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Analysis of global mineral market price for selected earth materials

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Earth materials play a vital role in day-to-day life as well as in the global economy. These earth materials are mainly used in industrial applications from ancient times. Ilmenite, rutile, and zircon can be categorized as heavy minerals, and they play a major role in the mineral industry in Sri Lanka. Rare earth elements (REE) are a combination of seventeen elements including the elements in the series of Lanthanides. In addition, Sri Lanka can be identified as a possible repository for rare earth elements (REEs) to the global mineral market. Consequently, the objective of this study is to examine and model the annual global market price variations of earth materials known as heavy minerals and REEs. In this study, the annual unit price variations of heavy minerals and REEs from 1950 to 2017 were analyzed using raw data obtained from the United States Geological Survey (USGS). Results show that the adequate models obtained for the annual prices of REEs, ilmenite, rutile, and zircon are ARIMA (2,1,2), ARIMA (2,1,2), ARIMA (1,1,0), and ARIMA (0,1,0), respectively, whereas minimum AIC values were used to identify the best fitting models. Besides, no ARCH behavior was confirmed at the preliminary analysis. Finally, the outcomes of this study can be used to improve the action plans of the mineral industry in Sri Lanka.

Keywords: Rare Earth Elements (REEs), Heavy minerals, Market value, Time series modeling

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