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## Co-movements of financial volatilities in a changing environment

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Anthropogenic climate change has been attributed mainly to the excessive burning of fossil fuels and the release of carbon compounds. On average, 75% of the primary energy is still being produced by means of fossil fuels. In order to mitigate the global effects of climate change, a transition towards low-carbon economies is thus necessary. However, given current technology, this transition requires investments to shift away from high-carbon assets and so the effectiveness of changes in investment decisions depends highly on the expectations about policy change (e.g. regarding carbon pricing). The systemic implications of disruptive technological progress on the prices of carbon-intensive assets are thus compounded by the geopolitical nature of transition risk. If investors are pricing transition risk, this implies prices of high-carbon assets should all be responsive to climate-related policy news. For modelling the dynamics of volatility co-movements at the global scale, we propose an extension to the global volatility factor model of Engle and Martins (in preparation). To allow for richer structures of the global volatility process, including dynamics, structural changes, outliers or time-varying parameters, we adapt the indicator saturation approach introduced by Hendry (1999) to the second moment and high-frequency data. In the model, climate change is interpreted as a source of structural change affecting the financial system. The new global volatility model is applied to the daily share prices of major Oil and Gas companies from different countries traded in the NYSE to avoid asynchronicity. As a proxy for climate change risk, we use the climate change news index of Engle et al. (2019). This index is a time series that captures news about long-run climate risk. In particular, we use the innovations in their negative (or bad) news index which is based on sentiment analysis.