Profitability Assessment of Granite Aggregate Production and the Development of a Profit Assessment Model

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Abstract : The purpose of this research is to create empirical models for assessing the profitability of granite aggregate production in Akure, Ondo state aggregate quarries. In addition, an artificial neural network (ANN) model and multivariate predicting models for granite profitability were developed in the study. A formal survey questionnaire was used to collect data for the study. The data extracted from the case study mine for this study includes granite marketing operations, royalty, production costs, and mine production information. The following methods were used to achieve the goal of this study: descriptive statistics, MATLAB 2017, and SPSS16.0 software in analyzing and modeling the data collected from granite traders in the study areas. The ANN and Multi Variant Regression models' prediction accuracy was compared using a coefficient of determination (R^2), Root mean square error (RMSE), and mean square error (MSE). Due to the high prediction error, the model evaluation indices revealed that the ANN model was suitable for predicting generated profit in a typical quarry. More quarries in Nigeria's southwest region and other geopolitical zones should be considered to improve ANN prediction accuracy.

Keywords : national development, granite, profitability assessment, ANN models
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