# Discussion of:
# "Reset Price Inflation and the Impact of Monetary Policy Shocks"
# by Bils, Klenow and Malin

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# PREMISE

Main two ways of generating large monetary non-neutrality:

- Time dependent pricing
- Strategic complementarities

This paper:

- Investigates “telltale implications” of these modeling features
- Persistence and volatility of inflation and ”rest price inflation”

Positive economics at its best!

# Reset Price Inflation

- Theoretically: Price firm would set if it changed today
- Empirically:

$$\hat{p}^*_{i,t} = \begin{cases} p_{i,t} & \text{if } p_{i,t} \neq p_{i,t-1} \\ \hat{p}^*_{i,t-1} + \hat{\pi}^*_t & \text{if } p_{i,t} = p_{i,t-1} \end{cases}$$

- Imputes to all items both changing and not, the reset price changes of changers ($\hat{\pi}^*_t$)
- Example: Calvo model, no strategic complementarity, frequency of price change is $f$, permanent increase in money supply $\Delta m$.
  - Actual inflation: $f\Delta m$, $(1-f)f\Delta m$, $(1-f)^2 f\Delta m$, etc.
  - Reset inflation: $\Delta m$, 0 , 0, ...

TABLE

Main Results

| | Data | Calvo | | Menu Cost | |
|---|---|---|---|---|---|
| | Ex. Sales | No SC | SC | No SC | SC |
| Reset Price Inflation | | | | | |
| Standard Deviation | 1.13% | 0.50% | 0.28% | 1.58% | 0.42% |
| | (0.05) | (0.03) | (0.01) | (0.08) | (0.02) |
| Autocorrelation | -0.43 | -0.04 | -0.02 | -0.32 | -0.19 |
| | (0.05) | (0.07) | (0.07) | (0.06) | (0.06) |
| Inflation | | | | | |
| Standard Deviation | 0.14% | 0.12% | 0.08% | 0.28% | 0.11% |
| | (0.01) | (0.01) | (0.01) | (0.02) | (0.01) |
| Autocorrelation | -0.06 | 0.73 | 0.8 | 0.38 | 0.86 |
| | (0.06) | (0.05) | (0.05) | (0.07) | (0.03) |

# Main Conclusion

- None of the models match empirical features of PI and RPI
- TDP and strategic complementarities make things worse

- Mainly a negative paper
- Or perhaps: Measurement is ahead of theory

# My Comments

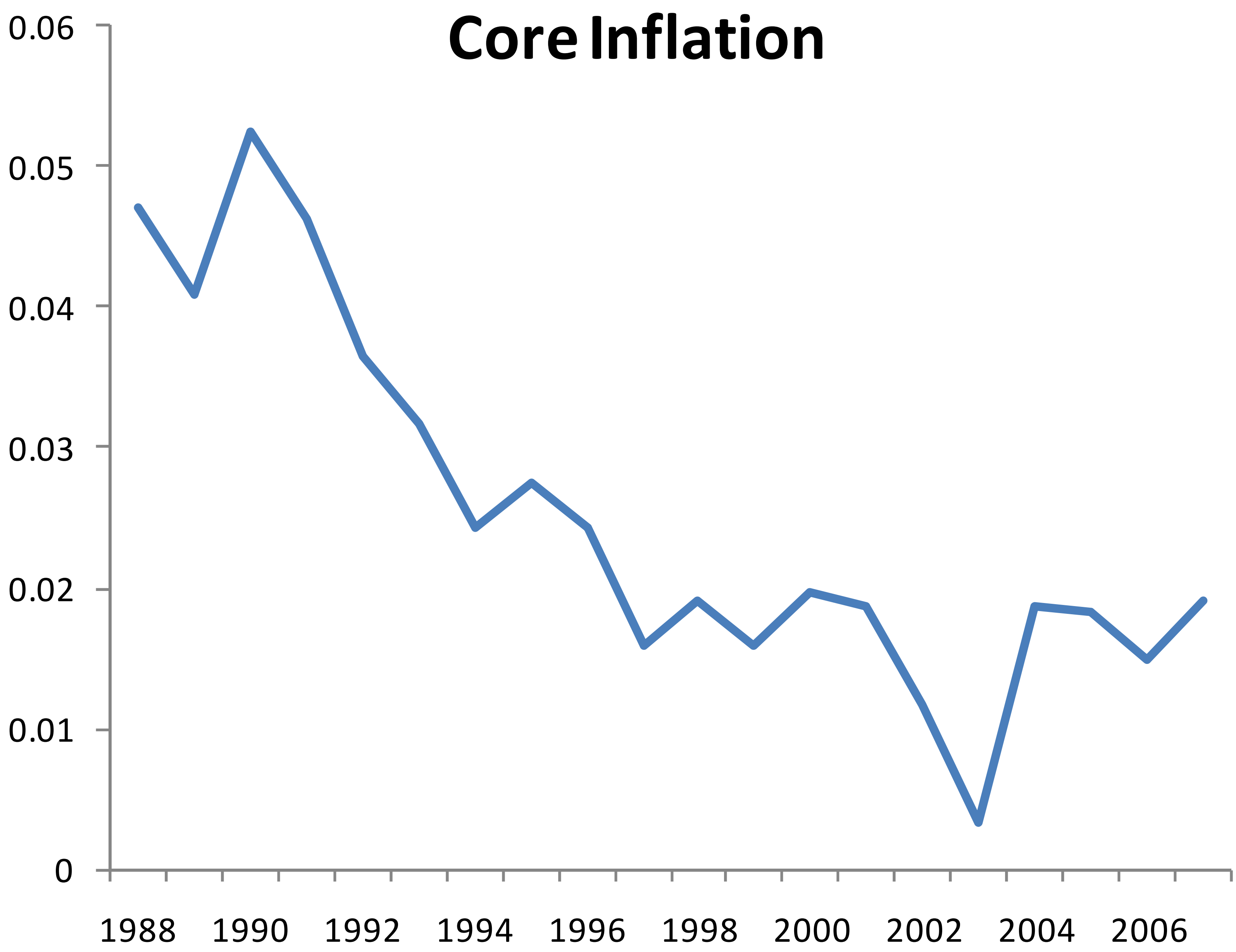
- Persistence of inflation at different frequencies
- Sampling error
- Internal vs. external persistence

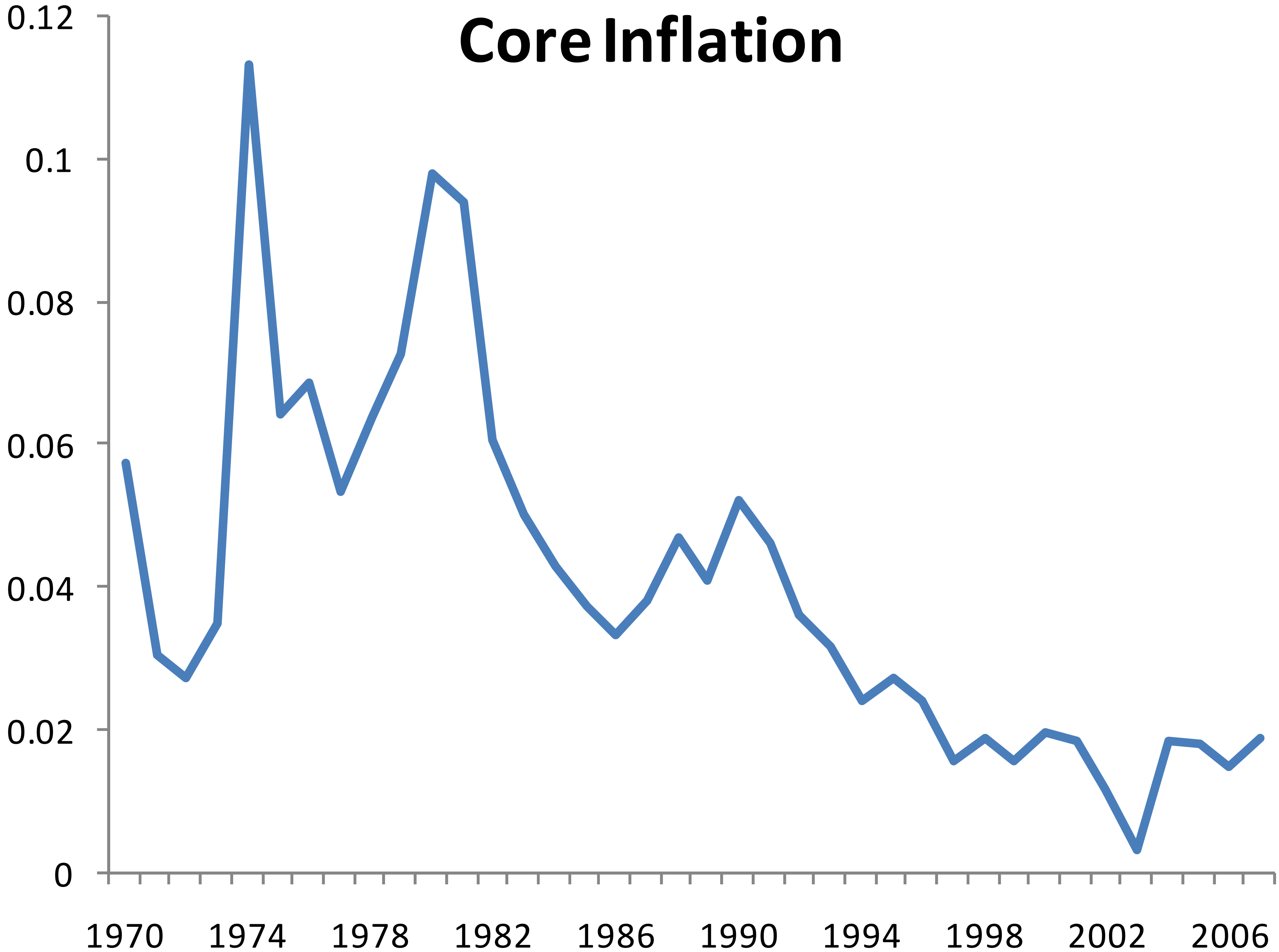
TABLE

Inflation Persistence

| | HP-filtered | | Not HP-filtered | |
|---|---|---|---|---|
| | Monthly | Annual | Monthly | Annual |
| BKM inflation | -0.06 | | | |
| CPI | 0.24 | 0.36 | 0.30 | 0.43 |
| CPI not s.a. | 0.34 | 0.39 | 0.38 | 0.46 |
| CPI core | 0.07 | 0.55 | 0.44 | 0.86 |
| CPI core not s.a. | 0.40 | 0.50 | 0.47 | 0.84 |
| Calvo No SC | 0.73 | -0.02 | | |
| Calvo SC | 0.80 | 0.02 | | |
| Menu Cost No SC | 0.38 | -0.01 | | |
| Menu Cost SC | 0.73 | 0.09 | | |

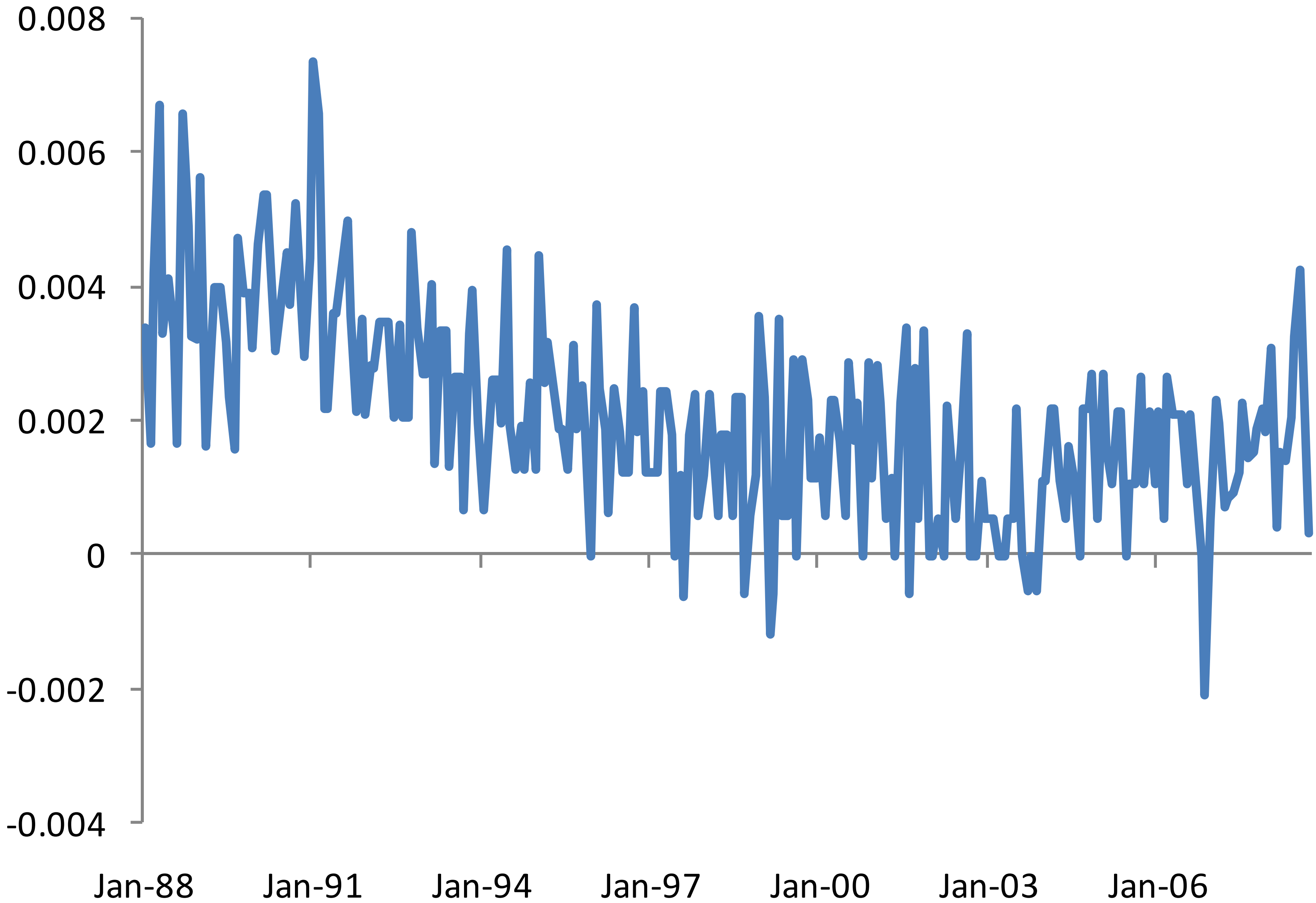
HP-filter, Seasonality, processed food,
weights, sampling error

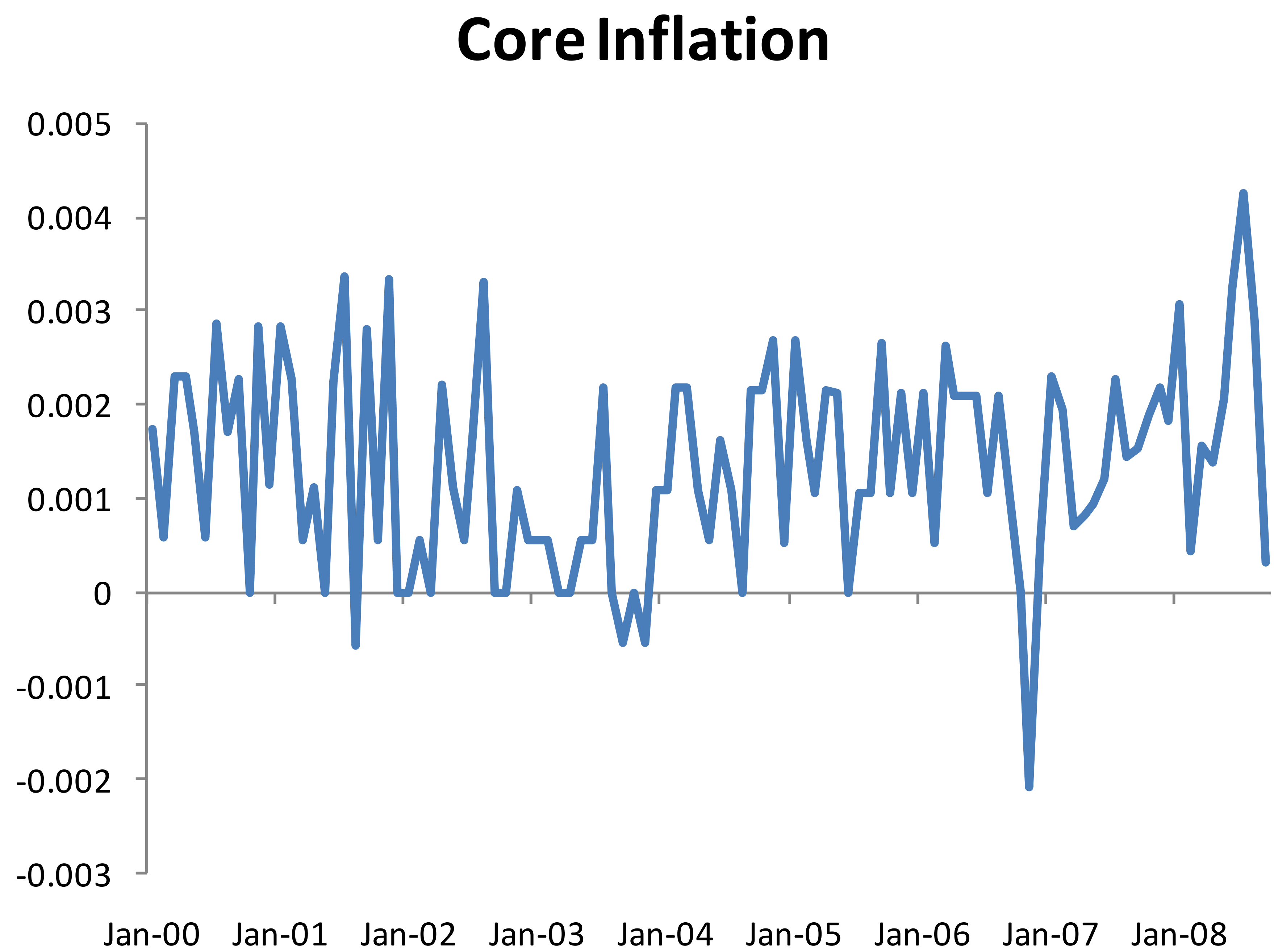

Core Inflation
0.06
0.05
0.04
0.03
0.02
0.01
0
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006



Core Inflation
0.12
0.1
0.08
0.06
0.04
0.02
0
1970
1974
1978
1982
1986
1990
1994
1998
2002
2006

# Core Inflation




Core Inflation
0.005
0.004
0.003
0.002
0.001
0
-0.001
-0.002
-0.003
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08

# Inflation Persistence

Data:

- High persistence at annual frequency
- Low persistence at monthly frequency

Models:

- Too much inflation persistence at monthly frequency
- Too little inflation persistence at annual frequency

# PERSISENCE: TOO HIGH OR TOO LOW?

- Need new models?
- Different aggregate shock process?
  - Endogenous monetary policy (low growth after boom)
  - Kills volatility of inflation
- Sampling error?

TABLE

Sampling Error in CPI Data

| | 1 Month | | 12 Month | |
|---|---|---|---|---|
| | Mean Price Change | Standard Error | Mean Price Change | Standard Error |
| All items | 0.33 | 0.06 | 3.25 | 0.10 |
| Less food, energy | 0.11 | 0.08 | 2.16 | 0.13 |
| Less food, energy, shelter | 0.16 | 0.07 | 1.85 | 0.16 |

Source: BLS

BKM use only top 3 cities. Less data. More sampling error.

# SAMPLING ERROR AND RESET PRICE INFLATION

Simple example:

- Taylor pricing, 2 period contracts
- $p^*_{i,t} = m_t + A_{i,t}$
- $\Delta m_t$ constant (say equal to 1)
- $A_{i,t}$ doesn't wash out for changers ($\epsilon_t$)
- Everyone reset at time 0
- Autocorrelation of inflation = 0
- Autocorrelation of RPI = - 0.50

TABLE
Taylor Pricing Example

| Time | P1 | P2 | RP1 | RP2 | RPI |
|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | |
| 1 | $1+\varepsilon_1$ | 0 | $1+\varepsilon_1$ | $1+\varepsilon_1$ | $1+\varepsilon_1$ |
| 2 | $1+\varepsilon_1$ | $2+\varepsilon_2$ | $2+\varepsilon_2$ | $2+\varepsilon_2$ | $1+\varepsilon_2-\varepsilon_1$ |
| 3 | $3+\varepsilon_3$ | $2+\varepsilon_2$ | $3+\varepsilon_3$ | $3+\varepsilon_3$ | $1+\varepsilon_3-\varepsilon_2$ |

# Sampling Error in Models

- BKM create the same quantity of data from the models as there is real data available
- Data from models has sampling error
- Does model understate sampling error in the real data?
  - Model: Idiosyncratic shocks are uncorrelated across firms
  - Real world has sectors, variables that affect many firms
  - Model does not match distribution of size of price changes

# What do we learn?

- Low persistence of inflation and RPI at high frequency
- Models generate too much persistence at high frequency
- Stark contrast with low frequencies
- Models that do best on high freq. do worst on low freq.
- Possibilities:
  - New Models
  - More complicated aggregate shocks
  - Sampling error in monthly data