

Artificial Intelligence (AI)-based predicting influence of technological innovation on stock price of iron ore mining companies

Mugebe, P¹., Kizil, M. S²., Yahyaei, M³. and Low, R^{4,5}.

¹ PhD student. MMEng; MBA; BSc.(Min) Eng.; MAusIMM. The University of Queensland, School of Mechanical and Mining, St Lucia QLD 4067 Australia. Email: p.mugebe@uq.edu.au

² A/Professor; PhD; SFHEA; MAusIMM; MSME; MIEAust; MAAEE. The University of Queensland, School of Mechanical and Mining, St Lucia QLD 4067 Australia. Email: m.kizil@uq.edu.au

³ Professor; PhD; MSc.; B.Eng. The University of Queensland, Julius Kruttschnitt Mineral Research Centre. Indooroopilly QLD 4067 Australia. Email: m.yahyaei@uq.edu.au

⁴ Hon. Senior Fellow; PhD; BE(1st Hons); BCompSci; CPEng.; MIEAust; Dip Proj Mgt. The University of Queensland, School of Business, St Lucia QLD 4067 Australia. Email: r.low@business.uq.edu.au

⁵ A/Professor; PhD; BE(1st Hons); BCompSci; CPEng.; MIEAust; Dip Proj Mgt. Bond University, Bond Business School, Robina QLD 4225, Australia. Email: rlow@bond.edu.au

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ABSTRACT

Numerous research studies have applied Artificial Intelligence (AI) to historical stock market technical indicators to develop a stock price prediction model. Nevertheless, it remains uncertain whether using fundamental factors as input data for an AI stock price prediction model can yield comparably reliable outcomes for a mineral commodity company stock price. This study explores the use of firm-specific fundamental factors influenced by the Autonomous Haulage System (AHS) technology in iron ore mining, along with macroeconomic factors. The AHS-driven factors encompass essential mine performance indicators and financial performance metrics. The selected macroeconomic variables also consist of foreign currency exchange rates and iron ore prices.

The investigation takes a two-step approach. The first step involves the development of a stock price prediction model using an Artificial Neural Network (ANN) architecture called Long-short-term memory (LSTM), constructed using Python programming language. The LSTM architecture gives satisfactory prediction results. The second step investigates the principal components driving the stock price prediction to confirm whether the firm-specific factors driven by technology implementation are prominent in driving the share price prediction. The outcome is positive. Based on these results, it can be concluded that the AI methodology is applicable in developing an iron ore stock price prediction model using firm-specific technology-driven and macroeconomic factors. This is despite the identified shortfalls pertaining to dataset frequency, the LSTM architecture limitations, and the use of one case study.