Embedding R into Eviews-programming

A practical example using the Eurostat-API

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Setting

Small statistical office

- No central database

Forecasting Unit

- Uses many different data sources
- Flexible regarding internal processes
- Relies on proprietary software
- Small team of modelers

The Problem

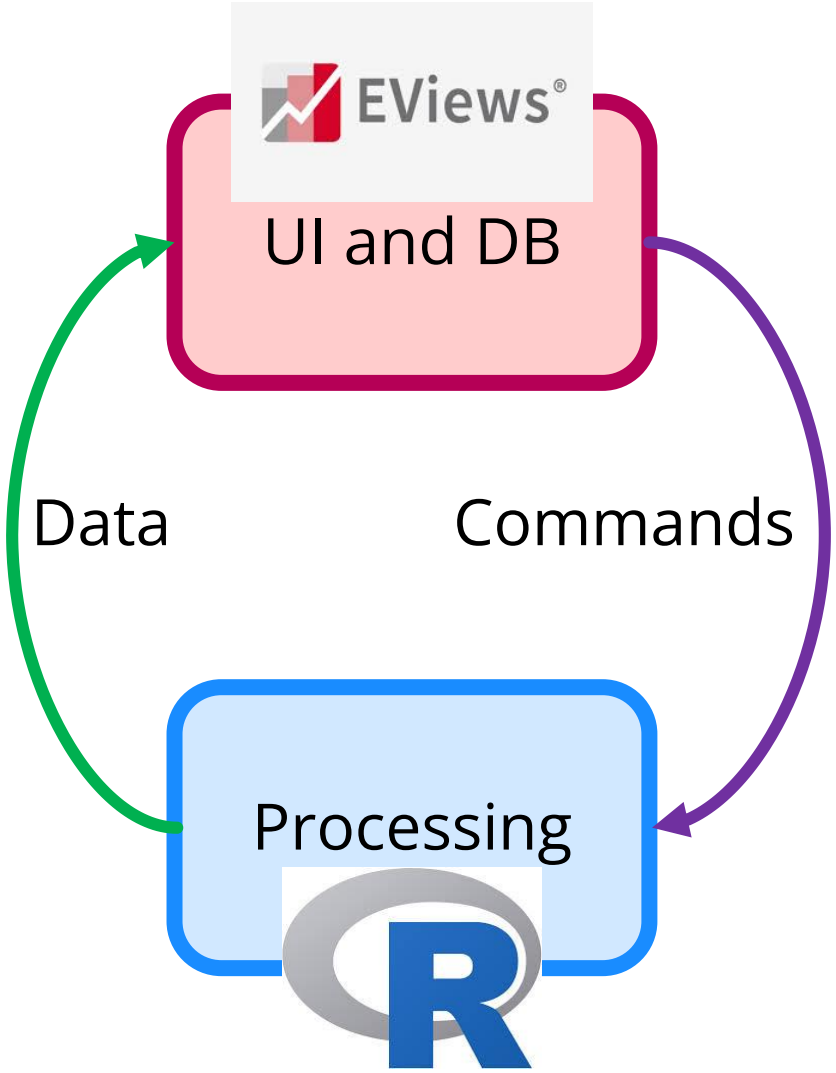
Legacy system Limitations:

- Eviews Eurostat connector is slow and outdated
  - Loading series iteratively
  - Pseudo-SDMX definition of fetch-command for individual series
  - No Metadata-handling integrated
- Replacing Eviews is not an option
  - Replacement has huge costs in training and infrastructure
  - Eviews still a decent option for our core business of modelling

The Solution

Integration of R:

- Retaining EViews' familiar interface for end-users.
- Using Eurostat's R package for data retrieval and processing.
- Pushing Data back to Eviews, assembling and storage in database



Workflow Breakdown

1. Initiation in EViews:

- EViews initializes the program, takes user inputs and stored user inputs for fetching data.
- Key commands:
  - xopen(r) - Opens the R connection.
  - xput() - Transfers user selections like table_name, country_list, and freq to R.
  - Xon/xoff – enables R-code in Eviews
  - source() launches the R-script

```
'R communication
xopen(r)
xput(name=table_name, rtype = "vector") table_name_R
xput(name=country_list, rtype = "vector") country_list_R
xput(name=freq, rtype = "vector") freq
'R-code after xon
xon
source("S:/Projets/Modelisation/Data/PRG_BASE/SUB/eurostat_r_eviews_connector_R_part.R", echo = TRUE)
xoff
xclose
```

Workflow Breakdown

2. Data Fetching in R:

- R uses get_eurostat() to fetch data based on preselected parameters
- Metadata and time-series are processed into a format compatible with EViews.
- Key commands:
  - Tidyverse for data-cleansing
  - get_eurostat_dic translates codelists into text
  - pivot_wider() - Converts data into a wide format for EViews
  - write.csv() - Writes the processed data and metadata to disk

Workflow Breakdown

3. Return to EViews:

- EViews reads the .csv files created by R for further manipulation and storage.
  - Direct recovery in Eviews via the command xget() is slow
- Key commands:
  - pageload - Loads RESData.csv (data) and RESMeta.csv (metadata) into EViews
  - .setattr – Add metadata
  - store – store to Eviews DB

Final output for single variable

Series: HDD_NR_LU_M Workfile: UNTITLED::Untitled\

View | Proc | Object | Print | Name | Freeze

Enter new attribute name

Attribute	Value
Name:	HDD_NR_LU_M
Display Name:	
Last Update:	Last updated: 03/21/23 - 17:08
Description:	INDIC_NRG = Heating degree days // UNIT = Number // GEO = Luxembourg // FREQ = Monthly //
Varname:	HDD_NR_LU_M
Indic_nrg:	HDD
Unit:	NR
Geo:	LU
Raw_frequency:	M
Table_name:	nrg_chdd_m
Text_indic_nrg:	Heating degree days
Text_unit:	Number
Text_geo:	Luxembourg
Text_freq:	Monthly
First_val:	1/1/1979
Last_val:	1/12/2023
Source:	Eurostat
Download_program:	3_import_eurostat_R
Source_file:	Eurostat API
Remarks:	Imported from 'S:\Projets\Modelisation\Data\PRG_BASE\SUB\RESData.csv'

Key Benefits of Integration

- **Performance:** Fetching and processing large datasets in R is significantly faster. (up to >100x)
- **Flexibility:** The R Eurostat package enables convenient filtering, naming, and formatting.
- **Usability:** Retaining Eviews user-experience and Database.

Thank you for your attention!
Feel free to ask questions!