FCEA FACULTAD DE CIENCIAS ECONÓMICAS Y DE ADMINISTRACIÓN

IECON INSTITUTO DE ECONOMÍA

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Economic uncertainty impact in forecasting Uruguayan macro variables

Bibiana Lanzilotta

(coauthors: G. Mordecki and V. Umpiérrez)

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Introduction

- Uncertainty is important to understand economic performance. It plays a crucial role in macroeconomic fluctuations through different channels.
- As the environment becomes more uncertain, the agents will be more cautious and skeptical about making productive decisions such as investment and saving.
- Forecasting is harder in an uncertainty context.
- Uruguay is a small and open economy, located between two large countries: Brazil and Argentina, in the midst of two highly volatile economies.
- Uruguay is also a highly dollarized economy. This feature has slightly decreased in recent years.

Background (I): some uncertainty measures

- Measuring uncertainty has become a major issue, particularly in the aftermath of the 2008-2009 international crisis.

- **Uncertainty of decision-makers** => forecasts based on surveys of experts (Ferderer, 1993), entrepreneurs, or consumers (Bachman et al., 2013; Bloom et al., 2017, Claveria et al. 2018, 2019, among others).

- **EPU Index** => constructed by Baker, Bloom & Davis (2016).

- **Indicador de Incerteza da Economia Brasil (Economic Uncertainty Index for Brazil)** => computed by Fundação Getulio Vargas (2016).

- **Uncertainty Indicator based on internet searches** => computed by Bontempi et al. (2016).

- **World Uncertainty Index (WUI)** => calculated by Ahir et al. (2019).

Background (II): Transmission Channels

- **A strong relationship between stock market volatility and employment, output, and productivity growth** => Bloom (2009).
- **The linkage between the financial and monetary sectors with the real economy** => Leduc & Liu (2016).
- **International transmission of uncertainty between the financial and the real sector** => Abid (2019), Ahir et al. (2019).
- **Effect of uncertainty (business and consumer level) in macro aggregates** => Claveria (2021).
- **Uncertainty effects on economic activity between emerging and developed countries** => Carrière-Swallow & Céspedes (2013).
- **Uncertainty impact on South American countries**=> Barboza & Zilberman (2018); Costa Ferreira et al. (2018); Cerda et al. (2017).

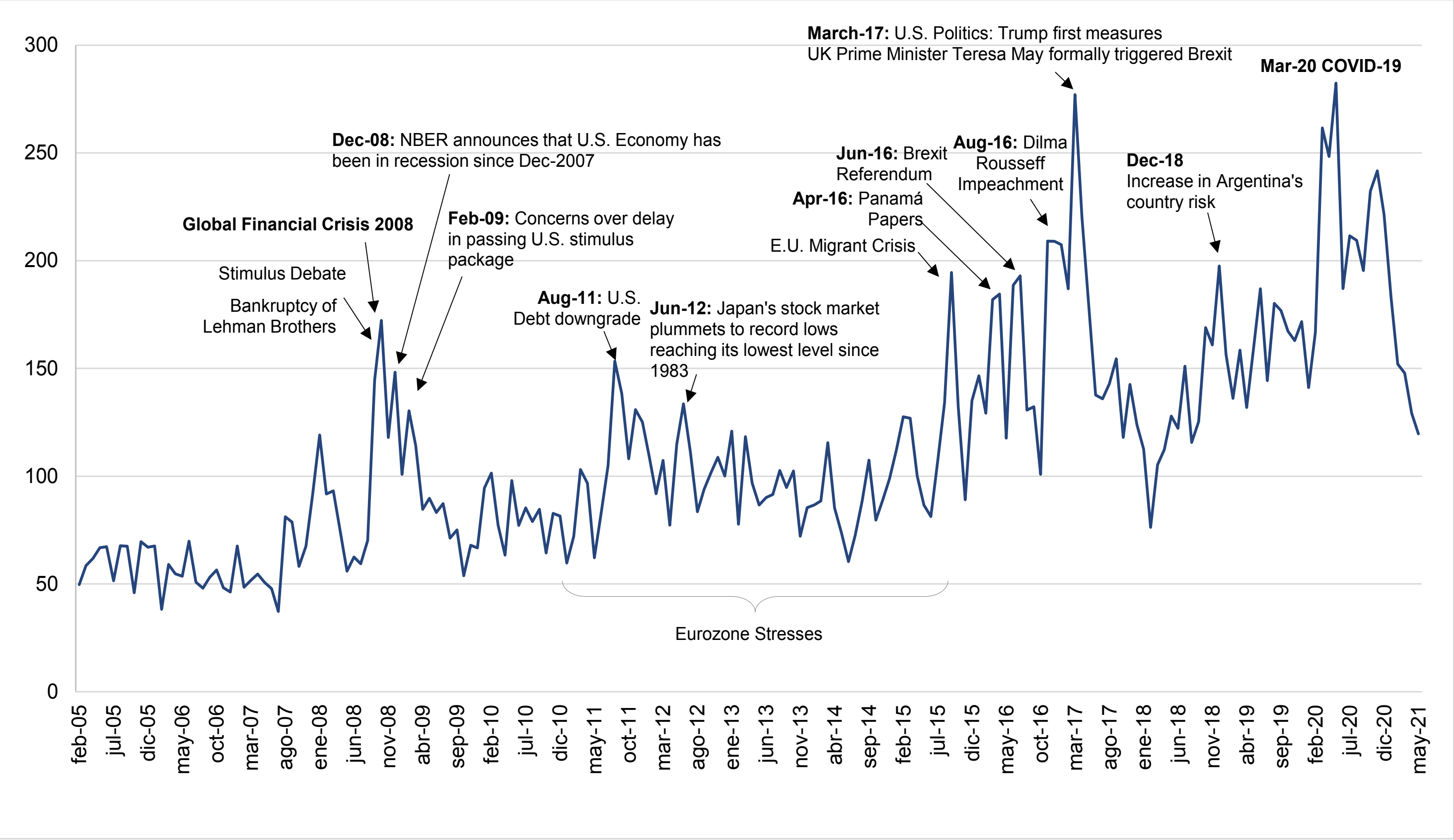
Uncertainty Indexes for Uruguay

Uruguay as a small and open economy is highly exposed to international, regional and domestic uncertainty. It is also a high dollarized economy.

Here, we proposed two alternative indexes:

- *CPU* => combines the EPUs of Brazil and the Global EPU with the standard deviation of the 12-month forecast of the exchange rate. Weights are obtained by principal components analysis (PCA) (Lanzilotta et al, 2019)
- *unc_pol* => survey-based agents' expectations about the country's situation regarding the overall economy both at present and by the end of the next six months, following the methodology of Claveria et al. (2018). It covers 373 firms that are a representative sample of industrial firms with 5 or more employees.

Uncertainty CPU Index for Uruguay



Source: Authors' calculation

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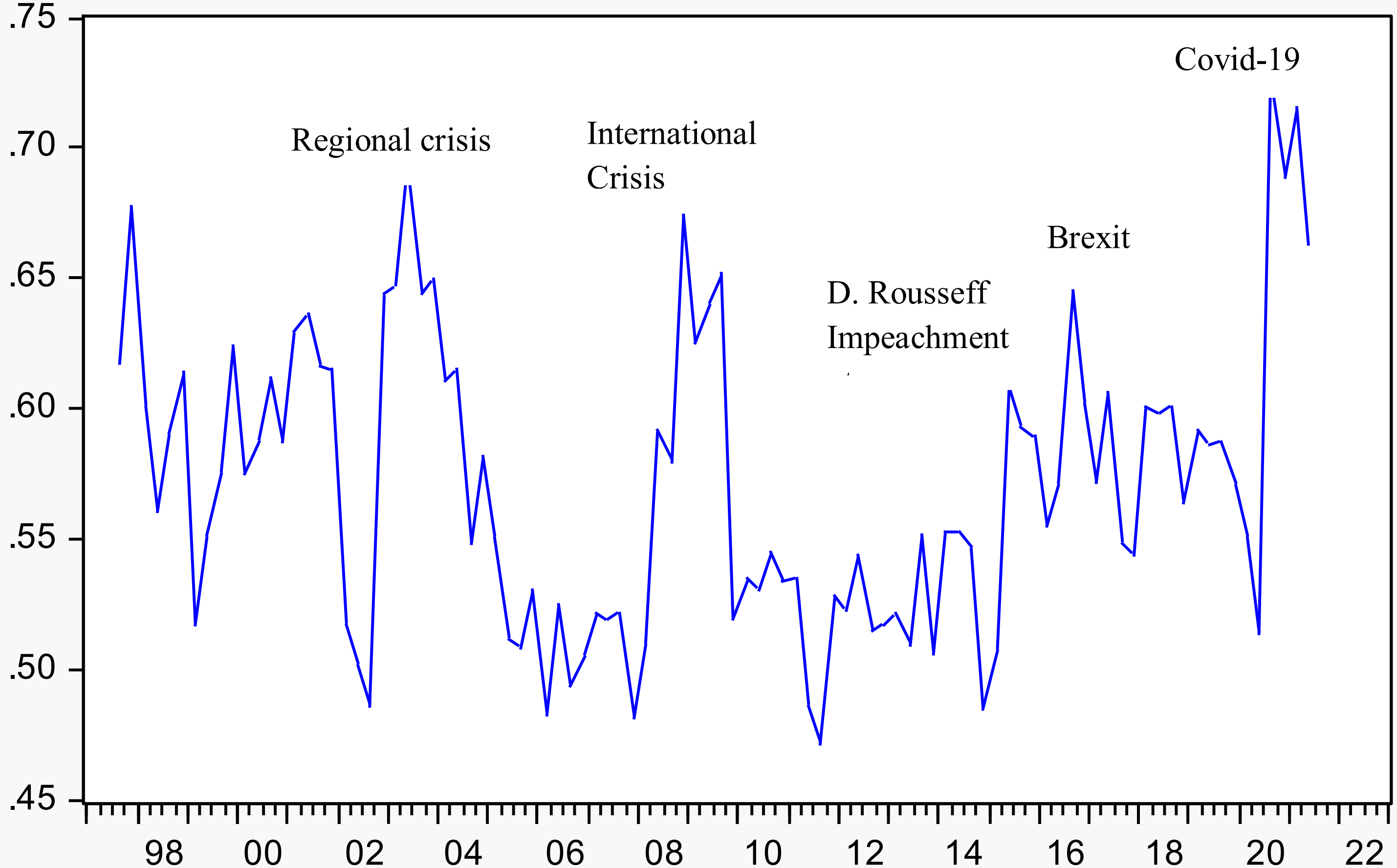
Uncertainty Index for Uruguay



Source: Authors' calculation

Objectives

1. Examine the impact of uncertainty on the macro variables of Uruguay.

2. Evaluate the accuracy of constructed uncertainty indexes for Uruguay on macroeconomic forecasting.

2. Analyze changing comovements between macroeconomic cycle and uncertainty.

Empirical strategy

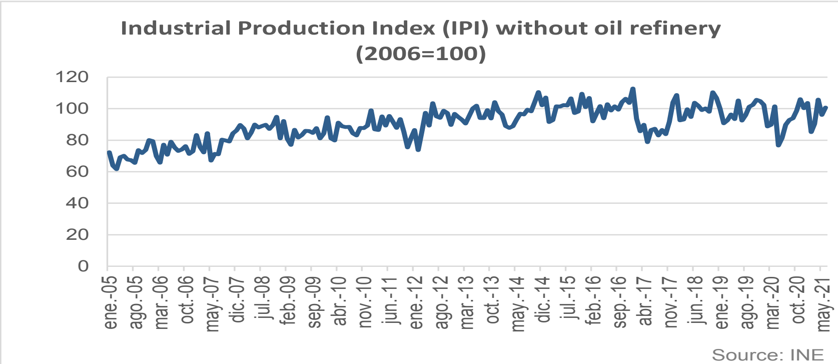
-Estimate a restricted vector autoregressive model (VAR).

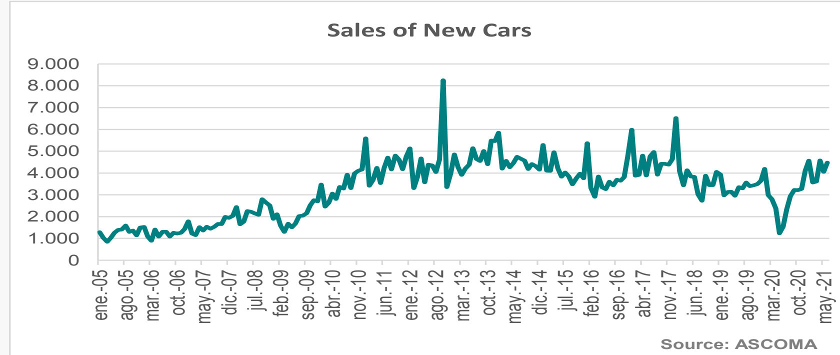
- Analyze the effects of shock simulations on the random disturbances in the system by computing the impulse-response functions (IRF) and the variance decomposition for 15 months.

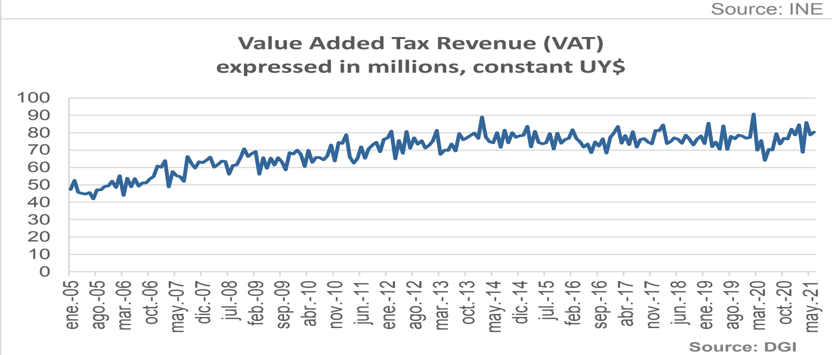
- COVID sanitary crisis increase SE of VAR equations. It was modeled by 3 outliers (2020.03, 2020.05, 2020.06)

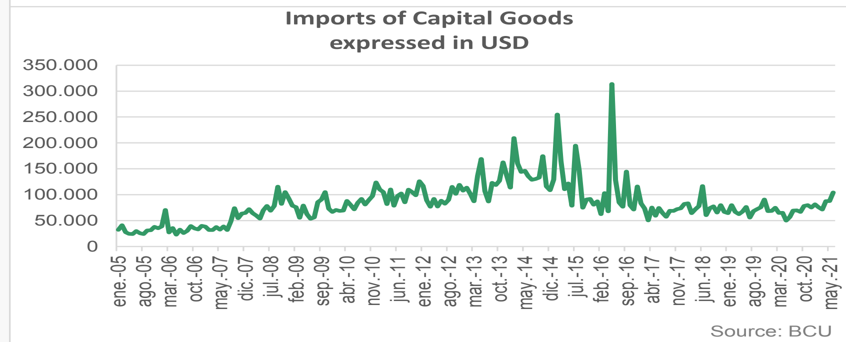
- Analyze co-movements between uncertainty and GDP cycle (in rolling windows).

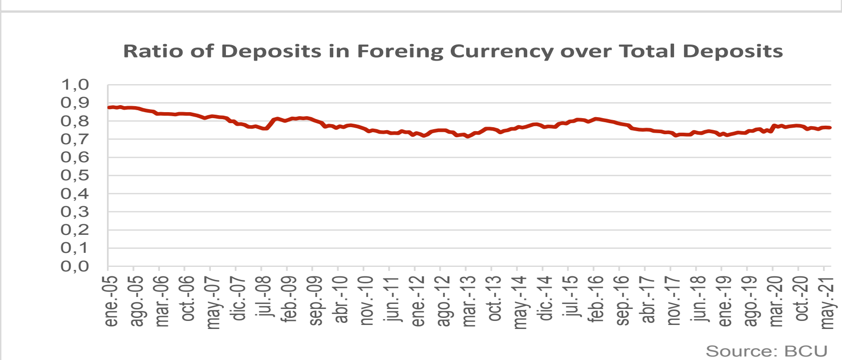
Input Data - Real and Financial Variables

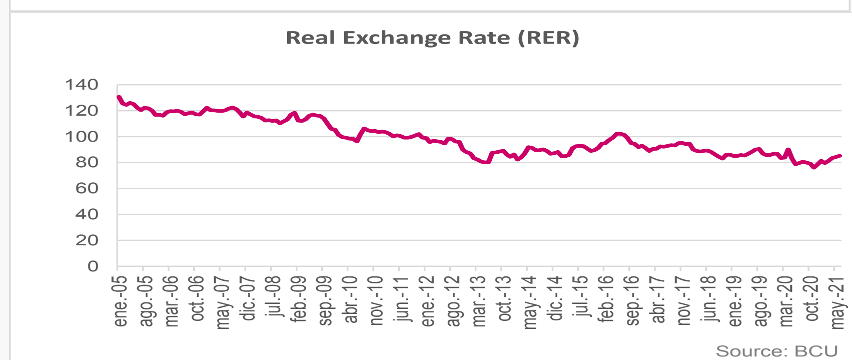




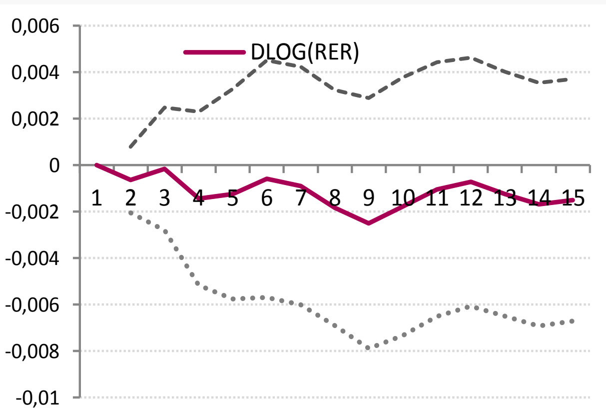


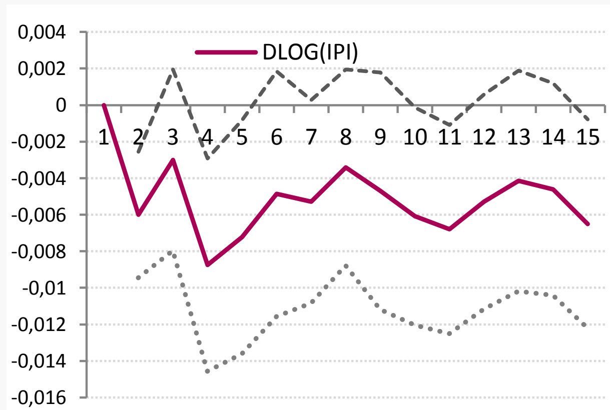


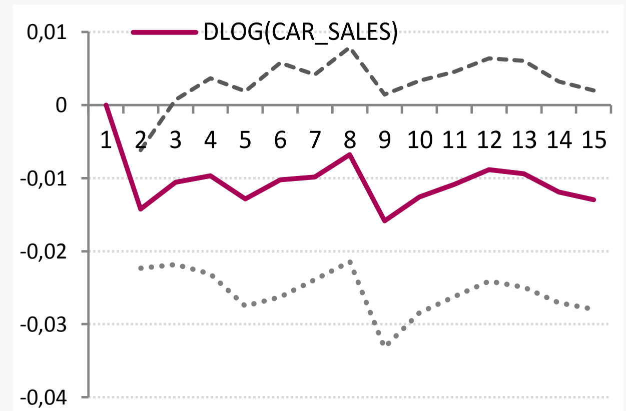


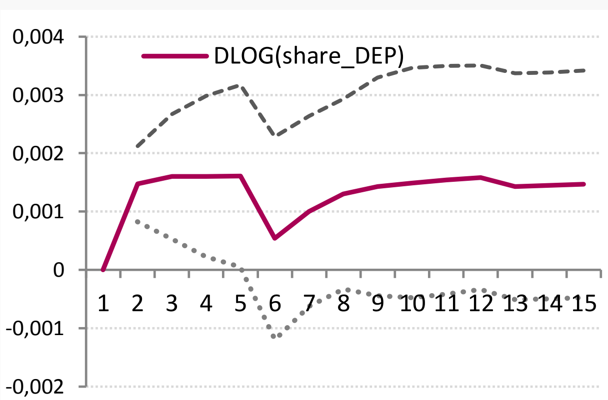


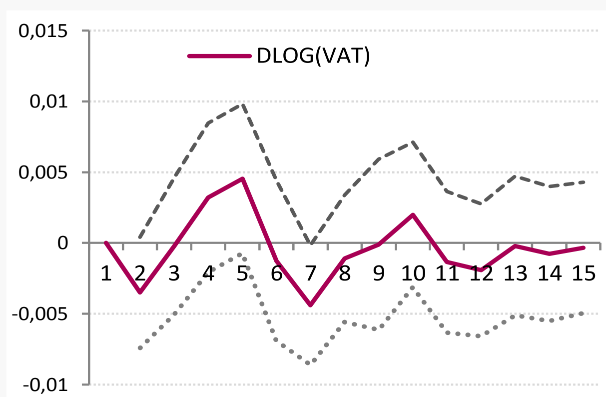
Results: response to an orthogonalized CPU uncertainty shock

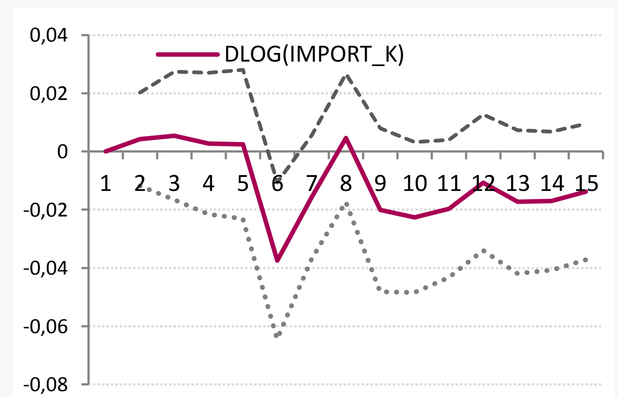




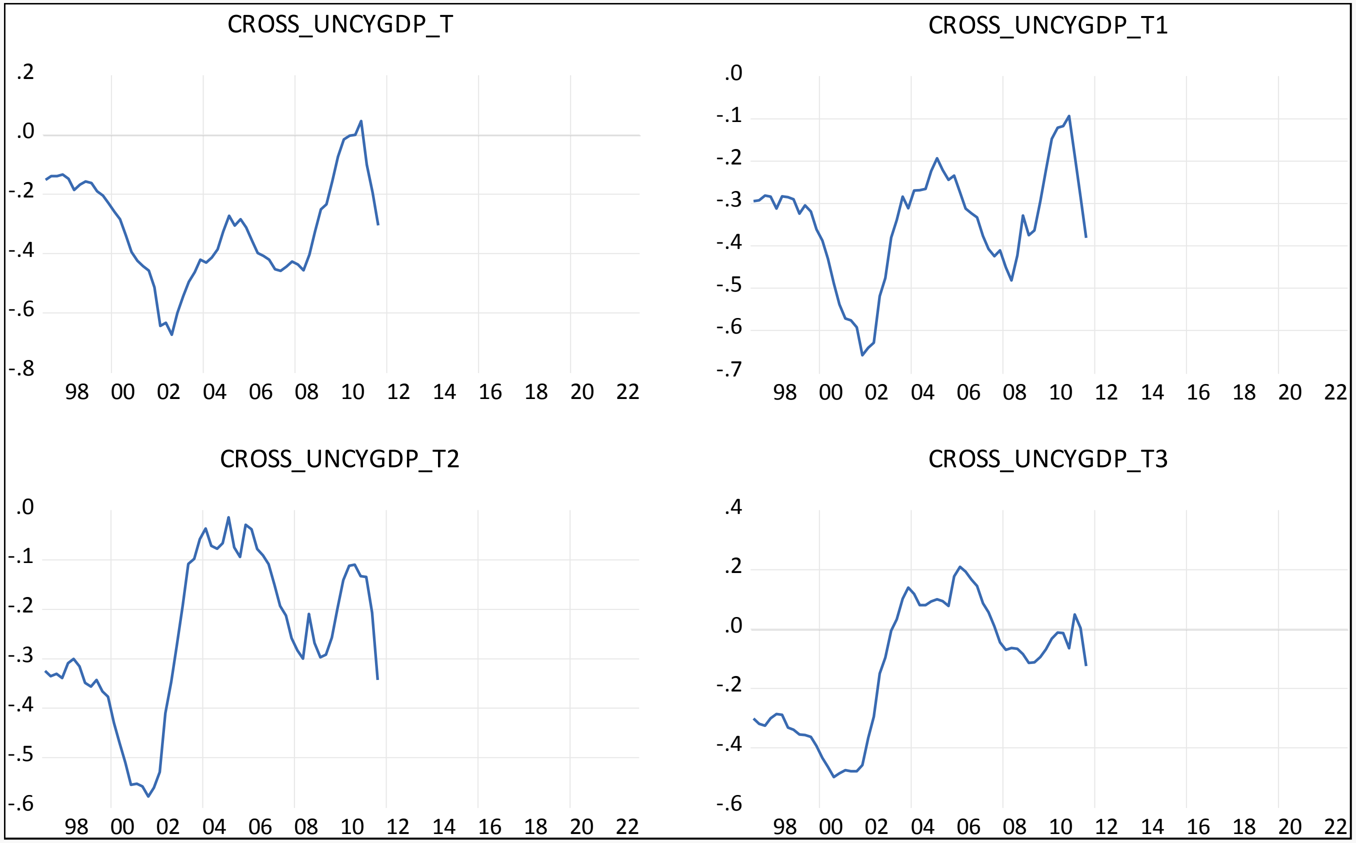






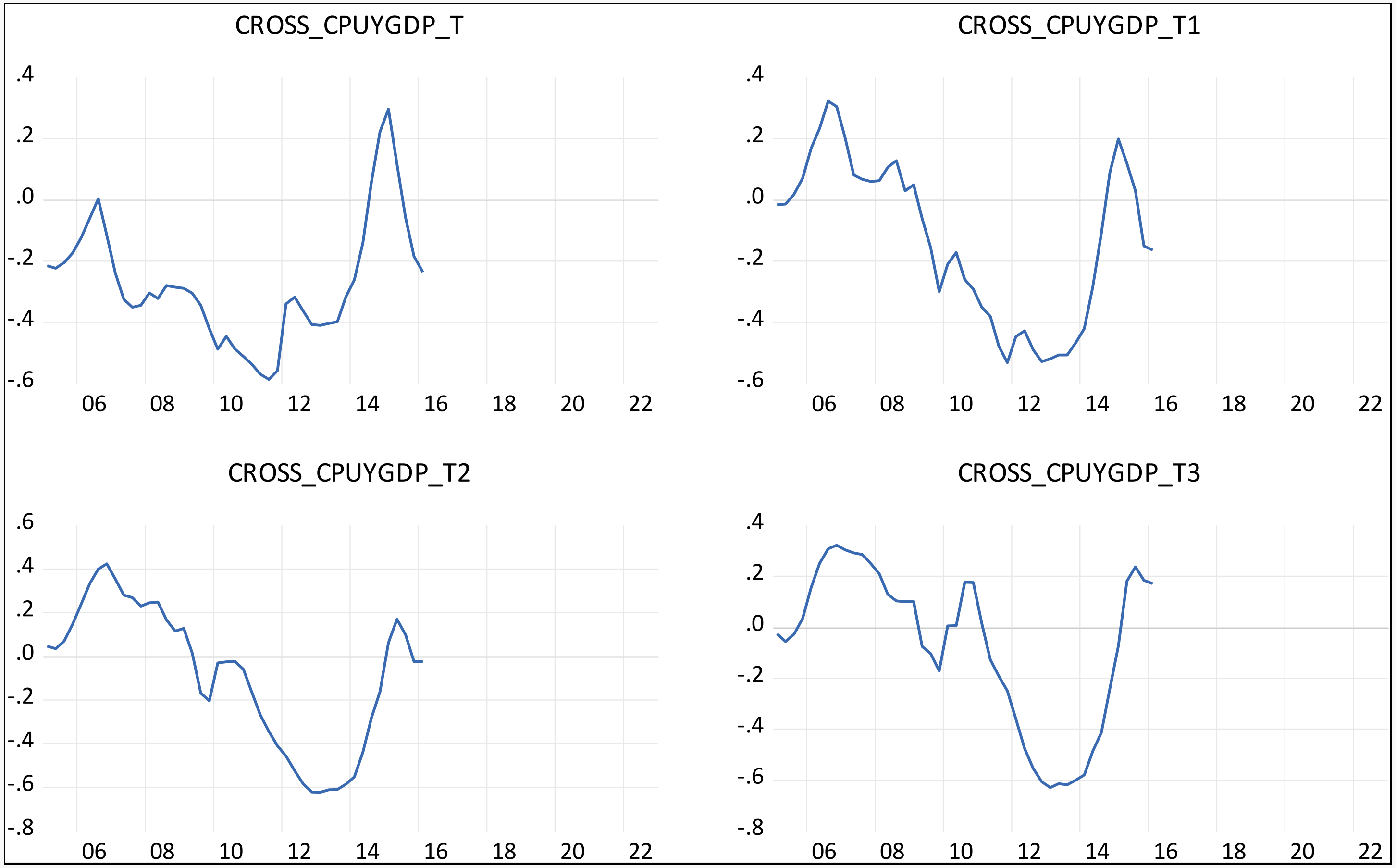


Co-movements: rolling cross-correlation analysis between *Unc_pol* Index - GDP cycle



Sample: 1997Q1 – 2021Q2, rolling window: 23,5 years

Rolling cross-correlation analysis between CPU Index - GDP cycle



Sample: 2005Q1 – 2021Q2, rolling window 16 years

Conclusions

- CPU Index is more volatile than *Unc_pol* index survey based on industrial firms' expectations.
- Impulse-response functions show an important impact on CPU uncertainty shock in new car sales and industrial production index (IPI) for real economy. On the financial side, it impacts the ratio of foreign currency deposits.
- Results remain unchanged despite the large Covid-19 shock.

- Both indicators anticipate macro fluctuations, and their predictive performance does not show significant differences, with the best predictor varying at different horizons.
- Nevertheless, we find evidence that correlations between the cycle and these uncertainty indicators vary along the analyzed period, with higher, showing higher values (in absolute terms) during economic crises.
- Although these findings are in line with previous research (Angelini et al. 2019; Caggiano et al. 2020), further research has to be conducted to analyze and identify the changing pattern of the relationship between uncertainty and Uruguayan macro fluctuations.

Thank you!

bibiana.lanzilotta@gmail.com