Econ 582

Multivariate Time Series

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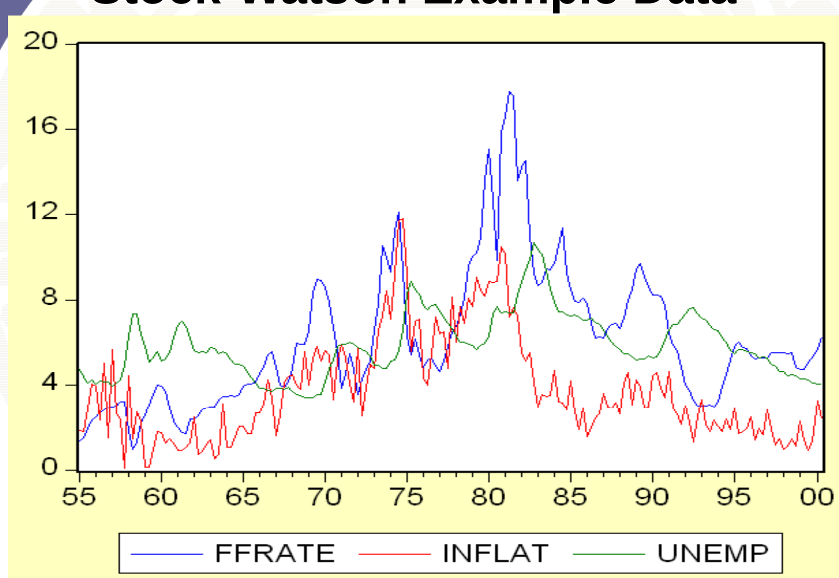
Stock-Watson Example Data



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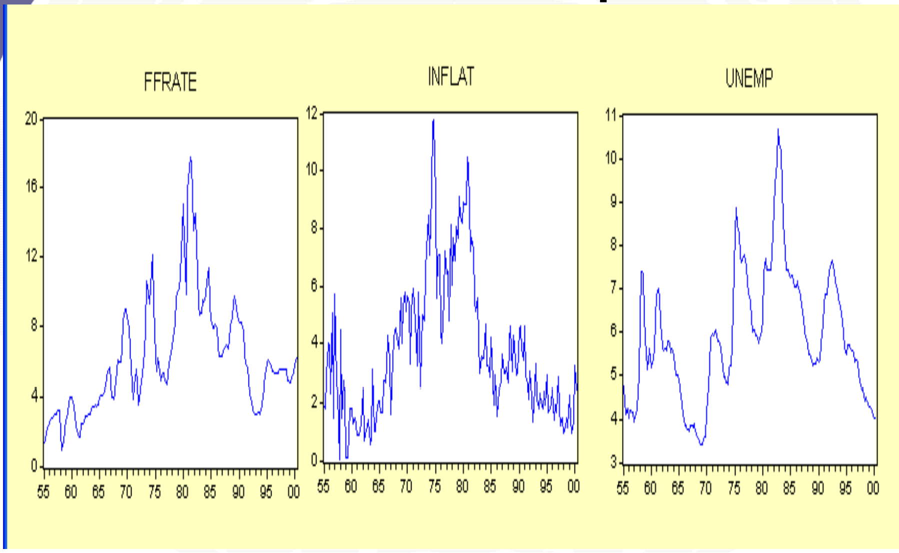
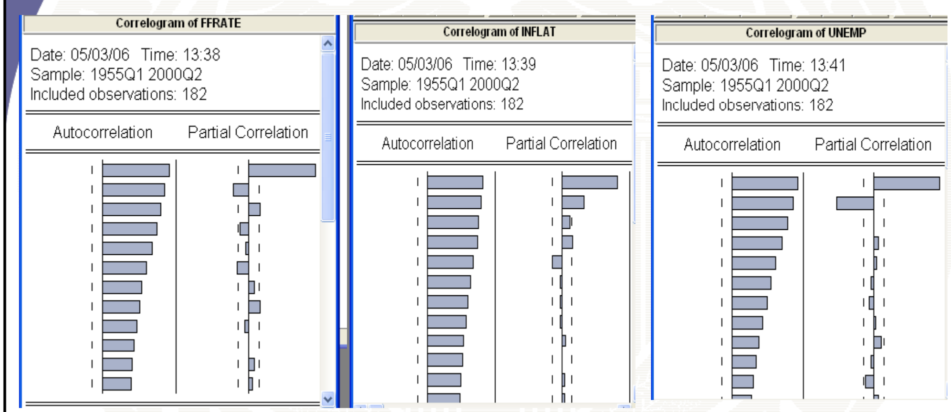
Stock-Watson Example Data



corr(r_t,r_{t-j}), corr(π_t, π_{t-j}), corr(u_t, u_{t-j})



r_t ~ AR(2) **π_t ~ AR(4)** **u_t ~ AR(2)**

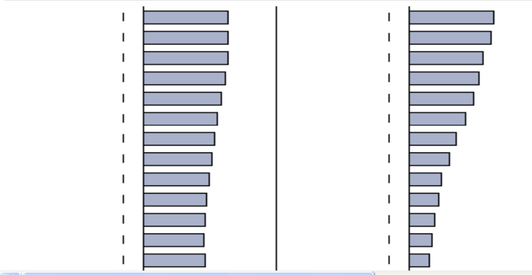
corr(r_t, π_{t-j}), corr(π_t, r_{t-j})

Group: UNTITLED Workfile: SWJEP\Swjep

View | Proc | Object | Print | Name | Freeze | Sample | Sheet | Stats | Spec

Cross Correlogram of FFRATE and INFLAT

Date: 05/03/06 Time: 11:04
Sample: 1955Q1 2000Q2
Included observations: 182
Correlations are asymptotically consistent approximations



FFRATE,INFLAT(-i)	FFRATE,INFLAT(+i)	i	lag	lead
		0	0.6662	0.6662
		1	0.6654	0.6416
		2	0.6664	0.5898
		3	0.6468	0.5463
		4	0.6120	0.5041
		5	0.5831	0.4470
		6	0.5644	0.3702
		7	0.5400	0.3149
		8	0.5233	0.2618
		9	0.4998	0.2335
		10	0.4846	0.2066
		11	0.4800	0.1822
		12	0.4889	0.1563

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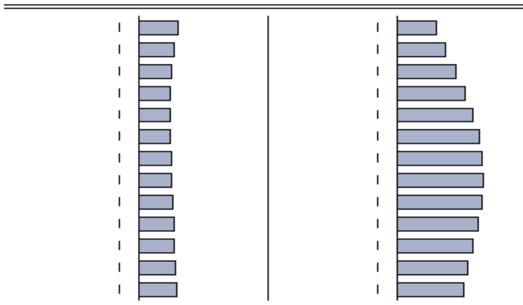
corr(r_t, u_{t-j}), corr(u_t, r_{t-j})

Group: UNTITLED Workfile: SWJEP\Swjep

View | Proc | Object | Print | Name | Freeze | Sample | Sheet | Stats | Spec

Cross Correlogram of FFRATE and UNEMP

Date: 05/03/06 Time: 11:07
Sample: 1955Q1 2000Q2
Included observations: 182
Correlations are asymptotically consistent approximations



FFRATE,UNEMP(-i)	FFRATE,UNEMP(+i)	i	lag	lead
		0	0.3240	0.3240
		1	0.2813	0.3952
		2	0.2633	0.4790
		3	0.2552	0.5531
		4	0.2567	0.6131
		5	0.2602	0.6559
		6	0.2627	0.6829
		7	0.2692	0.6926
		8	0.2757	0.6840
		9	0.2823	0.6536
		10	0.2893	0.6144
		11	0.2990	0.5714
		12	0.3072	0.5341

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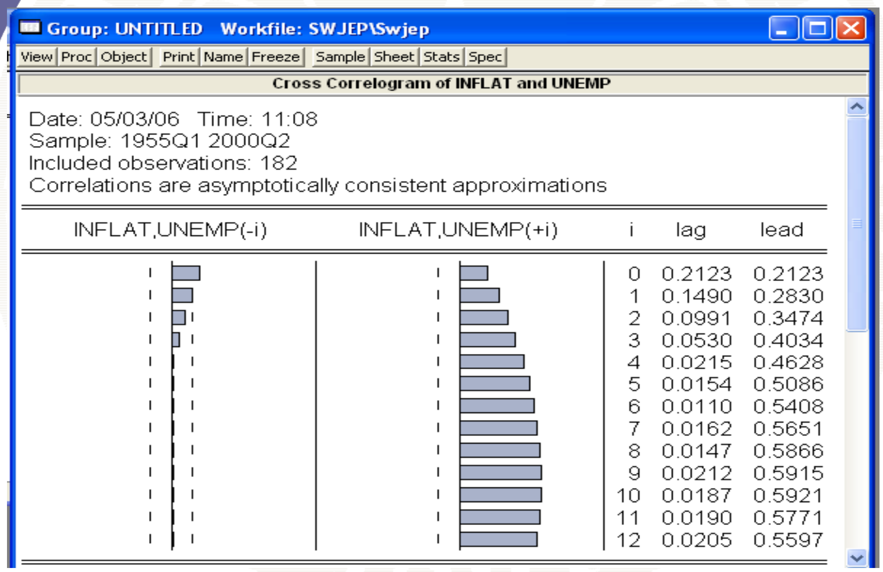
corr(π_t, u_{t-j}), corr(u_t, π_{t-j})



i	lag	lead
0	0.2123	0.2123
1	0.1490	0.2830
2	0.0991	0.3474
3	0.0530	0.4034
4	0.0215	0.4628
5	0.0154	0.5086
6	0.0110	0.5408
7	0.0162	0.5651
8	0.0147	0.5866
9	0.0212	0.5915
10	0.0187	0.5921
11	0.0190	0.5771
12	0.0205	0.5597

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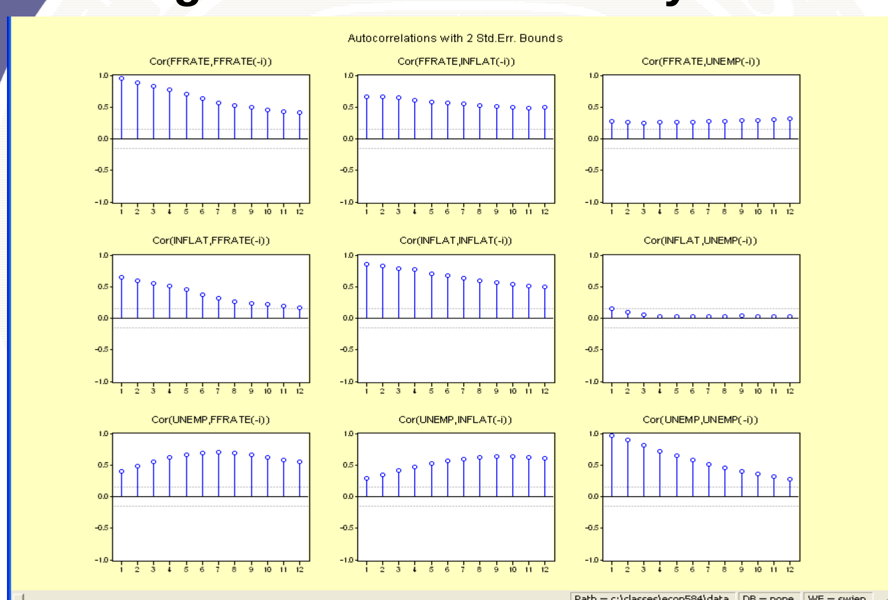
Lag correlation summary



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Automatic lag length selection

EViews - [Var: UNTITLED Workfile: SWJEP\Swjep]

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View | Proc | Object | Print | Name | Freeze | Estimate | Stats | Impulse | Resids

VAR Lag Order Selection Criteria
Endogenous variables: FFRATE INFLAT UNEMP
Exogenous variables: C
Date: 05/03/06 Time: 11:19
Sample: 1955Q1 2000Q2
Included observations: 174

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-1111.725	NA	73.64849	12.81293	12.86740	12.83503
1	-548.3197	1100.908	0.125789	6.440456	6.658322	6.528836
2	-489.6807	112.5599	0.071104	5.869893	6.251158*	6.024557
3	-474.8072	28.03739	0.066479	5.802381	6.347046	6.023331
4	-459.7487	27.86685	0.062035	5.732744	6.440808	6.019978*
5	-452.2485	13.62097	0.063160	5.749983	6.621447	6.103502
6	-437.2562	26.71045*	0.059019*	5.681106*	6.715969	6.100910
7	-435.0793	3.803321	0.063927	5.759532	6.957795	6.245621
8	-429.8794	8.905638	0.066910	5.808211	7.164873	6.355585

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Lags chosen by model selection criteria

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VAR(2) Model

Vector Autoregression Estimates
Date: 05/03/06 Time: 11:23
Sample (adjusted): 1955Q3 2000Q2
Included observations: 180 after adjustments
Standard errors in ( ) & t-statistics in [ ]

	FFRATE	INFLAT	UNEMP
FFRATE(-1)	0.963373 (0.08296) [11.6129]	0.283295 (0.10625) [2.66631]	0.009306 (0.02398) [0.38806]
FFRATE(-2)	-0.072105 (0.08386) [-0.85978]	-0.234782 (0.10741) [-2.18580]	0.024353 (0.02424) [1.00454]
INFLAT(-1)	0.022536 (0.05581) [0.40383]	0.508082 (0.07148) [7.10848]	0.026214 (0.01613) [1.62498]
INFLAT(-2)	0.131268 (0.05725) [2.29284]	0.363334 (0.07333) [4.95505]	-0.026581 (0.01655) [-1.60617]
UNEMP(-1)	-1.015520 (0.23915) [-4.24643]	-0.115833 (0.30629) [-0.37818]	1.505194 (0.06913) [21.7734]
UNEMP(-2)	0.971430 (0.22837) [4.25372]	0.020749 (0.29249) [0.07094]	-0.575886 (0.06602) [-8.72354]
C	0.375021 (0.28914) [1.29701]	0.744328 (0.37033) [2.00992]	0.211101 (0.08358) [2.52567]

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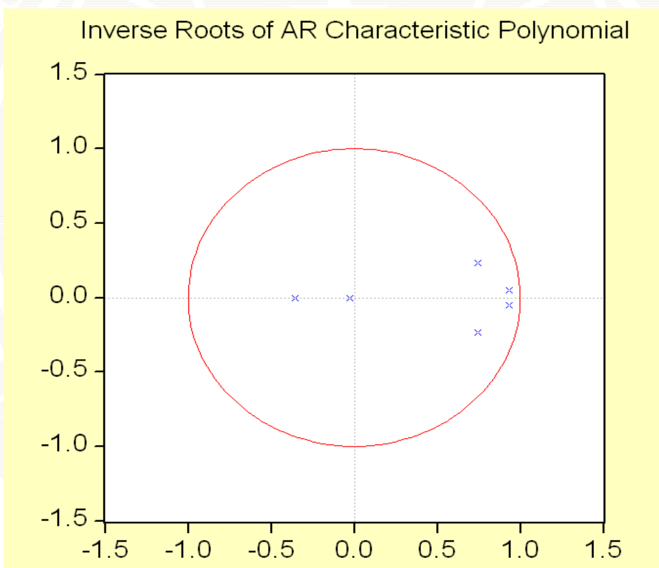
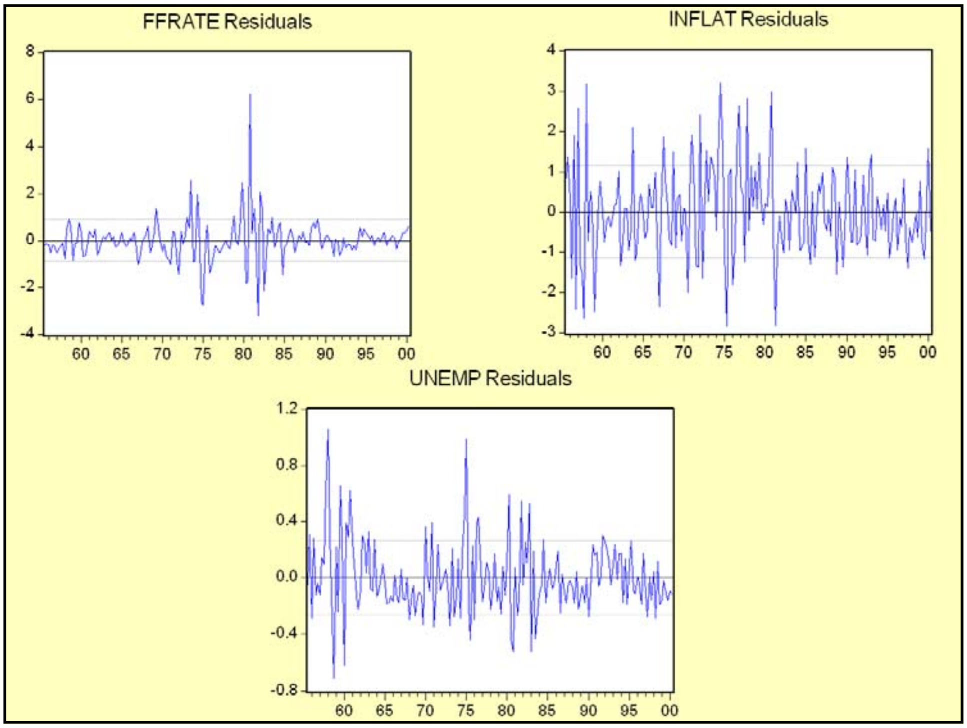
Goodness of Fit Statistics

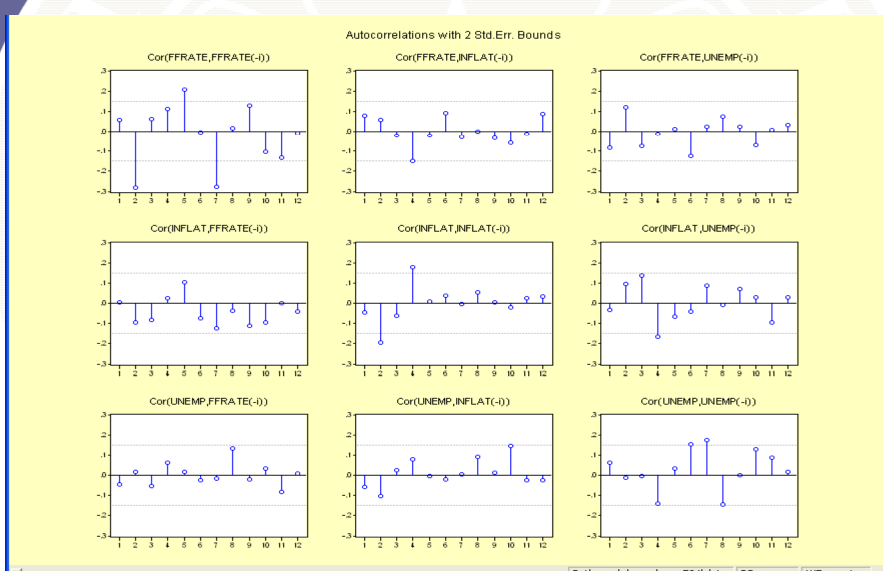
	FFRATE	INFLAT	UNEMP
R-squared	0.926086	0.784407	0.970363
Adj. R-squared	0.923523	0.776930	0.969335
Sum sq. resids	141.8205	232.6407	11.85063
S.E. equation	0.905413	1.159631	0.261726
F-statistic	361.2617	104.9063	944.0548
Log likelihood	-233.9534	-278.4974	-10.55707
Akaike AIC	2.677260	3.172193	0.195079
Schwarz SC	2.801431	3.296364	0.319249
Mean dependent	6.193370	3.757697	5.892593
S.D. dependent	3.274016	2.455269	1.494611

Eigenvalues of F matrix





Residual lag correlation structure



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Pairwise Granger Causality Tests

Pairwise Granger Causality Tests
Date: 05/03/06 Time: 14:12
Sample: 1955Q1 2000Q2
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Probability
INFLAT does not Granger Cause FFRATE	180	3.58975	0.02966
FFRATE does not Granger Cause INFLAT		5.96635	0.00311

Pairwise Granger Causality Tests
Date: 05/03/06 Time: 14:14
Sample: 1955Q1 2000Q2
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Probability
UNEMP does not Granger Cause FFRATE	180	5.28080	0.00593
FFRATE does not Granger Cause UNEMP		13.0718	5.1E-06

Pairwise Granger Causality Tests
Date: 05/03/06 Time: 14:15
Sample: 1955Q1 2000Q2
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Probability
UNEMP does not Granger Cause INFLAT	180	2.98796	0.05297
INFLAT does not Granger Cause UNEMP		6.55952	0.00179

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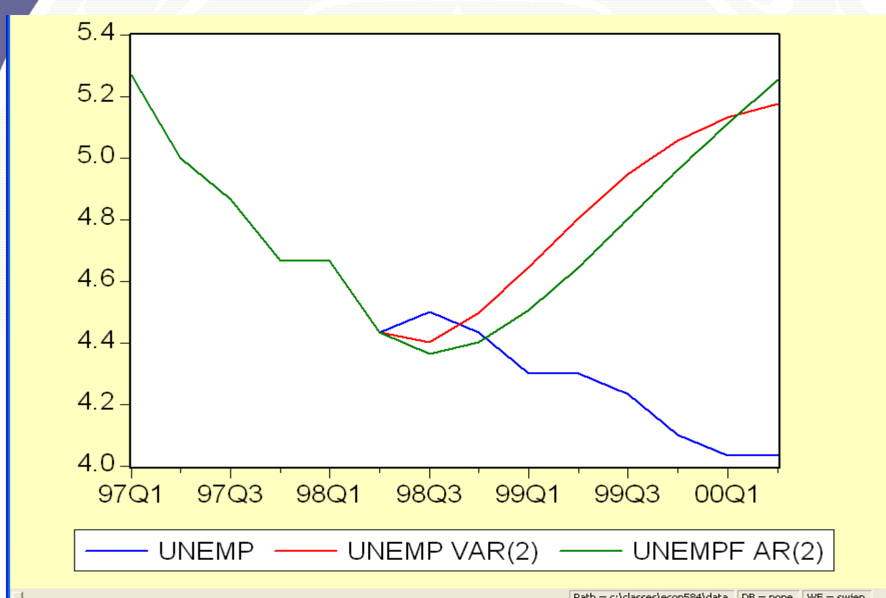
VAR(2) and AR(2) forecasts for u_t



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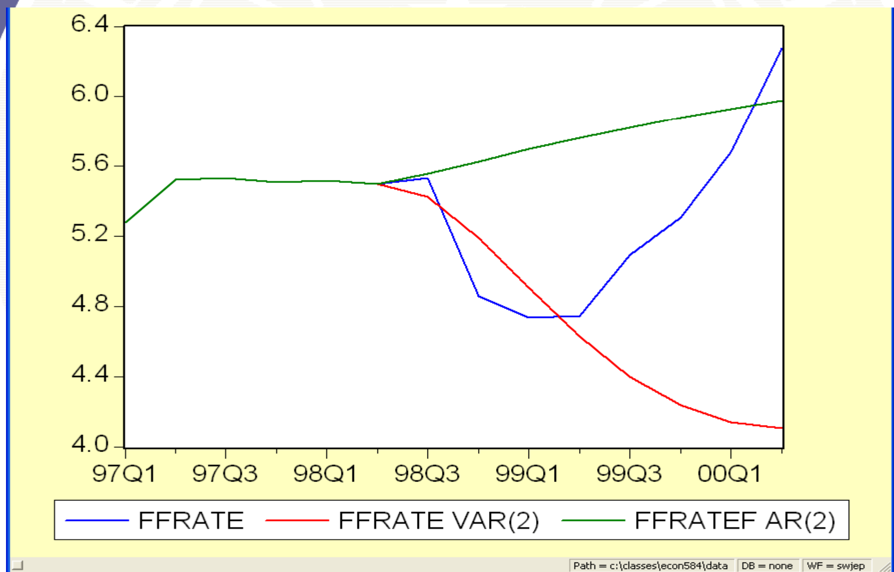
VAR(2) and AR(2) forecasts for r_t



VAR(2) and AR(2) forecast for π_t