

Research sheds light on how economies may respond to COVID-19 restrictions

1 September 2021, by Stephen Johns



Credit: Pixabay/CC0 Public Domain

New research from the Imperial College COVID-19 Response Team sheds light on how economies might respond to different levels of COVID-19 restrictions.

In the latest report, the researchers developed new methods to forecast Purchasing Managers' Indices (PMIs) during and after the COVID-19 pandemic and the potential impact of government virus mitigation strategies.

PMIs, which survey managers at private businesses on their purchasing intentions, are a leading indicator of the direction of economic activity.

The researchers, from the Statistics section of the Department of Mathematics, produced six-month forecasts of the UK composite PMI series under different scenarios of COVID-19 mitigation strategies, ranging from easing, to staying unchanged, to tightening between October 2020 and April 2021.

The new method also incorporates real-time data on the progress of the pandemic.

The researchers created a novel network time series model, which borrows strength from across thirteen world economies over time viewed as a network.

GDP forecasts

Gross domestic product (GDP) economic forecasts were then obtained by modeling the relationship between GDP and PMI using a mixed data sampling (MIDAS) regression model that links monthly PMI indices with quarterly GDP.

The team's results suggested that there would be a 4.5% difference in 2021 Q1 GDP growth and a 4.8% difference in 2021 Q2 GDP growth between the easing and tightening scenarios.

In September 2020, under a tightening scenario, the researchers used the model to estimate a drop in GDP of 1.2% for Q1 2021, with prediction ranges of -5.8 to 2.9. The actual value turned out to be a drop of 1.6%, which was close to the prediction and well within the prediction interval.

The researchers also predicted an increase of 3.2% for Q2 2021, with prediction ranges of -2.0 to 7.1. This prediction was for a linearly easing scenario from November 2020 until April 2021.

The recently announced Office for National Statistics first GDP estimate for Q2 2021 turned out to be a 4.8% increase, which is again well within the [prediction](#) range, but the actual underlying conditions were lockdown until 8 March 2021, then a gradual easing.

The research will be presented as a [Discussion Paper](#) at a Plenary session of the Royal Statistical Society International Conference this September.

A new way of forecasting the economic impact of COVID-19

Professor Guy Nason, from the Department of Mathematics, said: "This research has revealed a new way to forecast the impact to an economy under different levels of COVID-19 restrictions.

"By integrating economic indicators, people behavioral indices and [real-time data](#) from the pandemic we are able to [forecast](#) a country's economic performance.

"We are very excited by this methodology and pleased with its performance. It could be a useful tool when trying to understand the economic implications of different virus mitigation strategies."

James Wei, from the Department of Mathematics, said: "It is our hope that this kind of research can bring greater attention to the exciting field of network time series analysis. We see a lot of potential for similar methods to be applied to fields across both the social and natural sciences."

More information: Quantifying the Economic Response to COVID-19 Mitigations and Death Rates via Forecasting Purchasing Managers' Indices Using Generalised Network Autoregressive Models with Exogenous Variables.

[www.imperial.ac.uk/mrc-global- ... 45-economic-resonse/](http://www.imperial.ac.uk/mrc-global-...45-economic-resonse/)

Provided by Imperial College London

APA citation: Research sheds light on how economies may respond to COVID-19 restrictions (2021, September 1) retrieved 27 November 2021 from <https://phys.org/news/2021-09-economies-covid-restrictions.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.