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Research Article

# Corona, crisis and conditional heteroscedasticity

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## ABSTRACT

In this paper, we illustrate the macroeconomic risk associated with the early stage of the corona-virus outbreak. Using monthly data ranging from July 1991 to March 2020 on a recently developed coincidence indicator of global output growth, we estimate an autoregressive model with GARCH effects and non-Gaussian disturbances. Our results indicate that i) accounting for conditional heteroscedasticity is important and ii) risk, measured as the volatility of the shocks to the process, is at a very high level – largely on par with that experienced around the financial crisis of 2008–2009.

KEYWORDS:

GARCH

non-Gaussianity

fan charts

global output growth

JEL CLASSIFICATION:

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## Disclosure statement

No potential conflict of interest was reported by the authors.

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## Notes

<sup>1</sup> The Bank of England and the IMF instead employ methods that explicitly aim to account for time-variation in uncertainty; see Britton, Fisher, and Whitley ([1998](#)) and IMF ([2009](#)) for details.

<sup>2</sup> Abberger et al. ([2020](#)) also provide a leading composite indicator for global output growth. Unreported analysis (available on request) based on the leading indicator yields very similar results.

<sup>3</sup> For a fairly long time, the issue of time-varying volatility of the shocks hitting the economy has received a somewhat stepmotherly treatment in macroeconomics. While important contributions have been made by for example Stock and Watson ([2002](#)), Cogley and Sargent ([2005](#)) and Hamilton ([2010](#)), the vast majority of models being used assume that shocks are homoscedastic.

<sup>4</sup> Lag length was determined by applying the Schwarz ([1978](#)) information criterion to AR models assumed to be homoscedastic.

<sup>5</sup> The choice of a GARCH(1,1) specification was based on its robust usefulness in empirical work; see, for example, Hansen and Lunde ([2005](#)). The GARCH(1,1)

specification also seems to be appropriate when looking at the estimation results and tests shown in [Table 1](#).

<sup>6</sup> An estimate of the half-life can be calculated as  $\ln 0.5 / \ln \alpha^1 + \alpha^2$ .

## Additional information

### Funding

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