The relaxation of the photo-induced resistance changes in partially oxygen-deficient YBaCu0 was studied at various temperatures between 260 K and 305 K. The thin film samples were grown on tilted SrTiO3 substrates, offering the possibility to measure the anisotropic resistivity of YBaCuO. We observed that, after prolonged illumination with visible light, the in-plane resistivity $\sigma_{ab}$ as well as the out-of-plane resistivity $\sigma_c$ follow a thermal relaxation law $\tau = \tau_0 \exp(\Delta/kT)$, where $\Delta$ is the energy barrier which has to be overcome by the charge carriers. A slight difference of $\Delta$ for the two resistivities indicates that the photodoping process has different effects on the in-plane properties than on the out-of-plane properties of YBaCuO.