Not a short-run noise! The low-frequency volatility of energy inflation

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Overview   This repository contains R and MATLAB scripts to download, process, and analyze energy inflation data for major economies, focusing on year-over-year (YoY) dynamics and wavelet power spectrum (WPS) analysis.

R Script: Data Download & YoY Calculation

- Downloads monthly energy inflation data from Data source: FRED for France, Germany, Italy, Japan, the UK, and the US.

- Merges datasets by `observation_date`.

- Computes YoY growth for each country.

- Exports processed data to `data/data.xlsx`.

MATLAB Script: Visualization & Wavelet Analysis

- Loads `data/data.xlsx`.

- Plots time series charts for each country.

- Performs wavelet power spectrum analysis:

  - Computes continuous wavelet transform for each series.
  - Extracts local maxima (ridges) and global wavelet power spectra (GWPS).
  - Adds significance contours and cone of influence (COI).

- Saves all figures to the `results` folder in `.eps` format.

Outputs

- `data/data.xlsx` – YoY energy inflation data.

- `results/EI_<country>.eps` – Time series charts.

- `results/PS_<country>.eps` – Wavelet power spectra.

- `results/GWPS_<country>.eps` – Global wavelet power spectra.

References   Andreani, M., & Giri, F. (2023). *Not a short-run noise! The low-frequency volatility of energy inflation.* Finance Research Letters, 51, 103477.