We provide an affirmative answer to a problem posed by Barvinok and Veomett, showing that in general an $n$-dimensional convex body cannot be approximated by a projection of a section of a simplex of sub-exponential dimension. More precisely, we prove that for all $1 \leq n \leq N$ there exists an $n$-dimensional convex body $B$ such that for every $n$-dimensional convex body $K$ obtained as a projection of a section of an $N$-dimensional simplex one has

$$d(B, K) \geq c \sqrt{\frac{n}{\ln \frac{2N \ln(2N)}{n}}},$$

where $d(\cdot, \cdot)$ denotes the Banach-Mazur distance and $c$ is an absolute positive constant. The result is sharp up to a logarithmic factor. (Received September 01, 2012)