Everything will be of the form

$$\begin{aligned} & f\Big(\frac{n}{b^{\log_b(\frac{n}{n_0})+i}}\Big) \\ = f\Big(\frac{n}{b^{\log_b(n)-\log_b(n_0)+i}}\Big) \\ = f\Big(\frac{n}{nb^{-\log_b(n_0)+i}}\Big) \\ = f\Big(\frac{1}{b^{-\log_b(n_0)+i}}\Big) \end{aligned}$$