

## Composite asset - necessary adjustments

<http://www.happywednesday.org/portal/node/630>

Assume  $S_t$  in  $FX_t^h$  follows  $dS_t = \mu_h S_t dt + \sigma_s S_t dW_t$  and we have a foreign currency,  $FX_t^a$ , with the corresponding  $\mu_a$ ,  $\sigma_{fx_hfx_a}$  and  $\rho_{s,fx_hfx_a}$ .

A composite asset of  $S_t$  into  $FX_t^a$ ,  $S_t^a$ , is then

$$dS_t^a = \mu_a S_t^a dt + \sqrt{\sigma_s^2 + \sigma_{fx_hfx_a}^2 + 2\sigma_s \sigma_{fx_hfx_a} \rho_{s,fx_hfx_a}} S_t^a d\hat{W}_t$$