



TRACKING THE ECONOMY DURING THE COVID-19 PANDEMIC: THE CONTRIBUTION OF HIGH-FREQUENCY INDICATORS

FOURTH STATISTICS CONFERENCE “POST PANDEMIC STATISTICS” BANCO CENTRAL CHILE

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ROADMAP

- I. Introduction
- II. Covid-19: a source of concern for internet users
- III. The effects of the lockdown are real and can be measured physically
- IV. Covid-19 and house prices in the UK: what can be learned from web-scraping data?
- V. Conclusion and perspectives



I. INTRODUCTION

- Due to its brutality and multifaceted nature, the Covid-19 crisis has triggered major shifts in economic activity and household behavior.
- To analyze these trends, institutions such as the Banque de France have made use of high-frequency data (data published on a weekly or daily basis).
- This has allowed to get around the problem of the long publication times for official data, and rapidly measure the impact of the economic shock. It has also helped to provide real-time insight into households' behavior and expectations, and to identify their main concerns, alongside those of the business community.

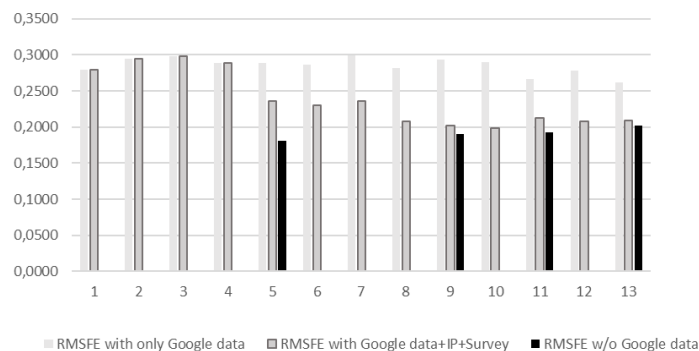


I. INTRODUCTION

- The so-called “open” data used in this article have three main characteristics:
 - they are not included in the official statistics published by the public institutions and authorities responsible for tracking the economy;
 - they can be accessed easily and free of charge via the internet;
 - they are available at a high frequency, generally at least daily.
- Open data are essentially statistics derived from social media platforms (Twitter), the internet (Google searches), granular open data databases (e.g. statistics linked to energy and transportation).
- Open data have proved extremely useful during the Covid-19 crisis for tracking fluctuations in economic activity:
 - bank card data (Carvalho et al., 2020);
 - electricity consumption (Cicala, 2020);
 - weekly unemployment figures (Coibion et al., 2020);
 - or the real-time location of global cargo ships (Cerdeiro et al., 2020).

I. INTRODUCTION

- Google data has proven useful for nowcasting and / or forecasting the first four weeks of the quarter, when official data is not available. From the 5th week onwards, their advantage disappears (“When are Google data useful to nowcast GDP? An approach via pre-selection and shrinkage” Laurent Ferrara Banque de France Anna Simoni CREST, CNRS February 20, 2019).



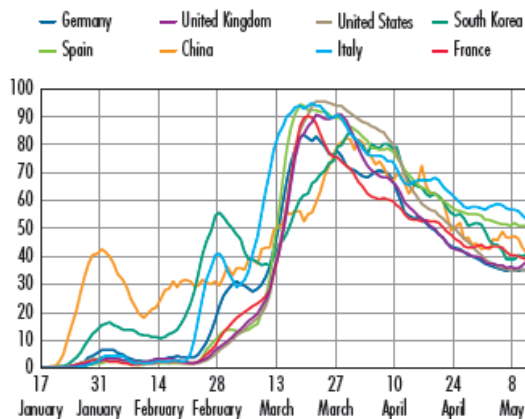
- This presentation reviews a selection of the indicators used, focusing in particular on household behaviour and on the tracking of the global economy.

II. COVID-19: A SOURCE OF CONCERN FOR INTERNET USERS

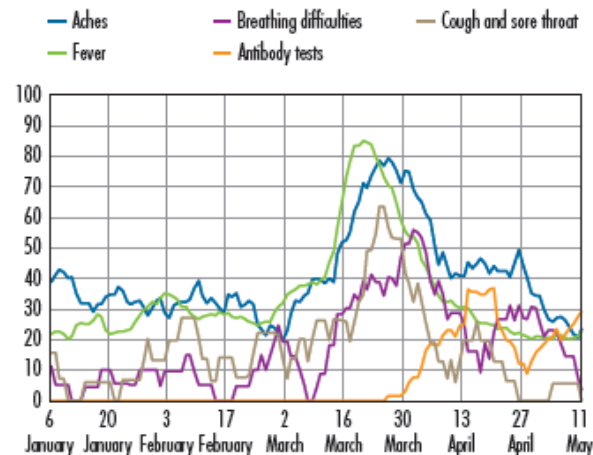
- The history of global Google searches for the keyword coronavirus and derivatives, shows a clear spike in volumes in China from the end of January 2020, then in South Korea and Italy from the end of February, and in other countries from the middle of March.
- French people searched for information on the symptoms of coronavirus, the health crisis and related disputes (chloroquine, masks and hand sanitizer), although to differing extents depending on the news flow and the progression of the pandemic.

a) Index of the popularity of Google searches for the keyword "coronavirus" and its derivatives by country

(17 January-11 May 2020)



a) Google searches for symptoms of and testing for the coronavirus (6 January-11 May 2020)



II. COVID-19: A SOURCE OF CONCERN FOR INTERNET USERS

- Google searches for the word “overindebtedness” point to another way in which the crisis has affected households, although in two distinct phases:
 - First, there is a clear turning point after the introduction of the lockdown (17 March 2020), with searches for overindebtedness dropping to very low levels;
 - then from mid-April onwards searches begin to rise again. The physical restrictions imposed during the lockdown appear to have discouraged households from seeking information about overindebtedness – at least initially. However, the length of the lockdown appears to have weighed heavily on their finances, especially for the most vulnerable households, a month after the start of the lockdown, the issue of overindebtedness resurfaces.
- These data are consistent with the massive fall in the number of overindebtedness applications submitted to the Banque de France between February and May 2020 (fall of more than 60%), and the marked upturn as of June (rise of more than 70% between May and June 2020).

C5 Google searches for the word “overindebtedness”

(2 February-11 May 2020)

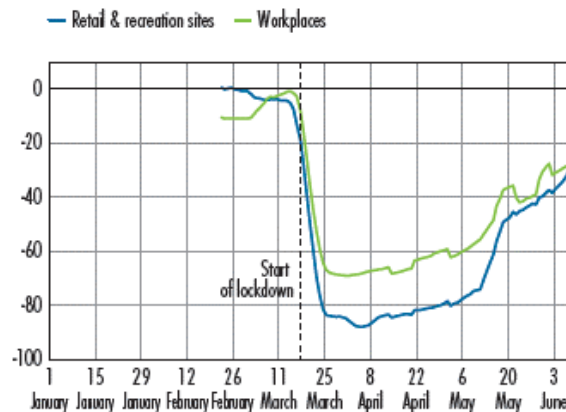


Source: Google.

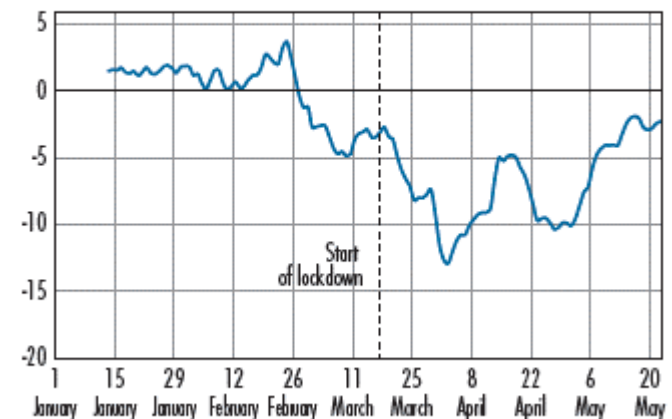
III. THE EFFECTS OF THE LOCKDOWN ARE REAL AND CAN BE MEASURED PHYSICALLY

- Google provides a Google Mobility Index, which is based on Google Maps data on the number and length of visits to certain locations. In France, movement to leisure sites and places of work fell by 85% during the lockdown (in other words, the observed level was just 20% of that recorded prior to the lockdown). After the lockdown was lifted mobility increased, but in June it was still 30% below its baseline level.
- Air pollution (corrected for the impact of temperatures, atmospheric pressure, wind speed and air humidity) also declined with the introduction of the lockdown. Nitrogen dioxide pollution dropped well below historical levels, reflecting the stoppage of industrial sites and of a portion of transportation activities. The decline can be seen in all French towns, especially Paris.

b) Mobility in France according to Google Mobility Indices
(% change versus baseline = average from 3 to 6 February 2020, 7-day moving average)



c) NO₂ pollution in Paris, corrected for meteorological data
(difference versus 2019, 14-day moving average)

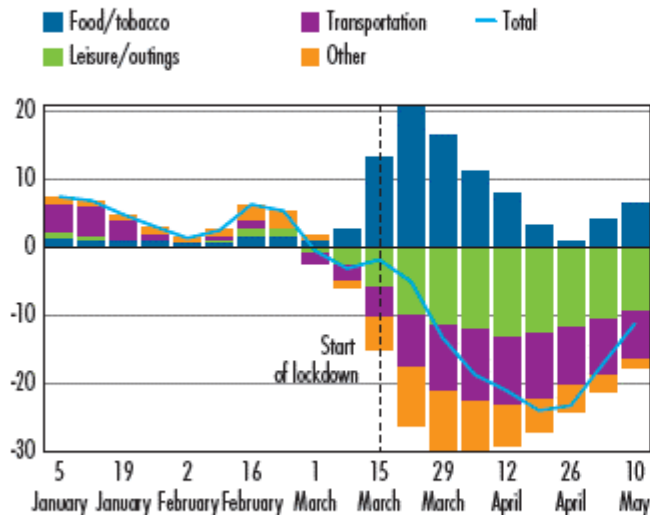


III. THE EFFECTS OF THE LOCKDOWN ARE REAL AND CAN BE MEASURED PHYSICALLY

- Google searches linked to consumer spending, dropped sharply following the lockdown in the categories “leisure” and “transportation”. This is a logical consequence of the closure of public places and reduction in transport provision. Conversely, the category “food and tobacco” hit a peak in popularity at the time of the lockdown – which potentially reflects panic-buying on the part of households to stockpile goods.
- Tourism also collapsed. The number of new reviews posted on Airbnb – an indicator of the number of stays booked and completed via the platform – plunged by 99%, meaning that activity all but evaporated. Unlike the other indicators, which increased again once the lockdown was lifted, this one remained flat at end-April due to the continuing shutdown of the tourist industry.

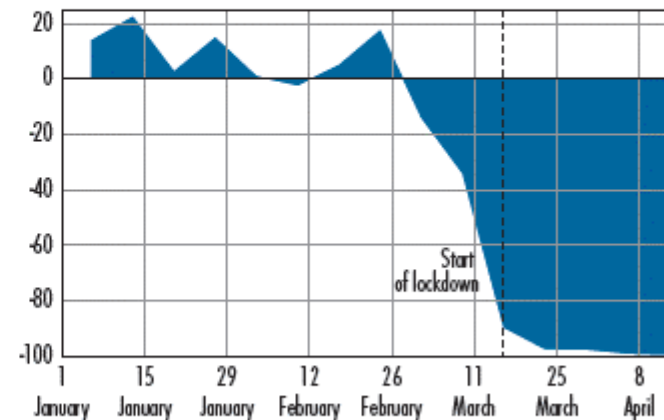
e) Popularity of searches linked to consumer spending according to Google Trends Indices

(% change versus 2019, 2-week moving average)



f) Number of new reviews on the Airbnb platform in Paris

(% change versus 2019)



Sources: Google Covid-19 Community Mobility Reports, OAG Aviation Limited, World Air Quality Index, Google Trends, InsideAirbnb, authors' calculations.

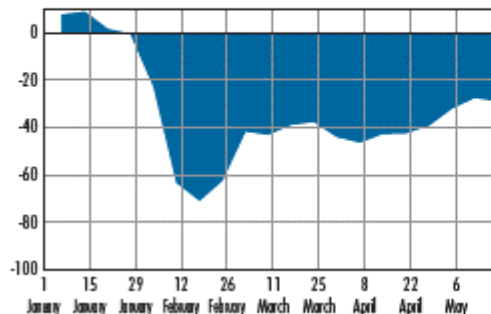
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- The indicators also make it possible to analyze the different stages of the lockdown lifting in each country:
 - A very gradual return to normal in China as of end-March: after a very sharp drop, NO2 pollution returned to its 2019 level in Wuhan at the start of June. Air traffic also began to rise again as of end-February, although it was still 30% below its 2019 level in June 2020;
 - Italy's economic activity has also been picking up. In northern Italy, electricity consumption during peak hours (corrected for temperatures) dropped by 40% after the lockdown. This reflected the abrupt stoppage of industrial and commercial activities, which was not offset by the rise in consumption by households that were confined to their homes. The indicator gradually began to increase again after 14 April (reopening of non-essential manufacturing industries and shops) and 4 May (phase 1 of the lockdown lifting).

C9 High-frequency indicators – China, Italy, United States

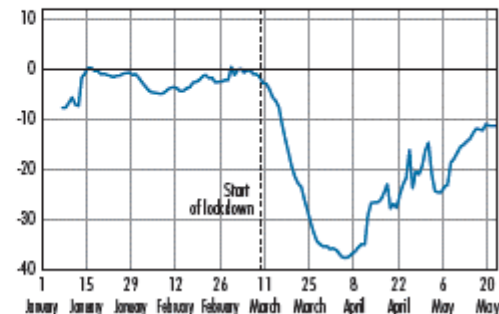
a) Number of flights per week leaving China

(% change versus 2019)



b) Electricity consumption in northern Italy, corrected for temperatures

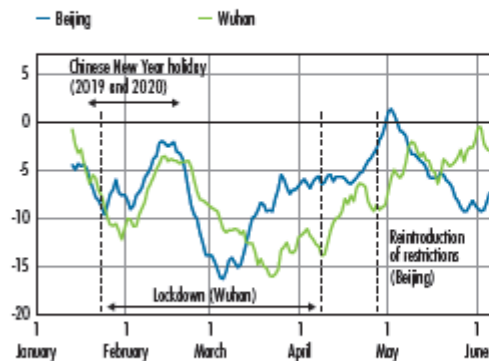
(% change versus 2019, consumption from 7 a.m. to 7 p.m., 7-day moving average)



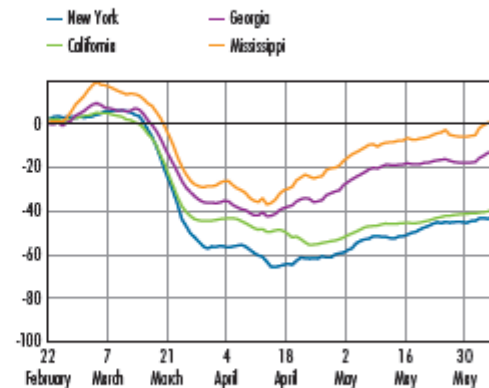
THE EFFECTS OF THE LOCKDOWN ARE REAL AND CAN BE MEASURED PHYSICALLY

- The indicators also make it possible to analyze the different stages of the lockdown lifting in each country:
 - Some indicators highlight regional disparities within countries. This is notably the case for the NO₂ pollution indicator in China. The situation differs in Beijing: the faster lifting of the lockdown meant that pollution returned more quickly to its 2019 levels; however, the reintroduction of certain lockdown measures at the start of April could be behind the renewed decline in pollution – albeit a smaller one than during the first lockdown;
 - Similarly, with the Google Mobility Indices in the United States, there is a striking contrast between the first federal states to be affected by the lockdown (New York and California) and others where the lockdown was introduced later, for a shorter duration and with less stringent rules (Georgia or Mississippi).

c) NO₂ pollution, corrected for meteorological data
(difference versus 2019, 14-day moving average)



d) Google Mobility Indices
(% change versus period from 3 January to 6 February 2020, 7-day moving average)



Sources: Google Covid-19 Community Mobility Reports, OAG Aviation Limited, World Air Quality Index, Google Trends, InsideAirbnb, authors' calculations.

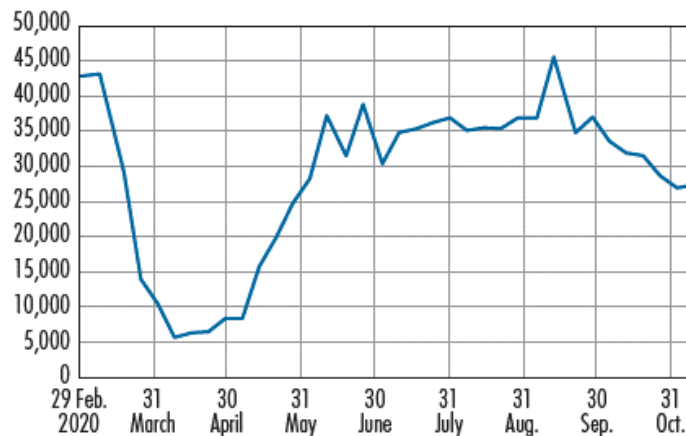
IV. COVID-19 AND HOUSE PRICES : WHAT CAN BE LEARNED FROM WEB-SCRAPING DATA?

- Official statistics on the housing market generally provide aggregated and/or lagged data. In addition, a lot of freely accessible granular information can be collected in real time from real estate websites using web-scraping techniques (automated retrieval of Internet data).
- Using the United Kingdom as an example, we illustrate the value of a daily, granular and real-time database, particularly for analyzing the behavior of sellers.
- These data confirm that during the first lockdown period, activity stalled and sellers adopted a wait-and-see attitude.
- The granular approach also reveals significant regional differences: while advertised prices were stable or even increased after the first lockdown in more rural areas, they declined continuously in London.
- The data are extracted through a daily automatic upload of data on the Internet from the major real estate classified ad sites in the UK: Rightmove, Zoopla and OnTheMarket. To improve coverage of more specific regions, PropertyPal – a property site specialising in Northern Ireland – and S1Homes, its counterpart for Scotland, are also included.
- Through these websites, more than 1.5 million real estate listings are downloaded on average every day, corresponding to the total stock of available listings.

IV. COVID-19 AND HOUSE PRICES : WHAT CAN BE LEARNED FROM WEB-SCRAPING DATA?

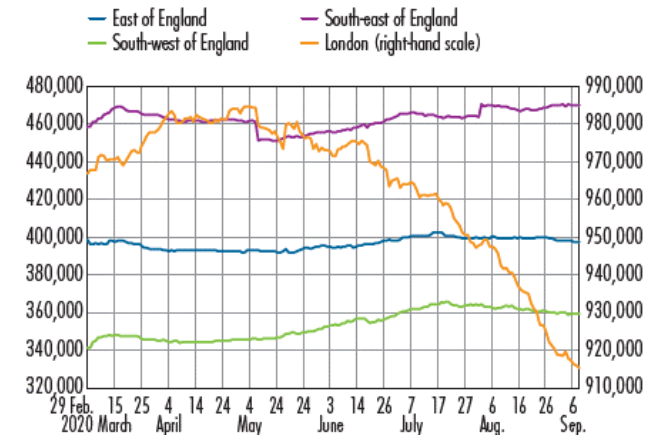
- The number of new listings reflects whether sellers are selling their properties at the right time: wide variability in this number, which was five to six times lower during the (first) lockdown than after or before it.
- Price trends in four regions of England. While the trends are relatively similar for the first three, with a certain stability or even a slight upward trend, London is different, with a continuous decline since May.

C1 New weekly property listings
(number)



Sources: Zoopla and authors' calculations.

C3 Average listing price by region
(in GBP by property)



Sources: Zoopla and authors' calculations.



CONCLUSION

- High-frequency indicators can provide information on their own, supplement existing indicators with additional or more immediate data, or be used to estimate other variables (production, consumption, GDP, etc.) using econometric methods.

- Ongoing issues:
 - Assess the added value in normal times and link these high-frequency data with more conventional economic variables;
 - IT and legal matters for collecting, maintaining and releasing high-frequency data;
 - New avenues:
 - Use of satellite data to assess climate risk exposure and building activity;
 - Use of webscraping data to gauge the risk on financial actors (including real estate transaction negotiation margins, reputational risk, etc.).



THANK YOU VERY MUCH FOR YOUR ATTENTION!