

INTISARI

Peramalan *Inflow* dan *Outflow* Uang Kartal Menggunakan Pendekatan *Hierarchical Time Series Bottom-Up*

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Uang kartal sangat berperan penting terhadap transaksi perekonomian masyarakat Indonesia. Dalam mengatur jumlah uang beredar, Bank Indonesia perlu menyusun perencanaan permintaan uang. Kebutuhan uang kartal salah satunya dapat ditinjau dari aliran masuk (*inflow*) dan keluar (*outflow*) uang kartal melalui Bank Indonesia. Oleh karena itu, dilakukan penelitian pemodelan peramalan *inflow* dan *outflow* uang kartal di Indonesia. Data *inflow* maupun *outflow* merupakan data deret waktu hirarki dengan beberapa tingkatan, yaitu data tingkat kantor perwakilan provinsi, kepulauan, dan tingkat nasional. Data yang digunakan yaitu data *inflow* dan *outflow* bulanan uang kartal di Indonesia dengan periode pengamatan Januari 2003 hingga Juni 2020. Penelitian ini membandingkan model peramalan *Autoregressive Integrated Moving Average (ARIMA) Independent* (non hirarki) dengan ARIMA menggunakan pendekatan *Hierarchical Time Series Bottom-Up* serta model peramalan *Holt Winters Exponential Smoothing Independent* (non hirarki) dengan *Holt Winters* menggunakan pendekatan *Hierarchical Time Series Bottom-Up*. Untuk pemilihan model terbaik digunakan perbandingan nilai *Mean Absolute Percentage Error (MAPE)*. Hasil penelitian menunjukkan bahwa baik pada data *inflow* maupun *outflow* level 0 (tingkat nasional), model peramalan yang tepat digunakan adalah model peramalan ARIMA dan *Holt Winters* dengan pendekatan *Hierarchical Time Series Bottom-Up*.

Kata Kunci : *Inflow* Uang Kartal, *Outflow* Uang Kartal, ARIMA, *Holt Winters*, *Hierarchical Time Series Bottom-Up*.

ABSTRACT

Forecasting of Currency Inflow and Outflow Using Hierarchical Time Series Bottom-Up Approach

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Currency plays an important role in economic transactions of Indonesian society. In order to guarantee the availability of currency, Bank Indonesia needs to procurement planning of currency. Demand of currency obtained by inflow and outflow in Bank Indonesia. The purpose of this study is getting the best modeling and predicting the currency inflow and outflow in Indonesia. The inflow and outflow data is a hierarchical time series that has some levels, branch office in province, islands and national level. The data which is used is monthly inflow and outflow of currency in Indonesia with the observation period starting from January 2003 to June 2020. This study compared the performance of Autoregressive Integrated Moving Average (ARIMA) Independent model with ARIMA Hierarchical Time Series Bottom-Up Approach and Holt Winters Exponential Smoothing Independent with Holt Winters Hierarchical Time Series Bottom-Up Approach. For the selection of the best models used Mean Absolute Percentage Error (MAPE). After analysis, it could be concluded that Hierarchical Time Series Bottom-Up Approach to prediction with ARIMA and Holt Winters are the best modeling for data currency of inflow and outflow in national level (level 0).

Keywords: *Currency Inflow, Currency Outflow, ARIMA, Holt Winters, Hierarchical Time Series Bottom-Up.*