The target of this work is to study an inclusion of the stratosphere in a global climate model and a sensitivity of model results on a choice of external parameters, which describe the model stratosphere. As the tool for this target a general circulation model called SPEEDY with spectral core based on simplified parametrizations and primitive-equation dynamics was used, the complex model CCM3 was used for discussion as well. The results of configuration of the model SPEEDY used in this study are presented as monthly-mean statistics outputs. The sensitivity of the model climate on the choice of the parameters of the model stratosphere is then studied by an application of linear regression model on an long-term monthly-means of selected meteorological quantities in the 1952-1992 period. The portion of the shortwave radiance absorbed by ozone layer plays here the role of the independent variable. It is also the only one external parameter, which characterize the stratosphere in the SPEEDY model. Then we look on the development of the model climatology in dependence of the parametrization of the model stratosphere according to the value of linear coefficient of the linear dependence on the portion of the absorbed shortwave radiation, eventually according to the value of linear and quadratic coefficient of the quadratic dependence. The changes of the selected meteorological quantities help us to estimate the impact of the absorption of shortwave radiation in the ozone layer also on some dynamical phenomena taking place in the lower stratosphere.