TABLE I

Parameters of Vector AR(1) Stochastic Process in Two Historical Episodes[a] Estimated Using Maximum Likelihood with U.S. Data[b]

A. Annual Data, 1901−40

Coefficient matrix P on lagged states; Coefficient matrix Q where $V = QQ'$

$$
\begin{bmatrix}
\underset{(.470,.856)}{.732} & \underset{(-.0364,.142)}{.0521} & \underset{(-.716,.130)}{-.317} & 0 \\
\underset{(-.339,.0504)}{-.150} & \underset{(.908,1.10)}{1.04} & \underset{(-.0751,.782)}{.390} & 0 \\
\underset{(-.384,.260)}{-.0114} & \underset{(-.262,.126)}{-.0197} & \underset{(-.363,.296)}{.0731} & 0 \\
0 & 0 & 0 & \underset{(.424,.814)}{.750}
\end{bmatrix}
\begin{bmatrix}
\underset{(.0440,.0666)}{.0575} & 0 & 0 & 0 \\
\underset{(-.0216,.00952)}{-.00561} & \underset{(.0378,.0643)}{.0555} & 0 & 0 \\
\underset{(-.0308,.0230)}{.000299} & \underset{(-.0167,.0121)}{-.000253} & \underset{(.0194,.0489)}{.0369} & 0 \\
0 & 0 & 0 & \underset{(.145,.276)}{.221}
\end{bmatrix}
$$

$$\text{Means of states } = [.541\,(.503, .591),\; -.190\,(-.271, -.0867),\; .286\,(.216, .364),\; -2.79\,(-2.95, -2.55)]$$

B. Quarterly Data, 1959:1−2004:3

Coefficient matrix P on lagged states; Coefficient matrix Q where $V = QQ'$

$$
\begin{bmatrix}
\underset{(.944,.984)}{.980} & \underset{(-.0192,.00222)}{-.0138} & \underset{(-.0129,-.00605)}{-.0117} & \underset{(.0125,.0259)}{.0192} \\
\underset{(-.0396,-.0061)}{-.0330} & \underset{(.920,.959)}{.956} & \underset{(-.0512,-.0286)}{-.0451} & \underset{(.0473,.0677)}{.0569} \\
\underset{(-.1087,-.0672)}{-.0702} & \underset{(-.0612,-.0304)}{-.0460} & \underset{(.879,.907)}{.896} & \underset{(.0817,.112)}{.104} \\
\underset{(-.0278,.0116)}{.00481} & \underset{(-.0158,.0157)}{-.00811} & \underset{(.0371,.0643)}{.0488} & \underset{(.954,.974)}{.971}
\end{bmatrix}
\begin{bmatrix}
\underset{(.0105,.0126)}{.0116} & 0 & 0 & 0 \\
\underset{(.000462,.00232)}{.00141} & \underset{(.00567,.00695)}{.00644} & 0 & 0 \\
\underset{(-.0141,-.00779)}{-.0105} & \underset{(-.00278,.00266)}{.00103} & \underset{(.0133,.0190)}{.0158} & 0 \\
\underset{(-.00219,.00132)}{-.000575} & \underset{(.00383,.00760)}{.00611} & \underset{(.0121,.0154)}{.0142} & \underset{(.00386,.00554)}{.00458}
\end{bmatrix}
$$

$$\text{Means of states } = [-.0239\,(-.0301, -.0137),\; .328, (.322, .336),\; .483\,(.473, .495),\; -1.53\,(-1.55, -1.52)]$$

[a] To ensure stationarity, we add a penalty term to the likelihood function proportional to $\max(|\lambda_{\max}| - .995, 0)^2$, where $\lambda_{\max}$ is the maximal eigenvalue of P. Numbers in parentheses are 90% confidence intervals for a bootstrapped distribution with 500 replications. To ensure that the variance-covariance matrix V is positive semi-definite, we estimate Q rather than $V = QQ'$.

[b] Sources of basic data: See Chari, Kehoe, and McGrattan (2006).

TABLE II

PROPERTIES OF THE WEDGES, 1959:1–2004:3[a]

A. SUMMARY STATISTICS

Wedges	Standard Deviation Relative to Output	Cross Correlation of Wedge with Output at Lag $k =$				
		−2	−1	0	1	2
Efficiency	.63	.65	.76	.85	.60	.35
Labor	.92	.52	.65	.71	.73	.68
Investment	1.18	.44	.48	.47	.30	.09
Government Consumption	1.51	−.42	−.42	−.33	−.24	−.11

B. CROSS CORRELATIONS

Wedges (X, Y)	Cross Correlation of X with Y at Lag $k =$				
	−2	−1	0	1	2
Efficiency, Labor	.57	.48	.30	.28	.16
Efficiency, Investment	.31	.46	.61	.47	.35
Efficiency, Government Consumption	−.27	−.33	−.34	−.35	−.31
Labor, Investment	−.07	.11	.18	.37	.46
Labor, Government Consumption	−.02	−.22	−.38	−.47	−.50
Investment, Government Consumption	−.60	−.73	−.88	−.70	−.51

[a] Series are first logged and detrended using the HP filter.

TABLE III

Properties of the Output Components, 1959:1–2004:3[a]

A. Summary Statistics

Output Components	Standard Deviation Relative to Output	Cross Correlation of Component with Output at Lag $k =$				
		−2	−1	0	1	2
Efficiency	.73	.65	.75	.83	.57	.31
Labor	.59	.44	.59	.68	.74	.74
Investment	.31	.33	.37	.40	.25	.07
Government Consumption	.40	−.45	−.45	−.39	−.25	−.08

B. Cross Correlations

Output Components (X, Y)	Cross Correlation of X with Y at Lag $k =$				
	−2	−1	0	1	2
Efficiency, Labor	.54	.41	.18	.15	.04
Efficiency, Investment	.30	.44	.60	.40	.28
Efficiency, Government Consumption	−.34	−.45	−.56	−.48	−.39
Labor, Investment	−.17	−.03	−.03	.20	.29
Labor, Government Consumption	.14	−.03	−.13	−.31	−.40
Investment, Government Consumption	−.49	−.63	−.87	−.66	−.48

[a] Series are first logged and detrended using the HP filter.