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Discussion of "Inflation and Relative Price Asymmetry" by Ratfai, A.

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Inflation and Relative Price Asymmetry

by

Attila Rátfai


Discussion by:

Daniel Levy

Lots of Work, Very Few Pages!

 Input: Clearly, Attila spent lots of time on this project

 Length: The manuscript length is a mere 20 pages


 Data: #Pages/Input-hours ratio is remarkably low.


Writing short papers is a challenge. Recall Pascal:

“I apologize for writing such a long letter. I did not have time to write a shorter letter.”

Brief Summary of the Study




 Goal: Effect of idiosyncratic shocks on SR price dynamics

 Model: Bivariate sector-level SVAR:
Inflation \leftrightarrow relative price asymmetry

 Data: Monthly store-level price data
Hungary (CPI component)
27 consumer products (food and services)
1992:1 – 1996:7 (♪125 observations/month)

Findings

- ✂ 1) Correlation (inflation, relative price asymmetry) > 0
(sector-level and store-level)

- ✂ 2) Idiosyncratic shocks account for 25%♪30% FEV in inflation
Robustness –  Identification schemes
 Definitions of relative prices
 Measures of asymmetry

- ✂ 3) Inflation responds to idiosyncratic shocks after 2♪5 months

Background

- ✂ Link between inflation and relative price variability
 - 🏛 Long history (Mills 1930s, I found few in 1920s)
 - 🏛 Friedman's oil-shock puzzle (Friedman, 1975, *Newsweek*)
 - 🏛 Ball and Mankiw's resolution of Friedman's Puzzle.

- ✂ Link between inflation and relative price asymmetry
 - 🏛 More recent literature
 - 🏛 Bryan and Cecchetti's debate with Ball and Mankiw (ReSTAT, 1999)

- ✂ Role of idiosyncratic shocks
 - 🏛 Match micro-data and macro models

This Paper

✂ Combines two of these issues

🏰 The link between inflation and relative price asymmetry

🏰 Role to Idiosyncratic shocks

✂ Neat data

🏰 Store-level observations

✂ SVAR

🏰 Identification strategy – micro-theoretical predictions

Distinguishing Characteristics 1

✂ Idiosyncratic shocks

 Existing literature (e.g., Rátfai, 2006; Dhyne, et al., 2007)
Explain individual price dynamics

 Here:
Explain inflation dynamics

Distinguishing Characteristics 2

✂ The link between inflation and relative price asymmetry

🏰 Existing literature (Sheshinski and Weiss, 1977):
Inflation → to relative price variability (i.e., inflation is assumed to be exogenous)

🏰 Few studies (Ball and Mankiw, 1994, 1995)
Relative price variability → inflation (i.e., relative price variability is assumed to be exogenous)

🏰 Attila: *Both are endogenous*
Inflation ↔ to relative price variability (see Fischer, 1981)

Relative Price Variability → Inflation

✂ Relative price variability can affect the inflation, if for example, prices are rigid downwards.

🏰 Consider the effect of a shock to the desired relative prices.

🏰 The shock alters nominal prices as follows:

With flexible prices, some prices increase & others decrease.
If, however, prices are rigid downward, then prices will only increase, leading to inflation.

🏰 Note: this applies in the SR only.

Inflation → Relative Price Variability

- ✂ Inflation can affect relative price variability in a state-dependent model (with menu cost and range of inaction) in two ways:
 - 🏰 If the shocks to desired prices have a symmetric distribution but a trend-inflation is present
 - 🏰 If the shocks to desired prices have an asymmetric distribution

Symmetric Distr. & Trend-Inflation 1

✂ If the distribution of shocks to desired relative prices is symmetric, then, with trend-inflation,

👑 positive shocks trigger greater adjustment than negative shocks

👑 The ongoing inflation reduces the relative price, and so a negative shock to the desired relative price requires no action: the inflation does the work.

👑 A positive shock, however, increases the gap between the desired price and the actual price

Symmetric Distr. & Trend-Inflation 2

- ✂ The result is that the price setter needs to respond to a positive shock because otherwise the gap between the optimal relative price (which is now higher) and the actual relative price (which is shrinking because of the ongoing inflation) gets bigger and bigger.

Therefore, positive shocks are more likely to induce a price adjustment than negative shocks.

Asymmetric Distr. (No Trend-Inflation) 1

✂ This is the approach taken in Attila's paper.

✂ Firms are hit with a distribution of shocks to desired prices
(Ball and Mankiw, 1995)

🏰 Assume: mean of desired change = 0
i.e., if all prices were adjusted, $\Delta(\text{average price level}) = 0$

🏰 Assume: menu cost \rightarrow range of inaction (assume symmetric)
Firms adjust only if the desired change exceeds the cutoff

Asymmetric Distr. (No Trend-Inflation) 2

- ✂ If the distribution of the shocks were *symmetric*, then there would be *no effect on the distribution of relative prices*. Both tails would be affected *proportionally*, and therefore, *no skewness* would be observed.

Asymmetric Distr. (No Trend-Inflation) 3

✂ If the distribution of the shocks are asymmetric, then there will be a change in the skewness of the distribution of relative prices.

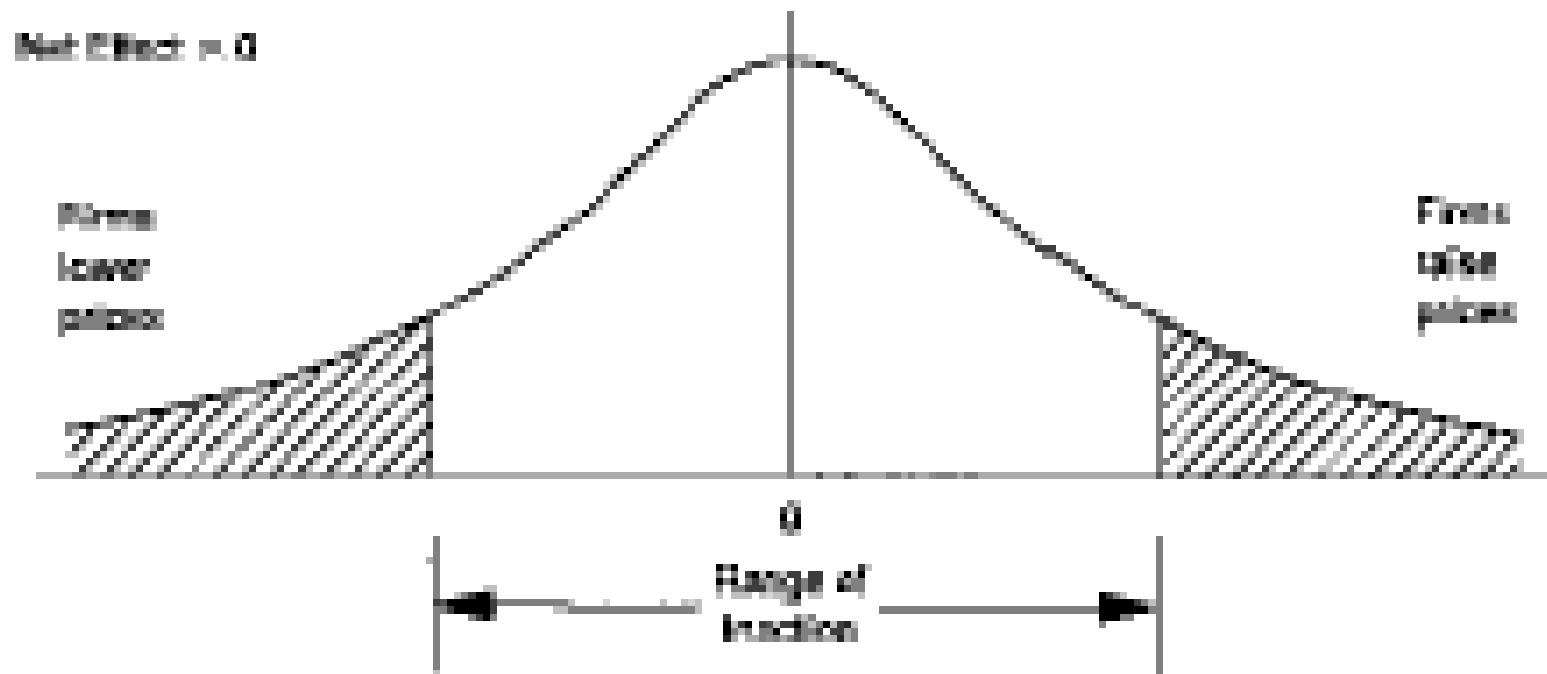
In particular, if the distribution of the shocks is skewed to the right, then the upper tail is larger than the lower tail. That is, more prices rise than fall. Therefore, the price level will increase.

In sum: if the distribution of the shocks to the desired prices is skewed to the right, the price level will increase and if it is skewed to the left, then the price level will decrease.

Skewness' Effect on the Price Level 1

Ball and Mankiw (1995)

A. Symmetric Distribution of Shocks

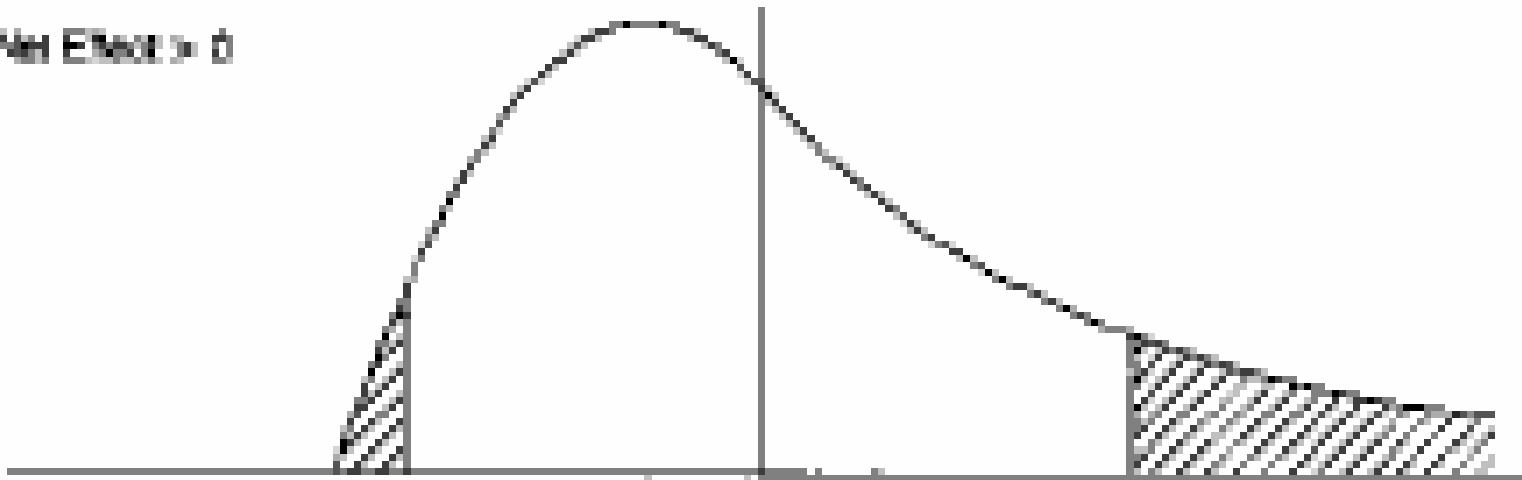


Symmetric Distribution of Shocks

Skewness' Effect on the Price Level 2

B. Skewed to Right

Net Effect > 0



Skewed to Right

Skewness' Effect on the Price Level 3

C. Skewed to Left:

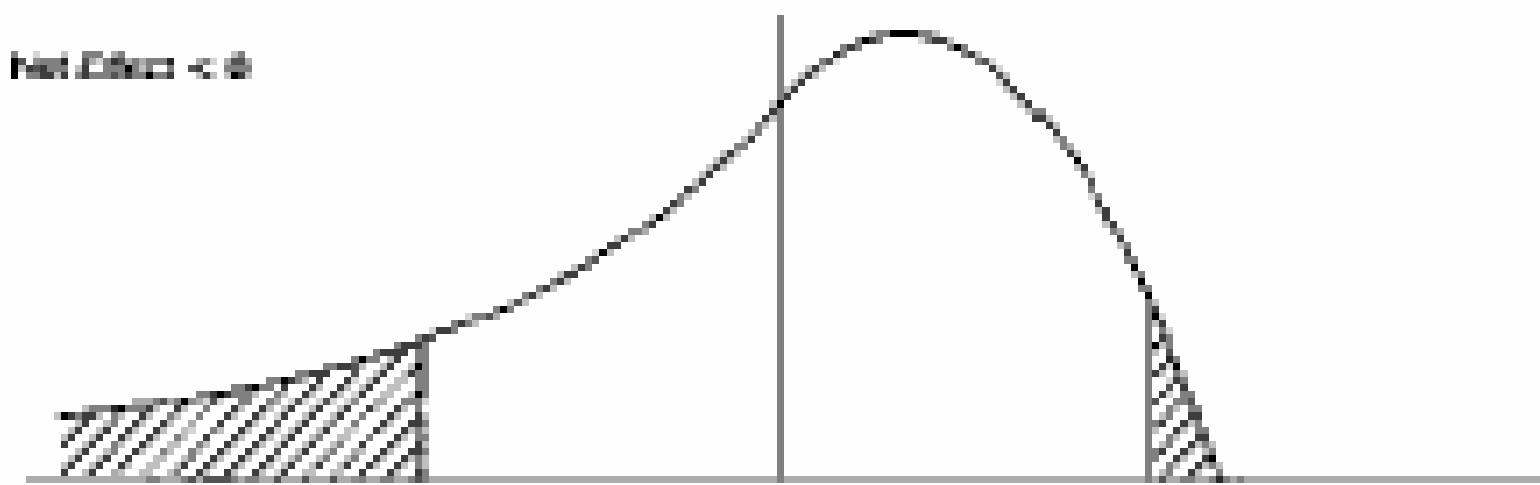


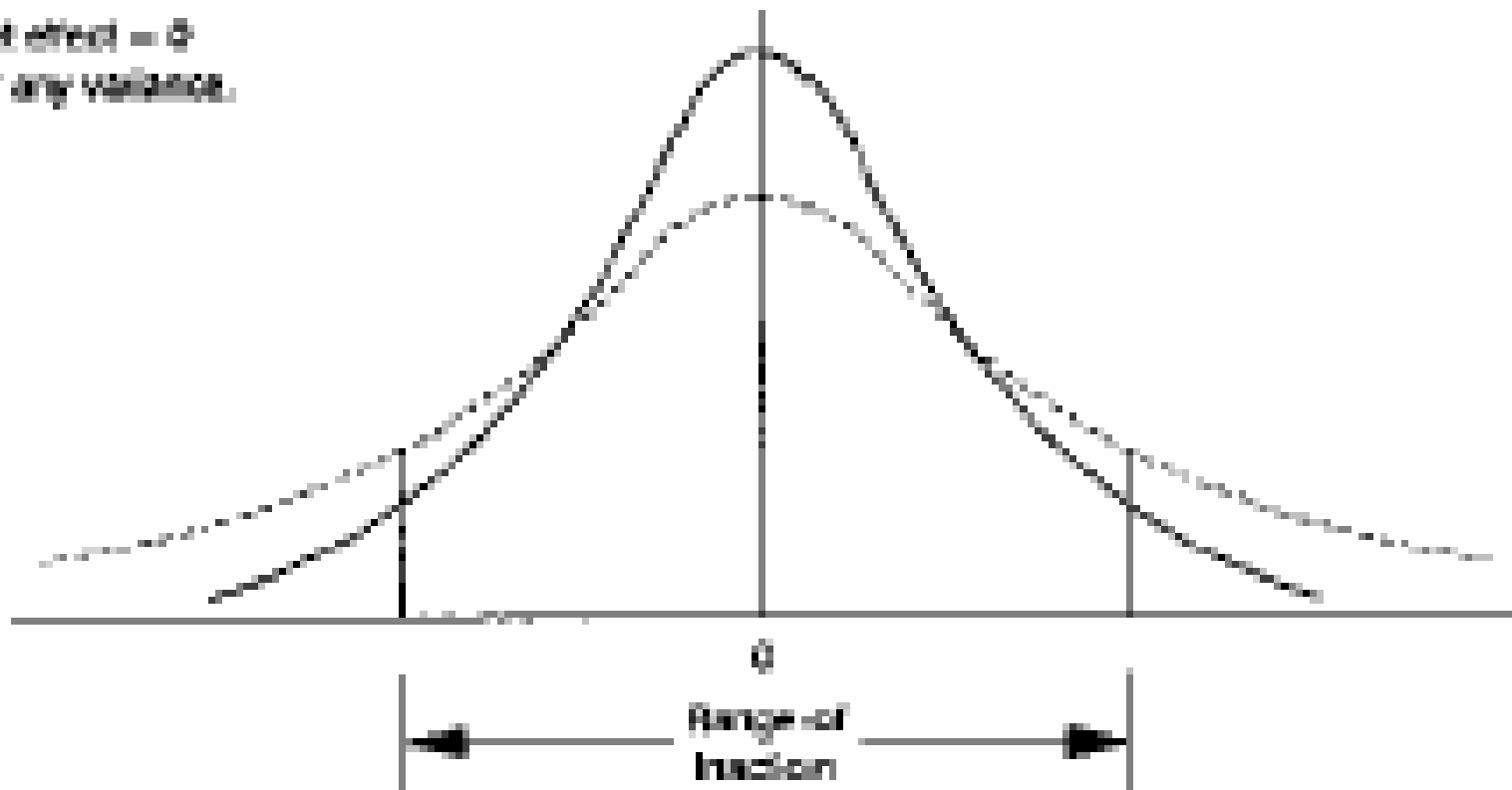
FIGURE 1

Skewed to Left

Inflation and Price Change Variance 1

A. Symmetric Distribution

Net effect = 0
for any variance.



Symmetric Distribution of Shocks

Inflation and Price Change Variance 2

B. Skewed Distribution

Greater variance
magnifies effect
of asymmetry.

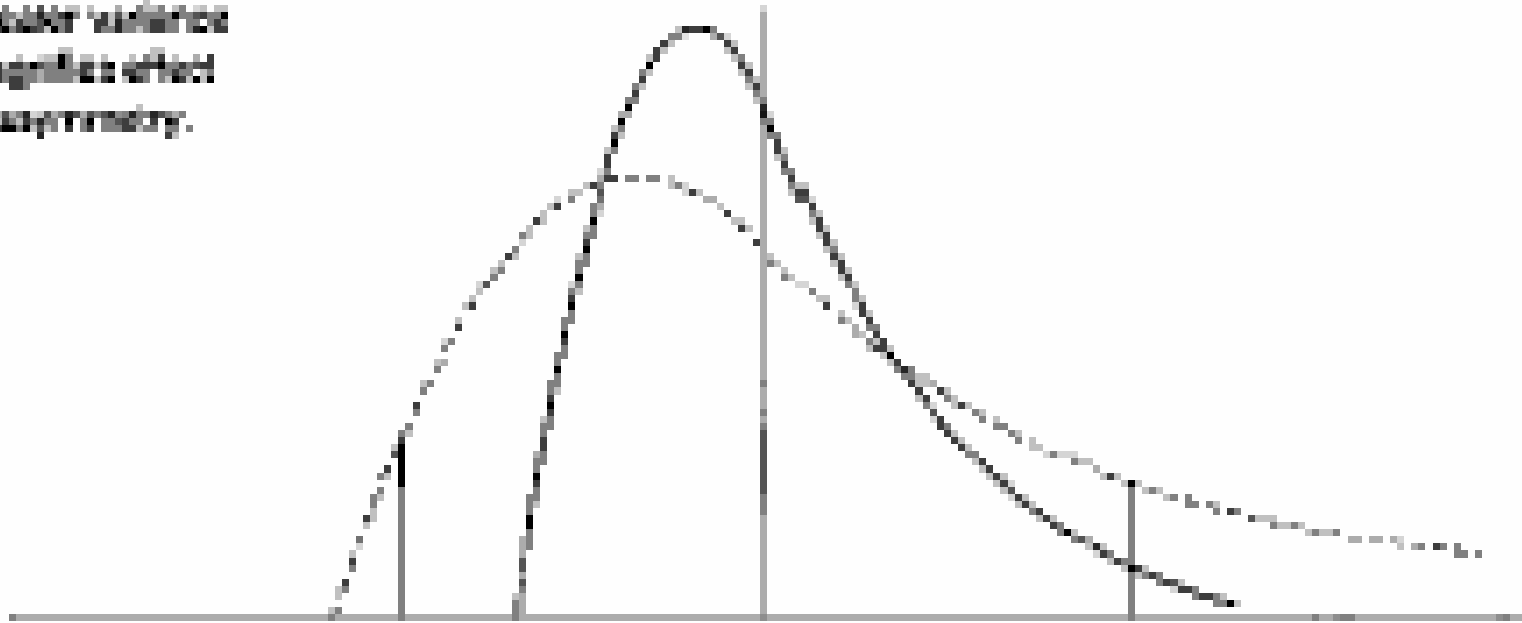
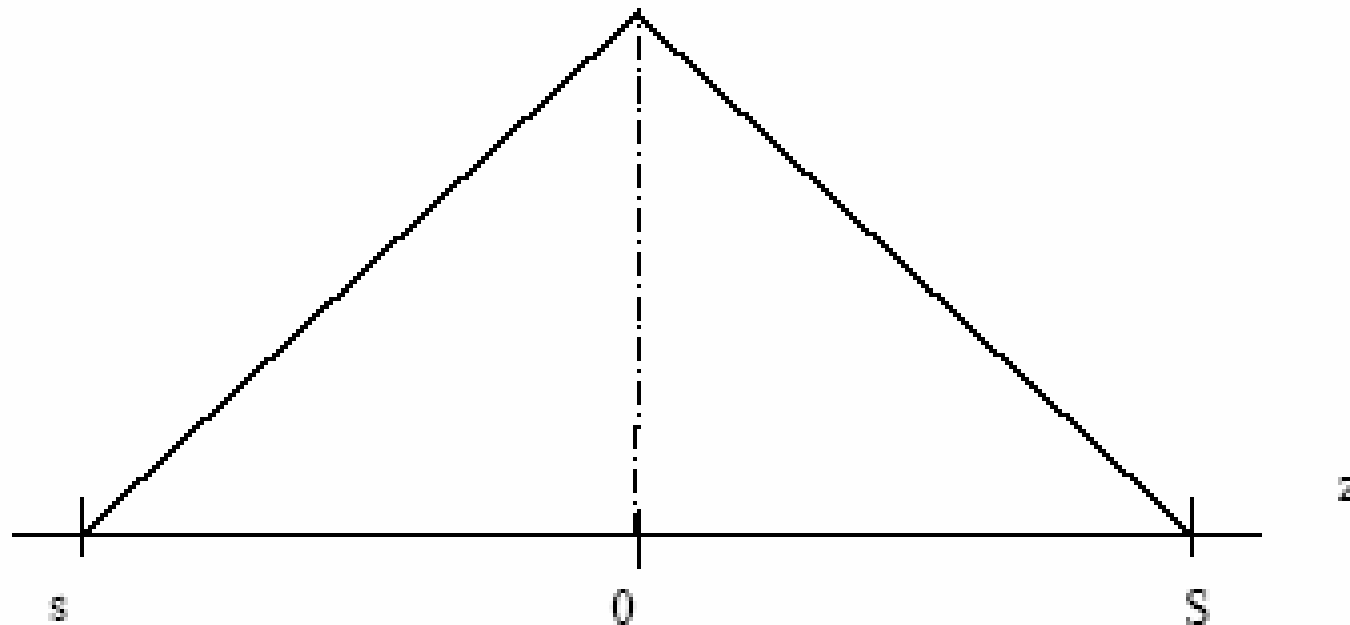


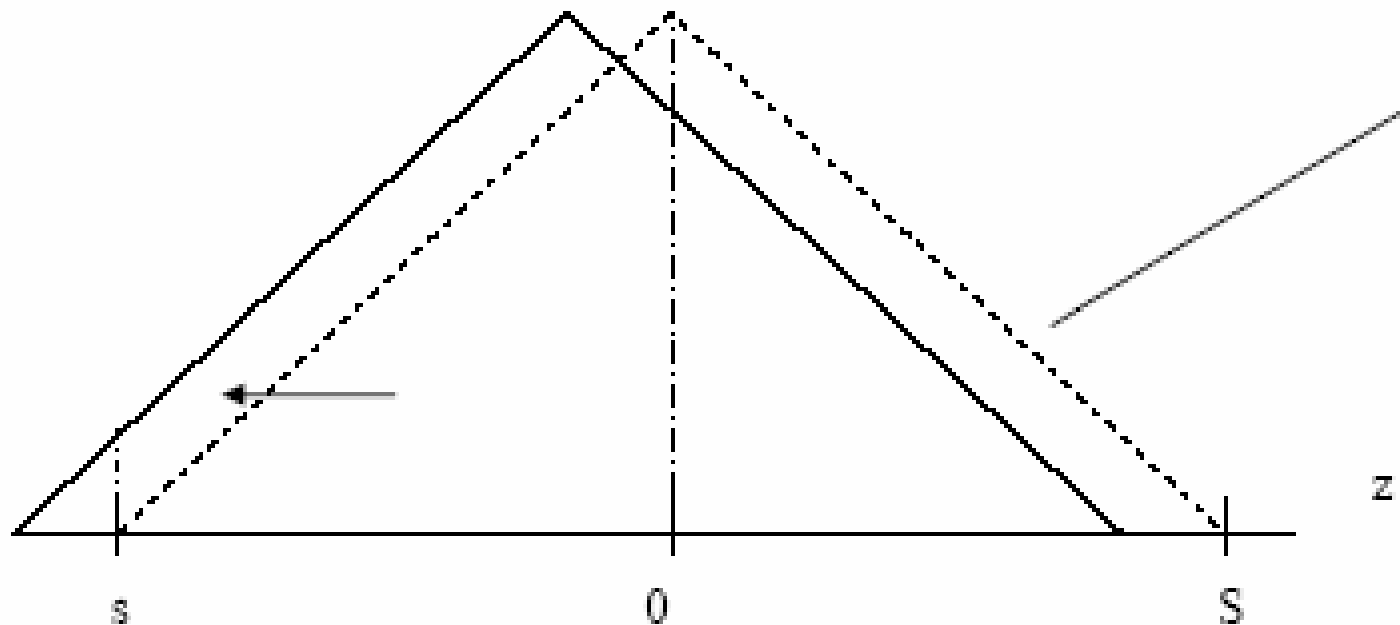
FIGURE 11

Skewed Distribution of Shocks

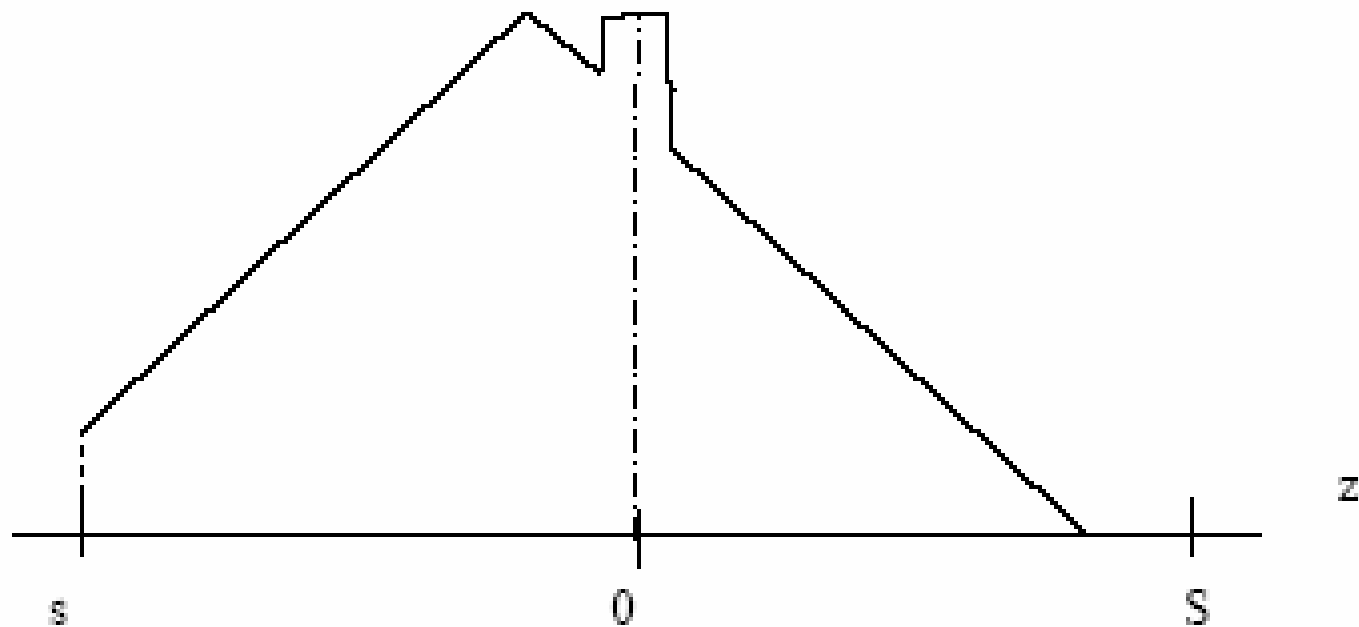
Relative Price Cross-Section Density: Aggregate Shock 1



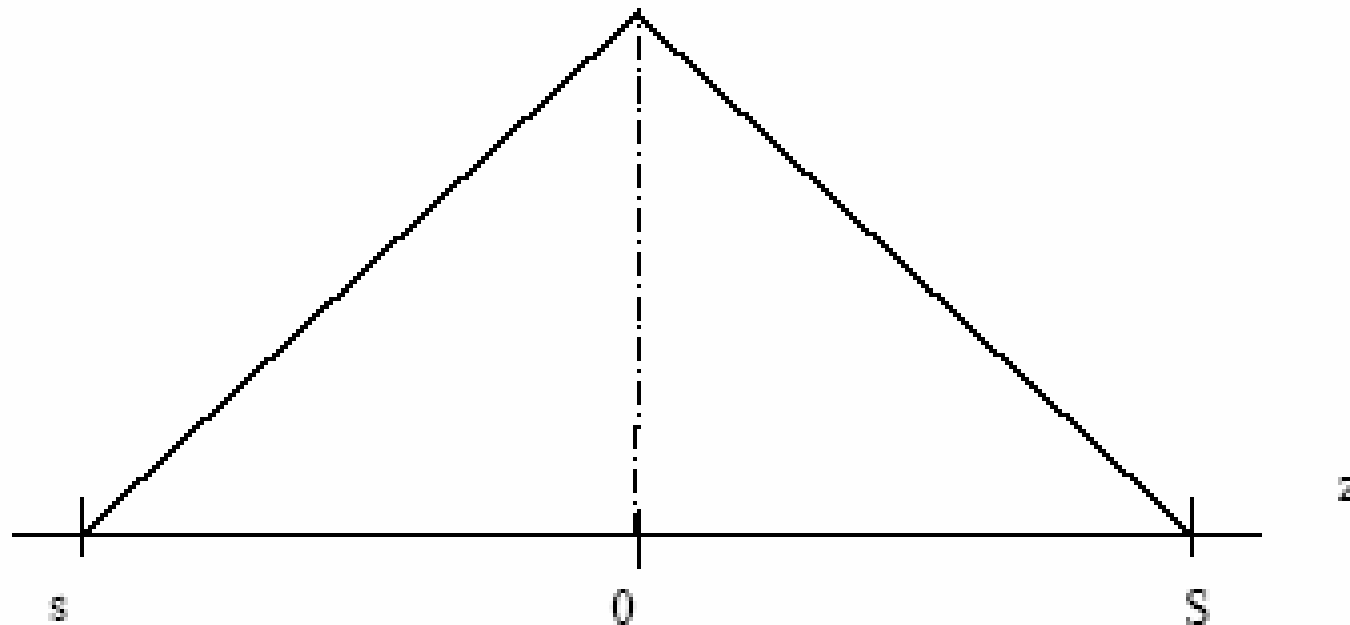
Relative Price Cross-Section Density: Aggregate Shock 2



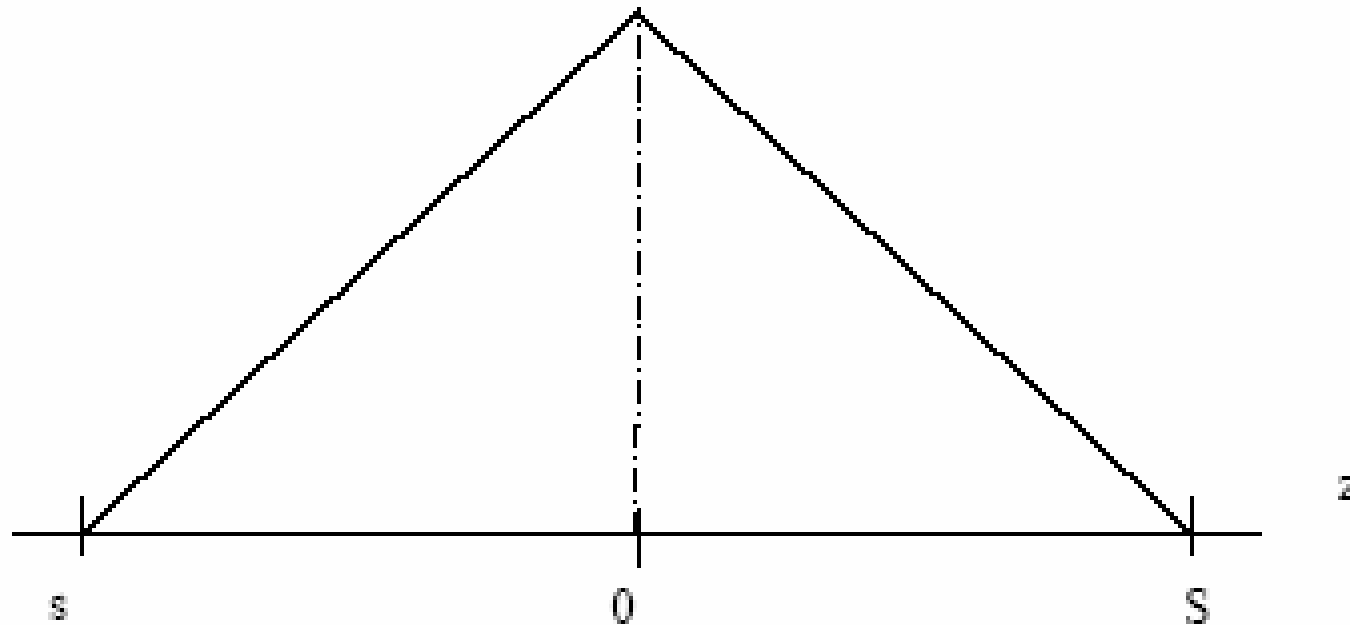
Relative Price Cross-Section Density: Aggregate Shock 3



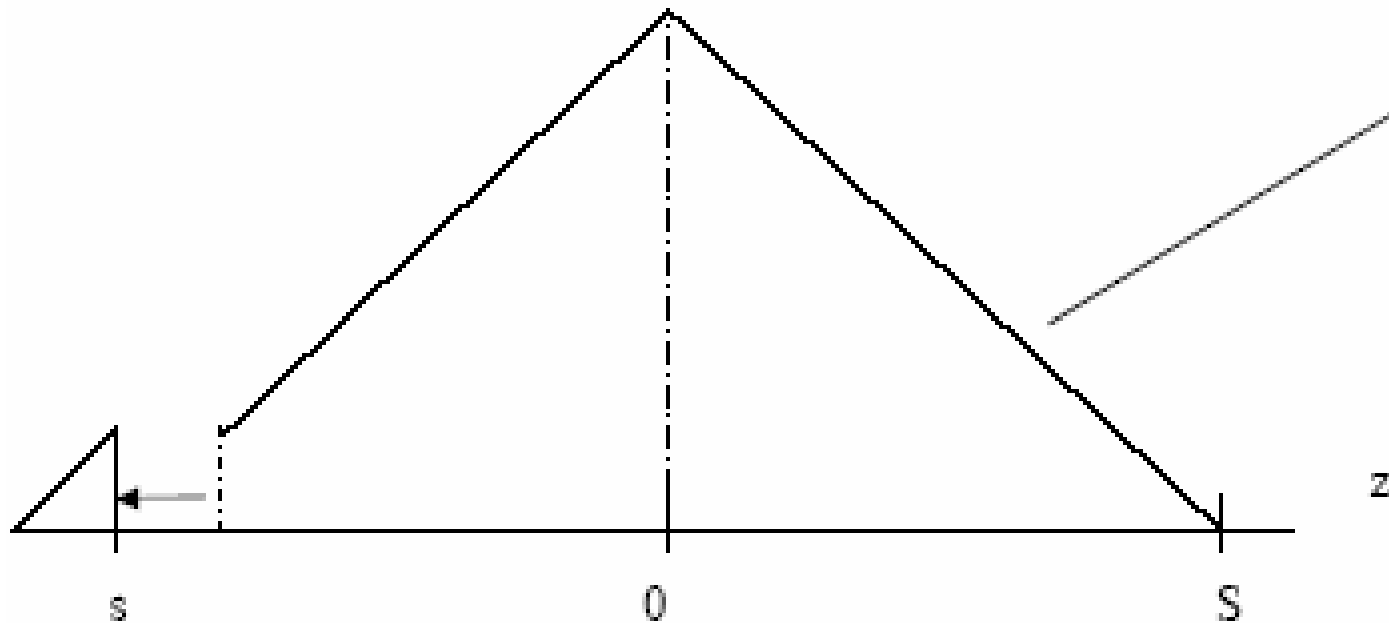
Relative Price Cross-Section Density: Aggregate Shock 4



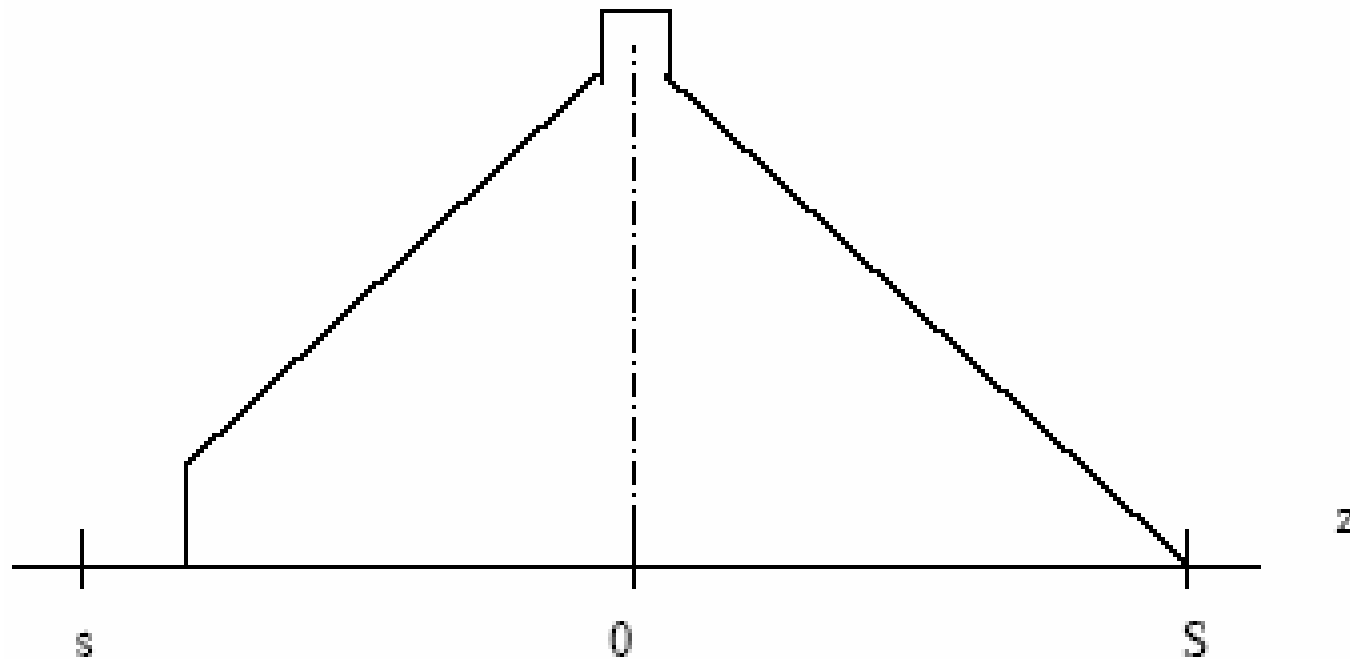
Relative Price Cross-Section Density: Idiosyncratic Shock 1



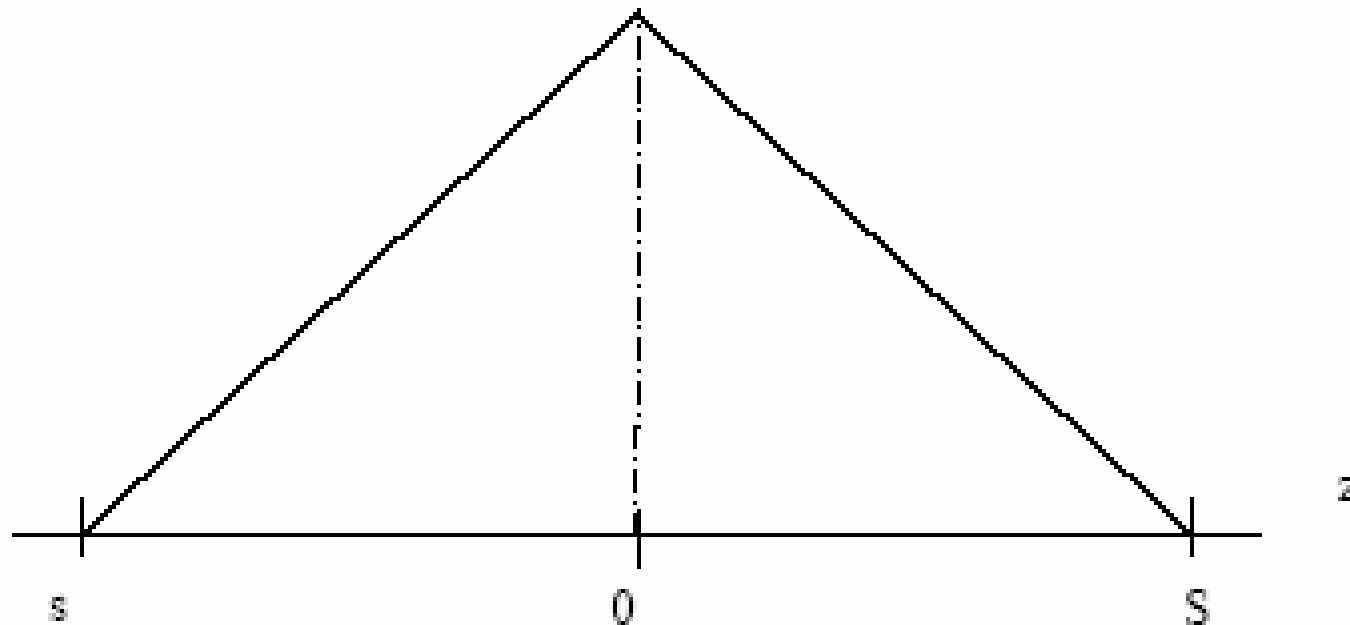
Relative Price Cross-Section Density: Idiosyncratic Shock 2



Relative Price Cross-Section Density: Idiosyncratic Shock 3



Relative Price Cross-Section Density: Idiosyncratic Shock 4



Implications for Identification

- ✂ Aggregate shocks have no contemporaneous effect on the shape of the pre-adjustment relative price distribution (including the asymmetry)
- ✂ Idiosyncratic shocks have no LR effect on the aggregate price level (although they could have a SR effect)

The Measurement

✂ z_{ijt} – Relative price in store i of product j at time t

✂ π_{jt} – Inflation rate for product j at month t

✂ s_{jt} – Skewness of the relative price of product j at month t

✂ Π_t – Aggregate in-sample inflation at month t

✂ S_t – Skewness of the relative prices, pooled together, at month t

Static Model – Findings

✂ Specification: Ball and Mankiw (1995)

✂ $\Pi_t = a + b\Pi_{t-1} + cS_t + \varepsilon_t$

✂ Persistence in the inflationary process

✂ $\hat{c} > 0$ (at both levels)

✂ Consistent with similar US findings

Dynamic Model – SVAR

✂ Two equations

✂ Four structural parameters

✂ Three reduced form parameter estimates

✂ One additional restriction is needed:

🏰 SR – Aggregate shock has no contemporaneous effect on S_t

🏰 LR – Aggregate inflation is governed by aggregate shocks

SVAR – Econometric Issues

- ✂ Stationarity
- ✂ U-root tests (ADF)
- ✂ Time-trend
- ✂ Structural breaks (Perron, 1997)
- ✂ Seasonality
- ✂ 13 VARs (OLS, DLS), Lags (LR Test, Schwartz Info Criterion)

SVAR – Findings 1

- ✂ Pooled evidence
- ✂ Product-specific evidence
- ✂ Panel evidence
- ✂ Many results independent of the
 - 🏛 Identification scheme used (LR or SR restriction)
 - 🏛 Relative price definition used (mm , W)
 - 🏛 Timing used in measuring the relative price

SVAR – Findings 2

- ✂ Idiosyncratic shocks are important for SR inflation variability
- ✂ Consistent with Dhyne, et al. (2007), Golosov and Lucas (2007)
- ✂ Positive link between inflation and relative price asymmetry
- ✂ Consistent with similar findings from the US (Ball and Mankiw) and other countries (Fischer, 1981)
- ✂ It takes 2[♫]5 months to idiosyncratic shocks to affect the inflation
- ✂ Consistent with sticky information model (I tend to agree)

Sampling Frequency

- ✂ The price setting cycle in the retail industry is weekly.
- ✂ The price data used here are sampled monthly.
- ✂ The true price change frequency – likely higher
- ✂ The estimation results could be affected

The Nature of Asymmetry

- ✂ I would like to see the plot of the frequency distribution of price changes (for each year).
- ✂ That could be useful in order to see if in this data there is a phenomenon of “asymmetric price adjustment in the small” (Levy, et al, 2006)
- ✂ That would enable the reader to see also more precisely the nature of the asymmetry that is present in the data.

Conclusion

- ✂ Enjoyed reading the paper
- ✂ Constitutes a useful contribution to the literature
- ✂ Interesting results (perhaps not so surprising)
- ✂ Technically – well done
- ✂ More work along these lines with other datasets can be useful
- ✂ Thank you.