Information Criteria for Nonlinear Time Series Models

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Supplementary Material

A Data Generating Processes

Table 1: DGP: Autoregressive Processes

AR(1)	$y_t = 0.5y_{t-1} + \varepsilon_t$
AR(2)	$y_t = -1.2 + 0.7y_{t-1} + 0.3y_{t-2} + \varepsilon_t$
AR(3)	$y_t = 1.2y_{t-1} - 0.35y_{t-2} - 0.1y_{t-3} + \varepsilon_t$

Table 2: DGP: Logistic Smooth Transition Autoregressive Processes

LSTAR(1,1)	$F_t(\cdot) = 1/(1+\exp(-y_{t-1}))$
	$y_t = (0.8y_{t-1})(1-F_t(\cdot)) + (0.2y_{t-1})F_t(\cdot) + \varepsilon_t$
LSTAR(2,2)	$F_t(\cdot) = 1/(1+\exp(-y_{t-1}))$
	$y_t = (1.8y_{t-1} - 1.06y_{t-2})(1-F_t(\cdot)) + (0.02 + 0.9y_{t-1} - 0.265y_{t-2})F_t(\cdot) + \varepsilon_t$
LSTAR(3,4)	$F_t(\cdot) = 1/(1+\exp(-y_{t-1}))$
	$y_t = (1.8y_{t-1} - 1.06y_{t-2} - 0.2y_{t-3})(1-F_t(\cdot))$
	$+(0.02 + 0.9y_{t-1} - 0.265y_{t-2} + 0.27y_{t-3} - 0.32y_{t-4})F_t(\cdot) + \varepsilon_t$

A DATA GENERATING PROCESSES

Table 3: DGP: Exponential Smooth Transition Autoregressive Processes

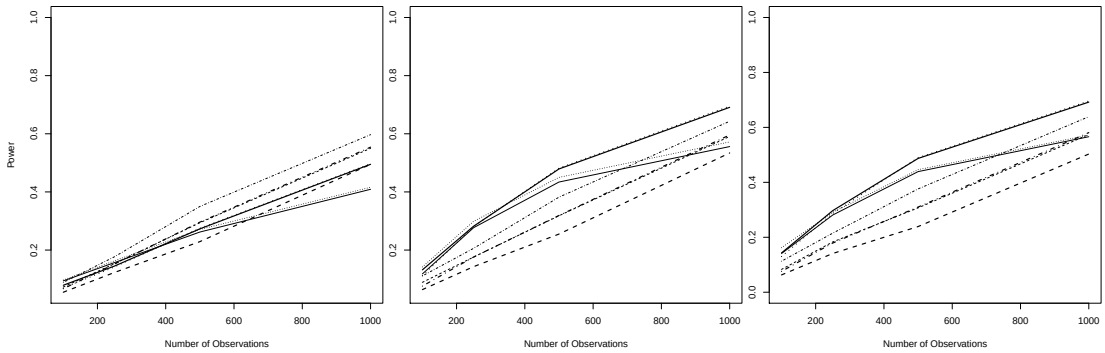
ESTAR(1,1)	$F_t(\cdot) = 1 - \exp(-y_{t-1}^2)$
	$y_t = (0.8y_{t-1})(1 - F_t(\cdot)) + (0.2y_{t-1})F_t(\cdot) + \varepsilon_t$
ESTAR(2,2)	$F_t(\cdot) = 1 - \exp(-y_{t-1}^2)$
	$y_t = (1.8y_{t-1} - 1.06y_{t-2})(1 - F_t(\cdot)) + (0.02 + 0.9y_{t-1} - 0.265y_{t-2})F_t(\cdot) + \varepsilon_t$
ESTAR(3,4)	$F_t(\cdot) = 1 - \exp(-y_{t-1}^2)$
	$y_t = (1.8y_{t-1} - 1.06y_{t-2} - 0.2y_{t-3})(1 - F_t(\cdot))$
	$+(0.02 + 0.9y_{t-1} - 0.265y_{t-2} + 0.27y_{t-3} - 0.32y_{t-4})F_t(\cdot) + \varepsilon_t$

Table 4: DGP: Self-exciting Threshold Autoregressive Processes

SETAR(1,1)	$y_t = (0.8y_{t-1} + \varepsilon_t)\mathbb{I}_{y_{t-1}>0} + (0.2y_{t-1} + \varepsilon_t)\mathbb{I}_{y_{t-1}\leq 0}$
SETAR(1,3)	$y_t = (0.2y_{t-1} + \varepsilon_t)\mathbb{I}_{y_{t-1}>0} + (1.2y_{t-1} - 0.35y_{t-2} - 0.1y_{t-3} + \varepsilon_t)\mathbb{I}_{y_{t-1}\leq 0}$
SETAR(2,1)	$y_t = (1.0 + 0.7y_{t-1} - 0.3y_{t-2} + \varepsilon_t)\mathbb{I}_{y_{t-1}>0} + (0.8y_{t-1} + \varepsilon_t)\mathbb{I}_{y_{t-1}\leq 0}$
SETAR(2,2)	$y_t = (1.2 + 0.7y_{t-1} - 0.2y_{t-2} + \varepsilon_t)\mathbb{I}_{y_{t-1}>0}$
	$+(1 - 1.1y_{t-1} + 0.18y_{t-2} + \varepsilon_t)\mathbb{I}_{y_{t-1}\leq 0}$
SETAR(2,3)	$y_t = (1.2 + 0.7y_{t-1} - 0.2y_{t-2} + \varepsilon_t)\mathbb{I}_{y_{t-1}>0}$
	$+(1.2y_{t-1} - 0.35y_{t-2} - 0.1y_{t-3} + \varepsilon_t)\mathbb{I}_{y_{t-1}\leq 0}$
SETAR(3,2)	$y_t = (1.2y_{t-1} - 0.35y_{t-2} - 0.1y_{t-3} + \varepsilon_t)\mathbb{I}_{y_{t-1}>0}$
	$+(1.2 + 0.7y_{t-1} - 0.2y_{t-2} + \varepsilon_t)\mathbb{I}_{y_{t-1}\leq 0}$
SETAR(4,3)	$y_t = (-1.0499y_{t-1} + 2.6535y_{t-3} - 0.9238y_{t-4} + \varepsilon_t)\mathbb{I}_{y_{t-1}>0}$
	$+(1.2y_{t-1} - 0.35y_{t-2} - 0.1y_{t-3} + \varepsilon_t)\mathbb{I}_{y_{t-1}\leq 0}$
SETAR(1,1,1)	$y_t = (-0.5y_{t-1} + \varepsilon_t)\mathbb{I}_{y_{t-1}>0.5} + (0.8y_{t-1} + \varepsilon_t)\mathbb{I}_{-0.5\leq y_{t-1}\leq 0.5} + (0.2y_{t-1} + \varepsilon_t)\mathbb{I}_{y_{t-1}<-0.5}$
SETAR(2,2,2)	$y_t = (1 + 0.7y_{t-1} - 0.3y_{t-2} + \varepsilon_t)\mathbb{I}_{y_{t-2}>12} + (6 + 1.9y_{t-1} - 1.2y_{t-2} + \varepsilon_t)\mathbb{I}_{5\leq y_{t-2}\leq 12}$
	$+(2.7 + 0.8y_{t-1} - 0.2y_{t-2} + \varepsilon_t)\mathbb{I}_{y_{t-2}<5}$

B Lag Order Selection

Underfitting in the SETAR(1,3) model. AIC and AICc outperform SIC and WIC due to their tendency to overfit.



(a) Regime Weighted IC **(b)** Equally Weighted IC **(c)** Overall IC

Figure 1: Power of the Information Criteria (IC) for SETAR Models (SETAR(1,3))

C Discriminating Linear and Nonlinear Models

Table 5: Selection Frequencies of the Information Criteria: AR vs. SETAR models for SETAR(1,1) DGP with n=100

(a) Regime Weighted Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
AR(1)	0.000	0.000	**0.471**	**0.494**	0.000	0.000	**0.398**	**0.436**
SETAR(1,1)	**0.263**	**0.382**	0.263	0.301	**0.334**	**0.449**	0.273	0.330
SETAR(1,2)	0.118	0.140	0.068	0.071	0.126	0.134	0.080	0.080
SETAR(1,3)	0.077	0.073	0.043	0.029	0.080	0.064	0.052	0.030
SETAR(1,4)	0.090	0.067	0.029	0.014	0.071	0.053	0.026	0.016
SETAR(2,1)	0.085	0.091	0.048	0.046	0.095	0.093	0.061	0.054
SETAR(3,1)	0.088	0.074	0.024	0.018	0.085	0.068	0.032	0.021
SETAR(4,1)	0.072	0.057	0.023	0.011	0.057	0.048	0.019	0.011

(b) Equally Weighted Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
AR(1)	0.000	0.000	**0.492**	**0.516**	0.000	0.000	**0.461**	**0.488**
SETAR(1,1)	**0.252**	**0.525**	0.299	0.380	**0.473**	**0.693**	0.319	0.405
SETAR(1,2)	0.115	0.114	0.049	0.031	0.124	0.107	0.052	0.039
SETAR(1,3)	0.093	0.054	0.026	0.013	0.059	0.020	0.022	0.007
SETAR(1,4)	0.105	0.045	0.021	0.007	0.045	0.018	0.018	0.005
SETAR(2,1)	0.111	0.105	0.043	0.027	0.124	0.078	0.040	0.029
SETAR(3,1)	0.092	0.066	0.022	0.011	0.076	0.040	0.023	0.009
SETAR(4,1)	0.066	0.035	0.017	0.003	0.035	0.017	0.009	0.001

(c) Overall Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
AR(1)	0.050	0.178	**0.806**	**0.863**	0.100	0.238	**0.591**	**0.710**
SETAR(1,1)	**0.272**	**0.479**	0.143	0.108	**0.342**	**0.491**	0.272	0.232
SETAR(1,2)	0.105	0.086	0.012	0.008	0.103	0.079	0.030	0.014
SETAR(1,3)	0.088	0.037	0.003	0.001	0.081	0.028	0.012	0.004
SETAR(1,4)	0.071	0.028	0.000	0.000	0.058	0.016	0.006	0.000
SETAR(2,1)	0.106	0.072	0.008	0.006	0.099	0.063	0.032	0.014
SETAR(3,1)	0.083	0.041	0.000	0.000	0.068	0.028	0.011	0.001
SETAR(4,1)	0.052	0.028	0.001	0.000	0.043	0.020	0.007	0.001

Table 6: Selection Frequencies of the Information Criteria:
AR vs. SETAR models for SETAR(1,1) DGP with n=250

(a) Regime Weighted Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
AR(1)	0.000	0.000	0.371	0.379	0.000	0.000	0.286	0.306
SETAR(1,1)	**0.295**	**0.400**	**0.390**	**0.423**	**0.322**	**0.420**	**0.391**	**0.440**
SETAR(1,2)	0.096	0.107	0.075	0.068	0.102	0.101	0.089	0.081
SETAR(1,3)	0.084	0.067	0.034	0.025	0.081	0.064	0.043	0.034
SETAR(1,4)	0.075	0.065	0.025	0.020	0.069	0.060	0.035	0.024
SETAR(2,1)	0.110	0.114	0.051	0.049	0.112	0.112	0.059	0.053
SETAR(3,1)	0.071	0.068	0.021	0.017	0.070	0.068	0.033	0.026
SETAR(4,1)	0.067	0.053	0.012	0.008	0.063	0.052	0.016	0.011

(b) Equally Weighted Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
AR(1)	0.000	0.000	0.406	0.411	0.000	0.000	0.356	0.366
SETAR(1,1)	**0.371**	**0.634**	**0.478**	**0.527**	**0.448**	**0.679**	**0.471**	**0.540**
SETAR(1,2)	0.106	0.113	0.041	0.026	0.114	0.094	0.049	0.034
SETAR(1,3)	0.074	0.047	0.011	0.002	0.064	0.039	0.018	0.004
SETAR(1,4)	0.081	0.024	0.007	0.001	0.054	0.020	0.012	0.003
SETAR(2,1)	0.114	0.092	0.034	0.022	0.115	0.090	0.049	0.031
SETAR(3,1)	0.070	0.043	0.009	0.003	0.063	0.039	0.016	0.008
SETAR(4,1)	0.050	0.018	0.005	0.003	0.040	0.016	0.008	0.004

(c) Overall Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
AR(1)	0.011	0.042	**0.632**	**0.691**	0.012	0.050	0.442	**0.512**
SETAR(1,1)	**0.388**	**0.641**	0.327	0.286	**0.425**	**0.645**	**0.471**	0.440
SETAR(1,2)	0.108	0.094	0.011	0.004	0.109	0.090	0.027	0.014
SETAR(1,3)	0.071	0.037	0.000	0.000	0.068	0.037	0.003	0.000
SETAR(1,4)	0.078	0.025	0.001	0.000	0.066	0.022	0.002	0.001
SETAR(2,1)	0.112	0.085	0.014	0.011	0.114	0.085	0.029	0.018
SETAR(3,1)	0.068	0.033	0.002	0.000	0.062	0.033	0.006	0.002
SETAR(4,1)	0.048	0.018	0.001	0.001	0.045	0.017	0.001	0.001

Table 7: Selection Frequencies of the Information Criteria:
AR vs. SETAR models for SETAR(1,1) DGP with n=500

(a) Regime Weighted Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
AR(1)	0.000	0.000	0.203	0.210	0.000	0.000	0.173	0.181
SETAR(1,1)	**0.349**	**0.447**	**0.540**	**0.567**	**0.367**	**0.449**	**0.514**	**0.554**
SETAR(1,2)	0.128	0.118	0.096	0.086	0.125	0.118	0.109	0.096
SETAR(1,3)	0.079	0.068	0.042	0.037	0.078	0.067	0.054	0.046
SETAR(1,4)	0.082	0.068	0.027	0.025	0.078	0.068	0.032	0.027
SETAR(2,1)	0.088	0.088	0.049	0.042	0.090	0.089	0.058	0.053
SETAR(3,1)	0.068	0.058	0.020	0.018	0.065	0.058	0.025	0.020
SETAR(4,1)	0.057	0.046	0.005	0.003	0.054	0.046	0.006	0.005

(b) Equally Weighted Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
AR(1)	0.000	0.000	0.244	0.246	0.000	0.000	0.220	0.226
SETAR(1,1)	**0.444**	**0.692**	**0.691**	**0.716**	**0.489**	**0.712**	**0.662**	**0.712**
SETAR(1,2)	0.118	0.109	0.035	0.025	0.118	0.109	0.054	0.033
SETAR(1,3)	0.072	0.031	0.004	0.000	0.068	0.028	0.008	0.003
SETAR(1,4)	0.067	0.025	0.001	0.001	0.052	0.021	0.008	0.001
SETAR(2,1)	0.089	0.073	0.017	0.010	0.086	0.068	0.029	0.018
SETAR(3,1)	0.066	0.030	0.002	0.000	0.059	0.026	0.006	0.002
SETAR(4,1)	0.047	0.018	0.002	0.000	0.041	0.017	0.004	0.002

(c) Overall Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
AR(1)	0.001	0.003	0.279	0.317	0.001	0.003	0.144	0.190
SETAR(1,1)	**0.480**	**0.714**	**0.687**	**0.661**	**0.500**	**0.723**	**0.793**	**0.777**
SETAR(1,2)	0.122	0.101	0.022	0.015	0.123	0.101	0.036	0.023
SETAR(1,3)	0.060	0.032	0.000	0.000	0.058	0.031	0.003	0.000
SETAR(1,4)	0.067	0.023	0.000	0.000	0.064	0.019	0.000	0.000
SETAR(2,1)	0.076	0.063	0.007	0.003	0.077	0.061	0.018	0.009
SETAR(3,1)	0.059	0.028	0.000	0.000	0.056	0.026	0.003	0.000
SETAR(4,1)	0.044	0.019	0.000	0.000	0.041	0.019	0.000	0.000

Table 8: Selection Frequencies of the Information Criteria: AR vs. SETAR models for SETAR(1,1) DGP with n=1000

(a) Regime Weighted Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
AR(1)	0.000	0.000	0.086	0.088	0.000	0.000	0.063	0.064
SETAR(1,1)	**0.360**	**0.475**	**0.637**	**0.668**	**0.369**	**0.477**	**0.622**	**0.653**
SETAR(1,2)	0.150	0.134	0.105	0.094	0.147	0.134	0.108	0.106
SETAR(1,3)	0.068	0.065	0.062	0.058	0.069	0.064	0.067	0.062
SETAR(1,4)	0.074	0.060	0.035	0.031	0.070	0.060	0.044	0.037
SETAR(2,1)	0.103	0.088	0.035	0.030	0.103	0.090	0.043	0.037
SETAR(3,1)	0.062	0.057	0.014	0.011	0.063	0.056	0.018	0.014
SETAR(4,1)	0.049	0.034	0.006	0.006	0.048	0.033	0.007	0.006

(b) Equally Weighted Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
AR(1)	0.000	0.000	0.106	0.106	0.000	0.000	0.090	0.091
SETAR(1,1)	**0.465**	**0.703**	**0.838**	**0.868**	**0.483**	**0.710**	**0.813**	**0.849**
SETAR(1,2)	0.130	0.095	0.030	0.016	0.123	0.093	0.047	0.030
SETAR(1,3)	0.066	0.040	0.002	0.002	0.067	0.037	0.009	0.002
SETAR(1,4)	0.053	0.020	0.002	0.000	0.049	0.020	0.003	0.002
SETAR(2,1)	0.105	0.076	0.015	0.003	0.106	0.077	0.026	0.018
SETAR(3,1)	0.056	0.030	0.004	0.002	0.056	0.029	0.006	0.004
SETAR(4,1)	0.053	0.016	0.000	0.000	0.050	0.015	0.000	0.000

(c) Overall Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
AR(1)	0.000	0.000	0.012	0.019	0.000	0.000	0.002	0.003
SETAR(1,1)	**0.501**	**0.728**	**0.952**	**0.970**	**0.506**	**0.734**	**0.935**	**0.958**
SETAR(1,2)	0.110	0.081	0.020	0.008	0.111	0.080	0.029	0.019
SETAR(1,3)	0.064	0.039	0.001	0.000	0.064	0.037	0.003	0.002
SETAR(1,4)	0.047	0.023	0.000	0.000	0.047	0.022	0.001	0.000
SETAR(2,1)	0.101	0.069	0.011	0.002	0.100	0.070	0.024	0.014
SETAR(3,1)	0.057	0.028	0.004	0.001	0.056	0.028	0.005	0.004
SETAR(4,1)	0.047	0.015	0.000	0.000	0.048	0.014	0.000	0.000

Table 9: Selection Frequencies of the Information Criteria:
AR vs. SETAR models for SETAR(2,3) DGP with n=100

(a) Regime Weighted Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
AR(1)	0.000	0.000	0.166	0.190	0.000	0.000	0.121	0.149
AR(2)	0.000	0.000	0.094	0.079	0.000	0.000	0.111	0.086
SETAR(1,1)	0.157	**0.242**	0.171	**0.230**	**0.211**	**0.290**	0.162	**0.223**
SETAR(1,2)	**0.166**	0.202	**0.184**	0.202	0.186	0.221	**0.188**	0.209
SETAR(1,3)	0.083	0.077	0.054	0.041	0.079	0.068	0.051	0.042
SETAR(2,1)	0.082	0.100	0.071	0.073	0.109	0.111	0.073	0.090
SETAR(2,2)	0.082	0.075	0.090	0.076	0.085	0.077	0.103	0.081
SETAR(2,3)	0.051	0.039	0.028	0.019	0.036	0.027	0.037	0.022

(b) Equally Weighted Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
AR(1)	0.000	0.000	0.166	0.199	0.000	0.000	0.136	0.172
AR(2)	0.000	0.000	0.109	0.091	0.000	0.000	0.134	0.109
SETAR(1,1)	0.077	0.210	0.176	**0.258**	0.182	**0.322**	0.169	**0.264**
SETAR(1,2)	0.142	**0.238**	**0.182**	0.195	**0.214**	0.262	**0.195**	0.205
SETAR(1,3)	0.065	0.056	0.046	0.031	0.056	0.039	0.044	0.026
SETAR(2,1)	0.083	0.126	0.077	0.076	0.137	0.143	0.084	0.084
SETAR(2,2)	**0.148**	0.149	0.108	0.090	0.149	0.115	0.112	0.082
SETAR(2,3)	0.088	0.040	0.027	0.014	0.044	0.020	0.020	0.009

(c) Overall Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
AR(1)	0.009	0.040	**0.351**	**0.463**	0.014	0.059	**0.199**	**0.293**
AR(2)	0.016	0.035	0.237	0.224	0.026	0.056	0.188	0.195
SETAR(1,1)	0.075	0.187	0.108	0.105	0.102	0.210	0.143	0.171
SETAR(1,2)	**0.163**	**0.239**	0.149	0.117	**0.184**	**0.244**	0.191	0.178
SETAR(1,3)	0.063	0.049	0.016	0.010	0.059	0.046	0.027	0.017
SETAR(2,1)	0.073	0.099	0.044	0.033	0.090	0.100	0.069	0.053
SETAR(2,2)	0.161	0.146	0.057	0.034	0.169	0.142	0.104	0.061
SETAR(2,3)	0.083	0.047	0.005	0.001	0.075	0.025	0.012	0.004

Table 10: Selection Frequencies of the Information Criteria:
AR vs. SETAR models for SETAR(2,3) DGP with n=250

(a) Regime Weighted Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
AR(1)	0.000	0.000	0.030	0.031	0.000	0.000	0.016	0.021
AR(2)	0.000	0.000	0.042	0.041	0.000	0.000	0.041	0.038
SETAR(1,1)	0.172	**0.206**	0.131	0.173	0.184	**0.215**	0.097	0.136
SETAR(1,2)	0.161	0.195	0.186	0.219	0.172	0.204	0.162	0.192
SETAR(1,3)	0.071	0.064	0.035	0.033	0.065	0.059	0.034	0.034
SETAR(2,1)	0.081	0.101	0.134	0.138	0.083	0.102	0.133	0.154
SETAR(2,2)	**0.173**	0.182	**0.285**	**0.252**	**0.185**	0.188	**0.310**	**0.283**
SETAR(2,3)	0.059	0.050	0.070	0.051	0.053	0.045	0.084	0.062

(b) Equally Weighted Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
AR(1)	0.000	0.000	0.040	0.043	0.000	0.000	0.021	0.032
AR(2)	0.000	0.000	0.062	0.056	0.000	0.000	0.063	0.056
SETAR(1,1)	0.019	0.053	0.103	0.165	0.029	0.063	0.069	0.127
SETAR(1,2)	0.070	0.126	0.180	0.213	0.086	0.146	0.157	0.191
SETAR(1,3)	0.027	0.026	0.023	0.017	0.023	0.024	0.022	0.021
SETAR(2,1)	0.056	0.115	0.109	0.118	0.082	0.126	0.106	0.123
SETAR(2,2)	**0.337**	**0.422**	**0.363**	**0.327**	**0.388**	**0.432**	**0.393**	**0.356**
SETAR(2,3)	0.142	0.095	0.061	0.035	0.110	0.078	0.075	0.049

(c) Overall Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
AR(1)	0.000	0.000	0.070	0.095	0.000	0.000	0.024	0.044
AR(2)	0.002	0.007	0.128	0.137	0.002	0.010	0.084	0.095
SETAR(1,1)	0.020	0.051	0.119	0.149	0.021	0.053	0.099	0.142
SETAR(1,2)	0.079	0.129	0.190	0.208	0.081	0.135	0.175	0.197
SETAR(1,3)	0.027	0.030	0.014	0.013	0.029	0.028	0.014	0.016
SETAR(2,1)	0.047	0.104	0.115	0.112	0.057	0.105	0.130	0.133
SETAR(2,2)	**0.346**	**0.433**	**0.315**	**0.256**	**0.368**	**0.436**	**0.378**	**0.323**
SETAR(2,3)	0.143	0.099	0.026	0.015	0.143	0.097	0.051	0.026

Table 11: Selection Frequencies of the Information Criteria:
AR vs. SETAR models for SETAR(2,3) DGP with n=500

(a) Regime Weighted Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
AR(1)	0.000	0.000	0.002	0.002	0.000	0.000	0.001	0.001
AR(2)	0.000	0.000	0.004	0.004	0.000	0.000	0.003	0.003
SETAR(1,1)	**0.210**	**0.237**	0.039	0.057	**0.216**	0.238	0.029	0.040
SETAR(1,2)	0.181	0.201	0.100	0.114	0.187	0.203	0.071	0.098
SETAR(1,3)	0.060	0.046	0.010	0.009	0.057	0.047	0.013	0.010
SETAR(2,1)	0.061	0.072	0.169	0.190	0.062	0.074	0.156	0.173
SETAR(2,2)	0.185	0.235	**0.514**	**0.504**	0.197	**0.242**	**0.522**	**0.522**
SETAR(2,3)	0.070	0.056	0.103	0.071	0.067	0.052	0.121	0.094

(b) Equally Weighted Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
AR(1)	0.000	0.000	0.003	0.003	0.000	0.000	0.001	0.001
AR(2)	0.000	0.000	0.014	0.013	0.000	0.000	0.012	0.013
SETAR(1,1)	0.002	0.006	0.019	0.027	0.002	0.007	0.013	0.021
SETAR(1,2)	0.010	0.025	0.066	0.081	0.014	0.027	0.045	0.071
SETAR(1,3)	0.001	0.002	0.002	0.004	0.001	0.003	0.004	0.002
SETAR(2,1)	0.030	0.050	0.101	0.153	0.032	0.058	0.074	0.116
SETAR(2,2)	**0.465**	**0.599**	**0.672**	**0.645**	**0.501**	**0.618**	**0.675**	**0.671**
SETAR(2,3)	0.182	0.148	0.092	0.058	0.167	0.131	0.117	0.078

(c) Overall Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
AR(1)	0.000	0.000	0.001	0.001	0.000	0.000	0.000	0.001
AR(2)	0.001	0.001	0.014	0.022	0.001	0.001	0.006	0.010
SETAR(1,1)	0.002	0.007	0.028	0.041	0.002	0.007	0.022	0.028
SETAR(1,2)	0.010	0.021	0.089	0.105	0.011	0.023	0.058	0.091
SETAR(1,3)	0.001	0.003	0.002	0.004	0.001	0.003	0.003	0.002
SETAR(2,1)	0.023	0.046	0.130	0.155	0.024	0.046	0.095	0.131
SETAR(2,2)	**0.468**	**0.606**	**0.677**	**0.639**	**0.481**	**0.616**	**0.711**	**0.677**
SETAR(2,3)	0.192	0.144	0.044	0.025	0.192	0.140	0.072	0.045

Table 12: Selection Frequencies of the Information Criteria:
AR vs. SETAR models for SETAR(2,3) DGP with n=1000

(a) Regime Weighted Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
AR(1)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AR(2)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SETAR(1,1)	**0.230**	0.237	0.005	0.008	**0.230**	0.238	0.004	0.005
SETAR(1,2)	0.225	**0.247**	0.012	0.015	0.228	**0.249**	0.010	0.012
SETAR(1,3)	0.050	0.042	0.000	0.000	0.049	0.040	0.000	0.000
SETAR(2,1)	0.031	0.034	0.130	0.141	0.031	0.034	0.118	0.130
SETAR(2,2)	0.170	0.257	**0.691**	**0.709**	0.179	0.260	**0.662**	**0.697**
SETAR(2,3)	0.083	0.067	0.118	0.094	0.081	0.065	0.137	0.112

(b) Equally Weighted Information Criteria

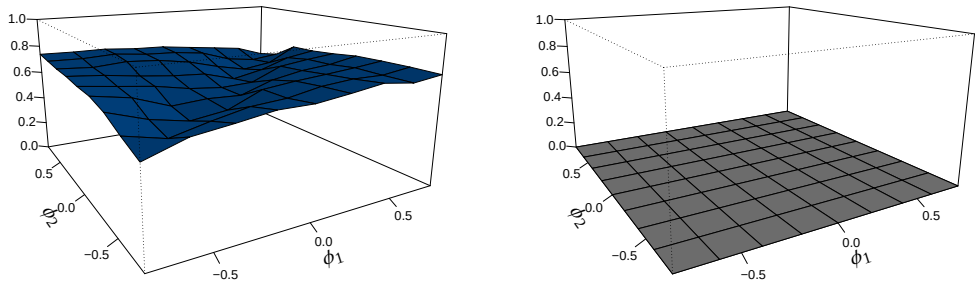
	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
AR(1)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AR(2)	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001
SETAR(1,1)	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001
SETAR(1,2)	0.000	0.000	0.006	0.008	0.000	0.000	0.003	0.006
SETAR(1,3)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SETAR(2,1)	0.001	0.003	0.022	0.037	0.001	0.005	0.013	0.023
SETAR(2,2)	**0.481**	**0.686**	**0.846**	**0.879**	**0.509**	**0.695**	**0.812**	**0.856**
SETAR(2,3)	0.215	0.173	0.103	0.067	0.205	0.169	0.133	0.094

(c) Overall Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
AR(1)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AR(2)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SETAR(1,1)	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001
SETAR(1,2)	0.000	0.000	0.011	0.013	0.000	0.000	0.006	0.011
SETAR(1,3)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SETAR(2,1)	0.001	0.002	0.026	0.041	0.001	0.002	0.015	0.024
SETAR(2,2)	**0.459**	**0.673**	**0.900**	**0.899**	**0.468**	**0.678**	**0.872**	**0.894**
SETAR(2,3)	0.233	0.185	0.053	0.040	0.235	0.182	0.083	0.058

D Effects of the Persistence Parameters

Weighted versions of AIC and AICc cannot distinguish between linear and nonlinear models, independent of the sample size. Instead, they always select the nonlinear model.



(a) SETAR(1,1) **(b)** AR(1)

Figure 3: Selection Frequency for Equally Weighted AIC with $\tilde{\sigma}^2$ and n=1000

E Discriminating Nonlinear Models

Table 13: Selection Frequencies of the Information Criteria:
ESTAR vs. LSTAR models for LSTAR(2,2) DGP with $\gamma = 1$ and n=100

(a) Regime Weighted Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
ESTAR(1,2)	0.010	0.011	0.066	0.089	0.008	0.011	0.103	0.123
ESTAR(2,1)	0.006	0.012	0.039	0.051	0.020	0.023	0.079	0.091
ESTAR(2,2)	0.026	0.032	0.183	0.156	0.023	0.020	0.160	0.147
ESTAR(2,3)	0.007	0.007	0.016	0.006	0.009	0.007	0.021	0.011
LSTAR(1,1)	0.131	0.193	0.092	0.134	**0.238**	**0.305**	0.063	0.101
LSTAR(2,1)	0.140	0.191	0.109	0.139	0.204	0.229	0.079	0.092
LSTAR(2,2)	**0.200**	**0.237**	**0.276**	**0.276**	0.195	0.201	**0.289**	**0.300**

(b) Equally Weighted Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
ESTAR(1,2)	0.064	0.108	0.101	0.146	0.094	0.125	0.124	0.158
ESTAR(2,1)	0.021	0.041	0.047	0.066	0.091	0.125	0.078	0.106
ESTAR(2,2)	0.225	0.274	0.295	0.277	0.172	0.171	0.232	0.206
ESTAR(2,3)	0.035	0.021	0.024	0.010	0.027	0.018	0.019	0.010
LSTAR(1,1)	0.004	0.022	0.031	0.048	0.008	0.019	0.025	0.042
LSTAR(2,1)	0.017	0.029	0.046	0.071	0.037	0.058	0.038	0.058
LSTAR(2,2)	**0.237**	**0.314**	**0.271**	**0.285**	**0.317**	**0.347**	**0.345**	**0.346**

(c) Overall Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
ESTAR(1,2)	0.059	0.114	0.176	0.212	0.082	0.126	0.143	0.187
ESTAR(2,1)	0.017	0.043	0.065	0.076	0.031	0.049	0.054	0.068
ESTAR(2,2)	0.247	0.285	0.266	0.230	0.279	0.292	0.284	0.261
ESTAR(2,3)	0.032	0.025	0.006	0.005	0.028	0.016	0.015	0.004
LSTAR(1,1)	0.004	0.014	0.052	0.086	0.009	0.022	0.028	0.060
LSTAR(2,1)	0.014	0.031	0.056	0.070	0.020	0.039	0.043	0.062
LSTAR(2,2)	**0.263**	**0.323**	**0.309**	**0.281**	**0.292**	**0.329**	**0.321**	**0.304**

Table 14: Selection Frequencies of the Information Criteria:
ESTAR vs. LSTAR models for LSTAR(2,2) DGP with $\gamma = 1$ and n=1000

(a) Regime Weighted Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
ESTAR(1,2)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ESTAR(2,1)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ESTAR(2,2)	0.000	0.000	0.148	0.153	0.000	0.000	0.139	0.146
ESTAR(2,3)	0.000	0.000	0.002	0.001	0.000	0.000	0.004	0.003
LSTAR(1,1)	0.035	0.049	0.000	0.000	0.037	0.053	0.000	0.000
LSTAR(2,1)	**0.285**	**0.333**	0.000	0.000	**0.288**	**0.333**	0.000	0.000
LSTAR(2,2)	0.201	0.246	**0.775**	**0.790**	0.205	0.250	**0.752**	**0.775**

(b) Equally Weighted Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
ESTAR(1,2)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ESTAR(2,1)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ESTAR(2,2)	0.061	0.083	0.132	0.136	0.063	0.081	0.120	0.126
ESTAR(2,3)	0.009	0.006	0.004	0.002	0.009	0.006	0.006	0.004
LSTAR(1,1)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
LSTAR(2,1)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
LSTAR(2,2)	**0.601**	**0.740**	**0.836**	**0.850**	**0.611**	**0.746**	**0.820**	**0.845**

(c) Overall Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
ESTAR(1,2)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ESTAR(2,1)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ESTAR(2,2)	0.059	0.074	0.089	0.092	0.060	0.075	0.087	0.089
ESTAR(2,3)	0.007	0.005	0.003	0.001	0.007	0.005	0.003	0.003
LSTAR(1,1)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
LSTAR(2,1)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
LSTAR(2,2)	**0.605**	**0.755**	**0.897**	**0.902**	**0.611**	**0.758**	**0.882**	**0.895**

Table 15: Selection Frequencies of the Information Criteria:
ESTAR vs. LSTAR models for LSTAR(2,2) DGP with $\gamma = 20$ and n=100

(a) Regime Weighted Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
ESTAR(1,2)	0.002	0.006	0.161	0.199	0.017	0.025	0.231	**0.284**
ESTAR(2,1)	0.005	0.006	0.012	0.017	0.009	0.010	0.025	0.029
ESTAR(2,2)	0.040	0.045	0.198	0.180	0.053	0.042	0.214	0.208
ESTAR(2,3)	0.005	0.003	0.008	0.004	0.002	0.002	0.009	0.002
LSTAR(1,1)	0.126	0.185	0.069	0.110	0.221	**0.283**	0.054	0.068
LSTAR(2,1)	0.128	0.158	0.051	0.064	0.175	0.206	0.033	0.045
LSTAR(2,2)	**0.239**	**0.276**	**0.306**	**0.289**	**0.241**	0.239	**0.250**	0.252

(b) Equally Weighted Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
ESTAR(1,2)	0.145	0.252	0.258	**0.348**	0.249	**0.318**	**0.308**	**0.363**
ESTAR(2,1)	0.005	0.009	0.008	0.009	0.019	0.029	0.013	0.019
ESTAR(2,2)	**0.274**	**0.321**	**0.331**	0.311	**0.256**	0.261	0.289	0.281
ESTAR(2,3)	0.044	0.028	0.017	0.007	0.016	0.008	0.014	0.002
LSTAR(1,1)	0.000	0.003	0.007	0.020	0.000	0.003	0.005	0.011
LSTAR(2,1)	0.003	0.005	0.012	0.016	0.009	0.017	0.012	0.018
LSTAR(2,2)	0.185	0.218	0.224	0.213	0.233	0.242	0.234	0.230

(c) Overall Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
ESTAR(1,2)	0.157	0.257	**0.374**	**0.439**	0.190	0.292	0.327	**0.385**
ESTAR(2,1)	0.005	0.008	0.011	0.013	0.007	0.008	0.008	0.012
ESTAR(2,2)	**0.304**	**0.349**	0.318	0.275	**0.355**	**0.351**	**0.339**	0.311
ESTAR(2,3)	0.051	0.032	0.008	0.003	0.045	0.023	0.021	0.007
LSTAR(1,1)	0.000	0.004	0.017	0.030	0.000	0.004	0.004	0.019
LSTAR(2,1)	0.002	0.004	0.014	0.017	0.002	0.009	0.012	0.017
LSTAR(2,2)	0.176	0.205	0.201	0.193	0.192	0.208	0.207	0.199

Table 16: Selection Frequencies of the Information Criteria:
ESTAR vs. LSTAR models for LSTAR(2,2) DGP with $\gamma = 20$ and n=1000

(a) Regime Weighted Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
ESTAR(1,2)	0.000	0.000	0.003	0.004	0.000	0.000	0.002	0.003
ESTAR(2,1)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ESTAR(2,2)	0.001	0.001	0.240	0.243	0.001	0.001	0.232	0.238
ESTAR(2,3)	0.000	0.000	0.005	0.003	0.000	0.000	0.007	0.005
LSTAR(1,1)	0.012	0.017	0.000	0.000	0.014	0.017	0.000	0.000
LSTAR(2,1)	0.133	0.164	0.000	0.000	0.133	0.165	0.000	0.000
LSTAR(2,2)	**0.254**	**0.315**	**0.694**	**0.710**	**0.261**	**0.318**	**0.670**	**0.695**

(b) Equally Weighted Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
ESTAR(1,2)	0.000	0.001	0.002	0.002	0.000	0.001	0.002	0.002
ESTAR(2,1)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ESTAR(2,2)	0.257	0.327	0.421	0.433	0.264	0.327	0.401	0.414
ESTAR(2,3)	0.045	0.037	0.013	0.008	0.049	0.037	0.016	0.013
LSTAR(1,1)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
LSTAR(2,1)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
LSTAR(2,2)	**0.389**	**0.480**	**0.538**	**0.545**	**0.401**	**0.489**	**0.540**	**0.549**

(c) Overall Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
ESTAR(1,2)	0.000	0.001	0.003	0.004	0.000	0.001	0.003	0.003
ESTAR(2,1)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ESTAR(2,2)	0.228	0.287	0.359	0.366	0.233	0.290	0.354	0.359
ESTAR(2,3)	0.042	0.032	0.012	0.007	0.040	0.032	0.013	0.012
LSTAR(1,1)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
LSTAR(2,1)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
LSTAR(2,2)	**0.425**	**0.518**	**0.614**	**0.618**	**0.429**	**0.519**	**0.607**	**0.614**

F Discriminating Regimes

Table 17: Selection Frequencies of the Information Criteria:
AR vs. SETAR(2;·,·) vs. SETAR(3;·,·,·) models for AR(2) DGP with n=100;
1-step Estimation

(a) Regime Weighted Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
AR(2)	0.000	0.000	**0.537**	**0.468**	0.000	0.000	**0.551**	**0.509**
SETAR(2,2)	0.000	0.000	0.040	0.031	0.004	0.004	0.048	0.040
SETAR(1,2,1)	0.134	0.176	0.034	0.040	**0.206**	**0.221**	0.024	0.029
SETAR(1,2,2)	0.190	**0.180**	0.033	0.034	0.173	0.160	0.029	0.029
SETAR(2,2,2)	**0.216**	0.162	0.035	0.029	0.113	0.088	0.022	0.018

(b) Equally Weighted Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
AR(2)	0.000	0.000	**0.470**	**0.410**	0.000	0.000	**0.547**	**0.500**
SETAR(2,2)	0.000	0.000	0.043	0.027	0.001	0.001	0.057	0.043
SETAR(1,2,1)	0.104	0.165	0.051	0.057	**0.191**	**0.208**	0.018	0.020
SETAR(1,2,2)	0.194	**0.170**	0.031	0.030	0.179	0.157	0.014	0.014
SETAR(2,2,2)	**0.236**	0.146	0.034	0.019	0.100	0.074	0.017	0.012

(c) Overall Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
AR(2)	**0.492**	**0.629**	**0.818**	**0.749**	**0.601**	**0.697**	**0.826**	**0.803**
SETAR(2,2)	0.072	0.045	0.001	0.000	0.065	0.036	0.007	0.003
SETAR(1,2,1)	0.042	0.027	0.000	0.000	0.034	0.017	0.001	0.001
SETAR(1,2,2)	0.045	0.018	0.000	0.000	0.026	0.011	0.002	0.001
SETAR(2,2,2)	0.071	0.015	0.000	0.000	0.031	0.004	0.000	0.000

Table 18: Selection Frequencies of the Information Criteria:
AR vs. SETAR(2;·,·) vs. SETAR(3;·,·,·) models for AR(2) DGP with n=1000;
1-step Estimation

(a) Regime Weighted Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
AR(2)	0.000	0.000	**0.562**	**0.561**	0.000	0.000	**0.500**	**0.498**
SETAR(2,2)	0.000	0.000	0.085	0.085	0.000	0.000	0.089	0.083
SETAR(1,2,1)	0.009	0.009	0.019	0.020	0.009	0.009	0.020	0.021
SETAR(1,2,2)	0.119	0.126	0.055	0.055	0.119	0.127	0.053	0.059
SETAR(2,2,2)	**0.484**	**0.473**	0.119	0.115	**0.483**	**0.472**	0.144	0.137

(b) Equally Weighted Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
AR(2)	0.000	0.000	**0.637**	**0.637**	0.000	0.000	**0.609**	**0.607**
SETAR(2,2)	0.000	0.000	0.036	0.030	0.000	0.000	0.042	0.037
SETAR(1,2,1)	0.002	0.004	0.011	0.018	0.002	0.005	0.007	0.011
SETAR(1,2,2)	0.034	0.059	0.053	0.051	0.035	0.060	0.043	0.057
SETAR(2,2,2)	**0.904**	**0.841**	0.158	0.137	**0.900**	**0.844**	0.220	0.187

(c) Overall Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
AR(2)	**0.695**	**0.870**	**1.000**	**1.000**	**0.711**	**0.874**	**1.000**	**1.000**
SETAR(2,2)	0.146	0.083	0.000	0.000	0.145	0.081	0.000	0.000
SETAR(1,2,1)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SETAR(1,2,2)	0.006	0.003	0.000	0.000	0.006	0.003	0.000	0.000
SETAR(2,2,2)	0.130	0.027	0.000	0.000	0.117	0.025	0.000	0.000

Table 19: Selection Frequencies of the Information Criteria:
AR vs. SETAR(2;·,·) vs. SETAR(3;·,·,·) models for AR(2) DGP with n=100;
2-step Estimation

(a) Regime Weighted Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
AR(2)	0.000	0.000	0.115	0.097	0.000	0.000	0.136	0.125
SETAR(2,2)	0.000	0.000	0.008	0.006	0.000	0.000	0.010	0.007
SETAR(1,2,1)	0.136	0.156	0.109	0.115	0.155	0.167	0.100	0.110
SETAR(1,2,2)	**0.213**	**0.207**	**0.168**	**0.167**	**0.209**	**0.202**	**0.177**	**0.173**
SETAR(2,2,2)	0.152	0.121	0.105	0.089	0.108	0.100	0.091	0.082

(b) Equally Weighted Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
AR(2)	0.000	0.000	**0.157**	0.139	0.000	0.000	**0.235**	**0.220**
SETAR(2,2)	0.000	0.000	0.010	0.006	0.000	0.000	0.014	0.010
SETAR(1,2,1)	0.103	0.114	0.084	0.092	0.136	0.138	0.062	0.066
SETAR(1,2,2)	**0.189**	**0.191**	0.154	**0.152**	**0.181**	**0.173**	0.133	0.129
SETAR(2,2,2)	0.167	0.129	0.097	0.089	0.101	0.086	0.074	0.061

(c) Overall Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
AR(2)	**0.536**	**0.645**	**0.818**	**0.749**	**0.622**	**0.703**	**0.828**	**0.804**
SETAR(2,2)	0.120	0.058	0.001	0.000	0.090	0.041	0.007	0.003
SETAR(1,2,1)	0.020	0.007	0.000	0.000	0.015	0.002	0.000	0.000
SETAR(1,2,2)	0.016	0.007	0.000	0.000	0.010	0.005	0.000	0.000
SETAR(2,2,2)	0.024	0.005	0.000	0.000	0.011	0.001	0.000	0.000

Table 20: Selection Frequencies of the Information Criteria:
AR vs. SETAR(2;·,·,·) vs. SETAR(3;·,·,·) models for AR(2) DGP with n=1000;
2-step Estimation

(a) Regime Weighted Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
AR(2)	0.000	0.000	0.059	0.059	0.000	0.000	0.053	0.052
SETAR(2,2)	0.000	0.000	0.005	0.005	0.000	0.000	0.007	0.006
SETAR(1,2,1)	0.011	0.012	0.003	0.003	0.011	0.012	0.003	0.003
SETAR(1,2,2)	**0.389**	**0.390**	**0.529**	**0.534**	**0.390**	**0.390**	**0.526**	**0.529**
SETAR(2,2,2)	0.302	0.301	0.194	0.189	0.301	0.301	0.198	0.195

(b) Equally Weighted Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
AR(2)	0.000	0.000	0.116	0.116	0.000	0.000	0.106	0.105
SETAR(2,2)	0.000	0.000	0.001	0.001	0.000	0.000	0.006	0.004
SETAR(1,2,1)	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
SETAR(1,2,2)	**0.443**	**0.446**	**0.426**	**0.431**	**0.443**	**0.445**	**0.423**	**0.429**
SETAR(2,2,2)	0.347	0.341	0.259	0.251	0.347	0.340	0.269	0.260

(c) Overall Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
AR(2)	**0.734**	**0.880**	**1.000**	**1.000**	**0.744**	**0.884**	**1.000**	**1.000**
SETAR(2,2)	0.208	0.094	0.000	0.000	0.203	0.091	0.000	0.000
SETAR(1,2,1)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SETAR(1,2,2)	0.002	0.000	0.000	0.000	0.002	0.000	0.000	0.000
SETAR(2,2,2)	0.032	0.006	0.000	0.000	0.027	0.006	0.000	0.000

Table 21: Selection Frequencies of the Information Criteria:
AR vs. SETAR(2;·,·) vs. SETAR(3;·,·,·) models for SETAR(1,1) DGP with n=100;
1-step Estimation

(a) Regime Weighted Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
AR(1)	0.000	0.000	**0.519**	**0.540**	0.000	0.000	**0.462**	**0.480**
SETAR(1,1)	0.005	0.006	0.177	0.200	0.012	0.015	0.222	0.252
SETAR(1,1,1)	**0.312**	**0.405**	0.089	0.096	**0.432**	**0.473**	0.074	0.079
SETAR(1,2,1)	0.177	0.178	0.030	0.026	0.188	0.173	0.038	0.031
SETAR(2,1,1)	0.172	0.161	0.030	0.026	0.144	0.135	0.021	0.019

(b) Equally Weighted Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
AR(1)	0.000	0.000	**0.504**	**0.532**	0.000	0.000	**0.468**	**0.489**
SETAR(1,1)	0.000	0.000	0.117	0.145	0.003	0.004	0.245	0.272
SETAR(1,1,1)	**0.327**	**0.500**	0.119	0.159	**0.501**	**0.567**	0.062	0.064
SETAR(1,2,1)	0.179	0.157	0.064	0.041	0.168	0.150	0.053	0.050
SETAR(2,1,1)	0.160	0.142	0.040	0.033	0.129	0.121	0.016	0.018

(c) Overall Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
AR(1)	0.147	**0.296**	**0.842**	**0.879**	**0.222**	**0.358**	**0.686**	**0.784**
SETAR(1,1)	0.167	0.288	0.096	0.090	0.217	0.315	0.171	0.147
SETAR(1,1,1)	**0.200**	0.158	0.012	0.005	0.174	0.117	0.030	0.018
SETAR(1,2,1)	0.094	0.046	0.001	0.000	0.070	0.029	0.007	0.002
SETAR(2,1,1)	0.088	0.036	0.002	0.001	0.057	0.024	0.007	0.004

Table 22: Selection Frequencies of the Information Criteria:
AR vs. SETAR(2;·,·) vs. SETAR(3;·,·,·) models for SETAR(1,1) DGP with
n=1000;
1-step Estimation

(a) Regime Weighted Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
AR(1)	0.000	0.000	0.086	0.086	0.000	0.000	0.067	0.069
SETAR(1,1)	0.000	0.000	**0.472**	**0.479**	0.000	0.000	**0.441**	**0.455**
SETAR(1,1,1)	**0.419**	**0.496**	0.215	0.223	**0.436**	**0.504**	0.228	0.239
SETAR(1,2,1)	0.157	0.149	0.066	0.063	0.156	0.149	0.075	0.072
SETAR(2,1,1)	0.151	0.154	0.040	0.040	0.149	0.153	0.048	0.046

(b) Equally Weighted Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
AR(1)	0.000	0.000	0.110	0.110	0.000	0.000	0.090	0.091
SETAR(1,1)	0.000	0.000	**0.524**	**0.536**	0.000	0.000	**0.506**	**0.524**
SETAR(1,1,1)	**0.469**	**0.634**	0.261	0.282	**0.504**	**0.650**	0.256	0.290
SETAR(1,2,1)	0.151	0.124	0.035	0.020	0.145	0.114	0.042	0.027
SETAR(2,1,1)	0.137	0.114	0.019	0.018	0.138	0.115	0.024	0.019

(c) Overall Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
AR(1)	0.000	0.000	0.016	0.021	0.000	0.000	0.003	0.005
SETAR(1,1)	**0.306**	**0.535**	**0.953**	**0.967**	**0.321**	**0.546**	**0.940**	**0.963**
SETAR(1,1,1)	0.254	0.206	0.003	0.001	0.252	0.200	0.008	0.004
SETAR(1,2,1)	0.094	0.044	0.000	0.000	0.090	0.043	0.000	0.000
SETAR(2,1,1)	0.079	0.041	0.000	0.000	0.077	0.040	0.000	0.000

Table 23: Selection Frequencies of the Information Criteria:
AR vs. SETAR(2;·,·) vs. SETAR(3;·,·,·) models for SETAR(1,1) DGP with n=100;
2-step Estimation

(a) Regime Weighted Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
AR(1)	0.000	0.000	0.154	0.164	0.000	0.000	0.144	0.154
SETAR(1,1)	0.015	0.017	0.061	0.067	0.023	0.026	0.086	0.091
SETAR(1,1,1)	**0.205**	**0.252**	**0.161**	**0.177**	**0.254**	**0.289**	**0.158**	**0.167**
SETAR(1,2,1)	0.182	0.189	0.141	0.142	0.182	0.176	0.150	0.141
SETAR(2,1,1)	0.175	0.176	0.146	0.145	0.173	0.170	0.150	0.151

(b) Equally Weighted Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
AR(1)	0.000	0.000	**0.200**	**0.215**	0.000	0.000	**0.220**	**0.234**
SETAR(1,1)	0.000	0.000	0.046	0.057	0.003	0.003	0.095	0.101
SETAR(1,1,1)	**0.219**	**0.283**	0.148	0.170	**0.288**	**0.327**	0.123	0.133
SETAR(1,2,1)	0.177	0.177	0.145	0.141	0.195	0.189	0.155	0.146
SETAR(2,1,1)	0.186	0.189	0.145	0.141	0.177	0.170	0.129	0.129

(c) Overall Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
AR(1)	0.179	0.310	**0.845**	**0.880**	0.237	**0.380**	**0.698**	**0.789**
SETAR(1,1)	**0.286**	**0.379**	0.103	0.092	**0.319**	0.376	0.188	0.158
SETAR(1,1,1)	0.091	0.069	0.005	0.003	0.076	0.050	0.010	0.006
SETAR(1,2,1)	0.054	0.026	0.000	0.000	0.034	0.021	0.005	0.001
SETAR(2,1,1)	0.038	0.015	0.000	0.000	0.024	0.007	0.001	0.001

Table 24: Selection Frequencies of the Information Criteria:
AR vs. SETAR(2;·,·) vs. SETAR(3;·,·,·) models for SETAR(1,1) DGP with
n=1000;
2-step Estimation

(a) Regime Weighted Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
AR(1)	0.000	0.000	0.018	0.018	0.000	0.000	0.015	0.016
SETAR(1,1)	0.034	0.036	0.162	0.164	0.034	0.037	0.153	0.157
SETAR(1,1,1)	**0.296**	**0.341**	**0.276**	**0.287**	**0.309**	**0.343**	**0.273**	**0.283**
SETAR(1,2,1)	0.159	0.149	0.136	0.136	0.156	0.149	0.139	0.138
SETAR(2,1,1)	0.215	0.210	0.187	0.184	0.214	0.212	0.191	0.187

(b) Equally Weighted Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
AR(1)	0.000	0.000	0.030	0.030	0.000	0.000	0.027	0.028
SETAR(1,1)	0.000	0.000	0.115	0.116	0.000	0.000	0.107	0.113
SETAR(1,1,1)	**0.328**	**0.381**	**0.318**	**0.330**	**0.342**	**0.383**	**0.311**	**0.323**
SETAR(1,2,1)	0.175	0.164	0.146	0.146	0.173	0.163	0.147	0.146
SETAR(2,1,1)	0.226	0.216	0.193	0.190	0.223	0.219	0.196	0.193

(c) Overall Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
AR(1)	0.000	0.000	0.016	0.021	0.000	0.000	0.003	0.005
SETAR(1,1)	**0.508**	**0.692**	**0.955**	**0.967**	**0.515**	**0.698**	**0.942**	**0.965**
SETAR(1,1,1)	0.109	0.083	0.001	0.001	0.109	0.081	0.006	0.002
SETAR(1,2,1)	0.046	0.021	0.000	0.000	0.045	0.020	0.001	0.000
SETAR(2,1,1)	0.023	0.010	0.000	0.000	0.022	0.010	0.000	0.000

Table 25: Selection Frequencies of the Information Criteria:
AR vs. SETAR(2;·,·) vs. SETAR(3;·,·,·) models for SETAR(2,2,2) DGP with n=100;
1-step Estimation

(a) Regime Weighted Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
SETAR(2,1,1)	0.060	0.087	0.084	0.110	0.129	0.149	0.133	0.147
SETAR(2,1,2)	0.139	0.130	0.128	0.121	0.134	0.133	0.130	0.128
SETAR(2,2,1)	0.189	0.226	0.259	0.306	0.166	0.203	0.190	0.241
SETAR(2,2,2)	**0.554**	**0.492**	**0.467**	**0.397**	**0.484**	**0.432**	**0.459**	**0.398**

(b) Equally Weighted Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
SETAR(2,1,1)	0.050	0.080	0.081	0.106	0.121	0.141	0.129	0.143
SETAR(2,1,2)	0.117	0.106	0.101	0.097	0.111	0.110	0.107	0.104
SETAR(2,2,1)	0.201	0.240	0.277	0.321	0.179	0.216	0.205	0.258
SETAR(2,2,2)	**0.552**	**0.488**	**0.461**	**0.392**	**0.481**	**0.425**	**0.451**	**0.388**

(c) Overall Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
SETAR(2,1,1)	0.019	0.035	0.052	0.067	0.026	0.040	0.043	0.056
SETAR(2,1,2)	0.017	0.013	0.012	0.010	0.019	0.013	0.013	0.012
SETAR(2,2,1)	0.344	**0.452**	**0.501**	**0.542**	**0.402**	**0.472**	**0.480**	**0.514**
SETAR(2,2,2)	**0.434**	0.308	0.236	0.178	0.365	0.279	0.268	0.217

Table 26: Selection Frequencies of the Information Criteria:
AR vs. SETAR(2;·,·) vs. SETAR(3;·,·,·) models for SETAR(2,2,2) DGP with n=1000;
1-step Estimation

(a) Regime Weighted Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
SETAR(2,1,1)	0.001	0.001	0.005	0.005	0.001	0.001	0.004	0.005
SETAR(2,1,2)	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
SETAR(2,2,1)	0.010	0.012	0.018	0.020	0.010	0.012	0.016	0.018
SETAR(2,2,2)	**0.978**	**0.976**	**0.968**	**0.966**	**0.978**	**0.976**	**0.970**	**0.968**

(b) Equally Weighted Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
SETAR(2,1,1)	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013
SETAR(2,1,2)	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
SETAR(2,2,1)	0.015	0.017	0.023	0.025	0.015	0.017	0.021	0.023
SETAR(2,2,2)	**0.969**	**0.967**	**0.961**	**0.959**	**0.969**	**0.967**	**0.963**	**0.961**

(c) Overall Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
SETAR(2,2,1)	0.017	0.028	0.059	0.076	0.017	0.028	0.050	0.057
SETAR(2,2,2)	**0.979**	**0.967**	**0.936**	**0.919**	**0.979**	**0.967**	**0.945**	**0.938**

Table 27: Selection Frequencies of the Information Criteria:
AR vs. SETAR(2;·,·) vs. SETAR(3;·,·,·) models for SETAR(2,2,2) DGP with n=100;
2-step Estimation

(a) Regime Weighted Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
SETAR(2,1,1)	0.102	0.142	0.124	0.183	0.198	0.224	0.186	0.217
SETAR(2,1,2)	**0.376**	**0.415**	**0.323**	**0.358**	**0.397**	**0.396**	**0.325**	**0.332**
SETAR(2,2,1)	0.169	0.165	0.206	0.181	0.111	0.111	0.143	0.152
SETAR(2,2,2)	0.285	0.206	0.261	0.192	0.225	0.200	0.266	0.222

(b) Equally Weighted Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
SETAR(2,1,1)	0.106	0.149	0.132	0.190	0.205	0.242	0.191	0.227
SETAR(2,1,2)	**0.371**	**0.410**	**0.325**	**0.361**	**0.396**	**0.394**	**0.320**	**0.328**
SETAR(2,2,1)	0.164	0.159	0.199	0.174	0.106	0.101	0.139	0.146
SETAR(2,2,2)	0.282	0.208	0.257	0.190	0.203	0.183	0.246	0.208

(c) Overall Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
SETAR(2,1)	0.147	0.200	0.263	**0.300**	0.163	0.217	0.244	0.270
SETAR(2,2)	**0.402**	**0.347**	**0.295**	0.255	**0.386**	**0.333**	**0.309**	**0.283**
SETAR(2,1,1)	0.082	0.089	0.089	0.089	0.082	0.088	0.089	0.090
SETAR(2,1,2)	0.012	0.006	0.004	0.004	0.011	0.007	0.006	0.004
SETAR(2,2,1)	0.095	0.104	0.105	0.103	0.102	0.104	0.104	0.105
SETAR(2,2,2)	0.069	0.045	0.022	0.015	0.054	0.038	0.030	0.019

Table 28: Selection Frequencies of the Information Criteria:
AR vs. SETAR(2;·,·) vs. SETAR(3;·,·,·) models for SETAR(2,2,2) DGP with
n=1000;
2-step Estimation

(a) Regime Weighted Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
SETAR(2,1,1)	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
SETAR(2,1,2)	0.019	0.038	0.050	0.065	0.027	0.044	0.044	0.053
SETAR(2,2,1)	0.021	0.023	0.025	0.026	0.021	0.023	0.025	0.025
SETAR(2,2,2)	**0.954**	**0.933**	**0.919**	**0.903**	**0.946**	**0.927**	**0.925**	**0.916**

(b) Equally Weighted Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
SETAR(2,1,1)	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
SETAR(2,1,2)	0.019	0.038	0.050	0.065	0.027	0.044	0.044	0.053
SETAR(2,2,1)	0.020	0.022	0.024	0.025	0.020	0.022	0.024	0.024
SETAR(2,2,2)	**0.952**	**0.931**	**0.917**	**0.901**	**0.944**	**0.925**	**0.923**	**0.914**

(c) Overall Information Criteria

	$AIC(\hat{\sigma})$	$AIC(\tilde{\sigma})$	$SIC(\hat{\sigma})$	$SIC(\tilde{\sigma})$	$AICc(\hat{\sigma})$	$AICc(\tilde{\sigma})$	$WIC(\hat{\sigma})$	$WIC(\tilde{\sigma})$
SETAR(2,2)	0.449	0.449	0.449	0.449	0.449	0.449	0.449	0.449
SETAR(2,1,1)	**0.482**	**0.500**	**0.504**	**0.504**	**0.483**	**0.501**	**0.504**	**0.504**
SETAR(2,1,2)	0.021	0.003	0.000	0.000	0.020	0.002	0.000	0.000
SETAR(2,2,1)	0.015	0.018	0.019	0.019	0.015	0.018	0.019	0.019
SETAR(2,2,2)	0.016	0.013	0.011	0.011	0.016	0.013	0.011	0.011