

# On Prediction of Annual Motorcycles Selling Using a Competition Mathematical Model

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In this paper, we discuss a mathematical model of the dynamic of motorcycle selling competition in Indonesia. We apply the Lotka-Volterra competition model to describe the competition. We also estimate parameters in the model by using the particle swarm optimization method. The estimation is performed based on the annual selling of motorcycle in Indonesia. From the model, we find the annual selling potential of motorcycles in Indonesia is around 8.495 million motorcycles/year, where the error margin of the prediction is around 11.5 percent. We also find that the prediction results from the model are not much different from the real data.

Keywords: annual motorcycles selling, competition mathematical model, Lotka-Volterra, parameter estimation, particle swarm optimization method.