Sticky Prices and Monetary Policy: Evidence from Disaggregated U.S. Data

by Boivin, Giannoni and Mihov

Comments by Mark Watson
12/2/2006

Questions addressed by BGM:

1. How sticky are prices? (Aggregate / Disaggregate)

2. How quickly do prices respond to shocks? (Which shocks?)

Framework used by BGM:

1. Dissagregated prices with factor model.

2. Monetary policy shocks estimated using a FAVAR.

My comments:

1. “Review” some empirical literature on price stickiness.

2. BGMs explanation of existing empirical results.

3. Temporal Stability

“Review” some empirical literature on price stickiness.

Disaggregated data:

Bills and Klenow: Prices change all the time

(or at least much more frequently than you thought !)

Aggregate Data:

Nelson and Schwert: Inflation follows an ARIMA(0,1,1) model

This implies

$$\pi_t = \tau_t + \eta_t$$
$$\tau_t = \tau_{t-1} + \varepsilon_t$$

$(\eta_t, \varepsilon_t) \sim$ white noise.

Persistence depends on the "size" of the unit component τ_t, that is the variance of ε_t relative to the variance of η_t.

BGM model

$$\Pi_t = \Lambda C_t + e_t$$

Π_t: large vector of disaggregated prices

C_t: small number macro of "factors"

ΛC_t: common components

e_t: idiosynchratic components.

BGM Model: $\pi_{it} = \lambda_i' C_t + e_{it}$

BGM Results:

(1) (a) var(e_{it}) is relatively large
(b) var($\lambda_i' C_t$) is relatively small

(2) (a) e_{it} is not persistent (white noise is not bad model)
(b) $\lambda_i' C_t$ is much more persistent

BGM reconciliation of disaggregate/aggregate results

$\pi_{it} = \lambda_i' C_t + e_{it}$; e_{it} large and not persistent (not sticky)

$\lambda_i' C_t$ small and persistent (sticky)

Dissagregated data: $\pi_{it} \approx e_{it}$

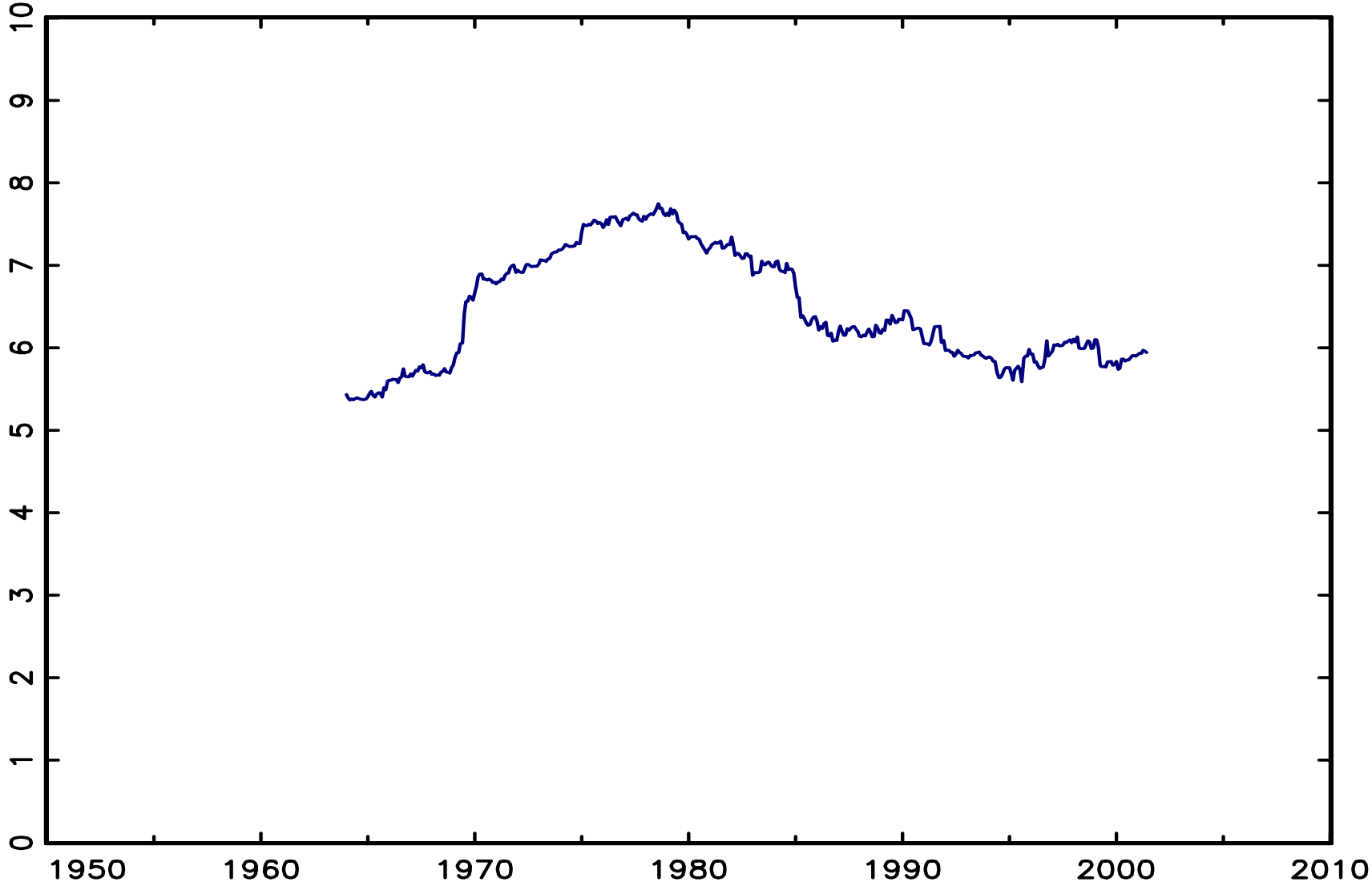
Aggregated data: $\pi_t = \sum w_i \pi_{it} = \sum w_i \lambda_i' C_t + \sum w_i e_{it}$

Variance of $\sum w_i e_{it}$ is much smaller than var(e_{it}).

Persistent component $\sum w_i \lambda_i' C_t$ is relatively much more important.

Stability: Disaggregated data 10-year rolling estimates of SD(π_{it})

Median (over n = 205 sectors, monthly PCE deflator components − 1960-2006)


0
1
2
3
4
5
6
7
8
9
10
1950
1960
1970
1980
1990
2000
2010

Aggregate data: Nelson and Schwert: Inflation follows an ARIMA(0,1,1) model

which implies

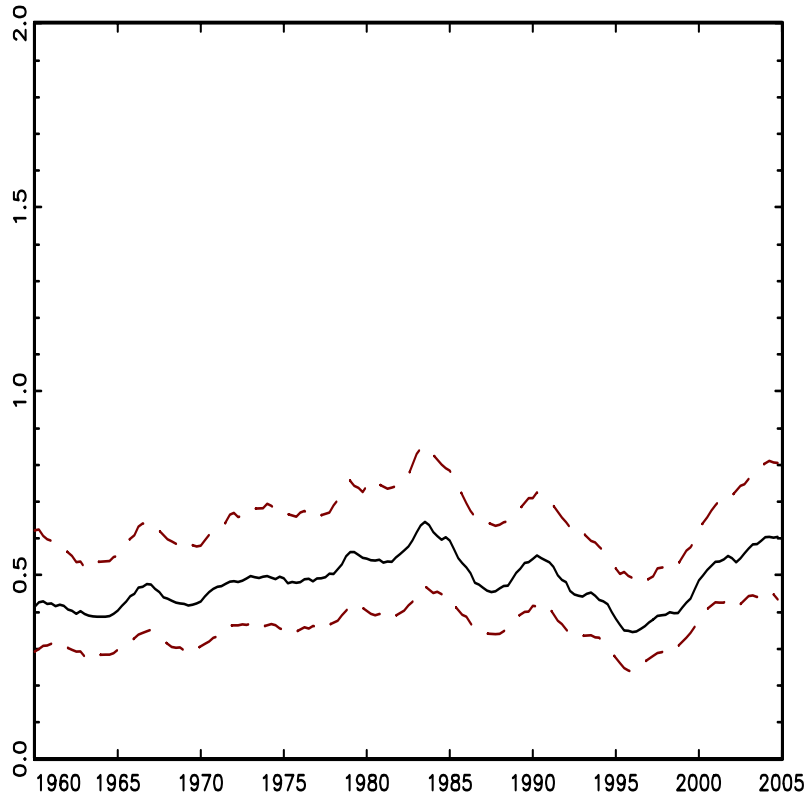
$$\pi_t = \tau_t + \eta_t$$
$$\tau_t = \tau_{t-1} + \varepsilon_t$$

$(\eta_t, \varepsilon_t) \sim$ white noise.

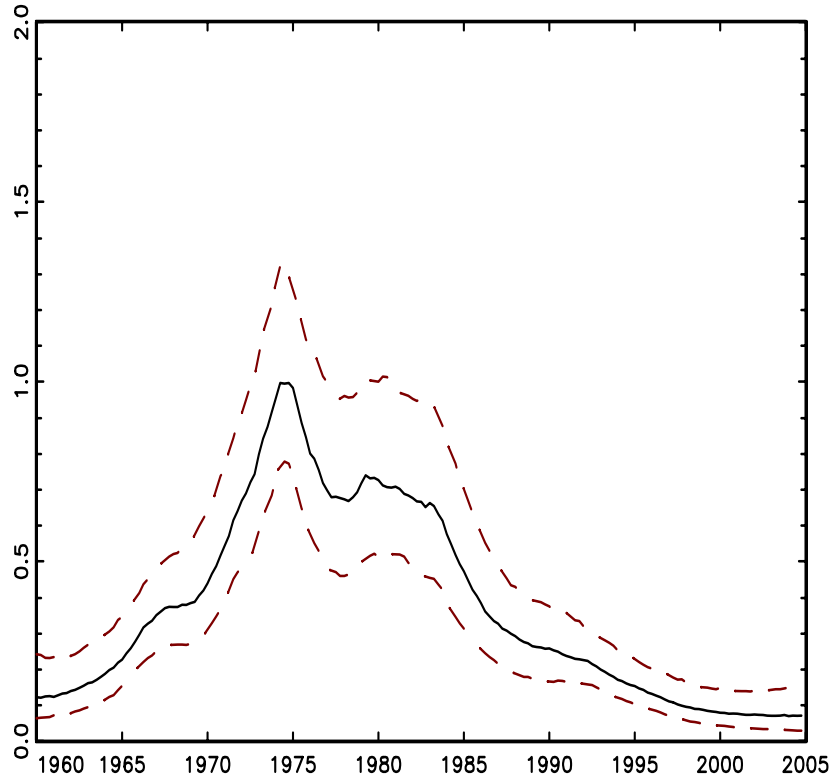
Estimates of $\sigma_\eta(t)$ and $\sigma_\varepsilon(t)$ from Stock-Watson (2005)

PCE Deflator

SD (η)



SD (ε)

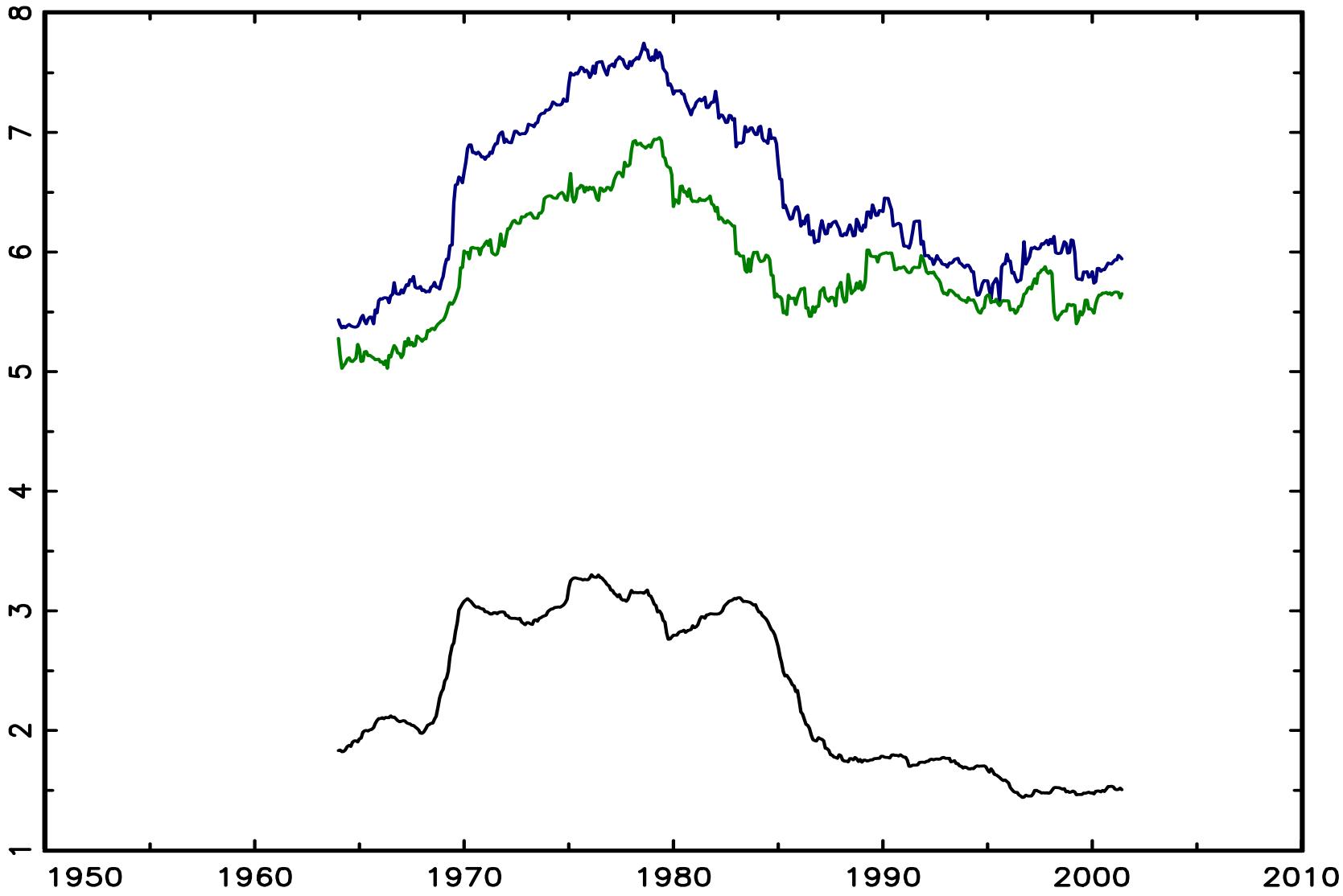


BGM Model: $\pi_{it} = \lambda_i' C_t + e_{it}$

Disaggregated data 10-year rolling estimates of

SD(π_{it}), SD($\lambda_i' C_t$) and SD(e_{it})

Median (over n = 205 sectors, monthly PCE deflator components − 1960-2006)


8
7
6
5
4
3
2
1
1950
1960
1970
1980
1990
2000
2010

Summary:

1. $\pi_{it} = \lambda_i' C_t + e_{it}$ is a useful characterization of disaggregated prices

2. What is $\lambda_i' C_t$?

Reis-Watson: $\pi_{it} = n_t + r_{it}$

n_t = "numeraire" inflation

r_{it} = relative price inflation