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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:

C22 E32 E37

Previous article View issue table of contents Next article

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Disclosure statement

No potential conflict of interest was reported by the authors.

Notes

1 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.

2 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.

3 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.

4 Lag length was determined by applying the Schwarz (1978) information criterion to AR models assumed to be homoscedastic.

5 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.

[6] An estimate of the half-life can be calculated as $\frac{\ln 0.5}{\ln(\hat{\alpha}_1+\hat{\alpha}_2)}$.

Additional information

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