True problem:

Max
$$\begin{array}{ll}
\text{Kex} & \text{E[B_t(y_t^w + g_{r_t^w})]} \\
\text{S.t.} & \text{X_t} \leq y_t + g_{f_t} + w_t^w + M_t^w \neq w \\
& \text{Z_t^w} \leq [N\epsilon] \\
\text{Z_t^w} \in G_{0,1}^3, & \text{Vwell} \\
\text{X_t,S_t^w} \geq 0 & \text{VfeT, Ywell} \\
\text{(y_t^w,r_w,w_t^w,v_w)} \in \text{Y} & \text{Vwell}
\end{array}$$

Lagrangian Relaxation:

$$L(\lambda) = \max \left\{ \frac{\left[R_{t} x_{t} - \mathbb{E} \left[B_{t} (y_{t}^{\omega} + g r_{t}^{\omega}) \right] \right) + \lambda \left[\lfloor N \varepsilon \rfloor - \mathbb{E} z^{\omega} \right]}{\varepsilon \left[R_{t} x_{t} - \mathbb{E} \left[B_{t} (y_{t}^{\omega} + g r_{t}^{\omega}) \right] \right] + \lambda \left[\lfloor N \varepsilon \rfloor - \mathbb{E} z^{\omega} \right]} \right\}$$

$$s.t. \quad x_{t} \leq y_{t} + g r_{t} + \omega_{t}^{\omega} + M_{t}^{\omega} z^{\omega}$$

$$z^{\omega} \in \{0, 13\} \qquad \forall \omega \in \mathbb{Q}$$

$$x_{t}^{\omega}, s_{t}^{\omega} \geq 0 \qquad \forall t \in \mathbb{T}, \forall \omega \in \mathbb{Q}$$

$$(y^{\omega}, r^{\omega}, u^{\omega}, v^{\omega}) \in Y \qquad \forall \omega \in \mathbb{Q}$$

Lagrangian Buel:

min $L(\lambda)$ s.t. $\lambda \ge 0$