Abstract

In this thesis, we examine how marine fuels could be used in asset allocation with respect to portfolio management in a multivariate modelling and cross-hedging framework. The territory that remains largely unexplored is the level of interdependence between bunker spot and five most actively traded energy futures contracts. This approach relies on the (A)DCC-GARCH models as a workhorse of financial applications. We investigate whether all correlations and volatilities show asymmetry of responses to positive and negative innovations during both normal and turbulent periods and whether patterns of correlations could be traced across the global ports. In doing so, time-varying conditional variance-covariance matrices estimated from these models are used in calculating the optimal portfolio design. The analysis works as an umbrella term for the IMO 2020 sulphur cap regulations concerning oil refineries, marine industry and energy investors. Overall, this study has four main findings. Joint dynamics between return series matches overly volatile correlations with weak and positive links between commodities. Employing four different hedging rules and performing a rolling window operation, we find that complex hedging strategies do not provide greater benefits in reducing portfolio variance contrary to the static methods. Gasoil is the universal hedging instrument to manage uncertainty. In the present state of arts, heavy-sulphur fuel oils along with scrubber-fitted vessels are a better option to comply with sulphur content limits.