Fall 2020 - Project

We would like to buy a contract paying at maturity T the amount in USD:

$$\max\left[0, \left(\frac{S(T)}{S(0)} - k\right) . \left(\frac{L(T-\Delta, T-\Delta, T)}{L(0, T-\Delta, T)} - k'\right)\right]$$

with:

- $S(t)$ the STOXX50E spot price *quantoed* from EUR into USD
- $L(t, T-\Delta, T)$ the Δ =3-month USD LIBOR rate bet. $T-\Delta$ and T
- T the expiration date (e.g. 1 year)
- k , k' given relative strike prices (e.g. both could be 1.0 or ...)

Provide a pricing routine (e.g. Python script) calculating the price of this contract, taking as inputs the deal terms (T, k,k') and relevant market data.

Explain your assumptions and methodology/ choices clearly in an accompanying write-up.