

# ANALISIS PERKEMBANGAN KENDARAAN BERMOTOR DI BALI MENGUNAKAN *HOLT'S SMOOTHING MODEL*

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## ABSTRAK

Penelitian ini bertujuan untuk mengetahui peramalan perkembangan kendaraan bermotor di Bali dengan menerapkan *Holt's Smoothing Model*. Data jumlah kendaraan bermotor di Bali tahun 1996 sampai tahun 2019 yang bersumber dari Badan Pusat Statistik (BPS) Provinsi Bali menunjukkan adanya pola *trend*, sehingga *Holt's Smoothing Model* dapat digunakan untuk menganalisis perkembangan kendaraan bermotor di Bali. Berdasarkan analisis yang dilakukan diperoleh rata-rata persentase *error* (MAPE) prediksi yang dihasilkan dari *Holt's Smoothing Model* pada masing-masing konstanta *smoothing* yaitu ( $\alpha = 0,7 \beta = 0,3$ ) sebesar 4,25%, ( $\alpha = 0,8 \beta = 0,2$ ) sebesar 3,99%, ( $\alpha = 0,8 \beta = 0,3$ ) sebesar 4,05%, ( $\alpha = 0,8 \beta = 0,4$ ) sebesar 4,18%, ( $\alpha = 0,8 \beta = 0,5$ ) sebesar 4,21%, ( $\alpha = 0,9 \beta = 0,2$ ) sebesar 3,79%, ( $\alpha = 0,9 \beta = 0,3$ ) sebesar 3,86%, ( $\alpha = 0,9 \beta = 0,4$ ) sebesar 4,02%, dan ( $\alpha = 0,9 \beta = 0,5$ ) sebesar 4,22%. MAPE yang dihasilkan memiliki tingkat akurasi yang sangat baik yang artinya metode ini dapat digunakan untuk meramalkan perkembangan kendaraan bermotor di Bali. MAPE terkecil didapatkan saat menggunakan konstanta *smoothing* ( $\alpha = 0,9 \beta = 0,2$ ), sebesar 3,79%. Berdasarkan nilai MAPE terkecil yaitu 3,79% dengan tingkat keakuratan peramalan adalah  $100\% - 3,79\% = 96,21\%$  kemudian dilakukan prediksi perkembangan kendaraan bermotor di provinsi Bali pada tahun 2020, 2021, dan 2022, sehingga diperoleh jumlah kendaraan bermotor di Bali tahun 2020 sebanyak 4.579.208 kendaraan, tahun 2021 sebanyak 4.806.407 kendaraan, dan tahun 2022 sebanyak 5.033.606 kendaraan.

Kata kunci: Kendaraan Bermotor di Bali, Peramalan, *Holt's Smoothing Model*

# ANALYSIS OF MOTOR VEHICLE DEVELOPMENT IN BALI USING HOLT'S SMOOTHING MODEL

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## ABSTRACT

This study aims to determine the forecasting of the development of motor vehicles in Bali by applying the Holt's Smoothing Model. Data on the number of motor vehicles in Bali from 1996 to 2019 sourced from the Central Statistics Agency (BPS) of Bali Province showed a trend pattern, so the Holt's Smoothing Model can be used to analyze the development of motor vehicles in Bali. Based on the analysis conducted, the average percentage error (MAPE) prediction generated from Holt's Smoothing Model on each smoothing constant is ( $\alpha = 0,7 \beta = 0,3$ ) of 4,25%, ( $\alpha = 0,8 \beta = 0,2$ ) at 3,99%, ( $\alpha = 0,8 \beta = 0,3$ ) at 4,05%, ( $\alpha = 0,8 \beta = 0,4$ ) at 4,18%, ( $\alpha = 0,8 \beta = 0,5$ ) by 4,21%, ( $\alpha = 0,9 \beta = 0,2$ ) by 3,79%, ( $\alpha = 0,9 \beta = 0,3$ ) by 3,86%, ( $\alpha = 0,9 \beta = 0,4$ ) by 4,02%, and ( $\alpha = 0,9 \beta = 0,5$ ) by 4,22%. MAPE produced has a very good level of accuracy which means this method can be used to predict the development of motorized vehicles in Bali. The smallest MAPE obtained when using the smoothing constant ( $\alpha = 0,9 \beta = 0,2$ ), amounted to 3,79%. Based on the smallest MAPE value of 3,79% with forecasting accuracy level of  $100\% - 3,79\% = 96,21\%$  then predictions of motor vehicle development in the provinces of Bali in 2020, 2021, and 2022, so that the number of motorized vehicles in Bali in 2020 were 4.579.208 vehicles, in 2021 there were 4.806.407 vehicles, and in 2022 there were 5.033.606 vehicles.

Keywords: Motorized Vehicles in Bali, Forecasting, Holt's Smoothing Model