Initial Reference Claim Cost for Standard Lives ($InitRefClaims_{st(pr)}$)	= $InitRefClaims_{st}$	Standard lives starting claim costs used in initial pricing; the model provides the flexibility to adjust the baseline claims for use in pricing, but the model currently does not make any such adjustment.
Q41	Initial Reference Claim Cost for Impaired Lives ($InitRefClaims_{im}$)	From Global Assumptions!D60	Best estimate of starting claim costs for impaired lives
S41	Pricing Assumption of Initial Reference Claim Cost for Impaired Lives ($InitRefClaims_{im(pr)}$)	= $InitRefClaims_{im}$	Impaired lives starting claim costs used in initial pricing; the model provides the flexibility to adjust the baseline claims for use in pricing, but the model currently does not make any such adjustment.

Individual Market Pool.xls – IMP Assumptions

Cells	Description	Formula	Comments
S42	Durational Deterioration Limitation Period (DDLP)	= 5	Hardcoded value; period during which the probability of a standard life becoming impaired is assumed to be greater than zero for pricing purposes
R43	Expected Monthly Premium Rate PMPM (ExpPrem)	= $126	Hardcoded value
V36:V40	Durational Rate Increase (DRI_x)	$= \begin{cases} 5\%, & x = 2 \\ 5\%, & x = 3 \\ 5\%, & x = 4 \\ 5\%, & x = 5 \\ 0\%, & x = 6, 7, 8, \ldots, 30 \end{cases}$	Hardcoded values; formula does not apply for x = 1
O46:O75	Standard Lives Base Lapse Rates Used in Pricing ($q_{x(st, pr)}$)	$= \max\{q_{min(st)}, \min[q_{max(st)}, Baseq_{x(st, pr)} + (AccumDRI_{x+1} / AccumDRI_x) * (1 + AgingTrend) – 1) * LapseAdjTrend_{st}) * ((AccumDRI – 1) * LapseAdjMkt_{st} + 1)]\}$ $q_{min(st)}$ is from Global Assumptions!D40 $q_{max(st)}$ is from Global Assumptions!D39 $Baseq_{x(st, pr)}$ is from the appropriate cell of Global Assumptions!E29:E33 AgingTrend is from Global Assumptions!C22 $LapseAdjTrend_{st}$ is from Global Assumptions!D36 $LapseAdjMkt_{st}$ is from Global Assumptions!D37	Baseline standard lives lapse rates adjusted to reflect higher anticipated lapses due to rate increases exceeding claim trend and renewal rates exceeding the market new business rate

Individual Market Pool.xls – IMP Assumptions

Cells	Description	Formula	Comments
P46:P75	Impaired Lives Base Lapse Rates Used in Pricing ($q_{x(im, pr)}$)	= $q_{x(st, pr)}$, x > DDLP max{min[$q_{max(im)}$, $Baseq_{im(pr)}$ + (DRI_{x+1} * $LapseAdjTrend_{im}$)], $q_{min(im)}$}, x ≤ DDLP and (x ≤ WaitPd or $AccumDRI_x$ < ThreshPrem%) 1 – {1 – max[min($q_{max(im)}$, $Baseq_{im(pr)}$ + (DRI_{x+1} * $LapseAdjTrend_{im}$)), $q_{min(im)}$]} * {1 - max[min((($AccumDRI_{x+1}$ / 1.5) - 1) * MigrSensPrem + (DRI_{x+1} * $MigrSensTrend_{hi}$), λ_{max}), λ_{min}]}, otherwise $q_{min(im)}$ is from Global Assumptions!D58 $q_{max(im)}$ is from Global Assumptions!D57 $Baseq_{im(pr)}$ is from Global Assumptions!D54 $LapseAdjTrend_{im}$ is from Global Assumptions!D56	Baseline impaired lives lapse rates adjusted to reflect higher anticipated lapses due to rate increases exceeding claim trend during durational deterioration limitation period; beyond DDLP, impaired lives lapse rates are equal to standard lives lapse rates.
Q46:Q75	Probability of Becoming Impaired Used in Pricing ($\mu_{x(pr)}$)	= μ_x, x ≤ DDLP 0, x > DDLP μ_x is from the appropriate cell of Global Assumptions!E43:E47	
R46:R75	Number of Standard Lives ($l_{x(st)}$)	= 1.00, x = 1 $l_{x-1(st)}$ * (1 - $\mu_{x-1(pr)}$) * (1 - $q_{x-1(st, pr)}$), x = 2, 3, 4, …, 30	The values in columns R, S, and T represent proportions of the number of first-year standard lives

Individual Market Pool.xls – IMP Assumptions

Cells	Description	Formula	Comments
S46:S75	Number of Impaired Lives ($l_{x(im)}$)	= 0, x = 1 $[l_{x-1(im)} * (1 - q_{x-1(im, pr)})] + [l_{x-1(st)} * \mu_{x-1(pr)}]$, x = 2, 3, 4, …, 30	
T46:T75	Number of Total Lives (l_x)	$= l_{x(st)} + l_{x(im)}$	
U46:U75	Accumulated Trend ($AccumTrend_x$)	= 1, x = 1 $AccumTrend_{x-1}$ * [1 + (Trend * TrendFlag)], x = 2, 3, 4, …, 30 Trend is from Global Assumptions!D21	
V46:V75	Discount Factor (v_x)	= 1, x = 1 $v_{x-1}/(1 + int)$, x = 2, 3, 4, …, 30	
W46:W75	Pricing Claims ($C_{x(pr)}$)	= {[$InitRefClaims_{st(pr)}$ * (1 + ((ExpPrem / InitRefPrem) - 1) * $MorbAdj_{st}$) * DF_x * $l_{x(st)}$)] + ($InitRefClaims_{im(pr)}$ * $l_{x(im)}$)} * PAF_x * $AccumTrend_x$, $x \le DDLP$ {[$InitRefClaims_{st(pr)}$ * (1 + ((ExpPrem / InitRefPrem) - 1) * $MorbAdj_{st}$) * $l_{x(st)}$)] + ($InitRefClaims_{im(pr)}$ * $l_{x(im)}$)} * PAF_x * $AccumTrend_x$, $x > DDLP$ InitRefPrem is from Global Assumptions!C24 $MorbAdj_{st}$ is from Global Assumptions!D51 DF_x is from the appropriate cell of IMP-1!D12:D43 PAF_x is from the appropriate cell of IMP-1!J12:J41	Standard lives' claims are adjusted each year for duration (within the DDLP), aging, and trend. Impaired lives' claims are adjusted each year for aging and trend.

Individual Market Pool.xls – IMP Assumptions

Cells	Description	Formula	Comments
X46:X75	Annual Durational Rate Increase ($ADRI_x$)	$= \begin{cases} 0, & x = 1 \\ DRI_x, & x = 2, 3, 4, \ldots, 30 \end{cases}$	
Y46:Y75	Accumulated Durational Rate Increase Factor ($AccumDRI_x$)	$= \begin{cases} 1, & x = 1 \\ AccumDRI_{x-1} * (1 + ADRI_x), & x = 2, 3, 4, \ldots, 30 \end{cases}$	
Z46:Z75	Pricing Premium ($P_{x(pr)}$)	$= \begin{cases} l_1 * \sum_{i=1}^{30} (C_{i(pr)} * v_i) / \sum_{j=1}^{30} (l_j * PAF_j * AccumTrend_j * v_j * AccumDRI_j) / TargetLR, & x = 1 \\ P_{1(pr)} / l_1 * PAF_x * l_x * AccumTrend_x * ADRI_x / ADRI_1, & x = 2, 3, 4, \ldots, 30 \end{cases}$ PAF_x is from the appropriate cell of IMP-1!J12:J41	
AA46:AA75	Pricing Loss Ratio ($LR_{x(pr)}$)	$= C_{x(pr)} / P_{x(pr)}$	

Individual Market Pool.xls – IMP Assumptions

Cells	Description	Formula	Comments
AB46:AB75	Pricing Expenses ($Exp_{x(pr)}$)	$= l_x * Exp_{Pol(x)} * (1 + Inflation)^{x-1}$ $+ Exp_{\%C(x)} * C_{x(pr)}$ $+ Comm_{B(x)} * P_{1(pr)} / l_1 * l_x$ $+ Comm_{R(x)} * [P_{x(pr)} – (P_{1(pr)} / l_1 * l_x)]$ $+ Exp_{Oth\%P(x)} * P_{x(pr)}$ $+ MinAssess\% * P_{x(pr)}$ $Exp_{Pol(x)}$ is from the appropriate cell of IMP-1!E12:E41 Inflation is from Global Assumptions!B64 $Exp_{\%C(x)}$ is from the appropriate cell of IMP-1!F12:F41 $Comm_{B(x)}$ is from the appropriate cell of IMP-1!G12:G41 $Comm_{R(x)}$ is from the appropriate cell of IMP-1!H12:H41 $Exp_{Oth\%P(x)}$ is from the appropriate cell of IMP-1!I12:I41	
AC46:AC75	Pricing Expense as a Percentage of Pricing Premium	$= Exp_{x(pr)} / P_{x(pr)}$	
AD46:AD75	Pricing Operating Gain ($Gain_{x(pr)}$)	$= P_{x(pr)} – C_{x(pr)} – Exp_{x(pr)}$	
AE46:AE75	Pricing Gain as a Percentage of Pricing Premium	$= Gain_{x(pr)} / P_{x(pr)}$	

Individual Market Pool.xls – IMP Assumptions

Cells	Description	Formula	Comments
T81	Interest (int)	From Global Assumptions!B63	
W77	Simple Sum of Pricing Claims (SumClaims)	$= \sum_{x=1}^{30} C_{x(pr)}$	
Z77	Simple Sum of Pricing Premiums (SumPrem)	$= \sum_{x=1}^{30} P_{x(pr)}$	
AA77	Pricing Loss Ratio, Using Simple Sums	= SumClaims / SumPrem	
AB77	Simple Sum of Pricing Expenses (SumExp)	$= \sum_{x=1}^{30} Exp_{x(pr)}$	
AC77	Pricing Expense Ratio, Using Simple Sums	= SumExp / SumPrem	
AD77	Simple Sum of Pricing Gains (SumGain)	$= \sum_{x=1}^{30} Gain_{x(pr)}$	
AE77	Pricing Gain Ratio, Using Simple Sums	= SumGain / SumPrem	

Individual Market Pool.xls – IMP Assumptions

Cells	**Description**	**Formula**	**Comments**
W78	Present Value of Pricing Claims over 10 Years ($PVClaims_{10}$)	$= NPV_{int} (C_{x(pr)}) * \sqrt{1+int}$, where NPV is taken over x = 1, 2, 3, ….10	
Z78	Present Value of Pricing Premiums over 10 Years ($PVPrem_{10}$)	$= NPV_{int} (P_{x(pr)}) * \sqrt{1+int}$, where NPV is taken over x = 1, 2, 3, ….10	
AA78	Pricing Loss Ratio, Using 10-Year NPVs	$= PVClaims_{10} / PVPrem_{10}$	
AB78	Present Value of Pricing Expenses over 10 Years ($PVExp_{10}$)	$= NPV_{int} (Exp_{x(pr)}) * \sqrt{1+int}$, where NPV is taken over x = 1, 2, 3, ….10	
AC78	Pricing Expense Ratio, Using 10-Year NPVs	$= PVExp_{10} / PVPrem_{10}$	
AD78	Present Value of Pricing Gains over 10 Years ($PVGain_{10}$)	$= NPV_{int} (Gain_{x(pr)}) * \sqrt{1+int}$, where NPV is taken over x = 1, 2, 3, ….10	
AE78	Pricing Gain Ratio, Using 10-Year NPVs	$= PVGain_{10} / PVPrem_{10}$	

Individual Market Pool.xls – IMP Assumptions

Cells	Description	Formula	Comments
W79	Present Value of Pricing Claims over 30 Years ($PVClaims_{30}$)	$= NPV_{int} (C_{x(pr)}) * \sqrt{1+int}$, where NPV is taken over x = 1, 2, 3, ….30	
Z79	Present Value of Pricing Premiums over 30 Years ($PVPrem_{30}$)	$= NPV_{int} (P_{x(pr)}) * \sqrt{1+int}$, where NPV is taken over x = 1, 2, 3, ….30	
AA79	Pricing Loss Ratio, Using 30-Year NPVs	$= PVClaims_{30} / PVPrem_{30}$	
AB79	Present Value of Pricing Expenses over 30 Years ($PVExp_{30}$)	$= NPV_{int} (Exp_{x(pr)}) * \sqrt{1+int}$, where NPV is taken over x = 1, 2, 3, ….30	
AC79	Pricing Expense Ratio, Using 30-Year NPVs	$= PVExp_{30} / PVPrem_{30}$	
AD79	Present Value of Gains over 30 Years ($PVGain_{30}$)	$= NPV_{int} (Gain_{x(pr)}) * \sqrt{1+int}$, where NPV is taken over x = 1, 2, 3, ….30	
AE79	Pricing Gain Ratio, Using 30-Year NPVs	$= PVGain_{30} / PVPrem_{30}$	

Individual Market Pool.xls – IMP Assumptions

Cells	Description	Formula	Comments
W80	PV of Pricing Claims as a Percentage of PV of Pricing Premium	$= PVClaims_{30} / PVPrem_{30}$	Model calculations produce a stream of premiums such that this is equal to the target lifetime loss ratio.
Z80	PV of Pricing Premium as a Percentage of PV of Pricing Premium	$= PVPrem_{30} / PVPrem_{30}$	Identically equal to 1
AB80	PV of Pricing Expenses as a Percentage of PV of Pricing Premium	$= PVExp_{30} / PVPrem_{30}$	Same as AC79
AD80	PV of Pricing Gain as a Percentage of PV of Pricing Premium	$= PVGain_{30} / PVPrem_{30}$	Same as AE79
AH46:AH75	Composite Loss Ratio by Projection Year for Block 1	$= LR_{z,1}$	
AJ46:BM75	Weighting Factor by Cohort for Block 1 ($W_{z,x,1}$)	$= \begin{cases} 0, & y < 1 \text{ or } y > 20 \\ (1 + AgingTrend)^z * AccumDRI_x * (l_{z,y,1(st)} + l_{z,y,1(im)}), & \text{otherwise} \end{cases}$ AgingTrend is from Global Assumptions!C22 $l_{z,y,1(st)}$ is from the appropriate cell of IMP-1!AC51:BF80 $l_{z,y,1(im)}$ is from the appropriate cell of IMP-1!AC89:BF118	Note that in this table, columns represent projection years, rows represent durations, and diagonals represent issue years.

Individual Market Pool.xls – IMP Assumptions

Cells	Description	Formula	Comments
AJ78:BM78	Composite Loss Ratio by Projection Year for Block 1 ($LR_{z,1}$)	$= (\sum_{i=1}^{30} W_{z,i,1} * LR_{i(pr)}) / \sum_{j=1}^{30} W_{z,j,1}$	Summations are over all positive durations for a given projection year.
AJ79:BM79	Total Weighting Factor by Projection Year for Block 1	$= \sum_{x=1}^{30} W_{z,x,1}$	

Individual Market Pool.xls – IMP - Global

Cells	Description	Formula	Comments
D4	Initial Reference Premium (InitRefPrem)	From Global Assumptions!C24	
D5	Initial Reference Claim Cost for Standard Lives ($InitRefClaims_{st}$)	From Global Assumptions!D49	
D6	Initial Reference Claim Cost for Impaired Lives ($InitRefClaims_{im}$)	From Global Assumptions!D60	
B12:B41	Base Lapse Rates for Standard Lives ($Baseq_{x(st)}$)	From the appropriate cell of Global Assumptions!D29:D33	
C12:C41	Base Lapse Rates for Impaired Lives ($Baseq_{x(im)}$)	From Global Assumptions!C54	
D12:D41	Duration Factor (DF_x)	From the appropriate cell of Global Assumptions!B77:B81	
E12:E41	Per Policy Expense Rates ($Exp_{Pol(x)}$)	From the appropriate cell of Global Assumptions!B70:B74	

Individual Market Pool.xls – IMP - Global

Cells	Description	Formula	Comments
F12:F41	Percentage-of-Claims Expense Rates ($Exp_{\%C(x)}$)	From the appropriate cell of Global Assumptions!C70:C74	
G12:G41	Base Commission Rates ($Comm_{B(x)}$)	From the appropriate cell of Global Assumptions!D70:D74	
H12:H41	Renewal Commission Rates ($Comm_{R(x)}$)	From the appropriate cell of Global Assumptions!E70:E74	
I12:I41	Other Premium-Related Expense Rates ($Exp_{Oth\%P(x)}$)	From the appropriate cell of Global Assumptions!F70:F74	
J12:J41	Premium Age Factor (PAF_x)	= 1, x = 1 PAF_{x-1} * (1 + PremGrowthAge) x = 2, 3, 4, …, 30 PremGrowthAge is from Global Assumptions!C25	
K12:K41	Rate of Impairment (μ_x)	From the appropriate cell of Global Assumptions!E43:E47	
L12:L41	Durational Rate Increase	From the appropriate cell of IMP Assumptions!X46:X75	
O12:O41	Reference Premium ($RefPrem_x$)	= InitRefPrem, x = 1 $RefPrem_{x-1}$ * (1 + $ActTrend_{x-1}$), x = 2, 3, 4, …, 30	

Individual Market Pool.xls – IMP - Global

Cells	Description	Formula	Comments
P12:P41	Baseline Sales ($BaseSales_x$)	From the appropriate cell of Global Assumptions!D4:D11	
Q12:Q41	Standard Lives Reference Claims ($RefClaims_{x(st)}$)	= $InitRefClaims_{st}$, x = 1 $C_{x-1(st)}$ * (1 + $ActTrend_{x-1}$), x = 2, 3, 4, …, 30	
R12:R41	Impaired Lives Reference Claims ($RefClaims_{x(im)}$)	= $InitRefClaims_{im}$, x = 1 $RefClaims_{x-1(im)}$ * (1 + $ActTrend_{x-1}$), x = 2, 3, 4, …, 30	
S12:S41	Actual Trend ($ActTrend_z$)	From the appropriate cell of Global Assumptions!B106:B135	
V12:V41	Market New Business Rate ($MarketRate_z$)	$P_{1(pr)}$ / l_1, z = 1 = $MarketRate_{z-1}$ * (1 + $ActTrend_{z-1}$) / (1 – $AggAssess\%_z$), z = 2 $MarketRate_{z-1}$ * (1 + $ActTrend_{z-1}$) / (1 – $AggAssess\%_z$) * (1 – $AggAssess\%_{z-1}$), z = 3, 4, 5, …, 30 $P_{1(pr)}$ is from IMP Assumptions!Z46 l_1 is from IMP Assumptions!T46	

Individual Market Pool.xls – IMP - Global

Cells	Description	Formula	Comments
W12:W41	Company New Business Rate	$= \sum_{b=1}^{10} ComNewBusnRate_{z,b}$ Note: In this and subsequent formulas on the IMP-Global tab, whenever a sum is taken over multiple blocks, the values are taken from tab IMP-1 for the first block, from tab IMP-2 for the second block, etc.	Sum of premium rate for projection year z across all ten blocks; this and other aggregations of premium rates and lapse rates across blocks implicitly assume that the blocks do not overlap.
X12:X41	Risk Pool Premium ($IMPPrem_z$)	$= MarketRate_z * PoolP\%$ PoolP% is from IMP Assumptions!E15	
AA12:BD41	Aggregate New Business Sales by Cohort ($AggSales_{z,y}$)	$= \sum_{b=1}^{10} Sales_{z,y,b}$	
AA42:BD42	Aggregate New Business Sales for Issue Year y	$= \sum_{z=1}^{30} AggSales_{z,y}$	
BG12:CJ41	Aggregate Actual Lapse Rates for Standard Lives by Cohort	$= \sum_{b=1}^{10} q_{z,y,b(st)}$	

Individual Market Pool.xls – IMP - Global

Cells	**Description**	**Formula**	**Comments**
CM12:DP41	Aggregate Newly Impaired Lives by Cohort ($AggNewImpLives_{z,y}$)	$= \sum_{b=1}^{10} NewImpLives_{z,y,b}$	
CM42:DP42	Aggregate Newly Impaired Lives for Issue Year y	$= \sum_{z=1}^{30} AggNewImpLives_{z,y}$	
AA51:BD80	Aggregate Enrollment of Standard Lives by Cohort ($Aggl_{z,y(st)}$)	$= \sum_{b=1}^{10} l_{z,y,b(st)}$	
AA81:BD81	Aggregate Enrollment of Standard Lives for Issue Year y	$= \sum_{z=1}^{30} l_{z,y(st)}$	
BG51:CJ80	Aggregate Actual Lapse Rates of Impaired Lives by Cohort	$= \sum_{b=1}^{10} q_{z,y,b(im)}$	
CM51:DP80	Aggregate Rate of Transfers to Risk Pool by Cohort ($AggPoolTrans\%_{z,y}$)	$= \sum_{b=1}^{10} PoolTrans\%_{z,y,b}$	
AA89:BD118	Aggregate Enrollment of Impaired Lives by Cohort ($Aggl_{z,y(im)}$)	$= \sum_{b=1}^{10} l_{z,y,b(im)}$	

Individual Market Pool.xls – IMP - Global

Cells	Description	Formula	Comments
AA119:BD119	Aggregate Exposure of Impaired Lives for Issue Year y	$= \sum_{z=1}^{30} l_{z,y(im)}$	
BG89:CJ118	Aggregate Premium Rates after Durational Adjustment but Before Age Adjustment, by Cohort	$= \sum_{b=1}^{10} DurAdjPremRate_{z,y,b}$	
CM89:DP118	Aggregate Age-Adjusted Premium Rates by Cohort ($AggAgeDurAdjPrem_{z,y}$)	$= \sum_{b=1}^{10} AgeAdjPremRate_{z,y,b}$	
AA126:BD155	Aggregate Age-Adjusted Market New Business Premium Rates by Cohort	$= \sum_{b=1}^{10} AgeAdjMktNewBusnRate_{z,y,b}$	
BG126:CJ155	Aggregate Standard Lives Claim Levels by Cohort ($AggClaims_{z,y(st)}$)	$= \sum_{b=1}^{10} C_{z,y,b(st)}$	
CM126:DP155	Aggregate Impaired Lives Claim Levels by Cohort ($AggClaims_{z,y(im)}$)	$= \sum_{b=1}^{10} C_{z,y,b(im)}$	
AA164:BD193	Aggregate Standard Lives Expense Levels by Cohort ($AggExp_{z,y(st)}$)	$= \sum_{b=1}^{10} Exp_{z,y,b(st)}$	

Individual Market Pool.xls – IMP - Global

Cells	**Description**	**Formula**	**Comments**
BG164:CJ193	Aggregate Impaired Lives Expense Levels by Cohort ($AggExp_{z,y(im)}$)	$= \sum_{b=1}^{10} Exp_{z,y,b(im)}$	
CM164:DP193	Aggregate Average Expense Levels by Cohort	$= \begin{cases} 0, & Aggl_{z,y(st)} + Aggl_{z,y(im)} = 0 \\ [(Aggl_{z,y(st)} * AggExp_{z,y(st)}) + (Aggl_{z,y(im)} * AggExp_{z,y(im)})] / (Aggl_{z,y(st)} + Aggl_{z,y(im)}), & \text{otherwise} \end{cases}$	
DS164:DS193	Aggregate Enrollment of Standard Lives by Projection Year ($Aggl_{z(st)}$)	$= \sum_{b=1}^{10} l_{z,b(st)}$	
DS194	Aggregate Enrollment of Standard Lives	$= \sum_{z=1}^{30} Aggl_{z(st)}$	
DT164:DT193	Aggregate Premium of Standard Lives by Projection Year ($AggPremium_{z(st)}$)	$= \sum_{b=1}^{10} P_{z,b(st)}$	
DT194	Aggregate Premium of Standard Lives ($AggPremium_{st}$)	$= \sum_{z=1}^{30} AggPremium_{z(st)}$	

Individual Market Pool.xls – IMP - Global

Cells	**Description**	**Formula**	**Comments**
DU164:DU193	Aggregate Claims of Standard Lives by Projection Year ($AggClaims_{z(st)}$)	$= \sum_{b=1}^{10} C_{z,b(st)}$	
DU194	Aggregate Claims of Standard Lives ($AggClaims_{st}$)	$= \sum_{z=1}^{30} AggClaims_{z(st)}$	
DV164:DV193	Aggregate Loss Ratio by Projection Year for Standard Lives	$= AggClaims_{z(st)} / AggPremium_{z(st)}$	
DV194	Aggregate Loss Ratio for Standard Lives	$= AggClaims_{st} / AggPremium_{st}$	
DY164:DY193	Aggregate Enrollment of Impaired Lives by Projection Year ($Aggl_{z(im)}$)	$= \sum_{b=1}^{10} l_{z,b(im)}$	
DY194	Aggregate Exposure of Impaired Lives	$= \sum_{z=1}^{30} Aggl_{z(im)}$	

Individual Market Pool.xls – IMP - Global

Cells	Description	Formula	Comments
DZ164:DZ193	Aggregate Premium of Impaired Lives by Projection Year ($AggPremium_{z(im)}$)	$= \sum_{b=1}^{10} P_{z,b(im)}$	
DZ194	Aggregate Premium of Impaired Lives ($AggPremium_{im}$)	$= \sum_{z=1}^{30} AggPremium_{z(im)}$	
EA164:EA193	Aggregate Claims of Impaired Lives by Projection Year ($AggClaims_{z(im)}$)	$= \sum_{b=1}^{10} C_{z,b(im)}$	
EA194	Aggregate Claims of Impaired Lives ($AggClaims_{im}$)	$= \sum_{z=1}^{30} AggClaims_{z(im)}$	
EB165:EB193	Aggregate Loss Ratio by Projection Year for Impaired Lives	$= AggClaims_{z(im)} / AggPremium_{z(im)}$,	Formula only applies for z = 2, 3, 4, …, 30.
EB194	Aggregate Loss Ratio for Impaired Lives	$= AggClaims_{im} / AggPremium_{im}$	
ED164:ED193	Aggregate Enrollment by Projection Year ($Aggl_z$)	$= \sum_{b=1}^{10} l_{z,b}$	

Individual Market Pool.xls – IMP - Global

Cells	Description	Formula	Comments
ED194	Aggregate Exposure	$= \sum_{z=1}^{30} \text{AggI}_z$	
EE164:EE193	Aggregate Premium by Projection Year (AggPremium_z)	$= \sum_{b=1}^{10} P_{z,b}$	
EE194	Aggregate Premium (AggPremium)	$= \sum_{z=1}^{30} \text{AggPremium}_z$	
EF164:EF193	Aggregate Claims by Projection Year (AggClaims_z)	$= \sum_{b=1}^{10} C_{z,b}$	
EF194	Aggregate Claims (AggClaims)	$= \sum_{z=1}^{30} \text{AggClaims}_z$	
EG164:EG193	Aggregate Pool Assessment by Projection Year (AggAssess_z)	$= \sum_{b=1}^{10} \text{Assess}_{z,b}$	
EG194	Aggregate Pool Assessment	$= \sum_{z=1}^{30} \text{AggAssess}_z$	

Individual Market Pool.xls – IMP - Global

Cells	**Description**	**Formula**	**Comments**
EH164:EH193	Aggregate Gross Claims by Projection Year ($AggGrossClaims_z$)	$= \sum_{b=1}^{10} GrossC_{z,b}$	Represents paid claims plus assessments.
EH194	Aggregate Gross Claims (AggGrossClaims)	$= \sum_{z=1}^{30} AggGrossClaims_z$	
EI164:EI193	Aggregate Gross Claims PMPM by Projection Year	$= AggGrossClaims_z / AggI_z / 12$	
EI194	Aggregate Gross Claims PMPM	= AggGrossClaims / AggI / 12	
EJ164:EJ193	Aggregate Gross Loss Ratio by Projection Year ($AggGLR_z$)	$= AggGrossClaims_z / AggPremium_z$	
EJ194	Aggregate Gross Loss Ratio	= AggGrossClaims / AggPremium	
EK164:EK193	Aggregate Expected Loss Ratio by Projection Year ($AggExpectedLR_z$)	From appropriate cell of IMP Assumptions!AH46:AH75	
EL164:EL193	Aggregate Actual to Expected Loss Ratio by Projection Year	$= AggGLR_z / AggExpectedLR_z$	

Individual Market Pool.xls – IMP - Global

Cells	**Description**	**Formula**	**Comments**
EM164:EM193	Aggregate Rolling Two-Year Loss Ratio	$AggClaims_1$ / $AggPremium_1$, z = 1 = ($AggClaims_{z-1}$ + $AggClaims_z$) / ($AggPremium_{z-1}$ + $AggPremium_z$), z = 2, 3, 4, …, 30	Note that this is on a net-of-assessments basis.
EN164:EN193	Aggregate Premium Less Aggregate Gross Claims by Projection Year ($AggPminusAggGrossC_z$)	= $AggPremium_z$ – $AggGrossClaims_z$	
EN194	Aggregate Premium Less Aggregate Gross Claims	= AggPremium – AggGrossClaims	
EO164:EO193	Aggregate Expenses by Projection Year ($AggExp_z$)	$= \sum_{b=1}^{10} Exp_{z,b}$	
EO194	Aggregate Expenses (AggExp)	$= \sum_{z=1}^{30} AggExp_z$	
EP164:EP193	Aggregate Expense Ratio by Projection Year	= $AggExp_z$ / $AggPremium_z$	
EP194	Aggregate Expense Ratio	= AggExp / AggPremium	

Individual Market Pool.xls – IMP - Global

Cells	Description	Formula	Comments
EQ164:EQ193	Aggregate Gain by Projection Year ($AggGain_z$)	$= AggPremium_z – AggGrossClaims_z – AggExp_z$	
EQ194	Aggregate Gain (AggGain)	$= \sum_{z=1}^{30} AggGain_z$	
ER164:ER193	Aggregate Gain as a Percentage of Aggregate Premium by Projection Year	$= AggGain_z / AggPremium_z$	
ER194	Aggregate Gain as a Percentage of Aggregate Premium	= AggGain / AggPremium	
ES164:ES193	Aggregate Risk-Based Capital by Projection Year ($AggRBC_z$)	$= AggPremium_z$ * RBC% RBC% is from Global Assumptions!D83	
ET164:ET193	Aggregate Opportunity Cost of Capital by Projection Year ($AggOCC_z$)	$= -AggRBC_z$ * OCC% OCC% is from Global Assumptions!D84	
ET194	Aggregate Opportunity Cost of Capital (AggOCC)	$= \sum_{z=1}^{30} AggOCC_z$	

Individual Market Pool.xls – IMP - Global

Cells	Description	Formula	Comments
EU164:EU193	Aggregate Economic Gain by Projection Year ($AggEconGain_z$)	$= AggGain_z + AggOCC_z$	
EU194	Aggregate Economic Gain	= AggGain + AggOCC	
EE197	Present Value of Aggregate Premium (PVAggPremium)	$= NPV_{int}(AggPremium_z) * \sqrt{1+int}$	For all of the following present value calculations, int is from Global Assumptions!B63, and the present values are taken over z = 1, 2, 3, …, 30.
EF197	Present Value of Aggregate Claims (PVAggClaims)	$= NPV_{int}(AggClaims_z) * \sqrt{1+int}$	
EG197	Present Value of Aggregate Assessments (PVAggAssess)	$= NPV_{int}(AggAssess_z) * \sqrt{1+int}$	
EH197	Present Value of Gross Claims (PVAggGrossClaims)	$= NPV_{int}(AggGrossClaims_z) * \sqrt{1+int}$	

Individual Market Pool.xls – IMP - Global

Cells	Description	Formula	Comments
EN197	Present Value of Aggregate Premium Less Aggregate Claims (PVAggPminusAggGrossC)	$= NPV_{int} (AggPminusAggGrossC_z) * \sqrt{1+int}$	
EO197	Present Value of Aggregate Expenses (PVAggExp)	$= NPV_{int} (AggExp_z) * \sqrt{1+int}$	
EQ197	Present Value of Aggregate Gain (PVAggGain)	$= NPV_{int} (AggGain_z) * \sqrt{1+int}$	
ET197	Present Value of Aggregate Opportunity Cost of Capital (PVAggOCC)	$= NPV_{int} (AggOCC_z) * \sqrt{1+int}$	
EU197	Present Value of Aggregate Economic Gain (PVAggEconGain)	$= NPV_{int} (AggEconGain_z) * \sqrt{1+int}$	
EE198	Present Value of Aggregate Premium as a Percentage of Present Value of Aggregate Premium	= PVAggPremium / PVAggPremium	Identically equal to 100%.

Individual Market Pool.xls – IMP - Global

Cells	Description	Formula	Comments
EF198	Present Value of Aggregate Claims as a Percentage of Present Value of Aggregate Premium	= PVAggClaims / PVAggPremium	
EG198	Present Value of Aggregate Assessments as a Percentage of Present Value of Aggregate Premium	= PVAggAssess / PVAggPremium	
EH198	Present Value of Aggregate Gross Claims as a Percentage of Present Value of Aggregate Premium	= PVAggGrossClaims / PVAggPremium	
EN198	Present Value of Aggregate Premium Less Aggregate Gross Claims as a Percentage of Present Value of Aggregate Premium	= PVAggPminusAggGrossC / PVAggPremium	
EO198	Present Value of Aggregate Expenses as a Percentage of Present Value of Aggregate Premium	= PVAggExp / PVAggPremium	

Individual Market Pool.xls – IMP - Global

Cells	Description	Formula	Comments
EQ198	Present Value of Aggregate Gain as a Percentage of Present Value of Aggregate Premium	= PVAggGain / PVAggPremium	
ET198	Present Value of Aggregate Opportunity Cost of Capital as a Percentage of Present Value of Aggregate Premium	= PVAggOCC / PVAggPremium	
EU198	Present Value of Aggregate Economic Gain as a Percentage of Present Value of Aggregate Premium	= PVAggEconGain / PVAggPremium	
AA204:BD233	Aggregate Age-Adjusted Risk Pool Premium Rates by Cohort ($AggAgeAdjPremRate_{z,y(pool)}$)	$= \begin{cases} 0, & x < 1 \\ IMPPrem_z * PAF_x, & x \geq 1 \end{cases}$	
BG204:CJ233	Aggregate New Transfers of Impaired Lives from Company to Risk Pool by Cohort ($AggPoolEntrants_{z,y}$)	$= \begin{cases} 0, & x \leq 1 \\ AggI_{z-1,y(im)} * AggPoolTrans\%_{z,y}, & x > 1 \end{cases}$	

Individual Market Pool.xls – IMP - Global

Cells	**Description**	**Formula**	**Comments**
BG234:CJ234	Aggregate New Transfers of Impaired Lives from Company to Risk Pool by Projection Year ($AggPoolEntrants_z$)	$= \sum_{z=1}^{30} AggPoolEntrants_{z,y}$	
CM204:DP233	Aggregate Lapse Rates of Pool Participants by Cohort ($Aggq_{z,y(pool)}$)	$= \begin{cases} 0, & x \le 1 \\ q_{pool}, & x > 1 \end{cases}$ q_{pool} is from IMP Assumptions!D30	Applies to risk pool participants that originally came from this company.
AA241:BD270	Aggregate Enrollment of Risk Pool by Cohort ($Aggl_{z,y(pool)}$)	$= \begin{cases} AggPoolEntrants_{z,y}, & x \le 1 \\ AggPoolEntrants_{z,y} + [Aggl_{z-1,y(pool)} * (1 - Aggq_{z,y(pool)})], & x > 1 \end{cases}$	
AA271:BD271	Aggregate Enrollment of Risk Pool by Projection Year	$= \sum_{z=1}^{30} Aggl_{z,y(pool)}$	
BG241:CJ270	Aggregate Claims of Risk Pool Participants by Cohort ($AggClaims_{z,y(pool)}$)	$= \begin{cases} 0, & x < 1 \\ RefClaims_{(im)}, & x = 1 \\ AggClaims_{z-1,y(pool)} * (1 + ActTrend_{z-1}) * (1 + AgingTrend), & x > 1 \end{cases}$ AgingTrend is from Global Assumptions!C22	
CM241:DP270	Aggregate Pool Assessment Rate by Cohort	$= AggAgeAdjPremRate_{z,y} * AggAssess\%_z$	

Individual Market Pool.xls – IMP - Global

Cells	Description	Formula	Comments
DS241:DS270	Aggregate Enrollment of Risk Pool by Projection Year ($AggI_{z(pool)}$)	$= \sum_{y=1}^{20} AggI_{z,y(pool)}$	
DS271	Aggregate Exposure of Risk Pool	$= \sum_{z=1}^{30} AggI_{z(pool)}$	
DT241:DT270	Aggregate Premium of Risk Pool by Projection Year ($AggPremium_{z(pool)}$)	$= \sum_{y=1}^{20} AggAgeAdjPremRate_{z,y(pool)} * AggI_{z,y(pool)} * 12$	
DT271	Aggregate Premium of Risk Pool ($AggPremium_{pool}$)	$= \sum_{z=1}^{30} AggPremium_{z(pool)}$	
DU241:DU270	Aggregate Pool Expenses by Projection Year ($AggExp_{z(pool)}$)	$= (AggPremium_{z(pool)} * PoolExp_{\%P}) + (AggClaims_{z(pool)} * PoolExp_{\%C}) + (AggI_{z(pool)} * PoolExp_{Pol} * 12)$ $PoolExp_{\%P}$ is from IMP Assumptions!K9 $PoolExp_{\%C}$ is from IMP Assumptions!K10 $PoolExp_{Pol}$ is from IMP Assumptions!K11	
DU271	Aggregate Pool Expenses	$= \sum_{z=1}^{30} AggExp_{z(pool)}$	

Individual Market Pool.xls – IMP - Global

Cells	Description	Formula	Comments
DV241:DV270	Aggregate Assessments by Projection Year ($AggAssess_z$)	$= \sum_{b=1}^{10} Assess_{z,b}$	Same as EG164:EG193.
DV271	Aggregate Assessments	$= \sum_{z=1}^{30} AggAssess_z$	
DW241:DW270	Aggregate Assessment Reserve by Projection Year ($AggAssessV_z$)	$= \begin{cases} 0, & z = 1 \\ \max\{0, [AggAssessV_{z-1} * (1 + int)] + AggVContr_{z-1}\}, & z = 2, 3, 4, \ldots, 30 \end{cases}$ int is from Global Assumptions!B63	
DX241:DX270	Aggregate Assessment Rate by Projection Year ($AggAssess\%_z$)	$= \max\{MinAssess\%, \min[MaxAssess\%,(AggClaims_{z(pool)} + AggExp_{z(pool)} – AggPremium_{z(pool)} – (AggAssessV_z * int)) / AggPremium_z]\}$ MinAssess% is from IMP Assumptions !D18 MaxAssess% is from IMP Assumptions!D19 int is from Global Assumptions!B63	Excess pool claims less interest earned on the assessment reserve, as a percentage of premium.
DY241:DY270	Aggregate Risk Pool Loss Ratio by Projection Year	$= \begin{cases} 0, & AggPremium_{z(pool)} \leq 0 \\ AggClaims_{z(pool)} / AggPremium_{z(pool)}, & AggPremium_{z(pool)} > 0 \end{cases}$	

Individual Market Pool.xls – IMP - Global

Cells	Description	Formula	Comments
DY271	Aggregate Risk Pool Loss Ratio	$= \begin{cases} 0, & AggPremium_{(pool)} \leq 0 \\ AggClaims_{(pool)} / AggPremium_{(pool)}, & AggPremium_{(pool)} > 0 \end{cases}$	
DZ241:DZ270	Aggregate per Capita Assessments by Projection Year	$= AggAssess_z / AggI_z$	
EA241:EA270	Aggregate Risk Pool Claims by Projection Year ($AggClaims_{z(pool)}$)	$= \sum_{y=1}^{20} AggClaims_{z,y(pool)} * AggI_{z,y(pool)} * 12$	
EA271	Aggregate Risk Pool Claims ($AggClaims_{pool}$)	$= \sum_{z=1}^{30} AggClaims_{z(pool)}$	
EB241:EB270	Aggregate Risk Pool Margin by Projection Year ($AggMargin_{z(pool)}$)	$= AggPremium_{z(pool)} + AggAssess_z – AggClaims_{z(pool)} – AggExp_{z(pool)}$	
EB271	Aggregate Risk Pool Margin	$= \sum_{z=1}^{30} AggMargin_{z(pool)}$	

Individual Market Pool.xls – IMP - Global

Cells	Description	Formula	Comments
EC241:EC270	Aggregate Contribution to Assessment Reserve by Projection Year ($AggVContr_z$)	$= \begin{cases} \max[AggMargin_{z(pool)}, -AggAssessV_z * (1 + int)], & AggMargin_{z(pool)} < 0 \\ 0, & AggMargin_{z(pool)} = 0 \\ AggMargin_{z(pool)}, & AggMargin_{z(pool)} > 0 \end{cases}$ int is from Global Assumptions!B63	
ED241:ED270	Aggregate Unsubsidized Risk Pool Losses by Projection Year ($AggUnsubLoss_{z(pool)}$)	$= AggMargin_{z(pool)} - AggVContr_z$	A negative value would represent an unsubsidized loss.
ED271	Aggregate Unsubsidized Risk Pool Losses	$= \sum_{z=1}^{30} AggUnsubLoss_{z(pool)}$	
DT274	Present Value of Aggregate Risk Pool Premium ($PVAggPremium_{pool}$)	$= NPV_{int} (AggPremium_{z(pool)}) * \sqrt{1+int}$ In this and subsequent present value calculations, int is from Global Assumptions!B63 and the present values are taken over z = 1, 2, 3, …, 30	
DU274	Present Value of Aggregate Risk Pool Expenses ($PVAggExp_{pool}$)	$= NPV_{int} (AggExp_z) * \sqrt{1+int}$	

Individual Market Pool.xls – IMP - Global

Cells	Description	Formula	Comments
DV274	Present Value of Aggregate Assessments (PVAggAssess)	$= NPV_{int}\ (AggAssess_{z})\ *\ \sqrt{1+int}$	
EA274	Present Value of Aggregate Risk Pool Claims ($PVAggClaims_{pool}$)	$= NPV_{int}\ (AggClaims_{z(pool)})\ *\ \sqrt{1+int}$	
EB274	Present Value of Aggregate Risk Pool Margin ($PVAggMargin_{pool}$)	$= NPV_{int}\ (AggMargin_{z(pool)})\ *\ \sqrt{1+int}$	
ED274	Present Value of Aggregate Unsubsidized Risk Pool Losses ($PVAggUnsubLoss_{pool}$)	$= NPV_{int}\ (AggUnsubLoss_{z(pool)})\ *\ \sqrt{1+int}$	
DT275	Present Value of Aggregate Risk Pool Premium as a Percentage of Present Value of Aggregate Risk Pool Premium	$= PVAggPremium_{pool}\ /\ PVAggPremium_{pool}$	Identically equal to 100%.
DU275	Present Value of Aggregate Risk Pool Expenses as a Percentage of Present Value of Aggregate Risk Pool Premium	$= PVAggExp_{pool}\ /\ PVAggPremium_{pool}$	

Individual Market Pool.xls – IMP - Global

Cells	Description	Formula	Comments
DV275	Present Value of Aggregate Assessments as a Percentage of Present Value of Aggregate Risk Pool Premium	$= PVAggAssess / PVAggPremium_{pool}$	
EA275	Present Value of Aggregate Risk Pool Claims as a Percentage of Present Value of Aggregate Risk Pool Premium	$= PVAggClaims_{pool} / PVAggPremium_{pool}$	
EB275	Present Value of Aggregate Risk Pool Margin as a Percentage of Present Value of Aggregate Risk Pool Premium	$= PVAggMargin_{pool} / PVAggPremium_{pool}$	
ED275	Present Value of Aggregate Unsubsidized Risk Pool Losses as a Percentage of Present Value of Aggregate Risk Pool Premium	$= PVAggUnsubLoss_{pool} / PVAggPremium_{pool}$	

Note: Cells EX164:FI194 contain calculations analogous to those in cells ED164:EU194 for the aggregate experience of blocks 1-5 only. Similarly, the calculations in cells FK164:FK194 are analogous to those in cells DS164:DS194, and the calculations in cells FL164:FL194 are analogous to those in cells DY164:DY194 Additionally, see the following page for the description of the calculations in cells FM164:FM193 and FM194.

All of these calculations are used in the Exhibits file because they are comparable to the other models, which also use five blocks.

Individual Market Pool.xls – IMP - Global

Cells	**Description**	**Formula**	**Comments**
FM164:FM193	Aggregate Risk Pool Enrollment by Projection Year, Blocks 1-5 Only ($Aggl_{z(pool)}$)	$= \sum_{y=1}^{15} Aggl_{z,y(pool)}$	
FM194	Aggregate Risk Pool Exposure, Blocks 1-5 Only	$= \sum_{z=1}^{30} Aggl_{z(pool)}$	

Individual Market Pool.xls – IMP-1, IMP-2, etc.

Cells	**Description**	**Formula**	**Comments**
D4	Initial Reference Premium (InitRefPrem)	From Global Assumptions!C24	
D5	Initial Reference Claim Cost for Standard Lives ($InitRefClaims_{st}$)	From Global Assumptions!D49	
D6	Initial Reference Claim Cost for Impaired Lives ($InitRefClaims_{im}$)	From Global Assumptions!D60	
D7	Year Introduced (IntroYr)	From the appropriate cell of IMP Assumptions!D38:D47	
B12:B41	Base Lapse Rates for Standard Lives ($Baseq_{x(st)}$)	From the appropriate cell of Global Assumptions!D29:D33	
C12:C41	Base Lapse Rates for Impaired Lives ($Baseq_{x(im)}$)	From Global Assumptions!C54	
D12:D41	Duration Factor (DF_x)	From the appropriate cell of Global Assumptions!B77:B81	
E12:E41	Per Policy Expense Rates ($Exp_{Pol(x)}$)	From the appropriate cell of Global Assumptions!B70:B74	

Individual Market Pool.xls – IMP-1, IMP-2, etc.

Cells	Description	Formula	Comments
F12:F41	Percentage-of-Claims Expense Rates ($Exp_{\%C(x)}$)	From the appropriate cell of Global Assumptions!C70:C74	
G12:G41	Base Commission Rates ($Comm_{B(x)}$)	From the appropriate cell of Global Assumptions!D70:D74	
H12:H41	Renewal Commission Rates ($Comm_{R(x)}$)	From the appropriate cell of Global Assumptions!E70:E74	
I12:I41	Other Premium-Related Expense Rates ($Exp_{Oth\%P(x)}$)	From the appropriate cell of Global Assumptions!F70:F74	
J12:J41	Premium Age Factor (PAF_x)	= 1, x = 1 PAF_{x-1} * (1 + PremGrowthAge), x = 2, 3, 4, …, 30 PremGrowthAge is from Global Assumptions!C25	
K12:K41	Rate of Impairment (μ_x)	From the appropriate cell of Global Assumptions!E43:E47	
L12:L41	Durational Rate Increase	From the appropriate cell of IMP Assumptions!X46:X75	
O12:O41	Reference Premium ($RefPrem_z$)	= InitRefPrem, z = 1 $RefPrem_{z-1}$ * (1 + $ActTrend_{z-1}$), z = 2, 3, 4, …, 30	

Individual Market Pool.xls – IMP-1, IMP-2, etc.

Cells	Description	Formula	Comments
P12:P41	Baseline Sales ($BaseSales_z$)	From the appropriate cell of IMP Assumptions!C51:L80	
Q12:Q41	Standard Lives Reference Claims ($RefClaims_{z(st)}$)	= $InitRefClaims_{st}$, z = 1 $RefClaims_{z-1(st,)}$ * (1 + $ActTrend_{z-1}$), z = 2, 3, 4, …, 30	
R12:R41	Impaired Lives Reference Claims ($RefClaims_{z(im)}$)	= $InitRefClaims_{im}$, z = 1 $RefClaims_{z-1(im)}$ * (1 + $ActTrend_{z-1}$), z = 2, 3, 4, …, 30	
S12:S41	Actual Trend ($ActTrend_z$)	From the appropriate cell of Global Assumptions!B106:B135	
T13:T41	Implemented Rate Increase for New Business ($ImpRateIncNew_z$)	= min(MaxRateInc, RegDamp * $ReqRateIncNew_z$) MaxRateInc is from Global Assumptions!D100 RegDamp is from the appropriate cell of Global Assumptions!D90:D99, based on the value of $ReqRateIncNew_z$	Formula only applies to z = 2, 3, 4, …, 30.
U13:U41	Implemented Rate Increase for Renewal Business ($ImpRateIncRen_z$)	= $ImpRateIncNew_z$, z = 2, 3, 4, …, 30	

Individual Market Pool.xls – IMP-1, IMP-2, etc.

Cells	Description	Formula	Comments
V12:V41	Market New Business Rate ($MarketRate_z$)	= $P_{1(pr)} / l_1$, $z = 1$ $MarketRate_1 * (1 + ActTrend_1)$, $z = 2$ $MarketRate_2 * (1 + ActTrend_2) / (1 – AggAssess\%_1)$, $z = 3$ $MarketRate_{z-1} * (1 + ActTrend_{z-1}) * (1 – AggAssess\%_{z-2}) / (1 – AggAssess\%_{z-1})$, $z = 4, 5, 6, \ldots, 30$ $P_{1(pr)}$ is from IMP Assumptions!Z46 l_1 is from IMP Assumptions!T46 AggAssess% is from the appropriate cell of IMP – Global!DX241:DX270	This may be an error; the assessments should begin in projection year 2 rather than 3 and should be lagged only one year rather than 2.
W12:W41	Company New Business Rate ($ComNewBusnRate_z$)	= 0, $BaseSales_z = 0$ $MarketRate_z * (1 – Disc@Intro)$, $BaseSales_z \neq 0$ and $z = IntroYr$ $ComNewBusnRate_{z-1} * (1 + ImpRateIncNew_z)$, $BaseSales_z \neq 0$ and $z > IntroYr$ Disc@Intro is from Global Assumptions!D26	
X12:X41	Risk Pool Premium Rate ($P_{z(pool)}$)	= $MarketRate_z * PoolP\%$ PoolP% is from IMP Assumptions!E15	

Individual Market Pool.xls – IMP-1, IMP-2, etc.

Cells	Description	Formula	Comments
Y13:Y41	Requested Rate Increase for New Business ($ReqRateIncNew_z$)	0, $z < IntroYr + 1$ $ActTrend_{z-1}$, $z = IntroYr + 1$ $= \max\{0,$ $[ActualLR_{z-2} / ExpectedLR_{z-IntroYr-1} * (1 + ActTrend_{z-2})^2$ $/ (1 + ImpRateIncNew_{z-1}) - 1],$ $[ActualLR_{z-2} / MaxLR * (1 + ActTrend_{z-2})^2$ $/ (1 + ImpRateIncNew_{z-1}) - 1]\}$, $z < IntroYr + 1$ $ExpectedLR_{z-2}$ is from the appropriate cell of IMP Assumptions!AH46:AH75 MaxLR is from IMP Assumptions!R35	Formula only applies for z = 2, 3, 4, …, 30.
Y13:Y41	Requested Rate Increase for Renewal Business ($ReqRateIncRen_z$)	$= ReqRateIncNew_z$	Formula only applies for z = 2, 3, 4, …, 30.

Individual Market Pool.xls – IMP-1, IMP-2, etc.

Cells	Description	Formula	Comments
AC12:BF41	New Business Sales by Cohort ($NewSales_{z,y}$)	0, $x \neq 1$ = max (0, $BaseSales_z$ * [1 + MktPriceSens * ($MarketRate_z$ / $RefPrem_z$ – 1)] * [1 + ComPriceSens * ($ComNewBusnRate_z$ / $MarketRate_z$ – 1)], otherwise MktPriceSens is from Global Assumptions!D14 ComPriceSens is from Global Assumptions!D15	
AC42:BF42	Total New Business Sales for Issue Year y	$= \sum_{z=1}^{30} NewSales_{z,y}$	

Individual Market Pool.xls – IMP-1, IMP-2, etc.

Cells	Description	Formula	Comments
BI12:CL41	Actual Lapse Rates for Standard Lives by Cohort ($q_{z,y(st)}$)	$= \begin{cases} 0, & x \le 1 \text{ or } BaseSales_y = 0 \\ \max\{q_{min(st)}, \min[q_{max(st)}, Baseq_{x-1(st)} + ((AgeAdjPremRate_{z,y} / AgeAdjPremRate_{z-1,y}) - 1 - ActTrend_z) * LapseAdjTrend_{st} * (((AgeAdjPremRate_{z,y} / AgeAdjMktNewBusnRate_{z,y}) - 1) * LapseAdjMkt_{st} + 1) - (((ComNewBusnRate_y / RefPrem_y) - 1) * LapseAdjSale_{st})]\}, & x = 2, 3, \text{ or } 4 \text{ and } BaseSales_y \neq 0 \\ \max\{q_{min(st)}, \min[q_{max(st)}, Baseq_{x-1(st)} + ((AgeAdjPremRate_{z,y} / AgeAdjPremRate_{z-1,y}) - 1 - ActTrend_z) * LapseAdjTrend_{st} * (((AgeAdjPremRate_{z,y} / AgeAdjMktNewBusnRate_{z,y}) - 1) * LapseAdjMkt_{st} + 1)]\}, & \text{otherwise} \end{cases}$ $q_{min(st)}$ is from Global Assumptions!D40 $q_{max(st)}$ is from Global Assumptions!D39 AgingTrend is from Global Assumptions!C22 $LapseAdjTrend_{st}$ is from Global Assumptions!D36 $LapseAdjMkt_{st}$ is from Global Assumptions!D37 $LapseAdjSale_{st}$ is from Global Assumptions!D38	
CO12:DR41	Newly Impaired Lives by Cohort ($NewImpLives_{z,y}$)	$= \begin{cases} 0, & x \le 1 \\ l_{z-1,y(st)} * \mu_{x-1} * (1 - q_{z,y(im)}), & x > 1 \end{cases}$	
CO42:DR42	Newly Impaired Lives for Issue Year y	$= \sum_{z=1}^{30} NewImpLives_{z,y}$	

Individual Market Pool.xls – IMP-1, IMP-2, etc.

Cells	Description	Formula	Comments
AC51:BF80	Enrollment of Standard Lives by Cohort ($l_{z,y(st)}$)	$= \begin{cases} NewSales_{z,y}, & x \le 1 \\ NewSales_{z,y} + [l_{z-1,y(st)} * (1 - \mu_{x-1}) * (1 - q_{z,y(st)})], & x > 1 \end{cases}$	
AC81:BF81	Total Exposure of Standard Lives by Issue Year	$= \sum_{z=1}^{30} l_{z,y(st)}$	
BI51:CL80	Actual Lapse Rates for Impaired Lives by Cohort ($q_{z,y(im)}$)	$= \begin{cases} 0, & x \le 1 \text{ or } BaseSales_y = 0 \\ \max\{q_{min(im)}, \min[q_{max(im)}, Baseq_{x-1(im)} + ((AgeAdjPremRate_{z,y} / AgeAdjPremRate_{z-1,y}) - 1 - ActTrend_z) * LapseAdjTrend_{im}]\}, & \text{otherwise} \end{cases}$ $q_{min(im)}$ is from Global Assumptions!D58 $q_{max(im)}$ is from Global Assumptions!D57 AgingTrend is from Global Assumptions!C22 $LapseAdjTrend_{im}$ is from Global Assumptions!D56	

Individual Market Pool.xls – IMP-1, IMP-2, etc.

<table>
<tr><th>Cells</th><th>Description</th><th>Formula</th><th>Comments</th></tr>
<tr><td>CO51:DR80</td><td>Rate of Transfers to Risk Pool by Cohort
($PoolTrans\%_{z,y}$)</td><td>$$PoolTrans\%_{z,y} = \begin{cases} 0, & BaseSales_y = 0 \text{ or } x < WaitPd + 1 \text{ or } AgeAdjPremRate_{z,y} / AgeAdjMktNewBusnRate_{z,y} \le ThreshPrem\% \\ \max\{\lambda_{min}, \min[\lambda_{max}, (((AgeAdjPremRate_{z,y} / AggAgeAdjPremRate_{z,y(pool)}) - 1) * MigrSensPrem) + (((AgeAdjPremRate_{z,y} / AgeAdjPremRate_{z-1,y}) - 1 - ActTrend_z) * MigrSensTrend_{hi})]\}, & BaseSales_y \ne 0 \text{ and } x \ge WaitPd + 1 \text{ and } AgeAdjPremRate_{z,y} / AgeAdjMktNewBusnRate_{z,y} \ge ThreshPrem\% \text{ and } AgeAdjPremRate_{z,y} / AggAgeAdjPremRate_{z,y(pool)} > BendPoint \\ \max\{\lambda_{min}, \min[\lambda_{max}, (((AgeAdjPremRate_{z,y} / AggAgeAdjPremRate_{z,y(pool)}) - 1) * MigrSensPrem) + (((AgeAdjPremRate_{z,y} / AgeAdjPremRate_{z-1,y}) - 1 - ActTrend_z) * MigrSensTrend_{lo})]\}, & \text{otherwise} \end{cases}$$
WaitPd is from IMP Assumptions!E9
ThreshPrem% is from IMP Assumptions!E11
λ_{min} is from IMP Assumptions!E29
λ_{max} is from IMP Assumptions!E28
MigrSensPrem is from IMP Assumptions!E23
$AggAgeAdjPremRate_{z,y(pool)}$ is from the appropriate cell of IMP – Global!AA204:BD233
BendPoint is from IMP Assumptions!F25
$MigrSensTrend_{hi}$ is from IMP Assumptions!F27
$MigrSensTrend_{lo}$ is from IMP Assumptions!F26</td><td></td></tr>
</table>

Individual Market Pool.xls – IMP-1, IMP-2, etc.

Cells	Description	Formula	Comments
AC89:BF118	Enrollment of Impaired Lives by Cohort ($l_{z,y(im)}$)	= $NewImpLives_{z,y}$, $x \leq 1$ $NewImpLives_{z,y} + [(l_{z-1,y(im)} * (1 - q_{z,y(im)}) * (1 – PoolTrans\%_{z,y})]$, $x > 1$	Note that the first case will always produce a value of zero.
AC119:BF119	Total Exposure of Impaired Lives by Issue Year	$= \sum_{z=1}^{30} l_{z,y(im)}$	
BI89:CL118	Premium Rates after Durational Adjustment but Before Age Adjustment, by Cohort ($DurAdjPremRate_{z,y}$)	= 0, $BaseSales_y = 0$ $ComNewBusnRate_z$, $BaseSales_y \neq 0$ and $x = 1$ $DurAdjPremRate_{z-1,y} * (1 + ImpRateIncRen_z) * (1 + DRI_x)$, otherwise	
CO89:DR118	Premium Rates Adjusted for both Duration and Age ($AgeAdjPremRate_{z,y}$)	= $DurAdjPremRate_{z,y}$, $x < 1$ $DurAdjPremRate_{z,y} * PAF_x$, $x \geq 1$	
AC126:BF155	Age-Adjusted Market-Level New Business Premium Rates by Cohort ($AgeAdjMktNewBusnRate_{z,y}$)	= 0, $x < 1$ or $BaseSales_y = 0$ $MarketRate_z * PAF_x$, otherwise	

Individual Market Pool.xls – IMP-1, IMP-2, etc.

Cells	Description	Formula	Comments
BI126:CL155	Standard Lives Claim Levels by Cohort ($C_{z,y(st)}$)	$= \begin{cases} 0, & BaseSales_y = 0 \\ RefClaims_{z(st)} * DF_x * [1 + (ComNewBusnRate_y / RefPrem_y - 1) * MorbAdj_{st}], & BaseSales_y \neq 0 \text{ and } x = 1 \\ C_{z-1,y(st)} * DF_x / DF_{x-1} * (1 + ActTrend_{z-1}) * (1 + AgingTrend), & \text{otherwise} \end{cases}$ $MorbAdj_{st}$ is from Global Assumptions!D51 AgingTrend is from Global Assumptions!C22	
CO126:DR155	Impaired Lives Claim Levels by Cohort ($C_{z,y(im)}$)	$= \begin{cases} 0, & BaseSales_y = 0 \\ RefClaims_{z(im)}, & BaseSales_y \neq 0 \text{ and } x = 1 \\ C_{z-1,y(im)} * (1 + ActTrend_{z-1}) * (1 + AgingTrend), & \text{otherwise} \end{cases}$ AgingTrend is from Global Assumptions!C22	
AC164:BF193	Standard Lives Expense Levels by Cohort ($Exp_{z,y(st)}$)	$= \begin{cases} 0, & BaseSales_y = 0 \text{ or } x < 1 \\ Exp_{Pol(x)} * (1 + Inflation)^{z-1} + C_{z,y(st)} * Exp_{\%C(x)} + ComNewBusnRate_y * Comm_{B(x)} + (AgeAdjPremRate_{z,y} - ComNewBusnRate_y) * Comm_{R(x)} + AgeAdjPremRate_{z,y} * Exp_{Oth\%P(x)}, & \text{otherwise} \end{cases}$ Inflation is from Global Assumptions!B64	

Individual Market Pool.xls – IMP-1, IMP-2, etc.

Cells	Description	Formula	Comments
BI164:CL193	Impaired Lives Expense Levels by Cohort ($Exp_{z,y(im)}$)	$= \begin{cases} 0, & BaseSales_y = 0 \text{ or } x < 1 \\ Exp_{Pol(x)} * (1 + Inflation)^{z-1} \\ \quad + C_{z,y(im)} * Exp_{\%C(x)} \\ \quad + ComNewBusnRate_y * Comm_{B(x)} \\ \quad + (AgeAdjPremRate_{z,y} - ComNewBusnRate_y) * Comm_{R(x)} \\ \quad + AgeAdjPremRate_{z,y} * Exp_{Oth\%P(x)}, & \text{otherwise} \end{cases}$ Inflation is from Global Assumptions!B64	
CO164:DR193	Average Expense Levels by Cohort ($Exp_{z,y}$)	$= \begin{cases} 0, & l_{z,y(st)} + l_{z,y(im)} = 0 \\ [(l_{z,y(st)} * Exp_{z,y(st)}) + (l_{z,y(im)} * Exp_{z,y(im)})] / (l_{z,y(st)} + l_{z,y(im)}), & \text{otherwise} \end{cases}$	
DU164:DU193	Standard Lives Enrollment by Projection Year ($l_{z(st)}$)	$= \sum_{y=1}^{30} l_{z,y(st)}$	
DU194	Total Standard Lives Exposure	$= \sum_{z=1}^{30} l_{z(st)}$	"Total" refers to the sum over all 30 projection years.
DV164:DV193	Standard Lives Premium by Projection Year ($P_{z(st)}$)	$= \sum_{y=1}^{30} l_{z,y(st)} * AgeAdjPremRate_{z,y} * 12$	

Individual Market Pool.xls – IMP-1, IMP-2, etc.

Cells	**Description**	**Formula**	**Comments**
DV194	Total Standard Lives Premium (P_{st})	$= \sum_{z=1}^{30} P_{z(st)}$	
DW164:DW193	Standard Lives Claims by Projection Year ($C_{z(st)}$)	$= \sum_{y=1}^{30} l_{z,y(st)} * C_{z,y(st)} * 12$	
DW194	Total Standard Lives Claims (C_{st})	$= \sum_{z=1}^{30} C_{z(st)}$	
DX164:DX193	Standard Lives Loss Ratio by Projection Year	$= \begin{cases} 0, & P_{z(st)} = 0 \\ C_{z(st)} / P_{z(st)}, & \text{otherwise} \end{cases}$	
DX194	Standard Lives Loss Ratio	$= \begin{cases} 0, & P_{st} = 0 \\ C_{st} / P_{st}, & \text{otherwise} \end{cases}$	
EA164:EA193	Impaired Lives Enrollment by Projection Year ($l_{z(im)}$)	$= \sum_{y=1}^{30} l_{z,y(im)}$	
EA194	Total Impaired Lives Exposure	$= \sum_{z=1}^{30} l_{z(im)}$	

Individual Market Pool.xls – IMP-1, IMP-2, etc.

Cells	Description	Formula	Comments
EB164:EB193	Impaired Lives Premium by Projection Year ($P_{z(im)}$)	$= \sum_{y=1}^{30} l_{z,y(im)} * AgeAdjPremRate_{z,y} * 12$	
EB194	Total Impaired Lives Premium (P_{im})	$= \sum_{z=1}^{30} P_{z(im)}$	
EC164:EC193	Impaired Lives Claims by Projection Year ($C_{z(im)}$)	$= \sum_{y=1}^{30} l_{z,y(im)} * C_{z,y(im)} * 12$	
EC194	Total Impaired Lives Claims (C_{im})	$= \sum_{z=1}^{30} C_{z(im)}$	
ED165:ED193	Impaired Lives Loss Ratio by Projection Year	$= \begin{cases} 0, & P_{z(im)} = 0 \\ C_{z(im)} / P_{z(im)}, & \text{otherwise} \end{cases}$	Formula only applies for z = 2, 3, 4, …, 30.
ED194	Impaired Lives Loss Ratio	$= \begin{cases} 0, & P_{im} = 0 \\ C_{im} / P_{im}, & \text{otherwise} \end{cases}$	
EF164:EF193	Combined Enrollment by Projection Year (l_z)	$= l_{z(st)} + l_{z(im)}$	"Combined" refers to the combination of standard and impaired.

Individual Market Pool.xls – IMP-1, IMP-2, etc.

Cells	Description	Formula	Comments
EF194	Total Combined Exposure (l)	$= \sum_{z=1}^{30} l_z$	
EG164:EG193	Combined Premium by Projection Year (P_z)	$= P_{z(st)} + P_{z(im)}$	
EG194	Total Combined Premium (Premium)	$= \sum_{z=1}^{30} P_z$	
EH164:EH193	Combined Claims by Projection Year (C_z)	$= C_{z(st)} + C_{z(im)}$	
EI164:EI193	Pool Assessment by Projection Year ($Assess_z$)	$= P_z * AggAssess\%_z$ $AggAssess\%_z$ is from the appropriate cell of IMP - Global!DX421:DX270	
EI194	Total Pool Assessment	$= \sum_{z=1}^{30} P_z$	
EJ164:EJ193	Gross Claims by Projection Year ($GrossC_z$)	$= C_z + Assess_z$	

Individual Market Pool.xls – IMP-1, IMP-2, etc.

Cells	Description	Formula	Comments
EJ194	Total Gross Claims (GrossClaims)	$= \sum_{z=1}^{30} GrossC_z$	
EK164:EK193	Gross Claims PMPM by Projection Year	= 0, $l_z = 0$ $GrossC_z / l_z / 12$, otherwise	
EK194	Gross Claims PMPM	= 0, $l_z = 0$ GrossClaims / l / 12, otherwise	
EL164:EL193	Combined Gross Loss Ratio by Projection Year ($ActualGLR_z$)	= 0, $P_z = 0$ $GrossC_z / P_z$, otherwise	
EL194	Combined Gross Loss Ratio	= 0, Premium = 0 GrossClaims / Premium, otherwise	
EM164:EM193	Combined Expected Loss Ratio by Projection Year ($ExpectedLR_z$)	From the appropriate cell of IMP Assumptions!AH46:AH75, based on duration	Produces #N/A errors for projection years prior to IntroYr.
EN164:EN193	Actual-to-Expected Combined Gross Loss Ratio by Projection Year	= 0, $ExpectedLR_z = 0$ $ActualGLR_z / ExpectedLR_z$, otherwise	

Individual Market Pool.xls – IMP-1, IMP-2, etc.

Cells	Description	Formula	Comments
EO164:EO193	Rolling Two-Year Combined Gross Loss Ratio by Projection Year	$= \begin{cases} 0, & (z = 1 \text{ and } P_z = 0) \text{ or } (z > 1 \text{ and } P_{z-1} + P_z = 0) \\ GrossC_z / P_z, & z = 1 \text{ and } P_z \neq 0 \\ (GrossC_{z-1} + GrossC_z) / (P_{z-1} + P_z), & \text{otherwise} \end{cases}$	
EP164:EP193	Combined Premium Less Gross Claims by Projection Year ($PminusC_z$)	$= P_z - GrossC_z$	
EP194	Total Combined Premium Less Claims	= Premium – GrossClaims	
EQ164:EQ193	Combined Expenses by Projection Year (Exp_z)	$= 12 * \sum_{y=1}^{30} [(l_{z,y(st)} * Exp_{z,y(st)}) + (l_{z,y(im)} * Exp_{z,y(im)})]$	
EQ194	Total Combined Expenses (Expenses)	$= \sum_{z=1}^{30} Exp_z$	
ER164:ER193	Combined Expense Ratio by Projection Year	$= \begin{cases} 0, & P_z = 0 \\ Exp_z / P_z, & \text{otherwise} \end{cases}$	
ER194	Total Combined Expense Ratio	$= \begin{cases} 0, & P = 0 \\ \text{Expenses / Premium}, & \text{otherwise} \end{cases}$	

Individual Market Pool.xls – IMP-1, IMP-2, etc.

Cells	**Description**	**Formula**	**Comments**
ES164:ES193	Combined Gain by Projection Year ($Gain_z$)	$= P_z – GrossC_z – Exp_z$	
ES194	Total Combined Gain (Gain)	$= \sum_{z=1}^{30} Gain_z$	
ET164:ET193	Combined Gain as a Percentage of Combined Premium by Projection Year	$= \begin{cases} 0, & P_z = 0 \\ Gain_z / P_z, & \text{otherwise} \end{cases}$	
ET194	Total Combined Gain as a Percentage of Combined Premium	$= \begin{cases} 0, & P = 0 \\ Gain / Premium, & \text{otherwise} \end{cases}$	
EU164:EU193	Risk-Based Capital by Projection Year (RBC_z)	$= P_z * RBC\%$ RBC% is from Global Assumptions!D83	Uses a predefined percentage of premium as a proxy for risk-based capital requirement.
EV164:EV193	Opportunity Cost of Capital by Projection Year (OCC_z)	$= -RBC_z * OCC\%$ OCC% is from Global Assumptions!D84	

Individual Market Pool.xls – IMP-1, IMP-2, etc.

Cells	Description	Formula	Comments
EV194	Total Opportunity Cost of Capital (OCC)	$= \sum_{z=1}^{30} OCC_z$	This formula is currently missing from the spreadsheet.
EW164:EW193	Economic Gain by Projection Year ($EconGain_z$)	$= Gain_z + OCC_z$	
EW194	Total Economic Gain	= Gain + OCC	
EG197	Present Value of Combined Premium (PVPremium)	$= NPV_{int}\,(P_z) * \sqrt{1+int}$	All present values in this section are taken over all 30 projection years, and int is from Global Assumptions!B63.
EI197	Present Value of Pool Assessments (PVAssess)	$= NPV_{int}\,(Assess_z) * \sqrt{1+int}$	
EJ197	Present Value of Gross Claims (PVGrossClaims)	$= NPV_{int}\,(GrossC_z) * \sqrt{1+int}$	
EP197	Present Value of Combined Premium Less Gross Claims (PVPminusGrossC)	$= NPV_{int}\,(PminusGrossC_z) * \sqrt{1+int}$	

Individual Market Pool.xls – IMP-1, IMP-2, etc.

Cells	**Description**	**Formula**	**Comments**
EQ197	Present Value of Combined Expenses (PVExpenses)	$= NPV_{int} (Exp_z) * \sqrt{1+int}$	
ES197	Present Value of Combined Gain (PVGain)	$= NPV_{int} (Gain_z) * \sqrt{1+int}$	
EV197	Present Value of Opportunity Cost of Capital (PVOCC)	$= NPV_{int} (OCC_z) * \sqrt{1+int}$	
EW197	Present Value of Economic Gain (PVEconGain)	$= NPV_{int} (EconGain_z) * \sqrt{1+int}$	
EG198	Present Value of Combined Premium as a Percentage of Present Value of Combined Premium	= PVPremium / PVPremium	Identically equal to 100%.
EI198	Present Value of Pool Assessments as a Percentage of Present Value of Combined Premium	= PVAssess / PVPremium	

Individual Market Pool.xls – IMP-1, IMP-2, etc.

Cells	Description	Formula	Comments
EJ198	Present Value of Gross Claims as a Percentage of Present Value of Combined Premium	= PVGrossClaims / PVPremium	
EP198	Present Value of Combined Premium Less Gross Claims as a Percentage of Present Value of Combined Premium	= PVPminusGrossC / PVPremium	
EQ198	Present Value of Combined Expenses as a Percentage of Present Value of Combined Premium	= PVExpenses / PVPremium	
ES198	Present Value of Combined Gain as a Percentage of Present Value of Combined Premium	= PVGain / PVPremium	
EV198	Present Value of Opportunity Cost of Capital as a Percentage of Present Value of Combined Premium	= PVOCC / PVPremium	

Individual Market Pool.xls – IMP-1, IMP-2, etc.

Cells	Description	Formula	Comments
EW198	Present Value of Economic Gain as a Percentage of Present Value of Combined Premium	= PVEconGain / PVPremium	

Interblock Subsidy.xls – Global Assumptions

The Global Assumptions tab within the Interblock Subsidy spreadsheet is nearly identical to the analogous tab in the Global spreadsheet. The field names, cell numbers, and values are identical, except that TrendScen is at cell G102 rather than cell C102. If a change is made in the Global Assumptions tab of the Global spreadsheet, the Global Assumptions tabs of all other spreadsheets in the model will be updated automatically the next time they are opened.

Interblock Subsidy.xls – Current Market Assump 5 blocks

Cells	**Description**	**Formula**	**Comments**
E3	Year at which Pooling Begins (PoolingYr)	= 31	Hardcoded value; value of 31 indicates no pooling.
D11:D15	Year of Introduction by Block (IntroYr_b)	$= \begin{cases} 1, & b = 1 \\ 4, & b = 2 \\ 7, & b = 3 \\ 10, & b = 4 \\ 13, & b = 5 \end{cases}$	Hardcoded values
L4	Target Lifetime Loss Ratio (TargetLR)	= 65.00%	Hardcoded value
M5	Maximum Allowable Loss Ratio (MaxLR)	= 200.0%	Hardcoded value
L7	Flag to Include Trend (TrendFlag)	= 1	Hardcoded value; value of 1 means to include trend in projections, value of 0 means to exclude trend.
L11	Initial Reference Claim Cost for Standard Lives ($\text{InitRefClaims}_{st}$)	From Global Assumptions!D49	Best estimate of starting claim costs for standard lives

Interblock Subsidy.xls – Current Market Assump 5 blocks

Cells	**Description**	**Formula**	**Comments**
N11	Pricing Assumption of Initial Reference Claim Cost for Standard Lives ($InitRefClaims_{st(pr)}$)	= $InitRefClaims_{st}$	Standard lives starting claim costs used in initial pricing; the model provides the flexibility to adjust the baseline claims for use in pricing, but the model currently does not make any such adjustment.
L12	Initial Reference Claim Cost for Impaired Lives ($InitRefClaims_{im}$)	From Global Assumptions!D60	Best estimate of starting claim costs for impaired lives
N12	Pricing Assumption of Initial Reference Claim Cost for Impaired Lives ($InitRefClaims_{im(pr)}$)	= $InitRefClaims_{im}$	Impaired lives starting claim costs used in initial pricing; the model provides the flexibility to adjust the baseline claims for use in pricing, but the model currently does not make any such adjustment.

Interblock Subsidy.xls – Current Market Assump 5 blocks

Cells	Description	Formula	Comments
M14	Durational Deterioration Limitation Period (DDLP)	= 5	Hardcoded value; period during which the probability of a standard life becoming impaired is assumed to be greater than zero for pricing purposes
M15	Expected Premium Rate (ExpPrem)	= $126	Hardcoded value; this represents the company's targeted new business rate
O4, Q4, S4, U4, W4	Standard Lives Morbidity Adjustment Factors by Block ($MorbAdj_{b(st)}$)	= 1.00, b = 1, 2, 3, 4, 5	Hardcoded values
P4, R4, T4, V4, X4	Impaired Lives Morbidity Adjustment Factors by Block ($MorbAdj_{b(im)}$)	= 1.00, b = 1, 2, 3, 4, 5	Hardcoded values
R6:R10	Durational Rate Increase (DRI_x)	Renewal 1 (x = 2): 5% Renewal 2 (x = 3): 5% Renewal 3 (x = 4): 5% Renewal 4 (x = 5): 5% Renewals 5-29 (x = 6, 7, 8, …, 30): 0%	Hardcoded values; represents the additional rate increase needed each year due to anticipated wearoff of underwriting

Interblock Subsidy.xls – Current Market Assump 5 blocks

Cells	Description	Formula	Comments
B19:B48	Global Baseline Sales by Duration ($GlobalBaseSales_x$)	From the appropriate cell of Global Assumptions!O15:O44	
C19:G48	Baseline Sales by Projection Year by Block ($BaseSales_{z,b}$)	From the appropriate cell of Global Assumptions!P15:T44	
J19:J48	Standard Lives Base Lapse Rates Used in Pricing ($q_{x(st, pr)}$)	$= \max\{q_{min(st)}, \min[q_{max(st)}, Baseq_{x(st)} + (((PAF_{x+1} / PAF_x * AccumDRI_{x+1} / AccumDRI_x) – 1) * LapseAdjTrend_{st}) + ((AccumDRI_{x+1} -1) * LapseAdjMkt_{st})]\}$ $q_{min(st)}$ is from Global Assumptions!D40 $q_{max(st)}$ is from Global Assumptions!D39 $Baseq_{x(st, pr)}$ is from the appropriate cell of Global Assumptions!E29:E33 $LapseAdjTrend_{st}$ is from Global Assumptions!D36 $LapseAdjMkt_{st}$ is from Global Assumptions!D37	Baseline standard lives lapse rates adjusted to reflect higher anticipated lapses due to rate increases exceeding claim trend and renewal rates exceeding the market new business rate

Interblock Subsidy.xls – Current Market Assump 5 blocks

Cells	Description	Formula	Comments
K19:K48	Impaired Lives Base Lapse Rates Used in Pricing ($q_{x(im, pr)}$)	= $\max\{q_{min(im)}, \min[q_{max(im)}, Baseq_{x(im)} + (DRI_{x+1} * LapseAdjTrend_{im}),$ $x \leq DDLP$; $q_{x(st, pr)},$ $x > DDLP$ $q_{min(im)}$ is from Global Assumptions!D58 $q_{max(im)}$ is from Global Assumptions!D57 $Baseq_{im(pr)}$ is from Global Assumptions!D54 $LapseAdjTrend_{im}$ is from Global Assumptions!D56	Baseline impaired lives lapse rates adjusted to reflect higher anticipated lapses due to rate increases exceeding claim trend during durational deterioration limitation period; beyond DDLP, impaired lives lapse rates are equal to standard lives lapse rates.
L19:L48	Probability of Becoming Impaired Used in Pricing ($\mu_{x(pr)}$)	= $\mu_x,$ $x \leq DDLP$; $0,$ $x > DDLP$ μ_x is from the appropriate cell of Global Assumptions!E43:E47	
M19:M48	Number of Standard Lives ($l_{x(st)}$)	= $1,$ $x = 1$; $l_{x-1(st)} * (1 - \mu_{x-1(pr)}) * (1 - q_{x-1(st, pr)}),$ $x = 2, 3, 4, \ldots, 30$	The values in columns M, N, and O represent proportions of the number of first-year standard lives.
N19:N48	Number of Impaired Lives ($l_{x(im)}$)	= $0,$ $x = 1$; $[l_{x-1(im)} * (1 - q_{x-1(im, pr)})] + [l_{x-1(st)} * \mu_{x-1(pr)}],$ $x = 2, 3, 4, \ldots, 30$	

Interblock Subsidy.xls – Current Market Assump 5 blocks

Cells	Description	Formula	Comments
O19:O48	Number of Total Lives (l_x)	$= l_{x(st)} + l_{x(im)}$	
P19:P48	Accumulated Trend ($AccumTrend_x$)	$=$ 1, x = 1 $AccumTrend_{x-1}$ * [1 + (Trend * TrendFlag)], x = 2, 3, 4, …, 30 Trend is from Global Assumptions!D21	
Q19:Q48	Discount Factor (v_x)	$=$ 1, x = 1 $v_{x-1}/(1 + int)$, x = 2, 3, 4, …, 30	
R19:R49	Premium Age Factor (PAF)	$=$ 1, x = 1 PAF_{x-1} * (1 + PremGrowthAge), x = 2, 3, 4, …, 30 PremGrowthAge is from Global Assumptions!C25	A 31st-year value is needed for the calculation of $q_{30(st, pr)}$.

Interblock Subsidy.xls – Current Market Assump 5 blocks

Cells	**Description**	**Formula**	**Comments**
S19:S48	Pricing Claims ($C_{x(pr)}$)	= $\{[InitRefClaims_{st(pr)} * (1 + ((ExpPrem / InitRefPrem) - 1) * MorbAdj_{st}) * DF_x * l_{x(st)})] + (InitRefClaims_{im(pr)} * l_{x(im)})\} * PAF_x * AccumTrend_x$, $x \le DDLP$ $\{[InitRefClaims_{st(pr)} * (1 + ((ExpPrem / InitRefPrem) - 1) * MorbAdj_{st}) * l_{x(st)})] + (InitRefClaims_{im(pr)} * l_{x(im)})\} * PAF_x * AccumTrend_x$, $x > DDLP$ InitRefPrem is from Global Assumptions!C24 $MorbAdj_{st}$ is from Global Assumptions!D51 DF_x is from the appropriate cell of Current Market Summary 5 blocks!D12:D41	Standard lives' claims are adjusted each year for morbidity, duration (within the DDLP), aging, and trend. Impaired lives' claims are adjusted each year for aging and trend.
T19:T48	Annual Durational Rate Increase ($ADRI_x$)	= 0, $x = 1$ DRI_x, $x = 2, 3, 4, \ldots, 30$	
U19:U49	Accumulated Durational Rate Increase Factor ($AccumDRI_x$)	= 1, $x = 1$ $AccumDRI_{x-1} * (1 + ADRI_x)$, $x = 2, 3, 4, \ldots, 31$	A 31^{st}-year value is needed for the calculation of $q_{30(st, pr)}$.

Interblock Subsidy.xls – Current Market Assump 5 blocks

Cells	Description	Formula	Comments
V19:V48	Pricing Premium ($P_{x(pr)}$)	$= l_1 * \sum_{i=1}^{30} (C_{i(pr)} * v_i) / \sum_{j=1}^{30} (l_j * PAF_j * AccumTrend_j * v_j * AccumDRI_j)$ / TargetLR, $x = 1$ $P_{1(pr)} / l_1 * PAF_x * l_x * AccumTrend_x * ADRI_x / ADRI_1$, $x = 2, 3, 4, \ldots, 30$ PAF_x is from Current Market Summary 5 blocks!J12:J41	
W19:W48	Pricing Loss Ratio ($LR_{x(pr)}$)	$= C_{x(pr)} / P_{x(pr)}$	

Interblock Subsidy.xls – Current Market Assump 5 blocks

Cells	Description	Formula	Comments
X19:X48	Pricing Expenses ($Exp_{x(pr)}$)	$= l_x * Exp_{Pol(x)} * (1 + Inflation)^{x-1}$ $+ \ Exp_{\%C(x)} * C_{x(pr)}$ $+ \ Comm_{B(x)} * P_{1(pr)} / l_1 * l_x$ $+ \ Comm_{R(x)} * [P_{x(pr)} – (P_{1(pr)} / l_1 * l_x)]$ $+ \ Exp_{Oth\%P(x)} * P_{x(pr)}$ $Exp_{Pol(x)}$ is from the appropriate cell of Current Market Summary 5 blocks!E12:E41 Inflation is from Global Assumptions!B64 $Exp_{\%C(x)}$ is from the appropriate cell of Current Market Summary 5 blocks!F12:F41 $Comm_{B(x)}$ is from the appropriate cell of Current Market Summary 5 blocks!G12:G41 $Comm_{R(x)}$ is from the appropriate cell of Current Market Summary 5 blocks!H12:H41 $Exp_{Oth\%P(x)}$ is from the appropriate cell of Current Market Summary 5 blocks!I12:I41	
Y19:Y48	Pricing Expense as a Percentage of Pricing Premium	$= Exp_{x(pr)} / P_{x(pr)}$	
Z19:Z48	Pricing Operating Gain ($Gain_{x(pr)}$)	$= P_{x(pr)} – C_{x(pr)} – Exp_{x(pr)}$	

Interblock Subsidy.xls – Current Market Assump 5 blocks

Cells	Description	Formula	Comments
AA19:AA48	Pricing Gain as a Percentage of Pricing Premium	$= \text{Gain}_{x(pr)} / P_{x(pr)}$	
S50	Simple Sum of Pricing Claims (SumClaims)	$= \sum_{x=1}^{30} C_{x(pr)}$	
V50	Simple Sum of Pricing Premiums (SumPrem)	$= \sum_{x=1}^{30} P_{x(pr)}$	
W50	Pricing Loss Ratio, Using Simple Sums	= SumClaims / SumPrem	
X50	Simple Sum of Pricing Expenses (SumExp)	$= \sum_{x=1}^{30} \text{Exp}_{x(pr)}$	
Y50	Pricing Expense Ratio, Using Simple Sums	= SumExp / SumPrem	
Z50	Simple Sum of Pricing Gains (SumGain)	$= \sum_{x=1}^{30} \text{Gain}_{x(pr)}$	

Interblock Subsidy.xls – Current Market Assump 5 blocks

Cells	**Description**	**Formula**	**Comments**
AA50	Pricing Gain Ratio, Using Simple Sums	= SumGain / SumPrem	
S51	Present Value of Pricing Claims over 10 Years ($PVClaims_{10}$)	$= NPV_{int}(C_{x(pr)}) * \sqrt{1+int}$, where NPV is taken over x = 1, 2, 3, ….10	
V51	Present Value of Pricing Premiums over 10 Years ($PVPrem_{10}$)	$= NPV_{int}(P_{x(pr)}) * \sqrt{1+int}$, where NPV is taken over x = 1, 2, 3, ….10	
W51	Pricing Loss Ratio, Using 10-Year NPVs	$= PVClaims_{10} / PVPrem_{10}$	
X51	Present Value of Pricing Expenses over 10 Years ($PVExp_{10}$)	$= NPV_{int}(Exp_{x(pr)}) * \sqrt{1+int}$, where NPV is taken over x = 1, 2, 3, ….10	
Y51	Pricing Expense Ratio, Using 10-Year NPVs	$= PVExp_{10} / PVPrem_{10}$	
Z51	Present Value of Pricing Gains over 10 Years ($PVGain_{10}$)	$= NPV_{int}(Gain_{x(pr)}) * \sqrt{1+int}$, where NPV is taken over x = 1, 2, 3, ….10	
AA51	Pricing Gain Ratio, Using 10-Year NPVs	$= PVGain_{10} / PVPrem_{10}$	

Interblock Subsidy.xls – Current Market Assump 5 blocks

Cells	Description	Formula	Comments
S52	Present Value of Pricing Claims over 30 Years ($PVClaims_{30}$)	$= NPV_{int} (C_{x(pr)}) * \sqrt{1+int}$, where NPV is taken over x = 1, 2, 3, ….30	
V52	Present Value of Pricing Premiums over 30 Years ($PVPrem_{30}$)	$= NPV_{int} (P_{x(pr)}) * \sqrt{1+int}$, where NPV is taken over x = 1, 2, 3, ….30	
W52	Pricing Loss Ratio, Using 30-Year NPVs	$= PVClaims_{30} / PVPrem_{30}$	
X52	Present Value of Pricing Expenses over 30 Years ($PVExp_{30}$)	$= NPV_{int} (Exp_{x(pr)}) * \sqrt{1+int}$, where NPV is taken over x = 1, 2, 3, ….30	
Y52	Pricing Expense Ratio, Using 30-Year NPVs	$= PVExp_{30} / PVPrem_{30}$	
Z52	Present Value of Gains over 30 Years ($PVGain_{30}$)	$= NPV_{int} (Gain_{x(pr)}) * \sqrt{1+int}$, where NPV is taken over x = 1, 2, 3, ….30	
AA52	Pricing Gain Ratio, Using 30-Year NPVs	$= PVGain_{30} / PVPrem_{30}$	

Interblock Subsidy.xls – Current Market Assump 5 blocks

Cells	**Description**	**Formula**	**Comments**
S53	PV of Pricing Claims as a Percentage of PV of Pricing Premium	$= PVClaims_{30} / PVPrem_{30}$	Model calculations produce a stream of premiums such that this is equal to the target lifetime loss ratio.
V53	PV of Pricing Premium as a Percentage of PV of Pricing Premium	$= PVPrem_{30} / PVPrem_{30}$	Identically equal to 1.000.
X53	PV of Pricing Expenses as a Percentage of PV of Pricing Premium	$= PVExp_{30} / PVPrem_{30}$	
Z53	PV of Pricing Gain as a Percentage of PV of Pricing Premium	$= PVGain_{30} / PVPrem_{30}$	
O54	Interest (int)	From Global Assumptions!B63	
AC19:AC48	Expected Loss Ratio by Projection Year ($ExpectedLR_z$)	See formula for cells AE51:BH51, below.	

Interblock Subsidy.xls – Current Market Assump 5 blocks

Cells	Description	Formula	Comments
AE19:BH48	Expected Premium Inforce at Age Adjusted Market New Business Rates, by Cohort ($ExpInforce_{z,x}$)	$= \begin{cases} 0, & y < 1 \text{ or } y > 20 \\ AggAgeAdjMktNewBusnRate_{z,y} * (Aggl_{z,y(st)} + Aggl_{z,y(im)}), & \text{otherwise} \end{cases}$ $AggAgeAdjMktNewBusnRate_{z,y}$ is from the appropriate cell of Current Market Summary 5 blocks!BT89:CM118 $Aggl_{z,y(st)}$ is from the appropriate cell of Current Market Summary 5 blocks!AB51:AU80 $Aggl_{z,y(im)}$ is from the appropriate cell of Current Market Summary 5 blocks!AB89:AU80	Note that in this table, columns represent projection years, rows represent durations, and diagonals represent issue years.
AE51:BH51	Composite Expected Loss Ratio by Projection Year	$= \begin{cases} 0, & \sum_{x=1}^{30} P_{z,x} = 0 \\ (\sum_{i=1}^{30} ExpInforce_{z,i} * LR_i) / \sum_{j=1}^{30} ExpInforce_{z,j}, & \text{otherwise} \end{cases}$	Summations are over all positive durations for a given projection year.
AE52:BH52	Total Expected Premium Inforce by Projection Year, for Block 1	$= \sum_{x=1}^{30} ExpInforce_{z,x,1}$	

Interblock Subsidy.xls – Current Market Summary 5 blocks

Cells	**Description**	**Formula**	**Comments**
D4	Reference Premium (InitRefPrem)	From Global Assumptions!C24	
D5	Initial Reference Claim Cost for Standard Lives ($InitRefClaims_{st}$)	From Global Assumptions!D49	
D6	Initial Reference Claim Cost for Impaired Lives ($InitRefClaims_{im}$)	From Global Assumptions!D60	
B12:B41	Base Lapse Rates for Standard Lives ($Baseq_{x(st)}$)	From the appropriate cell of Global Assumptions!D29:D33	
C12:C41	Base Lapse Rates for Impaired Lives ($Baseq_{x(im)}$)	From Global Assumptions!C54	
D12:D41	Duration Factor (DF_x)	From the appropriate cell of Global Assumptions!B77:B81	
E12:E41	Per Policy Expense Rates ($Exp_{Pol(x)}$)	From the appropriate cell of Global Assumptions!B70:B74	

Interblock Subsidy.xls – Current Market Summary 5 blocks

Cells	**Description**	**Formula**	**Comments**
F12:F41	Percentage-of-Claims Expense Rates ($Exp_{\%C(x)}$)	From the appropriate cell of Global Assumptions!C70:C74	
G12:G41	Base Commission Rates ($Comm_{B(x)}$)	From the appropriate cell of Global Assumptions!D70:D74	
H12:H41	Renewal Commission Rates ($Comm_{R(x)}$)	From the appropriate cell of Global Assumptions!E70:E74	
I12:I41	Other Premium-Related Expense Rates ($Exp_{Oth\%P(x)}$)	From the appropriate cell of Global Assumptions!F70:F74	
J12:J41	Premium Age Factor (PAF_x)	= 1, x = 1 PAF_{x-1} * (1 + PremGrowthAge), x = 2, 3, 4, …, 30 PremGrowthAge is from Global Assumptions!C25	
K12:K41	Rate of Impairment (μ_x)	From the appropriate cell of Global Assumptions!E43:E47	
L12:L41	Durational Rate Increase	From the appropriate cell of Current Market Assump 5 blocks!T19:T48	
O12:O41	Reference Premium ($RefPrem_z$)	= InitRefPrem, z = 1 $RefPrem_{z-1}$ * (1 + $ActTrend_{z-1}$), z = 2, 3, 4, …, 30	

Interblock Subsidy.xls – Current Market Summary 5 blocks

Cells	Description	Formula	Comments
P12:P41	Baseline Sales ($BaseSales_z$)	From the appropriate cell of Current Market Assump 5 blocks!B19:B48	
Q12:Q41	Standard Lives Reference Claims ($RefClaims_{z(st)}$)	= $InitRefClaims_{st}$, z = 1 $RefClaims_{z-1(st)}$ * (1 + $ActTrend_{z-1}$), z = 2, 3, 4, …, 30	
R12:R41	Impaired Lives Reference Claims ($RefClaims_{z(im)}$)	= $InitRefClaims_{im}$, z = 1 $RefClaims_{z-1(im)}$ * (1 + $ActTrend_{z-1}$), z = 2, 3, 4, …, 30	
S12:S41	Actual Trend ($ActTrend_z$)	From the appropriate cell of Global Assumptions!B106:B135	
T13:T41	Implemented Rate Increase for New Business ($ImpRateIncNew_z$)	= min(MaxRateInc, RegDamp * $ReqRateIncNew_z$) MaxRateInc is from Global Assumptions!D100 RegDamp is from the appropriate cell of Global Assumptions!D90:D99, based on the value of $ReqRateIncNew_z$	Formula only applies for z = 2, 3, 4, …, 30.
U13:U41	Implemented Rate Increase for Renewal Business ($ImpRateIncRen_z$)	= $ImpRateIncNew_z$	Formula only applies for z = 2, 3, 4, …, 30.

Interblock Subsidy.xls – Current Market Summary 5 blocks

Cells	Description	Formula	Comments
V12:V41	Market New Business Rate ($MarketRate_z$)	$= \begin{cases} P_{1(pr)}, & z = 1 \\ MarketRate_{z-1} * (1 + ActTrend_{z-1}), & z = 2, 3, 4, \ldots, 30 \end{cases}$ $P_{1(pr)}$ is from Current Market Assump 5 blocks!V19	
W12:W41	Global Company New Business Rate ($GlobalComNewBusnRate_z$)	$= \sum_{b=1}^{5} ComNewBusnRate_{z,b}$ $ComNewBusnRate_{z,b}$ are from the appropriate cell from W12:W41 in CM-1, CM-2, CM-3, CM-4, and CM-5, respectively.	The formula in the spreadsheet appears to be in error.
X13:X41	Global Requested Rate Increase for New Business ($GlobalReqRateIncNew_z$)	$= \begin{cases} ActTrend_{z-1}, & z \leq IntroYr + 1 \\ \max\{0, [ActualLR_{z-2} / ExpectedLR_{z-2} * (1 + ActTrend_{z-2})^2 / (1 + ImpRateIncNew_{z-1}) - 1], [ActualLR_{z-2} / MaxLR * (1 + ActTrend_{z-2})^2 / (1 + ImpRateIncNew_{z-1}) - 1]\}, & \text{otherwise} \end{cases}$ $ExpectedLR_{z-2}$ is from the appropriate cell of Current Market Assump 5 blocks!AC19:AC48 MaxLR is from Current Market Assump 5 blocks!M5	Formula only applies for z = 2, 3, 4, …, 30.
Y13:Y41	Requested Rate Increase for Renewal Business ($GlobalReqRateIncRen_z$)	$= GlobalReqRateIncNew_z$	Formula only applies for z = 2, 3, 4, …, 30.

Interblock Subsidy.xls – Current Market Summary 5 blocks

Cells	Description	Formula	Comments
Z8	Year of Introduction (IntroYr)	$= \min(IntroYr_b)$, $b = 1, 2, 3, 4, 5$ $IntroYr_b$ is from the appropriate cell of Current Market Assump 5 blocks!D11:D15	
AB12:AU41	Aggregate New Business Sales by Cohort ($AggSales_{z,y}$)	$= \sum_{b=1}^{5} Sales_{z,y,b}$	In this and subsequent formulas in this tab, the values being aggregated are from CM-1, CM-2, CM-3, CM-4, and CM-5.
AB42:AU42	Aggregate New Business Sales for Issue Year y	$= \sum_{z=1}^{30} AggSales_{z,y}$	
AX12:BQ41	Aggregate Actual Lapse Rates for Standard Lives by Cohort ($Aggq_{z,y(st)}$)	$= \begin{cases} 0, & x \leq 1 \text{ or } Aggl_{z-1,y(st)} = 0 \\ \sum_{i=1}^{5} (l_{z-1,y,i(st)} * q_{z,y,i(st)}) / \sum_{j=1}^{5} l_{z-1,y,j(st)}, & \text{otherwise} \end{cases}$	
BT12:CM41	Aggregate Newly Impaired Lives by Cohort ($AggNewImpLives_{z,y}$)	$= \sum_{b=1}^{5} NewImpLives_{z,y,b}$	

Interblock Subsidy.xls – Current Market Summary 5 blocks

Cells	Description	Formula	Comments
BT42:CM42	Aggregate Newly Impaired Lives for Issue Year y	$= \sum_{z=1}^{30} AggNewImpLives_{z,y}$	
AB51:AU80	Aggregate Enrollment of Standard Lives by Cohort ($Aggl_{z,y(st)}$)	$= \sum_{b=1}^{5} l_{z,y,b(st)}$	
AB81:AU81	Aggregate Enrollment of Standard Lives for Issue Year y	$= \sum_{z=1}^{30} l_{z,y(st)}$	
AX51:BQ80	Aggregate Actual Lapse Rates of Impaired Lives by Cohort ($Aggq_{z,y(im)}$)	$= \sum_{b=1}^{5} q_{z,y,b(im)}$	
BT51:CM80	Aggregate Combined Actual Lapse Rates by Cohort	$= \sum_{b=1}^{5} q_{z,y,b}$	
AB89:AU118	Aggregate Enrollment of Impaired Lives by Cohort ($l_{z,y(im)}$)	$= \sum_{b=1}^{5} l_{z,y,b(im)}$	
AB119:AU119	Aggregate Exposure of Impaired Lives for Issue Year y	$= \sum_{z=1}^{30} l_{z,y(im)}$	

Interblock Subsidy.xls – Current Market Summary 5 blocks

Cells	Description	Formula	Comments
AX89:BQ118	Aggregate Premium Rates Before Age Adjustment, by Cohort	$= \begin{cases} 0, & x < 1 \text{ or } Aggl_{z,y(st)} + Aggl_{z,y(im)} = 0 \\ \sum_{i=1}^{5} [UnadjPremRate_{z,y,i} * (l_{z,y,i(st)} + l_{z,y,i(im)})] / \sum_{j=1}^{5} (l_{z,y,j(st)} + l_{z,y,j(im)}), & \text{otherwise} \end{cases}$	
BT89:CM118	Aggregate Age-Adjusted Premium Rates by Cohort ($AggAgeAdjPremRate_{z,y}$)	$= \begin{cases} 0, & x < 1 \text{ or } Aggl_{z,y(st)} + Aggl_{z,y(im)} = 0 \\ \sum_{i=1}^{5} [AgeAdjPremRate_{z,y,i} * (l_{z,y,i(st)} + l_{z,y,i(im)})] / \sum_{j=1}^{5} (l_{z,y,j(st)} + l_{z,y,j(im)}), & \text{otherwise} \end{cases}$	
AB126:AU155	Aggregate Age-Adjusted Market New Business Premium Rates by Cohort	$= \begin{cases} 0, & x < 1 \\ MarketRate_z * PAF_x, & \text{otherwise} \end{cases}$	
AX126:BQ155	Aggregate Standard Lives Claim Levels by Cohort ($AggClaims_{z,y(st)}$)	$= \begin{cases} 0, & Aggl_{z,y(st)} = 0 \\ \sum_{i=1}^{5} (l_{z,y,i(st)} * C_{z,y,i(st)}) / \sum_{j=1}^{5} l_{z,y,j(st)}, & \text{otherwise} \end{cases}$	

Interblock Subsidy.xls – Current Market Summary 5 blocks

Cells	Description	Formula	Comments
BT126:CM155	Aggregate Impaired Lives Claim Levels by Cohort ($AggClaims_{z,y(im)}$)	$= \begin{cases} 0, & Aggl_{z,y(im)} = 0 \\ \sum_{i=1}^{5} (l_{z,y,i(im)} * C_{z,y,i(im)}) / \sum_{j=1}^{5} l_{z,y,j(im)}, & \text{otherwise} \end{cases}$	
AB164:AU193	Aggregate Standard Lives Expense Levels by Cohort ($AggExp_{z,y(st)}$)	$= \begin{cases} 0, & Aggl_{z,y(st)} = 0 \\ \sum_{i=1}^{5} (l_{z,y,i(st)} * Exp_{z,y,i(st)}) / \sum_{j=1}^{5} l_{z,y,j(st)}, & \text{otherwise} \end{cases}$	
AX164:BQ193	Aggregate Impaired Lives Expense Levels by Cohort ($AggExp_{z,y(im)}$)	$= \begin{cases} 0, & Aggl_{z,y(im)} = 0 \\ \sum_{i=1}^{5} (l_{z,y,i(im)} * Exp_{z,y,i(im)}) / \sum_{j=1}^{5} l_{z,y,j(im)}, & \text{otherwise} \end{cases}$	
BT164:CM193	Aggregate Average Expense Levels by Cohort	$= \begin{cases} 0, & Aggl_{z,y(st)} + Aggl_{z,y(im)} \leq 0 \\ [(Aggl_{z,y(st)} * AggExp_{z,y(st)}) + (Aggl_{z,y(im)} * AggExp_{z,y(im)})] / (Aggl_{z,y(st)} + Aggl_{z,y(im)}), & \text{otherwise} \end{cases}$	
CP164:CP193	Aggregate Enrollment of Standard Lives by Projection Year ($Aggl_{z(st)}$)	$= \sum_{b=1}^{5} l_{z,y,b(st)}$	

Interblock Subsidy.xls – Current Market Summary 5 blocks

Cells	Description	Formula	Comments
CP194	Aggregate Exposure of Standard Lives	$= \sum_{z=1}^{30} \text{AggI}_{z(st)}$	
CQ164:CQ193	Aggregate Premium of Standard Lives by Projection Year ($\text{AggPremium}_{z(st)}$)	$= \sum_{b=1}^{5} P_{z,b(st)}$	
CQ194	Aggregate Premium of Standard Lives (AggPremium_{st})	$= \sum_{z=1}^{30} \text{AggPremium}_{z(st)}$	
CR164:CR193	Aggregate Claims of Standard Lives by Projection Year ($\text{AggClaims}_{z(st)}$)	$= \sum_{b=1}^{5} C_{z,b(st)}$	
CR194	Aggregate Claims of Standard Lives (AggClaims_{st})	$= \sum_{z=1}^{30} \text{AggClaims}_{z(st)}$	
CS164:CS193	Aggregate Loss Ratio by Projection Year for Standard Lives	$= \text{AggClaims}_{z(st)} / \text{AggPremium}_{z(st)}$	
CS194	Aggregate Loss Ratio for Standard Lives	$= \text{AggClaims}_{st} / \text{AggPremium}_{st}$	

Interblock Subsidy.xls – Current Market Summary 5 blocks

Cells	Description	Formula	Comments
CV164:CV193	Aggregate Enrollment of Impaired Lives by Projection Year ($Aggl_{z(im)}$)	$= \sum_{b=1}^{5} l_{z,y,b(im)}$	
CV194	Aggregate Exposure of Impaired Lives	$= \sum_{z=1}^{30} Aggl_{z(im)}$	
CW164:CW193	Aggregate Premium of Impaired Lives by Projection Year ($AggPremium_{z(im)}$)	$= \sum_{b=1}^{5} P_{z,b(im)}$	
CW194	Aggregate Premium of Impaired Lives ($AggPremium_{im}$)	$= \sum_{z=1}^{30} AggPremium_{z(im)}$	
CX164:CX193	Aggregate Claims of Impaired Lives by Projection Year ($AggClaims_{z(im)}$)	$= \sum_{b=1}^{5} C_{z,b(im)}$	
CX194	Aggregate Claims of Impaired Lives ($AggClaims_{im}$)	$= \sum_{z=1}^{30} AggClaims_{z(im)}$	

Interblock Subsidy.xls – Current Market Summary 5 blocks

Cells	**Description**	**Formula**	**Comments**
CY164:CY193	Aggregate Loss Ratio by Projection Year for Impaired Lives	$= AggClaims_{z(im)} / AggPremium_{z(im)}$	Formula applies only for z = 2, 3, 4, …, 30.
CY194	Aggregate Loss Ratio for Impaired Lives	$= AggClaims_{im} / AggPremium_{im}$	
DG159	Trend Scenario Number	From Global Assumptions!G102	
DJ159	Year at Which Pooling Begins	From Current Market Assump 5 blocks!E3	
DA164:DA193	Aggregate Enrollment by Projection Year ($Aggl_z$)	$= Aggl_{z(st)} + Aggl_{z(im)}$	
DA194	Aggregate Exposure (Aggl)	$= \sum_{z=1}^{30} Aggl_z$	
DB164:DB193	Aggregate Premium by Projection Year ($AggPremium_z$)	$= AggPremium_{z(st)} + AggPremium_{z(im)}$	
DB194	Aggregate Premium (AggPremium)	$= \sum_{z=1}^{30} AggPremium_z$	

Interblock Subsidy.xls – Current Market Summary 5 blocks

Cells	Description	Formula	Comments
DC164:DC193	Aggregate Claims by Projection Year ($AggClaims_z$)	$= AggClaims_{z(st)} + AggClaims_{z(im)}$	
DC194	Aggregate Claims (AggClaims)	$= \sum_{z=1}^{30} AggClaims_z$	
DD164:DD193	Aggregate Claims PMPM by Projection Year	$= AggClaims_z / AggI_z / 12$	
DD194	Aggregate Claims PMPM	= AggClaims / AggI / 12	
DE164:DE193	Aggregate Loss Ratio by Projection Year ($AggLR_z$)	$= AggClaims_z / AggPremium_z$	
DE194	Aggregate Loss Ratio	= AggClaims / AggPremium	
DF164:DF193	Aggregate Expected Loss Ratio by Projection Year ($AggExpectedLR_z$)	$= ExpectedLR_z$ $ExpectedLR_z$ is from the appropriate cell of Current Market Assump 5 blocks!AC19:AC48	
DG164:DG193	Aggregate Actual to Expected Loss Ratio by Projection Year	$= AggLR_z / AggExpectedLR_z$	

Interblock Subsidy.xls – Current Market Summary 5 blocks

Cells	Description	Formula	Comments
DH164:DH193	Aggregate Rolling Two-Year Loss Ratio	$AggClaims_1 / AggPremium_1$, $z = 1$ $= (AggClaims_{z-1} + AggClaims_z) / (AggPremium_{z-1} + AggPremium_z)$, $z = 2, 3, 4, \ldots, 30$	
DI164:DI193	Aggregate Premium Less Aggregate Claims by Projection Year ($AggPminusAggC_z$)	$= AggPremium_z – AggClaims_z$	
DI194	Aggregate Premium Less Aggregate Claims	= AggPremium – AggClaims	
DJ164:DJ193	Aggregate Expenses by Projection Year ($AggExp_z$)	$= \sum_{b=1}^{5} Exp_{z,b}$	
DJ194	Aggregate Expenses (AggExp)	$= \sum_{z=1}^{30} AggExp_z$	
DK164:DK193	Aggregate Expense Ratio by Projection Year	$= AggExp_z / AggPremium_z$	
DK194	Aggregate Expense Ratio	= AggExp / AggPremium	

Interblock Subsidy.xls – Current Market Summary 5 blocks

Cells	Description	Formula	Comments
DL164:DL193	Aggregate Gain by Projection Year ($AggGain_z$)	$= AggPremium_z – AggClaims_z – AggExp_z$	
DL194	Aggregate Gain (AggGain)	$= \sum_{z=1}^{30} AggGain_z$	
DM164:DM193	Aggregate Gain as a Percentage of Aggregate Premium by Projection Year	$= AggGain_z / AggPremium_z$	
DM194	Aggregate Gain as a Percentage of Aggregate Premium	= AggGain / AggPremium	
DN164:DN193	Aggregate Risk-Based Capital by Projection Year ($AggRBC_z$)	$= \sum_{b=1}^{5} RBC_{z,b}$	
DO164:DO193	Aggregate Opportunity Cost of Capital by Projection Year ($AggOCC_z$)	$= -AggRBC_z * OCC\%$ OCC% is from Global Assumptions!D84	
DO194	Aggregate Opportunity Cost of Capital	$= \sum_{z=1}^{30} AggOCC_z$	

Interblock Subsidy.xls – Current Market Summary 5 blocks

Cells	Description	Formula	Comments
DP164:DP193	Aggregate Economic Gain by Projection Year ($AggEconGain_z$)	$= AggGain_z + OCC_z$	
DP194	Aggregate Economic Gain	$= \sum_{z=1}^{30} AggGain_z$	
DQ164:DQ193	Market New Business Rate	$= MarketRate_z$	The values in cells DQ164:DU193 are duplicate copies of values calculated elsewhere; they are repeated here for convenience.
DR164:DR193	Company New Business Rate	$= ComNewBusnRate_z$	
DS164:DS193	Implemented Rate Increase for New Business	$= ImpRateIncNew_z$	
DS194	Average Rate Increase	$= \sum_{z=2}^{30} ImpRateIncNew_z / 29$	

Interblock Subsidy.xls – Current Market Summary 5 blocks

Cells	**Description**	**Formula**	**Comments**
DS195	Minimum Rate Increase	= Min($MinRI_1$, $MinRI_2$, $MinRI_3$, $MinRI_4$, $MinRI_5$) $MinRI_b$ are from cell DT195 of CM-1, CM-2, CM-3, CM-4, and CM-5, respectively	
DS196	Maximum Rate Increase	= Max($MaxRI_1$, $MaxRI_2$, $MaxRI_3$, $MaxRI_4$, $MaxRI_5$) $MaxRI_b$ are from cell DT196 of CM-1, CM-2, CM-3, CM-4, and CM-5, respectively	
DT164:DT193	Implemented Rate Increase for Renewal Business	= $ImpRateIncRen_z$	
DU164:DU183	Aggregate Actual Sales by Projection Year ($ActualSales_z$)	= $AggSales_{z,z}$	Formula applies only for z = 1, 2, 3, …, 20.
DB197	Present Value of Aggregate Premium (PVAggPremium)	= NPV_{int} ($AggPremium_z$) * $\sqrt{1+\text{int}}$	For all of the following present value calculations, int is from Global Assumptions!B63, and the present values are taken over z = 1, 2, 3, …, 30.

Interblock Subsidy.xls – Current Market Summary 5 blocks

Cells	**Description**	**Formula**	**Comments**
DC197	Present Value of Aggregate Claims (PVAggClaims)	$= NPV_{int}\ (AggClaims_{z})\ *\ \sqrt{1+\text{int}}$	
DI197	Present Value of Aggregate Premium Less Aggregate Claims (PVAggPminusAggC)	$= NPV_{int}\ (AggPminusAggC_{z})\ *\ \sqrt{1+\text{int}}$	
DJ197	Present Value of Aggregate Expenses (PVAggExp)	$= NPV_{int}\ (AggExp_{z})\ *\ \sqrt{1+\text{int}}$	
DL197	Present Value of Aggregate Gain (PVAggGain)	$= NPV_{int}\ (AggGain_{z})\ *\ \sqrt{1+\text{int}}$	
DO197	Present Value of Aggregate Opportunity Cost of Capital (PVAggOCC)	$= NPV_{int}\ (AggOCC_{z})\ *\ \sqrt{1+\text{int}}$	
DP197	Present Value of Aggregate Economic Gain (PVAggEconGain)	$= NPV_{int}\ (AggEconGain_{z})\ *\ \sqrt{1+\text{int}}$	

Interblock Subsidy.xls – Current Market Summary 5 blocks

Cells	Description	Formula	Comments
DB198	Present Value of Aggregate Premium as a Percentage of Present Value of Aggregate Premium	= PVAggPremium / PVAggPremium	Identically equal to 100%.
DC198	Present Value of Aggregate Claims as a Percentage of Present Value of Aggregate Premium	= PVAggClaims / PVAggPremium	
DI198	Present Value of Aggregate Premium Less Aggregate Claims as a Percentage of Present Value of Aggregate Premium	= PVAggPminusAggC / PVAggPremium	
DJ198	Present Value of Aggregate Expenses as a Percentage of Present Value of Aggregate Premium	= PVAggExp / PVAggPremium	
DL198	Present Value of Aggregate Gain as a Percentage of Present Value of Aggregate Premium	= PVAggGain / PVAggPremium	

Interblock Subsidy.xls – Current Market Summary 5 blocks

Cells	Description	Formula	Comments
DO198	Present Value of Aggregate Opportunity Cost of Capital as a Percentage of Present Value of Aggregate Premium	= PVAggOCC / PVAggPremium	
DP198	Present Value of Aggregate Economic Gain as a Percentage of Present Value of Aggregate Premium	= PVAggEconGain / PVAggPremium	

Interblock Subsidy.xls – CM-1_TLR, CM-2_TLR, etc.

Cells	Description	Formula	Comments
D4	Target Lifetime Loss Ratio (TargetLR)	From Current Market Assump 5 blocks!L4	
D7	Flag to Include Trend (TrendFlag)	From Current Market Assump 5 blocks!L7	Hardcoded value; value of 1 means to include trend in projections, value of 0 means to exclude trend.
D11	Initial Reference Claim Cost for Standard Lives ($InitRefClaims_{st}$)	From Global Assumptions!D49	Best estimate of starting claim costs for standard lives
F11	Pricing Assumption of Initial Reference Claim Cost for Standard Lives ($InitRefClaims_{st(pr)}$)	= $InitRefClaims_{st}$	Standard lives starting claim costs used in initial pricing; the model provides the flexibility to adjust the baseline claims for use in pricing, but the model currently does not make any such adjustment.
D12	Initial Reference Claim Cost for Impaired Lives ($InitRefClaims_{im}$)	From Global Assumptions!D60	Best estimate of starting claim costs for impaired lives

Interblock Subsidy.xls – CM-1_TLR, CM-2_TLR, etc.

Cells	Description	Formula	Comments
F12	Pricing Assumption of Initial Reference Claim Cost for Impaired Lives ($InitRefClaims_{im(pr)}$)	= $InitRefClaims_{im}$	Impaired lives starting claim costs used in initial pricing; the model provides the flexibility to adjust the baseline claims for use in pricing, but the model currently does not make any such adjustment.
E14	Durational Deterioration Limitation Period (DDLP)	From Current Market Assump 5 blocks!M14	
E15	Expected Premium Rate (ExpPrem)	From Current Market Assump 5 blocks!M15	
J6:J10	Durational Rate Increase (DRI_x)	From the appropriate cell of Current Market Assump 5 blocks!R6:R10	

Interblock Subsidy.xls – CM-1_TLR, CM-2_TLR, etc.

Cells	Description	Formula	Comments
B19:B48	Standard Lives Base Lapse Rates Used in Pricing ($q_{x(st, pr)}$)	= max{$q_{min(st)}$, min[$q_{max(st)}$, $Baseq_{x(st)}$ + (((PAF_{x+1} / PAF_x * $AccumDRI_{x+1}$ / $AccumDRI_x$) – 1) * $LapseAdjTrend_{st}$) + (($AccumDRI_{x+1}$ -1) * $LapseAdjMkt_{st}$)]} $q_{min(st)}$ is from Global Assumptions!D40 $q_{max(st)}$ is from Global Assumptions!D39 $Baseq_{x(st, pr)}$ is from the appropriate cell of Global Assumptions!E29:E33 $LapseAdjTrend_{st}$ is from Global Assumptions!D36 $LapseAdjMkt_{st}$ is from Global Assumptions!D37	Baseline standard lives lapse rates adjusted to reflect higher anticipated lapses due to rate increases exceeding claim trend and renewal rates exceeding the market new business rate
C19:C48	Impaired Lives Base Lapse Rates Used in Pricing ($q_{x(im, pr)}$)	= max{$q_{min(im)}$, min[$q_{max(im)}$, $Baseq_{x(im)}$ + (DRI_{x+1} * $LapseAdjTrend_{im}$), x ≤ DDLP = $q_{x(st, pr)}$, x > DDLP $q_{min(im)}$ is from Global Assumptions!D58 $q_{max(im)}$ is from Global Assumptions!D57 $Baseq_{im(pr)}$ is from Global Assumptions!D54 $LapseAdjTrend_{im}$ is from Global Assumptions!D56	Baseline impaired lives lapse rates adjusted to reflect higher anticipated lapses due to rate increases exceeding claim trend during durational deterioration limitation period; beyond DDLP, impaired lives lapse rates are equal to standard lives lapse rates.
D19:D48	Rate of Impairment Used in Pricing ($\mu_{x(pr)}$)	= 0, x > DDLP μ_x, x ≤ DDLP	

Interblock Subsidy.xls – CM-1_TLR, CM-2_TLR, etc.

Cells	Description	Formula	Comments
E19:E48	Number of Standard Lives ($l_{x(st)}$)	= 1, x = 1 $l_{x-1(st)}$ * (1 - $\mu_{x-1(pr)}$) * (1 - $q_{x-1(st, pr)}$), x = 2, 3, 4, …, 30	The values in columns E, F, and G represent proportions of the number of first-year standard lives.
F19:F48	Number of Impaired Lives ($l_{x(im)}$)	= 0, x = 1 [$l_{x-1(im)}$ * (1 - $q_{x-1(im, pr)}$)] + ($l_{x-1(st)}$ * $\mu_{x-1(pr)}$), x = 2, 3, 4, …, 30	
G19:G48	Number of Total Lives (l_x)	= $l_{x(st)}$ + $l_{x(im)}$	
H19:H48	Accumulated Trend ($AccumTrend_x$)	= 1, x = 1 $AccumTrend_{x-1}$ * [1 + (Trend * TrendFlag)], x = 2, 3, 4, …, 30 Trend is from Global Assumptions!D21	
I19:I48	Discount Factor (v_x)	= 1, x = 1 v_{x-1}/(1 + int), x = 2, 3, 4, …, 30	
J19:J48	Premium Age Factor (PAF_x)	= 1, x = 1 PAF_{x-1} * (1 + PremGrowthAge), x = 2, 3, 4, …, 30 PremGrowthAge is from Global Assumptions!C25	

Interblock Subsidy.xls – CM-1_TLR, CM-2_TLR, etc.

Cells	**Description**	**Formula**	**Comments**
K19:K48	Pricing Claims ($C_{x(pr)}$)	$\{[InitRefClaims_{st(pr)} * (1 + ((ExpPrem / InitRefPrem) - 1)$ $* MorbAdj_{st}) * DF_x * l_{x(st)})] + (InitRefClaims_{im(pr)} * l_{x(im)})\}$ $* PAF_x * AccumTrend_x,$ $x \le DDLP$ $=$ $\{[InitRefClaims_{st(pr)} * (1 + ((ExpPrem / RefPrem_1) - 1)$ $* MorbAdj_{st}) * l_{x(st)})] + (InitRefClaims_{im(pr)} * l_{x(im)})\}$ $* PAF_x * AccumTrend_x,$ $x > DDLP$ InitRefPrem is from Global Assumptions!C24 $MorbAdj_{st}$ is from Global Assumptions!D51 DF_x is from the appropriate cell of CM-1!D12:D41	Standard lives' claims are adjusted each year for morbidity, duration (within the DDLP), aging, and trend. Impaired lives' claims are adjusted each year for aging and trend.
L19:L48	Annual Durational Rate Increase ($ADRI_x$)	$=$ $0,$ $x = 1$ $DRI_x,$ $x = 2, 3, 4, \ldots, 30$	
M19:M49	Accumulated Durational Rate Increase Factor ($AccumDRI_x$)	$=$ $1,$ $x = 1$ $AccumDRI_{x-1} * (1 + ADRI_x),$ $x = 2, 3, 4, \ldots, 31$	A 31^{st}-year value is needed for the calculation of $q_{30(st, pr)}$.

Interblock Subsidy.xls – CM-1_TLR, CM-2_TLR, etc.

Cells	**Description**	**Formula**	**Comments**
N19:N48	Pricing Premium ($P_{x(pr)}$)	$= \; l_1 * \sum_{i=1}^{30} (C_{i(pr)} * v_i) / \sum_{j=1}^{30} (l_j * PAF_j * AccumTrend_j * v_j * AccumDRI_j) / TargetLR, \quad x = 1$ $P_{1(pr)} / l_1 * PAF_x * l_x * AccumTrend_x * ADRI_x / ADRI_1, \quad x = 2, 3, 4, \ldots, 30$ PAF_x is from the appropriate cell of Current Market Summary 5 blocks!J12:J41	
O19:O48	Pricing Loss Ratio ($LR_{x(pr)}$)	$= C_{x(pr)} / P_{x(pr)}$	

Interblock Subsidy.xls – CM-1_TLR, CM-2_TLR, etc.

Cells	Description	Formula	Comments
P19:P48	Pricing Expenses ($Exp_{x(pr)}$)	$= l_x * Exp_{Pol(x)} * (1 + Inflation)^{x-1}$ $+ Exp_{\%C(x)} * C_{x(pr)}$ $+ Comm_{B(x)} * P_{1(pr)} / l_1 * l_x$ $+ Comm_{R(x)} * [P_{x(pr)} – (P_{1(pr)} / l_1 * l_x)]$ $+ Exp_{Oth\%P(x)} * P_{x(pr)}$ $Exp_{Pol(x)}$ is from the appropriate cell of Current Market Summary 5 blocks!E12:E41 Inflation is from Global Assumptions!B64 $Exp_{\%C(x)}$ is from the appropriate cell of Current Market Summary 5 blocks!F12:F41 $Comm_{B(x)}$ is from the appropriate cell of Current Market Summary 5 blocks!G12:G41 $Comm_{R(x)}$ is fromthe appropriate cell of Current Market Summary 5 blocks!H12:H41 $Exp_{Oth\%P(x)}$ is from the appropriate cell of Current Market Summary 5 blocks!I12:I41	
Q19:Q48	Pricing Expense as a Percentage of Pricing Premium	$= Exp_{x(pr)} / P_{x(pr)}$	
R19:R48	Pricing Operating Gain ($Gain_{x(pr)}$)	$= P_{x(pr)} – C_{x(pr)} – Exp_{x(pr)}$	

Interblock Subsidy.xls – CM-1_TLR, CM-2_TLR, etc.

Cells	Description	Formula	Comments
S19:S48	Pricing Gain as a Percentage of Pricing Premium	$= \text{Gain}_{x(pr)} / P_{x(pr)}$	
K50	Simple Sum of Pricing Claims (SumClaims)	$= \sum_{x=1}^{30} C_{x(pr)}$	
N50	Simple Sum of Pricing Premiums (SumPrem)	$= \sum_{x=1}^{30} P_{x(pr)}$	
O50	Pricing Loss Ratio, Using Simple Sums	= SumClaims / SumPrem	
P50	Simple Sum of Pricing Expenses (SumExp)	$= \sum_{x=1}^{30} \text{Exp}_{x(pr)}$	
Q50	Pricing Expense Ratio, Using Simple Sums	= SumExp / SumPrem	
R50	Simple Sum of Pricing Gains (SumGain)	$= \sum_{x=1}^{30} \text{Gain}_{x(pr)}$	

Interblock Subsidy.xls – CM-1_TLR, CM-2_TLR, etc.

Cells	Description	Formula	Comments
S50	Pricing Gain Ratio, Using Simple Sums	= SumGain / SumPrem	
K51	Present Value of Pricing Claims over 10 Years ($PVClaims_{10}$)	$= NPV_{int}\ (C_{x(pr)}) * \sqrt{1+int}$, where NPV is taken over x = 1, 2, 3, ….10	
N51	Present Value of Pricing Premiums over 10 Years ($PVPrem_{10}$)	$= NPV_{int}\ (P_{x(pr)}) * \sqrt{1+int}$, where NPV is taken over x = 1, 2, 3, ….10	
O51	Pricing Loss Ratio, Using 10-Year NPVs	$= PVClaims_{10}\ /\ PVPrem_{10}$	
P51	Present Value of Pricing Expenses over 10 Years ($PVExp_{10}$)	$= NPV_{int}\ (Exp_{x(pr)}) * \sqrt{1+int}$, where NPV is taken over x = 1, 2, 3, ….10	
Q51	Pricing Expense Ratio, Using 10-Year NPVs	$= PVExp_{10}\ /\ PVPrem_{10}$	
R51	Present Value of Pricing Gains over 10 Years ($PVGain_{10}$)	$= NPV_{int}\ (Gain_{x(pr)}) * \sqrt{1+int}$, where NPV is taken over x = 1, 2, 3, ….10	
S51	Pricing Gain Ratio, Using 10-Year NPVs	$= PVGain_{10}\ /\ PVPrem_{10}$	

Interblock Subsidy.xls – CM-1_TLR, CM-2_TLR, etc.

Cells	Description	Formula	Comments
K52	Present Value of Pricing Claims over 30 Years ($PVClaims_{30}$)	$= NPV_{int}(C_{x(pr)}) * \sqrt{1+int}$, where NPV is taken over x = 1, 2, 3, ….30	
N52	Present Value of Pricing Premiums over 30 Years ($PVPrem_{30}$)	$= NPV_{int}(P_{x(pr)}) * \sqrt{1+int}$, where NPV is taken over x = 1, 2, 3, ….30	
O52	Pricing Loss Ratio, Using 30-Year NPVs	$= PVClaims_{30} / PVPrem_{30}$	
P52	Present Value of Pricing Expenses over 30 Years ($PVExp_{30}$)	$= NPV_{int}(Exp_{x(pr)}) * \sqrt{1+int}$, where NPV is taken over x = 1, 2, 3, ….30	
Q52	Pricing Expense Ratio, Using 30-Year NPVs	$= PVExp_{30} / PVPrem_{30}$	
R52	Present Value of Gains over 30 Years ($PVGain_{30}$)	$= NPV_{int}(Gain_{x(pr)}) * \sqrt{1+int}$, where NPV is taken over x = 1, 2, 3, ….30	
S52	Pricing Gain Ratio, Using 30-Year NPVs	$= PVGain_{30} / PVPrem_{30}$	

Interblock Subsidy.xls – CM-1_TLR, CM-2_TLR, etc.

Cells	**Description**	**Formula**	**Comments**
K53	PV of Pricing Claims as a Percentage of PV of Pricing Premium	$= PVClaims_{30} / PVPrem_{30}$	Model calculations produce a stream of premiums such that this is equal to the target lifetime loss ratio.
N53	PV of Pricing Premium as a Percentage of PV of Pricing Premium	$= PVPrem_{30} / PVPrem_{30}$	Identically equal to 1.000.
P53	PV of Pricing Expenses as a Percentage of PV of Pricing Premium	$= PVExp_{30} / PVPrem_{30}$	
R53	PV of Pricing Gain as a Percentage of PV of Pricing Premium	$= PVGain_{30} / PVPrem_{30}$	
G54	Interest (int)	From Global Assumptions!B63	
U19:U48	Loss Ratio by Projection Year ($ExpectedLR_z$)	See formula for cells Y51:BB51, below.	

Interblock Subsidy.xls – CM-1_TLR, CM-2_TLR, etc.

Cells	**Description**	**Formula**	**Comments**
V20:V48	Loss Ratio by Projection Year for Two Most Recent Issue Years ($ExpectedLR2Recent_z$)	$LR_{x-1(pr)}$, $z = IntroYr_b + 1$ = $[(ExpInforcel_{z-IntroYr(b)-1,z} * LR_{z-IntroYr(b)-1(pr)})$ $+ (ExpInforce_{z-IntroYr(b),z} * LR_{z-IntroYr(b)(pr)})]$ $/ (ExpInforce_{z-IntroYr(b)-1,z} + ExpInforcel_{z-IntroYr(b),z})$, $z > IntroYr_b + 1$	Formula applies only for values of $z \geq IntroYr_b + 1$.
W19:W48	Target Loss Ratios for Durational Pooling by Projection Year ($PoolingTLR_z$)	$ExpectedLR2Recent_z$, $z = PoolingYr + IntroYr_b -1$ = $LR_{PoolingYr-1(pr)}$, $z = PoolingYr + IntroYr_b$ $ExpectedLR_z$, otherwise PoolingYr is from IBS Assump DUR pooling!E3 $IntroYr_1$ is from IBS Assump DUR pooling!D11	Formula applies only for values of $z \geq IntroYr_b$.
X20:X48	Target Loss Ratios for Durational Pooling for Second Year of Pool by Projection Year ($2ndYearPoolingTLR_z$)	$= [(ExpInforce_{z,z} * LR_{z(pr)}) + (ExpInforce_{z,z-1} * LR_{z-1(pr)})]$ $/ (ExpInforce_{z,z} + ExpInforce_{z,z-1})$	Note that this only appears in CM-1_TLR. Formula only applies for z = 2, 3, 4, …, 30.
X19:BA48 (Y19:BB48 in CM-1_TLR)	Expected Premium Inforce at Age Adjusted Market New Business Rates by Cohort ($ExpInforce_{z,x,b}$)	= 0, $y < 1$ or $y > 20$ $AgeAdjMktNewBusnRate_{z,y,b} * (l_{z,y,b(st)} + l_{z,y,b(im)})$, otherwise $AgeAdjMktNewBusnRate_{z,y,b}$ is from the appropriate cell of CM-b!BT89:CM118, where b is the block number $l_{z,y,b(st)}$ is from the appropriate cell of CM- b!AB51:AU80, where b is the block number $l_{z,y,b(im)}$ is from the appropriate cell of CM- b!AB89:AU118, where b is the block number	Note that in this table, columns represent projection years, rows represent durations, and diagonals represent issue years.

Interblock Subsidy.xls – CM-1_TLR, CM-2_TLR, etc.

Cells	Description	Formula	Comments
X51:BA51 (Y51:BB51 in CM-1_TLR)	Composite Expected Loss Ratio by Projection Year for Block 1	$= (\sum_{i=1}^{30} ExpInforce_{z,i} * LR_{i(pr)}) / \sum_{j=1}^{30} ExpInforce_{z,j}$	
X52:BA52 (Y52:BB52 in CM-1_TLR)	Total Expected Premium Inforce by Projection Year ($ExpInforce_z$)	$= \sum_{x=1}^{30} ExpInforce_{z,x}$	

Interblock Subsidy.xls – CM-1, CM-2, CM-3, CM-4, CM-5

Cells	Description	Formula	Comments
D4	Reference Premium (InitRefPrem)	From Global Assumptions!C24	
D5	Initial Reference Claim Cost for Standard Lives ($InitRefClaims_{st}$)	From Global Assumptions!D49	
D6	Initial Reference Claim Cost for Impaired Lives ($InitRefClaims_{im}$)	From Global Assumptions!D60	
B12:B41	Base Lapse Rates for Standard Lives ($Baseq_{x(st)}$)	From the appropriate cell of Global Assumptions!D29:D33	
C12:C41	Base Lapse Rates for Impaired Lives ($Baseq_{x(im)}$)	From Global Assumptions!C54	
D12:D41	Duration Factor (DF_x)	From the appropriate cell of Global Assumptions!B77:B81	
E12:E41	Per Policy Expense Rates ($Exp_{Pol(x)}$)	From the appropriate cell of Global Assumptions!B70:B74	

Interblock Subsidy.xls – CM-1, CM-2, CM-3, CM-4, CM-5

Cells	Description	Formula	Comments
F12:F41	Percentage-of-Claims Expense Rates ($Exp_{\%C(x)}$)	From the appropriate cell of Global Assumptions!C70:C74	
G12:G41	Base Commission Rates ($Comm_{B(x)}$)	From the appropriate cell of Global Assumptions!D70:D74	
H12:H41	Renewal Commission Rates ($Comm_{R(x)}$)	From the appropriate cell of Global Assumptions!E70:E74	
I12:I41	Other Premium-Related Expense Rates ($Exp_{Oth\%P(x)}$)	From the appropriate cell of Global Assumptions!F70:F74	
J12:J41	Premium Age Factor (PAF_x)	$= \begin{cases} 1, & x = 1 \\ PAF_{x-1} * (1 + PremGrowthAge), & x = 2, 3, 4, \ldots, 30 \end{cases}$ PremGrowthAge is from Global Assumptions!C25	
K12:K41	Rate of Impairment (μ_x)	From the appropriate cell of Global Assumptions!E43:E47	
L12:L41	Durational Rate Increase (DRI_x)	From the appropriate cell of Current Market Assump 5 blocks!T19:T48	

Interblock Subsidy.xls – CM-1, CM-2, CM-3, CM-4, CM-5

Cells	Description	Formula	Comments
O12:O41	Reference Premium ($RefPrem_z$)	= InitRefPrem, z = 1 $RefPrem_{z-1}$ * (1 + $ActTrend_{z-1}$), z = 2, 3, 4, …, 30	
P12:P41	Baseline Sales ($BaseSales_z$)	From the appropriate cell of Current Market Assump 5 blocks!C19:G48, based on the block number and projection year	
Q12:Q41	Standard Lives Reference Claims ($RefClaims_{z(st)}$)	= $InitRefClaims_{st}$ * $MorbAdj_{b(st)}$, z = 1 $RefClaims_{z-1(st)}$ * (1 + $ActTrend_{z-1}$), z = 2, 3, 4, …, 30 $MorbAdj_{b(st)}$ is from the appropriate cell of Current Market Assump 5 blocks!O4, Q4, S4, U4, and W4	
R12:R41	Impaired Lives Reference Claims ($RefClaims_{z(im)}$)	= $InitRefClaims_{im}$ * $MorbAdj_{b(im)}$, z = 1 $RefClaims_{z-1(im)}$ * (1 + $ActTrend_{z-1}$), z = 2, 3, 4, …, 30 $MorbAdj_{b(im)}$ is from the appropriate cell of Current Market Assump 5 blocks!P4, R4, T4, V4, and X4	
S12:S41	Actual Trend ($ActTrend_z$)	From the appropriate cell of Global Assumptions!B106:B135	
T13:T41	Implemented Rate Increase for New Business ($ImpRateIncNew_z$)	= min(MaxRateInc, RegDamp * $ReqRateIncNew_z$), MaxRateInc is from Global Assumptions!D100 RegDamp is from the appropriate cell of Global Assumptions!D90:D99, based on the value of $ReqRateIncNew_z$	Formula only applies for z = 2, 3, 4, …, 30.

Interblock Subsidy.xls – CM-1, CM-2, CM-3, CM-4, CM-5

Cells	**Description**	**Formula**	**Comments**
U13:U41	Implemented Rate Increase for Renewal Business ($ImpRateIncRen_z$)	$= ImpRateIncNew_z$	Formula only applies for z = 2, 3, 4, …, 30.
V12:V41	Market New Business Rate ($MarketRate_z$)	$= \begin{cases} P_{1(pr)}, & z = 1 \\ MarketRate_{z-1} * (1 + ActTrend_{z-1}), & z = 2, 3, 4, \ldots, 30 \end{cases}$ $P_{1(pr)}$ is from Current Market Assump 5 blocks!V19	
W12:W41	Company New Business Rate ($ComNewBusnRate_z$)	$= \begin{cases} 0, & z < IntroYr_b \\ MarketRate_z * (1 – Disc@Intro), & z = IntroYr_b \\ ComNewBusnRate_{z-1} * (1 + ImpRateIncNew_z), & z > IntroYr_b \end{cases}$ $IntroYr_b$ is from the appropriate cell of Current Market Assump 5 blocks!D11:D15 Disc@Intro is from Global Assumptions!D26	

Interblock Subsidy.xls – CM-1, CM-2, CM-3, CM-4, CM-5

Cells	Description	Formula	Comments
X13:X41	Requested Rate Increase for New Business ($ReqRateIncNew_z$)	$= \begin{cases} GlobalReqRateIncNew_z, & z \geq PoolingYr \\ ActTrend_{z-1}, & z < PoolingYr \text{ and } z \leq IntroYr_b + 1 \\ \max\{0, [ActualLR_{z-2} / ExpectedLR_{z-2} * (1 + ActTrend_{z-2})^2 / (1 + ImpRateIncNew_{z-1}) - 1], [ActualLR_{z-2} / MaxLR * (1 + ActTrend_{z-2})^2 / (1 + ImpRateIncNew_{z-1}) - 1]\}, & \text{otherwise} \end{cases}$ $GlobalReqRateIncNew_z$ is from the appropriate cell of Current Market Summary 5 blocks!X13:X41 PoolingYr is from Current Market Assump 5 blocks!E3 $IntroYr_b$ is from the appropriate cell of Current Market Assump 5 blocks!D11:D15 $ExpectedLR_{z-2}$ is from the appropriate cell of CM-b_TLR!U19:U48, where b is the block number MaxLR is from Current Market Assump 5 blocks!M5	Formula only applies for z = 2, 3, 4, …, 30.
Y13:Y41	Requested Rate Increase for Renewal Business ($ReqRateIncRen_z$)	$= \begin{cases} ReqRateIncNew_z, & z < PoolingYr \\ GlobalReqRateIncRen_z, & z \geq PoolingYr \end{cases}$ PoolingYr is from Current Market Assump 5 blocks!E3 $GlobalReqRateIncRen_z$ is from the appropriate cell of Current Market Summary 5 blocks!Y13:Y41	Formula only applies for z = 2, 3, 4, …, 30.

Interblock Subsidy.xls – CM-1, CM-2, CM-3, CM-4, CM-5

Cells	Description	Formula	Comments
AB12:AU41	New Business Sales by Cohort ($NewSales_{z,y}$)	$= \begin{cases} 0, & x \neq 1 \\ \max \{0, BaseSales_z * [1 + MktPriceSens * ((MarketRate_z / RefPrem_z) - 1)] * [1 + ComPriceSens * ((ComNewBusnRate_z / MarketRate_z) - 1)]\}, & \text{otherwise} \end{cases}$ MktPriceSens is from Global Assumptions!D14 ComPriceSens is from Global Assumptions!D15	
AB42:AU42	Total New Business Sales for Issue Year y	$= \sum_{z=1}^{30} NewSales_{z,y}$	

Interblock Subsidy.xls – CM-1, CM-2, CM-3, CM-4, CM-5

Cells	Description	Formula	Comments
AX12:BQ41	Actual Lapse Rates for Standard Lives by Cohort ($q_{z,y(st)}$)	= 0, $x \le 1$ or $BaseSales_y = 0$ $\max\{q_{min(st)}, \min[q_{max(st)}, Baseq_{x-1(st)} + ((AgeAdjPremRate_{z,y} / AgeAdjPremRate_{z-1,y}) - 1 - ActTrend_z) * LapseAdjTrend_{st} * (((AgeAdjPremRate_{z,y} / AgeAdjMktNewBusnRate_{z,y}) - 1) * LapseAdjMkt_{st} + 1) - (((ComNewBusnRate_y / RefPrem_y) - 1) * LapseAdjSale_{st})]\}$, $x = 2, 3,$ or 4 and $BaseSales_y \neq 0$ $\max\{q_{min(st)}, \min[q_{max(st)}, Baseq_{x-1(st)} + ((AgeAdjPremRate_{z,y} / AgeAdjPremRate_{z-1,y}) - 1 - ActTrend_z) * LapseAdjTrend_{st} * (((AgeAdjPremRate_{z,y} / AgeAdjMktNewBusnRate_{z,y}) - 1) * LapseAdjMkt_{st} + 1)]\}$, otherwise $q_{min(st)}$ is from Global Assumptions!D40 $q_{max(st)}$ is from Global Assumptions!D39 AgingTrend is from Global Assumptions!C22 $LapseAdjTrend_{st}$ is from Global Assumptions!D36 $LapseAdjMkt_{st}$ is from Global Assumptions!D37 $LapseAdjSale_{st}$ is from Global Assumptions!D38	
BT12:CM41	Newly Impaired Lives by Cohort ($NewImpLives_{z,y}$)	= 0, $x \le 1$ $l_{z-1,y(st)} * \mu_{x-1} * (1 - q_{z,y(im)})$, $x > 1$	
BT42:CM42	Total Number of Newly Impaired Lives for Issue Year y	$= \sum_{z=1}^{30} NewImpLives_{z,y}$	

Interblock Subsidy.xls – CM-1, CM-2, CM-3, CM-4, CM-5

Cells	Description	Formula	Comments
AB51:AU80	Enrollment of Standard Lives by Cohort ($l_{z,y(st)}$)	$= \begin{cases} 0, & x < 1 \\ NewSales_{z,y}, & x = 1 \\ NewSales_{z,y} + l_{z-1,y(st)} * (1 - \mu_{x-1}) * (1 - q_{z,y(st)}), & x > 1 \end{cases}$	
AB81:AU81	Total Enrollment of Standard Lives by Issue Year	$= \sum_{z=1}^{30} l_{z,y(st)}$	
AX51:BQ80	Actual Lapse Rates for Impaired Lives by Cohort ($q_{z,y(im)}$)	$= \begin{cases} 0, & x \leq 1 \text{ or } BaseSales_y = 0 \\ \max\{q_{min(im)}, \min[q_{max(im)}, Baseq_{x-1(im)} + ((AgeAdjPremRate_{z,y} / AgeAdjPremRate_{z-1,y}) - 1 - ActTrend_z) * LapseAdjTrend_{im}]\}, & \text{otherwise} \end{cases}$ $q_{min(im)}$ is from Global Assumptions!D58 $q_{max(im)}$ is from Global Assumptions!D57 AgingTrend is from Global Assumptions!C22 $LapseAdjTrend_{im}$ is from Global Assumptions!D56	
BT51:CM80	Actual Combined Lapse Rates by Cohort ($q_{z,y}$)	$= \begin{cases} 0, & l_{z,y(st)} + l_{z,y(im)} = 0 \\ [(l_{z,y(st)} * q_{z,y(st)}) + (l_{z,y(im)} * q_{z,y(im)})] / (l_{z,y(st)} + l_{z,y(im)}), & \text{otherwise} \end{cases}$	
AB89:AU118	Enrollment of Impaired Lives by Cohort ($l_{z,y(im)}$)	$= \begin{cases} 0, & x \leq 1 \\ NewImpLives_{z,y} + [l_{z-1,y(im)} * (1 - q_{z,y(im)})], & x > 1 \end{cases}$	

Interblock Subsidy.xls – CM-1, CM-2, CM-3, CM-4, CM-5

Cells	**Description**	**Formula**	**Comments**
AB119:AU119	Total Enrollment of Impaired Lives by Issue Year	$= \sum_{z=1}^{30} l_{z,y(im)}$	
AX89:BQ118	Premium Rates after Durational Adjustment but Before Age Adjustment, by Cohort ($DurAdjPremRate_{z,y}$)	$= \begin{cases} 0, & x < 1 \\ ComNewBusnRate_z, & x = 1 \\ DurAdjPremRate_{z-1,y} * (1 + ImpRateIncRen_z) * (1 + DRI_x), & x > 1 \end{cases}$	
BT89:CM118	Premium Rates After Age Adjustment by Cohort ($AgeAdjPremRate_{z,y}$)	$= DurAdjPremRate_{z,y} * PAF_x$	
AB126:AU155	Age-Adjusted Market-Level New Business Premium Rates by Cohort ($AgeAdjMktNewBusnRate_{z,y}$)	$= \begin{cases} 0, & x < 1 \\ MarketRate_z * PAF_x, & \text{otherwise} \end{cases}$	

Interblock Subsidy.xls – CM-1, CM-2, CM-3, CM-4, CM-5

Cells	Description	Formula	Comments
AX126:BQ155	Standard Lives Claim Levels by Cohort ($C_{z,y(st)}$)	= 0, $x < 1$ RefClaims$_{z(st)}$ * DF$_x$ * {1 + [(ComNewBusnRate$_y$ / RefPrem$_y$) – 1] * MorbAdj$_{st}$}, $x = 1$ $C_{z-1,y(st)}$ * DF$_x$ / DF$_{x-1}$ * (1 + ActTrend$_{z-1}$) * (1 + AgingTrend), otherwise MorbAdj$_{st}$ is from Global Assumptions!D51 AgingTrend is from Global Assumptions!C22	
BT126:CM155	Impaired Lives Claim Levels by Cohort ($C_{z,y(im)}$)	= 0, $x < 1$ RefClaims$_{z(im)}$, $x = 1$ $C_{z-1,y(im)}$ * (1 + ActTrend$_{z-1}$) * (1 + AgingTrend), $x > 1$ AgingTrend is from Global Assumptions!C22	
AB164:AU193	Standard Lives Expense Levels by Cohort ($Exp_{z,y(st)}$)	= 0, $x < 1$ Exp$_{Pol(x)}$ * (1 + Inflation)$^{z-1}$ + $C_{z,y(st)}$ * Exp$_{\%C(x)}$ + ComNewBusnRate$_y$ * Comm$_{B(x)}$ + (AgeAdjPremRate$_{z,y}$ – ComNewBusnRate$_y$) * Comm$_{R(x)}$ + AgeAdjPremRate$_{z,y}$ * Exp$_{Oth\%P(x)}$, $x \geq 1$ Inflation is from Global Assumptions!B64	

Interblock Subsidy.xls – CM-1, CM-2, CM-3, CM-4, CM-5

Cells	Description	Formula	Comments
AX164:BQ193	Impaired Lives Expense Levels by Cohort ($Exp_{z,y(im)}$)	$= \begin{cases} 0, & x < 1 \\ Exp_{Pol(x)} * (1 + Inflation)^{z-1} \\ \quad + C_{z,y(im)} * Exp_{\%C(x)} \\ \quad + ComNewBusnRate_y * Comm_{B(x)} \\ \quad + (AgeAdjPremRate_{z,y} – ComNewBusnRate_y) * Comm_{R(x)} \\ \quad + AgeAdjPremRate_{z,y} * Exp_{Oth\%P(x)}, & x \geq 1 \end{cases}$ Inflation is from Global Assumptions!B64	
BT164:CM193	Average Expense Levels by Cohort ($Exp_{z,y}$)	$= \begin{cases} 0, & l_{z,y(st)} + l_{z,y(im)} \leq 0 \\ [(l_{z,y(st)} * Exp_{z,y(st)}) + (l_{z,y(im)} * Exp_{z,y(im)})] / (l_{z,y(st)} + l_{z,y(im)}), & \text{otherwise} \end{cases}$	
CP164:CP193	Standard Lives Enrollment by Projection Year ($l_{z(st)}$)	$= \sum_{y=1}^{20} l_{z,y(st)}$	
CP194	Total Standard Lives Exposure	$= \sum_{z=1}^{30} l_{z(st)}$	"Total" refers to the sum over all 30 projection years.
CQ164:CQ193	Standard Lives Premium by Projection Year ($P_{z(st)}$)	$= \sum_{y=1}^{20} l_{z,y(st)} * AgeAdjPremRate_{z,y} * 12$	

Interblock Subsidy.xls – CM-1, CM-2, CM-3, CM-4, CM-5

Cells	**Description**	**Formula**	**Comments**
CQ194	Total Standard Lives Premium (P_{st})	$= \sum_{z=1}^{30} P_{z(st)}$	
CR164:CR193	Standard Lives Claims by Projection Year ($C_{z(st)}$)	$= \sum_{y=1}^{20} l_{z,y(st)} * C_{z,y(st)} * 12$	
CR194	Total Standard Lives Claims (C_{st})	$= \sum_{z=1}^{30} C_{z(st)}$	
CS164:CS193	Standard Lives Loss Ratio by Projection Year	$= \begin{cases} 0, & P_{z(st)} = 0 \\ C_{z(st)} / P_{z(st)}, & P_{z(st)} \neq 0 \end{cases}$	
CS194	Standard Lives Loss Ratio	$= C_{st} / P_{st}$	
CV164:CV193	Impaired Lives Enrollment by Projection Year ($l_{z(im)}$)	$= \sum_{y=1}^{20} l_{z,y(im)}$	
CV194	Total Impaired Lives Exposure	$= \sum_{z=1}^{30} l_{z(im)}$	

Interblock Subsidy.xls – CM-1, CM-2, CM-3, CM-4, CM-5

Cells	Description	Formula	Comments
CW164:CW193	Impaired Lives Premium by Projection Year ($P_{z(im)}$)	$= \sum_{y=1}^{20} l_{z,y(im)} * AgeAdjPremRate_{z,y} * 12$	
CW194	Total Impaired Lives Premium (P_{im})	$= \sum_{z=1}^{30} P_{z(im)}$	
CX164:CX193	Impaired Lives Claims by Projection Year ($C_{z(im)}$)	$= \sum_{y=1}^{20} l_{z,y(im)} * C_{z,y(im)} * 12$	
CX194	Total Impaired Lives Claims (C_{im})	$= \sum_{z=1}^{30} C_{z(im)}$	
CY165:CY193	Impaired Lives Loss Ratio by Projection Year	$= \begin{cases} 0, & P_{z(im)} = 0 \\ C_{z(im)} / P_{z(im)}, & P_{z(im)} \neq 0 \end{cases}$	Formula only applies for z = 2, 3, 4, …, 30.
CY194	Impaired Lives Loss Ratio	$= C_{im} / P_{im}$	
DA164:DA193	Combined Enrollment by Projection Year (l_z)	$= l_{z(st)} + l_{z(im)}$	“Combined” refers to the combination of standard and impaired.

Interblock Subsidy.xls – CM-1, CM-2, CM-3, CM-4, CM-5

Cells	Description	Formula	Comments
DA194	Total Combined Exposure (l)	$= \sum_{z=1}^{30} l_z$	
DB164:DB193	Combined Premium by Projection Year (P_z)	$= P_{z(st)} + P_{z(im)}$	
DB194	Total Combined Premium (P)	$= \sum_{z=1}^{30} P_z$	
DC164:DC193	Combined Premium PMPM by Projection Year	$= \begin{cases} 0, & l_z = 0 \\ P_z / l_z / 12, & \text{otherwise} \end{cases}$	
DD164:DD193	Combined Claims by Projection Year (C_z)	$= C_{z(st)} + C_{z(im)}$	
DD194	Total Combined Claims (C)	$= \sum_{z=1}^{30} C_z$	
DE164:DE193	Combined Claims PMPM by Projection Year	$= \begin{cases} 0, & l_z = 0 \\ C_z / l_z / 12, & \text{otherwise} \end{cases}$	

Interblock Subsidy.xls – CM-1, CM-2, CM-3, CM-4, CM-5

Cells	Description	Formula	Comments
DE194	Total Combined Claims PMPM	= 0, l = 0 C / l / 12, otherwise	
DF164:DF193	Combined Loss Ratio by Projection Year ($ActualLR_z$)	= 0, $P_z = 0$ C_z / P_z, otherwise	
DF194	Total Combined Loss Ratio	= 0, P = 0 C / P, otherwise	
DG164:DG193	Combined Expected Loss Ratio by Projection Year ($ExpectedLR_z$)	From the appropriate cell of CM-b_TLR!U19:U48, based on projection year, where b is the block number	
DH164:DH193	Actual-to-Expected Combined Loss Ratio by Projection Year	= 0, $P_z = 0$ $ActualLR_z / ExpectedLR_z$, otherwise	
DI164:DI193	Rolling Two-Year Combined Loss Ratio by Projection Year	= C_z / P_z, z = 1 $(C_{z-1} + C_z) / (P_{z-1} + P_z)$, z = 2, 3, 4, …, 30	
DJ164:DJ193	Combined Premium Less Claims by Projection Year ($PminusC_z$)	$= P_z – C_z$	

Interblock Subsidy.xls – CM-1, CM-2, CM-3, CM-4, CM-5

Cells	**Description**	**Formula**	**Comments**
DJ194	Total Combined Premium Less Claims	$= P - C$	
DK164:DK193	Combined Expenses by Projection Year (Exp_z)	$= 12 * [\sum_{y=1}^{20} (l_{z,y(st)} * Exp_{z,y(st)}) + \sum_{y=1}^{20} (l_{z,y(im)} * Exp_{z,y(im)})]$	
DK194	Total Combined Expenses (Exp)	$= \sum_{z=1}^{30} Exp_z$	
DL164:DL193	Combined Expense Ratio by Projection Year	$= \begin{cases} 0, & P_z = 0 \\ Exp_z / P_z, & \text{otherwise} \end{cases}$	
DL194	Total Combined Expense Ratio	$= \begin{cases} 0, & P = 0 \\ Exp / P, & \text{otherwise} \end{cases}$	
DM164:DM193	Combined Gain by Projection Year ($Gain_z$)	$= P_z - C_z - Exp_z$	
DM194	Total Combined Gain (Gain)	$= \sum_{z=1}^{30} Gain_z$	
DN164:DN193	Combined Gain as a Percentage of Combined Premium by Projection Year	$= \begin{cases} 0, & P_z = 0 \\ Gain_z / P_z, & \text{otherwise} \end{cases}$	

Interblock Subsidy.xls – CM-1, CM-2, CM-3, CM-4, CM-5

Cells	Description	Formula	Comments
DN194	Total Combined Gain as a Percentage of Combined Premium	$= \begin{cases} 0, & P = 0 \\ \text{Gain} / P, & \text{otherwise} \end{cases}$	
DO164:DO193	Risk-Based Capital by Projection Year (RBC_z)	$= P_z * RBC\%$ RBC% is from Global Assumptions!D83	Uses a predefined percentage of premium as a proxy for risk-based capital requirement.
DP164:DP193	Opportunity Cost of Capital by Projection Year (OCC_z)	$= -RBC_z * OCC\%$ OCC% is from Global Assumptions!D84	
DP194	Total Opportunity Cost of Capital	$= \sum_{z=1}^{30} OCC_z$	
DQ164:DQ193	Economic Gain by Projection Year ($EconGain_z$)	$= Gain_z + OCC_z$	
DQ194	Total Economic Gain	$= \sum_{z=1}^{30} EconGain_z$	

Interblock Subsidy.xls – CM-1, CM-2, CM-3, CM-4, CM-5

Cells	Description	Formula	Comments
DR164:DR193	Market New Business Rate	$= \text{MarketRate}_z$	The values in cells DR164:DV193 are duplicate copies of values calculated elsewhere; they are repeated here for convenience.
DS164:DS193	Company New Business Rate	$= \text{ComNewBusnRate}_z$	
DT164:DT193	Implemented Rate Increase for New Business	$= \text{ImpRateIncNew}_z$	
DT194	Average Rate Increase	$= \sum_{z=\text{IntroYr(b)}+1}^{30} \text{ImpRateIncNew}_z \,/\, (30 - \text{IntroYr}_b)$ IntroYr_b is from the appropriate cell of Current Market Assump 5 blocks!D11:D15	
DT195	Minimum Rate Increase	$= \min(\text{IncRateIncNew}_z)$, where the minimum is taken over $z = \text{IntroYr}_b + 1, \text{IntroYr}_b + 2, \text{IntroYr}_b + 3, \ldots, 30$ IntroYr_b is from the appropriate cell of Current Market Assump 5 blocks!D11:D15	

Interblock Subsidy.xls – CM-1, CM-2, CM-3, CM-4, CM-5

Cells	Description	Formula	Comments
DT196	Maximum Rate Increase	= max($IncRateIncNew_z$), where the maximum is taken over $z = IntroYr_b + 1, IntroYr_b + 2, IntroYr_b + 3, \ldots, 30$ $IntroYr_b$ is from the appropriate cell of Current Market Assump 5 blocks!D11:D15	
DU164:DU193	Implemented Rate Increase for Renewal Business	$= ImpRateIncRen_z$	
DV164:DV183	Aggregate Actual Sales by Projection Year ($ActualSales_z$)	$= AggSales_{z,z}$	Formula applies only for z = 1, 2, 3, …, 20.
DB197	Present Value of Combined Premium (PVPremium)	$= NPV_{int} (P_z) * \sqrt{1+int}$	All present values in this section are taken over all 30 projection years, and int is from Global Assumptions!B63.
DD197	Present Value of Combined Claims (PVClaims)	$= NPV_{int} (C_z) * \sqrt{1+int}$	
DJ197	Present Value of Combined Premium Less Combined Claims (PVPminusC)	$= NPV_{int} (PminusC_z) * \sqrt{1+int}$	

Interblock Subsidy.xls – CM-1, CM-2, CM-3, CM-4, CM-5

Cells	Description	Formula	Comments
DK197	Present Value of Combined Expenses (PVExp)	$= NPV_{int} (Exp_z) * \sqrt{1+int}$	
DM197	Present Value of Combined Gain (PVGain)	$= NPV_{int} (Gain_z) * \sqrt{1+int}$	
DP197	Present Value of Opportunity Cost of Capital (PVOCC)	$= NPV_{int} (OCC_z) * \sqrt{1+int}$	
DQ197	Present Value of Economic Gain (PVEconGain)	$= NPV_{int} (EconGain_z) * \sqrt{1+int}$	
DB198	Present Value of Combined Premium as a Percentage of Present Value of Combined Premium	= PVPremium / PVPremium	Identically equal to 100%.
DD198	Present Value of Combined Claims as a Percentage of Present Value of Combined Premium	= PVClaims / PVPremium	

Interblock Subsidy.xls – CM-1, CM-2, CM-3, CM-4, CM-5

Cells	Description	Formula	Comments
DJ198	Present Value of Combined Premium Less Combined Claims as a Percentage of Present Value of Combined Premium	= PVPminusC / PVPremium	
DK198	Present Value of Combined Expenses as a Percentage of Present Value of Combined Premium	= PVExp / PVPremium	
DM198	Present Value of Combined Gain as a Percentage of Present Value of Combined Premium	= PVGain / PVPremium	
DP198	Present Value of Opportunity Cost of Capital as a Percentage of Present Value of Combined Premium	= PVOCC / PVPremium	
DQ198	Present Value of Economic Gain as a Percentage of Present Value of Combined Premium	= PVEconGain / PVPremium	

Interblock Subsidy.xls – IBS Assump CY pooling

Cells	Description	Formula	Comments
E3	Year at which Pooling Begins (PoolingYr)	= 31	Hardcoded value; value of 31 indicates no pooling.
D11:D15	Year of Introduction by Block ($IntroYr_b$)	$= \begin{cases} 1, & b = 1 \\ 4, & b = 2 \\ 7, & b = 3 \\ 10, & b = 4 \\ 13, & b = 5 \end{cases}$	Hardcoded values
L4	Target Lifetime Loss Ratio (TargetLR)	= 65.00%	Hardcoded value
M5	Maximum Allowable Loss Ratio (MaxLR)	From Current Market Assump 5 blocks!M5	
L7	Flag to Include Trend (TrendFlag)	= 1	Hardcoded value; value of 1 means to include trend in projections, value of 0 means to exclude trend.
L11	Initial Reference Claim Cost for Standard Lives ($InitRefClaims_{st}$)	From Global Assumptions!D49	Best estimate of starting claim costs for standard lives

Interblock Subsidy.xls – IBS Assump CY pooling

Cells	Description	Formula	Comments
N11	Pricing Assumption of Initial Reference Claim Cost for Standard Lives ($InitRefClaims_{st(pr)}$)	= $InitRefClaims_{st}$	Standard lives starting claim costs used in initial pricing; the model provides the flexibility to adjust the baseline claims for use in pricing, but the model currently does not make any such adjustment.
L12	Initial Reference Claim Cost for Impaired Lives ($InitRefClaims_{im}$)	From Global Assumptions!D60	Best estimate of starting claim costs for impaired lives
N12	Pricing Assumption of Initial Reference Claim Cost for Impaired Lives ($InitRefClaims_{im(pr)}$)	= $InitRefClaims_{im}$	Impaired lives starting claim costs used in initial pricing; the model provides the flexibility to adjust the baseline claims for use in pricing, but the model currently does not make any such adjustment.

Interblock Subsidy.xls – IBS Assump CY pooling

Cells	Description	Formula	Comments
M14	Durational Deterioration Limitation Period (DDLP)	= 5	Hardcoded value; period during which the probability of a standard life becoming impaired is assumed to be greater than zero for pricing purposes
M15	Expected Premium Rate (ExpPrem)	From Current Market Assump 5 blocks!M15	
O4, Q4, S4, U4, W4	Standard Lives Morbidity Adjustment Factors by Block ($MorbAdj_{b(st)}$)	From the appropriate cell of Current Market Assump 5 blocks!O4, Q4, S4, U4, and W4	
P4, R4, T4, V4, X4	Impaired Lives Morbidity Adjustment Factors by Block ($MorbAdj_{b(im)}$)	From the appropriate cell of Current Market Assump 5 blocks!P4, R4, T4, V4, and X4	
R6:R10	Durational Rate Increase (DRI_x)	Renewal 1 (x = 2): 5% Renewal 2 (x = 3): 5% Renewal 3 (x = 4): 5% Renewal 4 (x = 5): 5% Renewals 5-29 (x = 6, 7, 8, …, 30): 0%	Hardcoded values; represents the additional rate increase needed each year due to anticipated wearoff of underwriting

Interblock Subsidy.xls – IBS Assump CY pooling

Cells	Description	Formula	Comments
B19:B48	Global Baseline Sales by Projection Year ($GlobalBaseSales_z$)	From the appropriate cell of Global Assumptions!O15:O44	
C19:G48	Baseline Sales by Projection Year by Block ($BaseSales_{z,b}$)	From the appropriate cell of Global Assumptions !P15:T44	
J19:J48	Standard Lives Base Lapse Rates Used in Pricing ($q_{x(st,\ pr)}$)	= max{$q_{min(st)}$, min[$q_{max(st)}$, $Baseq_{x(st)}$ + (((PAF_{x+1} / PAF_x * $AccumDRI_{x+1}$ / $AccumDRI_x$) – 1) * $LapseAdjTrend_{st}$) + (($AccumDRI_{x+1}$ -1) * $LapseAdjMkt_{st}$)]} $q_{min(st)}$ is from Global Assumptions!D40 $q_{max(st)}$ is from Global Assumptions!D39 $Baseq_{x(st,\ pr)}$ is from the appropriate cell of Global Assumptions!E29:E33 $LapseAdjTrend_{st}$ is from Global Assumptions!D36 $LapseAdjMkt_{st}$ is from Global Assumptions!D37	Baseline standard lives lapse rates adjusted to reflect higher anticipated lapses due to rate increases exceeding claim trend and renewal rates exceeding the market new business rate

Interblock Subsidy.xls – IBS Assump CY pooling

Cells	Description	Formula	Comments
K19:K48	Impaired Lives Base Lapse Rates Used in Pricing ($q_{x(im, pr)}$)	= max{$q_{min(im)}$, min[$q_{max(im)}$, Base$q_{x(im)}$ + (DRI$_{x+1}$ * LapseAdjTrend$_{im}$), x ≤ DDLP $q_{x(st, pr)}$, x > DDLP $q_{min(im)}$ is from Global Assumptions!D58 $q_{max(im)}$ is from Global Assumptions!D57 Base$q_{im(pr)}$ is from Global Assumptions!D54 LapseAdjTrend$_{im}$ is from Global Assumptions!D56	Baseline impaired lives lapse rates adjusted to reflect higher anticipated lapses due to rate increases exceeding claim trend during durational deterioration limitation period; beyond DDLP, impaired lives lapse rates are equal to standard lives lapse rates.
L19:L48	Rate of Impairment Used in Pricing ($\mu_{x(pr)}$)	= 0, x > DDLP μ_x, x ≤ DDLP μ_x is from the appropriate cell of Global Assumptions!E43:E47	
M19:M48	Number of Standard Lives ($l_{x(st)}$)	= 1, x = 1 $l_{x-1(st)} * (1 - \mu_{x-1(pr)}) * (1 - q_{x-1(st, pr)})$, x = 2, 3, 4, …, 30	The values in columns M, N, and O represent proportions of the number of first-year standard lives.
N19:N48	Number of Impaired Lives ($l_{x(im)}$)	= 0, x = 1 $[l_{x-1(im)} * (1 - q_{x-1(im, pr)})] + [l_{x-1(st)} * \mu_{x-1(pr)}]$, x = 2, 3, 4, …, 30	

Interblock Subsidy.xls – IBS Assump CY pooling

Cells	Description	Formula	Comments
O19:O48	Number of Total Lives (l_x)	$= l_{x(st)} + l_{x(im)}$	
P19:P48	Accumulated Trend ($AccumTrend_x$)	= 1, x = 1 $AccumTrend_{x-1}$ * [1 + (Trend * TrendFlag)], x = 2, 3, 4, …, 30 Trend is from Global Assumptions!D21	
Q19:Q48	Discount Factor (v_x)	= 1, x = 1 v_{x-1}/(1 + int), x = 2, 3, 4, …, 30	
R19:R49	Premium Age Factor (PAF_x)	= 1, x = 1 PAF_{x-1} * (1 + PremGrowthAge), x = 2, 3, 4, …, 30 PremGrowthAge is from Global Assumptions!C25	

Interblock Subsidy.xls – IBS Assump CY pooling

Cells	Description	Formula	Comments
S19:S48	Pricing Claims ($C_{x(pr)}$)	= {[InitRefClaims$_{st(pr)}$ * (1 + ((ExpPrem / InitRefPrem) - 1) * MorbAdj$_{st}$) * DF$_x$ * $l_{x(st)}$)] + (InitRefClaims$_{im(pr)}$ * $l_{x(im)}$)} * PAF$_x$ * AccumTrend$_x$, $x \le$ DDLP {[InitRefClaims$_{st(pr)}$ * (1 + ((ExpPrem / InitRefPrem) - 1) * MorbAdj$_{st}$) * $l_{x(st)}$)] + (InitRefClaims$_{im(pr)}$ * $l_{x(im)}$)} * PAF$_x$ * AccumTrend$_x$, $x >$ DDLP InitRefPrem is from Global Assumptions!C24 MorbAdj$_{st}$ is from Global Assumptions!D51 DF$_x$ is from the appropriate cell of IBS CY Pooling Summary!D12:D41	Standard lives' claims are adjusted each year for morbidity, duration (within the DDLP), aging, and trend. Impaired lives' claims are adjusted each year for aging and trend.
T19:T48	Annual Durational Rate Increase (ADRI$_x$)	= 0, $x = 1$ DRI$_x$, $x = 2, 3, 4, \ldots, 30$	
U19:U49	Accumulated Durational Rate Increase Factor (AccumDRI$_x$)	= 1, $x = 1$ AccumDRI$_{x-1}$ * (1 + ADRI$_x$), $x = 2, 3, 4, \ldots, 31$	A 31st-year value is needed for the calculation of $q_{30(st,\ pr)}$.

Interblock Subsidy.xls – IBS Assump CY pooling

Cells	Description	Formula	Comments
V19:V48	Pricing Premium ($P_{x(pr)}$)	$= \begin{cases} l_1 * \sum_{i=1}^{30} (C_{i(pr)} * v_i) / \sum_{j=1}^{30} (l_j * PAF_j * AccumTrend_j * v_j * AccumDRI_j) / TargetLR, & x = 1 \\ P_{1(pr)} / l_1 * PAF_x * l_x * AccumTrend_x * ADRI_x / ADRI_1, & x = 2, 3, 4, \ldots, 30 \end{cases}$ PAF_x is from the appropriate cell of Current Market Summary 5 blocks!J12:J41	This formula should use the PAF_x values calculated in this tab rather than pulling them from Current Market Summary 5 blocks.
W19:W48	Pricing Loss Ratio ($LR_{x(pr)}$)	$= C_{x(pr)} / P_{x(pr)}$	

Interblock Subsidy.xls – IBS Assump CY pooling

Cells	Description	Formula	Comments
X19:X48	Pricing Expenses ($Exp_{x(pr)}$)	$= l_x * Exp_{Pol(x)} * (1 + Inflation)^{x-1}$ $+ Exp_{\%C(x)} * C_{x(pr)}$ $+ Comm_{B(x)} * P_{1(pr)} / l_1 * l_x$ $+ Comm_{R(x)} * [P_{x(pr)} – (P_{1(pr)} / l_1 * l_x)]$ $+ Exp_{Oth\%P(x)} * P_{x(pr)}$ $Exp_{Pol(x)}$ is from the appropriate cell of IBS CY Pooling Summary!E12:E41 Inflation is from Global Assumptions!B64 $Exp_{\%C(x)}$ is from the appropriate cell of IBS CY Pooling Summary!F12:F41 $Comm_{B(x)}$ is from the appropriate cell of IBS CY Pooling Summary!G12:G41 $Comm_{R(x)}$ is from the appropriate cell of IBS CY Pooling Summary!H12:H41 $Exp_{Oth\%P(x)}$ is from the appropriate cell of IBS CY Pooling Summary!I12:I41	
Y19:Y48	Pricing Expense as a Percentage of Pricing Premium	$= Exp_{x(pr)} / P_{x(pr)}$	
Z19:Z48	Pricing Operating Gain ($Gain_{x(pr)}$)	$= P_{x(pr)} – C_{x(pr)} – Exp_{x(pr)}$	

Interblock Subsidy.xls – IBS Assump CY pooling

Cells	Description	Formula	Comments
AA19:AA48	Pricing Gain as a Percentage of Pricing Premium	$= Gain_{x(pr)} / P_{x(pr)}$	
S50	Simple Sum of Pricing Claims (SumClaims)	$= \sum_{x=1}^{30} C_{x(pr)}$	
V50	Simple Sum of Pricing Premiums (SumPrem)	$= \sum_{x=1}^{30} P_{x(pr)}$	
W50	Pricing Loss Ratio, Using Simple Sums	= SumClaims / SumPrem	
X50	Simple Sum of Pricing Expenses (SumExp)	$= \sum_{x=1}^{30} Exp_{x(pr)}$	
Y50	Pricing Expense Ratio, Using Simple Sums	= SumExp / SumPrem	
Z50	Simple Sum of Pricing Gains (SumGain)	$= \sum_{x=1}^{30} Gain_{x}$	

Interblock Subsidy.xls – IBS Assump CY pooling

Cells	Description	Formula	Comments
AA50	Pricing Gain Ratio, Using Simple Sums	= SumGain / SumPrem	
S51	Present Value of Pricing Claims over 10 Years ($PVClaims_{10}$)	$= NPV_{int} (C_{x(pr)}) * \sqrt{1+int}$, where NPV is taken over x = 1, 2, 3, ….10	
V51	Present Value of Pricing Premiums over 10 Years ($PVPrem_{10}$)	$= NPV_{int} (P_{x(pr)}) * \sqrt{1+int}$, where NPV is taken over x = 1, 2, 3, ….10	
W51	Pricing Loss Ratio, Using 10-Year NPVs	$= PVClaims_{10} / PVPrem_{10}$	
X51	Present Value of Pricing Expenses over 10 Years ($PVExp_{10}$)	$= NPV_{int} (Exp_{x(pr)}) * \sqrt{1+int}$, where NPV is taken over x = 1, 2, 3, ….10	
Y51	Pricing Expense Ratio, Using 10-Year NPVs	$= PVExp_{10} / PVPrem_{10}$	
Z51	Present Value of Pricing Gains over 10 Years ($PVGain_{10}$)	$= NPV_{int} (Gain_{x(pr)}) * \sqrt{1+int}$, where NPV is taken over x = 1, 2, 3, ….10	
AA51	Pricing Gain Ratio, Using 10-Year NPVs	$= PVGain_{10} / PVPrem_{10}$	

Interblock Subsidy.xls – IBS Assump CY pooling

Cells	Description	Formula	Comments
S52	Present Value of Pricing Claims over 30 Years ($PVClaims_{30}$)	$= NPV_{int}(C_{x(pr)}) * \sqrt{1+int}$, where NPV is taken over x = 1, 2, 3, ….30	
V52	Present Value of Pricing Premiums over 30 Years ($PVPrem_{30}$)	$= NPV_{int}(P_{x(pr)}) * \sqrt{1+int}$, where NPV is taken over x = 1, 2, 3, ….30	
W52	Pricing Loss Ratio, Using 30-Year NPVs	$= PVClaims_{30} / PVPrem_{30}$	
X52	Present Value of Pricing Expenses over 30 Years ($PVExp_{30}$)	$= NPV_{int}(Exp_{x(pr)}) * \sqrt{1+int}$, where NPV is taken over x = 1, 2, 3, ….30	
Y52	Pricing Expense Ratio, Using 30-Year NPVs	$= PVExp_{30} / PVPrem_{30}$	
Z52	Present Value of Gains over 30 Years ($PVGain_{30}$)	$= NPV_{int}(Gain_{x(pr)}) * \sqrt{1+int}$, where NPV is taken over x = 1, 2, 3, ….30	
AA52	Pricing Gain Ratio, Using 30-Year NPVs	$= PVGain_{30} / PVPrem_{30}$	

Interblock Subsidy.xls – IBS Assump CY pooling

Cells	Description	Formula	Comments
S53	PV of Pricing Claims as a Percentage of PV of Pricing Premium	= $PVClaims_{30}$ / $PVPrem_{30}$	Model calculations produce a stream of premiums such that this is equal to the target lifetime loss ratio.
V53	PV of Pricing Premium as a Percentage of PV of Pricing Premium	= $PVPrem_{30}$ / $PVPrem_{30}$	Identically equal to 1.000.
X53	PV of Pricing Expenses as a Percentage of PV of Pricing Premium	= $PVExp_{30}$ / $PVPrem_{30}$	
Z53	PV of Pricing Gain as a Percentage of PV of Pricing Premium	= $PVGain_{30}$ / $PVPrem_{30}$	
O54	Interest (int)	From Global Assumptions!B63	
AC19:AC48	Loss Ratio by Projection Year ($ExpectedLR_z$)	See formula for cells AE51:BH51, below.	

Interblock Subsidy.xls – IBS Assump CY pooling

Cells	Description	Formula	Comments
AE19:BH48	Expected Premium Inforce at Age Adjusted Market New Business Rates, by Cohort ($ExpInforce_{z,x}$)	$= \begin{cases} 0, & y < 1 \text{ or } y > 20 \\ AggAgeAdjMktNewBusnRate_{z,y} * (Aggl_{z,y(st)} + Aggl_{z,y(im)}), & \text{otherwise} \end{cases}$ $AggAgeAdjMktNewBusnRate_{z,y}$ is from the appropriate cell of IBS CY Pooling Summary!BT89:CM118 $Aggl_{z,y(st)}$ is from the appropriate cell of IBS CY Pooling Summary!AB51:AU80 $Aggl_{z,y(im)}$ is from the appropriate cell of IBS CY Pooling Summary!AB89:AU118	Note that in this table, columns represent projection years, rows represent durations, and diagonals represent issue years.
AB51:BE51	Composite Expected Loss Ratio by Projection Year	$= \begin{cases} 0, & \sum_{x=1}^{30} P_{z,x} = 0 \\ (\sum_{i=1}^{30} ExpInforce_{z,i} * LR_i) / \sum_{j=1}^{30} ExpInforce_{z,j}, & \text{otherwise} \end{cases}$	Summations are over all positive durations for a given projection year.
AB52:BE52	Total Expected Premium Inforce by Projection Year	$= \sum_{x=1}^{30} ExpInforce_{z,x,1}$	

Interblock Subsidy.xls – IBS CY Pooling Summary

The IBS CY Pooling Summary tab is analogous to the Current Market Summary 5 blocks tab. Current Market Summary 5 blocks is the aggregation of results across the entire projection period for the scenario with no pooling; IBS CY Pooling Summary is the aggregation of results across the entire projection period for the scenario with calendar year pooling. Where Current Market Summary 5 blocks refers to values in the tab 'Current Market Assump 5 blocks', IBS CY Pooling Summary refers to the analogous values from the tab 'IBS Assump CY pooling'. Similarly, where Current Market Summary 5 blocks refers to values from the tabs 'CM-1', 'CM-2', etc., IBS CY Pooling Summary refers to the analogous values from the tabs 'IBS-1P', 'IBS-2P', etc.

It can be demonstrated that IBS CY Pooling Summary and Current Market Summary 5 blocks work similarly by setting the year at which pooling begins to 31 in 'IBS Assump CY pooling', which means that there is no pooling, and then comparing the results of Current Market Summary 5 blocks and IBS CY Pooling Summary.

IBS CY Pooling Summary includes a table of average premiums by projection year by block in cells DV164:DZ193. This table does not appear in the Current Market Summary 5 blocks tab. It appears in the IBS CY Pooling Summary tab as a convenience only; these values are not used in any calculations. The values are from the appropriate cell of DC164:DC193 of the appropriate tab IBS-1P, IBS-2P, etc. If the average premium of a given block in a given projection year is zero, the corresponding cell is assigned a null value ("").

The only other calculations that differ for IBS CY Pooling Summary relative to Current Market Summary 5 blocks are shown below.

W13:W41: Global Company New Business Rate by Projection Year ($GlobalComNewBusnRate_z$):

$$
= \begin{cases} MarketRate_z * (1 - Disc@Intro), & z = 1 \text{ or } z = PoolingYr \\ 0, & 1 < z < PoolingYr \\ GlobalComNewBusnRate_{z-1,y} * (1 + ImpRateIncRen_z), & \text{otherwise} \end{cases}
$$

Disc@Intro is from Global Assumptions!D26
PoolingYr is from IBS Assump CY pooling!E3

Interblock Subsidy.xls – IBS CY Pooling Summary

Differences in calculations between IBS CY Pooling Summary and Current Market Summary 5 blocks (continued):

X13:X41: Requested Rate Increase for New Business by Projection Year ($ReqRateIncNew_z$):

$$
ReqRateIncNew_z = \begin{cases} ActTrend_{z-1}, & z \leq PoolingYr + 1 \\ \max\{0, [ActualLR_{z-2} / ExpectedLR_{z-2} * (1 + ActTrend_{z-2})^2 / (1 + ImpRateIncNew_{z-1}) - 1], [ActualLR_{z-2} / MaxLR * (1 + ActTrend_{z-2})^2 / (1 + ImpRateIncNew_{z-1}) - 1]\}, & \text{otherwise} \end{cases}
$$

PoolingYr is from IBS Assump CY pooling!E3

$ExpectedLR_{z-2}$ is from the appropriate cell of IBS Assump CY pooling!AC19:AC48

MaxLR is from IBS Assump CY pooling!M5

Z8: IBS CY Pooling Summary does not have a Year of Introduction cell as in Current Market Summary 5 blocks.

BT51:CM80 To calculate Aggregate Combined Actual Lapse Rates by Cohort, Current Market Summary 5 blocks sums the values of this parameter from CM-1, CM-2, CM-3, CM-4, and CM-5. In contrast, IBS CY Pooling Summary calculates weighted averages (weighted by the relative number of standard and impaired lives) of the Aggregate Actual Lapse Rates of Standard Lives by Cohort and the Aggregate Actual Lapse Rates of Impaired Lives by Cohort calculated previously in the IBS CY Pooling Summary tab.

Interblock Subsidy.xls – IBS CY Pooling Summary

Differences in calculations between IBS CY Pooling Summary and Current Market Summary 5 blocks (continued):

AX89:BQ118 Aggregate Premium Rates after Durational Adjustment but Before Age Adjustment, by Cohort ($AggDurAdjPremRate_{z,y}$):

$$= \begin{cases} DurAdjPremRate_{z,y}, & z < PoolingYr \\ 0, & z \geq PoolingYr \text{ and } x < 1 \\ ComNewBusnRate_{z}, & z \geq PoolingYr \text{ and } x = 1 \\ AggDurAdjPremRate_{z-1,y} * (1 + ImpRateIncRen_{z}) * (1 + DRI_{x}), & \text{otherwise} \end{cases}$$

DurAdjPremRate is from the appropriate cell of IBS-1P!AX89:AZ118 for y = 1, 2, and 3, from the appropriate cell of IBS2-P!BA89:BC118 for y = 4, 5, and 6, etc.
PoolingYr is from IBS Assump CY Pooling!E3

Note that the formula only applies for y = 1, 2, 3, …, 15, and that it assumes that block1 is issued in years 1-3 only, block 2 is issued in years 4-6 only, etc.

DK159 Year at which Pooling Begins appears at DK159 in IBS CY Pooling Summary as compared to DJ159 in Current Market Summary 5 blocks.

Interblock Subsidy.xls – IBS-1P, IBS-2P, IBS-3P, IBS-4P, IBS-5P

The IBS-1P, IBS-2P, etc., tabs are analogous to the CM-1, CM-2, etc., tabs. The former contain the calculations for each block when calendar year pooling is used; the latter contain the calculations for each block when no pooling is used. Where CM-1, CM-2, etc., refer to values in the tab 'Current Market Assump 5 blocks', IBS-1P, IBS-2P, etc., refer to the analogous values from the tab 'IBS Assump CY pooling'. Similarly, where CM-1, CM-2, etc., refer to values from the tab 'Current Market Summary 5 blocks', IBS-1P, IBS-2P, etc., refer to the analogous values from the tab 'IBS-CY Pooling Summary'.

It can be demonstrated that the two sets of tabs are consistent in the pre-pooling period by setting the year at which pooling begins to 31 in 'IBS Assump CY pooling' (which means that there is no pooling) and then comparing the results of CM-1 vs. IBS-1P, CM-2 vs. IBS-2P, etc.

The only difference between the two tabs is the calculation of Company New Business Rate in cells W12:W41. The formula used in IBS-1P, IBS-2P, etc., is as follows:

$$= \begin{cases} \text{GlobalComNewBusnRate}_z, & z \geq \text{PoolingYr} \\ \text{MarketRate}_z * (1 - \text{Disc@Intro}), & z < \text{PoolingYr and } z = \text{IntroYr}_b \\ \text{ComNewBusnRate}_{z-1} * (1 + \text{ImpRateIncRen}_z), & \text{otherwise} \end{cases}$$

$\text{GlobalComNewBusnRate}_z$ is from the appropriate cell of IBS CY Pooling Summary!W12:W41
PoolingYr is from IBS Assump CY pooling!E3
Disc@Intro is from Global Assumptions!D26
IntroYr_b is from the appropriate cell of IBS Assump CY pooling!D11:D15

Interblock Subsidy.xls – IBS Assump DUR pooling

Cells	Description	Formula	Comments
E3	Duration at which Pooling Begins (PoolingDur)	= 1	Hardcoded value; value of 31 indicates no pooling.
D11:D15	Year of Introduction by Block ($IntroYr_b$)	$= \begin{cases} 1, & b = 1 \\ 4, & b = 2 \\ 7, & b = 3 \\ 10, & b = 4 \\ 13, & b = 5 \end{cases}$	Hardcoded values
L4	Target Lifetime Loss Ratio (TargetLR)	= 65.00%	Hardcoded value
M5	Maximum Allowable Loss Ratio (MaxLR)	From Current Market Assump 5 blocks!M5	
L7	Flag to Include Trend (TrendFlag)	= 1	Hardcoded value; value of 1 means to include trend in projections, value of 0 means to exclude trend.
L11	Initial Reference Claim Cost for Standard Lives ($InitRefClaims_{st}$)	From Global Assumptions!D49	Best estimate of starting claim costs for standard lives

Interblock Subsidy.xls – IBS Assump DUR pooling

Cells	Description	Formula	Comments
N11	Pricing Assumption of Initial Reference Claim Cost for Standard Lives ($InitRefClaims_{st(pr)}$)	= $InitRefClaims_{st}$	Standard lives starting claim costs used in initial pricing; the model provides the flexibility to adjust the baseline claims for use in pricing, but the model currently does not make any such adjustment.
L12	Initial Reference Claim Cost for Impaired Lives ($InitRefClaims_{im}$)	From Global Assumptions!D60	Best estimate of starting claim costs for impaired lives
N12	Pricing Assumption of Initial Reference Claim Cost for Impaired Lives ($InitRefClaims_{im(pr)}$)	= $InitRefClaims_{im}$	Impaired lives starting claim costs used in initial pricing; the model provides the flexibility to adjust the baseline claims for use in pricing, but the model currently does not make any such adjustment.

Interblock Subsidy.xls – IBS Assump DUR pooling

Cells	Description	Formula	Comments
M14	Durational Deterioration Limitation Period (DDLP)	= 5	Hardcoded value; period during which the probability of a standard life becoming impaired is assumed to be greater than zero for pricing purposes
M15	Expected Premium Rate (ExpPrem)	From Current Market Assump 5 blocks!M15	
O4, Q4, S4, U4, W4	Standard Lives Morbidity Adjustment Factors by Block ($MorbAdj_{b(st)}$)	From the appropriate cell of Current Market Assump 5 blocks!O4, Q4, S4, U4, or W4	
P4, R4, T4, V4, X4	Impaired Lives Morbidity Adjustment Factors by Block ($MorbAdj_{b(im)}$)	From the appropriate cell of Current Market Assump 5 blocks!P4, R4, T4, V4, or X4	
R6:R10	Durational Rate Increase (DRI_x)	Renewal 1 (x = 2): 5% Renewal 2 (x = 3): 5% Renewal 3 (x = 4): 5% Renewal 4 (x = 5): 5% Renewals 5-29 (x = 6, 7, 8, …, 30): 0%	Hardcoded values; represents the additional rate increase needed each year due to anticipated wearoff of underwriting

Interblock Subsidy.xls – IBS Assump DUR pooling

Cells	Description	Formula	Comments
B19:B48	Global Baseline Sales by Projection Year ($GlobalBaseSales_z$)	From the appropriate cell of Global Assumptions!O15:O44	
C19:G48	Baseline Sales by Projection Year by Block ($BaseSales_{z,b}$)	From the appropriate cell of Global Assumptions!P15:T44	
J19:J48	Standard Lives Base Lapse Rates Used in Pricing ($q_{x(st, pr)}$)	$= \max\{q_{min(st)}, \min[q_{max(st)}, Baseq_{x(st)} + (((PAF_{x+1} / PAF_x * AccumDRI_{x+1} / AccumDRI_x) – 1) * LapseAdjTrend_{st}) + ((AccumDRI_{x+1} -1) * LapseAdjMkt_{st})]\}$ $q_{min(st)}$ is from Global Assumptions!D40 $q_{max(st)}$ is from Global Assumptions!D39 $Baseq_{x(st, pr)}$ is from the appropriate cell of Global Assumptions!E29:E33 $LapseAdjTrend_{st}$ is from Global Assumptions!D36 $LapseAdjMkt_{st}$ is from Global Assumptions!D37	Baseline standard lives lapse rates adjusted to reflect higher anticipated lapses due to rate increases exceeding claim trend and renewal rates exceeding the market new business rate

Interblock Subsidy.xls – IBS Assump DUR pooling

Cells	Description	Formula	Comments
K19:K48	Impaired Lives Base Lapse Rates Used in Pricing ($q_{x(im, pr)}$)	$= \begin{cases} \max\{q_{min(im)}, \min[q_{max(im)}, Baseq_{x(im)} + (DRI_{x+1} * LapseAdjTrend_{im}), & x \le DDLP \\ q_{x(st, pr)}, & x > DDLP \end{cases}$ $q_{min(im)}$ is from Global Assumptions!D58 $q_{max(im)}$ is from Global Assumptions!D57 $Baseq_{im(pr)}$ is from Global Assumptions!D54 $LapseAdjTrend_{im}$ is from Global Assumptions!D56	Baseline impaired lives lapse rates adjusted to reflect higher anticipated lapses due to rate increases exceeding claim trend during durational deterioration limitation period; beyond DDLP, impaired lives lapse rates are equal to standard lives lapse rates.
L19:L48	Rate of Impairment Used in Pricing ($\mu_{x(pr)}$)	$= \begin{cases} 0, & x > DDLP \\ \mu_x, & x \le DDLP \end{cases}$ μ_x is from the appropriate cell of Global Assumptions!E43:E47	
M19:M48	Number of Standard Lives ($l_{x(st)}$)	$= \begin{cases} 1, & x = 1 \\ l_{x-1(st)} * (1 - \mu_{x-1(pr)}) * (1 - q_{x-1(st, pr)}), & x = 2, 3, 4, \ldots, 30 \end{cases}$	The values in columns M, N, and O represent proportions of the number of first-year standard lives.
N19:N48	Number of Impaired Lives ($l_{x(im)}$)	$= \begin{cases} 0, & x = 1 \\ [l_{x-1(im)} * (1 - q_{x-1(im, pr)})] + [l_{x-1(st)} * \mu_{x-1(pr)}], & x = 2, 3, 4, \ldots, 30 \end{cases}$	

Interblock Subsidy.xls – IBS Assump DUR pooling

Cells	Description	Formula	Comments
O19:O48	Number of Total Lives (l_x)	$= l_{x(st)} + l_{x(im)}$	
P19:P48	Accumulated Trend ($AccumTrend_x$)	= 1, x = 1 $AccumTrend_{x-1}$ * [1 + (Trend * TrendFlag)], x = 2, 3, 4, …, 30 Trend is from Global Assumptions!D21	
Q19:Q48	Discount Factor (v_x)	= 1, x = 1 v_{x-1}/(1 + int), x = 2, 3, 4, …, 30	
R19:R49	Premium Age Factor (PAF_x)	= 1, x = 1 PAF_{x-1} * (1 + PremGrowthAge), x = 2, 3, 4, …, 30 PremGrowthAge is from Global Assumptions!C25	

Interblock Subsidy.xls – IBS Assump DUR pooling

Cells	**Description**	**Formula**	**Comments**
S19:S48	Pricing Claims ($C_{x(pr)}$)	= {[$InitRefClaims_{st(pr)}$ * (1 + ((ExpPrem / InitRefPrem) - 1) * $MorbAdj_{st}$) * DF_x * $l_{x(st)}$)] + ($InitRefClaims_{im(pr)}$ * $l_{x(im)}$)} * PAF_x * $AccumTrend_x$, $x \leq DDLP$ = {[$InitRefClaims_{st(pr)}$ * (1 + ((ExpPrem / InitRefPrem) - 1) * $MorbAdj_{st}$) * $l_{x(st)}$)] + ($InitRefClaims_{im(pr)}$ * $l_{x(im)}$)} * PAF_x * $AccumTrend_x$, $x > DDLP$ InitRefPrem is from Global Assumptions!C24 $MorbAdj_{st}$ is from Global Assumptions!D51 DF_x is from the appropriate cell of IBS CY Pooling Summary!D12:D41	Standard lives' claims are adjusted each year for morbidity, duration (within the DDLP), aging, and trend. Impaired lives' claims are adjusted each year for aging and trend.
T19:T48	Annual Durational Rate Increase ($ADRI_x$)	= 0, $x = 1$ DRI_x, $x = 2, 3, 4, \ldots, 30$	
U19:U49	Accumulated Durational Rate Increase Factor ($AccumDRI_x$)	= 1, $x = 1$ $AccumDRI_{x-1}$ * (1 + $ADRI_x$), $x = 2, 3, 4, \ldots, 31$	A 31st-year value is needed for the calculation of $q_{30(st, pr)}$.

Interblock Subsidy.xls – IBS Assump DUR pooling

Cells	Description	Formula	Comments
V19:V48	Pricing Premium ($P_{x(pr)}$)	$P_{x(pr)} = l_1 * \sum_{i=1}^{30} (C_{i(pr)} * v_i) / \sum_{j=1}^{30} (l_j * PAF_j * AccumTrend_j * v_j * AccumDRI_j) / TargetLR$, $x = 1$ $P_{1(pr)} / l_1 * PAF_x * l_x * AccumTrend_x * ADRI_x / ADRI_1$, $x = 2, 3, 4, \ldots, 30$ PAF_x is from the appropriate cell of Current Market Summary 5 blocks!J12:J41	This formula should use the PAF_x values calculated in this tab rather than pulling them from Current Market Summary 5 blocks.
W19:W48	Pricing Loss Ratio ($LR_{x(pr)}$)	$= C_{x(pr)} / P_{x(pr)}$	

Interblock Subsidy.xls – IBS Assump DUR pooling

Cells	Description	Formula	Comments
X19:X48	Pricing Expenses ($Exp_{x(pr)}$)	$= l_x * Exp_{Pol(x)} * (1 + Inflation)^{x-1}$ $+ Exp_{\%C(x)} * C_{x(pr)}$ $+ Comm_{B(x)} * P_{1(pr)} / l_1 * l_x$ $+ Comm_{R(x)} * [P_{x(pr)} – (P_{1(pr)} / l_1 * l_x)]$ $+ Exp_{Oth\%P(x)} * P_{x(pr)}$ $Exp_{Pol(x)}$ is from the appropriate cell of IBS CY Pooling Summary!E12:E41 Inflation is from Global Assumptions!B64 $Exp_{\%C(x)}$ is from the appropriate cell of IBS CY Pooling Summary!F12:F41 $Comm_{B(x)}$ is from the appropriate cell of IBS CY Pooling Summary!G12:G41 $Comm_{R(x)}$ is from the appropriate cell of IBS CY Pooling Summary!H12:H41 $Exp_{Oth\%P(x)}$ is from the appropriate cell of IBS CY Pooling Summary!I12:I41	
Y19:Y48	Pricing Expense as a Percentage of Pricing Premium	$= Exp_{x(pr)} / P_{x(pr)}$	
Z19:Z48	Pricing Operating Gain ($Gain_{x(pr)}$)	$= P_{x(pr)} – C_{x(pr)} – Exp_{x(pr)}$	

Interblock Subsidy.xls – IBS Assump DUR pooling

Cells	Description	Formula	Comments
AA19:AA48	Pricing Gain as a Percentage of Pricing Premium	$= Gain_{x(pr)} / P_{x(pr)}$	
S50	Simple Sum of Pricing Claims (SumClaims)	$= \sum_{x=1}^{30} C_{x(pr)}$	
V50	Simple Sum of Pricing Premiums (SumPrem)	$= \sum_{x=1}^{30} P_{x(pr)}$	
W50	Pricing Loss Ratio, Using Simple Sums	= SumClaims / SumPrem	
X50	Simple Sum of Pricing Expenses (SumExp)	$= \sum_{x=1}^{30} Exp_{x(pr)}$	
Y50	Pricing Expense Ratio, Using Simple Sums	= SumExp / SumPrem	
Z50	Simple Sum of Pricing Gains (SumGain)	$= \sum_{x=1}^{30} Gain_{x}$	

Interblock Subsidy.xls – IBS Assump DUR pooling

Cells	**Description**	**Formula**	**Comments**
AA50	Pricing Gain Ratio, Using Simple Sums	= SumGain / SumPrem	
S51	Present Value of Pricing Claims over 10 Years ($PVClaims_{10}$)	$= NPV_{int} (C_{x(pr)}) * \sqrt{1+int}$, where NPV is taken over x = 1, 2, 3, ….10	
V51	Present Value of Pricing Premiums over 10 Years ($PVPrem_{10}$)	$= NPV_{int} (P_{x(pr)}) * \sqrt{1+int}$, where NPV is taken over x = 1, 2, 3, ….10	
W51	Pricing Loss Ratio, Using 10-Year NPVs	$= PVClaims_{10} / PVPrem_{10}$	
X51	Present Value of Pricing Expenses over 10 Years ($PVExp_{10}$)	$= NPV_{int} (Exp_{x(pr)}) * \sqrt{1+int}$, where NPV is taken over x = 1, 2, 3, ….10	
Y51	Pricing Expense Ratio, Using 10-Year NPVs	$= PVExp_{10} / PVPrem_{10}$	
Z51	Present Value of Pricing Gains over 10 Years ($PVGain_{10}$)	$= NPV_{int} (Gain_{x(pr)}) * \sqrt{1+int}$, where NPV is taken over x = 1, 2, 3, ….10	
AA51	Pricing Gain Ratio, Using 10-Year NPVs	$= PVGain_{10} / PVPrem_{10}$	

Interblock Subsidy.xls – IBS Assump DUR pooling

Cells	Description	Formula	Comments
S52	Present Value of Pricing Claims over 30 Years ($PVClaims_{30}$)	$= NPV_{int} (C_{x(pr)}) * \sqrt{1+int}$, where NPV is taken over x = 1, 2, 3, ….30	
V52	Present Value of Pricing Premiums over 30 Years ($PVPrem_{30}$)	$= NPV_{int} (P_{x(pr)}) * \sqrt{1+int}$, where NPV is taken over x = 1, 2, 3, ….30	
W52	Pricing Loss Ratio, Using 30-Year NPVs	$= PVClaims_{30} / PVPrem_{30}$	
X52	Present Value of Pricing Expenses over 30 Years ($PVExp_{30}$)	$= NPV_{int} (Exp_{x(pr)}) * \sqrt{1+int}$, where NPV is taken over x = 1, 2, 3, ….30	
Y52	Pricing Expense Ratio, Using 30-Year NPVs	$= PVExp_{30} / PVPrem_{30}$	
Z52	Present Value of Gains over 30 Years ($PVGain_{30}$)	$= NPV_{int} (Gain_{x(pr)}) * \sqrt{1+int}$, where NPV is taken over x = 1, 2, 3, ….30	
AA52	Pricing Gain Ratio, Using 30-Year NPVs	$= PVGain_{30} / PVPrem_{30}$	

Interblock Subsidy.xls – IBS Assump DUR pooling

Cells	**Description**	**Formula**	**Comments**
S53	PV of Pricing Claims as a Percentage of PV of Pricing Premium	= $PVClaims_{30}$ / $PVPrem_{30}$	Model calculations produce a stream of premiums such that this is equal to the target lifetime loss ratio.
V53	PV of Pricing Premium as a Percentage of PV of Pricing Premium	= $PVPrem_{30}$ / $PVPrem_{30}$	Identically equal to 1.000.
X53	PV of Pricing Expenses as a Percentage of PV of Pricing Premium	= $PVExp_{30}$ / $PVPrem_{30}$	
Z53	PV of Pricing Gain as a Percentage of PV of Pricing Premium	= $PVGain_{30}$ / $PVPrem_{30}$	
O54	Interest (int)	From Global Assumptions!B63	
AC19:AC48	Loss Ratio by Projection Year ($ExpectedLR_z$)	See formula for cells AF51:BI51, below.	

Interblock Subsidy.xls – IBS Assump DUR pooling

Cells	Description	Formula	Comments
AE19:AE48	Target Loss Ratios for Durational Pooling ($DurTLR_z$)	= 0, z < PoolingDur $TLRAfterPooling_z$, z ≥ PoolingDur	
AF19:BI48	Expected Premium Inforce at Age Adjusted Market New Business Rates, by Cohort ($ExpInforce_{z,x}$)	= 0, y < 1 or y > 20 $AggAgeAdjMktNewBusnRate_{z,y} * (Aggl_{z,y(st)} + Aggl_{z,y(im)})$, otherwise $AggAgeAdjMktNewBusnRate_{z,y}$ is from the appropriate cell of IBS DUR Pooling Summary!BT89:CM118 $Aggl_{z,y(st)}$ is from the appropriate cell of IBS DUR Pooling Summary!AB51:AU80 $Aggl_{z,y(im)}$ is from the appropriate cell of IBS DUR Pooling Summary!AB89:AU118	Note that in this table, columns represent projection years, rows represent durations, and diagonals represent issue years.
AF51:BI51	Composite Expected Loss Ratio by Projection Year ($ExpectedLR_z$)	$= (\sum_{i=1}^{30} ExpInforce_{z,i} * LR_{i(pr)}) / \sum_{j=1}^{30} ExpInforce_{z,j}$, otherwise	
AF52:BI52	Total Expected Premium Inforce by Projection Year	$= \sum_{x=1}^{30} ExpInforce_{z,x}$	
AG53	Year at which Pooling Begins	= PoolingDur	

Interblock Subsidy.xls – IBS Assump DUR pooling

Cells	Description	Formula	Comments
AF54:BI54	Total Expected Premium Inforce for Durations at and Beyond the Pooling Year, by Projection Year ($ExpInforceAfterPooling_z$)	$= \sum_{x=PoolingDur}^{30} ExpInforce_{z,x}$	
AF55:BI55	Composite Target Loss Ratio for Durations at and Beyond the Pooling Year, by Projection Year ($TLRAfterPooling_z$)	$= \left(\sum_{i=PoolingDur}^{30} ExpInforce_{z,i} * LR_{i(pr)} \right) / \sum_{j=PoolingDur}^{30} ExpInforce_{z,j}$	
BT16	First Duration after Pooling Starts	= PoolingDur + 1	Not used in any calculations
BL19:CO48	Target Loss Ratio for Pool when Durational Pooling Applies, by Projection Year and Duration ($PoolTLR_{z,x}$)	$= \begin{cases} 0, & x < PoolingDur \text{ or } x > z \\ LR_{x(pr)}, & \text{otherwise} \end{cases}$	
BL51:CO51	Target Loss Ratio for Pool when Durational Pooling Applies, by Projection Year	$= \begin{cases} 0, & \sum_{x=1}^{30} PoolTLR_{x,z} = 0 \\ \sum_{x=1}^{30} ExpInforce_{z,x} * PoolTLR_{z,x} / ExpInforceAfterPooling_z, & \text{otherwise} \end{cases}$	Values match those in cells AF55:BI55 for projection years on and after PoolingDur.

Interblock Subsidy.xls – IBS DUR pooling Summary

Cells	Description	Formula	Comments
D4	Reference Premium (InitRefPrem)	From Global Assumptions!C24	
D5	Initial Reference Claim Cost for Standard Lives ($\text{InitRefClaims}_{st}$)	From Global Assumptions!D49	
D6	Initial Reference Claim Cost for Impaired Lives ($\text{InitRefClaims}_{im}$)	From Global Assumptions!D60	
B12:B41	Base Lapse Rates for Standard Lives ($\text{Baseq}_{x(st)}$)	From the appropriate cell of Global Assumptions!D29:D33	
C12:C41	Base Lapse Rates for Impaired Lives ($\text{Baseq}_{x(im)}$)	From Global Assumptions!C54	
D12:D41	Duration Factor (DF_x)	From the appropriate cell of Global Assumptions!B77:B81	
E12:E41	Per Policy Expense Rates ($\text{Exp}_{Pol(x)}$)	From the appropriate cell of Global Assumptions!B70:B74	

Interblock Subsidy.xls – IBS DUR pooling Summary

Cells	**Description**	**Formula**	**Comments**
F12:F41	Percentage-of-Claims Expense Rates ($Exp_{\%C(x)}$)	From the appropriate cell of Global Assumptions!C70:C74	
G12:G41	Base Commission Rates ($Comm_{B(x)}$)	From the appropriate cell of Global Assumptions!D70:D74	
H12:H41	Renewal Commission Rates ($Comm_{R(x)}$)	From the appropriate cell of Global Assumptions!E70:E74	
I12:I41	Other Premium-Related Expense Rates ($Exp_{Oth\%P(x)}$)	From the appropriate cell of Global Assumptions!F70:F74	
J12:J41	Premium Age Factor (PAF_x)	$= \begin{cases} 1, & x = 1 \\ PAF_{x-1} * (1 + PremGrowthAge), & x = 2, 3, 4, \ldots, 30 \end{cases}$ PremGrowthAge is from Global Assumptions!C25	
K12:K41	Rate of Impairment (μ_x)	From the appropriate cell of Global Assumptions!E43:E47	
L12:L41	Annual Durational Rate Increase ($ADRI_x$)	From the appropriate cell of IBS Assump DUR pooling!T19:T48	

Interblock Subsidy.xls – IBS DUR pooling Summary

Cells	Description	Formula	Comments
O12:O41	Reference Premium ($RefPrem_z$)	= InitRefPrem, z = 1 $RefPrem_{z-1}$ * (1 + $ActTrend_{z-1}$), z = 2, 3, 4, …, 30	
P12:P41	Baseline Sales ($BaseSales_z$)	From the appropriate cell of IBS Assump DUR pooling!B19:B48	
Q12:Q41	Standard Lives Reference Claims ($RefClaims_{z(st)}$)	= $InitRefClaims_{st}$, z = 1 $RefClaims_{z-1(st)}$ * (1 + $ActTrend_{z-1}$), z = 2, 3, 4, …, 30	
R12:R41	Impaired Lives Reference Claims ($RefClaims_{z(im)}$)	= $InitRefClaims_{im}$, z = 1 $RefClaims_{z-1(im)}$ * (1 + $ActTrend_{z-1}$), z = 2, 3, 4, …, 30	
S12:S41	Actual Trend ($ActTrend_z$)	From the appropriate cell of Global Assumptions!B106:B135	
T13:T41	Implemented Rate Increase for New Business ($ImpRateIncNew_z$)	= min(RegDamp * $ReqRateIncNew_z$, MaxRateInc) MaxRateInc is from Global Assumptions!D100 RegDamp is from the appropriate cell of Global Assumptions!D90:D99, based on the value of $ReqRateIncNew_z$	Formula only applies for z = 2, 3, 4, …, 30.
U13:U41	Implemented Rate Increase for Renewal Business ($ImpRateIncRen_z$)	= $ImpRateIncNew_z$	Formula only applies for z = 2, 3, 4, …, 30.

Interblock Subsidy.xls – IBS DUR pooling Summary

Cells	Description	Formula	Comments
V12:V41	Market New Business Rate ($MarketRate_z$)	$= \begin{cases} P_{1(pr)}, & z = 1 \\ MarketRate_{z-1} * (1 + ActTrend_{z-1}), & z = 2, 3, 4, \ldots, 30 \end{cases}$ $P_{1(pr)}$ is from IBS Assump DUR pooling!V19	
W12:W41	Company New Business Rate ($GlobalComNewBusnRate_z$)	$= \begin{cases} 0, & \sum_{b=1}^{5} BaseSales_{z,b} = 0 \\ MarketRate_z * (1 - Disc@Intro), & \sum_{b=1}^{5} BaseSales_{z,b} \neq 0,\ PoolingDur = 1, \text{ and } z = 1 \\ GlobalComNewBusnRate_{z-1} * (1 + ImpRateIncNew_z), & \sum_{b=1}^{5} BaseSales_{z,b} \neq 0,\ PoolingDur = 1, \text{ and } z > 1 \\ \sum_{b=1}^{5} ComNewBusnRate_{z,b}, & \text{otherwise} \end{cases}$ $BaseSales_{z,b}$ is from the appropriate cell of IBS Assump DUR pooling!C19:G48 Disc@Intro is from Global Assumptions!D26 PoolingDur is from IBS Assump DUR pooling!E3 $ComNewBusnRate_{z,b}$ is from the appropriate cell of IBS-bD!W12:W41, where b is the block number	

Interblock Subsidy.xls – IBS DUR pooling Summary

Cells	Description	Formula	Comments
X13:X41	Requested Rate Increase for New Business (GlobalReqRateIncNew$_z$)	$ActTrend_{z-1}$, $z \le PoolingDur + 1$ = max {0, [ActualLR$_{z-2}$ / PoolAggExpectedLR$_{z-2}$ * (1 + ActTrend$_{z-2}$)^2 / (1 + ImpRateIncNew$_{z-1}$) – 1], [ActualLR$_{z-2}$ / MaxLR * (1 + ActTrend$_{z-2}$)^2 / (1 + ImpRateIncNew$_{z-1}$) – 1]}, otherwise PoolingDur is from IBS Assump DUR pooling!E3 MaxLR is from IBS Assump DUR pooling!M5	Formula only applies for z = 2, 3, 4, …, 30.
Y13:Y41	Requested Rate Increase for Renewal Business (GlobalReqRateIncRen$_z$)	= GlobalReqRateIncNew$_z$	Formula only applies for z = 2, 3, 4, …, 30. The calculations in cells Z13:Z26 are extraneous.
AB12:AU41	Aggregate New Business Sales by Cohort (AggSales$_{z,y}$)	$= \sum_{b=1}^{5} Sales_{z,y,b}$	In this and subsequent formulas in this tab, the values being aggregated are from IBS-1D, IBS-2D, IBS-3D, IBS-4D, and IBS-5D.
AB42:AU42	Aggregate New Business Sales for Issue Year y	$= \sum_{z=1}^{30} AggSales_{z,y}$	

Interblock Subsidy.xls – IBS DUR pooling Summary

Cells	Description	Formula	Comments
AX12:BL41	Aggregate Actual Lapse Rates for Standard Lives by Cohort ($Aggq_{z,y(st)}$)	$= \begin{cases} 0, & x \geq PoolingDur \text{ and } (x \leq 1 \text{ or } y < IntroYr_1) \\ \sum_{b=1}^{5} q_{z,y,b(st)}, & x < PoolingDur \\ \max\{q_{min(st)}, \min[q_{max(st)}, Baseq_{x-1(st)} + ((AggAgeAdjPremRate_{z,y} / AggAgeAdjPremRate_{z-1,y}) - 1 - ActTrend_z) * LapseAdjTrend_{st} * ((((AggAgeAdjPremRate_{z,y} / MktNewBusnRate_{z,y}) - 1) * LapseAdjMkt_{st}) + 1) - (((ComNewBusnRate_y / RefPrem_y) - 1) * LapseAdjSale_{st})]\}, & x \geq PoolingDur \text{ and } y > IntroYr_1 \text{ and } 2 \leq x \leq 4 \\ \max\{q_{min(st)}, \min[q_{max(st)}, Baseq_{x-1(st)} + ((AggAgeAdjPremRate_{z,y} / AggAgeAdjPremRate_{z-1,y}) - 1 - ActTrend_z) * LapseAdjTrend_{st} * ((((AggAgeAdjPremRate_{z,y} / MktNewBusnRate_{z,y}) - 1) * LapseAdjMkt_{st}) + 1)]\}, & \text{otherwise} \end{cases}$ PoolingDur is from IBS Assump DUR pooling!E3 $IntroYr_1$ is from IBS Assump DUR pooling!D11 $q_{min(st)}$ is from Global Assumptions!D40 $q_{max(st)}$ is from Global Assumptions!D39 $LapseAdjTrend_{st}$ is from Global Assumptions!D36 $LapseAdjMkt_{st}$ is from Global Assumptions!D37 $LapseAdjSale_{st}$ is from Global Assumptions!D38	Formula only applies for y = 1, 2, 3, …, 15.

Interblock Subsidy.xls – IBS DUR pooling Summary

Cells	Description	Formula	Comments
BT12:CM41	Aggregate Newly Impaired Lives by Cohort ($AggNewImpLives_{z,y}$)	$= \begin{cases} \sum_{b=1}^{5} NewImpLives_{z,y,b}, & x < PoolingDur \\ 0, & PoolingDur \leq x \leq 1 \\ Aggl_{z-1,y(st)} * \mu_{x-1} * (1 - Aggq_{z,y(im)}), & \text{otherwise} \end{cases}$	
BS42:CL42	Aggregate Newly Impaired Lives for Issue Year y	$= \sum_{z=1}^{30} AggNewImpLives_{z,y}$	
AB51:AU80	Aggregate Enrollment of Standard Lives by Cohort ($Aggl_{z,y(st)}$)	$= \begin{cases} \sum_{b=1}^{5} l_{z,y,b(st)}, & x < PoolingDur \\ AggSales_{z,y}, & PoolingDur \leq x \leq 1 \\ AggSales_{z,y} + [Aggl_{z-1,y(st)} * (1 - \mu_{x-1}) * (1 - Aggq_{z,y(st)})], & \text{otherwise} \end{cases}$	
AB81:AU81	Aggregate Enrollment of Standard Lives for Issue Year y	$= \sum_{z=1}^{30} Aggl_{z,y(st)}$	

Interblock Subsidy.xls – IBS DUR pooling Summary

Cells	Description	Formula	Comments
AX51:BL80	Aggregate Actual Lapse Rates of Impaired Lives by Cohort ($Aggq_{z,y(im)}$)	$= \begin{cases} 0, & PoolingDur \le x \le 1 \\ \sum_{b=1}^{5} q_{z,y,b(im)}, & x < PoolingDur \\ \max\{q_{min(im)}, \min[q_{max(im)}, Baseq_{x-1(im)} + ((AggAgeAdjPremRate_{z,y} / AggAgeAdjPremRate_{z-1,y}) - 1 - ActTrend_z) * LapseAdjTrend_{im}]\}, & \text{otherwise} \end{cases}$ PoolingDur is from IBS Assump DUR pooling!E3 $q_{min(im)}$ is from Global Assumptions!D58 $q_{max(im)}$ is from Global Assumptions!D57 $LapseAdjTrend_{im}$ is from Global Assumptions!D56	Formula only applies for y = 1, 2, 3, …, 15.
BT51:CM80	Aggregate Combined Actual Lapse Rates by Cohort	$= \begin{cases} 0, & Aggl_{z-1,y(st)} + Aggl_{z-1,y(im)} = 0 \\ [(Aggl_{z-1,y(st)} * Aggq_{z,y(st)}) + (Aggl_{z-1,y(im)} * Aggq_{z,y(im)})] / (Aggl_{z-1,y(st)} + Aggl_{z-1,y(im)}), & \text{otherwise} \end{cases}$	

Interblock Subsidy.xls – IBS DUR pooling Summary

Cells	Description	Formula	Comments
AB89:AU118	Aggregate Enrollment of Impaired Lives by Cohort ($Aggl_{z,y(im)}$)	$= \begin{cases} 0, & x \leq 1 \\ \sum_{b=1}^{5} l_{z,y,b(im)}, & 1 < x < PoolingDur \\ AggNewImpLives_{z,y} + [Aggl_{z-1,y} * (1 - Aggq_{z,y(im)})], & otherwise \end{cases}$ PoolingDur is from IBS Assump DUR pooling!E3	
AB119:AU119	Aggregate Enrollment of Impaired Lives for Issue Year y	$= \sum_{z=1}^{30} Aggl_{z,y(im)}$	
AX89:BQ118	Aggregate Premium Rates Before Age Adjustment, by Cohort ($AggDurAdjPremRate_{z,y}$)	$= \begin{cases} DurAdjPremRate_{z,y,b}, & x < PoolingDur \\ GlobalComNewBusnRate_{z}, & x \geq PoolingDur \text{ and } x = 1 \\ AggDurAdjPremRate_{z-1,y} * (1 + ImpRateIncRen_{z}) * (1 + ADRI_{x}), & otherwise \end{cases}$ PoolingDur is from IBS Assump DUR pooling!E3 $DurAdjPremRate_{z,y,b}$ is from the appropriate cell of IBS-1D!AX89:AZ118 for y = 1, 2, 3; from the appropriate cell of IBS-2D!BA89:BC118 for y = 4, 5, 6; etc.	The formulas for y = 16, 17, 18, 19, and 20 are extraneous.

Interblock Subsidy.xls – IBS DUR pooling Summary

Cells	Description	Formula	Comments
BT89:CM118	Aggregate Age-Adjusted Premium Rates by Cohort ($AggAgeAdjPremRate_{z,y}$)	= $AggDurAdjPremRate_{z,y}$, $x < 1$ $AggDurAdjPremRate_{z,y} * PAF_x$, $x \geq 1$	The first condition is irrelevant since premium rates are undefined for $x < 1$.
CP90:DD118	Rate Increase Factor by Cohort	= $AggDurAdjPremRate_{z,y}$ / $AggDurAdjPremRate_{z-1,y}$	Formula only applies for $y = 1, 2, 3, \ldots, 15$ and $x > 1$.
AB126:AU155	Aggregate Age-Adjusted Market New Business Premium Rates by Cohort	= 0, $x < 1$ $MarketRate_z * PAF_x$, $x \geq 1$	
AX123:BL123	Morbidity Adjustment for Standard Lives by Block ($MorbAdj_{st(b)}$)	From the appropriate cell of IBS Assump DUR pooling!O4, Q4, S4, U4, or W4; block 1 value is in cells AX123:AZ123, block 2 value is in cells BA123:BC123, etc.	

Interblock Subsidy.xls – IBS DUR pooling Summary

Cells	Description	Formula	Comments
AX126:BQ155	Aggregate Standard Lives Claim Levels by Cohort ($AggClaims_{z,y(st)}$)	$= \begin{cases} 0, & Aggl_{z,y(st)} = 0 \text{ and } x < PoolingDur \\ \sum_{i=1}^{5} (l_{z,y,i(st)} * C_{z,y,i(st)}) / \sum_{j=1}^{5} l_{z,y,j(st)}, & Aggl_{z,y(st)} \neq 0 \text{ and } x < PoolingDur \\ MorbAdj_{st(b)} * RefClaims_{z(st)} * DF_x * \{1 + [(GlobalComNewBusnRate_y / RefPrem_y) - 1] * MorbAdjSale_{st}\}, & x < PoolingDur \text{ and } x = 1 \\ AggClaims_{z-1,y(st)} * DF_x / DF_{x-1} * (1 + ActTrend_{z-1}) * (1 + AgingTrend), & \text{otherwise} \end{cases}$ PoolingDur is from IBS Assump DUR pooling!E3 $MorbAdj_{st(1)}$ is used for y = 1, 2, 3; $MorbAdj_{st(2)}$ is used for y = 4, 5, 6; etc. $MorbAdjSale_{st}$ is from Global Assumptions!D51 AgingTrend is from Global Assumptions!C22	
BT123:CH123	Morbidity Adjustment for Impaired Lives by Block ($MorbAdj_{im(b)}$)	From the appropriate cell of IBS Assump DUR pooling!P4, R4, T4, V4, or X4; block 1 value is in cells BT123:BV123, block 2 value is in cells BW123:BY123, etc.	

Interblock Subsidy.xls – IBS DUR pooling Summary

Cells	Description	Formula	Comments
BT126:CM155	Aggregate Impaired Lives Claim Levels by Cohort ($AggClaims_{z,y(im)}$)	$= \begin{cases} 0, & x < PoolingDur \text{ and } x \neq 1 \text{ and } AggI_{z,y(im)} = 0 \\ MorbAdj_{im(b)} * RefClaims_{z(im)}, & x = 1 \\ \sum_{i=1}^{5} (l_{z,y,i(im)} * C_{z,y,i(im)}) / \sum_{j=1}^{5} l_{z,y,j(im)}, & x < PoolingDur \text{ and } x \neq 1 \text{ and } AggI_{z,y(im)} \neq 0 \\ AggClaims_{z-1,y(im)} * (1 + ActTrend_{z-1}) * (1 + AgingTrend), & \text{otherwise} \end{cases}$ PoolingDur is from IBS Assump DUR pooling!E3 $MorbAdj_{im(1)}$ is used for y = 1, 2, 3; $MorbAdj_{im(2)}$ is used for y = 4, 5, 6; etc. AgingTrend is from Global Assumptions!C22	

Interblock Subsidy.xls – IBS DUR pooling Summary

Cells	Description	Formula	Comments
AB164:AU193	Aggregate Standard Lives Expense Levels by Cohort ($AggExp_{z,y(st)}$)	$AggExp_{z,y(st)} = \begin{cases} 0, & (x < PoolingDur \text{ and } Aggl_{z,y(st)} = 0) \text{ or } (x \geq PoolingDur \text{ and } x < 1) \\ \sum_{i=1}^{5} (l_{z,y,i(st)} * Exp_{z,y,i(st)}) / \sum_{j=1}^{5} l_{z,y,j(st)}, & x < PoolingDur \text{ and } Aggl_{z,y(st)} \neq 0 \\ Exp_{Pol(x)} * (1 + Inflation)^{z-1} + AggClaims_{z,y(st)} * Exp_{\%C(x)} + GlobalComNewBusnRate_y * Comm_{B(x)} + [(AggAgeAdjPremRate_{z,y} - GlobalComNewBusnRate_y) * Comm_{R(x)}] + AggAgeAdjPremRate_{z,y} * Exp_{Oth\%P(x)}, & \text{otherwise} \end{cases}$ PoolingDur is from IBS Assump DUR pooling!E3 Inflation is from Global Assumptions!B64	

Interblock Subsidy.xls – IBS DUR pooling Summary

Cells	Description	Formula	Comments
AX164:BQ193	Aggregate Impaired Lives Expense Levels by Cohort ($AggExp_{z,y(im)}$)	$= \begin{cases} 0, & (x < PoolingDur \text{ and } AggI_{z,y(im)} = 0) \text{ or } (x \geq PoolingDur \text{ and } x < 1) \\ \sum_{i=1}^{5} (l_{z,y,i(im)} * Exp_{z,y,i(im)}) / \sum_{j=1}^{5} l_{z,y,j(im)}, & x < PoolingDur \text{ and } AggI_{z,y(im)} \neq 0 \\ Exp_{Pol(x)} * (1 + Inflation)^{z-1} + AggClaims_{z,y(im)} * Exp_{\%C(x)} + GlobalComNewBusnRate_y * Comm_{B(x)} + [(AggAgeAdjPremRate_{z,y} - GlobalComNewBusnRate_y) * Comm_{R(x)}] + AggAgeAdjPremRate_{z,y} * Exp_{Oth\%P(x)}, & \text{otherwise} \end{cases}$ PoolingDur is from IBS Assump DUR pooling!E3 Inflation is from Global Assumptions!B64	
BT164:CM193	Aggregate Average Expense Levels by Cohort	$= \begin{cases} 0, & AggI_{z,y(st)} + AggI_{z,y(im)} \leq 0 \\ [(AggI_{z,y(st)} * AggExp_{z,y(st)}) + (AggI_{z,y(im)} * AggExp_{z,y(im)})] / (AggI_{z,y(st)} + AggI_{z,y(im)}), & \text{otherwise} \end{cases}$	
CP164:CP193	Aggregate Enrollment of Standard Lives by Projection Year ($AggI_{z(st)}$)	$= \sum_{y=1}^{20} AggI_{z,y(st)}$	

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Cells	Description	Formula	Comments
CP194	Aggregate Enrollment of Standard Lives	$= \sum_{z=1}^{30} AggI_{z(st)}$	
CQ164:CQ193	Aggregate Premium of Standard Lives by Projection Year ($AggPremium_{z(st)}$)	$= (\sum_{y=1}^{20} AggI_{z,y(st)} * AggAgeAdjPremRate_{z,y}) * 12$	
CQ194	Aggregate Premium of Standard Lives ($AggPremium_{st}$)	$= \sum_{z=1}^{30} AggPremium_{z(st)}$	
CR164:CR193	Aggregate Claims of Standard Lives by Projection Year ($AggClaims_{z(st)}$)	$= (\sum_{y=1}^{20} AggI_{z,y(st)} * AggClaims_{z,y(st)}) * 12$	
CR194	Aggregate Claims of Standard Lives ($AggClaims_{st}$)	$= \sum_{z=1}^{30} AggClaims_{z(st)}$	
CS164:CS193	Aggregate Loss Ratio by Projection Year for Standard Lives	$= AggClaims_{z(st)} / AggPremium_{z(st)}$	
CS194	Aggregate Loss Ratio for Standard Lives	$= AggClaims_{st} / AggPremium_{st}$	

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Cells	**Description**	**Formula**	**Comments**
CV164:CV193	Aggregate Enrollment of Impaired Lives by Projection Year ($AggI_{z(im)}$)	$= \sum_{y=1}^{20} AggI_{z,y(im)}$	
CV194	Aggregate Enrollment of Impaired Lives	$= \sum_{z=1}^{30} AggI_{z(im)}$	
CW164:CW193	Aggregate Premium of Impaired Lives by Projection Year ($AggPremium_{z(im)}$)	$= (\sum_{y=1}^{20} AggI_{z,y(im)} * AggAgeAdjPremRate_{z,y}) * 12$	
CW194	Aggregate Premium of Impaired Lives ($AggPremium_{im}$)	$= \sum_{z=1}^{30} AggPremium_{z(im)}$	
CX164:CX193	Aggregate Claims of Impaired Lives by Projection Year ($AggClaims_{z(im)}$)	$= (\sum_{y=1}^{20} AggI_{z,y(st)} * AggClaims_{z,y(im)}) * 12$	
CX194	Aggregate Claims of Impaired Lives ($AggClaims_{im}$)	$= \sum_{z=1}^{30} AggClaims_{z(im)}$	

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Cells	**Description**	**Formula**	**Comments**
CY165:CY193	Aggregate Loss Ratio by Projection Year for Impaired Lives	$= AggClaims_{z(im)} / AggPremium_{z(im)}$	Formula applies only for z = 2, 3, 4, …, 30
CY194	Aggregate Loss Ratio for Impaired Lives	$= AggClaims_{im} / AggPremium_{im}$	
DJ159	Trend Scenario Number	From Global Assumptions!G102	
DN159	Duration at Which Pooling Begins	From IBS Assump DUR pooling!E3	
DA164:DA193	Aggregate Enrollment by Projection Year ($Aggl_z$)	$= Aggl_{z(st)} + Aggl_{z(im)}$	
DA194	Aggregate Enrollment	$= \sum_{z=1}^{30} Aggl_z$	
DB164:DB193	Aggregate Premium by Projection Year ($AggPremium_z$)	$= AggPremium_{z(st)} + AggPremium_{z(im)}$	
DB194	Aggregate Premium (AggPremium)	$= \sum_{z=1}^{30} AggPremium_z$	

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Cells	Description	Formula	Comments
DC164:DC193	Aggregate Premium PMPM by Projection Year	$= AggPremium_z / AggI_z / 12$	
DC194	Aggregate Premium PMPM	$= AggPremium / AggI / 12$	
DD164:DD193	Aggregate Claims by Projection Year ($AggClaims_z$)	$= AggClaims_{z(st)} + AggClaims_{z(im)}$	
DD194	Aggregate Claims (AggClaims)	$= \sum_{z=1}^{30} AggClaims_z$	
DE164:DE193	Aggregate Claims PMPM by Projection Year	$= AggClaims_z / AggI_z / 12$	
DE194	Aggregate Claims PMPM	$= AggClaims / AggI / 12$	
DF164:DF193	Aggregate Loss Ratio by Projection Year ($AggLR_z$)	$= AggClaims_z / AggPremium_z$	
DF194	Aggregate Loss Ratio	$= AggClaims / AggPremium$	
DG164:DG193	Aggregate Expected Loss Ratio by Projection Year ($AggExpectedLR_z$)	These cells are currently blank.	

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Cells	Description	Formula	Comments
DH164:DH193	Aggregate Actual to Expected Loss Ratio by Projection Year	$= AggLR_z / AggExpectedLR_z$	Currently produces #DIV/0! Errors because the expected loss ratios in DG164:DG193 are blank.
DI164:DI193	Aggregate Rolling Two-Year Loss Ratio	$= \begin{cases} AggClaims_1 / AggPremium_1, & z = 1 \\ (AggClaims_{z-1} + AggClaims_z) / (AggPremium_{z-1} + AggPremium_z), & z = 2, 3, 4, \ldots, 30 \end{cases}$	
DJ164:DJ193	Aggregate Premium Less Aggregate Claims by Projection Year ($AggPminusAggC_z$)	$= AggPremium_z – AggClaims_z$	
DJ194	Aggregate Premium Less Aggregate Claims	= AggPremium – AggClaims	
DK164:DK193	Aggregate Expenses by Projection Year ($AggExp_z$)	$= 12 * [\sum_{y=1}^{20} (AggI_{z(st)} * AggExp_{z(st)}) + \sum_{y=1}^{20} (AggI_{z(im)} * AggExp_{z(im)})]$	
DK194	Aggregate Expenses (AggExp)	$= \sum_{z=1}^{30} AggExp_z$	

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Cells	Description	Formula	Comments
DL164:DL193	Aggregate Expense Ratio by Projection Year	$= AggExp_z / AggPremium_z$	
DL194	Aggregate Expense Ratio	= AggExp / AggPremium	
DM164:DM193	Aggregate Gain by Projection Year ($AggGain_z$)	$= AggPremium_z – AggClaims_z – AggExp_z$	
DM194	Aggregate Gain (AggGain)	$= \sum_{z=1}^{30} AggGain_z$	
DN164:DN193	Aggregate Gain as a Percentage of Aggregate Premium by Projection Year	$= AggGain_z / AggPremium_z$	
DN194	Aggregate Gain as a Percentage of Aggregate Premium	= AggGain / AggPremium	
DO164:DO193	Aggregate Risk-Based Capital by Projection Year ($AggRBC_z$)	$= AggPremium_z * RBC\%$ RBC% is from Global Assumptions!D83	

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Cells	Description	Formula	Comments
DP164:DP193	Aggregate Opportunity Cost of Capital by Projection Year ($AggOCC_z$)	= $-AggRBC_z$ * OCC% OCC% is from Global Assumptions!D84	
DP194	Aggregate Opportunity Cost of Capital	$= \sum_{z=1}^{30} AggOCC_z$	
DQ164:DQ193	Aggregate Economic Gain by Projection Year ($AggEconGain_z$)	= $AggGain_z + OCC_z$	
DQ194	Aggregate Economic Gain	$= \sum_{z=1}^{30} AggEconGain_z$	
DR164:DR193	Market New Business Rate	= $MarketRate_z$	The values in cells DR164:DV193 are duplicate copies of values calculated elsewhere; they are repeated here for convenience.
DS164:DS193	Global Company New Business Rate	= $GlobalComNewBusnRate_z$	

Interblock Subsidy.xls – IBS DUR pooling Summary

Cells	Description	Formula	Comments
DT164:DT193	Implemented Rate Increase for New Business	$= \text{ImpRateIncNew}_z$	
DT194	Average Rate Increase	$= \sum_{z=2}^{30} \text{ImpRateIncNew}_z / 29$	
DT195	Minimum Rate Increase	$= \min(\text{MinRI}_1, \text{MinRI}_2, \text{MinRI}_3, \text{MinRI}_4, \text{MinRI}_5)$ MinRI_b are from cell DT277 of IBS-1D, IBS-2D, IBS-3D, IBS-4D, and IBS-5D	
DT196	Maximum Rate Increase	$= \max(\text{MaxRI}_1, \text{MaxRI}_2, \text{MaxRI}_3, \text{MaxRI}_4, \text{MaxRI}_5)$ MaxRI_b are from cell DT278 of IBS-1D, IBS-2D, IBS-3D, IBS-4D, and IBS-5D	
DU164:DU193	Implemented Rate Increase for Renewal Business	$= \text{ImpRateIncRen}_z$	
DV164:DV183	Aggregate New Business Sales by Projection Year	$= \text{AggSales}_{z,z}$	Formula applies only for z = 1, 2, 3, …, 20.

Interblock Subsidy.xls – IBS DUR pooling Summary

Cells	Description	Formula	Comments
DB197	Present Value of Aggregate Premium (PVAggPremium)	$= NPV_{int} (AggPremium_z) * \sqrt{1+int}$	For all of the following present value calculations, int is from Global Assumptions!B63, and the present values are taken over z = 1, 2, 3, …, 30.
DD197	Present Value of Aggregate Claims (PVAggClaims)	$= NPV_{int} (AggClaims_z) * \sqrt{1+int}$	
DIJ97	Present Value of Aggregate Premium Less Aggregate Claims (PVAggPminusAggC)	$= NPV_{int} (AggPminusAggC_z) * \sqrt{1+int}$	
DK197	Present Value of Aggregate Expenses (PVAggExp)	$= NPV_{int} (AggExp_z) * \sqrt{1+int}$	
DM197	Present Value of Aggregate Gain (PVAggGain)	$= NPV_{int} (AggGain_z) * \sqrt{1+int}$	

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Cells	Description	Formula	Comments
DP197	Present Value of Aggregate Opportunity Cost of Capital (PVAggOCC)	$= NPV_{int} (AggOCC_z) * \sqrt{1+int}$	
DQ197	Present Value of Aggregate Economic Gain (PVAggEconGain)	$= NPV_{int} (AggEconGain_z) * \sqrt{1+int}$	
DB198	Present Value of Aggregate Premium as a Percentage of Present Value of Aggregate Premium	= PVAggPremium / PVAggPremium	Identically equal to 100.0%.
DD198	Present Value of Aggregate Claims as a Percentage of Present Value of Aggregate Premium	= PVAggClaims / PVAggPremium	
DJ198	Present Value of Aggregate Premium Less Aggregate Claims as a Percentage of Present Value of Aggregate Premium	= PVAggPminusAggC / PVAggPremium	
DK198	Present Value of Aggregate Expenses as a Percentage of Present Value of Aggregate Premium	= PVAggExp / PVAggPremium	

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Cells	**Description**	**Formula**	**Comments**
DM198	Present Value of Aggregate Gain as a Percentage of Present Value of Aggregate Premium	= PVAggGain / PVAggPremium	
DP198	Present Value of Aggregate Opportunity Cost of Capital as a Percentage of Present Value of Aggregate Premium	= PVAggOCC / PVAggPremium	
DQ198	Present Value of Aggregate Economic Gain as a Percentage of Present Value of Aggregate Premium	= PVAggEconGain / PVAggPremium	
DQ199	Sum of Present Value of Each Block's Aggregate Economic Gain	$= \sum_{b=1}^{5} \text{AggEconGain}_b$	
BT206:CM235	Duration Identification (DurID)	= max(x, 0)	This and subsequent formulas in this tab are used only to verify that the results above are correct.

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Cells	Description	Formula	Comments
CP206:CP235	Alternate Calculation of Aggregate Enrollment of Standard Lives by Projection Year ($AltAggl_{z(st)}$)	$= PoolAggl_{z(st)} + \sum_{b=1}^{5} Prepooll_{z,b(st)}$	In this and subsequent formulas in this tab, parameters contained within summations are from IBS-1D, IBS-2D, IBS-3D, IBS-4D, and IBS-5D.
CP236	Alternate Calculation of Aggregate Enrollment of Standard Lives	$= \sum_{z=1}^{30} AltAggl_{z(st)}$	
CQ206:CQ235	Alternate Calculation of Aggregate Premium of Standard Lives by Projection Year ($AltAggPremium_{z(st)}$)	$= PoolAggPremium_{z(st)} + \sum_{b=1}^{5} PrepoolPremium_{z,b(st)}$	
CQ236	Alternate Calculation of Aggregate Premium of Standard Lives ($AltAggPremium_{st}$)	$= \sum_{z=1}^{30} AltAggPremium_{z(st)}$	
CR206:CR235	Alternate Calculation of Aggregate Claims of Standard Lives by Projection Year ($AltAggClaims_{z(st)}$)	$= PoolAggClaims_{z(st)} + \sum_{b=1}^{5} PrepoolClaims_{z,b(st)}$	

Interblock Subsidy.xls – IBS DUR pooling Summary

Cells	Description	Formula	Comments
CR236	Alternate Calculation of Aggregate Claims of Standard Lives ($AltAggClaims_{st}$)	$= \sum_{z=1}^{30} AltAggClaims_{z(st)}$	
CS206:CS235	Alternate Calculation of Aggregate Loss Ratio for Standard Lives by Projection Year	$= \begin{cases} 0, & AltAggPremium_{z(st)} = 0 \\ AltAggClaims_{z(st)} / AltAggPremium_{z(st)}, & AltAggPremium_{z(st)} \neq 0 \end{cases}$	
CS236	Alternate Calculation of Aggregate Loss Ratio for Standard Lives	$= \begin{cases} 0, & AltAggPremium_{st} = 0 \\ AltAggClaims_{st} / AltAggPremium_{st}, & AltAggPremium_{st} \neq 0 \end{cases}$	
CV206:CV235	Alternate Calculation of Aggregate Enrollment of Impaired Lives by Projection Year ($AltAggl_{z(im)}$)	$= PoolAggl_{z(im)} + \sum_{b=1}^{5} Prepooll_{z,b(im)}$	
CV236	Alternate Calculation of Aggregate Enrollment of Impaired Lives	$= \sum_{z=1}^{30} AltAggl_{z(im)}$	
CW206:CW235	Alternate Calculation of Aggregate Premium of Impaired Lives by Projection Year ($AltAggPremium_{z(im)}$)	$= PoolAggPremium_{z(im)} + \sum_{b=1}^{5} PrepoolPremium_{z,b(im)}$	

Interblock Subsidy.xls – IBS DUR pooling Summary

Cells	Description	Formula	Comments
CW236	Alternate Calculation of Aggregate Premium of Impaired Lives ($AltAggPremium_{im}$)	$= \sum_{z=1}^{30} AltAggPremium_{z(im)}$	
CX206:CX235	Alternate Calculation of Aggregate Claims of Impaired Lives by Projection Year ($AltAggClaims_{z(im)}$)	$= PoolAggClaims_{z(im)} + \sum_{b=1}^{5} PrepoolClaims_{z,b(im)}$	
CX236	Alternate Calculation of Aggregate Claims of Impaired Lives ($AltAggClaims_{im}$)	$= \sum_{z=1}^{30} AltAggClaims_{z(im)}$	
CY206:CY235	Alternate Calculation of Aggregate Loss Ratio by Projection Year for Impaired Lives	$= \begin{cases} 0, & AltAggPremium_{z(im)} = 0 \\ AltAggClaims_{z(im)} / AltAggPremium_{z(im)}, & AltAggPremium_{z(im)} \neq 0 \end{cases}$	
CX236	Alternate Calculation of Aggregate Loss Ratio for Impaired Lives	$= \begin{cases} 0, & AltAggPremium_{im} = 0 \\ AltAggClaims_{im} / AltAggPremium_{im}, & AltAggPremium_{im} \neq 0 \end{cases}$	
DJ201	Trend Scenario Number	From Global Assumptions!G102	

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Cells	Description	Formula	Comments
DN201	Duration at Which Pooling Begins	From IBS Assump DUR pooling!E3	
DA206:DA235	Alternate Calculation of Aggregate Enrollment by Projection Year ($AltAggl_z$)	$= AltAggl_{z(st)} + AltAggl_{z(im)}$	
DA236	Alternate Calculation of Aggregate Enrollment ($AltAggl$)	$= \sum_{z=1}^{30} AltAggl_z$	
DB206:DB235	Alternate Calculation of Aggregate Premium by Projection Year ($AltAggPremium_z$)	$= AltAggPremium_{z(st)} + AltAggPremium_{z(im)}$	
DB236	Alternate Calculation of Aggregate Premium ($AltAggPremium$)	$= \sum_{z=1}^{30} AltAggPremium_z$	
DC206:DC235	Alternate Calculation of Aggregate Premium PMPM by Projection Year	$= \begin{cases} 0, & AltAggl_z = 0 \\ AltAggPremium_z / AltAggl_z / 12, & AltAggl_z \neq 0 \end{cases}$	
DC236	Alternate Calculation of Aggregate Premium PMPM	$= \begin{cases} 0, & AltAggl = 0 \\ AltAggPremium / AltAggl / 12, & AltAggl \neq 0 \end{cases}$	

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Cells	Description	Formula	Comments
DD206:DD235	Alternate Calculation of Aggregate Claims by Projection Year ($AltAggClaims_z$)	$= AltAggClaims_{z(st)} + AltAggClaims_{z(im)}$	
DD236	Alternate Calculation of Aggregate Claims (AltAggClaims)	$= \sum_{z=1}^{30} AltAggClaims_z$	
DE206:DE235	Alternate Calculation of Aggregate Claims PMPM by Projection Year	$= \begin{cases} 0, & AltAggl_z = 0 \\ AltAggClaims_z / AltAggl_z / 12, & AltAggl_z \neq 0 \end{cases}$	
DE236	Alternate Calculation of Aggregate Claims PMPM	$= \begin{cases} 0, & AltAggl = 0 \\ AltAggClaims / AltAggl / 12, & AltAggl \neq 0 \end{cases}$	
DF206:DF235	Alternate Calculation of Aggregate Loss Ratio by Projection Year ($AltAggLR_z$)	$= \begin{cases} 0, & AltAggPremium_z = 0 \\ AltAggClaims_z / AltAggPremium_z, & AltAggPremium_z \neq 0 \end{cases}$	
DF236	Alternate Calculation of Aggregate Loss Ratio	$= \begin{cases} 0, & AltAggPremium = 0 \\ AltAggClaims / AltAggPremium, & AltAggPremium \neq 0 \end{cases}$	

Interblock Subsidy.xls – IBS DUR pooling Summary

Cells	Description	Formula	Comments
DJ206:DJ235	Alternate Calculation of Aggregate Premium Less Aggregate Claims by Projection Year ($AltAggPminusAggC_z$)	$= AltAggPremium_z - AltAggClaims_z$	
DJ236	Alternate Calculation of Aggregate Premium Less Aggregate Claims	$= AltAggPremium - AltAggClaims$	
DK206:DK235	Alternate Calculation of Aggregate Expenses by Projection Year ($AltAggExp_z$)	$= PoolAggExpense_z + \sum_{b=1}^{5} PrepoolExpense_{z,b}$	
DK236	Alternate Calculation of Aggregate Expenses (AltAggExp)	$= \sum_{z=1}^{30} AltAggExp_z$	
DL206:DL235	Alternate Calculation of Aggregate Expense Ratio by Projection Year	$= \begin{cases} 0, & AltAggPremium_z = 0 \\ AltAggExp_z / AltAggPremium_z, & AltAggPremium_z \neq 0 \end{cases}$	
DL236	Alternate Calculation of Aggregate Expense Ratio	$= \begin{cases} 0, & AltAggPremium = 0 \\ AltAggExp / AltAggPremium, & AltAggPremium \neq 0 \end{cases}$	

Interblock Subsidy.xls – IBS DUR pooling Summary

Cells	Description	Formula	Comments
DM206:DM235	Alternate Calculation of Aggregate Gain by Projection Year ($AltAggGain_z$)	$= AltAggPremium_z - AltAggClaims_z - AltAggExp_z$	
DM236	Alternate Calculation of Aggregate Gain (AltAggGain)	$= \sum_{z=1}^{30} AltAggGain_z$	
DN206:DN235	Alternate Calculation of Aggregate Gain as a Percentage of Aggregate Premium by Projection Year	$= \begin{cases} 0, & AltAggPremium_z = 0 \\ AltAggGain_z / AltAggPremium_z, & AltAggPremium_z \neq 0 \end{cases}$	
DN236	Alternate Calculation of Aggregate Gain as a Percentage of Aggregate Premium	$= \begin{cases} 0, & AltAggPremium = 0 \\ AltAggGain / AltAggPremium, & AltAggPremium \neq 0 \end{cases}$	
DO206:DO235	Alternate Calculation of Aggregate Risk-Based Capital by Projection Year ($AltAggRBC_z$)	$= PoolAggRBC_z + \sum_{b=1}^{5} PrepoolRBC_{z,b}$	

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Cells	Description	Formula	Comments
DP206:DP235	Alternate Calculation of Aggregate Opportunity Cost of Capital by Projection Year ($AltAggOCC_z$)	$= PoolAggOCC_z + \sum_{b=1}^{5} PrepoolOCC_{z,b}$	
DP236	Alternate Calculation of Aggregate Opportunity Cost of Capital	$= \sum_{z=1}^{30} AltAggOCC_z$	
DQ206:DQ235	Alternate Calculation of Aggregate Economic Gain by Projection Year ($AltAggEconGain_z$)	$= AltAggGain_z + OCC_z$	
DQ236	Alternate Calculation of Aggregate Economic Gain	$= \sum_{z=1}^{30} AltAggGain_z$	
DR206:DR235	Market New Business Rate	$= MarketRate_z$	The values in cells DR164:DV193 are duplicate copies of values calculated elsewhere; they are repeated here for convenience.
DS206:DS235	Global Company New Business Rate	$= GlobalComNewBusnRate_z$	

Interblock Subsidy.xls – IBS DUR pooling Summary

Cells	**Description**	**Formula**	**Comments**
DT206:DT235	Implemented Rate Increase for New Business	$= ImpRateIncNew_z$	
DT236	Average Rate Increase	$= \sum_{z=2}^{30} ImpRateIncNew_z / 29$	
DT237	Minimum Rate Increase	$= \min(MinRI_1, MinRI_2, MinRI_3, MinRI_4, MinRI_5)$ $MinRI_b$ are from cell DT277 of IBS-1D, IBS-2D, IBS-3D, IBS-4D, and IBS-5D	
DT238	Maximum Rate Increase	$= \max(MaxRI_1, MaxRI_2, MaxRI_3, MaxRI_4, MaxRI_5)$ $MaxRI_b$ are from cell DT278 of IBS-1D, IBS-2D, IBS-3D, IBS-4D, and IBS-5D	
DU206:DU235	Implemented Rate Increase for Renewal Business	$= ImpRateIncRen_z$	
DV206:DV225	Aggregate New Business Sales by Projection Year ($ActualSales_z$)	$= AggSales_{z,z}$	Formula applies only for z = 1, 2, 3, …, 20.

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Cells	Description	Formula	Comments
DB239	Present Value of Alternate Calculation of Aggregate Premium (PVAltAggPremium)	= NPV_{int} ($AltAggPremium_z$) * $\sqrt{1+int}$	For all of the following present value calculations, int is from Global Assumptions!B63, and the present values are taken over z = 1, 2, 3, …, 30.
DD239	Present Value of Alternate Calculation of Aggregate Claims (PVAltAggClaims)	= NPV_{int} ($AltAggClaims_z$) * $\sqrt{1+int}$	
DJ239	Present Value of Alternate Calculation of Aggregate Premium Less Alternate Calculation of Aggregate Claims (PVAltAggPminusAlt AggC)	= NPV_{int} ($AltAggPminusAltAggC_z$) * $\sqrt{1+int}$	
DK239	Present Value of Alternate Calculation of Aggregate Expenses (PVAltAggExp)	= NPV_{int} ($AltAggExp_z$) * $\sqrt{1+int}$	

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Cells	**Description**	**Formula**	**Comments**
DM239	Present Value of Alternate Calculation of Aggregate Gain (PVAltAggGain)	$= NPV_{int}(AltAggGain_z) * \sqrt{1+int}$	
DP239	Present Value of Alternate Calculation of Aggregate Opportunity Cost of Capital (PVAltAggOCC)	$= NPV_{int}(AltAggOCC_z) * \sqrt{1+int}$	
DQ239	Present Value of Alternate Calculation of Aggregate Economic Gain (PVAltAggEconGain)	$= NPV_{int}(AltAggEconGain_z) * \sqrt{1+int}$	
DB240	Present Value of Alternate Calculation of Aggregate Premium as a Percentage of Present Value of Alternate Calculation of Aggregate Premium	= PVAltAggPremium / PVAltAggPremium	Identically equal to 100.0%.
DD240	Present Value of Alternate Calculation of Aggregate Claims as a Percentage of Present Value of Alternate Calculation of Aggregate Premium	= PVAltAggClaims / PVAltAggPremium	

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Cells	Description	Formula	Comments
DJ240	Present Value of Alternate Calculation of Aggregate Premium Less Alternate Calculation of Aggregate Claims as a Percentage of Present Value of Alternate Calculation of Aggregate Premium	= PVAltAggPminusAggC / PVAltAggPremium	
DK240	Present Value of Alternate Calculation of Aggregate Expenses as a Percentage of Present Value of Alternate Calculation of Aggregate Premium	= PVAltAggExp / PVAltAggPremium	
DM240	Present Value of Alternate Calculation of Aggregate Gain as a Percentage of Present Value of Alternate Calculation of Aggregate Premium	= PVAltAggGain / PVAltAggPremium	
DP240	Present Value of Alternate Calculation of Aggregate Opportunity Cost of Capital as a Percentage of Present Value of Alternate Calculation of Aggregate Premium	= PVAltAggOCC / PVAltAggPremium	

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Cells	Description	Formula	Comments
DQ240	Present Value of Alternate Calculation of Aggregate Economic Gain as a Percentage of Present Value of Alternate Calculation of Aggregate Premium	= PVAltAggEconGain / PVAltAggPremium	
BT246:CM275	Duration Use Indicator ($DurFlag_{z,y}$)	$= \begin{cases} 0, & x < 1 \text{ or } (x \geq 1 \text{ and DurID} < \text{PoolingDur}) \\ 1, & \text{otherwise} \end{cases}$	
CP246:CP275	Aggregate Enrollment of Standard Lives by Projection Year During Pooling ($PoolAggl_{z(st)}$)	$= \sum_{y=1}^{20} Aggl_{z,y(st)} * DurFlag_{z,y}$	
CP276	Aggregate Enrollment of Standard Lives During Pooling	$= \sum_{z=1}^{30} PoolAggl_{z(st)}$	
CQ246:CQ275	Aggregate Premium of Standard Lives by Projection Year During Pooling ($PoolAggPremium_{z(st)}$)	$= (\sum_{y=1}^{20} Aggl_{z,y(st)} * AggAgeAdjPremRate_{z,y} * DurFlag_{z,y}) * 12$	

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Cells	Description	Formula	Comments
CQ276	Aggregate Premium of Standard Lives During Pooling ($PoolAggPremium_{st}$)	$= \sum_{z=1}^{30} PoolAggPremium_{z(st)}$	
CR246:CR275	Aggregate Claims of Standard Lives by Projection Year During Pooling ($PoolAggClaims_{z(st)}$)	$= (\sum_{y=1}^{20} AggI_{z,y(st)} * AggClaims_{z,y(st)} * DurFlag_{z,y}) * 12$	
CR276	Aggregate Claims of Standard Lives During Pooling ($PoolAggClaims_{st}$)	$= \sum_{z=1}^{30} PoolAggClaims_{z(st)}$	
CS246:CS275	Aggregate Loss Ratio by Projection Year for Standard Lives During Pooling	$= \begin{cases} 0, & PoolAggPremium_{z(st)} = 0 \\ PoolAggClaims_{z(st)} / PoolAggPremium_{z(st)}, & PoolAggPremium_{z(st)} \neq 0 \end{cases}$	
CS276	Aggregate Loss Ratio for Standard Lives During Pooling	$= \begin{cases} 0, & PoolAggPremium_{st} = 0 \\ PoolAggClaims_{st} / PoolAggPremium_{st}, & PoolAggPremium_{st} \neq 0 \end{cases}$	

Interblock Subsidy.xls – IBS DUR pooling Summary

Cells	Description	Formula	Comments
CV246:CV275	Aggregate Enrollment of Impaired Lives by Projection Year During Pooling (PoolAggl$_{z(im)}$)	$= \sum_{y=1}^{20} Aggl_{z,y(im)} * DurFlag_{z,y}$	
CV276	Aggregate Enrollment of Impaired Lives During Pooling	$= \sum_{z=1}^{30} PoolAggl_{z(im)}$	
CW246:CW275	Aggregate Premium of Impaired Lives by Projection Year During Pooling (PoolAggPremium$_{z(im)}$)	$= (\sum_{y=1}^{20} Aggl_{z,y(im)} * AggAgeAdjPremRate_{z,y} * DurFlag_{z,y}) * 12$	
CW276	Aggregate Premium of Impaired Lives During Pooling (PoolAggPremium$_{im}$)	$= \sum_{z=1}^{30} PoolAggPremium_{z(im)}$	
CX246:CX275	Aggregate Claims of Impaired Lives by Projection Year During Pooling (PoolAggClaims$_{z(im)}$)	$= (\sum_{y=1}^{20} Aggl_{z,y(im)} * AggClaims_{z,y(im)} * DurFlag_{z,y}) * 12$	

Interblock Subsidy.xls – IBS DUR pooling Summary

Cells	**Description**	**Formula**	**Comments**
CX276	Aggregate Claims of Impaired Lives During Pooling ($PoolAggClaims_{im}$)	$= \sum_{z=1}^{30} PoolAggClaims_{z(im)}$	
CY246:CY275	Aggregate Loss Ratio by Projection Year for Impaired Lives During Pooling	$= \begin{cases} 0, & PoolAggPremium_{z(im)} = 0 \\ PoolAggClaims_{z(im)} / PoolAggPremium_{z(im)}, & PoolAggPremium_{z(im)} \neq 0 \end{cases}$	
CY276	Aggregate Loss Ratio for Impaired Lives During Pooling	$= \begin{cases} 0, & PoolAggPremium_{im} = 0 \\ PoolAggClaims_{im} / PoolAggPremium_{im}, & PoolAggPremium_{im} \neq 0 \end{cases}$	
DJ241	Trend Scenario Number	From Global Assumptions!G102	
DN241	Duration at Which Pooling Begins	From IBS Assump DUR pooling!E3	
DA246:DA275	Aggregate Enrollment by Projection Year During Pooling ($PoolAggl_z$)	$= PoolAggl_{z(st)} + PoolAggl_{z(im)}$	
DA276	Aggregate Enrollment During Pooling	$= \sum_{z=1}^{30} PoolAggl_z$	

Interblock Subsidy.xls – IBS DUR pooling Summary

Cells	Description	Formula	Comments
DB246:DB275	Aggregate Premium by Projection Year During Pooling (PoolAggPremium$_z$)	$= PoolAggPremium_{z(st)} + PoolAggPremium_{z(im)}$	
DB276	Aggregate Premium During Pooling (PoolAggPremium)	$= \sum_{z=1}^{30} PoolAggPremium_z$	
DD246:DD275	Aggregate Claims by Projection Year During Pooling (PoolAggClaims$_z$)	$= PoolAggClaims_{z(st)} + PoolAggClaims_{z(im)}$	
DD276	Aggregate Claims During Pooling (PoolAggClaims)	$= \sum_{z=1}^{30} PoolAggClaims_z$	
DE246:DE275	Aggregate Claims PMPM by Projection Year During Pooling	$= \begin{cases} 0, & PoolAggl_z = 0 \\ PoolAggClaims_z / PoolAggl_z / 12, & PoolAggl_z \neq 0 \end{cases}$	
DE276	Aggregate Claims PMPM During Pooling	$= \begin{cases} 0, & PoolAggl = 0 \\ PoolAggClaims / PoolAggl / 12, & PoolAggl \neq 0 \end{cases}$	

Interblock Subsidy.xls – IBS DUR pooling Summary

Cells	Description	Formula	Comments
DF246:DF275	Aggregate Loss Ratio by Projection Year During Pooling ($PoolAggLR_z$)	$= \begin{cases} 0, & PoolAggPremium_z = 0 \\ PoolAggClaims_z / PoolAggPremium_z, & PoolAggPremium_z \neq 0 \end{cases}$	
DF276	Aggregate Loss Ratio During Pooling	$= \begin{cases} 0, & PoolAggPremium = 0 \\ PoolAggClaims / PoolAggPremium, & PoolAggPremium \neq 0 \end{cases}$	
DG246:DG275	Aggregate Expected Loss Ratio by Projection Year During Pooling ($PoolAggExpectedLR_z$)	$= \begin{cases} 0, & z < PoolingDur \\ DurLR_z, & z \geq PoolingDur \end{cases}$ PoolingDur is from IBS Assump DUR pooling!E3 $DurLR_z$ is from the appropriate cell of IBS Assump DUR pooling!AE19:AE48	
DH246:DH275	Aggregate Actual to Expected Loss Ratio by Projection Year During Pooling	$= \begin{cases} 0, & PoolAggPremium_z = 0 \\ PoolAggLR_z / PoolAggExpectedLR_z, & PoolAggPremium_z \neq 0 \end{cases}$	

Interblock Subsidy.xls – IBS DUR pooling Summary

Cells	Description	Formula	Comments
DI246:DI275	Aggregate Rolling Two-Year Loss Ratio During Pooling	$0,\quad (z = 1 \text{ and } PoolAggPremium_1 = 0)$ or $(z > 1 \text{ and } PoolAggPremium_{z-1} + PoolAggPremium_z = 0)$ $= \quad PoolAggClaims_1 / PoolAggPremium_1,\quad z = 1 \text{ and } PoolAggPremium_1 \neq 0$ $(PoolAggClaims_{z-1} + PoolAggClaims_z) / (PoolAggPremium_{z-1} + PoolAggPremium_z),\quad \text{otherwise}$	
DJ246:DJ275	Aggregate Premium Less Aggregate Claims by Projection Year During Pooling $(PoolAggPminusAggC_z)$	$= PoolAggPremium_z – PoolAggClaims_z$	
DJ276	Aggregate Premium Less Aggregate Claims During Pooling	= PoolAggPremium – PoolAggClaims	
DK246:DK275	Aggregate Expenses by Projection Year During Pooling $(PoolAggExp_z)$	$= 12 * [\sum_{i=1}^{20} (AggI_{z,i(st)} * AggExp_{z,i(st)} * DurFlag_{z,i})$ $+ \sum_{j=1}^{20} (AggI_{z,j(im)} * AggExp_{z,j(im)} * DurFlag_{z,j})]$	

Interblock Subsidy.xls – IBS DUR pooling Summary

Cells	Description	Formula	Comments
DK276	Aggregate Expenses During Pooling (PoolAggExp)	$= \sum_{z=1}^{30} \text{PoolAggExp}_z$	
DL246:DL275	Aggregate Expense Ratio by Projection Year During Pooling	$= \begin{cases} 0, & \text{PoolAggPremium}_z = 0 \\ \text{PoolAggExp}_z / \text{PoolAggPremium}_z, & \text{PoolAggPremium}_z \neq 0 \end{cases}$	
DL276	Aggregate Expense Ratio During Pooling	$= \begin{cases} 0, & \text{PoolAggPremium} = 0 \\ \text{PoolAggExp} / \text{PoolAggPremium}, & \text{PoolAggPremium} \neq 0 \end{cases}$	
DM246:DM275	Aggregate Gain by Projection Year During Pooling (PoolAggGain_z)	$= \text{PoolAggPremium}_z - \text{PoolAggClaims}_z - \text{PoolAggExp}_z$	
DM276	Aggregate Gain During Pooling (PoolAggGain)	$= \sum_{z=1}^{30} \text{PoolAggGain}_z$	
DN246:DN275	Aggregate Gain as a Percentage of Aggregate Premium by Projection Year During Pooling	$= \begin{cases} 0, & \text{PoolAggPremium}_z = 0 \\ \text{PoolAggGain}_z / \text{PoolAggPremium}_z, & \text{PoolAggPremium}_z \neq 0 \end{cases}$	
DN276	Aggregate Gain as a Percentage of Aggregate Premium During Pooling	$= \begin{cases} 0, & \text{PoolAggPremium}_z = 0 \\ \text{PoolAggGain} / \text{PoolAggPremium}, & \text{PoolAggPremium}_z \neq 0 \end{cases}$	

Interblock Subsidy.xls – IBS DUR pooling Summary

Cells	Description	Formula	Comments
DO246:DO275	Aggregate Risk-Based Capital by Projection Year During Pooling ($PoolAggRBC_z$)	$= PoolAggPremium_z * RBC\%$ RBC% is from Global Assumptions!D83	
DP246:DP275	Aggregate Opportunity Cost of Capital by Projection Year During Pooling ($PoolAggOCC_z$)	$= -PoolAggRBC_z * OCC\%$ OCC% is from Global Assumptions!D84	
DP276	Aggregate Opportunity Cost of Capital During Pooling	$= \sum_{z=1}^{30} PoolAggOCC_z$	
DQ246:DQ275	Aggregate Economic Gain by Projection Year During Pooling ($PoolAggEconGain_z$)	$= PoolAggGain_z + PoolAggOCC_z$	
DQ276	Aggregate Economic Gain During Pooling	$= \sum_{z=1}^{30} PoolAggEconGain_z$	

Interblock Subsidy.xls – IBS DUR pooling Summary

Cells	Description	Formula	Comments
DB197	Present Value of Aggregate Premium During Pooling (PVPoolAggPremium)	$= NPV_{int}(PoolAggPremium_z) * \sqrt{1+int}$	For all of the following present value calculations, int is from Global Assumptions!B63, and the present values are taken over z = 1, 2, 3, …, 30.
DD197	Present Value of Aggregate Claims During Pooling (PVPoolAggClaims)	$= NPV_{int}(PoolAggClaims_z) * \sqrt{1+int}$	
DJ197	Present Value of Aggregate Premium Less Aggregate Claims During Pooling (PVPoolAggPminusAggC)	$= NPV_{int}(PoolAggPminusAggC_z) * \sqrt{1+int}$	
DK197	Present Value of Aggregate Expenses During Pooling (PVPoolAggExp)	$= NPV_{int}(PoolAggExp_z) * \sqrt{1+int}$	
DM197	Present Value of Aggregate Gain During Pooling (PVPoolAggGain)	$= NPV_{int}(PoolAggGain_z) * \sqrt{1+int}$	

Interblock Subsidy.xls – IBS DUR pooling Summary

Cells	Description	Formula	Comments
DP197	Present Value of Aggregate Opportunity Cost of Capital During Pooling (PVPoolAggOCC)	= NPV_{int} ($PoolAggOCC_z$) * $\sqrt{1+\text{int}}$	
DQ197	Present Value of Aggregate Economic Gain During Pooling (PVPoolAggEconGain)	= NPV_{int} ($PoolAggEconGain_z$) * $\sqrt{1+\text{int}}$	
DB198	Present Value of Aggregate Premium as a Percentage of Present Value of Aggregate Premium During Pooling	= PVPoolAggPremium / PVPoolAggPremium	Identically equal to 100.0%.
DD198	Present Value of Aggregate Claims as a Percentage of Present Value of Aggregate Premium During Pooling	= PVPoolAggClaims / PVPoolAggPremium	
DJ198	Present Value of Aggregate Premium Less Aggregate Claims as a Percentage of Present Value of Aggregate Premium During Pooling	= PVPoolAggPminusAggC / PVPoolAggPremium	

Interblock Subsidy.xls – IBS DUR pooling Summary

Cells	Description	Formula	Comments
DK198	Present Value of Aggregate Expenses as a Percentage of Present Value of Aggregate Premium During Pooling	= PVPoolAggExp / PVPoolAggPremium	
DM198	Present Value of Aggregate Gain as a Percentage of Present Value of Aggregate Premium During Pooling	= PVPoolAggGain / PVPoolAggPremium	
DP198	Present Value of Aggregate Opportunity Cost of Capital as a Percentage of Present Value of Aggregate Premium During Pooling	= PVPoolAggOCC / PVPoolAggPremium	
DQ198	Present Value of Aggregate Economic Gain as a Percentage of Present Value of Aggregate Premium During Pooling	= PVPoolAggEconGain / PVPoolAggPremium	

Interblock Subsidy.xls – IBS-1D, IBS-2D, IBS-3D, IBS-4D, IBS-5D

Cells	**Description**	**Formula**	**Comments**
D4	Reference Premium (InitRefPrem)	From Global Assumptions!C24	
D5	Initial Reference Claim Cost for Standard Lives ($InitRefClaims_{st}$)	From Global Assumptions!D49	
D6	Initial Reference Claim Cost for Impaired Lives ($InitRefClaims_{im}$)	From Global Assumptions!D60	
B12:B41	Base Lapse Rates for Standard Lives ($Baseq_{x(st)}$)	From the appropriate cell of Global Assumptions!D29:D33	
C12:C41	Base Lapse Rates for Impaired Lives ($Baseq_{x(im)}$)	From Global Assumptions!C54	
D12:D41	Duration Factor (DF_x)	From the appropriate cell of Global Assumptions!B77:B81	
E12:E41	Per Policy Expense Rates ($Exp_{Pol(x)}$)	From the appropriate cell of Global Assumptions!B70:B74	

Interblock Subsidy.xls – IBS-1D, IBS-2D, IBS-3D, IBS-4D, IBS-5D

Cells	**Description**	**Formula**	**Comments**
F12:F41	Percentage-of-Claims Expense Rates ($Exp_{\%C(x)}$)	From the appropriate cell of Global Assumptions!C70:C74	
G12:G41	Base Commission Rates ($Comm_{B(x)}$)	From the appropriate cell of Global Assumptions!D70:D74	
H12:H41	Renewal Commission Rates ($Comm_{R(x)}$)	From the appropriate cell of Global Assumptions!E70:E74	
I12:I41	Other Premium-Related Expense Rates ($Exp_{Oth\%P(x)}$)	From the appropriate cell of Global Assumptions!F70:F74	
J12:J41	Premium Age Factor (PAF_x)	$= \begin{cases} 1, & x = 1 \\ PAF_{x-1} * (1 + PremGrowthAge), & x = 2, 3, 4, \ldots, 30 \end{cases}$ PremGrowthAge is from Global Assumptions!C25	
K12:K41	Rate of Impairment (μ_x)	From the appropriate cell of Global Assumptions!E43:E47	
L12:L41	Durational Rate Increase (DRI_x)	From the appropriate cell of IBS Assump DUR pooling!T19:T48	

Interblock Subsidy.xls – IBS-1D, IBS-2D, IBS-3D, IBS-4D, IBS-5D

Cells	**Description**	**Formula**	**Comments**
O12:O41	Reference Premium ($RefPrem_z$)	= InitRefPrem, z = 1 $RefPrem_{z-1}$ * (1 + $ActTrend_{z-1}$), z = 2, 3, 4, …, 30	
P12:P41	Baseline Sales ($BaseSales_z$)	From the appropriate cell of IBS Assump DUR pooling!C19:G48	
Q12:Q41	Standard Lives Reference Claims ($RefClaims_{z(st)}$)	= $InitRefClaims_{st}$ * $MorbAdj_{b(st)}$, z = 1 $RefClaims_{z-1(st)}$ * (1 + $ActTrend_{z-1}$), z = 2, 3, 4, …, 30 $MorbAdj_{b(st)}$ is from the appropriate cell of IBS Assump DUR pooling!O4, Q4, S4, U4, or W4	
R12:R41	Impaired Lives Reference Claims ($RefClaims_{z(im)}$)	= $InitRefClaims_{im}$ * $MorbAdj_{b(im)}$, z = 1 $RefClaims_{z-1(im)}$ * (1 + $ActTrend_{z-1}$), z = 2, 3, 4, …, 30 $MorbAdj_{b(im)}$ is from the appropriate cell of IBS Assump DUR pooling!P4, R4, T4, V4, or X4	
S12:S41	Actual Trend ($ActTrend_z$)	From the appropriate cell of Global Assumptions!B106:B135	
T13:T41	Implemented Rate Increase for New Business ($ImpRateIncNew_z$)	= min(MaxRateInc, RegDamp * $ReqRateIncNew_z$) MaxRateInc is from Global Assumptions!D100 RegDamp is from the appropriate cell of Global Assumptions!D90:D99, based on the value of $ReqRateIncNew_z$	Formula only applies for z = 2, 3, 4, …, 30

Interblock Subsidy.xls – IBS-1D, IBS-2D, IBS-3D, IBS-4D, IBS-5D

Cells	Description	Formula	Comments
U13:U41	Implemented Rate Increase for Renewal Business ($ImpRateIncRen_z$)	$= ImpRateIncNew_z$	Formula only applies for z = 2, 3, 4, …, 30
V12:V41	Market New Business Rate ($MarketRate_z$)	$= P_{1(pr)}$, z = 1 $MarketRate_{z-1} * (1 + ActTrend_{z-1})$, z = 2, 3, 4, …, 30 $P_{1(pr)}$ is from IBS Assump DUR pooling!V19	
W12:W41	Company New Business Rate ($ComNewBusnRate_z$)	0, $z < IntroYr_b$ or $BaseSales_{z,b} = 0$ = $GlobalComNewBusnRate_z$, $z \geq IntroYr_b$ and $BaseSales_{z,b} \neq 0$ and PoolingDur = 1 $MarketRate_z * (1 – Disc@Intro)$, $BaseSales_{z,b} \neq 0$ and PoolingDur $\neq$ 1 and $z = IntroYr_b$ $ComNewBusnRate_{z-1} * (1 + ImpRateIncNew_z)$, otherwise $IntroYr_b$ is from the appropriate cell of IBS Assump DUR pooling!D11:D15 $BaseSales_{z,b}$ is from the appropriate cell of IBS Assump DUR pooling!C19:G48 PoolingDur is from ABS Assump DUR pooling!E3 $GlobalComNewBusnRate_z$ is from the appropriate cell of IBS DUR pooling Summary!W12:W41 Disc@Intro is from Global Assumptions!D26	

Interblock Subsidy.xls – IBS-1D, IBS-2D, IBS-3D, IBS-4D, IBS-5D

Cells	Description	Formula	Comments
X13:X41	Requested Rate Increase for New Business (ReqRateIncNew$_z$)	= $GlobalReqRateIncNew_z$, $z \geq PoolingDur + IntroYr_b + 1$ $ActTrend_{z-1}$, $z \leq IntroYr_b + 1$ max {0, [$ActualLR_{z-2}$ / $PoolingTLR_{z-2}$ * (1 + $ActTrend_{z-2})^2$ / (1 + $ImpRateIncNew_{z-1}$) – 1], [$ActualLR_{z-2}$ / MaxLR * (1 + $ActTrend_{z-2})^2$ / (1 + $ImpRateIncNew_{z-1}$) – 1]}, otherwise $GlobalReqRateIncNew_z$ is from the appropriate cell of IBS DUR pooling Summary!X13:X41 PoolingDur is from IBS Assump DUR pooling!E3 $IntroYr_b$ is from the appropriate cell of IBS Assump DUR pooling!D11:D15 $PoolingTLR_{z-2}$ is from the appropriate cell of CM-b_TLR!W19:W48, based on projection year, where b is the block number MaxLR is from IBS Assump DUR pooling!M5	Formula only applies for z = 2, 3, 4, …, 30.
X42	Average Requested Rate Increase for New Business Prior to Pooling	= average($ReqRateIncNew_z$), where the average is taken over z = $IntroYr_b$, $IntroYr_b$ + 1, $IntroYr_b$ + 2, …, $IntroYr_b$ + PoolingDur – 3, $IntroYr_b$ + PoolingDur – 2, $IntroYr_b$ + PoolingDur – 1 $IntroYr_b$ is from the appropriate cell of IBS Assump DUR pooling!D11:D15 PoolingDur is from IBS Assump DUR pooling!E3	

Interblock Subsidy.xls – IBS-1D, IBS-2D, IBS-3D, IBS-4D, IBS-5D

Cells	**Description**	**Formula**	**Comments**
X43	Minimum Requested Rate Increase for New Business Prior to Pooling	= min($ReqRateIncNew_z$), where the minimum is taken over z = $IntroYr_b$, $IntroYr_b$ + 1, $IntroYr_b$ + 2, …, $IntroYr_b$ + PoolingDur – 3, $IntroYr_b$ + PoolingDur – 2, $IntroYr_b$ + PoolingDur – 1 $IntroYr_b$ is from the appropriate cell of IBS Assump DUR pooling!D11:D15 PoolingDur is from IBS Assump DUR pooling!E3	
X44	Maximum Requested Rate Increase for New Business Prior to Pooling	= max($ReqRateIncNew_z$), where the maximum is taken over z = $IntroYr_b$, $IntroYr_b$ + 1, $IntroYr_b$ + 2, …, $IntroYr_b$ + PoolingDur – 3, $IntroYr_b$ + PoolingDur – 2, $IntroYr_b$ + PoolingDur – 1 $IntroYr_b$ is from the appropriate cell of IBS Assump DUR pooling!D11:D15 PoolingDur is from IBS Assump DUR pooling!E3	
Y13:Y41	Requested Rate Increase for Renewal Business ($ReqRateIncRen_z$)	= $ReqRateIncNew_z$, z < PoolingDur + $IntroYr_b$ + 1 $GlobalReqRateIncRen_z$, z ≥ PoolingDur + $IntroYr_b$ + 1 PoolingDur is from IBS Assump DUR pooling!E3 $IntroYr_b$ is from the appropriate cell of IBS Assump DUR pooling!D11:D15 $GlobalReqRateIncRen_z$ is from the appropriate cell of IBS DUR pooling Summary!Y13:Y41	Formula only applies for z = 2, 3, 4, …, 30.

Interblock Subsidy.xls – IBS-1D, IBS-2D, IBS-3D, IBS-4D, IBS-5D

Cells	Description	Formula	Comments
AB12:AU41	New Business Sales by Cohort ($NewSales_{z,y}$)	$$= \begin{cases} 0, & x \neq 1 \\ \max \{0, BaseSales_z * [1 + MktPriceSens * ((MarketRate_z / RefPrem_z) - 1)] * [1 + ComPriceSens * ((ComNewBusnRate_z / MarketRate_z) - 1)]\}, & \text{otherwise} \end{cases}$$ MktPriceSens is from Global Assumptions!D14 ComPriceSens is from Global Assumptions!D15	
AB42:AU42	Total New Business Sales for Issue Year y	$= \sum_{z=1}^{30} NewSales_{z,y}$	

Interblock Subsidy.xls – IBS-1D, IBS-2D, IBS-3D, IBS-4D, IBS-5D

Cells	Description	Formula	Comments
AX12:BQ41	Actual Lapse Rates for Standard Lives by Cohort ($q_{z,y(st)}$)	= 0, $\quad x \le 1$ or $BaseSales_y = 0$ $\max\{q_{min(st)}, \min[q_{max(st)}, Baseq_{x-1(st)} + ((AgeAdjPremRate_{z,y} / AgeAdjPremRate_{z-1,y}) - 1 - ActTrend_z) * LapseAdjTrend_{st} * (((AgeAdjPremRate_{z,y} / AgeAdjMktNewBusnRate_{z,y}) - 1) * LapseAdjMkt_{st} + 1) - (((ComNewBusnRate_y / RefPrem_y) - 1) * LapseAdjSale_{st})]\}$, $\quad x = 2, 3,$ or 4 and $BaseSales_y \neq 0$ $\max\{q_{min(st)}, \min[q_{max(st)}, Baseq_{x-1(st)} + ((AgeAdjPremRate_{z,y} / AgeAdjPremRate_{z-1,y}) - 1 - ActTrend_z) * LapseAdjTrend_{st} * (((AgeAdjPremRate_{z,y} / AgeAdjMktNewBusnRate_{z,y}) - 1) * LapseAdjMkt_{st} + 1)]\}$, $\quad$ otherwise $q_{min(st)}$ is from Global Assumptions!D40 $q_{max(st)}$ is from Global Assumptions!D39 $LapseAdjTrend_{st}$ is from Global Assumptions!D36 $LapseAdjMkt_{st}$ is from Global Assumptions!D37 $LapseAdjSale_{st}$ is from Global Assumptions!D38	
BT12:CM41	Newly Impaired Lives by Cohort ($NewImpLives_{z,y}$)	= 0, $\quad x \le 1$ $l_{z-1,y(st)} * \mu_{x-1} * (1 - q_{z,y(im)})$, $\quad x > 1$	
BT42:CM42	Total Number of Newly Impaired Lives for Issue Year y	$= \sum_{z=1}^{30} NewImpLives_{z,y}$	

Interblock Subsidy.xls – IBS-1D, IBS-2D, IBS-3D, IBS-4D, IBS-5D

Cells	Description	Formula	Comments
AB51:AU80	Enrollment of Standard Lives by Cohort ($l_{z,y(st)}$)	$= \begin{cases} 0, & x < 1 \\ NewSales_{z,y}, & x = 1 \\ NewSales_{z,y} + l_{z-1,y(st)} * (1 - \mu_{x-1}) * (1 - q_{z,y(st)}), & x > 1 \end{cases}$	
AB81:AU81	Total Enrollment of Standard Lives by Issue Year	$= \sum_{z=1}^{30} l_{z,y(st)}$	
AX51:BQ80	Actual Lapse Rates for Impaired Lives by Cohort ($q_{z,y(im)}$)	$= \begin{cases} 0, & x \leq 1 \text{ or } BaseSales_y = 0 \\ \max\{q_{min(im)}, \min[q_{max(im)}, Baseq_{x-1(im)} + ((AgeAdjPremRate_{z,y} / AgeAdjPremRate_{z-1,y}) - 1 - ActTrend_z) * LapseAdjTrend_{im}]\}, & \text{otherwise} \end{cases}$ $q_{min(im)}$ is from Global Assumptions!D58 $q_{max(im)}$ is from Global Assumptions!D57 $LapseAdjTrend_{im}$ is from Global Assumptions!D56	
BT51:CM80	Actual Combined Lapse Rates by Cohort ($q_{z,y}$)	$= \begin{cases} 0, & l_{z,y(st)} + l_{z,y(im)} = 0 \\ [(l_{z,y(st)} * q_{z,y(st)}) + (l_{z,y(im)} * q_{z,y(im)})] / (l_{z,y(st)} + l_{z,y(im)}), & \text{otherwise} \end{cases}$	
AB89:AU118	Enrollment of Impaired Lives by Cohort ($l_{z,y(im)}$)	$= \begin{cases} 0, & x \leq 1 \\ NewImpLives_{z,y} + [l_{z-1,y(im)} * (1 - q_{z,y(im)})], & x > 1 \end{cases}$	

Interblock Subsidy.xls – IBS-1D, IBS-2D, IBS-3D, IBS-4D, IBS-5D

Cells	Description	Formula	Comments
AB119:AU119	Total Enrollment of Impaired Lives by Issue Year	$= \sum_{z=1}^{30} l_{z,y(im)}$	
AX89:BQ118	Premium Rates Before Age Adjustment by Cohort ($DurAdjPremRate_{z,y}$)	$= \begin{cases} 0, & x < 1 \\ ComNewBusnRate_z, & x = 1 \\ DurAdjPremRate_{z-1,y} * (1 + ImpRateIncRen_z) * (1 + DRI_x), & x > 1 \end{cases}$	
BT89:CM118	Premium Rates After Age Adjustment by Cohort ($AgeAdjPremRate_{z,y}$)	$= DurAdjPremRate_{z,y} * PAF_x$	
AB126:AU155	Age-Adjusted Market-Level New Business Premium Rates by Cohort ($AgeAdjMktNewBusnRate_{z,y}$)	$= \begin{cases} 0, & x < 1 \\ MarketRate_z * PAF_x, & \text{otherwise} \end{cases}$	

Interblock Subsidy.xls – IBS-1D, IBS-2D, IBS-3D, IBS-4D, IBS-5D

Cells	Description	Formula	Comments
AX126:BQ155	Standard Lives Claim Levels by Cohort ($C_{z,y(st)}$)	= 0, $x < 1$ $RefClaims_{z(st)} * DF_x * \{1 + [(ComNewBusnRate_y / RefPrem_y) - 1] * MorbAdj_{st}\}$, $x = 1$ $C_{z-1,y(st)} * DF_x / DF_{x-1} * (1 + ActTrend_{z-1}) * (1 + AgingTrend)$, otherwise $MorbAdj_{st}$ is from Global Assumptions!D51 AgingTrend is from Global Assumptions!C22	
BT126:CM155	Impaired Lives Claim Levels by Cohort ($C_{z,y(im)}$)	= 0, $x < 1$ $RefClaims_{z(im)}$, $x = 1$ $C_{z-1,y(im)} * (1 + ActTrend_{z-1}) * (1 + AgingTrend)$, $x > 1$ AgingTrend is from Global Assumptions!C22	
AB164:AU193	Standard Lives Expense Levels by Cohort ($Exp_{z,y(st)}$)	= 0, $x < 1$ $Exp_{Pol(x)} * (1 + Inflation)^{z-1}$ $+ C_{z,y(st)} * Exp_{\%C(x)}$ $+ ComNewBusnRate_y * Comm_{B(x)}$ $+ (AgeAdjPremRate_{z,y} - ComNewBusnRate_y) * Comm_{R(x)}$ $+ AgeAdjPremRate_{z,y} * Exp_{Oth\%P(x)}$, $x \geq 1$ Inflation is from Global Assumptions!B64	

Interblock Subsidy.xls – IBS-1D, IBS-2D, IBS-3D, IBS-4D, IBS-5D

Cells	**Description**	**Formula**	**Comments**
AX164:BQ193	Impaired Lives Expense Levels by Cohort ($Exp_{z,y(im)}$)	$= \begin{cases} 0, & x < 1 \\ Exp_{Pol(x)} * (1 + Inflation)^{z-1} + C_{z,y(im)} * Exp_{\%C(x)} + ComNewBusnRate_{y} * Comm_{B(x)} + (AgeAdjPremRate_{z,y} - ComNewBusnRate_{y}) * Comm_{R(x)} + AgeAdjPremRate_{z,y} * Exp_{Oth\%P(x)}, & x \geq 1 \end{cases}$ Inflation is from Global Assumptions!B64	
BT164:CM193	Average Expense Levels by Cohort ($Exp_{z,y}$)	$= \begin{cases} 0, & l_{z,y(st)} + l_{z,y(im)} = 0 \\ [(l_{z,y(st)} * Exp_{z,y(st)}) + (l_{z,y(im)} * Exp_{z,y(im)})] / (l_{z,y(st)} + l_{z,y(im)}), & \text{otherwise} \end{cases}$	
CP164:CP193	Standard Lives Enrollment by Projection Year ($l_{z(st)}$)	$= \sum_{y=1}^{20} l_{z,y(st)}$	
CP194	Total Standard Lives Exposure	$= \sum_{z=1}^{30} l_{z(st)}$	"Total" refers to the sum over all 30 projection years.
CQ164:CQ193	Standard Lives Premium by Projection Year ($P_{z(st)}$)	$= \sum_{y=1}^{20} l_{z,y(st)} * AgeAdjPremRate_{z,y} * 12$	

Interblock Subsidy.xls – IBS-1D, IBS-2D, IBS-3D, IBS-4D, IBS-5D

Cells	Description	Formula	Comments
CQ194	Total Standard Lives Premium (P_{st})	$= \sum_{z=1}^{30} P_{z(st)}$	
CR164:CR193	Standard Lives Claims by Projection Year ($C_{z(st)}$)	$= \sum_{y=1}^{20} l_{z,y(st)} * C_{z,y(st)} * 12$	
CR194	Total Standard Lives Claims (C_{st})	$= \sum_{z=1}^{30} C_{z(st)}$	
CS164:CS193	Standard Lives Loss Ratio by Projection Year	$= \begin{cases} 0, & P_{z(st)} = 0 \\ C_{z(st)} / P_{z(st)}, & P_{z(st)} \neq 0 \end{cases}$	
CS194	Standard Lives Loss Ratio	$= C_{st} / P_{st}$	
CV164:CV193	Impaired Lives Enrollment by Projection Year ($l_{z(im)}$)	$= \sum_{y=1}^{20} l_{z,y(im)}$	
CV194	Total Impaired Lives Exposure	$= \sum_{z=1}^{30} l_{z(im)}$	

Interblock Subsidy.xls – IBS-1D, IBS-2D, IBS-3D, IBS-4D, IBS-5D

Cells	**Description**	**Formula**	**Comments**
CW164:CW193	Impaired Lives Premium by Projection Year ($P_{z(im)}$)	$= \sum_{y=1}^{20} l_{z,y(im)} * AgeAdjPremRate_{z,y} * 12$	
CW194	Total Impaired Lives Premium (P_{im})	$= \sum_{z=1}^{30} P_{z(im)}$	
CX164:CX193	Impaired Lives Claims by Projection Year ($C_{z(im)}$)	$= \sum_{y=1}^{20} l_{z,y(im)} * C_{z,y(im)} * 12$	
CX194	Total Impaired Lives Claims (C_{im})	$= \sum_{z=1}^{30} C_{z(im)}$	
CY165:CY193	Impaired Lives Loss Ratio by Projection Year	$= \begin{cases} 0, & P_{z(im)} = 0 \\ C_{z(im)} / P_{z(im)}, & P_{z(im)} \neq 0 \end{cases}$	
CY194	Impaired Lives Loss Ratio	$= C_{im} / P_{im}$	
DG159	Trend Scenario	From Global Assumptions!G102	
DK159	Pooling Duration	From IBS Assump CY pooling!E3	Should be from IBS Assump DUR pooling but is not used anyway.

Interblock Subsidy.xls – IBS-1D, IBS-2D, IBS-3D, IBS-4D, IBS-5D

Cells	**Description**	**Formula**	**Comments**
DA164:DA193	Combined Enrollment by Projection Year (l_z)	$= l_{z(st)} + l_{z(im)}$	"Combined" refers to the combination of standard and impaired.
DA194	Total Combined Exposure (l)	$= \sum_{z=1}^{30} l_z$	
DB164:DB193	Combined Premium by Projection Year (P_z)	$= P_{z(st)} + P_{z(im)}$	
DB194	Total Combined Premium (P)	$= \sum_{z=1}^{30} P_z$	
DC164:DC193	Total Combined Premium PMPM	$= \begin{cases} 0, & l_z = 0 \\ P_z / l_z / 12, & l_z \neq 0 \end{cases}$	
DD164:DD193	Combined Claims by Projection Year (C_z)	$= C_{z(st)} + C_{z(im)}$	
DD194	Total Combined Claims (C)	$= \sum_{z=1}^{30} C_z$	

Interblock Subsidy.xls – IBS-1D, IBS-2D, IBS-3D, IBS-4D, IBS-5D

Cells	Description	Formula	Comments
DE164:DE193	Combined Claims PMPM by Projection Year	$= \begin{cases} 0, & l_z = 0 \\ C_z / l_z / 12, & l_z \neq 0 \end{cases}$	
DE194	Total Combined Claims PMPM	$= \begin{cases} 0, & l = 0 \\ C / l / 12, & l \neq 0 \end{cases}$	
DF164:DF193	Combined Loss Ratio by Projection Year (ActualLR_z)	$= \begin{cases} 0, & P_z = 0 \\ C_z / P_z, & P_z \neq 0 \end{cases}$	
DF194	Total Combined Loss Ratio	$= \begin{cases} 0, & P = 0 \\ C / P, & P \neq 0 \end{cases}$	
DG164:DG193	Combined Expected Loss Ratio by Projection Year (ExpectedLR_z)	From the appropriate cell of CM-b_TLR!W19:W48, based on projection year, where b is the block number	The formula in IBS-2D is in error; the formulas in the other tabs are correct.
DH164:DH193	Actual-to-Expected Combined Loss Ratio by Projection Year	$= \begin{cases} 0, & P_z = 0 \\ \text{ActualLR}_z / \text{ExpectedLR}_z, & P_z \neq 0 \end{cases}$	
DI164:DI193	Rolling Two-Year Combined Loss Ratio by Projection Year	$= \begin{cases} C_z / P_z, & z = 1 \\ (C_{z-1} + C_z) / (P_{z-1} + P_z), & z = 2, 3, 4, \ldots, 30 \end{cases}$	Produces #DIV/0! errors for projection years prior to the introduction year of the block.

Interblock Subsidy.xls – IBS-1D, IBS-2D, IBS-3D, IBS-4D, IBS-5D

Cells	Description	Formula	Comments
DJ164:DJ193	Combined Premium Less Claims by Projection Year ($PminusC_z$)	$= P_z - C_z$	
DJ194	Total Combined Premium Less Claims	$= P - C$	
DK164:DK193	Combined Expenses by Projection Year (Exp_z)	$= 12 * [\sum_{y=1}^{20} (l_{z,y(st)} * Exp_{z,y(st)}) + \sum_{y=1}^{20} (l_{z,y(im)} * Exp_{z,y(im)})]$	
DK194	Total Combined Expenses (Exp)	$= \sum_{z=1}^{30} Exp_z$	
DL164:DL193	Combined Expense Ratio by Projection Year	$= \begin{cases} 0, & P_z = 0 \\ Exp_z / P_z, & P_z \neq 0 \end{cases}$	
DL194	Total Combined Expense Ratio	$= \begin{cases} 0, & P = 0 \\ Exp / P, & P \neq 0 \end{cases}$	
DM164:DM193	Combined Gain by Projection Year ($Gain_z$)	$= P_z - C_z - Exp_z$	
DM194	Total Combined Gain ($Gain$)	$= \sum_{z=1}^{30} Gain_z$	

Interblock Subsidy.xls – IBS-1D, IBS-2D, IBS-3D, IBS-4D, IBS-5D

Cells	Description	Formula	Comments
DN164:DN193	Combined Gain as a Percentage of Combined Premium by Projection Year	$= \begin{cases} 0, & P_z = 0 \\ Gain_z / P_z, & P_z \neq 0 \end{cases}$	
DN194	Total Combined Gain as a Percentage of Combined Premium	$= \begin{cases} 0, & P = 0 \\ Gain / P, & P \neq 0 \end{cases}$	
DO164:DO193	Risk-Based Capital by Projection Year (RBC_z)	$= P_z * RBC\%$ RBC% is from Global Assumptions!D83	Uses a predefined percentage of premium as a proxy for risk-based capital requirement.
DP164:DP193	Opportunity Cost of Capital by Projection Year (OCC_z)	$= -RBC_z * OCC\%$ OCC% is from Global Assumptions!D84	
DP194	Total Opportunity Cost of Capital	$= \sum_{z=1}^{30} OCC_z$	
DQ164:DQ193	Economic Gain by Projection Year ($EconGain_z$)	$= Gain_z + OCC_z$	

Interblock Subsidy.xls – IBS-1D, IBS-2D, IBS-3D, IBS-4D, IBS-5D

Cells	Description	Formula	Comments
DQ194	Total Economic Gain	$= \sum_{z=1}^{30} EconGain_z$	
DR164:DR193	Market New Business Rate	$= MarketRate_z$	These are just copies of values calculated elsewhere in this tab. They are copied here for convenience only.
DS164:DS193	Company New Business Rate	$= ComNewBusnRate_z$	
DT164:DT193	Implemented Rate Increase for New Business	$= ImpRateIncNew_z$	
DU164:DU193	Implemented Rate Increase for Renewal Business	$= ImpRateIncRen_z$	
DV164:DV183	New Business Sales	$= NewSales_{z,z}$	Formula applies only for z = 1, 2, 3, …, 20.
DB197	Present Value of Combined Premium (PVPremium)	$= NPV_{int}\ (P_z) * \sqrt{1+int}$	All present values in this section are taken over all 30 projection years, and int is from Global Assumptions!B63.

Interblock Subsidy.xls – IBS-1D, IBS-2D, IBS-3D, IBS-4D, IBS-5D

Cells	**Description**	**Formula**	**Comments**
DD197	Present Value of Combined Claims (PVClaims)	$= NPV_{int} (C_z) * \sqrt{1+int}$	
DJ197	Present Value of Combined Premium Less Combined Claims (PVPminusC)	$= NPV_{int} (PminusC_z) * \sqrt{1+int}$	
DK197	Present Value of Combined Expenses (PVExp)	$= NPV_{int} (Exp_z) * \sqrt{1+int}$	
DM197	Present Value of Combined Gain (PVGain)	$= NPV_{int} (Gain_z) * \sqrt{1+int}$	
DP197	Present Value of Opportunity Cost of Capital (PVOCC)	$= NPV_{int} (OCC_z) * \sqrt{1+int}$	
DQ197	Present Value of Economic Gain (PVEconGain)	$= NPV_{int} (EconGain_z) * \sqrt{1+int}$	

Interblock Subsidy.xls – IBS-1D, IBS-2D, IBS-3D, IBS-4D, IBS-5D

Cells	**Description**	**Formula**	**Comments**
DB198	Present Value of Combined Premium as a Percentage of Present Value of Combined Premium	= PVPremium / PVPremium	Identically equal to 100.0%.
DD198	Present Value of Combined Claims as a Percentage of Present Value of Combined Premium	= PVClaims / PVPremium	
DJ198	Present Value of Combined Premium Less Combined Claims as a Percentage of Present Value of Combined Premium	= PVPminusC / PVPremium	
DK198	Present Value of Combined Expenses as a Percentage of Present Value of Combined Premium	= PVExp / PVPremium	
DM198	Present Value of Combined Gain as a Percentage of Present Value of Combined Premium	= PVGain / PVPremium	

Interblock Subsidy.xls – IBS-1D, IBS-2D, IBS-3D, IBS-4D, IBS-5D

Cells	Description	Formula	Comments
DP198	Present Value of Opportunity Cost of Capital as a Percentage of Present Value of Combined Premium	= PVOCC / PVPremium	
DQ198	Present Value of Economic Gain as a Percentage of Present Value of Combined Premium	= PVEconGain / PVPremium	
BT206:CM235	Duration Identification ($DurID_{z,y}$)	= max(x, 0)	
BT246:CM275	Duration Use Indicator ($DurFlag_{z,y}$)	= 0, x < 1 or (x ≥ 1 and $DurID_{z,y}$ > PoolingDur) 1, otherwise	
CP246:CP275	Standard Lives Enrollment by Projection Year Prior to Pooling ($l_{z(st,pre)}$)	$= \sum_{y=1}^{20} l_{z,y(st)} * DurFlag_{z,y}$	Subscript "pre" denotes that the variable reflects only durations earlier than PoolingDur.
CP276	Total Standard Lives Exposure Year Prior to Pooling ($l_{st,pre}$)	$= \sum_{z=1}^{30} l_{z(st,pre)}$	“Total” refers to the sum over all 30 projection years.

Interblock Subsidy.xls – IBS-1D, IBS-2D, IBS-3D, IBS-4D, IBS-5D

Cells	Description	Formula	Comments
CQ246:CQ275	Standard Lives Premium by Projection Year Prior to Pooling ($P_{z(st,pre)}$)	$= \sum_{y=1}^{20} l_{z,y(st)} * AgeAdjPremRate_{z,y} * DurFlag_{z,y} * 12$	
CQ276	Total Standard Lives Premium Year Prior to Pooling ($P_{st,pre}$)	$= \sum_{z=1}^{30} P_{z(st,pre)}$	
CR246:CR275	Standard Lives Claims by Projection Year Prior to Pooling ($C_{z(st,pre)}$)	$= \sum_{y=1}^{20} l_{z,y(st)} * C_{z,y(st)} * DurFlag_{z,y} * 12$	
CR276	Total Standard Lives Claims ($C_{st,pre}$)	$= \sum_{z=1}^{30} C_{z(st,pre)}$	
CS246:CS275	Standard Lives Loss Ratio by Projection Year Prior to Pooling	$= \begin{cases} 0, & P_{z(st,pre)} = 0 \\ C_{z(st,pre)} / P_{z(st,pre)}, & P_{z(st,pre)} \neq 0 \end{cases}$	
CS276	Standard Lives Loss Ratio Prior to Pooling	$= \begin{cases} 0, & P_{st,pre} = 0 \\ C_{st,pre} / P_{st,pre}, & P_{st,pre} \neq 0 \end{cases}$	

Interblock Subsidy.xls – IBS-1D, IBS-2D, IBS-3D, IBS-4D, IBS-5D

Cells	Description	Formula	Comments
CV246:CV275	Impaired Lives Enrollment by Projection Year Prior to Pooling ($l_{z(im,pre)}$)	$= \sum_{y=1}^{20} l_{z,y(im)} * DurFlag_{z,y}$	
CV276	Total Impaired Lives Exposure Year Prior to Pooling	$= \sum_{z=1}^{30} l_{z(im,pre)}$	
CW246:CW275	Impaired Lives Premium by Projection Year Prior to Pooling ($P_{z(im,pre)}$)	$= \sum_{y=1}^{20} l_{z,y(im)} * AgeAdjPremRate_{z,y} * DurFlag_{z,y} * 12$	
CW276	Total Impaired Lives Premium Year Prior to Pooling ($P_{im,pre}$)	$= \sum_{z=1}^{30} P_{z(im,pre)}$	
CX246:CX275	Impaired Lives Claims by Projection Year Prior to Pooling ($C_{z(im,pre)}$)	$= \sum_{y=1}^{20} l_{z,y(im)} * C_{z,y(im)} * DurFlag_{z,y} * 12$	
CX276	Total Impaired Lives Claims Year Prior to Pooling ($C_{im,pre}$)	$= \sum_{z=1}^{30} C_{z(im,pre)}$	

Interblock Subsidy.xls – IBS-1D, IBS-2D, IBS-3D, IBS-4D, IBS-5D

Cells	Description	Formula	Comments
CY246:CY275	Impaired Lives Loss Ratio by Projection Year Prior to Pooling	$= \begin{cases} 0, & P_{z(im,pre)} = 0 \\ C_{z(im,pre)} / P_{z(im,pre)}, & P_{z(im,pre)} \neq 0 \end{cases}$	
CY276	Impaired Lives Loss Ratio Prior to Pooling	$= \begin{cases} 0, & P_{im,pre} = 0 \\ C_{im,pre} / P_{im,pre}, & P_{im,pre} \neq 0 \end{cases}$	
DH241	Trend Scenario	From Global Assumptions!G102	
DL241	Pooling Year (PoolingDur)	From IBS Assump DUR pooling!E3	
DA246:DA275	Combined Enrollment by Projection Year Prior to Pooling ($l_{z,pre}$)	$= l_{z(st,pre)} + l_{z(im,pre)}$	"Combined" refers to the combination of standard and impaired.
DA275	Total Combined Exposure Prior to Pooling (l_{pre})	$= \sum_{z=1}^{30} l_{z,pre}$	
DB246:DB275	Combined Premium by Projection Year Prior to Pooling ($P_{z,pre}$)	$= P_{z(st,pre)} + P_{z(im,pre)}$	

Interblock Subsidy.xls – IBS-1D, IBS-2D, IBS-3D, IBS-4D, IBS-5D

Cells	Description	Formula	Comments
DB276	Total Combined Premium Prior to Pooling (P_{pre})	$= \sum_{z=1}^{30} P_{z,pre}$	
DC246:DC275	Combined Premium PMPM by Projection Year Prior to Pooling	$= \begin{cases} 0, & P_{z,pre} = 0 \\ P_{z,pre} / l_{z,pre} / 12, & P_{z,pre} \neq 0 \end{cases}$	
DC276	Total Combined Premium PMPM Prior to Pooling	$= \begin{cases} 0, & P_{pre} = 0 \\ P_{pre} / l_{pre} / 12, & P_{pre} \neq 0 \end{cases}$	
DD246:DD275	Combined Claims by Projection Year Prior to Pooling ($C_{z,pre}$)	$= C_{z(st,pre)} + C_{z(im,pre)}$	
DD276	Total Combined Claims Prior to Pooling (C_{pre})	$= \sum_{z=1}^{30} C_{z,pre}$	
DE246:DE275	Combined Claims PMPM by Projection Year Prior to Pooling	$= \begin{cases} 0, & l_{z,pre} = 0 \\ C_{z,pre} / l_{z,pre} / 12, & l_{z,pre} \neq 0 \end{cases}$	
DE276	Total Combined Claims PMPM Prior to Pooling	$= \begin{cases} 0, & l_{pre} = 0 \\ C_{pre} / l_{pre} / 12, & l_{pre} \neq 0 \end{cases}$	

Interblock Subsidy.xls – IBS-1D, IBS-2D, IBS-3D, IBS-4D, IBS-5D

Cells	Description	Formula	Comments
DF246:DF275	Combined Loss Ratio by Projection Year Prior to Pooling ($ActualLR_{z,pre}$)	= 0, $P_{z,pre} = 0$ $C_{z,pre} / P_{z,pre}$, $P_{z,pre} \neq 0$	
DF276	Total Combined Loss Ratio Prior to Pooling	= 0, $P_{pre} = 0$ C_{pre} / P_{pre}, $P_{pre} \neq 0$	
DG246:DG275	Combined Expected Loss Ratio by Projection Year Prior to Pooling ($ExpectedLR_{z,pre}$)	From the appropriate cell of CM-b_TLR!W19:W48, based on projection year, where b is the block number	
DH246:DH275	Actual-to-Expected Combined Loss Ratio by Projection Year Prior to Pooling	= 0, $P_{z,pre} = 0$ $ActualLR_{z,pre} / ExpectedLR_{z,pre}$, $P_{z,pre} \neq 0$	
DI246:DI275	Rolling Two-Year Combined Loss Ratio by Projection Year Prior to Pooling	0, $(z = 1 \text{ and } P_{1,pre} = 0) \text{ or } (z > 1 \text{ and } P_{z-1,pre} + P_{z,pre}) = 0$ = $C_{z,pre} / P_{z,pre}$, $z = 1 \text{ and } P_{1,pre} \neq 0$ $(C_{z-1,pre} + C_{z,pre}) / (P_{z-1,pre} + P_{z,pre})$, otherwise	
DJ246:DJ275	Combined Premium Less Claims by Projection Year Prior to Pooling ($PminusC_{z,pre}$)	$= P_{z,pre} - C_{z,pre}$	

Interblock Subsidy.xls – IBS-1D, IBS-2D, IBS-3D, IBS-4D, IBS-5D

Cells	Description	Formula	Comments
DJ276	Total Combined Premium Less Claims Prior to Pooling	$= P_{pre} - C_{pre}$	
DK246:DK275	Combined Expenses by Projection Year Prior to Pooling ($Exp_{z,pre}$)	$= 12 * [\sum_{i=1}^{20} (l_{z,i(st)} * Exp_{z,i(st)} * DurFlag_{z,i}) + \sum_{j=1}^{20} (l_{z,j(im)} * Exp_{z,j(im)} * DurFlag_{z,j})]$	
DK276	Total Combined Expenses Prior to Pooling (Exp_{pre})	$= \sum_{z=1}^{30} Exp_{z,pre}$	
DL246:DL275	Combined Expense Ratio by Projection Year Prior to Pooling	$= \begin{cases} 0, & P_{z,pre} = 0 \\ Exp_{z,pre} / P_{z,pre}, & P_{z,pre} \neq 0 \end{cases}$	
DL276	Total Combined Expense Ratio Prior to Pooling	$= \begin{cases} 0, & P_{pre} = 0 \\ Exp_{pre} / P_{pre}, & P_{pre} \neq 0 \end{cases}$	
DM246:DM275	Combined Gain by Projection Year Prior to Pooling ($Gain_{z,pre}$)	$= P_{z,pre} - C_{z,pre} - Exp_{z,pre}$	

Interblock Subsidy.xls – IBS-1D, IBS-2D, IBS-3D, IBS-4D, IBS-5D

Cells	Description	Formula	Comments
DM276	Total Combined Gain Prior to Pooling ($Gain_{pre}$)	$= \sum_{z=1}^{30} Gain_{z,pre}$	
DN246:DN275	Combined Gain as a Percentage of Combined Premium by Projection Year Prior to Pooling	$= \begin{cases} 0, & P_{z,pre} = 0 \\ Gain_{z,pre} / P_{z,pre}, & P_{z,pre} \neq 0 \end{cases}$	
DN276	Total Combined Gain as a Percentage of Combined Premium Prior to Pooling	$= \begin{cases} 0, & P_{pre} = 0 \\ Gain_{pre} / P_{pre}, & P_{pre} \neq 0 \end{cases}$	
DO246:DO275	Risk-Based Capital by Projection Year Prior to Pooling ($RBC_{z,pre}$)	$= P_{z,pre}$ * RBC% RBC% is from Global Assumptions!D83	Uses a predefined percentage of premium as a proxy for risk-based capital requirement.
DP246:DP275	Opportunity Cost of Capital by Projection Year Prior to Pooling ($OCC_{z,pre}$)	$= -RBC_{z,pre}$ * OCC% OCC% is from Global Assumptions!D84	
DP276	Total Opportunity Cost of Capital Prior to Pooling	$= \sum_{z=1}^{30} OCC_{z,pre}$	

Interblock Subsidy.xls – IBS-1D, IBS-2D, IBS-3D, IBS-4D, IBS-5D

Cells	**Description**	**Formula**	**Comments**
DQ246:DQ275	Economic Gain by Projection Year Prior to Pooling ($EconGain_{z,pre}$)	$= Gain_{z,pre} + OCC_{z,pre}$	
DQ276	Total Economic Gain Prior to Pooling	$= \sum_{z=1}^{30} EconGain_{z,pre}$	
DR246:DR275	Market New Business Rate	$= MarketRate_z$	These are just copies of values calculated elsewhere in this tab. They are copied here for convenience only.
DS246:DS275	Company New Business Rate	$= ComNewBusnRate_z$	
DT246:DT275	Implemented Rate Increase for New Business	$= ImpRateIncNew_z$	
DT276	Average Implemented Rate Increase for New Business Prior to Pooling	= average($ImpRateIncNew_z$), where the average is taken over z = $IntroYr_b$ + 1, $IntroYr_b$ + 2, $IntroYr_b$ + 3, …, $IntroYr_b$ + PoolingDur – 2, $IntroYr_b$ + PoolingDur – 1, $IntroYr_b$ + PoolingDur $IntroYr_b$ is pulled from the appropriate cell of IBS Assump DUR pooling!D11:D15 PoolingDur is from IBS Assump DUR pooling!E3	

Interblock Subsidy.xls – IBS-1D, IBS-2D, IBS-3D, IBS-4D, IBS-5D

Cells	Description	Formula	Comments
DS277	Minimum Implemented Rate Increase for New Business Prior to Pooling ($MinRI_b$)	= min($ImpRateIncNew_z$), where the minimum is taken over z = $IntroYr_b$ + 1, $IntroYr_b$ + 2, $IntroYr_b$ + 3, …, $IntroYr_b$ + PoolingDur – 2, $IntroYr_b$ + PoolingDur – 1, $IntroYr_b$ + PoolingDur $IntroYr_b$ is from the appropriate cell of IBS Assump DUR pooling!D11:D15 PoolingDur is from IBS Assump DUR pooling!E3	
DS278	Maximum Implemented Rate Increase for New Business Prior to Pooling ($MaxRI_b$)	= max($ImpRateIncNew_z$), where the maximum is taken over z = $IntroYr_b$ + 1, $IntroYr_b$ + 2, $IntroYr_b$ + 3, …, $IntroYr_b$ + PoolingDur – 2, $IntroYr_b$ + PoolingDur – 1, $IntroYr_b$ + PoolingDur $IntroYr_b$ is from the appropriate cell of IBS Assump DUR pooling!D11:D15 PoolingDur is from IBS Assump DUR pooling!E3	
DU246:DU275	Implemented Rate Increase for Renewal Business	= $ImpRateIncRen_z$	
DV246:DV265	New Business Sales	= $NewSales_{z,z}$	Formula only applies for z = 1, 2, 3, …, 20.
DB279	Present Value of Combined Premium Prior to Pooling ($PVPremium_{pre}$)	= NPV_{int} ($P_{z,pre}$) * $\sqrt{1+\text{int}}$	All present values in this section are taken over all 30 projection years, and int is from Global Assumptions!B63.

Interblock Subsidy.xls – IBS-1D, IBS-2D, IBS-3D, IBS-4D, IBS-5D

Cells	**Description**	**Formula**	**Comments**
DD279	Present Value of Combined Claims Prior to Pooling ($PVClaims_{pre}$)	$= NPV_{int} (C_{z,pre}) * \sqrt{1+int}$	
DJ279	Present Value of Combined Premium Less Combined Claims Prior to Pooling ($PVPminusC_{pre}$)	$= NPV_{int} (PminusC_{z,pre}) * \sqrt{1+int}$	
DK279	Present Value of Combined Expenses Prior to Pooling ($PVExp_{pre}$)	$= NPV_{int} (Exp_{z,pre}) * \sqrt{1+int}$	
DM279	Present Value of Combined Gain Prior to Pooling ($PVGain_{pre}$)	$= NPV_{int} (Gain_{z,pre}) * \sqrt{1+int}$	
DP279	Present Value of Opportunity Cost of Capital Prior to Pooling ($PVOCC_{pre}$)	$= NPV_{int} (OCC_{z,pre}) * \sqrt{1+int}$	
DQ279	Present Value of Economic Gain ($PVEconGain_{pre}$)	$= NPV_{int} (EconGain_{z,pre}) * \sqrt{1+int}$	

Interblock Subsidy.xls – IBS-1D, IBS-2D, IBS-3D, IBS-4D, IBS-5D

Cells	Description	Formula	Comments
DB280	Present Value of Combined Premium Prior to Pooling as a Percentage of Present Value of Combined Premium Prior to Pooling	$= PVPremium_{pre} / PVPremium_{pre}$	The formula in the spreadsheet is in error.
DD280	Present Value of Combined Claims Prior to Pooling as a Percentage of Present Value of Combined Premium Prior to Pooling	$= PVClaims_{pre} / PVPremium_{pre}$	
DJ280	Present Value of Combined Premium Less Combined Claims Prior to Pooling as a Percentage of Present Value of Combined Premium Prior to Pooling	$= PVPminusC_{pre} / PVPremium_{pre}$	
DK280	Present Value of Combined Expenses Prior to Pooling as a Percentage of Present Value of Combined Premium Prior to Pooling	$= PVExp_{pre} / PVPremium_{pre}$	
DM280	Present Value of Combined Gain Prior to Pooling as a Percentage of Present Value of Combined Premium Prior to Pooling	$= PVGain_{pre} / PVPremium_{pre}$	

Interblock Subsidy.xls – IBS-1D, IBS-2D, IBS-3D, IBS-4D, IBS-5D

Cells	Description	Formula	Comments
DP280	Present Value of Opportunity Cost of Capital Prior to Pooling as a Percentage of Present Value of Combined Premium Prior to Pooling	$= PVOCC_{pre} / PVPremium_{pre}$	
DQ280	Present Value of Economic Gain Prior to Pooling as a Percentage of Present Value of Combined Premium Prior to Pooling	$= PVEconGain_{pre} / PVPremium_{pre}$	

Interblock Subsidy.xls – Rate Compression Assumptions

Cells	**Description**	**Formula**	**Comments**
AM2	Degree of Rate Compression (Comp)	= 3	Hardcoded value
AM3	Year that Rate Compression Begins (CompYr)	= 1	Hardcoded value
AM4	Trend Scenario	From Global Assumptions!G102	
AT3:AT7	Durational Rate Increase (DRI_x)	From the appropriate cell of Current Market Assump 5 blocks!R6:R10	
AV4, AX4, AZ4, BB4, BD4	Standard Lives Morbidity Adjustment Factors by Block ($MorbAdj_{b(st)}$)	From the appropriate cell of Current Market Assump 5 blocks!O4, Q4, S4, U4, or W4	
AW4, AY4, BA4, BC4, BE4	Impaired Lives Morbidity Adjustment Factors by Block ($MorbAdj_{b(im)}$)	From the appropriate cell of Current Market Assump 5 blocks!P4, R4, T4, V4, or X4	

Interblock Subsidy.xls – Rate Compression Assumptions

Cells	Description	Formula	Comments
B12:P41	Premium Rate Before Rate Compression, by Cohort ($PremBeforeComp_{z,y}$)	$= \begin{cases} \text{“”}, & x < 1 \\ PremBeforeComp_{z,y,b}, & x \geq 1 \end{cases}$ $PremBeforeComp_{z,y,1}$ is from the appropriate cell of IBS-1C!J89:L118 for block 1, from the appropriate cell of IBS-2C!M89:O118 for block 2, etc. Block 1 is used for y = 1, 2, and 3; block 2 is used for y = 4, 5, and 6; etc.	
Q12:Q41	Minimum Premium Rate Before Rate Compression, by Projection Year ($MinPremBeforeComp_z$)	= min($PremBeforeComp_{z,y}$), where the minimum is taken over y = 1, 2, 3, …, 15	
R12:R41	Maximum Premium Rate Before Rate Compression, by Projection Year	= max($PremBeforeComp_{z,y}$), where the maximum is taken over y = 1, 2, 3, …, 15	
S12:S41	Maximum Implied Premium Rate by Projection Year ($MaxImpliedPrem_z$)	$= MinPremBeforeComp_z * Comp$	
T12:AH41	Preliminary Adjustment Before Rebalancing by Cohort ($PrelimAdj_{z,y}$)	$= \begin{cases} MaxImpliedPrem_z / PremBeforeComp_{z,y}, & z \geq CompYr \text{ and } type(PremBeforeComp_{z,y}) \neq 2 \text{ and } PremBeforeComp_{z,y} \geq MaxImpliedPrem_z \\ 1, & \text{otherwise} \end{cases}$	The "type" function checks to see whether $AvgPremNoAge_{z,b}$ is text. This will only be true for years prior to the year of introduction for a given block.

Interblock Subsidy.xls – Rate Compression Assumptions

Cells	Description	Formula	Comments
AI12:AI41	Premium Adjustment Factor by Projection Year ($PremAdj_z$)	= 1, z = 1, 2, 3, …, 17, 18, 19, 26, 27, 28, 29, 30 1.00180082504587, z = 20 1.00468398806258, z = 21 1.00553246378391, z = 22 0.996302685807441, z = 23 1.00407304480366, z = 24 1.00164974449571, z = 25	Hardcoded values; these are meaningless starting values that will be altered when the Set Profit Difference Percentage to Zero macro is run.
AI43	Maximum Premium Adjustment Factor Before Constraint	= max($PremAdj_z$), where the maximum is taken over z = 1, 2, 3, …, 30	
AJ7	Flag to Constrain Premium Adjustment Factors to Within Specified Minimum and Maximum (ConstrainFlag)	= 1	Hardcoded value; value of 1 means constrain to specified minimum and maximum; value of 0 means do not constrain.
AJ9	Maximum Allowed Premium Adjustment Factor (MaxPremAdj)	= 1.02	Hardcoded value
AJ11	Minimum Allowed Premium Adjustment Factor (MinPremAdj)	= 0.98	Hardcoded value

Interblock Subsidy.xls – Rate Compression Assumptions

Cells	Description	Formula	Comments
AJ12:AJ41	Constrained Premium Adjustment Factor by Projection Year ($ConstrPremAdj_z$)	$= \begin{cases} \max[\min(PremAdj_z, MaxPremAdj), MinPremAdj], & ConstrainFlag = 1 \\ PremAdj_z, & ConstrainFlag \neq 1 \end{cases}$	
AK12:AO41	Final Premium Adjustment Factor by Block and Projection Year ($FinalPremAdj_{z,b}$)	= $\min(PrelimAdj_{z,y})$ * $ConstrPremAdj_z$, where the minimum is taken over y = 1, 2, 3 for block 1; y = 4, 5, 6 for block 2; etc.	
AP12:AP41	Aggregate Economic Gain from Current Market Model, by Projection Year ($CMAggEconGain_z$)	From the appropriate cell of Current Market Summary 5 blocks!DP164:DP193	
AQ12:AQ41	Aggregate Economic Gain as a Percentage of Aggregate Premium from the Current Market Model, by Projection Year ($CMAggEconGain\%_z$)	= $AggEconGain_z$ / $AggPremium_z$ $AggEconGain_z$ is from the appropriate cell of Current Market Summary 5 blocks!DP164:DP193 $AggPremium_z$ is from the appropriate cell of Current Market Summary 5 blocks!DB164:DB193	
AR12:AR41	Aggregate Economic Gain from Rate Compression Model, by Projection Year ($RCAggEconGain_z$)	From the appropriate cell of IBS Compression Summary!DP164:DP193	

Interblock Subsidy.xls – Rate Compression Assumptions

Cells	Description	Formula	Comments
AS12:AS41	Aggregate Economic Gain as a Percentage of Aggregate Premium from the Rate Compression Model, by Projection Year ($RCAggEconGain\%_z$)	= $AggEconGain_z$ / $AggPremium_z$ $AggEconGain_z$ is from the appropriate cell of IBS Compression Summary!DP164:DP193 $AggPremium_z$ is from the appropriate cell of IBS Compression Summary!DB164:DB193	
AT12:AT41	Difference in Aggregate Economic Gain Between the Current Market and Rate Compression Models, by Projection Year	= $RCAggEconGain_z$ - $CMAggEconGain_z$	
AU12:AU41	Difference in Aggregate Economic Gain as a Percentage of Aggregate Premium Between the Current Market and Rate Compression Models, by Projection Year ($\Delta AggEconGain\%_z$)	= $RCAggEconGain\%_z$ – $CMAggEconGain\%_z$	

Interblock Subsidy.xls – Rate Compression Assumptions

Cells	Description	Formula	Comments
AV12:AZ41	Minimum Premium Rate Without Aging from Rate Compression Model, by Block and Projection Year ($MinDurAdjPremRate_{z,b}$)	= “”, $l_{z,b} = 0$ min($DurAdjPremRate_{z,y,b}$), $l_{z,b} \neq 0$ $DurAdjPremRate_{z,y,b}$ is from the appropriate cell of IBS-1C!BD89:BF118 for block 1, from the appropriate cell of IBS-2C!BG89:BI188 for block 2, etc. The minimum is taken over y = $IntroYr_b$ for x = 1; y = $IntroYr_b$ and $IntroYr_b$ + 1 for x = 2; and y = $IntroYr_b$, $IntroYr_b$ + 1, and $IntroYr_b$ + 2 for x > 2.	Formula only applies for projection years at or beyond the year of introduction of each block.
BA12:BE41	Maximum Premium Rate Without Aging from Rate Compression Model, by Block and Projection Year ($MaxDurAdjPremRate_{z,b}$)	= “”, $l_{z,b} = 0$ max($DurAdjPremRate_{z,y,b}$), $l_{z,b} \neq 0$ $DurAdjPremRate_{z,y,b}$ is from the appropriate cell of IBS-1C!BD89:BF118 for block 1, from the appropriate cell of IBS-2C!BG89:BI188 for block 2, etc. The maximum is taken over y = $IntroYr_b$ for x = 1; y = $IntroYr_b$ and $IntroYr_b$ + 1 for x = 2; and y = $IntroYr_b$, $IntroYr_b$ + 1, and $IntroYr_b$ + 2 for x > 2.	Formula only applies for projection years at or beyond the year of introduction of each block.
BF12:BF41	Minimum Premium Rate Without Aging from Rate Compression Model, by Projection Year ($MinDurAdjPremRate_z$)	= min($MinDurAdjPremRate_{z,b}$), where the minimum is taken over b = 1, 2, 3, 4, and 5	

Interblock Subsidy.xls – Rate Compression Assumptions

Cells	Description	Formula	Comments
BG12:BG41	Maximum Premium Rate Without Aging from Rate Compression Model, by Projection Year (MaxDurAdjPremRate$_z$)	= max(MaxDurAdjPremRate$_{z,b}$), where the maximum is taken over b = 1, 2, 3, 4, and 5	
BH12:BH41	Ratio of Maximum to Minimum Premium Rate Without Aging by Projection Year (MaxToMinRatio$_z$)	= MaxDurAdjPremRate$_z$ / MinDurAdjPremRate$_z$	
BI12:BI41	Check	= “error”, MaxToMinRatio$_z$ > Comp “ok”, MaxToMinRatio$_z$ ≤ Comp	
BJ12:BN41	Ratio of Maximum to Minimum Premium Rate Without Aging, Within a Block by Projection Year	= MaxDurAdjPremRate$_{z,b}$ / MinDurAdjPremRate$_{z,b}$	Formula only applies for projection years at or beyond the year of introduction of each block.
AP43	Aggregate Economic Gain from the Current Market Model (CMAggEconGain)	From Current Market Summary 5 blocks!DP194	

Interblock Subsidy.xls – Rate Compression Assumptions

Cells	Description	Formula	Comments
AQ43	Aggregate Economic Gain as a Percentage of Aggregate Premium from the Current Market Model (CMAggEconGain%)	= AggEconGain / AggPremium AggEconGain is from Current Market Summary 5 blocks!DP194 AggPremium is from Current Market Summary 5 blocks!DB194	
AR43	Aggregate Economic Gain from the Rate Compression Model (RCAggEconGain)	From IBS Compression Summary!DP194	
AS43	Aggregate Economic Gain as a Percentage of Aggregate Premium from the Rate Compression Model (RCAggEconGain%)	= AggEconGain / AggPremium AggEconGain is from IBS Compression Summary!DP194 AggPremium is from IBS Compression Summary!DB194	
AT43	Difference in Aggregate Economic Gain Between the Current Market and Rate Compression Models	= RCAggEconGain - CMAggEconGain	
AU43	Difference in Aggregate Economic Gain as a Percentage of Aggregate Premium Between the Current Market and Rate Compression Models	= RCAggEconGain% – CMAggEconGain%	

Interblock Subsidy.xls – Rate Compression Assumptions

Cells	Description	Formula	Comments
AP44	Present Value of Aggregate Economic Gain from the Current Market Model (CMPVAggEconGain)	From Current Market Summary 5 blocks!DP197	
AQ44	Present Value of Aggregate Economic Gain as a Percentage of Present Value of Aggregate Premium from the Current Market Model (CMPVAggEconGain%)	= PVAggEconGain / PVAggPremium PVAggEconGain is from Current Market Summary 5 blocks!DP197 PVAggPremium is from Current Market Summary 5 blocks!DB197	
AR44	Present Value of Aggregate Economic Gain from the Rate Compression Model (RCPVAggEconGain)	From IBS Compression Summary!DP197	
AS44	Present Value of Aggregate Economic Gain as a Percentage of Present Value of Aggregate Premium from the Rate Compression Model (RCPVAggEconGain%)	= PVAggEconGain / PVAggPremium PVAggEconGain is from IBS Compression Summary!DP197 PVAggPremium is from IBS Compression Summary!DB197	

Interblock Subsidy.xls – Rate Compression Assumptions

Cells	**Description**	**Formula**	**Comments**
AT44	Difference in Present Value of Aggregate Economic Gain Between the Current Market and Rate Compression Models	= RCPVAggEconGain - CMPVAggEconGain	
AU44	Difference in Present Value of Aggregate Economic Gain as a Percentage of Present Value of Aggregate Premium Between the Current Market and Rate Compression Models	= RCPVAggEconGain% - CMPVAggEconGain%	

The Rate Compression Assumptions tab contains a "Set Profit Difference Percentage to Zero" macro, which is executed by clicking on the button at cell AO2. This macro first sets the value of $PremAdj_z$ equal to 1 for every z, then successively applies the Microsoft Visual Basic GoalSeek function to each calendar year. The goal is to get $\Delta AggEconGain\%_z = 0$, and the changing cell is $PremAdj_z$.

Interblock Subsidy.xls – IBS Compression Summary

IBS Compression Summary is analogous to Current Market Summary 5 blocks. Please note the following differences between the two tabs:

- Throughout the tab, IBS Compression Summary pulls values from Rate Compression Assumptions, while Current Market Summary 5 blocks pulls values from Current Market Assump 5 blocks.
- Throughout the tab, IBS Compression Summary pulls values from IBS-1C, IBS-2C, etc., while Current Market Summary 5 blocks pulls values from CM-1, CM-2, etc.
- Note that in the calculation of Requested Rate Increase for New Business at cells X13:X41, IBS Compression Summary does not apply a maximum loss ratio, in contrast to the analogous calculations in Current Market Summary 5 blocks.
- IBS Compression Summary includes an array of average premium rates by block and projection year that is not included in Current Market Summary 5 blocks. This array is in cells DV164:DZ193. These premium rate values are calculated in IBS-1C, IBS-2C, etc.
- Finally, IBS Compression Summary includes a series of calculations used as checks only. These calculations are not included in Current Market Summary 5 blocks. The calculations are described below.

Cells	**Description**	**Formula**	**Comments**
DA201:DA230	Alternate Calculation of Aggregate Enrollment by Projection Year (AltAggl$_z$)	$= \sum_{y=1}^{20} (\text{Aggl}_{z,y(st)} + \text{Aggl}_{z,y(im)})$	Should match Aggl$_z$ values in cells DA164:DA193.
DA231	Alternate Calculation of Total Aggregate Enrollment	$= \sum_{z=1}^{30} \text{AltAggl}_z$	Should match Aggl value in cell DA194.

Interblock Subsidy.xls – IBS Compression Summary

Cells	Description	Formula	Comments
DB201:DB230	Alternate Calculation of Aggregate Premium by Projection Year ($AltAggPremium_z$)	$= \sum_{y=1}^{20} (AggI_{z,y(st)} + AggI_{z,y(im)}) * AggAgeAdjPremRate_{z,y} * 12$	Should match $AggPremium_z$ values in cells DB164:DB193.
DB231	Alternate Calculation of Total Aggregate Premium	$= \sum_{z=1}^{30} AltAggPremium_z$	Should match AggPremium value in cell DB194.
DC201:DC230	Alternate Calculation of Aggregate Claims by Projection Year ($AltAggClaims_z$)	$= \sum_{i=1}^{20} AggI_{z,i(st)} * AggClaims_{z,i(st)} * 12$ $+ \sum_{j=1}^{20} AggI_{z,j(im)} * AggClaims_{z,j(im)} * 12$	Should match $AggClaims_z$ values in cells DC164:DC193.
DC231	Alternate Calculation of Total Aggregate Claims	$= \sum_{z=1}^{30} AltAggClaims_z$	Should match AggClaims value in cell DC194.
DJ201:DJ230	Alternate Calculation of Aggregate Expenses by Projection Year ($AltAggExp_z$)	$= \sum_{i=1}^{20} AggI_{z,i(st)} * AggExp_{z,i(st)} * 12$ $+ \sum_{j=1}^{20} AggI_{z,j(im)} * AggExp_{z,j(im)} * 12$	Should match $AggExp_z$ values in cells DJ164:DJ193.

Interblock Subsidy.xls – IBS Compression Summary

Cells	Description	Formula	Comments
DJ231	Alternate Calculation of Total Aggregate Expenses	$= \sum_{z=1}^{30} AltAggExp_z$	Should match AggExp value in cell DJ194.
DO201:DO230	Alternate Calculation of Aggregate Opportunity Cost of Capital by Projection Year ($AltAggOCC_z$)	= -RBC% * OCC% * $AltAggPremium_z$ RBC% is from Global Assumptions!D83 OCC% is from Global Assumptions!D84	Should match $AggOCC_z$ values in cells DO164:DO193.
DO231	Alternate Calculation of Total Opportunity Cost of Capital	$= \sum_{z=1}^{30} AltAggOCC_z$	Should match AggOCC value in cell DO194.
DP201:DP230	Alternate Calculation of Aggregate Economic Gain by Projection Year ($AltAggEconGain_z$)	$= AltAggPremium_z - AltAggClaims_z - AltAggExp_z + AltAggOCC_z$	Should match $AggEconGain_z$ values in cells DP164:DP193.
DP231	Alternate Calculation of Total Opportunity Cost of Capital	$= \sum_{z=1}^{30} AltAggEconGain_z$	Should match AggEconGain value in cell DP194.

Interblock Subsidy.xls – IBS-1C, IBS-2C, IBS-3C, IBS-4C, IBS-5C

Cells	**Description**	**Formula**	**Comments**
D4	Reference Premium (InitRefPrem)	From Global Assumptions!C24	
D5	Initial Reference Claim Cost for Standard Lives ($InitRefClaims_{st}$)	From Global Assumptions!D49	
D6	Initial Reference Claim Cost for Impaired Lives ($InitRefClaims_{im}$)	From Global Assumptions!D60	
B12:B41	Base Lapse Rates for Standard Lives ($Baseq_{x(st)}$)	From the appropriate cell of Global Assumptions!D29:D33	
C12:C41	Base Lapse Rates for Impaired Lives ($Baseq_{x(im)}$)	From Global Assumptions!C54	
D12:D41	Duration Factor (DF_x)	From the appropriate cell of Global Assumptions!B77:B81	
E12:E41	Per Policy Expense Rates ($Exp_{Pol(x)}$)	From the appropriate cell of Global Assumptions!B70:B74	

Interblock Subsidy.xls – IBS-1C, IBS-2C, IBS-3C, IBS-4C, IBS-5C

Cells	**Description**	**Formula**	**Comments**
F12:F41	Percentage-of-Claims Expense Rates ($Exp_{\%C(x)}$)	From the appropriate cell of Global Assumptions!C70:C74	
G12:G41	Base Commission Rates ($Comm_{B(x)}$)	From the appropriate cell of Global Assumptions!D70:D74	
H12:H41	Renewal Commission Rates ($Comm_{R(x)}$)	From the appropriate cell of Global Assumptions!E70:E74	
I12:I41	Other Premium-Related Expense Rates ($Exp_{Oth\%P(x)}$)	From the appropriate cell of Global Assumptions!F70:F74	
J12:J41	Premium Age Factor (PAF_x)	$= \begin{cases} 1, & x = 1 \\ PAF_{x-1} * (1 + PremGrowthAge), & x = 2, 3, 4, \ldots, 30 \end{cases}$ PremGrowthAge is from Global Assumptions!C25	
K12:K41	Rate of Impairment (μ_x)	From the appropriate cell of Global Assumptions!E43:E47	
L12:L41	Durational Rate Increase (DRI_x)	From the appropriate cell of IBS Assump CY pooling!T19:T48	

Interblock Subsidy.xls – IBS-1C, IBS-2C, IBS-3C, IBS-4C, IBS-5C

Cells	Description	Formula	Comments
O12:O41	Reference Premium ($RefPrem_z$)	= InitRefPrem, $z = 1$ $RefPrem_{z-1}$ * (1 + $ActTrend_{z-1}$), $z = 2, 3, 4, \ldots, 30$	
P12:P41	Baseline Sales ($BaseSales_z$)	From the appropriate cell of IBS Assump CY pooling!C19:G48	
Q12:Q41	Standard Lives Reference Claims ($RefClaims_{z(st)}$)	= $InitRefClaims_{st}$ * $MorbAdj_{b(st)}$, $z = 1$ $RefClaims_{z-1(st)}$ * (1 + $ActTrend_{z-1}$), $z = 2, 3, 4, \ldots, 30$ $MorbAdj_{b(st)}$ is from the appropriate cell of IBS Assump CY pooling!O4, Q4, S4, U4, or W4	
R12:R41	Impaired Lives Reference Claims ($RefClaims_{z(im)}$)	= $InitRefClaims_{im}$ * $MorbAdj_{b(im)}$, $z = 1$ $RefClaims_{z-1(im)}$ * (1 + $ActTrend_{z-1}$), $z = 2, 3, 4, \ldots, 30$ $MorbAdj_{b(im)}$ is from the appropriate cell of IBS Assump CY pooling!P4, R4, T4, V4, or X4	
S12:S41	Actual Trend ($ActTrend_z$)	From the appropriate cell of Global Assumptions!B106:B135	
T13:T41	Implemented Rate Increase for New Business ($ImpRateIncNew_z$)	= [(1 + $ImpRateIncNewBeforeComp_z$) * $FinalPremAdj_{z,b}$] – 1 $FinalPremAdj_{z,b}$ is from the appropriate cell of Rate Compression Assumptions!AK12:AK41	Formula only applies for $z = 2, 3, 4, \ldots, 30$

Interblock Subsidy.xls – IBS-1C, IBS-2C, IBS-3C, IBS-4C, IBS-5C

Cells	**Description**	**Formula**	**Comments**
U13:U41	Implemented Rate Increase for Renewal Business ($ImpRateIncRen_z$)	= $ImpRateIncNew_z$	Formula only applies for z = 2, 3, 4, …, 30
V12:V41	Market New Business Rate ($MarketRate_z$)	= $P_{1(pr)}$, z = 1 $MarketRate_{z-1}$ * (1 + $ActTrend_{z-1}$), z = 2, 3, 4, …, 30 $P_{1(pr)}$ is from IBS Assump CY pooling!V19	
W12:W41	Company New Business Rate ($ComNewBusnRate_z$)	= $ComNewBusnRateBeforeComp_z$ * $FinalPremAdj_{z,b}$ $FinalPremAdj_{z,b}$ is from the appropriate cell of Rate Compression Assumptions!AK12:AK41	
Z13:Z41	Implemented Rate Increase for New Business Before Rate Compression ($ImpRateIncNewBeforeComp_z$)	= min(MaxRateInc, RegDamp * $ReqRateIncNew_z$) MaxRateInc is from Global Assumptions!D100 RegDamp is from the appropriate cell of Global Assumptions!D90:D99, based on the value of $ReqRateIncNew_z$	Formula only applies for z = 2, 3, 4, …, 30
AA13:AA41	Implemented Rate Increase for Renewal Business Before Rate Compression ($ImpRateIncRenBeforeComp_z$)	= $ImpRateIncNewBeforeComp_z$	Formula only applies for z = 2, 3, 4, …, 30

Interblock Subsidy.xls – IBS-1C, IBS-2C, IBS-3C, IBS-4C, IBS-5C

Cells	Description	Formula	Comments
AB12:AB41	Market New Business Rate Before Rate Compression ($MarketRateBeforeComp_z$)	$= P_{1(pr)}$, $z = 1$ $MarketRate_{z-1} * (1 + ActTrend_{z-1})$, $z = 2, 3, 4, \ldots, 30$ $P_{1(pr)}$ is from Current Market Assump 5 blocks!V19	
AC12:AC41	Company New Business Rate Before Rate Compression ($ComNewBusnRate BeforeComp_z$)	0, $z < IntroYr_b$ $= MarketRateBeforeComp_z * (1 – Disc@Intro)$, $z = IntroYr_b$ $ComNewBusnRate_{z-1} * (1 + ImpRateIncNewBeforeComp_z)$, $z > IntroYr_b$ $IntroYr_b$ is from the appropriate cell of Current Market Assump 5 blocks!D11:D15 Disc@Intro is from Global Assumptions!D26	
AD13:AD41	Requested Rate Increase for New Business Before Rate Compression ($ReqRateIncNew BeforeComp_z$)	$ActTrend_{z-1}$, $z \leq IntroYr_b + 1$ $= \max \{0, [ActualLR_{z-2} / ExpectedLR_{z-2} * (1 + ActTrend_{z-2})^2 / (1 + ImpRateIncNew_{z-1}) – 1], [ActualLR_{z-2} / MaxLR * (1 + ActTrend_{z-2})^2 / (1 + ImpRateIncNew_{z-1}) – 1]\}$, $z > IntroYr_b + 1$ $IntroYr_b$ is from the appropriate cell of IBS Assump DUR pooling!D11:D15 MaxLR is from Current Market Assump 5 blocks!M5	Formula only applies for z = 2, 3, 4, …, 30.

Interblock Subsidy.xls – IBS-1C, IBS-2C, IBS-3C, IBS-4C, IBS-5C

Cells	**Description**	**Formula**	**Comments**
AE13:AE41	Requested Rate Increase for Renewal Business Before Rate Compression ($ReqRateIncRenBeforeComp_z$)	$= ReqRateIncNewBeforeComp_z$	Formula only applies for z = 2, 3, 4, …, 30.
AH12:BA41	New Business Sales by Cohort ($NewSales_{z,y}$)	$= \begin{cases} 0, & x \neq 1 \\ \max \{0, BaseSales_z * [1 + MktPriceSens * ((MarketRate_z / RefPrem_z) - 1)] * [1 + ComPriceSens * ((ComNewBusnRate_z / MarketRate_z) - 1)]\}, & \text{otherwise} \end{cases}$ MktPriceSens is from Global Assumptions!D14 ComPriceSens is from Global Assumptions!D15	
AH42:BA42	Total New Business Sales for Issue Year y	$= \sum_{z=1}^{30} NewSales_{z,y}$	

Interblock Subsidy.xls – IBS-1C, IBS-2C, IBS-3C, IBS-4C, IBS-5C

Cells	Description	Formula	Comments
BD12:BW41	Actual Lapse Rates for Standard Lives by Cohort ($q_{z,y(st)}$)	= 0, $x \leq 1$ or $BaseSales_y = 0$ max{$q_{min(st)}$, min[$q_{max(st)}$, $Baseq_{x-1(st)}$ + (($AgeAdjPremRate_{z,y}$ / $AgeAdjPremRate_{z-1,y}$) – 1 – $ActTrend_z$) * $LapseAdjTrend_{st}$ * ((($AgeAdjPremRate_{z,y}$ / $AgeAdjMktNewBusnRate_{z,y}$) – 1) * $LapseAdjMkt_{st}$ +1) – ((($ComNewBusnRate_y$ / $RefPrem_y$) – 1) * $LapseAdjSale_{st}$)]}, x = 2, 3, or 4 and $BaseSales_y \neq 0$ max{$q_{min(st)}$, min[$q_{max(st)}$, $Baseq_{x-1(st)}$ + (($AgeAdjPremRate_{z,y}$ / $AgeAdjPremRate_{z-1,y}$) – 1 – $ActTrend_z$) * $LapseAdjTrend_{st}$ * ((($AgeAdjPremRate_{z,y}$ / $AgeAdjMktNewBusnRate_{z,y}$) – 1) * $LapseAdjMkt_{st}$ +1)]}, otherwise $q_{min(st)}$ is from Global Assumptions!D40 $q_{max(st)}$ is from Global Assumptions!D39 $LapseAdjTrend_{st}$ is from Global Assumptions!D36 $LapseAdjMkt_{st}$ is from Global Assumptions!D37 $LapseAdjSale_{st}$ is from Global Assumptions!D38	
BZ12:CS41	Newly Impaired Lives by Cohort ($NewImpLives_{z,y}$)	= 0, $x \leq 1$ $l_{z-1,y(st)} * \mu_{x-1} * (1 - q_{z,y(im)})$, $x > 1$	
BZ42:CS42	Total Number of Newly Impaired Lives for Issue Year y	$= \sum_{z=1}^{30} NewImpLives_{z,y}$	

Interblock Subsidy.xls – IBS-1C, IBS-2C, IBS-3C, IBS-4C, IBS-5C

Cells	Description	Formula	Comments
AH51:BA80	Enrollment of Standard Lives by Cohort ($l_{z,y(st)}$)	$= \begin{cases} 0, & x < 1 \\ NewSales_{z,y}, & x = 1 \\ NewSales_{z,y} + l_{z-1,y(st)} * (1 - \mu_{x-1}) * (1 - q_{z,y(st)}), & x > 1 \end{cases}$	
AH81:BA81	Total Enrollment of Standard Lives by Issue Year	$= \sum_{z=1}^{30} l_{z,y(st)}$	
BD51:BW80	Actual Lapse Rates for Impaired Lives by Cohort ($q_{z,y(im)}$)	$= \begin{cases} 0, & x \leq 1 \text{ or } BaseSales_y = 0 \\ \max\{q_{min(im)}, \min[q_{max(im)}, Baseq_{x-1(im)} + ((AgeAdjPremRate_{z,y} / AgeAdjPremRate_{z-1,y}) - 1 - ActTrend_z) * LapseAdjTrend_{im}]\}, & \text{otherwise} \end{cases}$ $q_{min(im)}$ is from Global Assumptions!D58 $q_{max(im)}$ is from Global Assumptions!D57 $LapseAdjTrend_{im}$ is from Global Assumptions!D56	
BZ51:CS80	Actual Combined Lapse Rates by Cohort ($q_{z,y}$)	$= \begin{cases} 0, & l_{z,y(st)} + l_{z,y(im)} = 0 \\ [(l_{z,y(st)} * q_{z,y(st)}) + (l_{z,y(im)} * q_{z,y(im)})] / (l_{z,y(st)} + l_{z,y(im)}), & \text{otherwise} \end{cases}$	

Interblock Subsidy.xls – IBS-1C, IBS-2C, IBS-3C, IBS-4C, IBS-5C

Cells	**Description**	**Formula**	**Comments**
J89:AC118	Premium Rates Before Age Adjustment Before Rate Compression, by Cohort (DurAdjPremRate BeforeComp$_{z,y}$)	$= \begin{cases} 0, & x < 1 \\ \text{ComNewBusnRateBeforeComp}_{z}, & x = 1 \\ \text{DurAdjPremRate}_{z-1,y} * (1 + \text{ImpRateIncRenBeforeComp}_{z}) * (1 + \text{DRI}_{x}), & x > 1 \end{cases}$	
AH89:BA118	Enrollment of Impaired Lives by Cohort ($l_{z,y(im)}$)	$= \begin{cases} 0, & x \leq 1 \\ \text{NewImpLives}_{z,y} + [l_{z-1,y(im)} * (1 - q_{z,y(im)})], & x > 1 \end{cases}$	
AH119:BA119	Total Enrollment of Impaired Lives by Issue Year	$= \sum_{z=1}^{30} l_{z,y(im)}$	
BD89:BW118	Premium Rates Before Age Adjustment by Cohort (DurAdjPremRate$_{z,y}$)	$= \begin{cases} 0, & x < 1 \\ \text{ComNewBusnRate}_{z}, & x = 1 \\ \text{DurAdjPremRate}_{z-1,y} * (1 + \text{ImpRateIncRen}_{z}) * (1 + \text{DRI}_{x}), & x > 1 \end{cases}$	
BZ89:CS118	Premium Rates After Age Adjustment by Cohort (AgeAdjPremRate$_{z,y}$)	$= \text{DurAdjPremRate}_{z,y} * \text{PAF}_{x}$	

Interblock Subsidy.xls – IBS-1C, IBS-2C, IBS-3C, IBS-4C, IBS-5C

Cells	Description	Formula	Comments
AH126:BA155	Age-Adjusted Market-Level New Business Premium Rates by Cohort ($AgeAdjMktNewBusnRate_{z,y}$)	= 0, x < 1 $MarketRate_z * PAF_x$, otherwise	
BD126:BW155	Standard Lives Claim Levels by Cohort ($C_{z,y(st)}$)	0, x < 1 = $RefClaims_{z(st)} * DF_x * \{1 + [(ComNewBusnRate_y / RefPrem_y) – 1] * MorbAdj_{st}\}$, x = 1 $C_{z-1,y(st)} * DF_x / DF_{x-1} * (1 + ActTrend_{z-1}) * (1 + AgingTrend)$, x > 1 $MorbAdj_{st}$ is from Global Assumptions!D51 AgingTrend is from Global Assumptions!C22	
BZ126:CS155	Impaired Lives Claim Levels by Cohort ($C_{z,y(im)}$)	0, x < 1 = $RefClaims_{z(im)}$, x = 1 $C_{z-1,y(im)} * (1 + ActTrend_{z-1}) * (1 + AgingTrend)$, x > 1 AgingTrend is from Global Assumptions!C22	

Interblock Subsidy.xls – IBS-1C, IBS-2C, IBS-3C, IBS-4C, IBS-5C

Cells	Description	Formula	Comments
AH164:BA193	Standard Lives Expense Levels by Cohort ($Exp_{z,y(st)}$)	= 0, $x < 1$ $Exp_{Pol(x)} * (1 + Inflation)^{z-1}$ $+ C_{z,y(st)} * Exp_{\%C(x)}$ $+ ComNewBusnRate_y * Comm_{B(x)}$ $+ (AgeAdjPremRate_{z,y} – ComNewBusnRate_y) * Comm_{R(x)}$ $+ AgeAdjPremRate_{z,y} * Exp_{Oth\%P(x)}$, $x \geq 1$ Inflation is from Global Assumptions!B64	
BD164:BW193	Impaired Lives Expense Levels by Cohort ($Exp_{z,y(im)}$)	= 0, $x < 1$ $Exp_{Pol(x)} * (1 + Inflation)^{z-1}$ $+ C_{z,y(im)} * Exp_{\%C(x)}$ $+ ComNewBusnRate_y * Comm_{B(x)}$ $+ (AgeAdjPremRate_{z,y} – ComNewBusnRate_y) * Comm_{R(x)}$ $+ AgeAdjPremRate_{z,y} * Exp_{Oth\%P(x)}$, $x \geq 1$ Inflation is from Global Assumptions!B64	
BZ164:CS193	Average Expense Levels by Cohort ($Exp_{z,y}$)	= 0, $l_{z,y(st)} + l_{z,y(im)} = 0$ $[(l_{z,y(st)} * Exp_{z,y(st)}) + (l_{z,y(im)} * Exp_{z,y(im)})] / (l_{z,y(st)} + l_{z,y(im)})$, otherwise	

Interblock Subsidy.xls – IBS-1C, IBS-2C, IBS-3C, IBS-4C, IBS-5C

Cells	Description	Formula	Comments
CV164:CV193	Standard Lives Enrollment by Projection Year ($l_{z(st)}$)	$= \sum_{y=1}^{20} l_{z,y(st)}$	
CV194	Total Standard Lives Exposure	$= \sum_{z=1}^{30} l_{z(st)}$	"Total" refers to the sum over all 30 projection years.
CW164:CW193	Standard Lives Premium by Projection Year ($P_{z(st)}$)	$= \sum_{y=1}^{20} l_{z,y(st)} * AgeAdjPremRate_{z,y} * 12$	
CW194	Total Standard Lives Premium (P_{st})	$= \sum_{z=1}^{30} P_{z(st)}$	
CX164:CX193	Standard Lives Claims by Projection Year ($C_{z(st)}$)	$= \sum_{y=1}^{20} l_{z,y(st)} * C_{z,y(st)} * 12$	
CX194	Total Standard Lives Claims (C_{st})	$= \sum_{z=1}^{30} C_{z(st)}$	
CY164:CY193	Standard Lives Loss Ratio by Projection Year	$= \begin{cases} 0, & P_{z(st)} = 0 \\ C_{z(st)} / P_{z(st)}, & P_{z(st)} \neq 0 \end{cases}$	

Interblock Subsidy.xls – IBS-1C, IBS-2C, IBS-3C, IBS-4C, IBS-5C

Cells	**Description**	**Formula**	**Comments**
CY194	Standard Lives Loss Ratio	$= C_{st} / P_{st}$	
DB164:DB193	Impaired Lives Enrollment by Projection Year ($l_{z(im)}$)	$= \sum_{y=1}^{20} l_{z,y(im)}$	
DB194	Total Impaired Lives Exposure	$= \sum_{z=1}^{30} l_{z(im)}$	
DC164:DC193	Impaired Lives Premium by Projection Year ($P_{z(im)}$)	$= \sum_{y=1}^{20} l_{z,y(im)} * \text{AgeAdjPremRate}_{z,y} * 12$	
DC194	Total Impaired Lives Premium (P_{im})	$= \sum_{z=1}^{30} P_{z(im)}$	
DD164:DD193	Impaired Lives Claims by Projection Year ($C_{z(im)}$)	$= \sum_{y=1}^{20} l_{z,y(im)} * C_{z,y(im)} * 12$	
DD194	Total Impaired Lives Claims (C_{im})	$= \sum_{z=1}^{30} C_{z(im)}$	

Interblock Subsidy.xls – IBS-1C, IBS-2C, IBS-3C, IBS-4C, IBS-5C

Cells	**Description**	**Formula**	**Comments**
DE165:DE193	Impaired Lives Loss Ratio by Projection Year	$= \begin{cases} 0, & P_{z(im)} = 0 \\ C_{z(im)} / P_{z(im)}, & P_{z(im)} \neq 0 \end{cases}$	
DE194	Impaired Lives Loss Ratio	$= C_{im} / P_{im}$	
DM159	Trend Scenario	From Global Assumptions!G102	
DQ159	Pooling Year	From IBS Assump CY pooling!E3	Not used
DV159	Year that Rate Compression Begins	From Rate Compression Assumptions!AM3	
DG164:DG193	Combined Enrollment by Projection Year (l_z)	$= l_{z(st)} + l_{z(im)}$	“Combined” refers to the combination of standard and impaired.
DG194	Total Combined Exposure (l)	$= \sum_{z=1}^{30} l_z$	
DH164:DH193	Combined Premium by Projection Year (P_z)	$= P_{z(st)} + P_{z(im)}$	
DH194	Total Combined Premium (P)	$= \sum_{z=1}^{30} P_z$	

Interblock Subsidy.xls – IBS-1C, IBS-2C, IBS-3C, IBS-4C, IBS-5C

Cells	Description	Formula	Comments
DI164:DI193	Total Combined Premium PMPM	$= \begin{cases} 0, & l_z = 0 \\ P_z / l_z / 12, & l_z \neq 0 \end{cases}$	
DJ164:DJ193	Combined Claims by Projection Year (C_z)	$= C_{z(st)} + C_{z(im)}$	
DJ194	Total Combined Claims (C)	$= \sum_{z=1}^{30} C_z$	
DK164:DK193	Combined Claims PMPM by Projection Year	$= \begin{cases} 0, & l_z = 0 \\ C_z / l_z / 12, & l_z \neq 0 \end{cases}$	
DK194	Total Combined Claims PMPM	$= \begin{cases} 0, & l = 0 \\ C / l / 12, & l \neq 0 \end{cases}$	
DL164:DL193	Combined Loss Ratio by Projection Year ($ActualLR_z$)	$= \begin{cases} 0, & P_z = 0 \\ C_z / P_z, & P_z \neq 0 \end{cases}$	
DL194	Total Combined Loss Ratio	$= \begin{cases} 0, & P = 0 \\ C / P, & P \neq 0 \end{cases}$	
DM164:DM193	Combined Expected Loss Ratio by Projection Year ($ExpectedLR_z$)	From the appropriate cell of CM-b_TLR!U19:U48, where b is the block number	

Interblock Subsidy.xls – IBS-1C, IBS-2C, IBS-3C, IBS-4C, IBS-5C

Cells	Description	Formula	Comments
DN164:DN193	Actual-to-Expected Combined Loss Ratio by Projection Year	= 0, $P_z = 0$ $ActualLR_z$ / $ExpectedLR_z$, $P_z \neq 0$	
DO164:DO193	Rolling Two-Year Combined Loss Ratio by Projection Year	= C_z / P_z, z = 1 $(C_{z-1} + C_z) / (P_{z-1} + P_z)$, z = 2, 3, 4, …, 30	Produces #DIV/0! errors for projection years prior to the introduction year of the block.
DP164:DP193	Combined Premium Less Claims by Projection Year ($PminusC_z$)	$= P_z – C_z$	
DP194	Total Combined Premium Less Claims	= P – C	
DQ164:DQ193	Combined Expenses by Projection Year (Exp_z)	$= 12 * [\sum_{y=1}^{20} (l_{z,y(st)} * Exp_{z,y(st)}) + \sum_{y=1}^{20} (l_{z,y(im)} * Exp_{z,y(im)})]$	
DQ194	Total Combined Expenses (Exp)	$= \sum_{z=1}^{30} Exp_z$	
DR164:DR193	Combined Expense Ratio by Projection Year	= 0, $P_z = 0$ Exp_z / P_z, $P_z \neq 0$	

Interblock Subsidy.xls – IBS-1C, IBS-2C, IBS-3C, IBS-4C, IBS-5C

Cells	**Description**	**Formula**	**Comments**
DR194	Total Combined Expense Ratio	$= \begin{cases} 0, & P = 0 \\ Exp / P, & P \neq 0 \end{cases}$	
DS164:DS193	Combined Gain by Projection Year ($Gain_z$)	$= P_z - C_z - Exp_z$	
DS194	Total Combined Gain (Gain)	$= \sum_{z=1}^{30} Gain_z$	
DT164:DT193	Combined Gain as a Percentage of Combined Premium by Projection Year	$= \begin{cases} 0, & P_z = 0 \\ Gain_z / P_z, & P_z \neq 0 \end{cases}$	
DT194	Total Combined Gain as a Percentage of Combined Premium	$= \begin{cases} 0, & P = 0 \\ Gain / P, & P \neq 0 \end{cases}$	
DU164:DU193	Risk-Based Capital by Projection Year (RBC_z)	$= P_z * RBC\%$ RBC% is from Global Assumptions!D83	Uses a predefined percentage of premium as a proxy for risk-based capital requirement.
DV164:DV193	Opportunity Cost of Capital by Projection Year (OCC_z)	$= -RBC_z * OCC\%$ OCC% is from Global Assumptions!D84	

Interblock Subsidy.xls – IBS-1C, IBS-2C, IBS-3C, IBS-4C, IBS-5C

Cells	Description	Formula	Comments
DV194	Total Opportunity Cost of Capital	$= \sum_{z=1}^{30} OCC_z$	
DW164:DW193	Economic Gain by Projection Year ($EconGain_z$)	$= Gain_z + OCC_z$	
DW194	Total Economic Gain	$= \sum_{z=1}^{30} EconGain_z$	
DX164:DX193	Market New Business Rate	$= MarketRate_z$	These are just copies of values calculated elsewhere in this tab. They are copied here for convenience only.
DY164:DY193	Company New Business Rate	$= ComNewBusnRate_z$	
DZ164:DZ193	Implemented Rate Increase for New Business	$= ImpRateIncNew_z$	

Interblock Subsidy.xls – IBS-1C, IBS-2C, IBS-3C, IBS-4C, IBS-5C

Cells	Description	Formula	Comments
DZ194	Average Rate Increase	$= \sum_{z=IntroYr(b)+1}^{30} ImpRateIncNew_z / (30 – IntroYr_b)$ $IntroYr_b$ is from the appropriate cell of IBS Assump CY pooling!D11:D15	
DZ195	Minimum Rate Increase	= min($IncRateIncNew_z$), where the minimum is taken over z = $IntroYr_b$ + 1, $IntroYr_b$ + 2, $IntroYr_b$ + 3, …, 30 $IntroYr_b$ is from the appropriate cell of IBS Assump CY pooling!D11:D15	
DZ196	Maximum Rate Increase	= max($IncRateIncNew_z$), where the maximum is taken over z = $IntroYr_b$ + 1, $IntroYr_b$ + 2, $IntroYr_b$ + 3, …, 30 $IntroYr_b$ is from the appropriate cell of IBS Assump CY pooling!D11:D15	
EA164:EA193	Implemented Rate Increase for Renewal Business	= $ImpRateIncRen_z$	
EB164:EB183	New Business Sales	= $NewSales_{z,z}$	Formula applies only for z = 1, 2, 3, …, 20.

Interblock Subsidy.xls – IBS-1C, IBS-2C, IBS-3C, IBS-4C, IBS-5C

Cells	**Description**	**Formula**	**Comments**
DH197	Present Value of Combined Premium (PVPremium)	$= NPV_{int} (P_z) * \sqrt{1+int}$	All present values in this section are taken over all 30 projection years, and int is from Global Assumptions!B63.
DJ197	Present Value of Combined Claims (PVClaims)	$= NPV_{int} (C_z) * \sqrt{1+int}$	
DP197	Present Value of Combined Premium Less Combined Claims (PVPminusC)	$= NPV_{int} (PminusC_z) * \sqrt{1+int}$	
DQ197	Present Value of Combined Expenses (PVExp)	$= NPV_{int} (Exp_z) * \sqrt{1+int}$	
DS197	Present Value of Combined Gain (PVGain)	$= NPV_{int} (Gain_z) * \sqrt{1+int}$	
DV197	Present Value of Opportunity Cost of Capital (PVOCC)	$= NPV_{int} (OCC_z) * \sqrt{1+int}$	

Interblock Subsidy.xls – IBS-1C, IBS-2C, IBS-3C, IBS-4C, IBS-5C

Cells	Description	Formula	Comments
DW197	Present Value of Economic Gain (PVEconGain)	= NPV_{int} ($EconGain_z$) * $\sqrt{1+\text{int}}$	
DH198	Present Value of Combined Premium as a Percentage of Present Value of Combined Premium	= PVPremium / PVPremium	Identically equal to 100.0%.
DJ198	Present Value of Combined Claims as a Percentage of Present Value of Combined Premium	= PVClaims / PVPremium	
DP198	Present Value of Combined Premium Less Combined Claims as a Percentage of Present Value of Combined Premium	= PVPminusC / PVPremium	
DQ198	Present Value of Combined Expenses as a Percentage of Present Value of Combined Premium	= PVExp / PVPremium	
DS198	Present Value of Combined Gain as a Percentage of Present Value of Combined Premium	= PVGain / PVPremium	

Interblock Subsidy.xls – IBS-1C, IBS-2C, IBS-3C, IBS-4C, IBS-5C

Cells	**Description**	**Formula**	**Comments**
DV198	Present Value of Opportunity Cost of Capital as a Percentage of Present Value of Combined Premium	= PVOCC / PVPremium	
DW198	Present Value of Economic Gain as a Percentage of Present Value of Combined Premium	= PVEconGain / PVPremium	

Interblock Subsidy.xls – Test Comparisons and To Do_ Changes

Interblock Subsidy.xls contains two additional tabs, "Test Comparisons" and "To Do_ Changes ", which will not be documented here since they are not part of the model per se. The former contains extensive calculations that the model developers used for their own reference when designing the spreadsheet. The latter contains a list of changes that have been or need to be made.

Exhibits

The final component of the model is a spreadsheet entitled Exhibits.xls, which compiles results from each of the models and displays selected results graphically. Most of the values are calculated in other spreadsheets and thus are reflected in the documentation above. There are some parameters calculated directly in Exhibits.xls, however these are straightforward and will not be documented here.