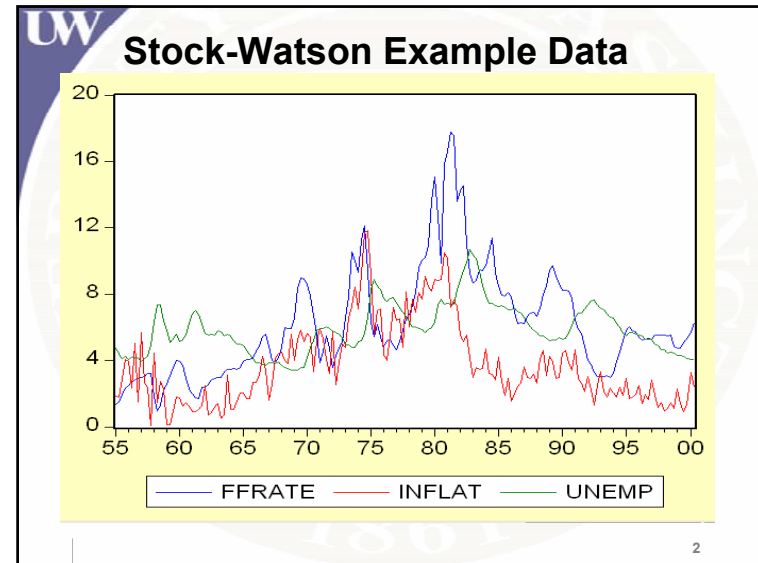


Econ 584
Time Series Econometrics
Structural VAR Models
 Eric Zivot
 May 10, 2006

1





Estimate VAR(4)

$$Y_t = c + \Pi_1 Y_{t-1} + \dots + \Pi_4 Y_{t-4} + u_t$$

$$Y_t = (\pi_t, u_t, r_t)'$$

1960 : I – 2000 : IV

3


EVIEWS - [Var: VAR01 Workfile: SWJEP:swjep]

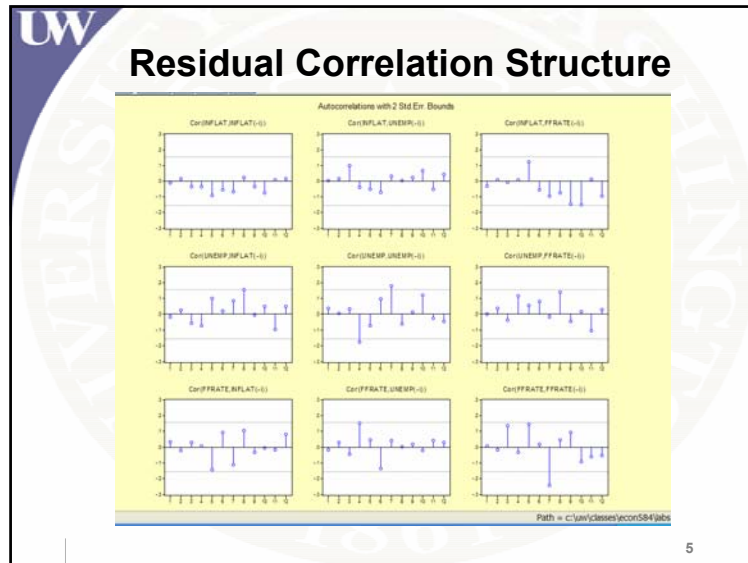
Vector Autoregression Estimates
 Date: 02/22/02 Time: 15:02
 Sample: 1960:1 2000:4
 Included observations: 164
 Standard errors in () & t-statistics in []

	INFLAT	UNEMP	FFRATE
INFLAT(-1)	0.546002 (0.07806) [6.94890]	0.030733 (0.01870) [1.64377]	0.086682 (0.06935) [1.24984]
INFLAT(-2)	0.075629 (0.08941) [0.84583]	-0.030821 (0.02125) [-1.45026]	0.193629 (0.07884) [2.45610]
INFLAT(-3)	0.111728 (0.09006) [1.24052]	0.029789 (0.02141) [1.39157]	-0.078252 (0.07941) [-0.98541]
INFLAT(-4)	0.266906 (0.08228) [3.24007]	-0.024084 (0.01956) [-1.23145]	-0.027216 (0.07255) [-0.37514]
UNEMP(-1)	-0.938366 (0.37394) [-2.51010]	1.484507 (0.08886) [16.7070]	-1.565494 (0.32961) [-4.74955]
UNEMP(-2)	1.639962 (0.63332) [2.58946]	-0.570681 (0.15053) [-3.79112]	1.701520 (0.55840) [3.04716]

UNEMP(-3)	-1.453189 (0.61834) [-2.35014]	0.082707 (0.14697) [0.56274]	-0.882607 (0.54519) [-1.61890]
UNEMP(-4)	0.587782 (0.34458) [1.70581]	-0.053440 (0.08190) [-0.65250]	0.626826 (0.30381) [2.06321]
FFRATE(-1)	0.227701 (0.10046) [2.26651]	-0.003358 (0.02388) [-0.14061]	0.948524 (0.08858) [10.7084]
FFRATE(-2)	-0.228725 (0.13458) [-1.69956]	0.050389 (0.03199) [1.57529]	-0.381030 (0.11866) [-3.21117]
FFRATE(-3)	0.062624 (0.13390) [0.46768]	-0.020360 (0.03183) [-0.63971]	0.332095 (0.11806) [2.81287]
FFRATE(-4)	-0.069266 (0.10242) [-0.67630]	0.005464 (0.02434) [0.22444]	0.029857 (0.09030) [0.33064]
C	1.027154 (0.37358) [2.74946]	0.101297 (0.08880) [1.14079]	0.505753 (0.32939) [1.53544]

R-squared 0.850962 0.977176 0.929424
 Adj. R-squared 0.839117 0.975362 0.925815
 Sum sq. resid. 150.0709 8.478154 116.0630
 S.E. equation 0.966819 0.236953 0.878978

4



5

Recursive Structural VAR

$$\pi_t = c_1 + \text{lags of } \pi_t, u_t, r_t + \varepsilon_{1t}$$

$$u_t = c_2 - b_{21}\pi_t + \text{lags of } \pi_t, u_t, r_t + \varepsilon_{2t}$$

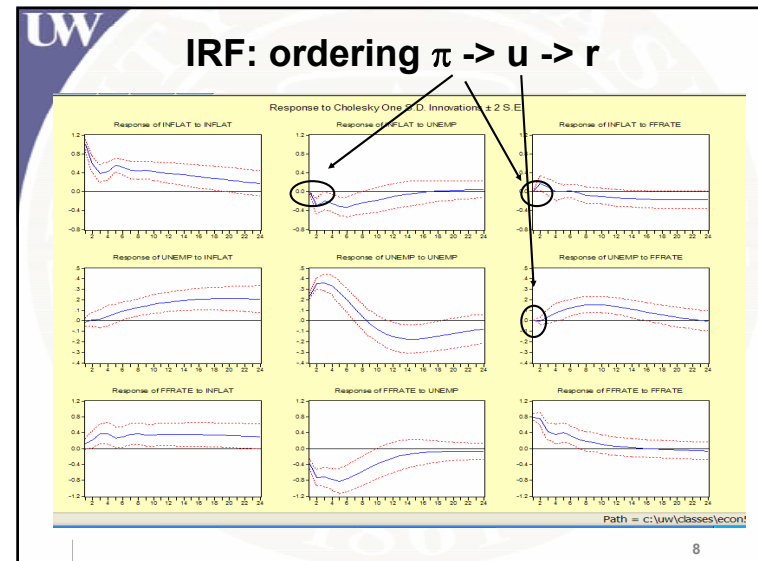
$$r_t = c_3 - b_{31}\pi_t - b_{32}u_t + \text{lags of } \pi_t, u_t, r_t + \varepsilon_{3t}$$

$$\begin{pmatrix} \varepsilon_{1t} \\ \varepsilon_{2t} \\ \varepsilon_{3t} \end{pmatrix} \sim iid \begin{pmatrix} \begin{pmatrix} 0 \\ 0 \\ 0 \end{pmatrix}, \begin{pmatrix} \sigma_1^2 & 0 & 0 \\ 0 & \sigma_1^2 & 0 \\ 0 & 0 & \sigma_1^2 \end{pmatrix} \end{pmatrix}$$

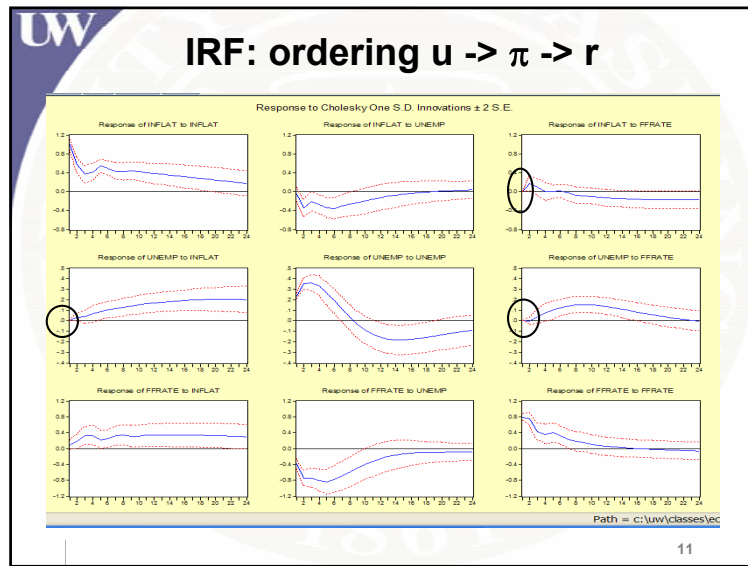
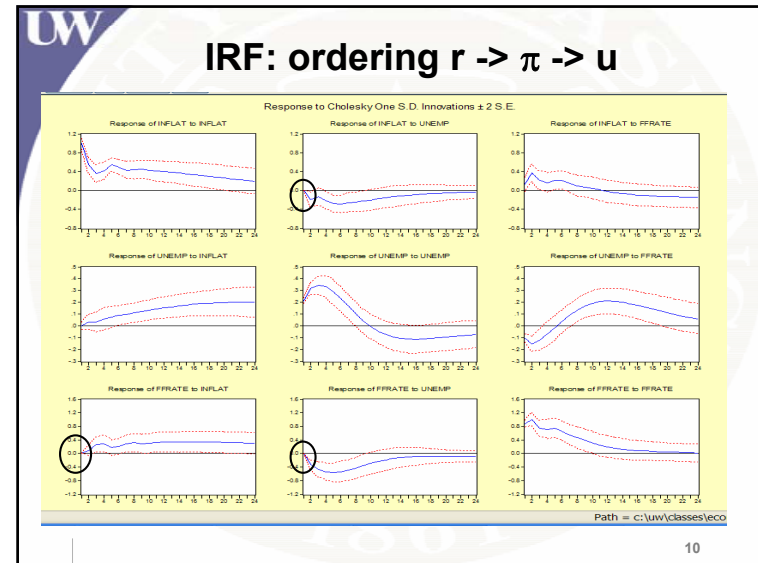
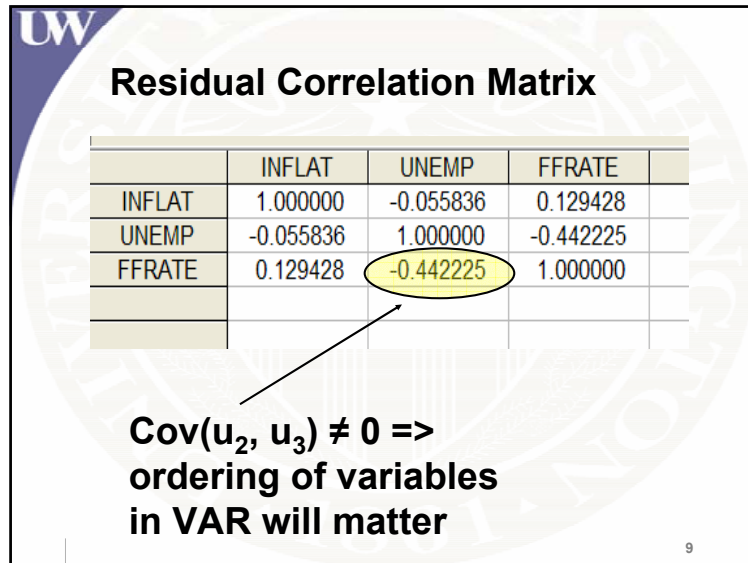
6

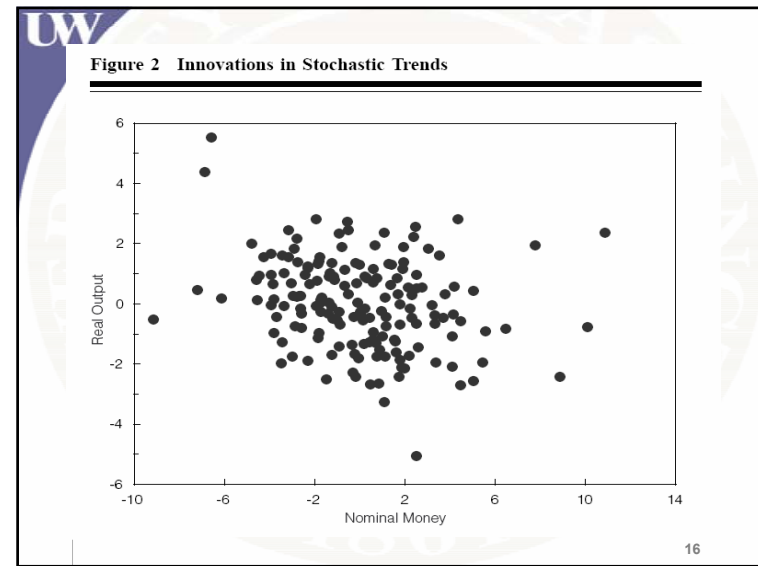
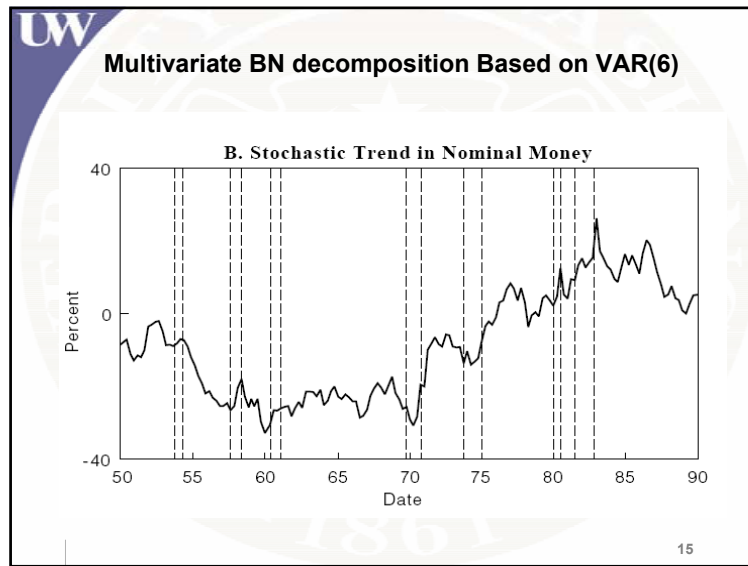
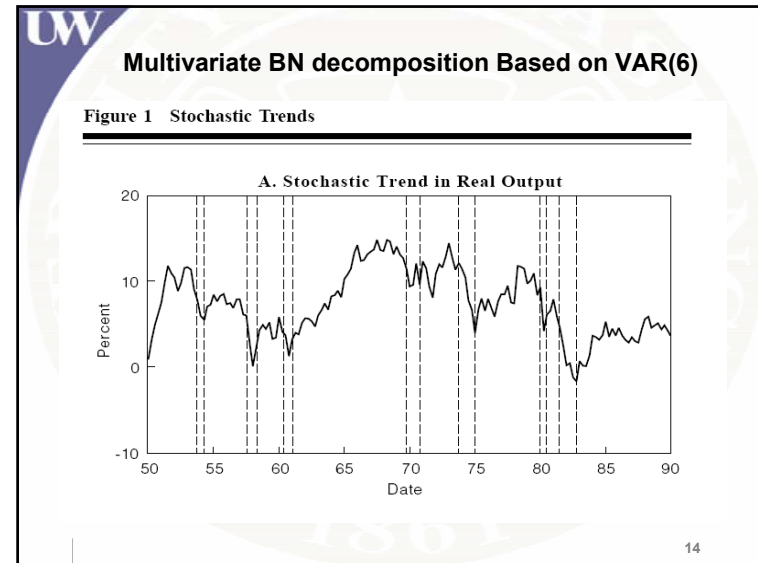
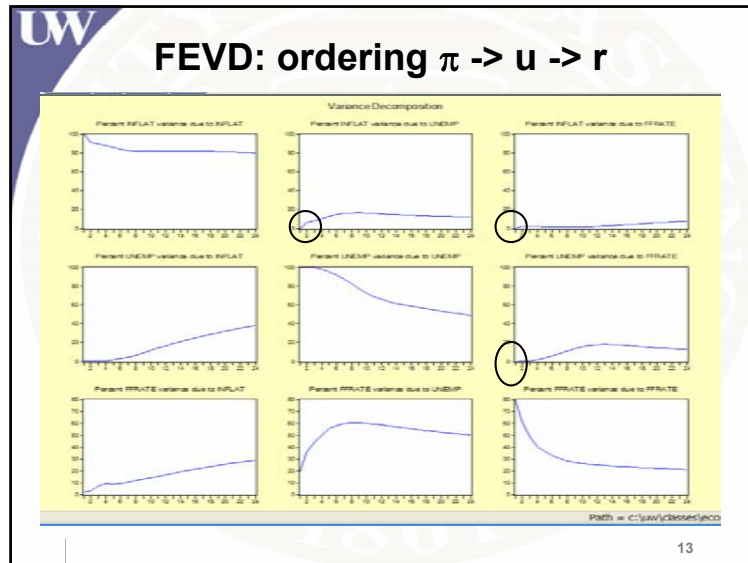
Compute Impulse Responses

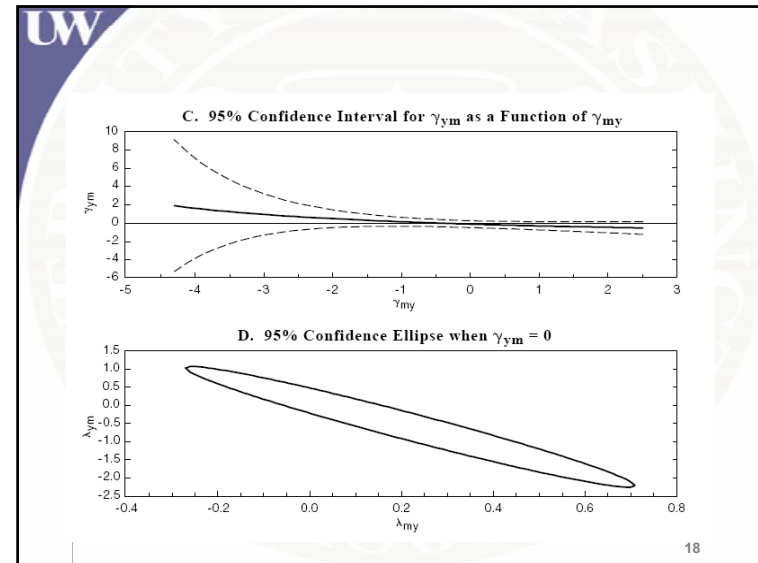
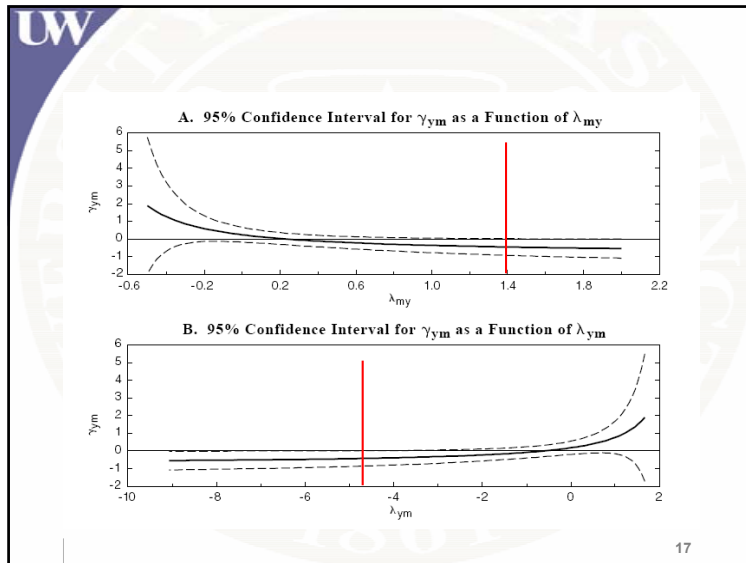
7



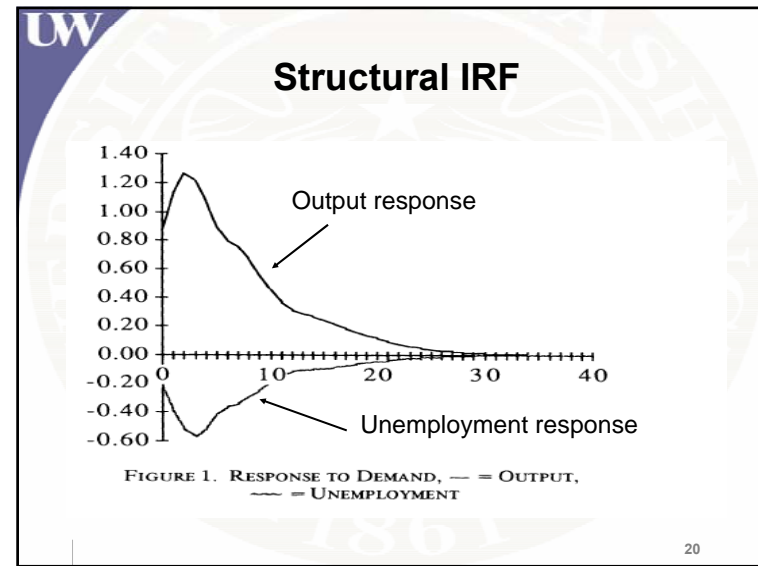
8

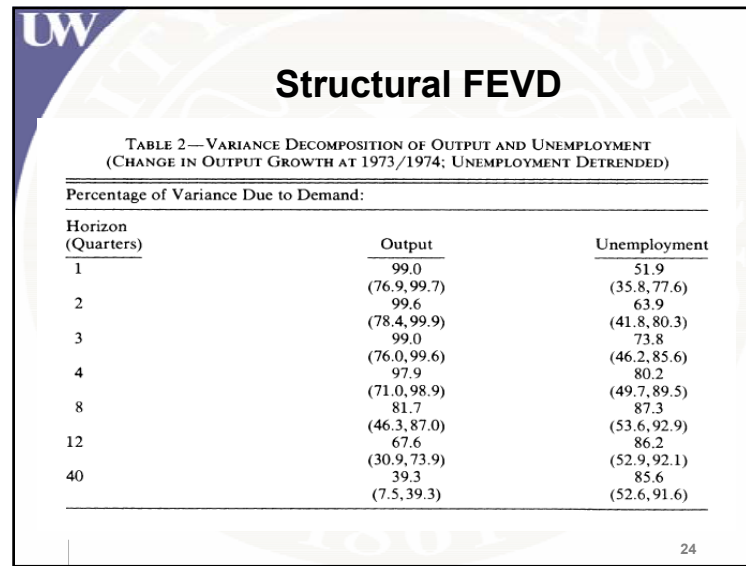
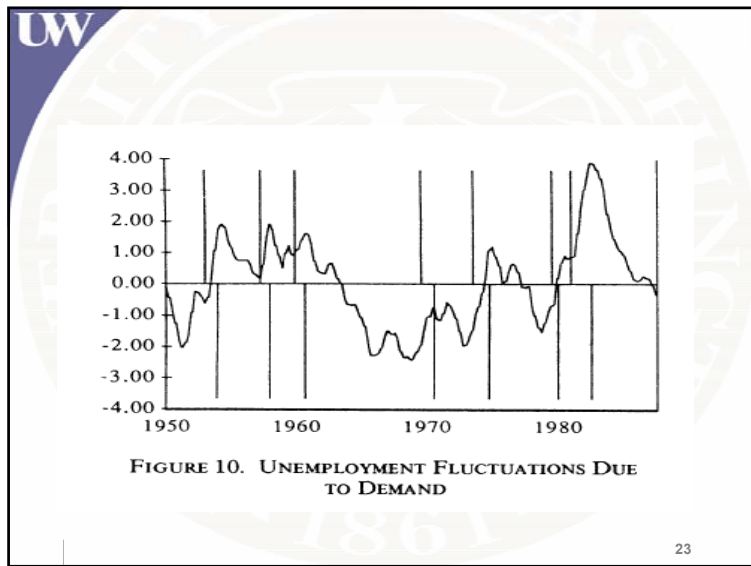
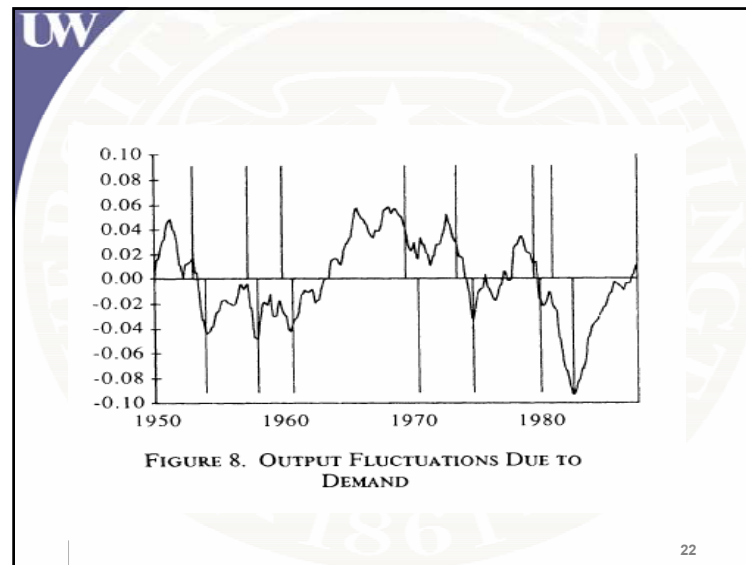
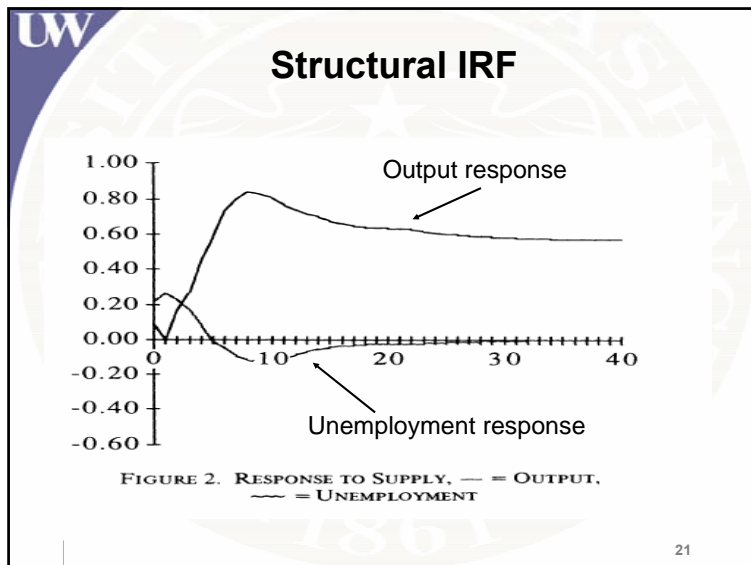






- Blanchard-Quah AER 1989
The Dynamic Effects of Demand and Supply Disturbances
- ▣ Bivariate SVAR with long-run restrictions
 - ▣ Postwar quarterly real GNP
 - ▣ Male, age 20 & over, unemployment rate
 - ▣ Allow for trend break in unemployment in 1973
 - ▣ Estimate VAR(8): 1950:2 – 1987:4
 - ▣ Identify SVAR by assuming that shocks to unemployment have not long-run effect on output
- 19





BQ Conclusions

- ▣ Demand shocks have humped shape effect on output and unemployment that vanishes after 3 years
- ▣ Supply shock have permanent effect on output after 5 years
- ▣ Demand shocks contribute substantially to output variability in the short run
- ▣ Results are not very precise