13.18 Expected squared hedging error is easiest obtained from the formula

$$\mathrm{ESRE}_t\left(H_{t+\Delta t}\right) = \mathrm{Var}_t\left(H_{t+\Delta t}\right) - \frac{\left(\mathrm{Cov}_t\left(H_{t+\Delta t}, X_{t+\Delta t}\right)\right)^2}{\mathrm{Var}_t\left(X_{t+\Delta t}\right)}$$

which yields

$$\begin{aligned}\mathrm{ESRE}_{l,t}\left(H_{t+\Delta t}\right)/\Delta t &= (H_{l+1,t} - H_{l,t})^2\lambda_1 + (H_{l+2,t} - H_{l,t})^2\lambda_2 \\ &\quad - \frac{\left(\sum_{j=1}^{2}(H_{l+j,t} - H_{l,t})(\mathrm{e}^{jJ} - 1)\lambda_j\right)^2}{\sum_{j=1}^{2}(\mathrm{e}^{jJ} - 1)^2\lambda_j} + o(\Delta t),\end{aligned}$$

and after passing to the limit we have

$$\begin{aligned}G_l(t) &\equiv \lim_{\Delta t \to 0} \mathrm{ESRE}_{l,t}\left(H_{t+\Delta t}\right)/\Delta t && (1) \\ &= \frac{\lambda_1\lambda_2(\mathrm{e}^J - 1)^2}{\sum_{j=1}^{2}(\mathrm{e}^{jJ} - 1)^2\lambda_j}\left((H_{l+2,t} - H_{l,t}) - (H_{l+1,t} - H_{l,t})(\mathrm{e}^J + 1)\right)^2 && (2)\end{aligned}$$

The expression for the total hedging error reads

$$\begin{aligned}\varepsilon_{0L}^2 &= \int_0^T \mathrm{E}_0\left[G(t)\right]\mathrm{d}t \\ &= \int_0^T \mathrm{e}^{-(\lambda_1+\lambda_2)t}\left(G_0(t) + \lambda_1 t G_1(t)\right),\end{aligned}$$

since after a jump of size $2J$ the option is out of the money and the hedging error is therefore 0, i.e.

$$G_l(t) = 0 \text{ for } l \geq 2.$$

Substituting (1) and the results of Exercise 12.17 into the preceding formula we find

$$\begin{aligned}\varepsilon_{0L}^2 &= \frac{\lambda_1\lambda_2(\mathrm{e}^J - 1)^2}{\sum_{j=1}^{2}(\mathrm{e}^{jJ} - 1)^2\lambda_j}\mathrm{e}^{-T(\lambda_1+\lambda_2)}\int_0^T \mathrm{e}^{-\eta(T-t)} \\ &\quad \times \left(\left(\mathrm{e}^J H_{0,T} + (\mathrm{e}^J + 1)H_{1,T} + \mathrm{e}^J\lambda_1^Q H_{1,T}(T-t)\right)^2 + \lambda_1 t H_{1,T}^2\mathrm{e}^{2J}\right)\mathrm{d}t \\ &= \frac{\lambda_1\lambda_2(\mathrm{e}^J - 1)^2}{\sum_{j=1}^{2}(\mathrm{e}^{jJ} - 1)^2\lambda_j}\mathrm{e}^{-T(\lambda_1+\lambda_2)} \\ &\quad \times \Big(I(-\eta, \mathrm{e}^J H_{0,T} + (\mathrm{e}^J + 1)H_{1,T}, \mathrm{e}^J\lambda_1^Q H_{1,T}) \\ &\quad + \lambda_1 H_{1,T}^2\mathrm{e}^{2J}\eta^{-2}\left((\eta T - 1) + \mathrm{e}^{-T\eta}\right)\Big),\end{aligned}$$

where

$$\eta = 2(\lambda_1^Q + \lambda_2^Q) - \lambda_1^P - \lambda_2^P,$$

$$I(\kappa, C_1, C_2) = \int_0^T \mathrm{e}^{\kappa(T-t)}(C_1 + C_2(T-t))^2\mathrm{d}t$$

$$= \frac{-\left(C_1\kappa - C_2\right)^2 + \kappa^2\mathrm{e}^{\kappa T}\left(C_1 + C_2 T\right)^2 + 2\mathrm{e}^{\kappa T}C_2(C_2 - C_1\kappa - C_2\kappa T) - C_2^2}{\kappa^3}.$$

It easy to verify that the hedging error is strictly positive, even though we are hedging continuously.