FUSION REGISTRY
VERSION 10

Data Reporting
This guide is for Data Providers who are reporting data to Fusion Registry

FUSION REGISTRY

Data Reporting

Contents

1 Overview

The Fusion Registry supports Data Providers by offering services for Data Authoring, Data Validation, Data Transformation, and Data Publishing. Services are offered through the Web Interface (via a web browser), through FusionXL (an integrated solution for Microsoft Excel), and through Web Services, enabling machine to machine automation.

This document discusses each data reporting service provided by the Fusion Registry, and how it is supported via the Web, Excel, and Web Services.
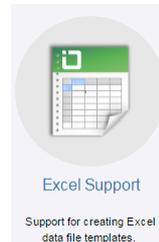
2   Data Authoring

The Fusion Registry accepts data in various formats including SDMX, CSV, and XLSX (Excel format). It provides services for creating datasets in XSLX format. The Fusion Registry can output an Excel template based on a selected Dataflow or Provision Agreement. Alternatively, if using the FusionXL plugin, Excel can be used to connect to the Fusion Registry and provides its own data authoring service.

2.1   Data Authoring Via Excel Template

To create an Excel Template, click on the 'Convert or Publish' link from the home page. Alternatively use the left hand menu to select Data→Load Data. Once on the Load Data page, click on the 'Excel Support' link to open a pop-up window. This window contains a number of controls that can be used to generate an Excel template.
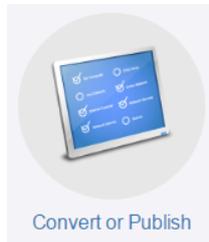
Convert or publish on the home page, this links to the Data→Load Data page.

Excel Support image, clicking on this opens a window for creating an Excel Template for data authoring.
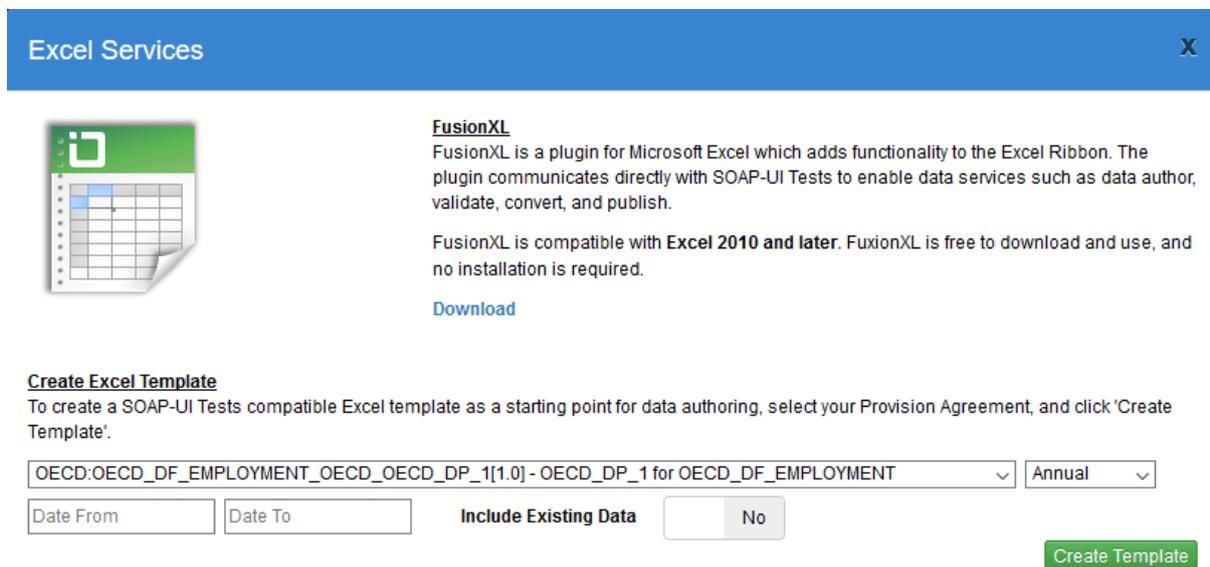

Figure 1 showing the pop-up window to Create an Excel Template

The pop-up window provides a drop down list of all the Dataflows in the Fusion Registry. If logged in as a Data Provider the list will contain all the Provision Agreements for the user (this is all the Dataflows that the Data Provider has been set up to supply data for). The window also contains a list of available Frequencies, and input fields for data start and end dates. If the control labelled 'Include Existing Data' is selected, then any existing data for the specified dates will be included in the generated template.

Enter the details for the dataset to be created (Dataflow/Provision Agreement) and the reporting begin and end dates, along with the Frequency. When the details have been completed, click the 'Create Template' button to generate a data reporting template.

This generated template will consist of the following sections:

2.1.1   Header Section

▲	A	B
1	OBS_STATUS	
2	FREQ	A
3	REF_AREA	UK

Figure 2 showing the header section of the Excel Template

The Header section consists of Observation Attributes (OBS_STATUS) and any Dimensions which only have a single possible value (FREQ=A and REF_AREA=UK). The Observation Attributes can be filled in to provide a default value for the whole dataset. Any observations which do not independently specify an observation attribute, will automatically take the default value if specified in the header section. The Dimensions with only one possible value are determined by cross-checking the Dataflow or Provision Agreement against the reporting rules (Constraint) imposed on them.

2.1.2   Data Section

5	DATA_DOMAIN	INDICATOR	COUNTERPART_AREA	BASE_PER	UNIT_MULT	TIME_FORMAT	2000	2001	2002	2003
6										
7										

Figure 3 showing the data section of the Excel Template

The data section consists of columns for each of the remaining Dimensions and Series Attributes that do not appear in the Header section. Columns are also created for each Time Period starting from the provided start date, and ending on the specified end date. Each time period increments by the specified Frequency.

Each row under the data section can be completed for each Data Series.

The Fusion Registry can be consulted to determine what the valid reporting values are for each Dimension/Attribute. Details for valid content can be found by navigating in the Fusion Registry to Data→Dataflows. Select the appropriate Dataflow and click the 'View Dataflow' button to open up a window showing valid content for that Dataflow.
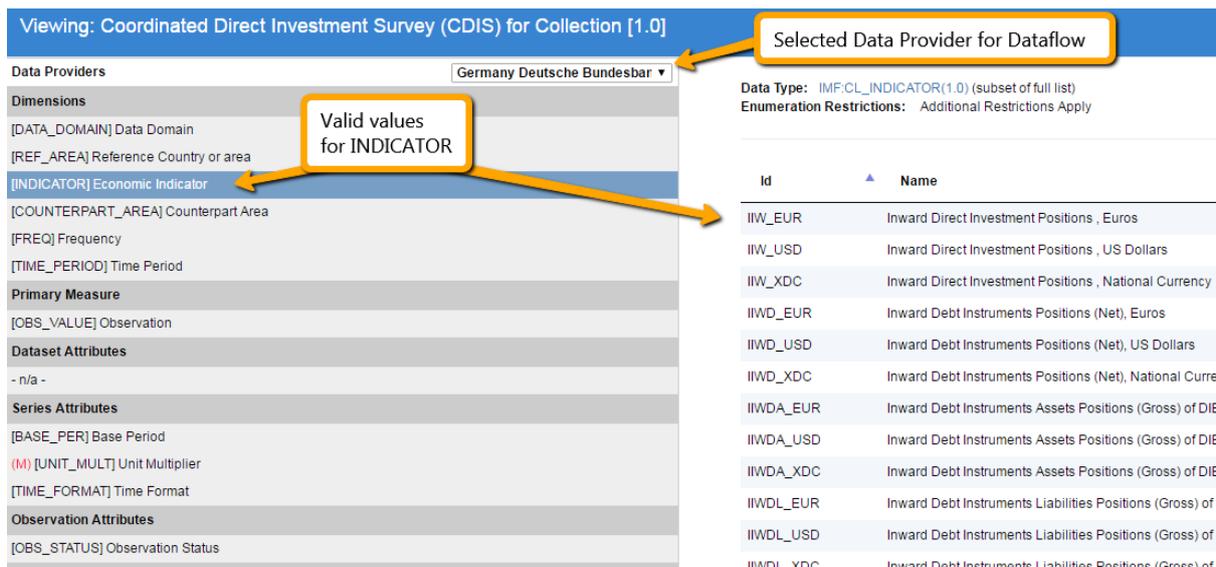
Figure 4 showing Details for a Dataflow with Germany Deutsche Bundesbank as the selected Data Provider

The Dataflow information will display the allowable content for each Dimension/Attribute. Selecting a Data Provider at the top of the window, may result in the allowable values in some Codelists being further restricted. Providing information for Series Attributes is optional unless the attribute is prefixed by (M) which is used to indicate it is a Mandatory attribute.

The Excel template can then be completed to report observation values for each time period, as shown below.

Figure 5 showing series and observation values in the Excel Template

The Excel file can be loaded into the Fusion Registry for further processing (such as validation, transformation and/or publishing). This is discussed in greater detail in later sections of this document.
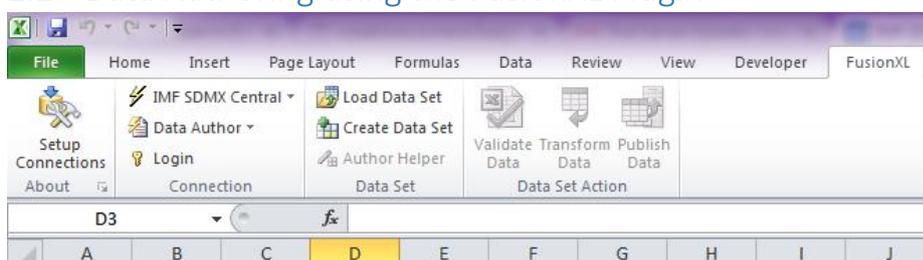
2.2   Data Authoring using the FusionXL Plugin

Figure 6 showing the Excel Ribbon

The FusionXL plugin provides a control on the Excel Ribbon for Authoring a Dataset. In addition to creating the appropriate columns, the FusionXL plugin also provides an Author Helper to assist in choosing the correct values for each Dimension/Attribute.

To create a Dataset, ensure the FusionXL is connected to the correct service. In the above image the IMF SDMX Central service is the connected service. To change the service, use the drop down list to select a different service. To create connections to services click on the 'Setup Connections' button.

The second drop-down in the Connection section must be set to 'Data Author'. Before a dataset can be authored, the user must Login and their user account must either have admin rights, or be linked to a Data Provider.

Once logged in, the user is able to click the 'Create Data Set' button.

Figure 7 showing the Create Data Set form in FusionXL

The Create Dataset form is similar to the form in the Web interface. The Data Provider, Dataflow, Frequency and Data start and end dates must be provided. On clicking 'Create Dataset' FusionXL will request a form to be generated from the Fusion Registry, and in addition to creating a form, the Fusion Registry will provide Excel with information about the valid content for each Dimension and Attribute. This information is used to generate a Data Set Author Helper, as shown below.
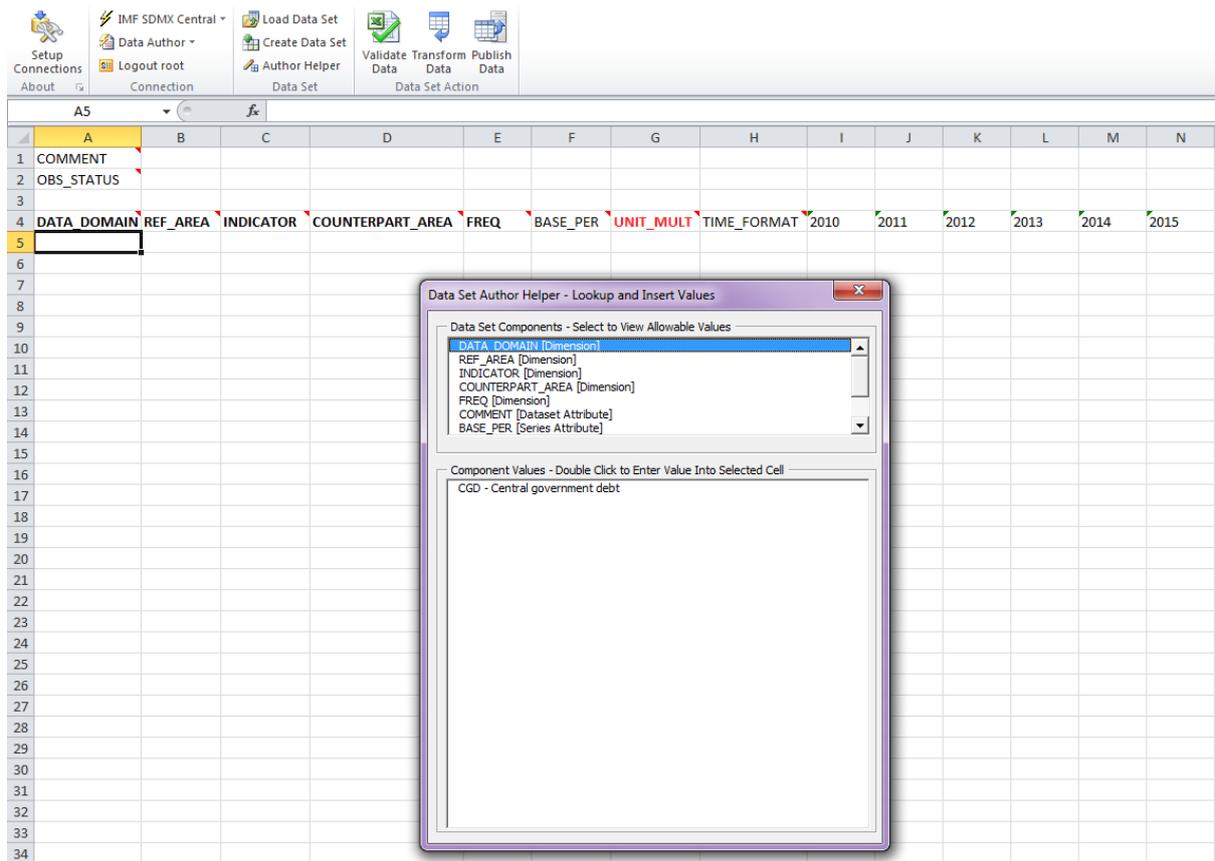
Figure 8 showing a generated dataset template, with the Dataset Author Helper pop-up

The Data Set Author Helper will automatically move the selected cell position to the appropriate location when clicking on a Dataset Component. On double clicking a Component Value, the value will be placed in the selected cell in the worksheet.

The Excel file generated via the FusionXL plugin is compatible with the template that is generated via the web User Interface (UI), and as such, the Excel file can be loaded into the Fusion Registry via the web UI. In addition, FusionXL provides controls on the ribbon for data Validation, Transformation, and Publishing.

3 Data Validation

The Fusion Registry is able to validate SDMX, CSV, and XLSX (Excel) files. The Fusion Registry provides 3 data validation services: validation via the web; validation via Excel (using the FusionXL plugin), validation via web services. Each service uses the same underlying validation logic, and will report the same errors. This section discusses how to perform data validation via each service.

3.1 Validation via the Web

The data validation page can be navigated to from the home page of the Registry, by clicking on the 'Convert or Publish' icon on the home page. Alternatively in the left-hand menu bar navigate to the Data→Data Load page.
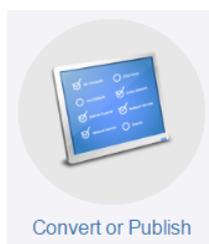

Convert or Publish

Figure 9 showing the "Convert or Publish" on the home page which links to the Data→Load Data page

Data Definitions
▸ Data Structures
▸ Dataflows
Data Reporting
▸ Provision Agreements
▸ Reporting Templates
▸ Reporting Constraints
▸ Validation Rules
Convert or Publish
▸ Load Data
Data Dissemination
▸ Pre-Defined Queries
▸ Browse Data

Figure 10 showing the Data Menu in the left hand menu bar

The Load Data page provides a simple form for completing the data set information. The only mandatory information is the dataset itself. This can be provided by either selecting a file from local disk (zip files are supported), or by changing the Data Source to 'Load from URL' a URL to the dataset can be provided. The Data Format may be manually set to reflect the format of the loaded dataset, but you may find that selecting a file automatically sets this value correctly. The Data Structure information is optional. If the dataset is in SDMX format, this can be determined if the information is present in the Header section of the dataset. If the dataset is in XLSX format this may be in the header of the spreadsheet. If the Data Structure is not provided and cannot be determined, then an error will be displayed and the user must make a selection from the drop-down provided.

Figure 11 showing the Load Data form

After clicking 'Load Data' the Fusion Registry will perform a number of data validation operations and on completion, the validation report will be displayed on screen.

Figure 12 showing a Validation Report having loaded in a dataset

The validation report provides the means to link or change the linked Provision Agreement, or Dataflow. Changing these links will prompt revalidation (via the "Re-Validate Data" button) and the report will be updated.

To understand more about each type of validation, and what a failure means, click on the question mark to the left of each validation heading.

If there were any validation failures, click on the error cell itself to open up a dialog box which lists the errors.
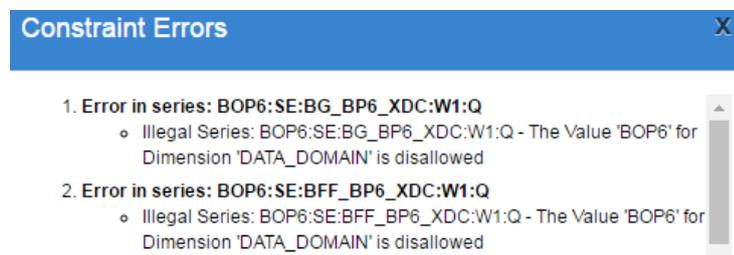

Figure 13 showing the validation errors for the Constraint validation.

Some errors do not necessarily mean the dataset is invalid. For example missing Mandatory Attributes may be expected if submitting a dataset which is modifying previously reported observation details.

Semantic validation errors for SDMX data files can usually be resolved by simply exporting the data file in the same data format. The export process consolidates the dataset (merges repeated series/observations) and will fix most semantically incorrect information.

After data validation, the Fusion Registry provides services for data visualisation, exporting the dataset into another data format (data transformation), and data publishing. These are described in the following sections.

3.2   Validation using FusionXL

The data validation services provided by FusionXL are designed to operate on datasets created using FusionXL (as described in section 2.2).
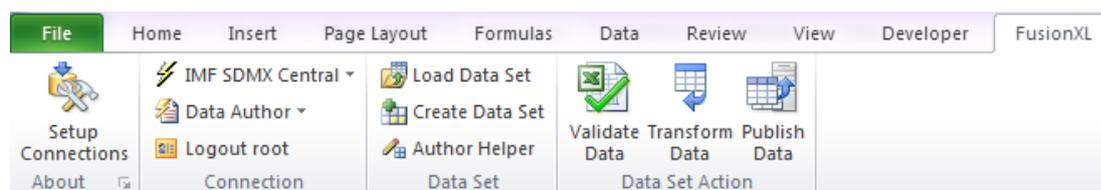
Figure 14showing Validate Data control in FusionXL

To validate a data file, click the Validate Data button. If there are any validation errors, these will be reported to the user via a new window in Excel. The validation report is the same as the web interface, as described in the previous section.

3.3   Validation using Web Service

The data validation services provided by the web service are intended for external software to automate the validation process from an external client. The web service is documented in section 4.1 of the Registry Web Services guide.

Full details on the web service are provided in the Fusion Registry Web Services document.

4 Data Transformation

The Fusion Registry is able to convert a dataset from one format to another. The supported output formats are SDMX, CSV, XLSX, and RDF. Each format may have a variety of supported syntaxes. For example RDF-Turtle and RDF-XML are both RDF syntaxes.

The Fusion Registry provides three data transformation services: validation via the web; validation via Excel (using the FusionXL plugin), validation via web services. Each service uses the same underlying transformation engine. This section discusses how to perform data transformation via each service.

4.1 Transformation via the Web

To transform a file via the web interface, load a data file in the Fusion Registry following the same process as described in section 3.1. In the middle of the validation form are a set of buttons for further actions. The 'Convert Data' button can be clicked to display a modal titled 'Download Data'. This modal contains options for download format, and depending on the download type, will contain sub-options. On activating the "Download" button, the data will be exported in the selected format.

Figure 15 showing the Download Data modal

4.2 Transformation using FusionXL

The data transformation services provided by FusionXL are designed to operate on datasets created using FusionXL (as described in section 2.2).
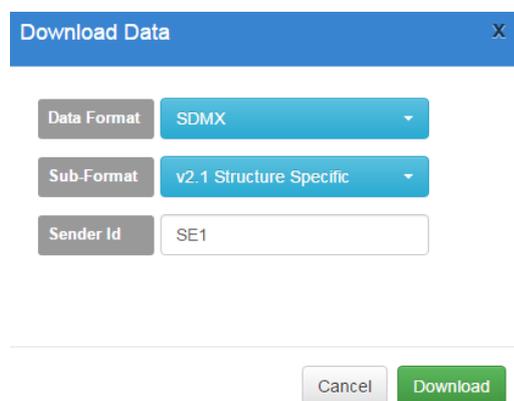
To transform a data set, click the 'Transform Data' button, the data will be exported as a file.

Figure 16 showing the Data Transform & Export form
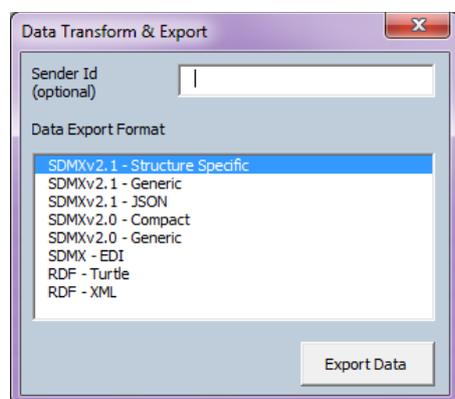
4.3   Transformation using Web Service

The data transformation services provided by the web service are intended for external software to automate the transformation process from an external client. The web service is documented in section 4.2 of the web services guide.

Full details on the web service are provided in the Fusion Registry Web Services document.

5 Data Publishing

The Fusion Registry enables Data Providers to publish data by either loading a dataset into the Fusion Registry store, or by registering the URL location of a dataset, or URL entry point of a valid SDMX RESTful web service. There are three mechanisms provided for data reporting; using the web interface; using the FusionXL plugin; and via the web service. This section describes all reporting methods.

5.1 Data Publishing via the Web

Data can be published via the web after loading a dataset as described in section 3.1. Alternatively navigate to the Data Registration Dashboard by clicking on the 'Data Registration' button on the home page.

Data Registration

Figure 17 showing the Data Registration button on the home page

The Data Dashboard shows all the Provision Agreements for which the authenticated Data Provider has been set up to provide data for. Each Provision Agreement reports if there are any series reported against it, and the last time the data was updated.

Welcome Matt Nelson

Showing your Data Dashboard

Provision Id ▲	Provision Name	Series	Last Updated ▼
BG_ILV2	Bulgaria Template on International Reserves and Foreign Currency Liquidity	295	2018-01-15T12:43:51
BG_CBS	Bulgaria Central Bank Survey	9	2018-01-12T13:52:55
BG_ILV1	Bulgaria Official Reserve Assets	5	2018-01-08T08:32:00
BG_FSI_123456	Bulgaria Financial Soundness Indicators (1-6)	6	2017-12-29T13:08:48
BG_IIP	Bulgaria International Investment Position	15	2017-12-28T14:23:17
BG_DCS	Bulgaria Depository Corporations Survey	9	2017-12-28T14:22:45
BG_EXD	Bulgaria External Debt	59	2017-12-22T12:09:20
BG_BOP	Bulgaria Balance of Payments	31	2017-12-19T12:15:30
No Filter ⌄	No Filter ⌄	Series	Last Updated

Figure 18- showing the Data Dashboard

Each row in the Data Dashboard table is clickable, and on row selection a sub-table of actions is displayed below the table. If the Data Provider has not previously reported any data for the selected Provision then there will be the action to register data (via the 'New Registration' button) or to publish data (via the 'Publish Data' button). The choice of button is dependant on how the Provision Agreement has been configured to report data.

5.1.1 Registering an External Service or File

The 'New Registration' action is provided if the user has been configured to register the location of a dataset which resides at a public URL on the web.

Clicking on this button opens a modal window, which prompts the user to provide a URL which resolves to either a dataset (File) or an SDMX Web Service. The options given on this form depend on how the Provision Agreement has been configured to report data.

If registering a file, the URL must resolve to a valid SDMX dataset, which can be in Compact, Structure Specific, Generic or SDMX-EDI format. The URL must resolve to a file without redirection (HTTP 3xx Response Codes are not supported).

Figure 19 showing the File URL data Registration form

If registering a web service, the URL must be to the entry point of the web service (terminating just before the data path parameter).

Figure 20 showing the URL to a valid SDMX web service (European Central Bank SDMX Web Service)

On clicking 'Register Data Source', the Fusion Registry will query the File or web service for validation. On successful validation, the dataset will be registered and the Data Dashboard will be updated to include the newly registered dataset.

Provision Id	Provision Name	Series	Last Updated
BG_ILV1	Bulgaria Official Reserve Assets	5	2018-01-08T08:32:00

Figure 21 showing the Data Dashboard data table with a registered dataset

On selecting a Registered Dataset, an Actions table will be displayed with further possible actions that can be taken on the registration.

In addition, a Registration details table will be displayed which provides an Id, a URL to the dataset, the User Id of the user who actioned the data registration and the reporting start and end dates of the data in the dataset.

Actions	Details	
Register Data	Data Provider US3 has been configured to supply data for this Dataflow as a URL referencing an external data source.	Change URL
Re-Register	If the data has changed at the URL location, a re-index will re-query the data to update the IMF SDMX Service (Dev) indexes, update the Data Registration details, and notify subscribed parties of the data change	Re-Register
View Data	View the series provided by you for this Dataflow. To view the data in the full context of the Dataflow, please Browse the Data.	View Data
Automate Registration	Generate SDMX Auto Registration document. The exported file can be used in for future submissions directly to the IMF SDMX Service (Dev) SDMX web service which will result in the Fusion Registry re-indexing the URL.	Automate Registration / Documentation
De-Register URL	Deleting the Data Registration will remove the link from the Fusion Registry to your data URL, this will remove any indexes and your data will not be visible or retrievable from the Fusion Registry User Interface or web services. **Note:** This action will notify any subscribed users.	Delete Source
Registration Details		
Registration Id	add00ad5b508ec81dca7613761b92621	
Data URL	http://www.federalreserve.gov/apps/fof/OpenSDMX.aspx?file=FSI	
User Id	user1	
Data Start Date	Thu Oct 01 00:00:00 GMT 2009	
Data End Date	Thu Oct 01 00:00:00 GMT 2009	

Figure 22 showing information for a Data Registration

Note: If file validation and visualisation is required before data registration, then the Data Validation service via the web can be used (as described in section 3.1). If validating a dataset from an external URL and the user has been configured to publish data from an external source, then the user will find they have the 'Register Data' button available to them at the bottom of the validation report.

5.1.2   Publishing a Dataset to the Fusion Registry

If the Data Provider has been configured to publish data to a Fusion Registry managed data store, then on selecting a Dataflow in their Data Dashboard, the available option will be to 'Publish Data'. On clicking the publish data button, the user will be asked to provide a data file, or URL to the dataset to publish.

Figure 23 showing the Publish Data form

On loading the data file, the Fusion Registry will validate the dataset, and redirect to the data validation results page (as described in section 3.1). Under the validation report form, the 'Publish Data' button will be available to publish the data to the data store.

On successful publication, the Fusion Registry will redirect to the home page of the Registry. The Registration details for the Dataflow will include a URL to the Data Provider's data that is held in the Fusion Registry managed data store.

Note: Unlike File Registrations which replace all previously reported data, a data publication to the Fusion Registry managed data store is an incremental update. Whilst it is possible to re-report previously reported data, it is not necessary. A dataset loaded to the Fusion Registry managed data store can consist of just the new observation values, and these will be published in addition to whatever is already held in the store.

5.2   Publishing via Web Service

The Fusion Registry provides a web service that accepts datasets to be published to. The content is POSTed to the web service, along with the user credentials required for authentication. The service responds with a token, which can be used to track the publication progress.

Full details on the web service are provided in the Fusion Registry Web Services document.

6   Viewing Data

Both published and unpublished data can be viewed in the web interface. Unpublished, validated data can be viewed from the validation results page. Published data can be viewed from the Data Dashboard, and via the Data Brower. The Data Dashboard shows just the data that was published by the specific Data Provider.   The Data Browser (which is linked to from the home page) shows all the data that is published or registered with the Fusion Registry, for all Data Providers.

In all cases the data can be viewed with a Pivot table. The table is presented in a default layout however the table headings are all clickable. Once clicked, options are presented to the user to move the Dimension position in the table, allowing columns and rows to be re-ordered using the left/right/up/down controls. The Central button moves the selected Dimension out of the table and into the header, providing a cross-sectional view of the dataset.

Financial Soundness Indicators

Frequency   Quarterly
Counterpart Area   Not applicable
Reference Country or area   United States
Data Domain   Financial Soundness Indicators

Economic Indicator ˅ / Time Period ›	2013-Q3	2013-Q4	2014-Q1	2014-Q2	2014-Q3	2014-Q4	20
Move: Time Period	12.7	12.8	12.9	13.1	13.4	13.1	
	9.0	9.1	9.2	9.1	9.1	9.1	
Financial, Financial Soundness Indicators, Core Set, Deposit Takers, Capital Adequacy, Non-performing Loans Net of Provisions to Capital, Percent	12.5	11.7	10.8	9.9	9.3	8.8	
Financial, Financial Soundness Indicators, Core Set, Deposit Takers, Asset Quality, Non-performing Loans to Total Gross Loans, Percent	2.6	2.5	2.3	2.1	2.0	1.9	
Financial, Financial Soundness Indicators, Core Set, Deposit Takers, Earnings and Profitability, Return on Assets, Percent	0.4	0.4	0.4	0.4	0.4	0.3	
Financial, Financial Soundness Indicators, Core Set, Deposit Takers, Liquidity, Liquid Assets to Short Term Liabilities, Percent	84.8	88.2	94.6	93.3	89.7	90.0	
Financial, Financial Soundness Indicators, Core Set, Real Estate Markets, Residential Real Estate Prices, Percentage change, corresponding period previous year, Percent	10.4	10.3	9.0	6.8	5.5	5.0	

Figure 24 showing the Pivot table for a dataset