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A Machine Learning Approach to Predict Economic Freedom Index

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Abstract: *In this study, machine learning methods are used to estimate a nation's economic freedom index. Economic growth and development have been proven to be strongly correlated with the economic freedom index, which measures a nation's economic laws and regulations. This study used a dataset that included the Economic Freedom Index and several economic variables for 162 countries. The data underwent processes such as outlier removal, encoding categorical variables, and filling in missing values. The performance of a machine learning model was enhanced through hyperparameter tuning after it had been trained using a variety of techniques, including decision trees, random forests, and XGBoost. The outcomes demonstrate that the XGBoost algorithm outperformed other models. It had a 92% accuracy rate in predicting a nation's economic freedom index. In order to help policymakers improve a nation's economic laws and regulations, this study illustrates the potential of employing machine learning techniques to anticipate economic freedom.*

Keywords: Economic freedom index (EFI), XGBoost, country, machine learning, economic growth, development and accuracy

REFERENCES

[1] Lima, M.S.M. and Delen, D., 2020. Predicting and explaining corruption across countries: A machine learning approach. Government Information Quarterly, 37(1), p.101407.
[2] Tran, C.L.H., Phan, T.H., Thi-Ngoc-Diem, P. and Nguyen, H.T., 2023, March. Gross Domestic Product Prediction in Various Countries with Classic Machine Learning Techniques. In Nature of Computation and Communication: 8th EAI International Conference, ICTCC 2022, Vinh Long, Vietnam, October 27-28, 2022, Proceedings (pp. 136-147). Cham: Springer Nature Switzerland.
[3] Özgür, Ö. and Akkoç, U., 2021. Inflation forecasting in an emerging economy: selecting variables with machine learning algorithms. International Journal of Emerging Markets.
[4] Adkins, L.C., Moomaw, R.L. and Savvides, A., 2002. Institutions, freedom, and technical efficiency. Southern economic journal, 69(1), pp.92-108.
[5] Heckelman, J.C., 2000. Economic freedom and economic growth: A short-run causal investigation. Journal of Applied Economics, 3(1), pp.71-91.
[6] Berggren, N. and Jordahl, H., 2006. Free to trust: Economic freedom and social capital. Kyklos, 59(2), pp.141-169.
[7] Gwartney, J.D., Lawson, R. and Edwards, C., 2002. Economic freedom of the world: 2002 annual report. The Fraser Institute.
[8] Grier, K.B. and Tullock, G., 1989. An empirical analysis of cross-national economic growth, 1951–1980. Journal of monetary economics, 24(2), pp.259-276.
[9] DEPREN, S.K. and Yangın, G., 2021. The Role of Economic Freedom in Interpreting Corruption Perception. International and Multidisciplinary Journal of Social Sciences, 10(3), pp.40-63.
[10] Meng, L.Y., 2022. Evaluation of Scientific and Technological Innovation Ability of Free Trade Zone Based on Random Forest Weighting Method. Mobile Information Systems, 2022.
[11] Ozden, E. and Guleryuz, D., 2022. Optimized machine learning algorithms for investigating the relationship between economic development and human capital. Computational Economics, 60(1), pp.347-373.

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[12] Cicceri, G., Inserra, G. and Limosani, M., 2020. A machine learning approach to forecast economic recessions—an italian case study. Mathematics, 8(2), p.241.
[13] Athey, S., 2018. The impact of machine learning on economics. In The economics of artificial intelligence: An agenda (pp. 507-547). University of Chicago Press.
[14] Paruchuri, H., 2021. Conceptualization of machine learning in economic forecasting. Asian Business Review, 11(2), pp.51-58.
[15] Gogas, P. and Papadimitriou, T., 2021. Machine learning in economics and finance. Computational Economics, 57, pp.1-4.