TABLE 2—DETERMINACY VERSUS INDETERMINACY (I)

		Log-data density		Probability	
Sample	Prior	Determinacy	Indeterminacy	Determinacy	Indeterminacy
Pre-Volcker	1	−372.4	−359.1	0.000	1.000
	2	−372.4	−359.8	0.000	1.000
	3	−372.4	−358.7	0.000	1.000
Volcker-Greenspan	1	−368.6	−368.6	0.502	0.498
	2	−368.6	−369.4	0.692	0.308
	3	−368.6	−368.1	0.379	0.621
Post-1982	1	−237.4	−241.9	0.989	0.011
	2	−237.4	−241.5	0.984	0.016
	3	−237.4	−241.3	0.980	0.020

Notes: According to the prior distribution in Table 1 the probability of determinacy is 0.527. The posterior probabilities are calculated based on the output of the Metropolis algorithm. Log marginal data densities are approximated by John F. Geweke's (1999) harmonic mean estimator.

of the determinacy region on all elements of the parameter vector θ. To obtain the posterior probabilities for the two regions of the parameter space it is convenient to define the following (marginal) data densities

$$(36)\quad p^s(\mathbf{Y}^T) = \int \{\theta \in \Theta^s\}\mathcal{L}(\theta, \mathbf{M}, \sigma_\zeta|\mathbf{Y}^T) \times p(\theta, \mathbf{M}, \sigma_\zeta)\, d\theta \cdot d\mathbf{M} \cdot d\sigma_\zeta \quad s \in \{D, I\}$$

by integrating the likelihood function over region s with respect to the parameters θ, $\mathbf{M}$, and σ_ζ.[11] It can be seen from equations (16) and (17) that the posterior probability of indeterminacy is given by

$$(37)\qquad \pi_T(I) = \frac{p^I(\mathbf{Y}^T)}{p^I(\mathbf{Y}^T) + p^D(\mathbf{Y}^T)}.$$

Table 2 reports $\ln p^s(\mathbf{Y}^T)$ and the resulting posterior probabilities by prior and subsample.

The posterior probabilities reveal striking differences among the three subsamples. The pre-Volcker posterior concentrates (almost) all of its probability mass in the indeterminacy region. The evidence from the Volcker-Greenspan sample is mixed. Depending on the choice of prior the probability of determinacy ranges from 0.38 to 0.7. These estimates could be strongly influenced by the Volcker disinflation period which is better characterized by nonborrowed-reserve targeting than by an interest rate rule. The inflation rate drops from 15 percent in 1980:I to about 6 percent in 1982. Hence, the sample which excludes the disinflation period is considered as an alternative. Under all three priors the posterior probability of determinacy is around 0.98 for the post-1982 sample.

The log-data densities of Table 2 can also be used to compare the different specifications of the DSGE model under indeterminacy. Under Prior 2 the model is restricted to the baseline indeterminacy solution. The odds of the unrestricted version (Prior 1) versus the $\mathbf{M} = 0$ version (Prior 2) are about 2 to 1 for the pre-Volcker and Volcker-Greenspan samples. This finding suggests that the fit of the model can be improved by deviating from the baseline solution and altering the propagation of the structural shocks. Under Prior 3 the variance of the sunspot shock is restricted to zero. Thus, agents do not react to an additional source of uncertainty. The only effect of indeterminacy is to change the transmission of structural shocks. For all three samples the "indeterminacy without

[11] The data density intrinsically penalizes the likelihood function under indeterminacy for the presence of the additional parameters $\mathbf{M}$ and σ_ζ. The Gideon Schwarz (1978) approximation of a Bayesian data density makes the penalty explicit.