

DISCUSSION PAPERS IN ECONOMICS

Working Paper No. 00-04

General Equilibrium Macroeconomic Models
and Superior Information

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June 2000

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We present and discuss [Redacted]

JEL Classification Codes: E32

[Redacted]

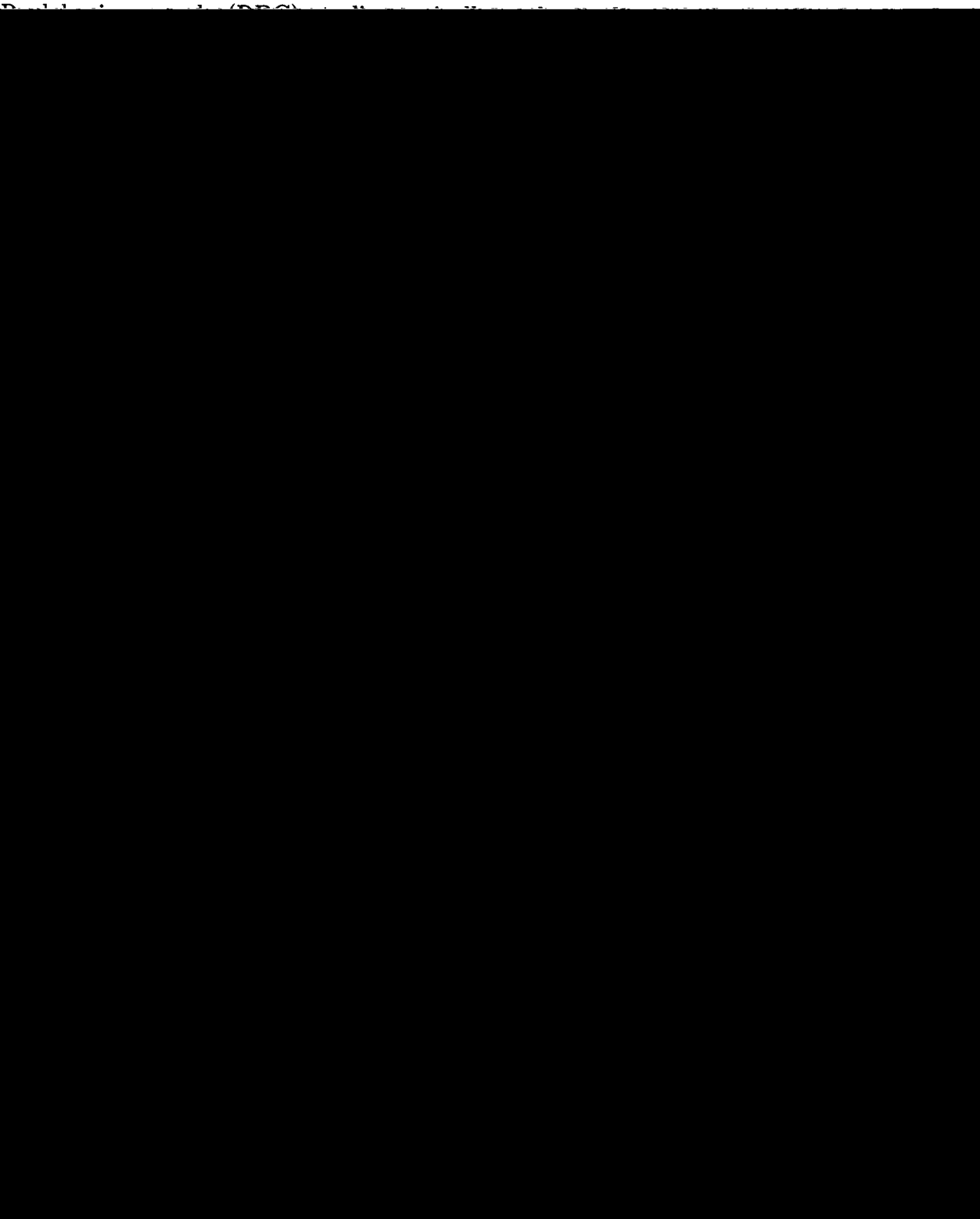
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1. Introduction



My 7th Lecture Econ

For illustrative purposes, we define the actual economy as a simple version of the Lucas

[REDACTED]

(2)

(3)

[REDACTED]

$$\begin{pmatrix} y_t \\ z_t \end{pmatrix} = \begin{pmatrix} \pi_{11} & \pi_{12} \\ \pi_{21} & \pi_{22} \end{pmatrix} \begin{pmatrix} y_{t-1} \\ z_{t-1} \end{pmatrix} + \begin{pmatrix} u_{yt} \\ u_{zt} \end{pmatrix}$$

or

$$W_t = \Pi W_{t-1} + U_t, \tag{4}$$

where u_t is the forcing variable, z_t is a composite of other exogenous variables, and U_t is

[REDACTED]

(5)

The agent constructs his expectations in (5) from the

[REDACTED]

$$W_t^e = \theta W_t = \theta_1 y_t + \theta_2 z_t + v_t$$

[REDACTED]

$$X_t = \Gamma X_{t-1} + V_t, \tag{7}$$

where $X_t = (y_t \ p_t)'$, $\Gamma = \Upsilon \Pi \Upsilon^{-1}$, $V_t = \Upsilon U_t$, and $\Upsilon = (e_1' \ \Theta)'$

3. The Artificial Economy

3.1. The Law of Motion of the Artificial Economy

As in most RBC studies, this law of motion involves only the forcing variable:

$$y_{dt} = \gamma y_{dt-1} + v_{yt}. \tag{8}$$

From estimates of (8), to obtain we construct the expectations in

$$p_{st} = \lambda y_{dt} \tag{9}$$

or

$$X_{dt} = \Gamma X_{dt-1} + V_t,$$

where V_t is a vector of zero-mean innovations



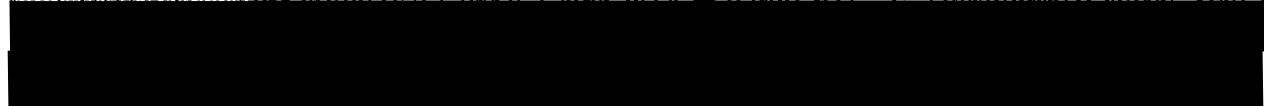
$$p_{at} = e_1 \beta \Gamma (I - \beta \Gamma)^{-1} X_{dt} = \Lambda X_{dt} = \lambda_1 y_{dt} + \lambda_2 p_{dt},$$

where p_{at} is the artificial price series generated under the augmented law of motion. The

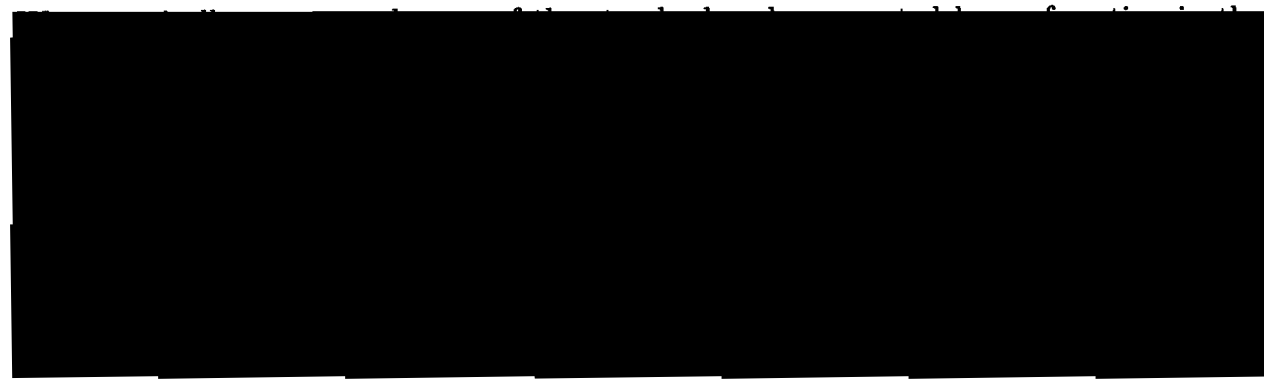


$$X_{at} = \Gamma_a X_{at-1} + V_{at},$$

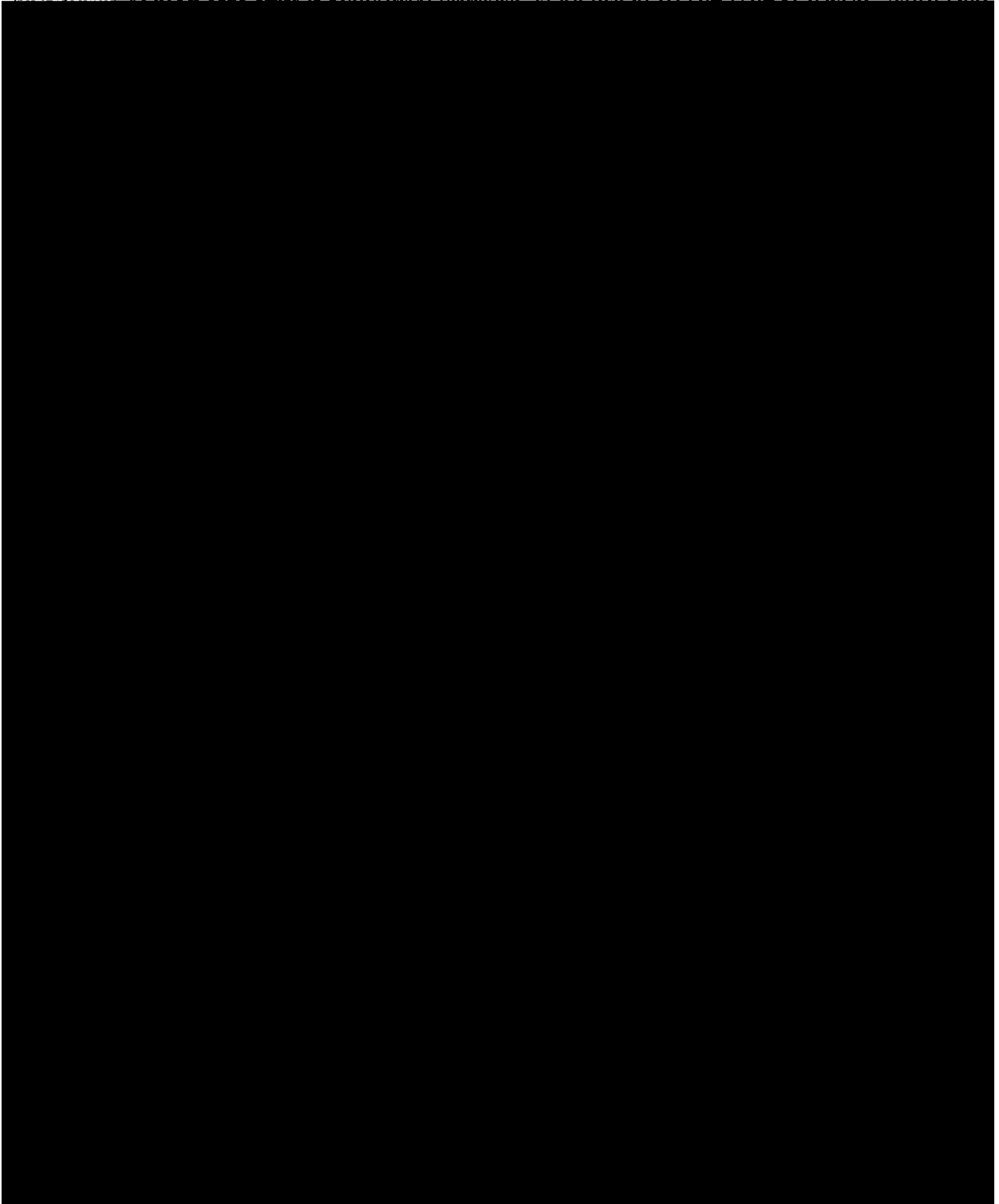
where $V_{at} = (y_{at}, p_{at})'$ is a vector of zero-mean innovations. The artificial price series p_{at} coincides with p_{dt} only if $\lambda_1 = 0$ and $\lambda_2 = 1$. Fortunately, these restric-



3.3. A Numerical Comparison



$\chi^2(1)$ -distributed test that a generated statistic is identical to the true statistic. Note that



4. Conclusion

The standard procedure to evaluate general equilibrium macroeconomic models is a joint test of the specification of the market features and of its law of motion for forcing variables



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Table 1. A Numerical Comparison

Panel A: No Superior Information							
$\pi_{12} = 0.0$							
$\pi_{11} = \pi_{22}$	Statistic	True	Standard	Augmented			
	σ_p	0.38	0.37 (0.94)	0.37 (0.94)			
	$\rho(p_t, p_{t-1})$	-0.49	-0.49 (1.00)	-0.49 (1.00)			
	$\rho(p_t, y_t)$	-1.00	-1.00 (1.00)	-1.00 (1.00)			
	σ_p	1.03	1.06 (0.92)	1.06 (0.92)			
	$\rho(p_t, p_{t-1})$	0.51	0.51 (1.00)				
	$\rho(p_t, y_t)$	1.00	1.00 (1.00)				

Panel B: Superior Information							
$\pi_{12} = -0.5$				$\pi_{12} = 0.5$			
$\pi_{11} = \pi_{22}$	Statistic	True	Standard	Augmented	True	Standard	Augmented
	σ_p	0.59			0.57	0.49 (0.20)	0.54 (0.70)
					-0.69	-0.56 (0.02)	-0.69 (1.00)
					-0.90	-1.00 (0.00)	-0.90 (1.00)
	σ_p	0.49	0.06 (0.00)	0.51 (0.80)	0.53	0.02 (0.00)	0.57 (0.71)
	$\rho(p_t, p_{t-1})$	0.04	-0.06 (0.16)	-0.05 (0.36)	-0.03	-0.01 (0.86)	0.02 (0.61)
	$\rho(p_t, y_t)$	0.00	-1.00 (0.32)		-0.06	-1.00 (0.35)	0.03 (0.59)
	σ_p	2.77	2.26 (0.41)	2.53 (0.74)	2.89	1.76 (0.07)	
	$\rho(p_t, p_{t-1})$		0.58 (0.94)	0.62 (0.52)	0.64		
	$\rho(p_t, y_t)$		1.00 (0.00)	0.82 (0.22)			