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# Now-casting business and financial cycles using low- and high-frequency data[1]

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[1] This contribution was prepared for the workshop. The views expressed are those of the authors and do not necessarily reflect the views of the Bank of Italy, the BIS, the IFC or the other central banks and institutions represented at the event.

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# Now-casting Business and Financial Cycles Using Low- and High-Frequency Data

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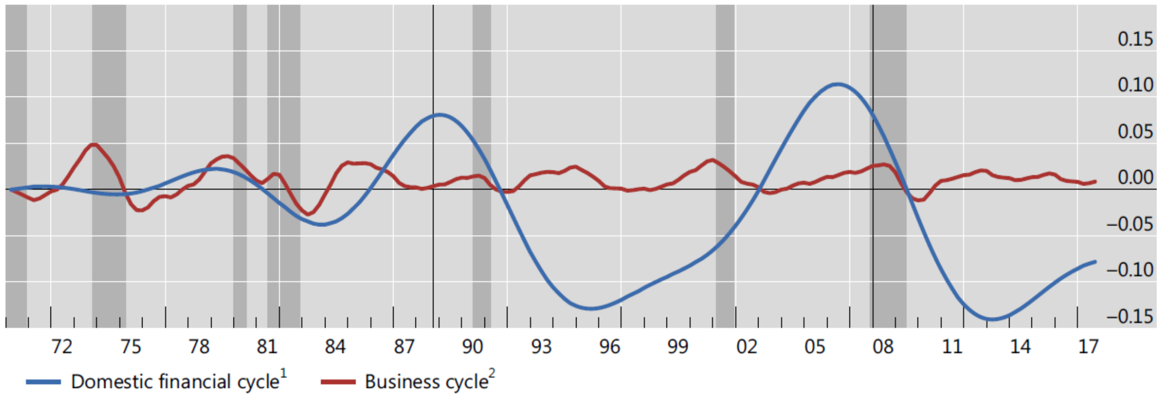
# Now-casting business and financial cycles: **objective of the project**

Objective: *Nowcasting* and *short-term forecasting* of economic and financial activity using a fully automated infrastructure. We seek to contribute to the understanding of these cycles using a wide range of macro and micro data, including qualitative information, from a wide range countries.

The domestic financial and business cycles in the United States — Graph 1




The shaded areas indicate recessions; the solid black lines indicate the start of a banking crisis as defined by Laeven and Valencia (2018).

[1] The financial cycle as measured by frequency-based (bandpass) filters capturing medium-term cycles in real credit, the credit-to-GDP ratio and real house prices. [2] The business cycle as measured by a frequency-based (bandpass) filter capturing fluctuations in real GDP over a period from one to eight years.

*Source:*
*Aldasoro, Avdjiev, Borio and Diyatat (2020)*

## Business cycles

- Recession dates (eg NBER)
- Business Climate (eg OECD)

## Financial cycles

- Asset price cycles (equities and house prices)
- Financial stability cycle (banking crises)
- Leverage cycles (credit growth)
- Capital flows cycles
- Composite financial cycle

# Now-casting business and financial cycles: **concept and data**

## Methods:

- Econometrics models and machine learning:
  - Binary logistic regression models
  - Exhaustive feature selection (up to 5 variables)

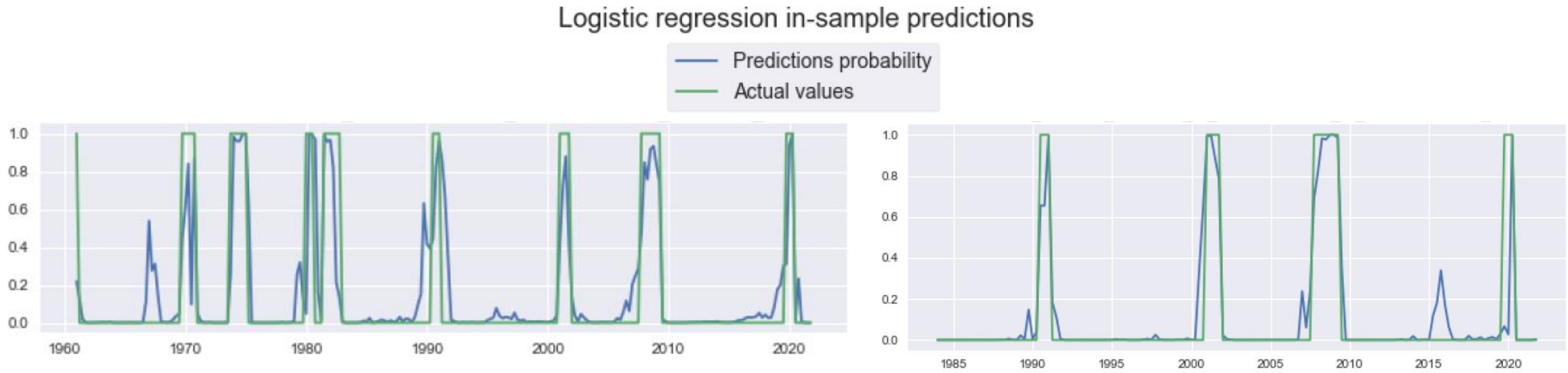
## Data:

- *Countries*: OECD countries and EMEs (cluster of countries by data availability)
- *Explanatory variables*: <u>*more than 50 variables*</u> collected and updated daily from macroeconomic and financial market indicators to micro data.
- *Frequencies*: daily, monthly and quarterly.
- *Sample*: 1950 – Today

# Now-casting business and financial cycles: **preview on results**

*Business cycle for the US (1961-2021)*

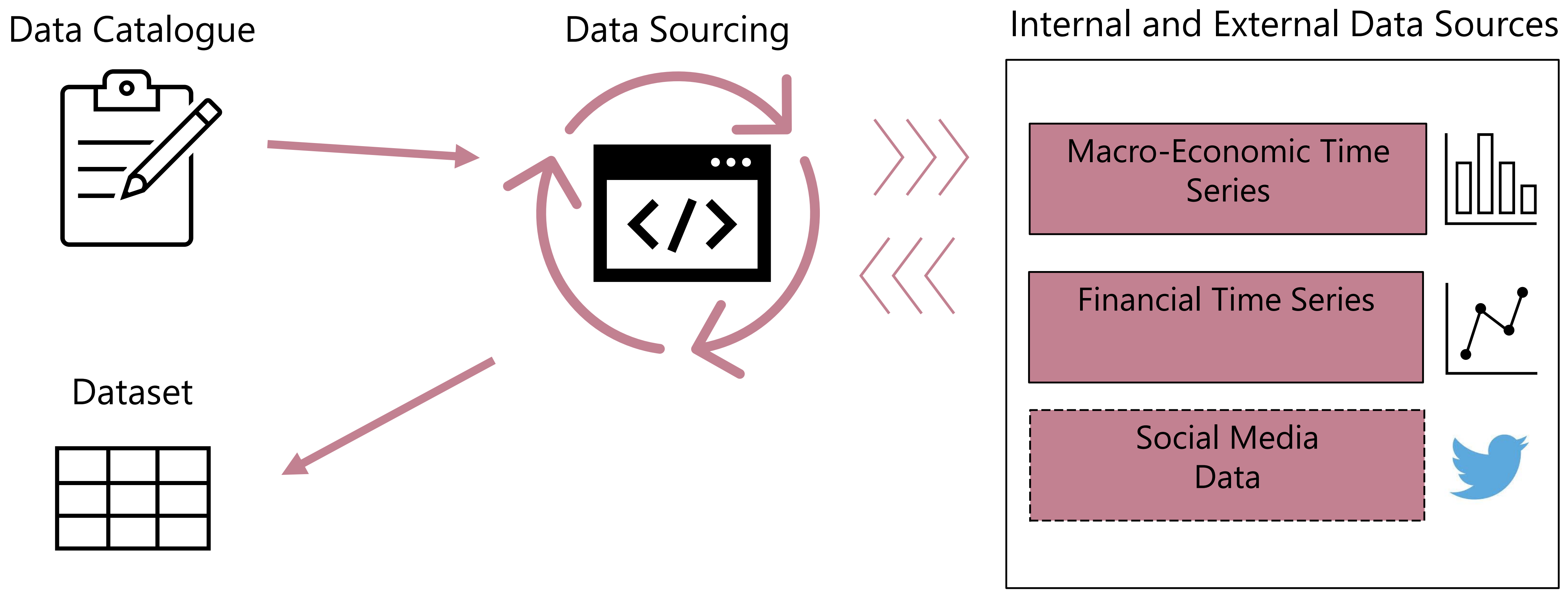
*Business cycle for the US (1984-2021)*



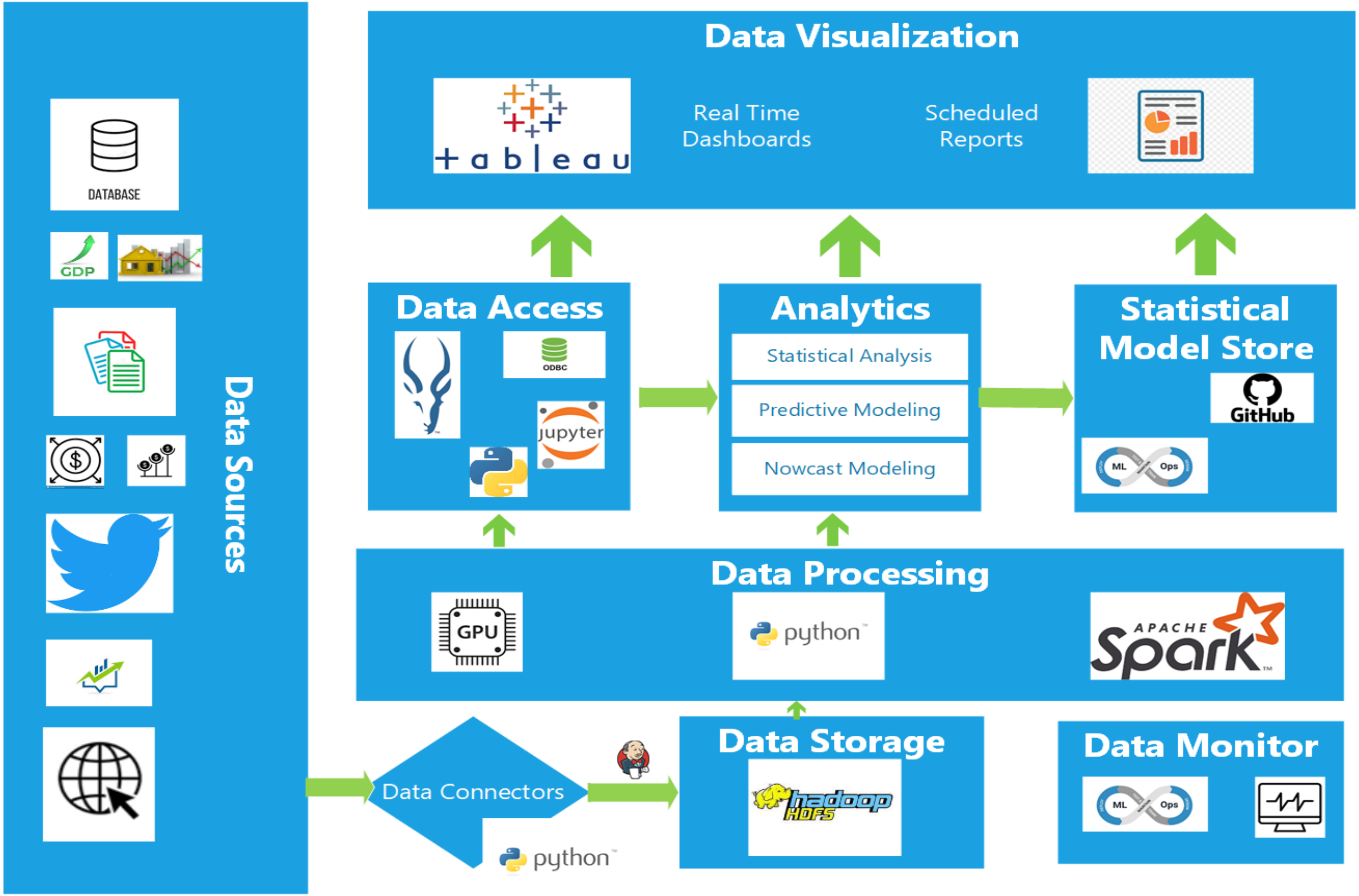

*Explanatory variables:*
Policy rate
Private consumption growth
Unemployment rate (*t*-1)
Policy rate (*t*-3)
Current account balance (*t*-2)

*Explanatory variables*:
Credit to households growth
Gross fixed capital formation growth
GDP growth (*t*-1)
Credit to government growth (*t*-2)
Policy rate (*t*-2)

# Now-casting dataset concept: Combining multiple data sources



# NOWCAST ML PIPELINE ARCHITECTURE



# Now-casting business and financial cycles: **next steps**

- Model calibration
- Compare different approaches (e.g. EFS vs step-wise)
- Out-of-sample simulations
- Cross-country comparison and robustness checks
- End-to-end pipeline
- Social media data ingestion