



Resi Global Model &
Validation Tool
User Guides

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I. About Fitch Ratings

Fitch Ratings is a global rating agency committed to providing value beyond the rating through independent and prospective credit opinions, research and data. Offering a world of knowledge and experience behind every opinion, we transform information to deliver meaning and utility to investors, issuers and other market participants. Fitch Ratings' global expertise draws on local market knowledge and spans the fixed-income universe. The additional context, perspective and insights we provide help investors make important credit judgments with confidence.

Dual-headquartered in New York and London, Fitch Ratings has over 50 offices worldwide. Fitch Ratings is part of the Fitch Group, a jointly owned subsidiary of Fimalac, S.A. and Hearst Corporation.

For additional information, please visit www.fitchratings.com.

II. Introduction

Thank you for downloading the Resi Global model.

Resi Global is an analytical model that helps with the risk assessment of residential mortgage loans in accordance with Fitch Ratings' RMBS criteria. The model can currently be used for Belgium, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal, Spain and the UK. Resi Global will also be extended to cover other jurisdictions in the future. ResiGlobal: Europe collectively refers to Belgium, France, Greece, Ireland, Italy, Netherlands, Portugal and Spain.

Fitch Ratings uses the model as the first stage in the quantitative analysis of an RMBS transaction and helps determine the expected default probability, loss severity and recovery on a loan-by-loan basis for transactions. The outputs from the Resi Global model can then be used as inputs for RMBS cash flow modelling purposes. Additionally, investors are able to input post-closing pool cuts into Resi Global for surveillance purposes.

These criteria can be found on the Fitch Ratings website at <https://www.fitchratings.com/site/criteria>.

Resi Global System Requirements

The system requirements to install and use the Resi Global model are as follows:

Operating System

- ◆ Windows 7, Windows 8 and Windows 10

Software

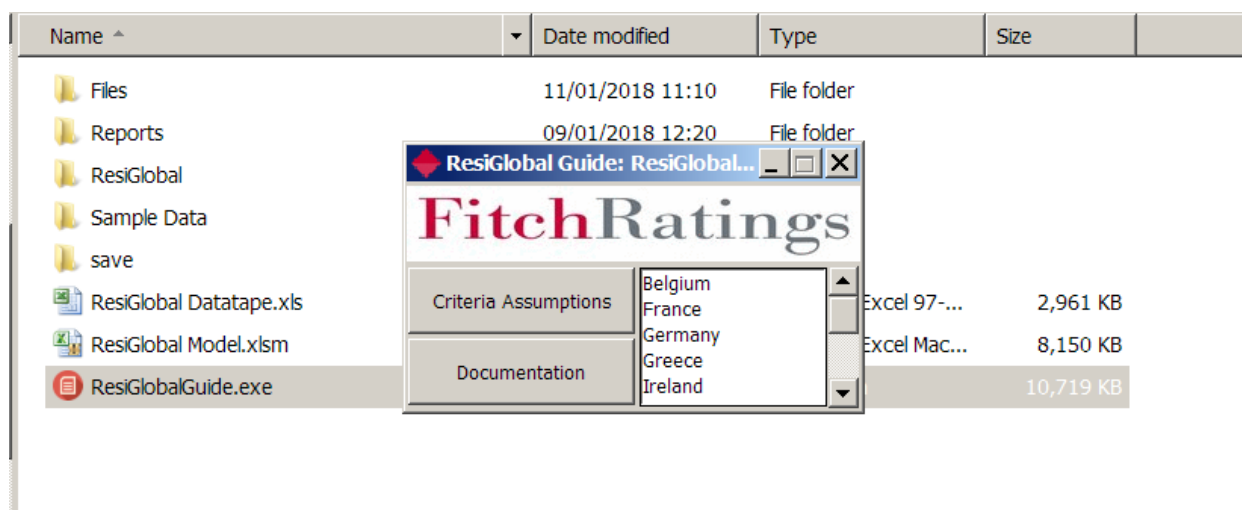
- ◆ Excel 2010 or 2013

Other Requirements

- ◆ The model must be installed on a local computer drive and you will need write-access to the directory in which the model is installed.
- ◆ Macros must be enabled in Excel for the model to function correctly.

III. Using Resi Global

In the extracted folder, the files that you will need to use are **ResiGlobal Model.xlsm** and **ResiGlobal Datatape.xls**. The **ResiGlobalGuide** application also contains the Criteria Assumptions for Belgium, France, Greece, Ireland, Italy, Netherlands, Portugal and Spain. This enables users to view the respective criteria assumptions without running the model.



European RMBS Rating Criteria

Country-Specific Assumption Sheet: France

Model Version: Europe.1.2.0

Generation Date: 2017-11-01 11:38:55

FF Assumptions

Base FF	Class 1	Class 2	Class 3	Class 4	Class 5
< 40%	0.8%	0.9%	1.1%	1.3%	1.6%
>= 40% and < 50%	1.0%	1.2%	1.3%	1.6%	1.9%
>= 50% and < 60%	1.2%	1.4%	1.6%	1.9%	2.3%
>= 60% and < 65%	1.3%	1.6%	1.8%	2.2%	2.7%
>= 65% and < 70%	1.5%	1.8%	2.1%	2.5%	3.0%
>= 70% and < 75%	1.7%	2.0%	2.3%	2.8%	3.4%
>= 75% and < 80%	1.8%	2.2%	2.6%	3.1%	3.7%
>= 80% and < 85%	2.0%	2.4%	2.8%	3.4%	4.1%
>= 85% and < 90%	2.2%	2.6%	3.1%	3.7%	4.4%
>= 90% and < 95%	2.6%	3.2%	3.7%	4.4%	5.3%
>= 95% and < 100%	3.2%	3.8%	4.4%	5.3%	6.4%
>= 100% and < 105%	3.7%	4.5%	5.2%	6.2%	7.5%
>= 105% and < 110%	4.7%	5.6%	6.6%	7.9%	9.5%
>= 110%	5.7%	6.8%	7.9%	9.5%	11.5%

* **Disclaimer:** This is the assumptions sheet for France and other countries may have differently layed out sheets.

Please note that the Resi Global model only accepts *.rmbs* files.

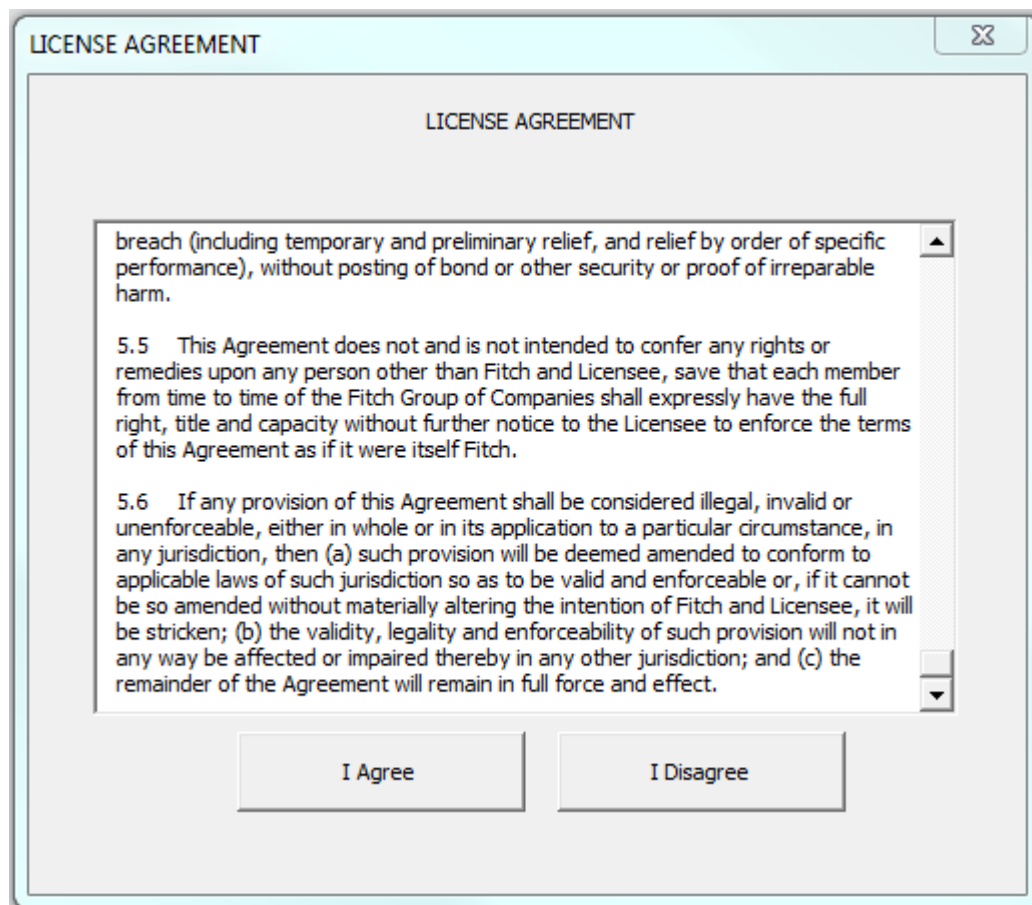
To create a *.rmbs* file, you must validate and certify a *.xls* or *.csv* file using the **ResiGlobal Datatape**. Once you have validated and certified the file through the datatape, the application will automatically create a *.rmbs* file and store it in the **Files** folder that was also extracted with the model. This can then be run through the **ResiGlobal Model**. Please note that you can only upload *.csv* files of up to 100,000 rows per file.

To see an example of the template that can be run through the **ResiGlobal Datatape**, take a look in the extracted **Sample Data** folder. It contains example *.xls* files of an RMBS loan pool for each of the jurisdictions currently available for use in Resi Global. These sample files can be validated following the steps in the datatape, and then subsequently run through the model.

You can also run your own loan pools through the datatape, and subsequently through the model as *.rmbs* files and this document will guide you through the process.

Opening the Model

When you open either the ResiGlobal Model or Datatape, you will be asked to accept Fitch Rating's license agreement before you are allowed to use the model.

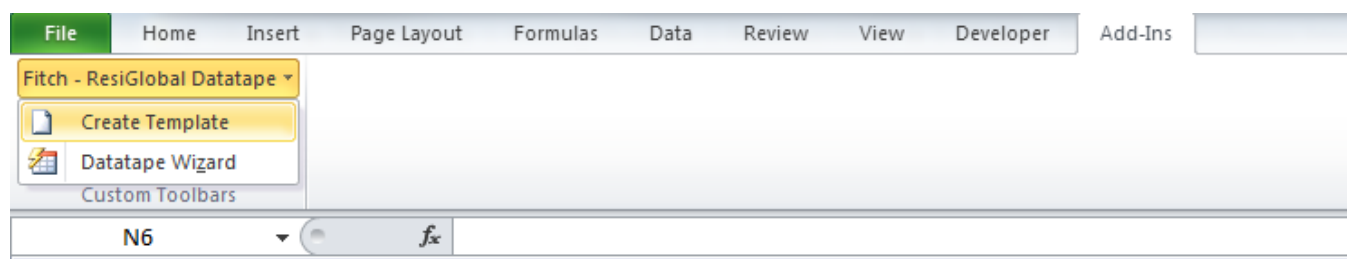


IV. Resi Global Datatape – Create Template

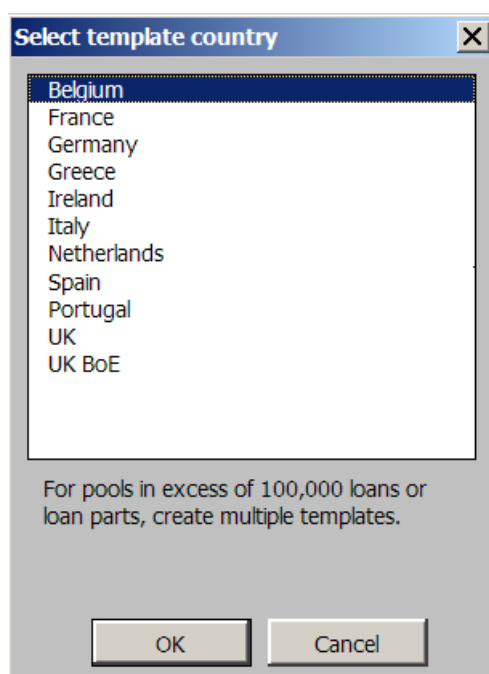
The **ResiGlobal Datatape** assists users in creating a suitable template with their loan data and validating that data to ensure greater accuracy in the *ResiGlobal Model* output.

Creating the Template

1. Open the **ResiGlobal Datatape** file. A validation window opens by default but you can close this until you have successfully created the template.
2. In the **Add-Ins** ribbon tab, select the **Fitch – ResiGlobal Datatape** button.
3. Select **Create Template** option.



4. You will be prompted to select the template country appropriate for the pool data. **Note:** The model assumes that the loans are all from the same country. If this is not the case, please subset the data into the appropriate countries and run multiple models.



- If the pool contains more than 100,000 loan or loan parts, create multiple input templates. Do not input data into multiple tabs in the same input template. **Note:** If there are multiple loans or loan parts linked to the same borrower, these loan parts or loans have to be in the same data template file.

	A	B	C	D	E	F	G	H	I
1	UK								
2	progressive number to count how many loans are in the datatape			If second charge loan, amount of outstanding balance of first charge			Amount of loan outstanding as of pool cut off date		
3									
4									
5	rowNumber	Loan ID	Loan amount at time of	Prior charge amount	Postcode	Property value at time of	Current ACTUAL loan bal	Valuation date at time of	Original term
6	1	1	120,000.00	0.00	RM13	150,000.00	100,000.00	2005-01-01	
7	2	2	60,000.00	0.00	RM13	150,000.00	50,000.00	2005-01-01	
8	3	3	180,000.00	0.00	RM13	150,000.00	150,000.00	2005-01-01	
9	4	4	120,000.00	80,000.00	RM13	150,000.00	100,000.00	2005-01-01	
10	5	5	120,000.00	0.00	RM13	300,000.00	100,000.00	2005-01-01	
11	6	6	120,000.00	0.00	RM13	120,000.00	100,000.00	2005-01-01	
12	7	7	120,000.00	0.00	RM13	150,000.00	100,000.00	2005-01-01	

- The grey background row contains the field names, with the mandatory fields highlighted by red font colour. Additionally, for ResiGlobal: Europe, the field names in black font are optional fields for purposes of validating the data tape, although any empty values for these fields will subsequently be replaced by the model under the 'Missing Values' section. Also for ResiGlobal: Europe, field names in grey do not feed into the model calculations and therefore do not need to be filled.
- Data can be imported from different sources (i.e. csv and Excel files) but ensure that format of the data exactly matches the template. This exact method is shown below.
- Once data has been imported, make sure to fill the **rowNumber** column in an ascending sequence from 1 (e.g. 1, 2, 3,...). This field is used by the model to assign a unique numeric identifier to every loan in the pool.
- Columns with blue data cells above them have the list data type and expect certain values. Permitted values are shown in a drop-down list as shown below.

		Please select from the li	Please select from the ti	Please input 1 if the bor	Please select from the li
			Unemployed		
Primary income (Borrower)	Secondary income (Borrower)	Borrower income cert	Temporary	First Time Buyer	Interest Rate Type
40,000.00	0.00	Certified	Self-employed		Other
18,000.00	0.00	Certified	Unemployed		Other
58,000.00	0.00	Certified	Pensioners		Other
80,000.00	0.00	Certified	Retired		Other
40,000.00	0.00	Certified	Civil servants		Other
40,000.00	0.00	Certified	Other		Other
40,000.00	0.00	Certified	Unknown		Other
40,000.00	0.00	Certified	Employed	N	Other
40,000.00	0.00	Certified	Employed	N	Other

***Note:** The rows below the column names without shading contain sample data. Data that is not submitted in the same format as the sample data will fail validation and cannot be used in the Resi Global model.

- Data that does not match permissible list values may result in a validation error. However, there is functionality in the validation application to help resolve these errors.
- Once completed, make sure to save your file in the **Files** folder for convenient future access.

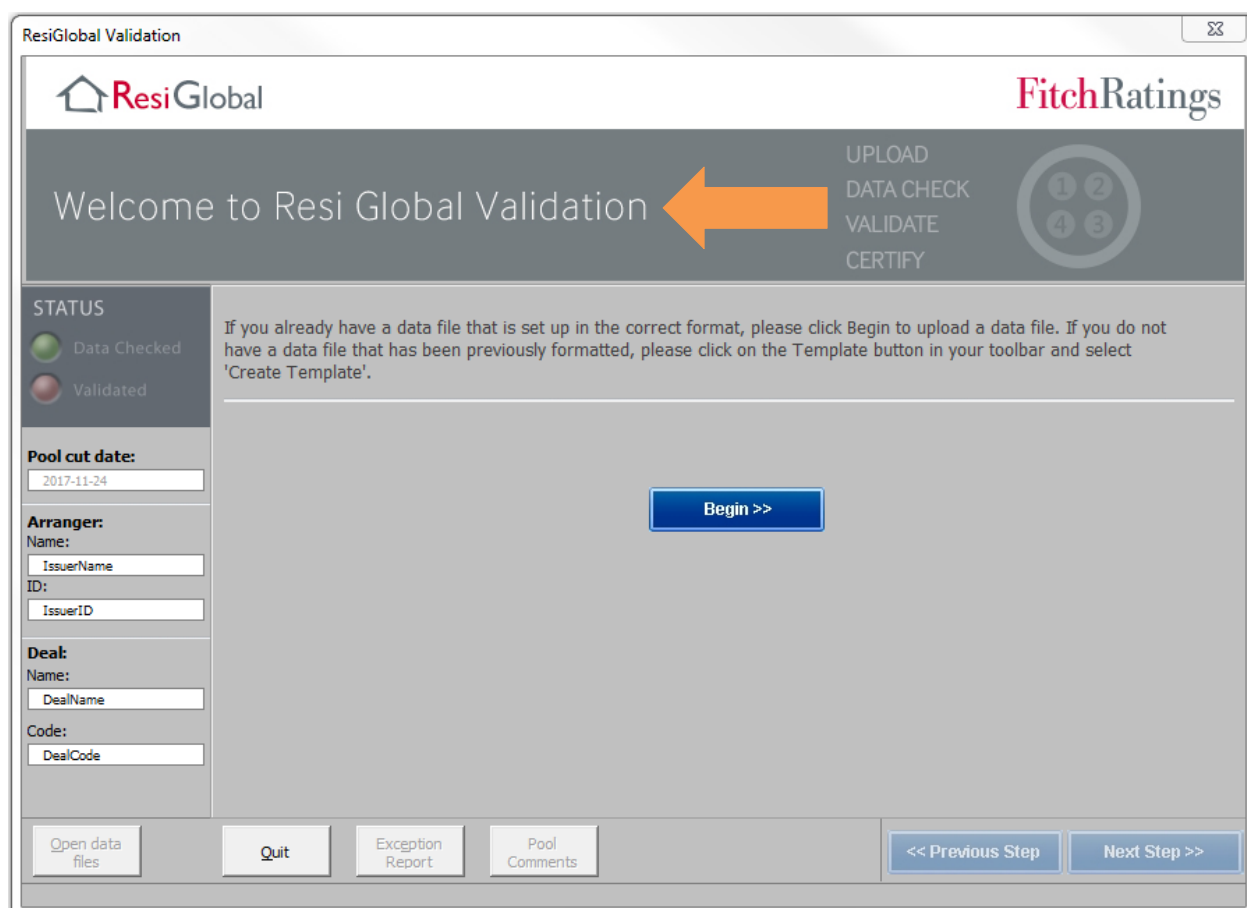
V. Resi Global Datatape – Validate Template

The **ResiGlobal Validation** wizard guides the analyst through four steps of data validation and this guide will detail that process. The wizard will create a *.rmbs* file from the saved data template from the above section.

The validation wizard can be sized into three window sizes during use:

- ◆ Full size;
- ◆ Header size;
- ◆ Minimised.

To change the size of the wizard, either click on the **Welcome to ResiGlobal Validation** header or the **ResiGlobal** icon as shown below.

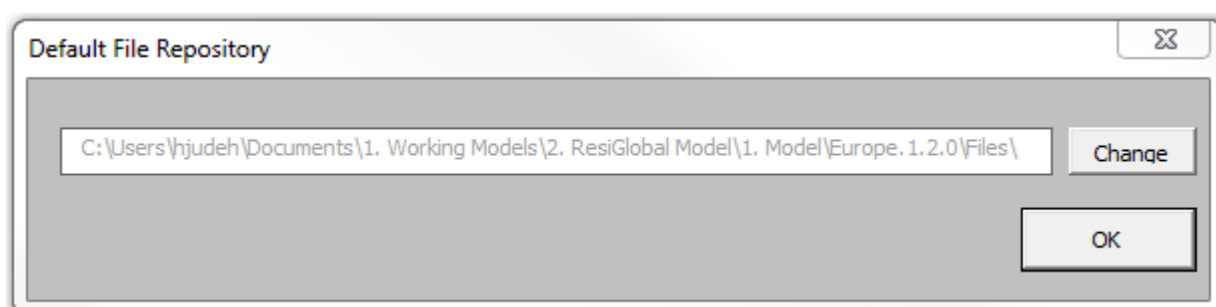
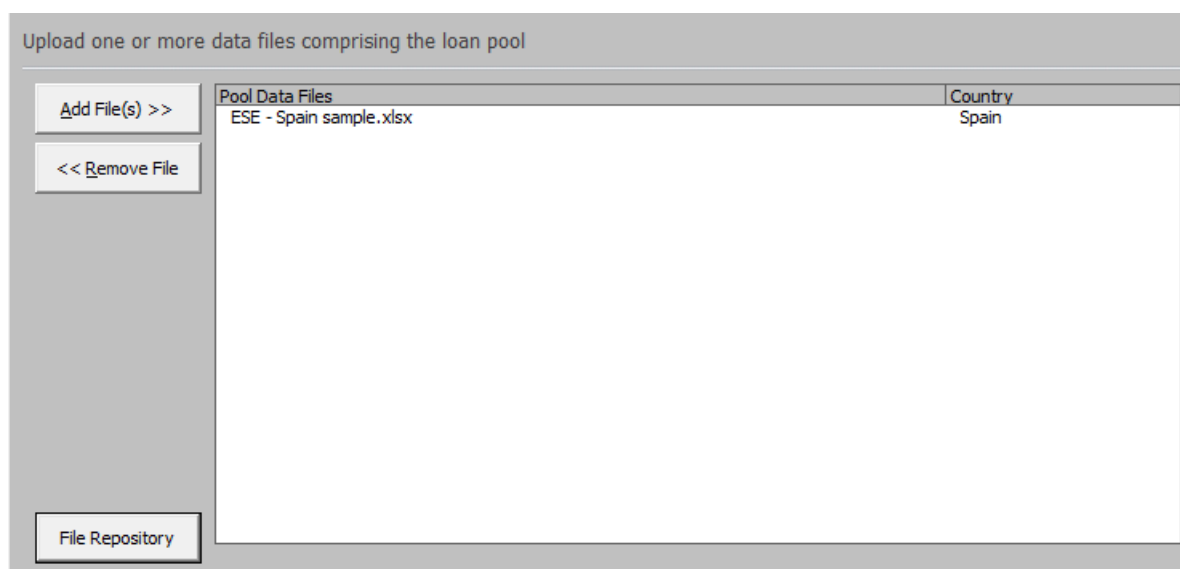




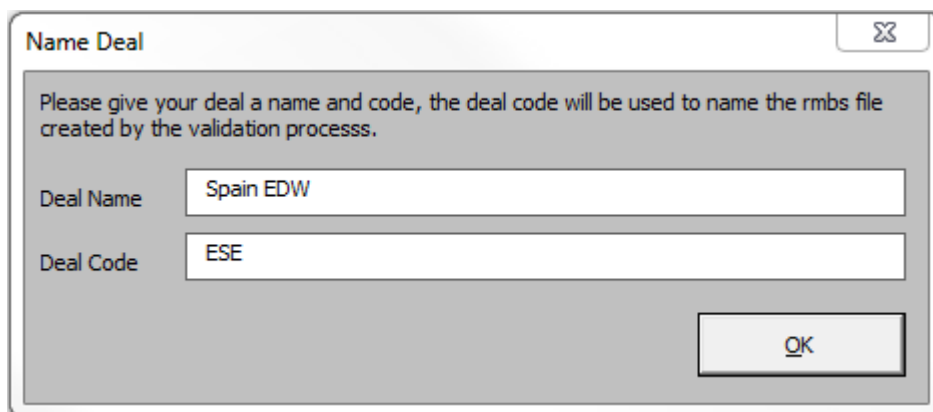
To start the validation, click on the **Begin** button on the wizard and follows the steps below.

Step 1: Upload the Loans

1. Once you click **Begin**, the model will automatically show the **Open File** dialogue box. Navigate back to the **Files** folder in the extracted model file, or any other location where you saved the completed data template. Click **Open**.
2. The first time the datatape is run, it will ask you to choose the **Default File Repository**, which it will use to store the all validation and model output files. We recommend using the **Files** folder, which is the default setting, but any local folder will be accepted. This setting can also later be changed by clicking on the **File Repository** button on the bottom left of the wizard.



3. You will get the chance to set the **Deal Name** and **Deal Code** once the file has uploaded.



Name Deal

Please give your deal a name and code, the deal code will be used to name the rmbs file created by the validation process.

Deal Name: Spain EDW

Deal Code: ESE

OK

4. Once the file has been uploaded, you will also have the opportunity to provide deal specific information on the left side bar such as the **Pool cut date**, **Arranger** and **Deal** details. For Resi Global: Europe, these details will not be used in the calculations.
5. The **Add Files** button can also be used to add multiple data templates for a single run. Each additional data template must be from the same country or the model will not accept it.
6. Once all data files have been uploaded, click the **Next Step** button. Note that the status indicator shows that the pool data has not yet passed the data check or validation.

Step 2: Check Data Format

1. The pool data is checked for the following:
 - a. mandatory fields contain values;
 - b. data types are as expected;
 - c. breaches of maximum or minimum validation limits.
2. The wizard will return a list of warnings and errors, if any are found. Each of these is treated differently by the model.

ResiGlobal Validation

ResiGlobal FitchRatings

STEP 2:
Check Data Formats

✓ **UPLOAD**
DATA CHECK
VALIDATE
CERTIFY

Warning: <1> types of data errors were found <360> total auto-format corrections were applied
100% Data check passed

Auto-Format Report

STATUS
☒ Data Checked
☐ Validated

Pool cut date:
2017-11-24

Arranger:
 Name: Issuer
 ID: IssuerID

Deal:
 Name: Spain EDW
 Code: ESE

Fix Selected Acknowledge Export Error List

☐ Select all warnings

Found in	Data field	Issue	Rows	Type
<input type="checkbox"/> ESE - Spain :	Foreign National	Value is missing	10	Warning
<input type="checkbox"/> ESE - Spain :	Secondary Income	Value is missing	10	Warning
<input type="checkbox"/> ESE - Spain :	Last County Court Judgements or equivalent – Year	Value is missing	10	Warning
<input type="checkbox"/> ESE - Spain :	Origination Channel / Arranging Bank or Division	Value is missing	10	Warning
<input type="checkbox"/> ESE - Spain :	Subsidy	Value is missing	10	Warning
<input type="checkbox"/> ESE - Spain :	Type of Guarantee Provider	Value is missing	10	Warning
<input type="checkbox"/> ESE - Spain :	Prior Balances	Value is missing	10	Warning
<input type="checkbox"/> ESE - Spain :	Pari Passu Loans	Value is missing	10	Warning
<input type="checkbox"/> ESE - Spain :	Maximum Balance	Value is missing	10	Warning
<input type="checkbox"/> ESE - Spain :	Restructuring Arrangement	Value is missing	10	Warning

Item 1 Information
 Found in: ESE - Spain sample.xlsx
 Data field: Foreign National
 Issue: Value is missing

Open data files Quit Exception Report Pool Comments << Previous Step Next Step >>

- Errors must be fixed before continuing to the next stage of the validation. This can be done by double-clicking on an error in the results window or selecting the required error and clicking **Fix Selected**. This will open a filtered view of the loan tape and an **Error Information** dialogue box in Excel, where they may be corrected.
- Once the first value is changed, a **Data Changed** dialogue box will appear allowing you to **Validate Amendments**. However, you may choose to correct multiple errors before validating the changes.

Data changed

Data to be saved and validated again

Foreign National	ESE - SPAIN SAMPLE.xlsx
------------------	-------------------------

Validate Amendments Validate Later

5. This button will return you to the model where you can see an updated list of warnings and errors.
6. It is not compulsory to correct the warnings, although the process for doing so is the same as for the errors. However, warnings must all be acknowledged using the **Acknowledge** button before moving onto the next step.

ResiGlobal Validation

STEP 2:

Check Data Formats

UPLOAD

DATA CHECK

VALIDATE

CERTIFY

STATUS

Data Checked

Validated

Warning: <1> types of data errors were found <360> total auto-format corrections were applied

100% Data check passed

Auto-Format Report

Fix Selected

Acknowledge

Export Error List

☒ Select all warnings

Pool cut date:

2017-11-24

Arranger:

Name:

Issuer

ID:

IssuerID

Deal:

Name:

Deal

Code:

DealCode

Found in	Data field	Issue	Rows	Type
<input checked="" type="checkbox"/>	ESE - Spain : Secondary Income	Value is missing	10	Warning
<input checked="" type="checkbox"/>	ESE - Spain : Last County Court Judgements or equivalent – Year	Value is missing	10	Warning
<input checked="" type="checkbox"/>	ESE - Spain : Origination Channel / Arranging Bank or Division	Value is missing	10	Warning
<input checked="" type="checkbox"/>	ESE - Spain : Subsidy	Value is missing	10	Warning
<input checked="" type="checkbox"/>	ESE - Spain : Type of Guarantee Provider	Value is missing	10	Warning
<input checked="" type="checkbox"/>	ESE - Spain : Prior Balances	Value is missing	10	Warning
<input checked="" type="checkbox"/>	ESE - Spain : Pari Passu Loans	Value is missing	10	Warning
<input checked="" type="checkbox"/>	ESE - Spain : Maximum Balance	Value is missing	10	Warning
<input checked="" type="checkbox"/>	ESE - Spain : Restructuring Arrangement	Value is missing	10	Warning
<input checked="" type="checkbox"/>	ESE - Spain : Occupancy Type	Value is missing	10	Warning

Item 1 Information

Found in:

ESE - Spain sample.xlsx

Data field:

Secondary Income

Issue:

Value is missing

Open data files

Quit

Exception Report

Pool Comments

<< Previous Step

Next Step >>

- Comments can also be left when warnings are acknowledged
- For your records, the error list can be exported using the **Export Error List** button. The **Auto-Format Report** also gives a breakdown of any values that the validation model has automatically changed. This is either because the values are not used or the change is required for a correct model behavior.
- Once complete, click **Next Step**.

Step 3: Validate the Pool

1. The loan data is then checked against the following:
 - a. Adherence to pre-defined validation rules related to list value inputs of mandatory columns;
 - b. List value inputs of non-mandatory columns are permitted (see blue cells above list columns in template)

ResiGlobal Validation

STEP 3: Validate the Pool

✓ UPLOAD
✓ DATA CHECK
VALIDATE
CERTIFY

STATUS

✓ Data Checked
✗ Validated

Pool cut date:
2017-11-24

Arranger:
Name: Issuer
ID: IssuerID

Deal:
Name: Spain EDW
Code: ESE

Validation failed, data has lookup errors.

Edit Alias Save Alias Settings Load Alias Settings View Alias Settings Revalidate

Found in	Data field	Issue	Rows
ESE - Spain sample.xlsx	Restructuring Arrangement	Lookup error	3
ESE - Spain sample.xlsx	Occupancy Type	Lookup error	2
ESE - Spain sample.xlsx	Property Type	Lookup error	1

Item 1 Information

Found in: ESE - Spain sample.xlsx
Data field: Restructuring Arrangement
Issue: Lookup error

Open data files Quit Exception Report Pool Comments << Previous Step Next Step >>

2. Validation errors can be corrected by double-clicking on each error. This will open a filtered version of the data pool with the all the rows for the specific error and the first error cell highlighted in orange. The **Error Information** dialogue box that also appears lists the permitted values in each cell.
3. Data can be corrected for all rows from this view. Once the first cell is changed, a new **Data Changed** dialogue box will appear with an option to **Validate Amendments**. This can be ignored until all required changes are made.
4. Once these changes have been made, you will have the opportunity to rerun the validation checks.

Final Margin	Final Step Date	Restructuring Arrange	Geographic Region Lis	Property Postcode
				18
		No		18
		Yes		18
		Yes		18

Error Information

Look up error.

Values filtered on sheet are not in this list

Y

N

No Data (ND) - Blank

Close

Data changed

Data to be saved and validated again

Occupancy Type

ESE - SPAIN SAMPLE.xlsx

Restructuring Arrangement

ESE - SPAIN SAMPLE.xlsx

Validate Amendments

Validate Later

- Alternatively, the data error can be adjusted by assigning an alias. This is generally done when the value entered is not incorrect but appears different to what the model expects (eg. No instead of N).
- To create an alias, highlight the error and click the **Edit Alias** button on the top left of the error list. This will open a dialogue box like the one below.

Map Unrecognised Data

Found in Column

Restructuring Arrangement

Add to Aliases Allowed

Unrecognised Values	Expected Values	Known Aliases
No	Y	
Yes	N	
	No Data (ND) - Blank	

Unrecognised data

Recognised as

Instructions

Click 'Add to Aliases Allowed' to map an 'Unrecognised Value' to an 'Expected Value'

Save

Cancel

- Unrecognised values can be mapped to expected values by selecting the relevant entry in each of the **Unrecognised Values** and **Expected Values** columns. You can then click the **Add to Alias Allowed** button on the top right.

Map Unrecognised Data

Found in Column

Restructuring Arrangement

Add to Aliases Allowed

Unrecognised Values	Expected Values	Known Aliases
No	Y	2
Yes	N	
	No Data (ND) - Blank	

Unrecognised data

Recognised as

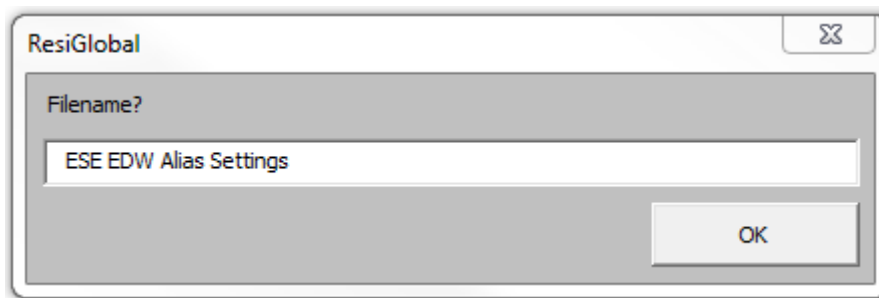
Instructions

Click 'Add to Aliases Allowed' to map an 'Unrecognised Value' to an 'Expected Value'

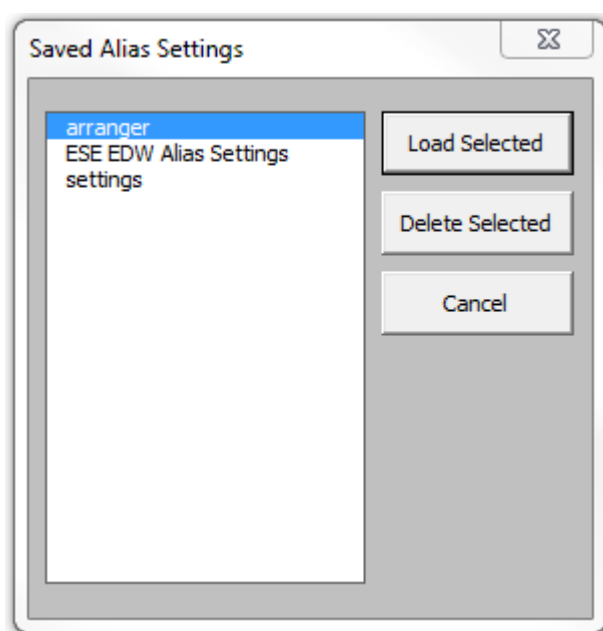
Save

Cancel

- Once all the aliases have been specified, make sure to click the **Save** button to implement the changes made.
- A useful option if creating aliases becomes a common practice in your workflow is to **Save Alias Settings**.



10. These will be kept for future use on new pool cuts of other transactions where they can be loaded using the **Load Alias Settings** button.



11. Once all the errors have been corrected and aliases have been added, the pool validation can be run successfully. Click **Next Step** to proceed.

Step 4: Certify

1. Complete the validation process by clicking **Certify Data**. This compresses the pool data and stores it in a locked format that can be read by the Resi Global model.

The screenshot shows the 'ResiGlobal Validation' window. The top bar includes the 'ResiGlobal' logo and the 'FitchRatings' logo. The main header area displays 'STEP 4: Certify' and a progress indicator with four steps: 1 (UPLOAD), 2 (DATA CHECK), 3 (VALIDATE), and 4 (CERTIFY). The 'CERTIFY' step is highlighted. Below the header, the 'STATUS' section shows 'Data Checked' and 'Validated' with green checkmarks. The 'Pool cut date' is set to '2017-11-24'. The 'Arranger' section includes fields for 'Name', 'ID', and 'IssuerID'. The 'Deal' section includes fields for 'Name' (set to 'Spain EDW') and 'Code' (set to 'ESE'). The main area contains the text 'The data provider, Issuer, confirms that accuracy of the data provided in this template.' and three buttons: 'Certify Data', 'Undo Certify', and 'Open Model'. At the bottom, there are buttons for 'Open data files', 'Quit', 'Exception Report', 'Pool Comments', '<< Previous Step', and 'Next Step >>'.

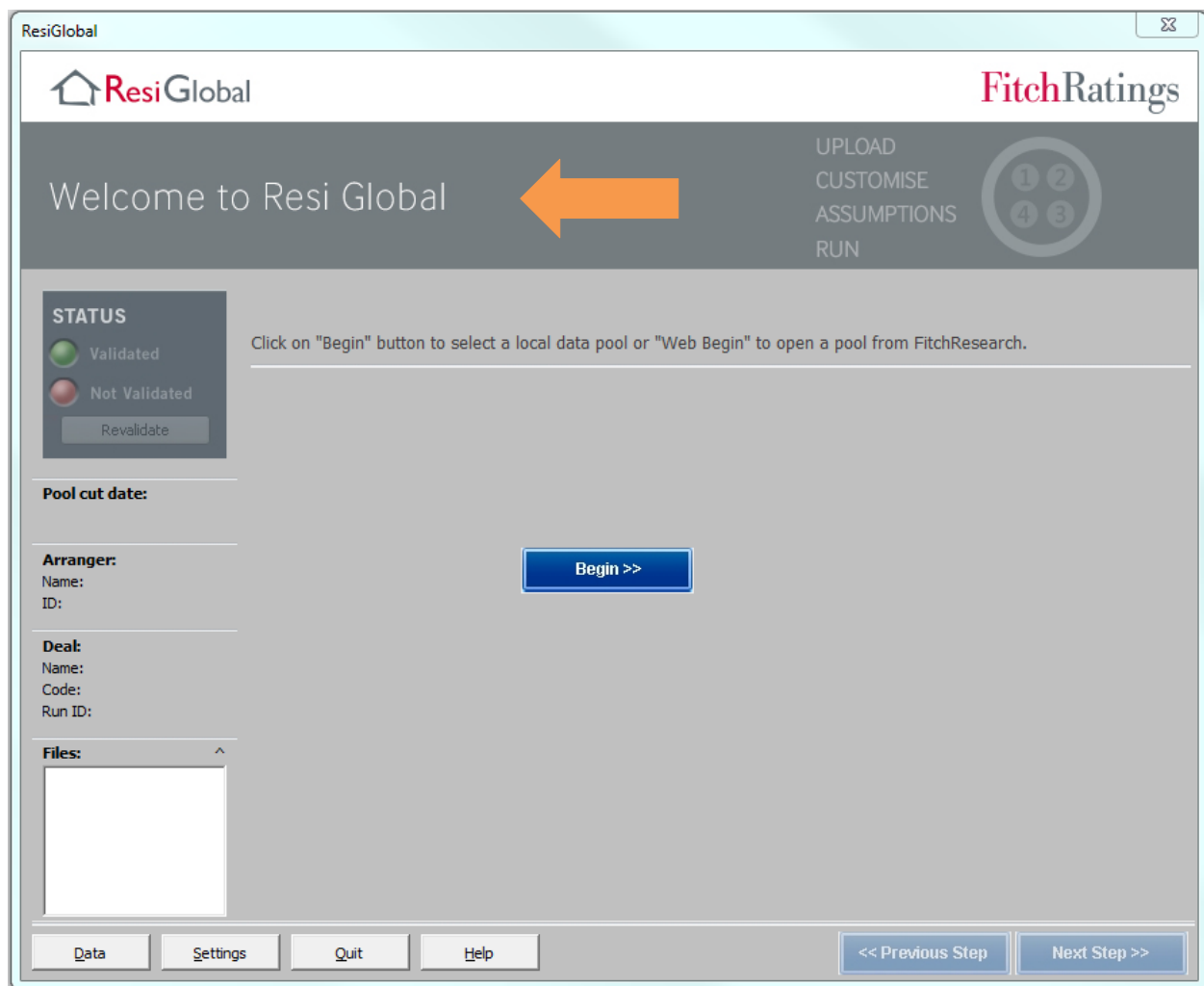
2. After certification, the pool data can no longer be edited. From here an **Exception Report** is generated to show any acknowledged warnings, aliases created or autoformats performed.
3. The **Pool Comments** button also shows any comments that were left during the process by the model user as well as computer generated comments for the aliases and autoformats.
4. If the pool needs to be further edited, the **Undo Certify** button can be clicked and the user can navigate to previous steps of the process. The loan data will need to be certified again before running the model.
5. Once complete, the model can be opened either using the **Open Model** button or independently from the extracted folder

VI. Resi Global Model

Like the Resi Global Validation wizard, the Resi Global Model wizard can be sized into three window sizes during use:

- ◆ Full size;
- ◆ Header size;
- ◆ Minimised.

To change the size of the wizard, either click on the **Welcome to Resi Global** header or the **ResiGlobal** icon as shown below.

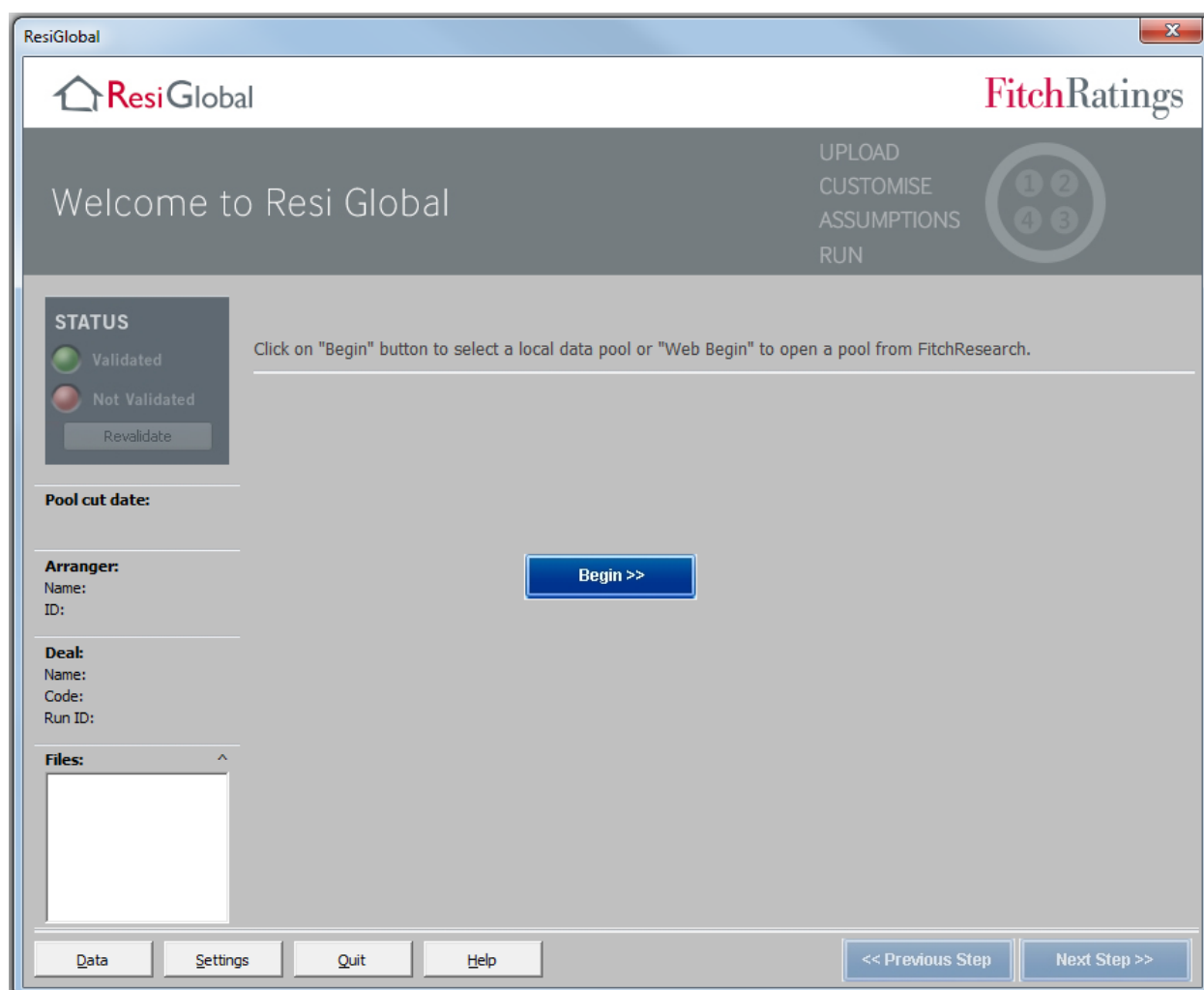




To start the model, click on the **Begin** button on the wizard and follows the steps below.

Step 1: Upload the Pool

1. Click on the **Begin** button to select a data pool to run through the model. The **Open File** dialogue box will open in your default repository.



2. Select a *.rmbs* file that has been run through the validation wizard. Steps on how to do this are in the previous section of this guide.

- The model will generate a summary pool statistics window that gives you an overview of the pool data that has been inputted. This should provide a quick sense check to ensure the correct *.rmbs* file was used.

ResiGlobal

ResiGlobal FitchRatings

STEP 1:
Upload the Pool

UPLOAD
CUSTOMISE
ASSUMPTIONS
RUN

Warning: <1> types of data errors were found <360> total auto-format corrections were applied
Pool statistical information is shown here. Click on "Next" to progress to next stage.

Auto-Format Report

STATUS
Validated
Not Validated
Revalidate

Pool cut date:
2017-11-24

Arranger:
Name: Issuer
ID: IssuerID

Deal:
Name: Spain EDW
Code: ESE
Run ID: 0

Files:
ESE - SPAIN SAMPLENorm

Summary Pool Statistics	
Number of borrowers	10.00
Number of properties	10.00
Number of loans	10.00
Total Current Balance	2,757,018.81
Average Current Balance per borrower	275,701.88
WA OLTV	0.63
WA CLTV	4.51
WA Indexed CLTV	6.29

Data Settings Quit Help << Previous Step Next Step >>

- The underlying data tape can be viewed by clicking **Data** followed by **Open data tape**. This should only be used for viewing the pool as the ideal time to make changes to the pool data is before creating the *.rmbs* file.
- The status bar at this point will be **Validated**. If the underlying pool data is modified for any reason, this will result in a change of validation status. The **Revalidate** button allows for the pool data to be rerun by the validation wizard.
- The **Arranger** and **Deal** attributes are inherited from the Resi Global Datatape and can be seen on the left side bar above.
- Once you are happy with the *.rmbs* file being run through the model, click the **Next Step** button.

Step 2: Deal Customisation

Deal customisation is an advanced feature that allows you to set deal-specific customisations for core model processes. These customisations include:

- ◆ Specifying how the model should treat missing data;
- ◆ Reviewing customisations made during the validation process.

It is important to note that this step is **optional** and that the model will run without any adjustments in this section.

Missing Values

In the missing values section, the user can specify which values the model should use to replace missing values in the loan data. The model uses a default value, as listed in the **Value if Missing** column, but this can be replaced with a specific value if required. The steps to do this are as follows:

1. Select the **Field Name** row that you would like to change.
2. For list item data types, select the appropriate list item using the drop down list under **Select List Item** label.
3. For non-list data types, enter a number under the **Edit Number** label.

ResiGlobal FitchRatings

STEP 2: Deal Customisation

✓ **UPLOAD**
CUSTOMISE
ASSUMPTIONS
RUN

STATUS
Validated
Not Validated
Revalidate

Pool cut date:
2017-11-24

Arranger:
Name: Issuer
ID: IssuerID

Deal:
Name: Spain EDW
Code: ESE
Run ID: 0

Customisations:
(M) Income Verification fo
(M) Payment Type

Missing Values | Overrides | Aliases | Warnings | Lists

Replace empty values in the data tape with custom values defined here.

Field Name	Value if Missing	Country
Foreign National	ND	ESE
Borrower's Employment Status	ND	ESE
Primary Income	1.00	ESE
Income Verification for Primary Income	No Data (ND)	ESE
Secondary Income	0.00	ESE
Bankruptcy or Individual Voluntary Arrangement Flag	ND	ESE
Origination Channel / Arranging Bank or Division	ND	ESE
Purpose	ND	ESE
Payment Frequency	ND	ESE
Payment Due	0.00	ESE
Payment Type	Fixed instalments (ch	ESE
Type of Guarantee Provider	ND	ESE
Subsidy	ND	ESE
Subsidy Received	0.00	ESE
Arrears Balance	0.00	ESE
Prior Balances	0.00	ESE
Pari Passu Loans	0.00	ESE
Maximum Balance	0.00	ESE

Select List Item:

Fixed instalments (changing maturity) w/

Fixed instalments (changing maturity) w/

Bullet (6)

Bullet + Savings deposit (7)

Bullet + Life insurance (8)

Bullet + Investment portfolio (9)

Bi-annual (10)

Tri-annual (11)

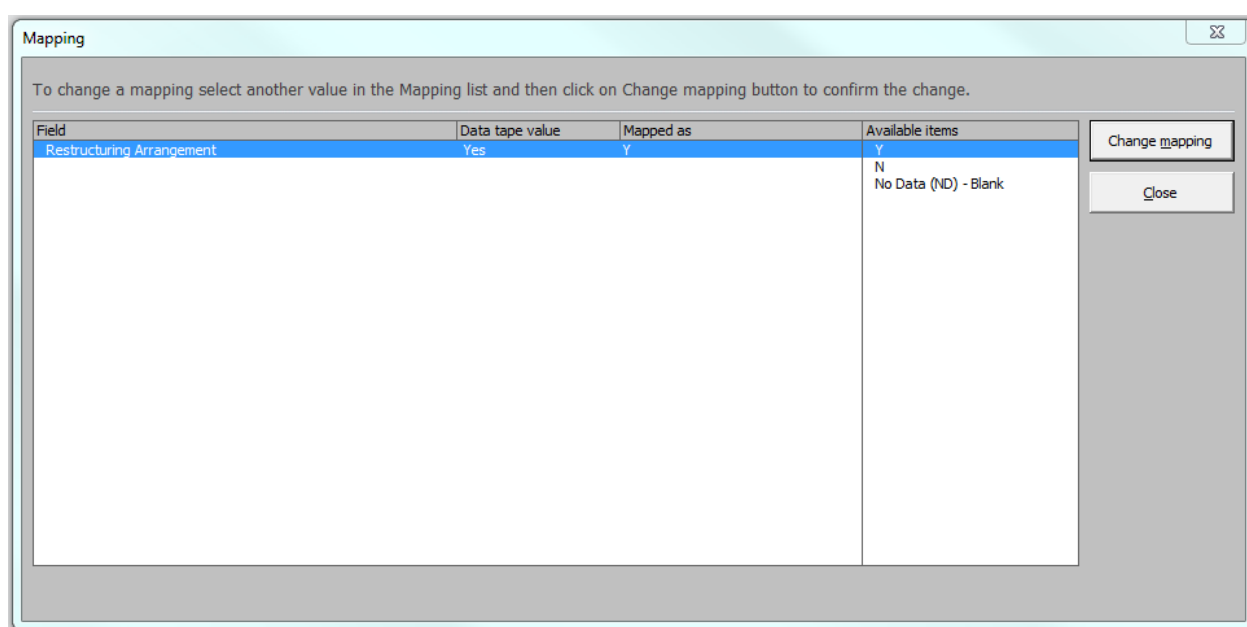
<< Previous Step Next Step >>

- Once selected, you will see an extra item in the **Customisations** window in the button right of the Model wizard.

Overrides & Aliases

The **Overrides** tab is only used for specific countries, such as the United Kingdom. For Resi Global: Europe, there are no overridable fields and therefore this feature is not available.

The **Aliases** tab is a list of the aliases that were set in the validation wizard. They can be edited by choosing the relevant alias and clicking the **Edit** button. The dialogue box that appears allows for the alias to be mapped to another of the permitted items.



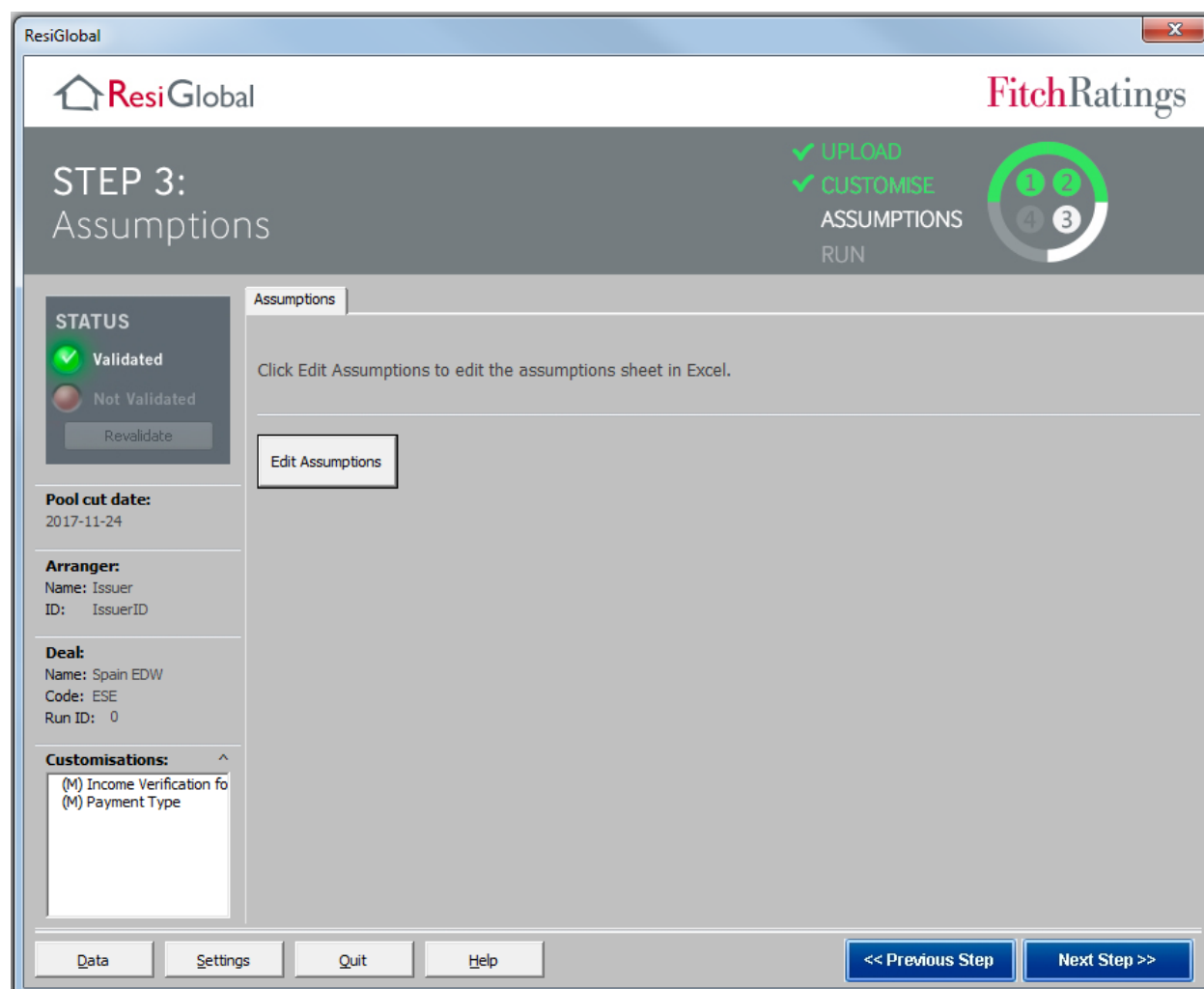
Warnings

The **Warnings** tab is a read-only display of the warnings that were generated as part of the processing of the datatape. In the event that you would like to address these warnings, you would need to run the file through the data validation wizard as detailed in the above section.

Step 3: Assumptions

This section allows you to view and modify the country-specific assumptions, while keeping track of the changes in the model report. To change the assumptions follow the steps below:

1. Click on the **Edit Assumptions** button. This will open up the country-specific assumptions in an Excel sheet.



2. The assumptions that can be modified vary by country. Cells highlighted in grey are locked and cannot be modified.
3. To run the model, a few assumptions must be changed. In particular:
 - a. **Europe:** it is necessary to update the **Transaction closing date** and **Average CDR** in the **Transaction-Specific Assumptions** section. If you proceed to the next stage without updating these, the model will not run and will return an error message as a reminder.

Transaction-Specific Assumptions	
Sector	Prime
Originator Adjustment	1.00
Transaction closing date	2012-12-12
Average CDR	0.00

- b. **UK:** it is necessary to update the **Pool cut-off Date**, **Type of Collateral BTL** and the **Type of Collateral** in the **Model Run** section. If you proceed to the next stage without updating these, the model will not run and will return an error message as a reminder.

ModelRun	
Pool cut-off Date	2017-09-30
Index Start date	1983-01-01
Index End date	2017-09-30
Index End date Limit	2017-09-30
Type of Collateral	-
Type of Collateral BTL	-

4. In Resi Global: Europe, some example sections and assumptions that may also be changed are detailed below. **Note:** changing the below is not required to run the model.
5. Every time you change a value, the model will prompt you to save the change.
6. Once you are happy with the changes, click on the model wizard and the **Next Step** button.

Potential Assumption Changes

1. Loan Level Adjustments Section:

- a. The first three loan-level adjustments are for the **Foreclosure Frequency (FF)** and the latter two for the **Applicable Property Value**. In order to 'activate' these adjustments, the corresponding fields in the data template (five dedicated fields in the right hand side of the data template) have to be filled in with a 1. For instance, to apply an additional loan-level FF adjustment for certain loans, one should enter 1 in the **Loan-level Adjustment 1 (non-floored FF)** field in the data template for these loans, and a corresponding adjustment assumption in **Adjustment 1 (non-floored FF)**.
- b. Similarly, to apply a particular adjustment to the **Applicable Property Value**, one should enter a 1 in the **Loan-Level Adjustment 4 (Applicable Property Value)** field for respective loans in the data template, and a corresponding adjustment assumption in **Adjustment 4 (Applicable Property Value) %**. A reduction in **Applicable Property Value** should be denoted with a negative sign. For example, an entry of -20% should be entered if the user intends to reduce the Applicable Property Value by 20%.

Loan Level Adjustments	
Adjustment 1 (non-floored FF)	1.00
Adjustment 2 (non-floored FF)	1.00
Adjustment 3 (non-floored FF)	1.00
Adjustment 4 (Applicable Property Value) %	0.00
Adjustment 5 (Applicable Property Value) %	0.00

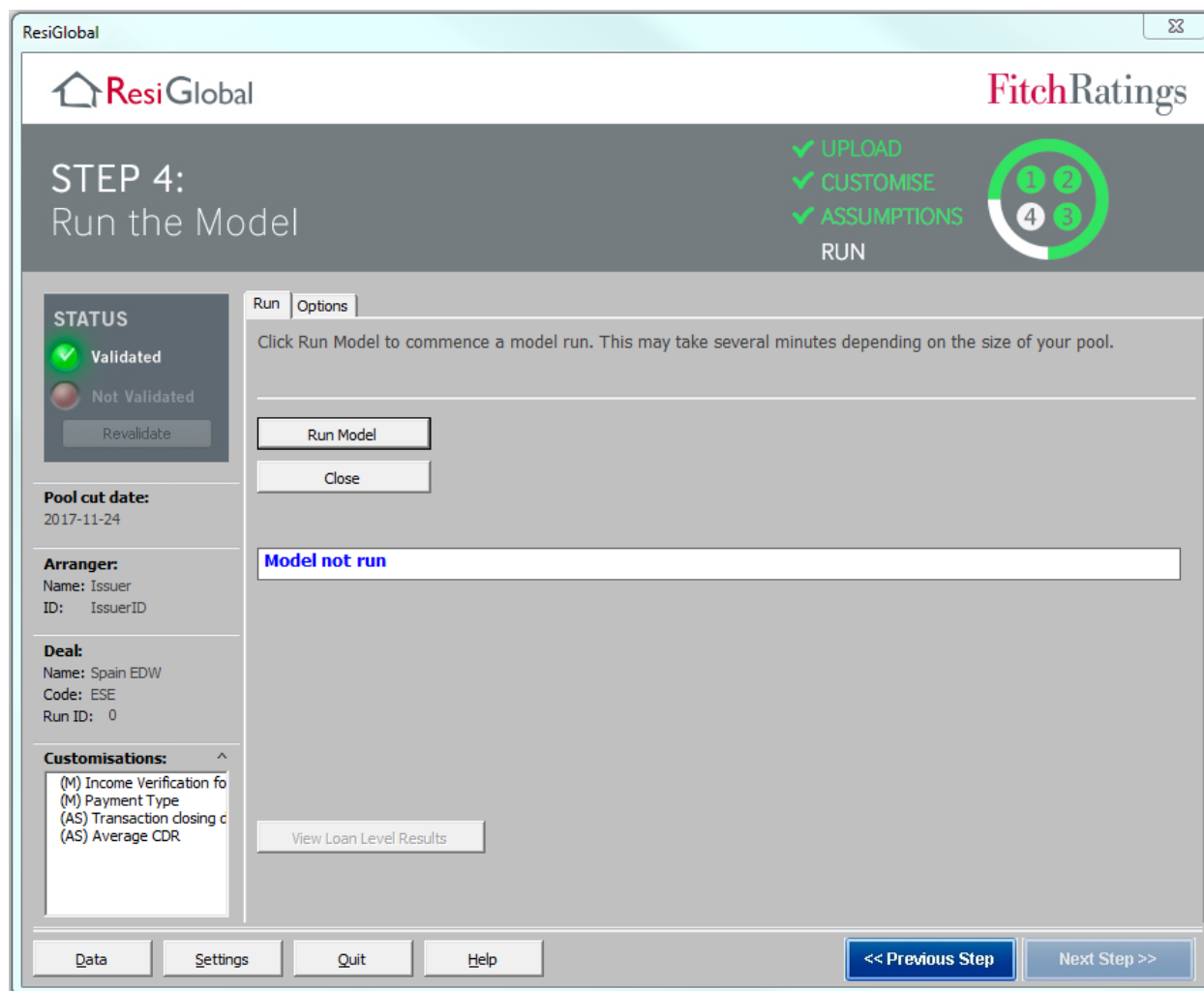
2. Portfolio Level Adjustments (WAFF):

- a. To use this feature, the user should enter the intended adjustment assumptions in **Adjustment Factor 1** and then a corresponding proportion in **Adjustment Factor 1 Performing Balance %**. Up to five of such adjustments can be made in the same way.

Portfolio Level Adjustments (WAFF)	
Adjustment Factor 1	0.00
Adjustment Factor 2	0.00
Adjustment Factor 3	0.00
Adjustment Factor 4	0.00
Adjustment Factor 5	0.00
Adjustment Factor 1 Performance Balance %	0.00
Adjustment Factor 2 Performance Balance %	0.00
Adjustment Factor 3 Performance Balance %	0.00
Adjustment Factor 4 Performance Balance %	0.00
Adjustment Factor 5 Performance Balance %	0.00

Step 4: Run the Model

1. For a default model run, simply click the **Run Model** button as shown below.



2. Alternatively, you may wish to run the model with **Loan Level Output Fields** rather than just pool level results. This setting can be activated under the **Options** tab. From there, you are able to choose which fields you are interested in.
3. Once the options are selected, you can go back to the **Run** tab and click the **Run Model** button. Applying the loan level results option will give you access to a further button: **View Loan Level Results**. This allows you to see your chosen fields for a chosen scenario level. By default this will pop up as soon as the model has finished running.

The screenshot shows the ResiGlobal FitchRatings application window. The title bar reads 'ResiGlobal'. The main header area contains the 'ResiGlobal' logo on the left and the 'FitchRatings' logo on the right. Below the header, a dark grey banner displays 'STEP 4: Run the Model'. To the right of this banner, there are three green checkmarks indicating completed steps: '✓ UPLOAD', '✓ CUSTOMISE', and '✓ ASSUMPTIONS', followed by a 'RUN' button. A circular progress indicator shows four steps, with step 4 highlighted in green.

The main interface is divided into several sections:

- STATUS:** Located on the left, it shows a green checkmark and the word 'Validated'. Below it, there is a 'Not Validated' option with a red circle and a 'Revalidate' button.
- Pool cut date:** Displays '2017-11-24'.
- Arranger:** Shows 'Name: Issuer' and 'ID: IssuerID'.
- Deal:** Shows 'Name: Spain EDW', 'Code: ESE', and 'Run ID: 0'.
- Customisations:** A list of customizations including '(M) Income Verification fo', '(M) Payment Type', '(AS) Transaction closing c', and '(AS) Average CDR'.
- Run Options:** The main panel on the right, titled 'Run Options', contains a 'Loan level output fields' section. It has a 'View all' checkbox and a list of fields with checkboxes:
 - ☒ Loan Identifier
 - ☐ Borrower Identifier
 - ☐ Property Identifier
 - ☒ OTM (months)
 - ☐ RTM (Years)
 - ☐ Seasoning (months)
 - ☒ Applicable Property Value
 - ☐ Applicable Loan Interest Rate
 - ☒ Applicable Loan Margin
 - ☒ Region Number
 - ☐ Indexation
- Results:** A section below the output fields with a checkbox for ☒ Loan level.

At the bottom of the window, there is a navigation bar with buttons for 'Data', 'Settings', 'Quit', and 'Help'. On the right side of this bar, there are two buttons: '<< Previous Step' and 'Next Step >>'.

- Once the model has run, you can access the report by double-clicking on the **Model Report** in the **Reports** window in the bottom right of the wizard. Alternatively, you can select the report and click the **View Report** button.

ResiGlobal: Results

Transaction Name Spain EDW
Pool Cut-Off Date 8-May-2017
ResiGlobal version Europe.1.2.0
Country Spain
Sector Prime
Run Date 2017-11-24 18:14:18

Gross Level Results

	Performing WAFF	Arrears WAFF	WAFF	WARR - Middle	Loss	Floored Loss	Floored WARR	IO Concentration WAFF	W
AAA	49.8%	0.0%	49.8%	20.4%	39.6%	39.6%	20.4%	0.0%	
AA+	43.7%	0.0%	43.7%	22.2%	34.0%	34.0%	22.2%	0.0%	
AA	40.6%	0.0%	40.6%	23.0%	31.2%	31.2%	23.0%	0.0%	
AA-	37.2%	0.0%	37.2%	23.9%	28.4%	28.4%	23.9%	0.0%	
A+	33.9%	0.0%	33.9%	24.7%	25.5%	25.5%	24.7%	0.0%	
A	30.5%	0.0%	30.5%	25.5%	22.7%	22.7%	25.5%	0.0%	
A-	27.8%	0.0%	27.8%	26.3%	20.5%	20.5%	26.3%	0.0%	
BBB+	25.0%	0.0%	25.0%	27.1%	18.2%	18.2%	27.1%	0.0%	
BBB	22.2%	0.0%	22.2%	27.9%	16.0%	16.0%	27.9%	0.0%	
BBB-	20.5%	0.0%	20.5%	28.4%	14.7%	14.7%	28.4%	0.0%	
BB+	18.7%	0.0%	18.7%	28.9%	13.3%	13.3%	28.9%	0.0%	
BB	16.9%	0.0%	16.9%	29.4%	12.0%	12.0%	29.4%	0.0%	
BB-	15.2%	0.0%	15.2%	29.8%	10.6%	10.6%	29.8%	0.0%	
B+	13.4%	0.0%	13.4%	30.3%	9.3%	9.3%	30.3%	0.0%	
B	11.6%	0.0%	11.6%	30.8%	8.1%	8.1%	30.8%	0.0%	
B-	11.3%	0.0%	11.3%	31.9%	7.7%	7.7%	31.9%	0.0%	
Expected Case	10.5%	0.0%	10.5%	34.2%	6.9%	6.9%	34.2%	0.0%	

WA Recovery Rate Vector

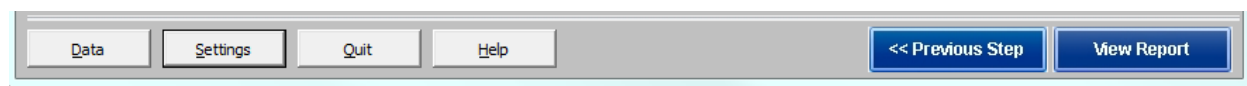
Year	AAA	AA+	AA	AA-	A+	A	A-	BBB+
1	16.8%	18.4%	19.1%	19.8%	20.5%	21.2%	22.0%	22.7%
2	17.3%	18.9%	19.7%	20.4%	21.1%	21.8%	22.6%	23.3%
3	17.9%	19.5%	20.3%	21.0%	21.8%	22.5%	23.3%	24.0%
4	18.5%	20.1%	20.9%	21.7%	22.5%	23.3%	24.0%	24.8%
5	19.2%	20.9%	21.7%	22.5%	23.3%	24.1%	24.9%	25.7%

* **Disclaimer:** This is the report for a Spanish transaction. Other countries may have differently layouts.

- To generate a Word version of the report, click the **Generate Word file** button. This will generate a Word report of all the tabs except the **Criteria Assumptions** tab.

Settings

A useful option in the model is to save the current settings. This is done by clicking the **Save Current Settings** button which can be found under the **Settings** dropdown. This saves any customisations or other changes in the assumptions for use on future transactions or pool cuts. If the same settings are applicable during future model runs, these can be loaded into the model by clicking on 'Load saved settings'.

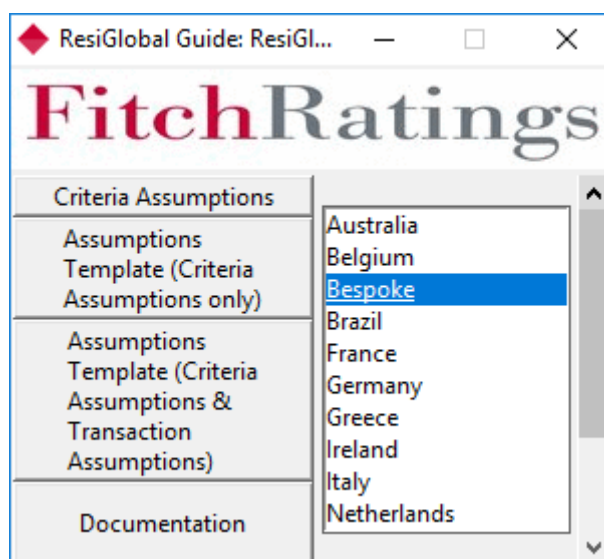


Using the 'Bespoke' functionality

The 'Bespoke' functionality is intended to be used for originator-specific (i.e bespoke) assumptions, for which criteria assumptions are not specifically defined. The data tape 'Bespoke' should be used in this instance.

Populating the Assumptions Template

1. To start, you will need to open, by double-clicking, the ResiGlobalGuide application. A window such as the one below will appear.



2. First click on the country, 'Bespoke', on the right hand side and then click on the button 'Assumptions Template (**Criteria Assumptions & Transaction Assumptions**)'.
3. An Excel assumption template will appear (snapshot as follows).

1	European RMBS Rating Criteria	
2	Model ID	3625
3	Country-Specific Assumption Template Sheet	Bespoke
4	Country Code	BSP
5	Model Version	1.3.3
6	Asset Class	RMBS
7	2018/12/17	
8		
9		
10	Transaction-Specific Assumptions	
11	Sector	Prime
12	Originator Adjustment	1.0
13	Transaction closing date	1900-12-30
14	Average CDR	0.0%
15		
16	Loan Level Adjustments	
17	Adjustment 1 (non-floored FF)	0.0
18	Adjustment 2 (non-floored FF)	0.0
19	Adjustment 3 (non-floored FF)	0.0
20	Adjustment 4 (Applicable Property Value) %	0.0%
21	Adjustment 5 (Applicable Property Value) %	0.0%
22		
23	Portfolio Level Adjustments (WAF)	
24	Adjustment Factor 1	0.0
25	Adjustment Factor 2	0.0
26	Adjustment Factor 3	0.0
27	Adjustment Factor 4	0.0
28	Adjustment Factor 5	0.0
29	Adjustment Factor 1 Performance Balance %	0.0%

4. You should double-check that the *Country-Specific Assumption Template Sheet* reads as 'Bespoke' and that the *Country Code* on the header section reads as 'BSP'.
5. You can then fill in the assumption values that you would like to test, bearing in mind the following notes.
 - a) Hyphens i.e. '-' are valid inputs. The model will convert these into 1.0. In the case of FF-related assumptions, this means that no relevant adjustments will be applied. In the case of RR-related assumptions, this could have an effect (read as 100%).
 - b) No text should be entered. Validation rules are in place to check this, but if values are pasted into the template then these rules will be overridden. Please check these.
 - c) Do not change the name of the sheets or the structure of the workbook.
 - d) The Valuation Indexation Table begins from Q1 2000 (corresponding to an Index Start Date of 31 March 2000). If your Valuation Index begins after Q1 2000, then all the values for the preceding quarters from Q1 2000 should be set identical to those of your starting quarter.
For example, if the indexation for a particular country started from Q2 2005 and the starting value for Region X was 250, then the value for Region X from Q1 2000 up until Q2 2005 should be set to 250.
 - e) The Valuation Indexation Table currently ends at Q4 2017 (corresponding to a Latest Index Date of 31 Dec 2017). You can add additional indexation quarters by using the button at the top of the sheet 'Add a new Quarter to the Valuation Indexation Tables' and ensuring that your Latest Index Date corresponds to this. If your Valuation Index ends prior to Q4 2017 e.g. Q2 2017, you can take either of the two options below:
 - i. Change the Latest Index Date accordingly i.e. in this example, change the Latest Index Date to 30 June 2017. Alternatively:
 - ii. Set the values for the quarters beyond
 - f) The number of Fitch Geographic Areas has been set to 20. A Geographic Region of '21' would be deemed as undefined. With respect to the table: EDW Geographic Region to Fitch Geographic Area, it is important to note the following:

EDW Geographic Region to Fitch Geographic Area	Values
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	1
10	1
11	1
12	1
13	1
14	1
15	1
16	1
17	1
18	1
19	1
20	1
21	
EDW Property Postcode to Fitch Geographic Area	Values
Other	1

If the number of Fitch Geographic Areas for a particular country has been defined as “X” (say 8), then the corresponding Fitch Geographic Area ‘Values’ on the right hand side of the table should have a 1:1 identical mapping for the Regions (on left hand side of the table). For the outstanding regions i.e. “X+1” (9 in this example) up to and including 20, the corresponding values should be set identical to the mapped Value for ‘Other’ in the table EDW Property Postcode to Fitch Geographic Area. Please see illustration in screenshots above. This ensures that any input entry that is not in the range of 1 to 8 will be treated as an unknown/undefined region.

Uploading the ‘Bespoke’ assumption template:

1. Click on the **Load Assumptions** button, which will appear in place of the **Edit Assumptions** button when a ‘bespoke’ data file has been uploaded.

ResiGlobal FitchRatings

STEP 3:
Assumptions

✓ UPLOAD
✓ CUSTOMISE
ASSUMPTIONS
RUN

STATUS
✓ Validated
● Not Validated
Revalidate

Pool cut date:
2018-02-24

Arranger:
Name: IssuerName
ID: IssuerID

Deal:
Name: BSP - Hypothetical
Code: BSP - Hypothetical
Run ID: 0

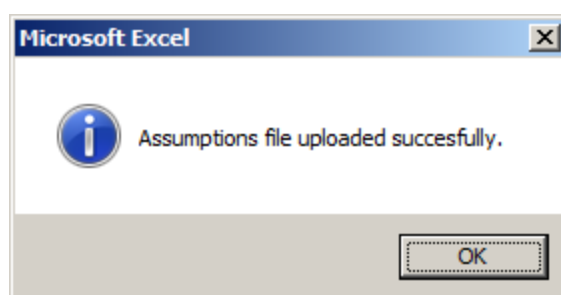
Files:
BSP - HYPOTHETICAL DATA

Click Edit Assumptions to edit the assumptions sheet in Excel.

Load Assumptions

Data Quit Help << Previous Step Next Step >>

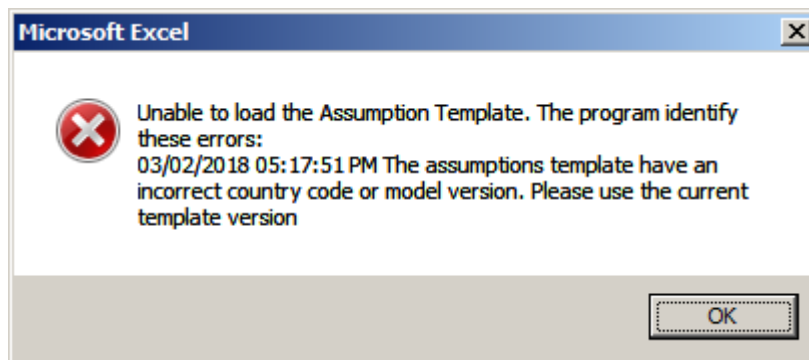
2. Select your relevant 'Bespoke' assumptions file to be loaded into the model.
3. A progress bar will appear and within approximately 20 seconds, the following message box should appear indicating that the assumptions file has been loaded successfully.



4. Click on the **Next Step** button.

Note:

- The assumptions template should have the right Country Code (i.e. BSP) and Model Version. If either of these is incorrect, then the assumptions file will not be loaded and an error message box such as the one overleaf will appear.



NB: Additionally, as previously indicated, the values in the assumptions template should not be in text format. This will not be accepted by the model and will result in an error message box indicating to the user the field with incorrect data format.