An RBC model with asset price, irreversibility, and endogenous labor supply with infinite Frisch elasticity

A represntative firm solves the following problem:

$$
\begin{aligned}
J(k;S) &= \max_{k',n} Ak^{\alpha}n^{\gamma} - w(S)n - k' + (1-\delta)k + \beta\mathbb{E}M(S,S')J(k';S') \\
&\quad \text{s.t. } k' - (1-\delta)k \geq \phi I_{ss}
\end{aligned}
$$

where I_{ss} is the steady-state investment level.

The household-side problem is as follows:

$$
\begin{aligned}
V(a;S) &= \max_{c,N,a'} \ log(c) - \eta N + \beta\mathbb{E}V(a';S') \\
\text{s.t.} \quad & c + \int a'(S')d\Gamma_{S'} = a + w(S)N
\end{aligned}
$$

The stochastic discount factor $M(S,S')$ and wage $w(S)$ are determined at the competitive market:

$$
\begin{aligned}
[M]: &\quad a(S) = J(k(S);S) \\
[w]: &\quad N(S) = n(S)
\end{aligned}
$$