Lemma. Let $\mathbf{Q}(\alpha) = \alpha \mathbf{Q}_0$ and $\mathbf{R}(\alpha) = \frac{1}{\alpha}\mathbf{R}_0$, $\alpha \in \mathbb{R}_+$. Let $\mathbf{u}^\star(\alpha)$ be the solution of the LQG problem with $\mathbf{Q}(\alpha)$ and $\mathbf{R}(\alpha)$. Then, under optimal control one has:

- $P_{\text{track}}(\alpha)$ is decreasing with α increasing.
- $P_{\text{effort}}(\alpha)$ is increasing with α increasing.