2 Appendix: Sources of Cost Push Shocks

Variations in desired price markups.
Assume that the elasticity of substitution among goods varies over time, according to some stationary stochastic process \( f_t \). Let the associated desired markup be given by \( \mu_t := \frac{\epsilon_t}{\epsilon_{t-1}} \). One can show that the log-linearized price setting rule is then given by:

\[
p_t^s = (1 - \beta \theta) \sum_{k=1}^{\infty} (\beta \theta)^k E_t \{ \mu_{t+k} + mc_{t+k} + p_{t+k} \}
\]

where \( \mu_t \) denotes the equilibrium level of output under a constant price markup \( \mu \).

Exogenous Variations in Wage Markups
In that case we still have \( \pi_t = \beta E_t \{ \pi_{t+1} \} + \lambda \hat{mc}_t \), though now

\[
mc_t = w_t - a_t = \mu^w_t + m r s_t - a_t = \mu^w_t + (\sigma + \varphi) y_t - (1 + \varphi) a_t
\]

thus implying

\[
\hat{mc}_t = (\sigma + \varphi)(y_t - \bar{y}_t) + (\mu^w_t - \mu^w)
\]

where \( \bar{y}_t \) denotes the equilibrium level of output under a constant price and wage markup.