(4) **Sensitivity measures:**

$$\Theta(t) := \frac{\partial}{\partial t} C_t^E = -Kre^{-r(T-t)}\Phi\big(d_2(t)\big) - \frac{\sigma S_t \phi\big(d_1(t)\big)}{2\sqrt{T-t}}$$

$$= -Ke^{-r(T-t)}\left(r\Phi\big(d_2(t)\big) + \frac{\sigma\phi\big(d_2(t)\big)}{2\sqrt{T-t}}\right),$$

It holds: $\Theta(t) < 0$, i.e. $C_t^E \downarrow$ in t.

$$\Delta(t) := \frac{\partial}{\partial S_t} C_t^E = \Phi\big(d_1(t)\big) = \alpha_t,$$

It holds: $\Delta(t) > 0$, i.e. $C_t^E \uparrow$ in S_t.

$$\Gamma(t) := \frac{\partial^2}{\partial S_t^2} C_t^E = \frac{\phi\big(d_1(t)\big)}{S_t\sigma\sqrt{T-t}},$$

It holds: $\Gamma(t) > 0$, i.e. C_t^E is strictly convex in S_t and α_t is increasing in S_t.

$$\Lambda(t) := \frac{\partial}{\partial \sigma} C_t^E = S_t\sqrt{T-t}\cdot\phi\big(d_1(t)\big),$$

It holds: $\Lambda(t) > 0$, i.e. $C_t^E \uparrow$ in σ.

$$\rho(t) := \frac{\partial}{\partial r} C_t^E = K(T-t)e^{-r(T-t)}\Phi\big(d_2(t)\big),$$

It holds: $\rho(t) > 0$, i.e. $C_t^E \uparrow$ in r.

$$\frac{\partial}{\partial K} C_t^E = -e^{-r(T-t)}\Phi\big(d_2(t)\big), \text{ i.e. } C_t^E \downarrow \text{ in } K.$$