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Remodeling the knowledge economy growth concept using machine learning analysis

(2020) *International Journal of Pharmaceutical Research*, 12 (2), pp. 1907-1920.

DOI: 10.31838/ijpr/2020.12.02.255

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Abstract
Traditional econometric models are now considered to be weak in measuring economic activities in line with new economic realities. The consequence is inaccurate forecasts and growing concerns for predicting impact and timely macroeconomic policy interventions. The purpose of this study was to identify features that expedite knowledge economy driven growth and create a machine learning model that addresses the methodological weaknesses of econometric models in assisting lagging economies drive a knowledge economy-based transition. A naïve bayes model was designed and implemented based on a small dataset from the Organisation of Economic Development and Corporation (OECD) members' Science and Technology Indicators (STIs) and World Bank Gross National Income (GNI) per capita growth rates from 44 countries (OECD and non-OECD countries). The initial dataset had observations over 4 years (2015-2018). The formulated model had an F1 score of 85% at its peak which was satisfactory based on the size of the dataset. The results from the study indicate that economies targeting sustainable high growth are continuously going to rely on the capacitation of business research. Transitioned economies in the last two decades have experienced negative growth rates in basic research with more focus being made towards applied and experimental research. In addition, there is need for the business sector to collaborate with government, with the former conducting much of the gross research in an economy.

Author Keywords
Knowledge economy; Machine learning; OECD; R&D

Index Keywords
article, basic research, econometric model, economic development, government, gross national income, growth rate, machine learning, spermatozoon capacitation, World Bank

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Publisher: Advanced Scientific Research

ISSN: 09752366
Language of Original Document: English
Abbreviated Source Title: Int. J. Pharm. Res.
2-s2.0-85089165281
Document Type: Article
Publication Stage: Final
Source: Scopus