PRICING MODEL

USER GUIDE

VERSION 2.22

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Contents

Overview

The RangeMountain Asset Pricing Model builds a comprehensive balance-sheet comprised of the proposed lending, the funding – both debt and equity - supporting it and the associated liquidity portfolio.

The model requires the firm to define four things

- Client asset terms
- Funding structure
- Composition of liquidity portfolio
- Target LCR

The model then solves for the amount of liquidity that must be held to meet the desired LCR level over the life of the asset as well as the capital required to support that liquidity. In turn, this allows the economics of the proposed business to be comprehensively evaluated.

Main Inputs

Asset Terms

a. Contractual terms - from borrower type, rate, term and fees to Loan to Value (LTV).
b. Prepayment assumptions together with proposed Early Redemption Charge structure.
c. Default expectations - whether on the Standardised or IRB approach.
d. Pipeline details to capture the "hidden" capital and liquidity costs of loan offers.

Funding Structure

a. Debt funding – sources, stickiness and rates.
b. Equity funding – Target Tier 1 capital ratio, Return on Equity (ROE) and Pillar 2 add-on. These values are used to calculate the capital needed to support both the loan asset and the liquidity portfolio.

Liquidity Portfolio

a. Asset allocation and yields within the liquidity pool.

Target LCR

a. Target LCR

Main Outputs

Net Income

The model calculates the net income of the new business taking account of asset income, funding costs (including required ROE), Expected Loss, the cost of holding liquidity, tax and overheads. It is expressed in terms of Net Present Value, on a cash accrual basis and as a percentage margin.

Required Capital

The model quantifies the regulatory capital required throughout the life of the asset to support both the loan and the liquidity portfolio.

NSFR and Leverage Ratio

These are shown graphically throughout the life of the asset.

Basis Risk

The model shows any basis risk arising from the proposed funding structure. Note that the model prices on the basis of hedging all fixed interest rate risk.

Further Functionality

Because the model captures the balance-sheet as a whole, the profit and loss or risk impact of changing any variable is immediately visible. The model readily quantifies the impact of the following

- Lending for different maturities
- Pricing for different LTV bands
- Changes of regulatory risk weightings
- Interest only versus capital repayment lending
- Cost of the loan offer pipeline
- Setting Early Redemption Charges at a level that is fair both to the firm and to customers
- If the asset price is known, solving for the optimal funding sources and price
- Evaluating the costs and benefits of funding shorter or longer
- Altering required ROE
- Altering Probability of Default assumptions
- Allowing for overheads
- Calculating the cost of holding liquidity
- Seeing the impact of altering the firm's liquidity targets
- Optimising the composition of the liquidity portfolio

The model offers lending firms important insights into the value of new business and the factors that determine that value. The model is driven by a clear and powerful logic that can be understood by staff at all levels, thus allowing informed management and oversight of the business.

Assumptions

Rates are constant

Market rates are assumed to remain at a constant level throughout the life of the asset being priced – the model deliberately excludes interest rate forecasts from the pricing process. The model captures the basis risk implicit within the lending / funding mix, thus allowing the user to evaluate margin management risks and opportunities.

Composition of funding is constant

Whatever funding profile is input by the user - in terms of source, product type and rate - is assumed to remain constant throughout the life of the asset.

All fixed items are swapped to variable

Fixed rate loans and fixed rate funding are swapped using the mid-market yield curve input by the user in the Market Rates tab. The model does not recognise margin earned by taking interest rate risk. The model does not accommodate loans which are fixed for more than 10 years. Similarly, the model does not accommodate loans which are Trackers for more than 10 years. The hedging functionality may be switched off.

All HQLA are assumed to be floating rate

The model assumes they are already floating rate or have been swapped. The model does not hedge fixed rate HQLA to floating.

Calculation base

Interest rate and percentage calculations are applied on a monthly basis. So, if SVR is 5%, the monthly payment flow is 5% * principal * 1/12. Percentages are applied similarly. An inflation rate of 5%, when applied to a principal of 100, will give 105.116 after 1 year.

Residential mortgages versus other Loan Types

The term Residential mortgages refers to the following product types – Home Loan, Buy-to-Let and Self-Build. The treatment of Residential mortgages differs from commercial loans in a number of ways set out in this User Guide.

User Notes

- *RangeMountain assesses overall profitability of proposed business – it does not segment profitability across departments.*
- *RangeMountain is not designed to assess the merits of Lifetime / Equity Release mortgages*
- *The model contains a number of iterative calculations. As an Excel tool, if a value is input which has no solution, RM may lock in a calculation loop and give an error message. For example, if the funding source is defined as being exclusively short-term corporate deposits it creates an insatiable demand for HQLA to meet the LCR requirements. If this happens, the model may need to be shut down and re-opened. To avoid losing work, we recommend frequently saving the version you are working on.*
- *Having 2 copies of the model open at the same time may slow calculation times markedly because of the computing capacity required.*

Cover Tab

Licence Expiry Date	Date on which software licence needs to be renewed
Open Workbook	Click to access RangeMountain pricing tool
Download Output and Graphs	Click to create an Excel copy of Output tab
Download Calculations	Click to create an Excel copy of Calculations tab so that the user can prepare tailored reports or analysis

Output Highlights Table

Outputs	This table is available on most tabs. It allows the impact of adjusting any input to be seen at once. Numbers are based on the Expected average loan size. More detailed outputs can be found on the Output tab
Economic Profit	The net present value of profit or loss over the expected life of the transaction, discounted at the user's Required ROE If Economic Profit is zero, the proposed loan covers all costs (funding, overheads, losses etc) and precisely meets the user's Required ROE A positive number means all costs are met and Required ROE is exceeded A negative number means that costs and Required ROE are not met. Note that if a loan covers all costs but does not meet Required ROE it would return a negative Economic Profit. However, such a loan would still be profitable for reporting and tax purposes.
Lifetime ROE	Lifetime Return on Equity calculated on an internal rate of return basis. This calculation produces different outcomes from a simple calculation of Return / Capital because it takes account of the time value of money
Capital Required	Peak Regulatory Capital requirement Normally this will occur on Drawdown but could be later if there is a Phased Drawdown or earlier if the user experiences very low conversion rates of committed offers
NPAT – Years 1 to 3	Net Profit after Tax in each year. A detailed 5-year breakdown is available on the Output tab
Payback Period	The length of time required for profit from the transaction to match the capital deployed. Measures how long the transaction takes to provide a return
Average Life	The weighted average life of the client asset, taking account of scheduled amortisation, expected prepayment and default. Example: a 20-year amortising loan with no prepayment or default has an average life of 11.4 years
Liquidity / Deposits	Ratio of required liquid assets by total Retail funding

Scenarios Tab

Scenarios	This tab allows the user to compare the Economic Profit and Lifetime ROE of many variants of the same client asset quickly and efficiently
Step 1	Set out the client asset terms in the Loan tab
Step 2	Select the Variables to be flexed. Up to 3 of the following inputs can be flexed at a time • LTV • Prepayment Curve • Borrower Rating • Length of Phase 1 • LCR Target Inputs are selected from the dropdown menus in the Variable Name table If 1 Variable is to be flexed, select the blank option in the first two rows of the Variable Name table If 2 Variables are to be flexed, select the blank option in the dropdown menu of the first row of the Variable Name table If 3 Variables are to be flexed, make selections in all 3 rows of the Variable Name table
Step 3	For each Variable selected, enter the different values to be calculated in the Scenarios table. Up to 20 different values can be entered for each Variable
Step 4	Outputs B/E Excess Spread – this is a very time and memory intensive series of calculations so the default setting is for this to be switched off Lifetime ROE and Economic Profit are automatically calculated
Step 5	Press Run Scenarios button This will generate a series of tables and graphs showing the Lifetime ROE and Economic Profit of all the permutations

Loan Tab

Loan Parameters

Proposed gross lending amount	The size of the tranche of loans being priced. RM uses the Expected average loan size as the principal basis for modelling; the Proposed gross lending amount grosses up certain outputs on the Output tab (Economic Value, Capital Required and DV01) giving tranche level outputs
Expected average loan size	The expected individual loan amount. It is used as the basis of all calculations. If absolute amounts are input (e.g. for fees payable or receivable on a loan), it is important to use an accurate estimate of the Expected average loan size
Loan Term	The contractual period between drawdown and final repayment of the loan. For loans with a Phased Drawdown, the Loan Term runs from the first drawdown until final repayment of the loan. The Loan Term does not include any Offer Period
Amortisation Calculation Method	Same as Loan Term – select if the loan amortises to zero at the final maturity date or does not amortise at all Different from Loan Term – select if the loan partially amortises by the final maturity date of the loan If Different from Loan Term is selected but both Phase 1 and Phase 2 are defined as Interest only then a red warning appears as these inputs are contradictory
Amortisation Calculation Date	If Same as Loan Term is selected as Amortisation Calculation Method, this will be blanked out If Amortisation Calculation Method is Different from Loan Term, enter the number of years over which amortisation is calculated Example: for a 5-year loan which amortises according to a 20-year amortising schedule, enter 20 If Different from Loan Term is selected, the Amortisation Calculation Date must exceed Loan Term

Offer Period

Offer Period	RM allows for Offer Periods for Residential mortgages but not for commercial loans.
	If commercial Loan Types are selected and the user tries to include an Offer Period, a red warning is displayed
Prefunded	Yes – select to include Offer Period liquidity costs in pricing No – select to omit
	The percentage of the asset that the lender chooses to fund is entered in the Lender Inputs tab
Offer Period	Enter period, in months, between committed offer being made and loan completing
Allocate Capital	Yes – select to include capital requirement during Offer Period No – select to omit
Conversion %	The proportion of committed offers that go through to completion
	RM calculates the capital required during the Offer Period in 3 steps: 1. Calculate requirement as if the asset was drawn 2. Scale it down to reflect its undrawn nature 3. Scale it up such that the loans that complete bear the costs of those that do not
Example	If the lender expects 3 out of 4 offers to complete, enter 75%
	<u>Sample calculation</u>

Loan balance		100
Risk weighting		35%
Capitalisation rate		10%
Drawn capital requirement	100 x 35% x 10%	3.5
Exposure Value for Offer Period		20%
Undrawn capital requirement	20% x 3.5	0.7
Conversion %		75%
Offer Period capital required	1/75% x 0.7	0.93

Drawdown

Drawdown Type	Single – select if Drawdown occurs on a single date Phased – select if Drawdown occurs over a series of dates
Drawdown Period	Enter the period in months between the first and last drawdown. Drawdowns are assumed to occur in equal monthly amounts over the Drawdown Period. RM allows for Drawdown Periods of up to 12 months
Loan Type	Select from dropdown menu of Loan Type options The Risk Weighting applicable to each product is entered on the Lender Inputs tab
Fixed / Variable	Select Fixed if interest payments are calculated using a fixed rate for Drawdown Period, otherwise select Variable
Variable Type	If Variable selected above, select from the available indices Variable indices are entered in the Loan Rate table on the Market Rates tab
Fixed Rate	If Fixed selected above, enter the fixed rate of interest applicable for the Drawdown Period
Variable index displayed	Displays basis risk category and rate of chosen index Rates are updated on the Market Rates tab
Spread (+/-)	If Variable selected above, enter any margin over or below the selected index rate as a percentage
Total Rate Paid	If Variable selected above, displays total of variable rate index plus any spread
Drawdown Rate Type	Displays basis risk category

Phase 1

Amortisation	Select Repayment loan if the loan amortises during Phase 1, otherwise select Interest only
Phase 1 Period	Enter length, in years, of Phase 1 of the loan
	A red warning is displayed if the sum of Drawdown Period and Phase 1 Period exceeds Loan Term
Loan Type	Select from dropdown menu of Loan Type options
	The Risk Weighting applicable to each product is entered on the Lender Inputs tab
Fixed / Variable	Select Fixed if interest payments are calculated using a fixed rate for Phase 1, otherwise select Variable
Variable Type	If Variable selected above, select from the available indices
	Variable indices are entered in the Loan Rate table on the Market Rates tab
Fixed Rate	If Fixed selected above, enter the fixed rate of interest applicable for Phase 1
Variable index displayed	If Variable selected above, displays the name of the rate index and associated interest rate
Spread (+/-)	If Variable selected above, enter any margin over or below the selected index rate as a percentage
Total Rate Paid	If Variable selected above, displays total of variable rate index plus any spread
Phase 1 Rate Type	Displays category into which the chosen rate is placed for basis risk analysis purposes.
	The basis risk position is shown graphically on the Output tab

Phase 2

Phase 2	Phase 2 is only applicable to Residential mortgages. For all other products, the user should select a Phase 1 Term which equals Loan Term – Drawdown Period (if any). A red warning is displayed if a Commercial loan has a Phase 2
Amortisation	Interest only – select if the loan has no contractual amortisation schedule during Phase 2 of the loan Repayment loan – select if the loan has a contractual amortisation schedule during Phase 2 of the loan
Remaining period	The length of the residual term of the loan after Phase 1 is displayed for information purposes. Calculated as Loan Term less Phase 1 Period less Drawdown Period
Fixed / Variable	Select Fixed if interest payments are calculated using a fixed rate for Phase 2, otherwise select Variable If Loan Term exceeds 10 years, only Variable is displayed for Phase 2. If the user has already selected Fixed for Phase 2 and then adjusts the term such that the total term exceeds 10 years, a red warning is displayed. The swap input table goes out to 10 years so fixed items longer than 10 years will not be correctly hedged
Variable Type	If Variable selected above, select from the available indices Variable indices are entered in the Loan Rate table on the Market Rates tab
Fixed Rate	If Fixed selected above, enter the fixed rate of interest applicable during Phase 2
Variable index displayed	If Variable selected above, displays the name of the rate index selected and associated interest rate
Spread (+/-)	If Variable selected above, enter any margin over or below the selected index rate as a percentage
Total Rate Paid	If Variable selected above, displays total of variable rate index plus any spread

Contractual Fees

Fees payable by lender	Input up to 3 fees payable by the lender
Fees payable by borrower	Input up to 5 fees receivable by the lender
Type	Input the fee by Type
Timing	1. Upon Application 2. Upon Completion 3. On Final Payment RM pro rates any fees payable On Final Payment across all principal repayments whether arising from contractual amortisation or prepayment Commercial practice is such that not all fees are payable at all 3 times (e.g. it is standard for Procuration Fees to be paid on Completion) so for some fee types the timing options may be limited to 2 or even 1 occasion
Absolute or %	Absolute – select if the fee is a defined amount such as £100 % - select if the fee is calculated as a percentage of the Expected average loan size
Fee	Enter the amount or percentage according to the choice made in the previous column Fees should be entered as positive numbers regardless of whether the fee is payable or receivable

Ancillary Income

Fee	If the lender expects to earn other income from the relationship with the borrower and wishes to factor that income into the evaluation of the profitability and ROE of the proposed loan, enter the expected annual income as a positive, absolute amount. The income is treated as arising annually throughout the life of the loan. If the Loan Term is not a full number of years, the Ancillary income will be pro-rated in the final year. The amount of income is not linked to the amount of the loan outstanding – it is constant throughout the loan life. Where there is a Phased Drawdown, the income is treated as arising on the anniversary of the first drawdown.

Probability of Default

Borrower Rating	Select value from 1 to 22 which links to table setting out expected Probability of Default (PD) rates. The table for PD rates is on the Expected Loss tab. The user may opt to populate fewer than 22 rows for more details, see Expected Loss tab.

Loss Given Default

LGD Calculation Method	1. Data Driven RM subtracts the Exposure at Default from the projected value of the security to determine what loss, if any, will arise. The projected value of the security takes account of user-input Asset Price Indexation (see Expected Loss tab), any Fire Sale Discount and any Costs Incurred on Repossession and Sale. Data Driven is only available for Residential mortgages. If a commercial loan is being priced and Data Driven was previously selected, a red warning is displayed. 2. User Input Input the LGD percentage to apply to the defaulted portion of the loan. This figure remains constant throughout the life of the loan. 3. LTV Driven Based on the LTV of the loan, RM applies a user-input LGD rate taken from a table on the Expected Loss tab which maps Loan Type and LTV to LGD. The LGD is calculated at monthly intervals based on that month's LTV. The monthly LTV may be impacted by loan amortisation.
LGD Specified	Enter expected Loss Given Default as a percentage Only applicable if User Input selected
Implied LGD	Displays, for information purposes, an annualised LGD rate. Only shown if Data Driven or LTV Driven are selected
Defaults Begin after	Number of months, after Final Drawdown, when defaults are expected to begin
Recovery Delay	Time, in months, expected to elapse between default and realisation of security

Fire Sale Discount	Percentage by which the value of the security is expected to be marked down in the event of a forced sale. Only applicable if Data Driven is selected
Costs incurred on Repossession % Sale	Administration cost arising from repossessing and realising security. Only applicable if Data Driven is selected

Security

LTV	For Residential mortgages only, enter ratio of the Expected average loan size to the value of the security
	The following inputs are only relevant to Loan Types other than Home Loan, Self-Build or Buy-to-Let
	RM calculates the RWA of a non-Residential mortgage asset by applying the most favourably weighted security first
	Step 1. Offset any Cash Security against the loan exposure Step 2. Offset any Residential Security against remaining exposure Step 3. Offset any Commercial Security against residual exposure
Cash Security	Enter any Cash Security
	An amount of the loan equal to the Cash Security will be zero weighted for capital calculations
SME Support Factor	Yes – select to apply SME Support Factor No – select to omit
	The SME Support Factor allows for a reduction in the RWA of a loan made to a small or medium size enterprise satisfying certain conditions around turnover and employee numbers. RM calculates the RWA as normal and then applies the factor. The factor is displayed on the Lender Inputs tab for information purposes.
Residential Security	Enter the value of any Residential Security
	Loan exposure secured by Residential Security is weighted in 2 steps. Up to a threshold LTV level (e.g. 80%), the weighting will be at a lower level (e.g. 35%). Any exposure above the LTV threshold is weighted at a higher level.
	The threshold and weightings are user inputs on the Lender Inputs tab
Commercial Security	Enter the value of any Commercial Security

	The weighting applied to any exposure over and above that secured by Cash and / or Residential Security will be the weighting entered in the Lender Inputs tab for the selected Loan Type
Total Connected Exposure not secured by Residential Security	Less than £1m – select to apply this rule Not applicable – select if this rule not to be applied If this rule is applied, the RWA will be multiplied by 75%. When setting up Loan Types on the Lender Inputs tab, this rule can be allowed or disallowed for each individual Loan Type

Prepayment

Prepayment Curve	Select either 1, 2 or 3 RM accommodates up to 3 prepayment schedules and associated Early Redemption Charges These are input on the ERC tab

ERC Tab

Prepayment Profile of Loan

Annual Prepayment Rate	Rate at which prepayments are expected to occur each year. Prepayments are payments over and above contractually due principal repayments
Of which, whole loan prepayments	Enter the percentage of prepayments represented by whole loan prepayments rather than partial prepayments
	This may be best understood by taking the case of 100 interest-only loans of £100 each. Assuming that prepayment occurs at a rate of 10% per annum, at the end of a year are there 90 loans remaining with a balance of £100 or 100 loans outstanding with a balance of £90?
	The significance of this distinction lies primarily in its impact on ERCs. If, for example, a borrower is permitted to prepay up to 10% of the loan annually without penalty, then if 100 loans are prepaid by 10% no ERCs will arise. However, if 10 loans are prepaid in their entirety, ERCs will be payable by the borrower.
	RM includes expected ERC revenue in its evaluation of loan profitability
Prepayments begin after	Number of months expected to elapse between Drawdown and the start of prepayment
	For loans with a Phased Drawdown, the period is measured from when the final drawdown occurs
Prepayment Spike?	Yes – select if there is expected to be a particular month in which a major prepayment event occurs
	No – select if no such event is expected
	A common instance of this would be after the expiry of Phase 1 of a mortgage when the initial attractive rate ends and the loan reverts to SVR
Period from Drawdown to Prepayment Spike	Number of months expected to elapse between Drawdown and the occurrence of the major prepayment event.
	For loans with a Phased Drawdown, the period is measured from when the final drawdown occurs
Prepayment Spike Rate	% of the loan expected to be prepaid Calculated as a % of the loan outstanding at the time of the Prepayment Spike, not as a % of the original loan balance

Early Redemption Charge Structure

Type of Early Redemption Penalty-free Allowance	Absolute – select if borrower is permitted to prepay a defined absolute amount each year without incurring ERCs
	Percentage – select if the amount that a borrower can prepay without penalty each year is expressed in percentage terms
Annual Penalty-Free Prepayment Amount	If Absolute selected above, enter the amount that can be prepaid each year without incurring ERCs
Type of Percent Prepayable without Penalty	If Percentage selected above
	% of Original Loan Amount – select if the ERC exempt amount is calculated as a % of the original loan balance
	% of Loan Outstanding at Beginning of that Year – select if the ERC exempt amount is calculated as a % of the loan balance at the beginning of the year in which prepayment occurs
Percent Prepayable Without Penalty	If Percentage selected above, enter the percentage of the loan which can be prepaid each year without incurring ERCs
Early Redemption Charge	Flat – select if the ERC remains constant over the life of the loan Varies over Time – select if the ERC changes in different time bands
Flat Charge	If Flat selected above, enter the rate at which ERCs will be charged on non-exempt prepayments
Yearly time bands	If Varies over Time selected above, enter the rates at which ERCs will be charged in each time band

Funding Tab

The Funding tab allows the user to set out the details of the debt funding to be used to finance the client asset and the associated liquidity assets.

The sources of the funding, its stability, tenor and price are all captured on this tab.

A key RM assumption is that the composition and cost of the funding remain constant throughout the life of the asset.

Sources of Funding

Retail	Enter percentage of funding sourced from retail depositors
Corporate	Enter percentage of funding sourced from corporate depositors
Wholesale and Bank	Enter percentage of funding sourced from Wholesale or Bank depositors
Runoff rates	For Corporate or Wholesale and Bank depositors, enter appropriate run off rate applicable under LCR rules
	Run off rate applied to term deposits in final month

Composition of Retail Non-Maturity Funding

Retail – stable, insured	Enter percentage of retail funding which can be categorised as stable together with appropriate run-off rate
Retail – less stable	Enter percentage of retail funding which can be categorised as less stable together with appropriate run-off rate
Retail – High Risk	Enter percentage of retail funding which can be categorised as High Risk together with appropriate run-off rate

Bonus Pricing

One issue facing a lender when pricing new lending is whether to use its average or marginal cost of funds. Using the existing average cost of funds is misleading if the firm has to source fresh funding to support new assets. However, using marginal costing may overstate the likely funding cost. It is reasonable to suppose that, over time, the cost of new retail funding can be managed down as fresh funding migrates from the front to the back book.

RM allows the user to factor in migration of retail funding from front to back book. It is predicated on the idea that the bank might have to pay a premium to attract fresh funding at the outset but

over time the rate could realistically be reduced for the loss of a limited percentage of the balances.

Bonus Pricing	Select Yes to activate Bonus Pricing feature Select No to omit
Bonus Removed after	Enter the period in months from when the rate paid on Retail Non-Maturity deposits is to be reduced
% of book rolling off after bonus period	For each Retail Account Type, enter the percentage of the balances which are expected to be withdrawn when the interest rate is reduced To assist in populating this field, please see the following table

		Bonus removed after (months)											
		1	2	3	4	5	6	7	8	9	10	11	12
	0%	0	0	0	0	0	0	0	0	0	0	0	0
	10%	0.9	1.7	2.6	3.5	4.3	5.1	6.0	6.8	7.6	8.4	9.2	10.0
	20%	1.8	3.7	5.4	7.2	8.9	10.6	12.2	13.8	15.4	17.0	18.5	20.0
Roll	30%	2.9	5.8	8.5	11.2	13.8	16.3	18.8	21.2	23.5	25.7	27.9	30.0
off	40%	4.2	8.2	12.0	15.7	19.2	22.5	25.8	28.9	31.8	34.7	37.4	40.0
%	50%	5.6	10.9	15.9	20.6	25.1	29.3	33.3	37.0	40.5	43.9	47.0	50.0
	60%	7.4	14.2	20.5	26.3	31.7	36.8	41.4	45.7	49.7	53.4	56.8	60.0
	70%	9.5	18.2	26.0	33.1	39.4	45.2	50.5	55.2	59.5	63.3	66.8	70.0
	80%	12.6	23.5	33.1	41.5	48.9	55.3	60.9	65.8	70.1	73.8	77.1	80.0
	90%	17.5	31.9	43.8	53.6	61.7	68.4	73.9	78.5	82.2	85.3	87.9	90.0
	100%	62.4	85.8	94.7	98.0	99.2	99.7	99.9	100	100	100	100	100

% of book rolling off after bonus period is an annualised number. If the user selects a number of months less than 12 in the Bonus Removed after cell, the roll-off will be less than the headline percentage. For example, if the user enters 30% roll off after 3 months, then the amount (see table above) which will roll off in 3 months is 8.5% of the balance. In turn this implies that 8.5% of the deposit will have to be attracted back with the original high rate whilst the remaining 91.5% can be expected to migrate to the lower later rate. These percentages will then remain constant thereafter.

Retail
Current Account, Demand Account, Notice Account

% of book	For each Account Type, enter the % of all retail funding coming from that source
Initial Rate	Input the rate payable for each Account Type
Later Rate	If Bonus Pricing = No, this is not applicable

	If Yes, enter the lower interest rate to be applied after the bonus period
Term Deposits	If the total is less than 100%, the balance is assumed to come from Term Deposits

Term Deposits

% of book	Enter the percentage of Term Deposits raised in that period
	For the avoidance of doubt, the % of book figure for Term Deposits is the percentage of Term Deposits, not the % of total Retail funding
Cost	For each Term Deposit, enter the rate applicable to that maturity i.e. the rate card for attracting funds
Corporate Wholesale and Bank	Repeat the input process described above for Retail funding. For Non-Maturity Funding, only one rate need be entered as the Bonus pricing feature only applies to Retail funding

Lender Inputs Tab

Credit Risk – Regulatory Approach

Standardised IRB	Select according to the firm's approach to the quantification of credit risk

IRB Inputs

Assumptions about Housing Market for IRB RWA	
House Price Fall Year 1	User input
House Price Fall Year 2	User input
Basel II Capital Inputs	
Correlation	15% displayed for information only This is the rate prescribed in the Basel regulations
Overriding Minimum LGD	User input

Capital Add-On

Pillar 1 Operational Risk Alpha	Select appropriate "Alpha" from dropdown menu to include capital for Operational Risk. If no Operational Risk is to be included, select 0% The Alpha is a factor used to calculate the capital required to support Operational Risk. RM calculates as follows: 1. Calculate average of 3 years prospective earnings 2. Convert to RWA by multiplying by Operational Risk Alpha and dividing by Pillar 1 ratio of 8% 3. Calculate capital needed by multiplying by Capitalisation Rate

Capitalisation

Pillar 1 Capitalisation Pillar 2 Add-On Capital Conservation Buffer Countercyclical Buffer G-SIB Buffer Management Buffer Other Buffer	User inputs as a percentage
Capitalisation Rate	Displays sum of all above inputs. Gives the Tier 1 Capital ratio that the user firm wishes to maintain

ROE and Tax

Required ROE	Enter required Return on Equity This rate is used to discount all future cashflows when determining the Economic Profit of the proposed transaction
Tax rate	Enter applicable corporate tax rate

Overheads

Overheads	Overheads are calculated as a percentage of the sum of the client loan and liquid assets outstanding each month. They are applied from first drawdown but not during the Offer Period. Each monthly overhead cost is calculated as Overheads % * (sum of client loan and liquidity assets) * 1/12
Flat	Select if Overheads are constant
Vary over Time	Select if Overheads change over time
Flat Charge	If Flat selected above, enter the Overhead charge as a percentage
Time bands	If Vary over Time selected above, enter Overhead charges in the relevant time band as a percentage

Idiosyncratic inputs

Amortise contractual fees	Yes – select to recognise Contractual Fees over an extended period rather than just when the occur
	No – select to recognise fees at the time of payment only
	For accounting purposes, some fees are spread or amortised rather than being recognised solely at time of payment. The user can elect to spread the fees set out in the Contractual Fees table on the Loan tab. This impacts the accrual profit and loss displayed on the Output tab.
	Fees are amortised on an arithmetic basis without allowance for time value.
	Note that the Economic Profit calculation – which calculates the present value of all cashflows – is based on when the cashflows actually occur rather than when they are reported so it will be unaffected by the choice to amortise fees.
Amortisation period	1. Behavioural life 2. End of Phase 1
	Select depending on whether the Contractual Fees are to be spread over the expected Behavioural life of the client loan or until the end of Phase 1
SME Support Factor	Displayed for information only
	The SME Support Factor allows for a reduction in the RWA of a loan made to a small or medium sized enterprise satisfying certain conditions around turnover and employee numbers. RM calculates the RWA as normal and then applies the Support Factor.
% Prefunded	Enter the percentage of the client loan that the user would opt to prefund during the offer period
Exposure Value for Phased Drawdown Loans	Enter capital weighting to apply to undrawn portion of Phased Drawdown loans.
	RM can apply a different capital weighting to the drawn and undrawn portions of a Phased Drawdown loan. The Exposure Value is a scalar which reduces the weighting applied to the undrawn portion. If the user does not wish to apply the scalar, the Exposure Value should be entered as 100%
Exposure Value for Offer Period	Enter capital weighting to apply to committed offers
	RM calculates the weighting that would be applied to a drawn commitment and then, in respect of a committed offer of that same loan, it applies a scalar to reflect its undrawn nature. Typically, for an

	undrawn offer of less than 12 months, a scalar of 20% is applied. RM only allows for an offer period up to 12 months.

Residential Security

Residential Security	Where the Loan Type is not Home Loan, Buy-to-Let or Self-Build, but Residential security is nevertheless available (perhaps as part of a mix of residential and commercial security) these are the risk weightings to be applied to the exposure secured by the Residential security
Res. Security Main Weight	Enter main weighting to apply to the Residential security
Res. Security Threshold	Enter LTV Threshold above which a higher weighting is applied
Res. Security Higher Weight	Enter higher weighting applied to exposure over Threshold

Liquidity Cost Method

Liquidity Cost Method	LCR Driven – select if the amount of liquidity to be held is based on LCR rules taking account of the user-specific funding profile and the nature of the asset
	Manual Input – select if the liquidity costs are calculated offline and are input manually
LCR Target	If LCR Driven selected above, enter the firm's LCR Target
	Based on the LCR Target, funding profile, HQLA composition and asset term, RM solves for the amount of liquidity that must be held at each monthly point through the life of the transaction
Manual Input	If Manual Input selected above, populate table with applicable liquidity costs in each time band.
	RM applies the liquidity cost based on the Average Life of the client asset, interpolating where the Average Life is not a whole year

Loan Type Table

Loan Type	List of Loan Types that can be priced in RM. Loan Types not mentioned by name can be set up using the Bespoke rows at the foot of the table
Main Weighting	Enter the capital weighting applicable to each Loan Type. Where a Loan Type has 2 possible weightings dependent on LTV, enter the weighting for the amount below the threshold.
Threshold for Higher Weighting	Enter the threshold above which any exposure attracts a higher capital weighting
Higher Weighting	Enter the capital weighting applicable to any exposure above the threshold
Cash Security	Yes – select if Cash collateral could be available as a form of security for this Loan Type N/A – select if Cash collateral would not be applicable to this Loan Type
Residential Security	Yes – select if Residential security could be available as a form of security for this Loan Type N/A – select if Residential security would not be applicable to this Loan Type
Connected Exposure <£1m	Yes – select if the favourable capital weighting arising from the Connected Exposure rules could apply to this Loan Type N/A – select if those rules are not to be applied to this Loan Type
SME SF	Yes – select if the favourable capital weighting arising from the SME Support Factor rules could apply to this Loan Type N/A – select if those rules are not to be applied to this Loan Type
PD Table	Select 1, 2 or 3 to link each Loan Type to the appropriate PD percentage column in the Probability of Default table on the Expected Loss tab

Expected Loss Tab

Probability of Default

Borrower Rating	The table accommodates up to 22 credit steps. The user only needs to populate the number of rows that they use in their internal credit grading system.
Table 1 Table 2 Table 3	The table allows the user to apply different PDs to different products. In the Lender Input tab the user links each product to the appropriate PD table. The percentage entered at each level represents the amount of the outstanding loan expected to default annually for that credit step. Sample calculation Loan balance £100 PD (annual basis) 3% PD (decompounded to monthly basis) 0.2535% Default in first month £2.54

Loss Given Default

Loss Given Default (LGD)	Users have a choice of 3 LGD Calculation Methods 1. Data Driven 2. User Input 3. LTV Driven This table is only relevant when LTV Driven is selected
LTV	The LTV column sets out the different available LTV bands
Commercial Residential	RM differentiates between Commercial and Residential exposures when applying the LTV Driven approach
Cash	Enter LGD applicable to exposures secured by Cash
Unsecured	Enter LGD applicable to unsecured exposures

Asset Price Indexation

Asset Price Indexation (API)	API allows the user to assess the impact of different inflation / deflation scenarios on the economics of the transaction.
	Applying inflation / deflation assumptions has 2 possible impacts.
	Firstly, it may alter the RWA and hence required Regulatory capital if it causes the LTV to cross a threshold (e.g. the 80% threshold applicable to Home Loans).
	Secondly, it will alter the LGD calculated by applying the Data Driven methodology.
Inflation Assumption	None – select if no inflation is to be factored in
	Constant – select if price change is to be the same each year
	Varies over Time – select if price change varies in different time periods
Inflation Rate	If Constant selected above, enter expected annual inflation / deflation rate
Time bands	If Varies over Time selected above, enter expected annual inflation / deflation rate in each time band
Sample calculation	Day 1 Loan balance £100,000 LTV 60.0% Security value £100,000 / 60% £166,667 API (annual rate) 1% Monthly change 1% * 1/12 * £166,667 £139 Revised security value £166,667 + £139 £166,806 Revised LTV £100,000 / £166,806 59.95%

Market Rates Tab

Hedging Methodology

Hedging Methodology	1. Fully hedged – select if all fixed rate assets and liabilities are to be swapped to variable
	2. Unhedged – select if nothing is to be hedged
	3. Personalised – select if RM has configured a user-specific hedging approach
	RM's default approach is to swap all fixed items to variable at a mid-market swap rate so that the user can see the "true" margin created by the transaction as opposed to margin created by taking an interest rate risk position

Swap Rates

1 m/s Interbank	This rate is taken from the Loan Rate Table
0.5 years to 10 years	Input swap rates out to 10 years
Compounding Basis	Semi-annual – select if fixed leg of the swap is payable every 6 months Annual – select if the fixed leg is payable every 12 months

Loan Rate Table

Loan reference rate	
SVR	Enter current Standard Variable Rate
Tracker	Enter current Base Rate
1 m/s Libor	Enter current 1-month Libor Rate
User Defined Rates	These lines can be used to enter other public or idiosyncratic indices
Rate Description	User can enter labels for each User Defined Rate
Rate	Enter current rate for each index
Basis risk category	Select appropriate Basis Risk category for Basis Risk reporting

HQLA Tab

HQLA View

HQLA Information	Summarised – select if overview of HQLA holdings is to be input Detailed – select if individual assets to be entered

Summarised view

HQLA Yield	Enter weighted average yield available from HQLA portfolio		
HQLA Risk -Weighting	Examples Risk weighting of Government bonds Risk weighting of Covered bonds	0% 10%	
HQLA Liquidity Factor	The liquidity factor is expressed as 1 less haircut %		
Examples	**Asset class** Government bonds Qualifying RMBS	**Haircut** 0% 25%	**Liquidity factor** 100% 75%
HQLA RSF Factor	Used to calculate the Net Stable Funding Ratio (NSFR) of the proposed transaction. A graph of the NSFR over time is provided on the Output tab		

Detailed View

Asset Type	Select each Asset Type held in HQLA portfolio from dropdown menu
% of Portfolio	For each asset, enter the percentage of the HQLA portfolio that it represents
Yield	Input the current Yield to Maturity of each asset
Risk-Weighting	Displayed for information purposes only
Liquidity Factor	Displayed for information purposes only

Output Tab

Inputs

Regulatory Approach	Displays Regulatory Approach chosen on the Lender Inputs tab
LTV	If asset being priced is a Residential mortgage then initial LTV is displayed. Otherwise blank.
Term of Loan	Displays the Loan Term for the client asset being priced

Outputs

Economic Profit	The net present value (NPV) of all profit or loss over the life of the transaction, discounted at the user's Required ROE rate. If Economic Profit is zero, the proposed loan covers all costs (funding, overheads, losses etc) and precisely meets the user's Required ROE A positive number means all costs are met and Required ROE is exceeded A negative number means that costs and Required ROE are not met. Note that if a loan covers all costs but does not meet Required ROE it would return a negative Economic Profit. However, such a loan would still be profitable for reporting and tax purposes.
Lifetime ROE	Note that this IRR basis for calculation produces different outcomes from a simple ROE calculation of Return / Capital because it takes account of time value.
Capital Required	Normally peak capital usage occurs on drawdown but can be later if there is a Phased Drawdown or earlier if there are very low conversion rates of committed offers.
Payback Period	Length of time required for profit from the transaction to equal the capital deployed. Measures how long the transaction takes to provide a return
Average Life	Weighted average life of the client asset, taking account of scheduled amortisation, expected prepayment and default. Example – a 20-year amortising loan with no prepayment or default has an average life of 11.4 years
Liquidity / Deposits	Ratio of required Liquid assets divided by Retail funding
Spread vs Breakeven	Press calculation button to calculate the percentage by which the return on the transaction exceeds or falls short of the Required ROE

	This output does not automatically re-calculate if an input is changed – the calculation button must be pressed again.	
DV01	Press calculation button to calculate the present value of a 1 basis point change in the interest rate payable on the client asset. This output does not automatically re-calculate if an input is changed – the calculation button must be pressed again	

Profit and Loss Account

a.	Interest income	Income from the client asset and any liquidity assets
b.	Interest expense	Debt funding costs
c.	Net Interest Income (a-b)	The net of the 2 values above
d.	Fee income	Income from any contractual fees. The timing of recognition is determined by the user on the Lender Inputs tab
e.	Hedging income	Income from any hedging contracts where the interest rate receivable exceeds the interest rate payable
f.	Prepayment income	Income arising from Early Redemption Charges
g.	Total income (a+d+e+f)	Sum of interest income, Fee income, Hedging income and Prepayment income
h.	Fee Expense	Any contractual fees payable by lender. The timing of recognition is determined by the user on the Lender Inputs tab
i.	Hedging Expenses	Expense arising from any hedging contracts where the interest rate payable exceeds the interest rate receivable
j.	Overhead Expenses	Overhead costs arising in that reporting year
k.	Loss Incurred	Any loss arising from defaulted loans
l.	Product PBT (c+d+e+f-h-i-j-k)	Product Profit before Tax is calculated as follows Net interest income +Fee income +Hedging income +Prepayment income -Fee expense -Hedging expenses -Overheads -Loss incurred

m.	Tax	Tax is assumed to be paid annually on the anniversary of the first drawdown. Tax is payable, at the rate input by the user in the Lender Inputs tab, on net profit for the previous 12-month period.
		Net profit is calculated as Loan Interest + Liquid asset interest + Hedging income + Prepayment income + Fee income Minus (Cost of funding + Hedging expense + Fee expenses + Overheads + Losses incurred)
		Fees are recognised either during the period in which they arise or over a number of periods depending on whether the user chooses to amortise fees in the Lender Inputs tab.
		If there is a loss during the period, it is carried forward and set off against any profit arising in the next profitable period. If the carried forward losses exceed the profit in the next profitable period, the residue is carried forward to the subsequent profitable period and so on. If there are insufficient profitable periods to absorb carried forward losses, the unabsorbed loss is recognised as income on the basis that the user firm would be entitled to a tax refund. If the transaction is profitable initially but loss making thereafter, tax will be payable during the profitable period; it will not be offset against the future unprofitable period.
		Tax may be payable even if the Economic Value of the transaction is negative. This is because the Economic Value reflects the value over and above the user firm's Target Return on Equity. If, for example, a transaction returned a Lifetime ROE of 5% and the user's target was 10% then the Economic Value would be negative but the transaction would still be profitable for tax purposes.
n.	Product PAT (l-m)	Product Profit after Tax is Product PBT less Tax
A.	Average Equity	Average of the Regulatory Capital deployed over the 12-month period. The first period begins from first drawdown.
B.	Average Loan Balance	Average of the outstanding loan balance over each 12-month period. The first period begins from first drawdown.
C.	Avg RWAs	The average Risk Weighted Assets outstanding during the period. Includes Credit and Operational RWA.
D.	Capitalisation rate x Average balance	User input capitalisation rate (see Lender Inputs tab) multiplied by Average Loan Balance

E.	Pre-tax ROE (Product PBT / Average equity required) (l/A)	Pre-tax Return on Equity calculated as Product PBT divided by Average Equity. This calculation does not take account of the time value of money – the result of the calculation is not affected whether the profit arises at the beginning or end of the period. This contrasts with the IRR calculation base for the Lifetime ROE calculation which takes account of when profit arises. Both metrics have their uses but this difference is noted as there will be differences in the two outputs.
F.	Post-tax ROE (Product PAT / Average Equity required) (n/A)	Post-tax Return on Equity calculated as Product PAT divided by Average Equity. This calculation does not take account of the time value of money – the result of the calculation is not affected whether the profit arises at the beginning or end of the period. This contrasts with the IRR calculation base for the Lifetime ROE calculation which takes account of when profit arises. Both metrics have their uses but this difference is noted as there will be differences in the two outputs.
G.	Product PBT (ignoring hedging) (c+d+f-h-j-k)	Profit before tax excluding any hedging income or expense. It is calculated as Net interest income + fee income + prepayment income -fee expenses -overheads -losses incurred
H.	Tax (ignoring hedging)	Tax payable (or receivable if tax credit created) calculated without hedging cashflows
I.	Product PAT (ignoring hedging) (G-H)	Product Profit after Tax (ignoring hedging) is calculated as Product PBT (ignoring hedging) -Tax (ignoring hedging)
J.	Pre-tax ROE ignoring hedging (Product PBT / Average Equity required) (G/A)	Pre-tax Return on Equity calculated as Product PAT ignoring hedging divided by Average Equity. This calculation does not take account of the time value of money – the result of the calculation is not affected whether the profit arises at the beginning or end of the period. This contrasts with the IRR calculation base for the Lifetime ROE calculation which takes account of when profit arises. Both metrics have their uses but this difference is noted as there will be differences in the two outputs.
K.	Post-tax ROE ignoring hedging (Product PAT / Average Equity required) (I/A)	Post-tax Return on Equity calculated as Product PAT ignoring hedging divided by Average Equity.

L. LTV	For Residential mortgages, LTV is calculated as the average of the loan balance outstanding divided by the projected property price. The projected property price is the initial property price plus or minus any user-input Asset Price Indexation. During any phased drawdown period, the LTV is calculated using the fully drawn balance.
	For commercial loans, LTV is calculated as net loan exposure (loan balance minus any cash collateral) divided by the sum of any residential or commercial security.
	If the cash collateral available equals or exceeds the loan balance, then the LTV will be reported as N/A.
	RM defaults to a maximum output of 1000% LTV if there is only nominal security.
	If there is no security then LTV will be reported as N/A.

Graphs

Loan Outstanding	Shows Scheduled Outstanding balance versus the Actual Outstanding balance taking account of prepayment and default.
NSFR and Leverage Ratios	Shows projected NSFR and Leverage Ratio given transaction parameters.
Liquid Assets, LCR and SDL Ratio	Shows the quantum of Liquid Assets required to meet desired LCR target. The graph will not display results if no LCR target is selected (i.e. if user selects Manual input for Liquidity Cost Method on the Lender Inputs tab
Composition of Funding	Provides a breakdown of funding sources
Composition of Assets	Provides a breakdown of assets held – in particular, gives perspective on the relationship between the size of the client asset and the liquid assets that must be held
Basis Risk	Shows the basis risk positions created by the chosen assets and liabilities and the net position.

Abbreviations

ASF	Available Stable Funding
ERC	Early Redemption Charge
FRN	Floating Rate Note
HQLA	High Quality Liquid Asset
LCR	Liquidity Coverage Requirement / Ratio
LGD	Loss Given Default
LTV	Loan to Value
NMD	Non-Maturity Deposit
NSFR	Net Stable Funding Ratio
PAT	Profit After Tax
PBT	Profit Before Tax
PD	Probability of Default
PRA	Prudential Regulation Authority
RM	RangeMountain Pricing Model
ROE	Return on Equity
RSF	Required Stable Funding
RWA	Risk Weighted Asset
SDL	Savings, Deposits and Loans