# CEMLA Growth at Risk Project (C-GARP)

FINANCIAL CONDITIONS INDEX CODE v1.0

These notes are intended to be a quick reference of the code **fci_main.R** to obtain the financial conditions indices of a given set of countries. For a more in-depth information of the methodology, please refer to the technical notes at the [CEMLA Growth-at-Risk](#) website.

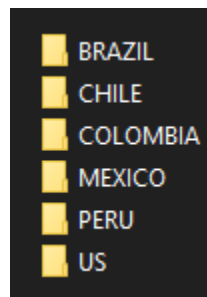The code is provided in zip file that contains the following folders:
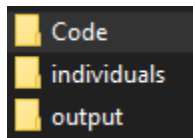
The operative code is based on the following files contained in the folder **Code**:
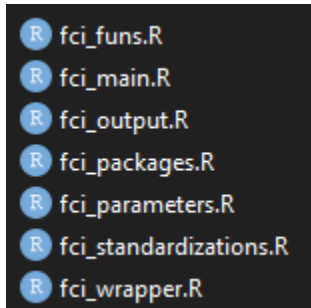
Required Data

1. Country specific data is stored in the folder **individuals**.
2. Each country has a folder, and it is identified with the corresponding name.

    For instance:

    In turn, each country that will be considered in the panel requires the following four files in csv format:
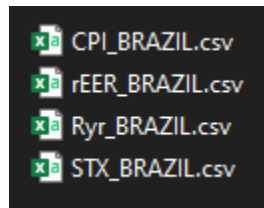
CEMLA Growth at Risk Project (C-GARP)

Daily data

- **CPI***.csv**   **Consumer price index**
- **Ryr***.csv**   **Sovereign 10Y bond yield**
- **STX***.csv**   **Stock market index**

Monthly data

- **rEER***.csv**   **Real effective exchange rate**

This is an example of the files in the BRAZIL folder:

Please note that the name of the files only requires to start with CPI, rEER, Ryr, STX. Whatever characters fall after those prefixes and before the file extension will be ignored by the code. Also, **only one file should be stored in every subfolder <u>per prefix</u>**.

Daily data files consist of two columns: a column DATES for dates in "DD/MM/YYYY" format, and a column whose name matches the prefix of the file as shown below. The second column is numeric and must not contain any other types of data.

CPI***.csv		Ryr***.csv		STX***.csv	
DATES	CPI	DATES	Ryr	DATES	STX
31/01/1970	0.00081582	28/01/2022	5.92	16/02/2022	1760.5
28/02/1970	0.0008575	27/01/2022	5.94	15/02/2022	1760.5
31/03/1970	0.00088728	26/01/2022	5.87	14/02/2022	1760.5

Monthly data file consists of two columns: a column DATES for dates in a numeric "YYYYMM" format, and a column whose name matches the prefix of the file as shown below. The second column is numeric and must not contain any other types of data.

CEMLA Growth at Risk Project (C-GARP)

rEER***.csv	
DATES	rEER
197912	150.594243
198001	151.990746
198002	155.064121
198003	160.983815

Code execution

3. Open the file **fci_main.R.**

4. Modify variable **workingDirectory** to include the <u>absolute path</u> of the folder that contains the FCI code. The path should be in R format, i.e., with slashes instead of backslashes (as in Windows).

   For instance, the following location in Windows C:\GaR\Code should be entered as **workingDirectory <- "C:/GaR/Code"**
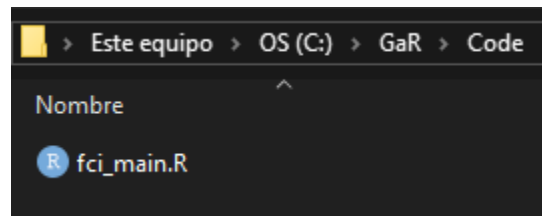
5. Open the file **fci_parameters.R.**

6. Modify the following parameters according to your requirements:

   1. **initialDate**: String with the format "YYYY-MM-DD". It is the initial date of the data panel.

   2. **finalDate**: String with the format "YYYY-MM-DD". It is the final date of the data panel. Daily data will be restricted to the initialDate—finalDate period. Internally, the date range will be comprised solely of *working days*. The results will be of monthly frequency and expressed as end-of-month values.

   3. **countries**: Vector composed of strings indicating the names of the individuals in the panel. In our case, they correspond to countries in the region.

      countries <- c("BRAZIL",
      "CHILE",

      "COLOMBIA",

      "MEXICO",

      "PERU")

Each name should correspond to a subfolder in the folder **individuals**, as shown in the data section.

4. **referenceRyrCountry:** The name of the country that will be used as benchmark for the bond market yield. It should coincide exactly with a subfolder in the **individuals** folder, and should contain two files: a **CPI***.csv** and a **Ryr***.csv** file. In our case, it is the "US" country and stands for the USA. <u>This country cannot be included in the **countries** vector.</u>

<u>For the following 4 variables, the units stand for working days. 20 days stand for a month, 260 for a year, and so on.</u>

5. **lagTilde:** Window length for the rolling standardization by the division of the standard deviation. Default set to 10 years.

6. **lagPeriod:** Window length for volatility stress indicator. Default set to a month.

7. **lagWindow:** Window length for cumulative performance comparison. Default set to two years.

8. **lagYear:** Period length considered to estimate the annual inflation obtain the real yield. Default set to a year.

<u>For the following three variables, the units stand for months.</u>

9. **lagTildeMonth:** Window length for the rolling standardization by the division of the standard deviation. Default set to 10 years.

10. **lagMonth:** Window length for volatility stress indicator. Default set to a month.

11. **lagWindowMonth:** Window length for cumulative performance comparison. Default set to a semester.

12. **standardizationMethod:** Select the standardization function. Its options are **"method_a_cdf"** or **"method_b_max"**.

CEMLA Growth at Risk Project (C-GARP)

13. **lambda:** Smoothing parameter in the Interval (0,1) for the estimation of EWMA crossing correlations. Values closer to 1 give more weight to newer information; values closer to 0 give more weight to previous correlations.

   The following values are all logical TRUE or FALSE and are related to the storage of the results:

14. **saveXLSX:** Select TRUE to save an Excel file in the outputPath trajectory.

15. **saveLong:** Select TRUE to save the FCI data in a long format table, with a **dates**, **country** and **fcis** column. Select FALSE for a short format, with **dates** and country columns.

16. **saveIndexRelatedData:** Select TRUE to save a sheet with the table with all the information relative to the indices: stress indicators, correlations and FCI's.

17. **saveMonthlyRelatedData:** Select TRUE to save a sheet with the table with all the information relative to the information with monthly frequency.

18. **saveDailyRelatedData:** Select TRUE to save a sheet with the table with all the information relative to the information with daily frequency.

19. **outputPath:** Write the path where the output file will be saved. The file name has the structure FCI + time stamp + fileTag (next parameter).

20. **fileTag:** String that is appended to the file name.

7. Execute the code in fci_main.R.

Results

1. The results are stored in an Excel file in the path and file set in the **fci_parameters.R** file. The name of the file is FCI_*DATE_TIME_fileTag*.xlsx.

2. It includes an FCI table, as well as the indicated index, monthly or daily data in the **save** parameters. It also stores a table with the parameters set in **fci_parameters.R** as reference.

3. The zip file already contains a ready to run example. Adjust **workingDirectory** accordingly and execute the code. The output would be located in the folder "\CGARP v1.0\output" and should match the file "\CGARP v1.0\output\FCI_test.xlsx".

CEMLA Growth at Risk Project (C-GARP)

In case of needing more detailed information, please consult the technical notes.

When using the code please cite: Ossandon Busch et al. (2022), Growth at Risk: methodology and applications in an open-source platform. Latin American Journal of Central Banking, Elsevier, forthcoming.

Do not hesitate to contact us to let us know your doubt, comments, suggestions, or if you want to report any bug at cgarp@cemla.org

Please remind that this code comes "as is", and it is provided with NO WARRANTY. CEMLA does not bear any responsibility for its use.