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Sales forecasting for computer wholesalers: A comparison of multivariate adaptive regression splines and artificial neural networks

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Resumen: Abstract: Artificial neural networks (ANNs) have been found to be useful for sales/demand forecasting. However, one of the main shortcomings of ANNs is their inability to identify important forecasting variables. This study uses multivariate adaptive regression splines (MARS), a nonlinear and non-parametric regression methodology, to construct sales forecasting models for computer wholesalers. Through the outstanding variable screening ability of MARS, important sales forecasting variables for computer wholesalers can be obtained to enable them to make better sales management decisions. Two sets of real sales data collected from Taiwanese computer wholesalers are used to evaluate the performance of MARS. The experimental results show that the MARS model outperforms backpropagation neural networks, a support vector machine, a cerebellar model articulation controller neural network, an extreme learning machine, an ARIMA model, a multivariate linear regression model, and four two-stage forecasting schemes across various performance criteria. Moreover, the MARS forecasting results provide useful information about the relationships between the forecasting variables selected and sales amounts through the basis functions, important predictor variables, and the MARS prediction function obtained, and hence they have important implications for the implementation of appropriate sales decisions or strategies. [Copyright &y& Elsevier]

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