Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.
Economic forecasting in times of COVID-19

Laurent Ferrara, Xuguang Simon Sheng

PII: S0169-2070(21)00212-0
DOI: https://doi.org/10.1016/j.ijforecast.2021.12.006
Reference: INTFOR 5017

To appear in: International Journal of Forecasting

Please cite this article as: L. Ferrara and X.S. Sheng, Economic forecasting in times of COVID-19. International Journal of Forecasting (2021), doi: https://doi.org/10.1016/j.ijforecast.2021.12.006.

This is a PDF file of an article that has undergone enhancements after acceptance, such as the addition of a cover page and metadata, and formatting for readability, but it is not yet the definitive version of record. This version will undergo additional copyediting, typesetting and review before it is published in its final form, but we are providing this version to give early visibility of the article. Please note that, during the production process, errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

© 2021 International Institute of Forecasters. Published by Elsevier B.V. All rights reserved.
Why was economic forecasting so difficult during COVID-19? To answer this question, we organized an online workshop in July 2020, sponsored by the International Institute of Forecasters (IIF) and hosted by American University. Below you will find some of the lessons that can be drawn from the special issue we edited.

Background

If we go back in time, at the end of 2019, various possible risks likely to have a significant impact on the global economic activity were considered by macroeconomic forecasters, such as the slowdown of Chinese economy, over-evaluation of asset prices on financial markets, trade war tensions between U.S. and China, etc. But, the possibility of a global pandemic was not in the scope of economic forecasters. The first quarter 2020 marked the first time in recent history that we faced a pandemic affecting the whole global economy, generating deep uncertainty among forecasters and analysts. In addition to this uncertainty shock, the subsequent COVID-19 economic crisis was driven by both large negative supply and demand shocks. The first shock was a supply shock due to the drop in labor force: without ways to manage the pandemic the only option for governments was lockdowns/social distancing measures. Thus, suddenly, millions of people around the globe were asked to stay at home and unable to work, leading to a major supply shock. Given the highly integrated global supply chains, this shock propagated from one country to the other. This initial supply shock rapidly turned into a demand shock as employment was strongly affected in sectors directly impacted by the lockdown and social distancing measures (e.g. tourism, bars, restaurants, construction). In addition, facing the uncertainty previously pointed out, precautionary savings tended to increase, further putting downward pressure on demand.

Given the size of the COVID-19 shock, economic policy responses were rapid and massive. The initial economic response in most industrialized countries relied on a “whatever it takes” approach: large expansionary fiscal policies ever enacted to help households and companies through the crisis, and large monetary accommodation by central banks to provide liquidity and loans to companies, especially to small and medium enterprises.

Facing this unusual sequence of large shocks and massive policy responses is very rare and not easy to account for in economic forecasting. Another important aspect of the COVID-19 crisis is that macroeconomic outcomes were conditioned by health scenarios, adding another layer of complexity in macroeconomic models.

Main results

Against this background, another difficulty for forecasters was to get reliable and timely data. Indeed, it is well known that official data on economic activity come with a delay. For example, the advance estimate of the U.S. GDP for 2020Q1 was only available on April 29, resulting in a lack of official information since the outbreak of the COVID-19 crisis. This is the reason why researchers tried to put forward nowcasting tools to assess in real-time, on a high-frequency basis, fluctuations in GDP growth and its main components. In this respect, econometric

1 See the workshop program here: https://www.american.edu/cas/economics/forecasting/
models have been developed trying to integrate new sources of high-frequency large data (sometimes referred to as alternative data), such as electronic payment, workplace mobility and Google Trends (see among others, D’Amuri and Marcucci, 2017; Galbraith and Tkacz, 2018; Chetty et al., 2020 and Davis et al., 2021). Those alternative data are available on a more frequent basis, often daily, and prove useful to get timely estimates of the depth of the recession and the shape of the recovery.

In this special issue, the five papers that we edited aim at shedding light on various forecasting approaches implemented during the heart of the COVID-19 crisis. Innovation comes from the type of alternative data used and/or the econometric approaches developed.

The first paper by Meyer, Prescott and Sheng uses firm-level data stemming from the Business Inflation Expectations (BIE) survey carried out by the Federal Reserve Bank of Atlanta. Business decisionmakers were asked to provide their perception about the nature of the COVID-19 shock and future inflation movements. Interestingly, it turns out that firms have viewed this crisis as of August 2020 largely as a demand rather than supply shock. Consequently, firms have lowered wages for a material share of their workforce, and at that time anticipated further wage cuts before the end of 2020 as well as lowering selling prices over the near term.

Being able to anticipate the public budget is of crucial importance during recessions when governments carry out counter-cyclical policies by spending money. Lahiri and Yang use both high-frequency data and machine learning models to forecast tax revenues for New York state during the COVID-19 period. They find that boosting with two dynamic factors extracted from a selected list of New York and U.S. leading indicators did best in correctly forecasting revenues. Importantly, this tool can be used to monitor revenues in real time for any fiscal year.

Aaronson, Brave, Butters, Fogarty, Sachs and Seo show how Google Trends data can be efficiently used to predict initial unemployment insurance claims, a timely indicator of the U.S. job market and a largely acknowledged leading indicator of the business cycle. They perform a state-level event-study focused on the costliest hurricanes to hit the U.S. mainland since 2004 and estimate the elasticity of unemployment insurance claims with respect to search intensity. Their hurricane-driven Google Trends elasticity leads to superior real-time forecasts of initial unemployment insurance claims relative to other standard models, especially during the COVID-19 pandemic.

Ferrara, Mogliani and Sahuc focus on macroeconomic risk assessment and put forward a new measure of real-time macroeconomic risk in the euro area. Specifically, they extend the quarterly Growth-at-Risk (GaR) approach of Adrian et al. (2019) by accounting for the high-frequency nature of financial indicators. To do so, they use Bayesian mixed-data sampling (MIDAS) quantile regressions to exploit the information content of both a financial stress index and a financial conditions index. Their real-time high-frequency GaR measure for the euro area could be very useful for policymakers, especially central bankers, to promptly adjust their policy stance.

Foroni, Marcellino and Stevanovic carry out a competition among standard forecasting approaches using a mix of economic indicators and time series econometric models to
nowcast and forecast macroeconomic variables, during the COVID-19 crisis and the subsequent recovery period. To this end, they use MIDAS models, forecast combinations, extension of model specifications by adding a moving-average part and intercept correction term. Interestingly, the nowcasts adjusted from the forecast errors made during the previous global financial crisis in 2008-09 tend to provide accurate results during the COVID-19 crisis for G7 economies.

Concluding remarks

Macroeconomic forecasting during crises is a challenging task, much more complex than in normal times. A clear trend that emerged from the COVID-19 crisis is the strong need for real-time information to serve as a compass during uncertain times. In this respect, empirical macroeconomists have explored new massive and high-frequency alternative datasets and developed new approaches and tools to analyze these data. Obviously, many challenges remain for the optimal treatment of high-frequency data in terms of outlier detection, seasonal adjustment and filtering. As shown in the papers presented in this special issue, academic research on the use of alternative data and associated models for macroeconomic forecasting appears extremely promising.

References

Adrian, T., N. Boyarchenko and D. Giannone (2019). “Vulnerable Growth”. American Economic Review, 109(4), 1263-1289.

Chetty, R., J. N. Friedman, N. Hendren, M. Stepner, and the Opportunity Insights Team (2020). “How Did COVID-19 and Stabilization Policies Affect Spending and Employment? A New Real-Time Economic Tracker Based on Private Sector Data”. NBER Working Paper No. 27431

D’Amuri, F. and J. Marcucci (2017). "The Predictive Power of Google Searches in Forecasting US Unemployment", International Journal of Forecasting, 33(4), 801-816.

Davis, S., D. Liu and X. S. Sheng (2021). “Stock Prices and Economic Activity in the Time of Coronavirus” forthcoming in IMF Economic Review.

Galbraith, J. W. and G. Tkacz (2018). “Nowcasting with Payments System Data”, International Journal of Forecasting, 34(2), 366-376.

Laurent Ferrara
SKEMA Business School, France

Xuguang Simon Sheng
American University, United States
Declaration of interests

☒ The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

☐ The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: