the target variables as any rule that is optimal from a timeless perspective, so if the family of rules under consideration includes such a rule, it is optimal within the restricted family. I turn now to some simple examples of policies that could be judged optimal within a restricted family of simple alternatives, though they are not fully optimal.

3.1 The Optimal Noninertial Plan

A restricted class of policies of particular interest is that of *purely forward-looking* policies, under which policy (and hence equilibrium outcomes) at each date depends only on the set of evolutions for the target variables that are possible from that date onward. Basing policy solely on projections of the economy's current and possible future states has a certain intuitive appeal, and the forecast-targeting procedures of central banks often seem to have this character; hence it may be of interest to know how different the best possible rules of this kind are from fully optimal policy.

In order to deal with this issue, I begin by considering which state-contingent evolution one should wish to bring about, among all those consistent with *any* purely forward-looking policy, and then subsequently ask which policy (or policies) can be used to implement the desired equilibrium. The set of possible state-contingent evolutions to which I restrict attention consists of those under which the current endogenous non-predetermined state variables z_t depend only on the (i) vector of exogenous states s_t that contains all the information available in period t about the disturbances to the structural equations in period t or later, and (ii) the vector Z_t of exogenous disturbances that matter for determination of the variables z_t. For the set of possible evolutions of the economy from date t onward depends only on the values of s_t and Z_t. It follows that if policy depends only on this set, it also depends only on those variables, and if the policy rule results in a determinate equilibrium, it must be one in which the equilibrium values z_t also depend only on (s_t, Z_t).

I call the optimal state-contingent evolution from within this restricted class the *optimal noninertial plan,* following Woodford (1999a). To be precise, this is the plan under which (i) the long-run average values of the variables z_t are those associated with a policy that is optimal from a timeless perspective, and (ii) the fluctuations in response to shocks are those that minimize the stabilization loss L^{stab}, subject to the constraint that z_t depend only on (s_t, Z_t).

As an example, consider again the model consisting of aggregate-supply relation (2.1), and suppose once more that social welfare is measured by the expected value of (1.2). For simplicity, suppose that the disturbance u_t evolves according to (2.18) for some $0 \leq \rho_u < 1$. As discussed earlier, in this case the set of variables (s_t, Z_t) reduces simply to the current value of u_t, and the only possible state-contingent paths that can be implemented by a purely forward-looking (linear) rule are ones in which π_t and x_t are linear functions of the current value of u_t, as in (2.19). Plans of this form are consistent with the equilibrium relation (2.1) if and only if

$$(1-\beta)\bar{\pi} = \kappa\bar{x}, \tag{3.2}$$

$$(1-\beta\rho_u)f_\pi = \kappa f_x + 1. \tag{3.3}$$

Furthermore, in the case of any plan of this form, the stabilization loss is given by

$$L^{stab} = \frac{\beta}{1-\beta}\frac{1-\rho_u^2}{1-\beta\rho_u^2}\left[f_\pi^2 + \lambda f_x^2\right]\sigma_u^2, \tag{3.4}$$

where σ_u^2 is the unconditional variance of the disturbance process $\{u_t\}$.

It follows from Proposition 7.2 that the long-run average values of inflation and the output gap associated with a timelessly optimal policy are $\bar{\pi} = \bar{x} = 0$. The optimal values of the coefficients (f_π, f_x) are those that minimize (3.4) or, equivalently, that minimize $f_\pi^2 + \lambda f_x^2$, subject to constraint (3.3). The solution to this latter problem is given by

$$f_\pi^{oni} = \frac{1-\beta\rho_u}{\kappa^2\lambda^{-1} + (1-\beta\rho_u)^2}, \qquad f_x^{oni} = -\frac{\kappa\lambda^{-1}}{\kappa^2\lambda^{-1} + (1-\beta\rho_u)^2}. \tag{3.5}$$

Thus I obtain the following.

Proposition 7.11. Consider the baseline (Calvo pricing) model, in which the aggregate-supply relation is of the form (2.1), and abstract from any grounds for a concern with interest-rate stabilization, so that the period loss function is of the form (1.2). Let the cost-push disturbance $\{u_t\}$ evolve according to (2.18) for some $0 \le \rho_u < 1$. Then the optimal noninertial plan is a state-contingent evolution of the form (2.19) in which $\bar{\pi} = \bar{x} = 0$, and the coefficients f_π, f_x indicating the response to cost-push shocks are given by (3.5).

Applying (2.3) to the case of an AR(1) disturbance process (2.18), one finds that the equilibrium responses under discretion are also of the form (2.19), but with

$$\bar{\pi}^{disc} = \frac{\kappa\lambda}{(1-\beta)\lambda + \kappa^2}x^* > 0$$

and