# Nowcasting during the Pandemic: Lessons from Argentina

## by

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**Objective**: Nowcast Argentina's quarterly GDP growth ($y_t$) from 2020Q1 to 2021Q2.

$$y_t = \sum_{i=1}^{p} \beta_i f_t^Q + \sum_{i=1}^{p} \gamma_i y_{t-1-i} + \varepsilon_t$$

$$f_t^Q = 13(f_t^m + f_{t-1}^m + f_{t-2}^m)$$

$f_t^m$ is extracted using the Kalman filter with 6 different schemes along a particular quarter from $N = 112$ monthly indicators, observed from 2016m1 to 2019m12.

**Compare forecasts based estimates of the parameters obtained with pre-pandemic data with updated estimates obtained using the most recent information**: Re-estimating or not is indifferent.

**New high-frequency data sources**: energy consumption (improves) and Google mobility (does not improve)

Figure 3. Nowcast Sequential Updates
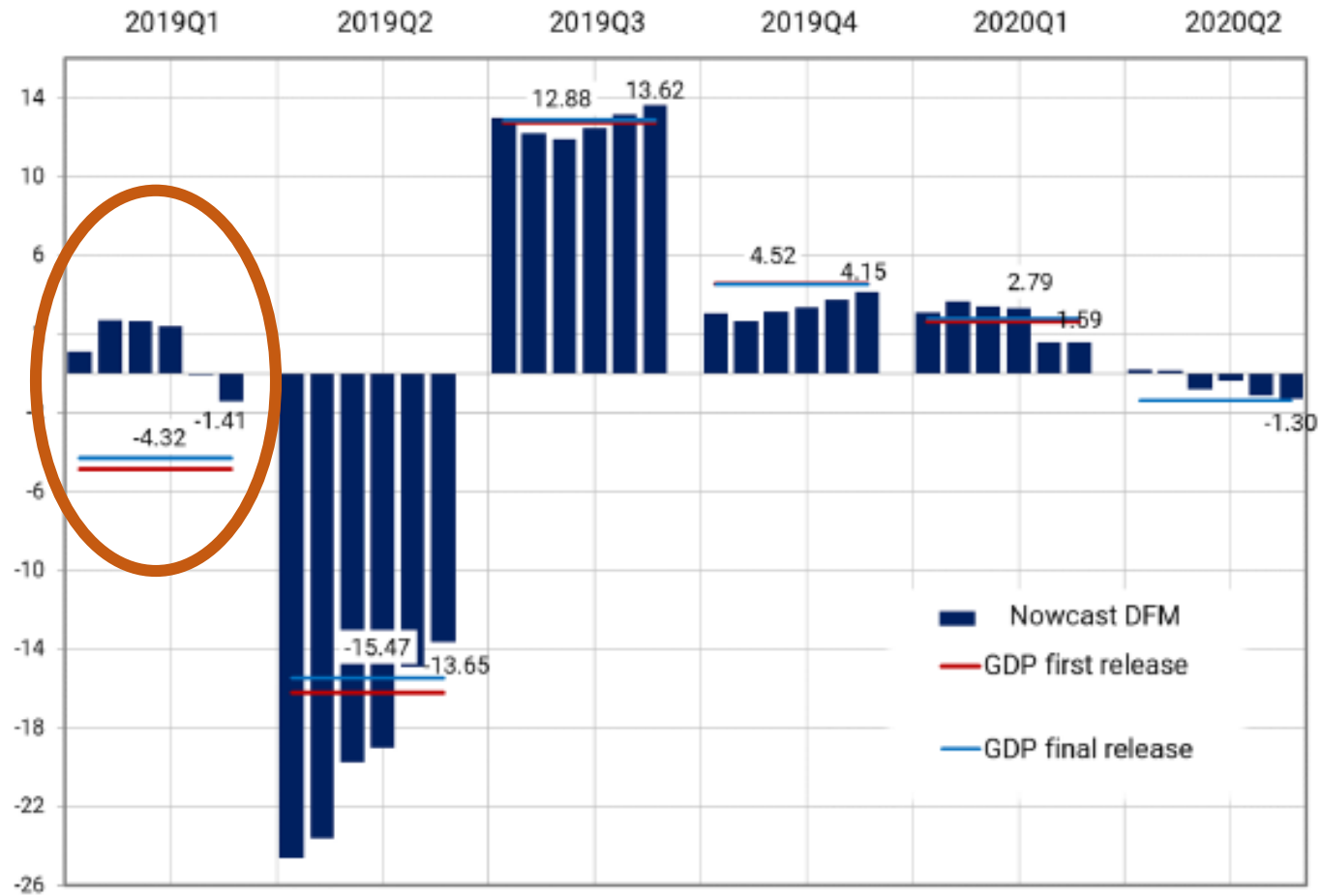
Remarkable performance. However…..

1. Severe and **unexpected** downturns are difficult to capture (and forecast or even nowcast)

2. Re-estimation of DFMs with most recent information: Effect of outliers and structural breaks

# Unexpected downturns cannot be forecasted using past data
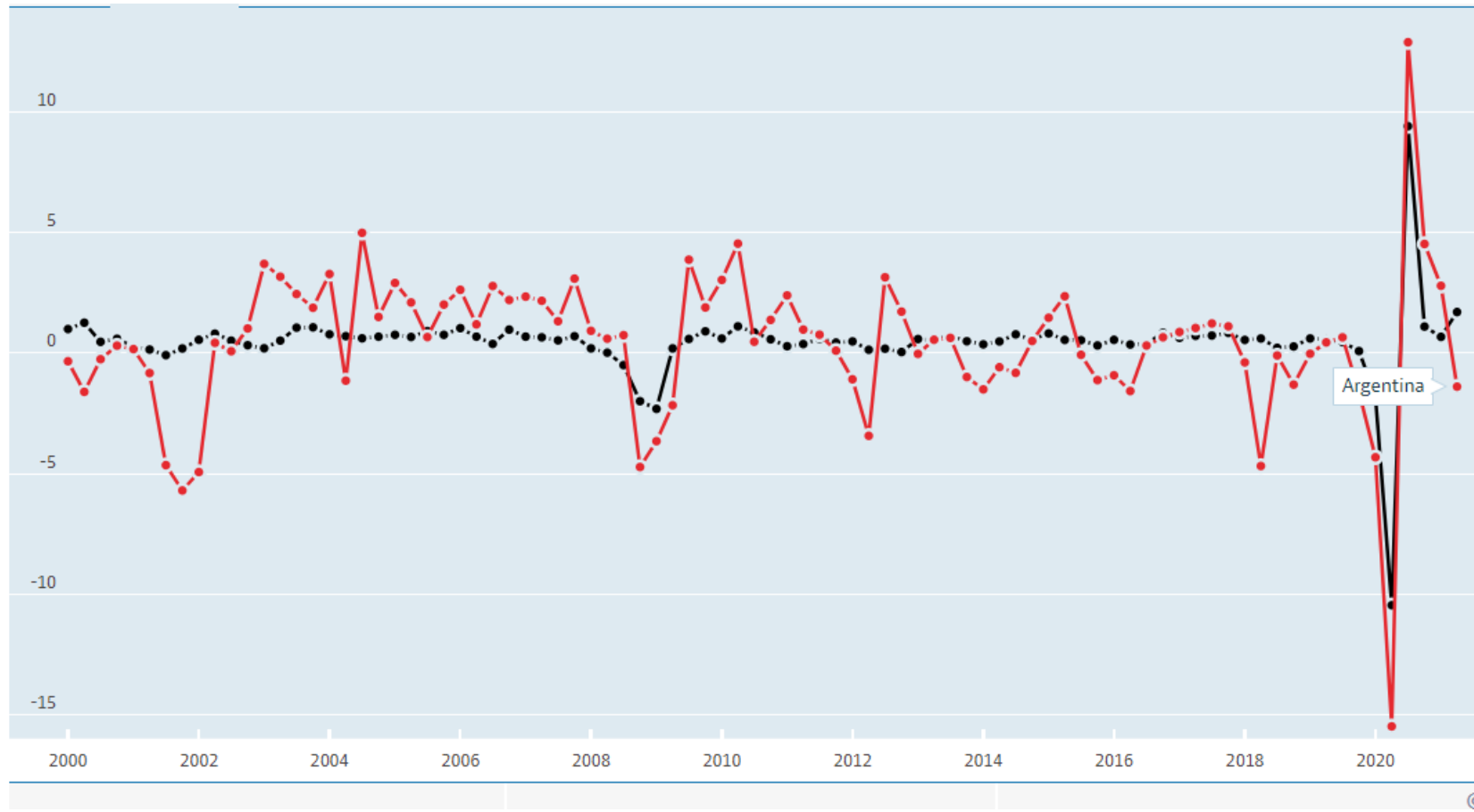


OECD (2021), Quarterly GDP (Accessed on 6th November 2021)

Implement measures of growth vulnerability:

**Growth at Risk (GAR)**. 5% quantile of growth distribution as a function of underlying factors. Adrian, Boyarchenko and Giannone (2019)

**Growth in Stress (GiS)**. Different scenarios for the factors underlying growth are considered with stress being defined as very unlikely scenarios. González-Rivera, Rodríguez and Ruiz (2020)

# Effect of outliers when estimating parameters and extracting factors

**Independent data**: Bai and Feng (2019, arXiv:1902.08735v2), Croux, Filzmoser and Fritz (2014, *Quality Control and Applied Statistics*) and Croux et al. (2017, *Statistica Sinica*)

**Volatility factors**: Trucios, Hotta and Pereira (2019)

**DFMs**: **Baragona and Battaglia (2007)** propose a procedure to detect outliers in large systems of variables generated by DFMs.

**Kristensen (2014)** analyse the effects on the determination of the number of factors and propose using a LAD estimator of the factors.

**Alonso, Galeano and Peña (2020)** propose cleaning the series of outliers previous to factor extraction.

**Factor-augmented regressions**: **Massaci and Kapetanios (2021)** show the effects of structural breaks.

# Using new high-frequency data sources



**Figure 7.** Argentina COVID-19 Community Mobility Report 2020
*7-day moving average*

Retail — Grocery and Pharmacy — Parks — Transit Stations — Workplaces — Residential
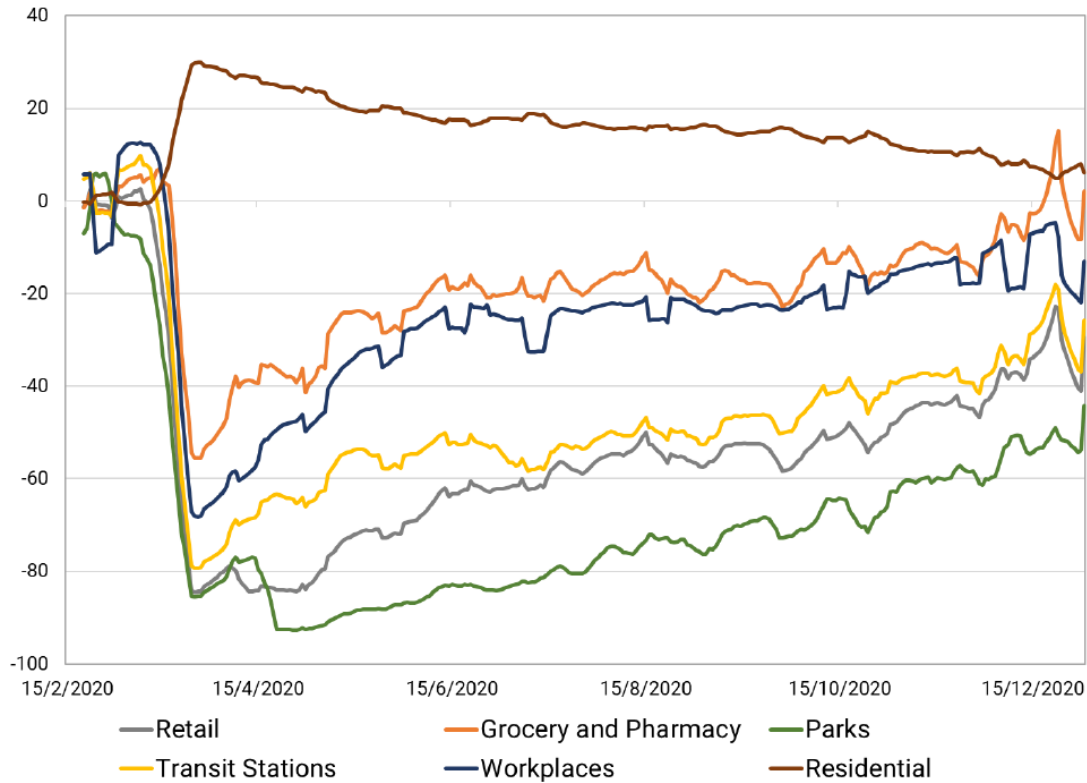
**Source:** Google Region Mobility Report (CSVs)

What about non-stationarity?

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