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

Levy, Daniel

Bar-Ilan University, Emory University and RCEA

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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 ↔ 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) Inflations 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, Δ(average price level) = 0
  - Assume: menu cost → 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.

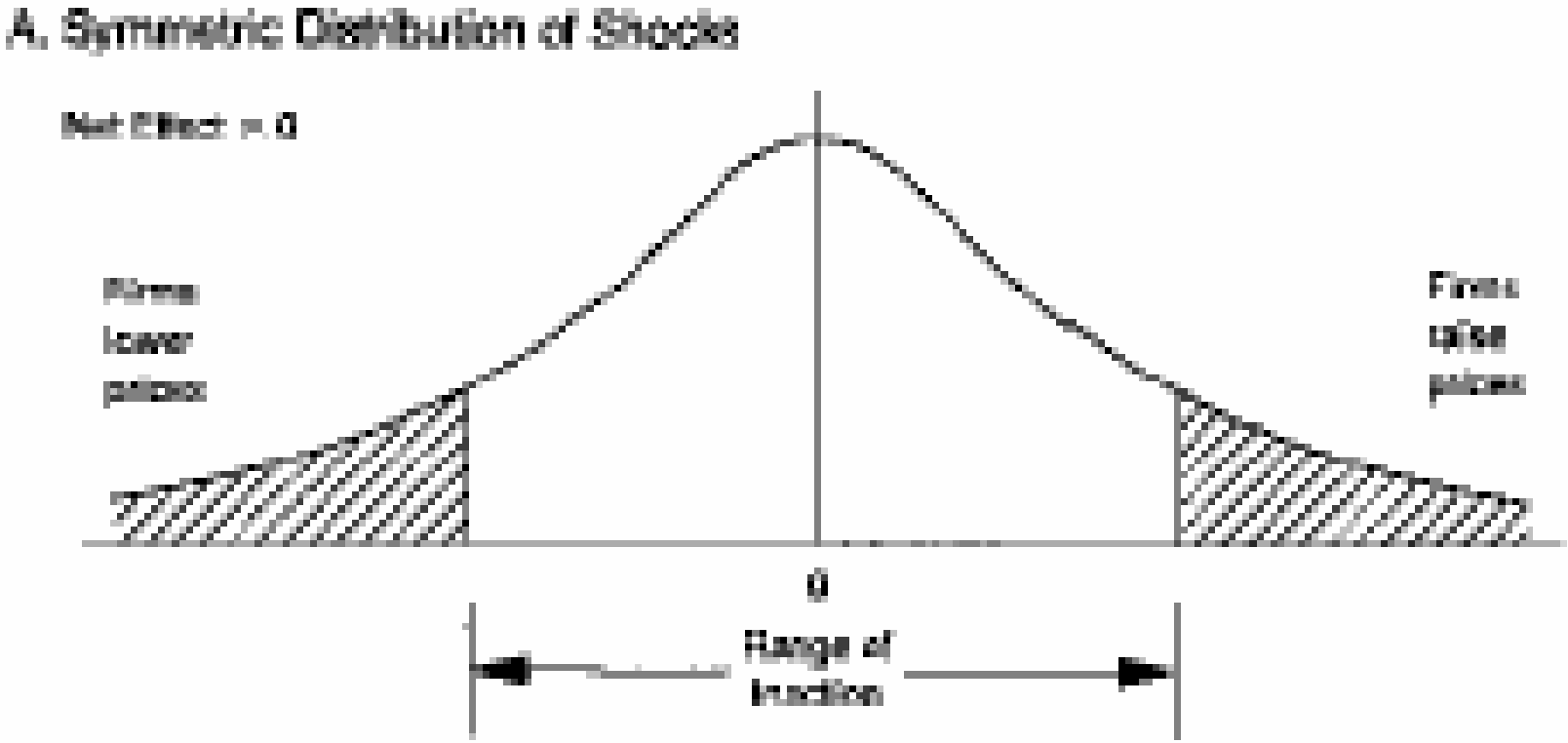
Asymmetric Distr. (No Trend-Inflation) 3

- If the distribution of the shocks are *asymmetric*, then there will be *a change in the skewnewss 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*.

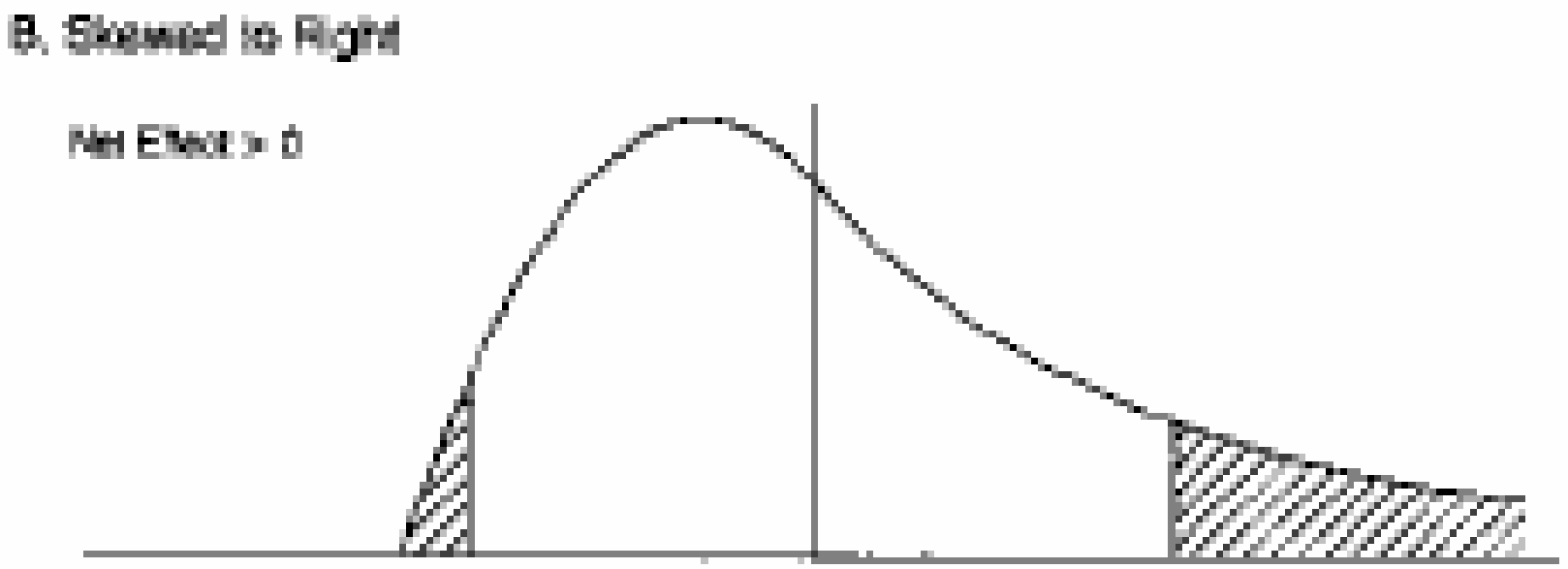
  In sum: if the distribution of the shocks to the desired prices is skewed to the *right*, the price level will *increase* and if it is skewed to the *left*, then the price level will *decrease*.

Skewness' Effect on the Price Level 1
Ball and Mankiw (1995)



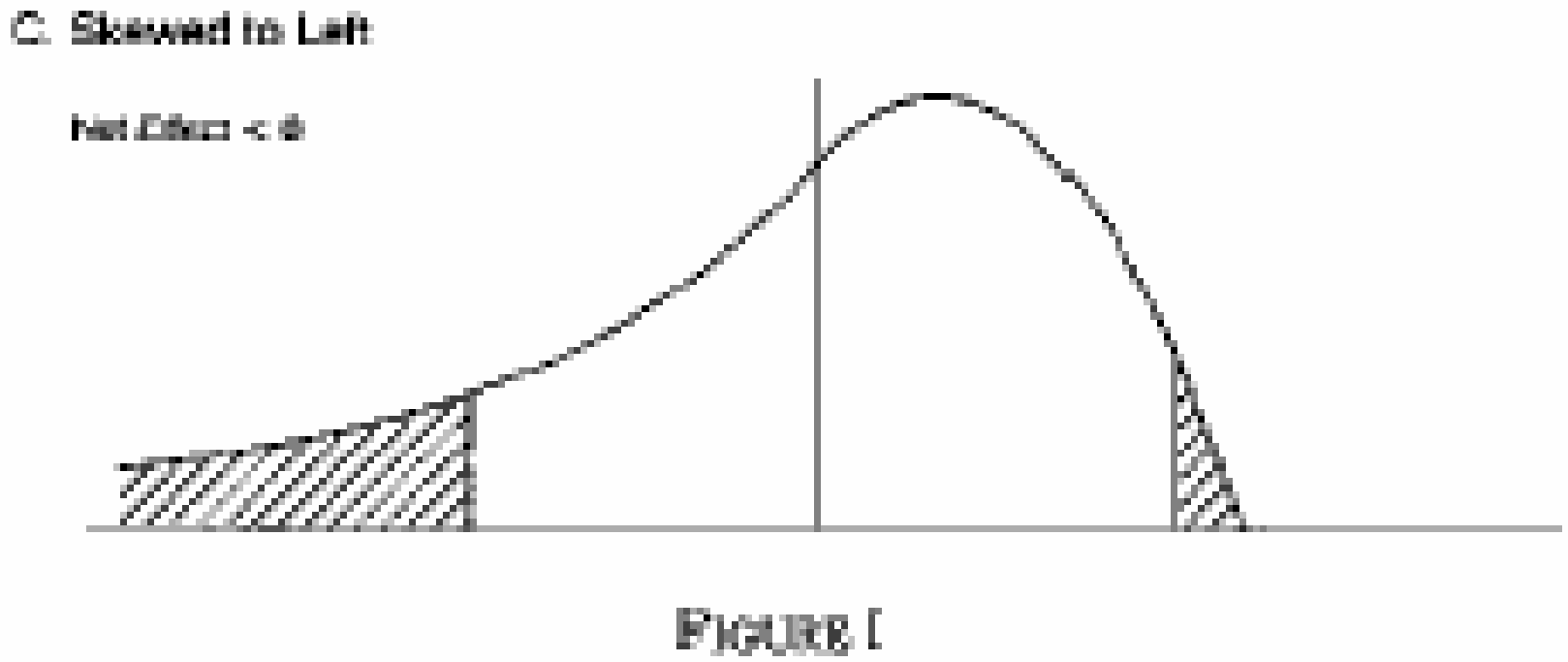
Symmetric Distribution of Shocks

Skewness' Effect on the Price Level 2



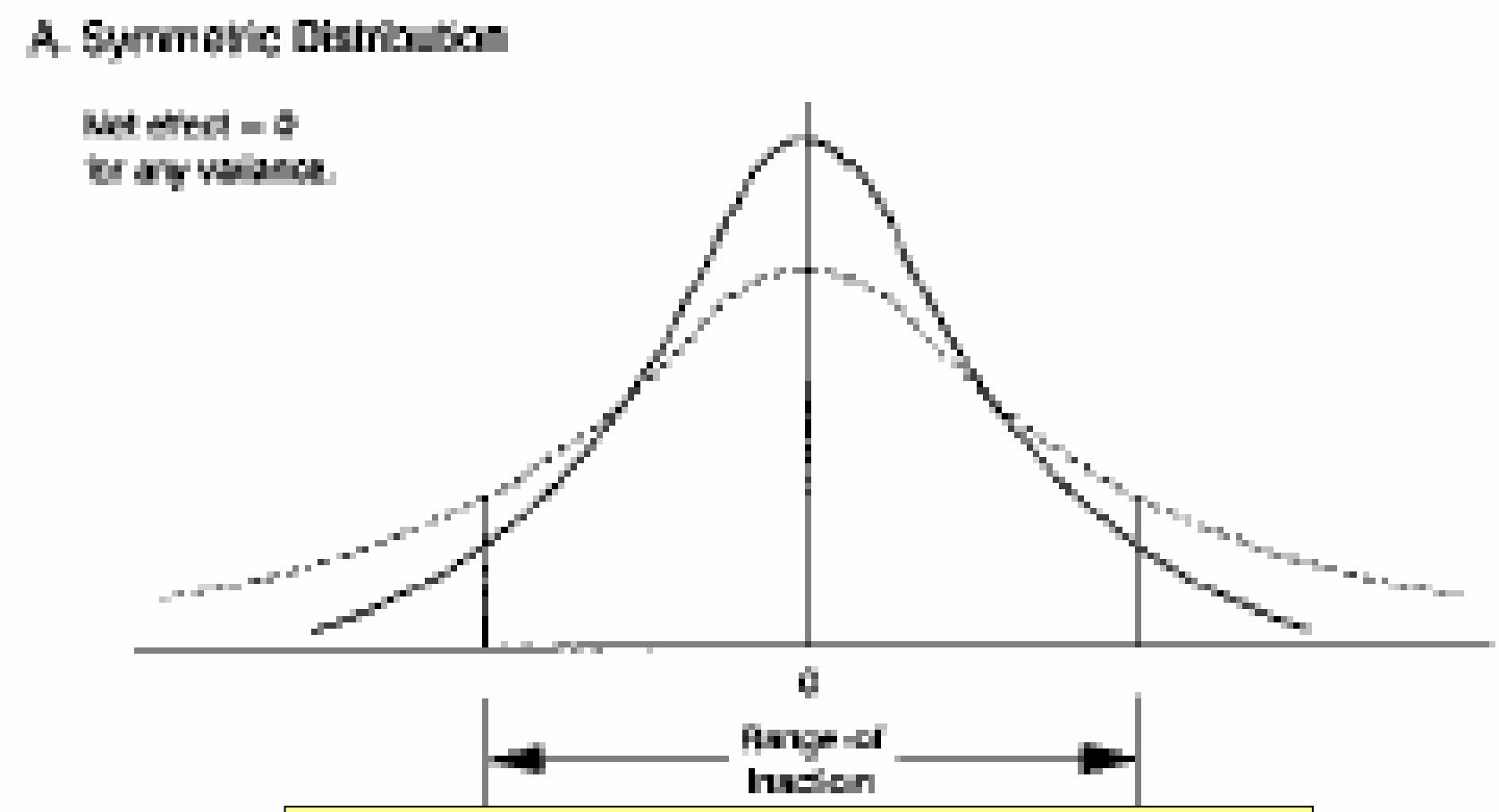
Skewed to Right

Skewness' Effect on the Price Level 3



Skewed to Left

Inflation and Price Change Variance 1



Symmetric Distribution of Shocks

Inflation and Price Change Variance 2

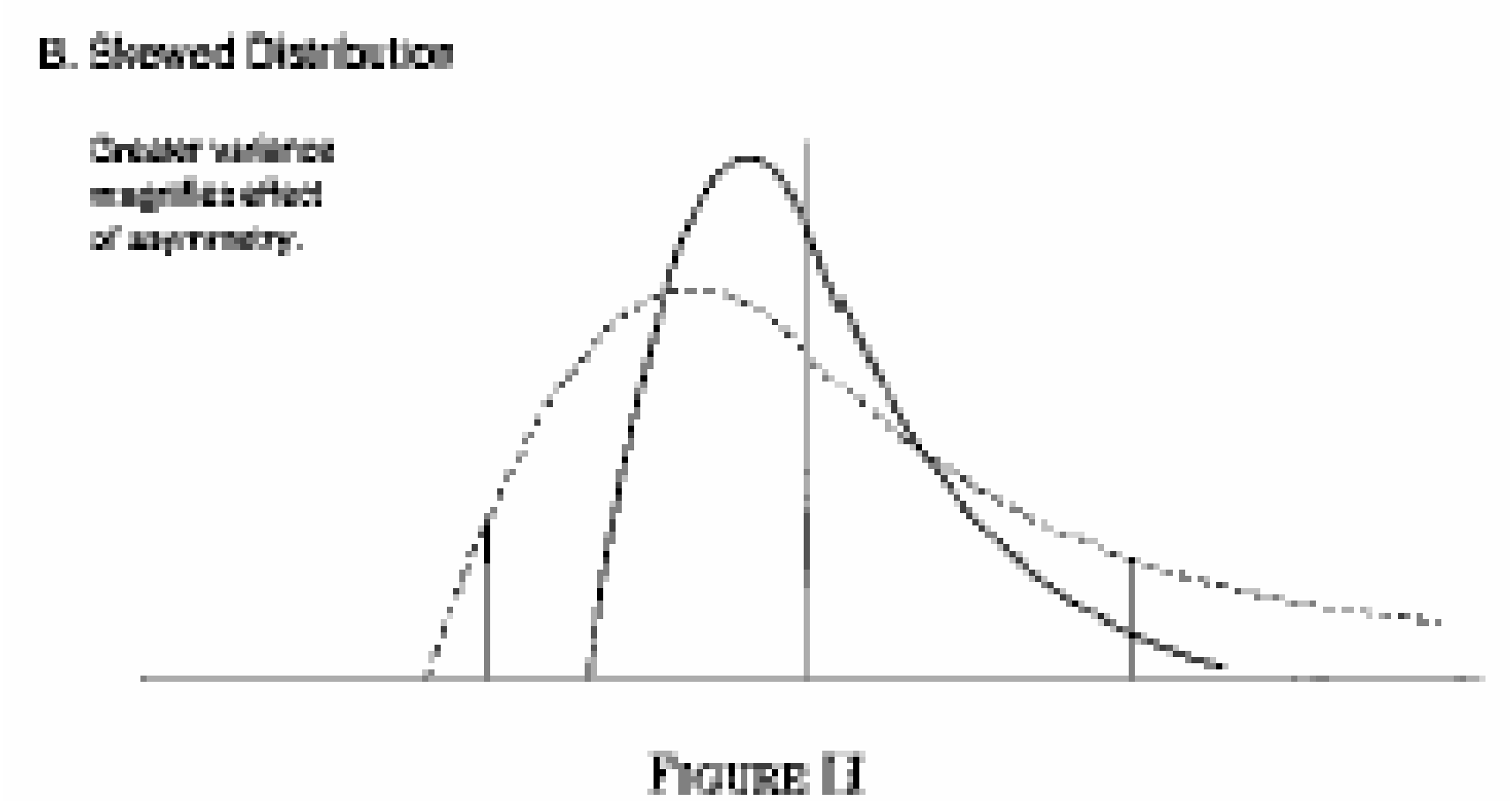
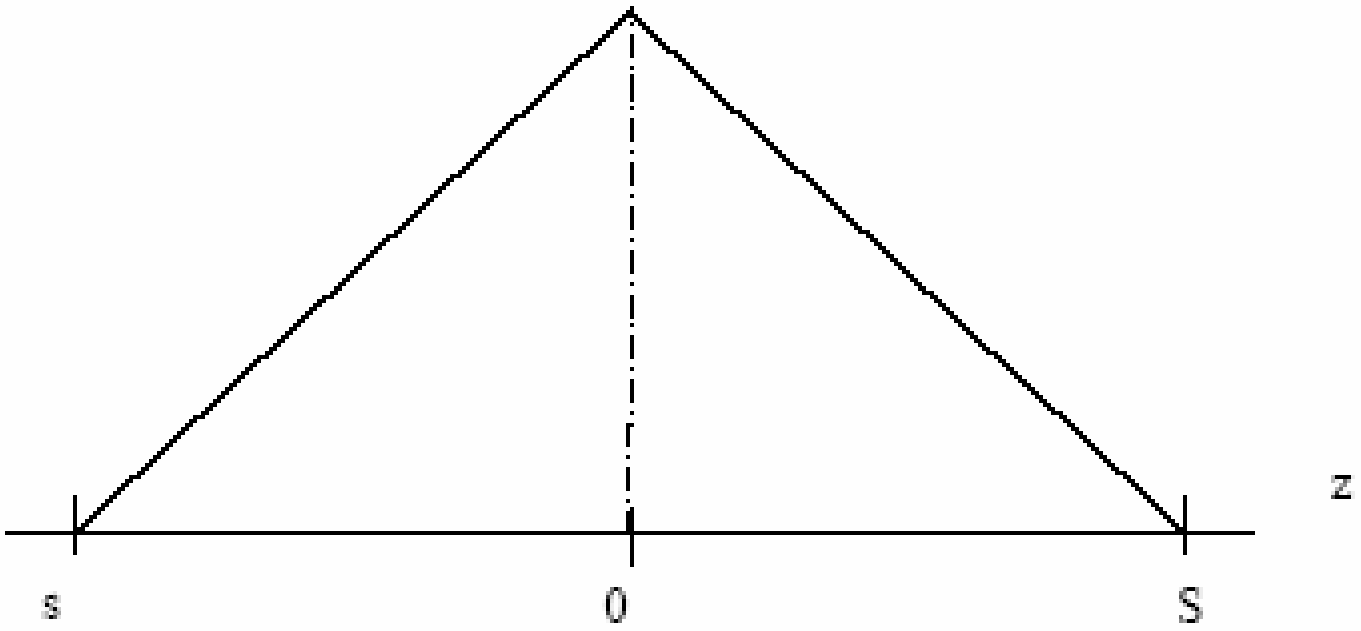


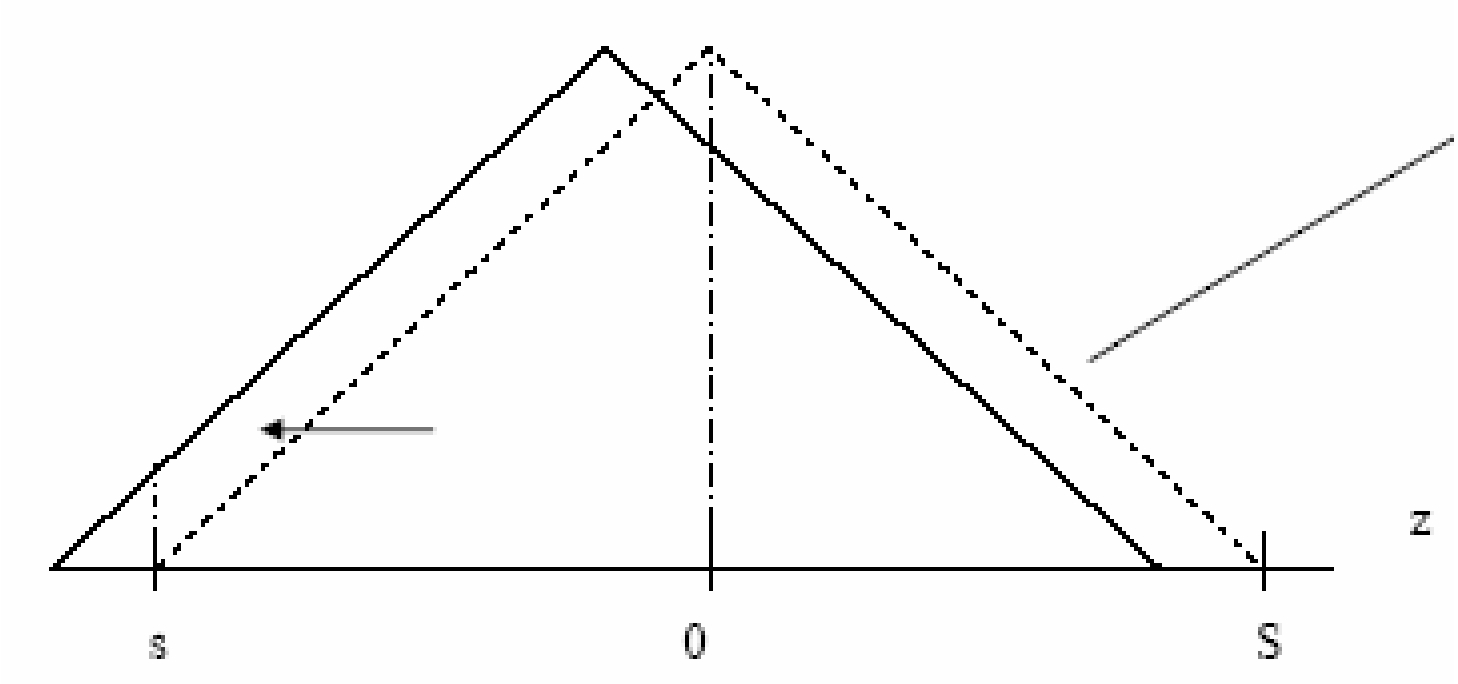
FIGURE II

Skewed Distribution of Shocks

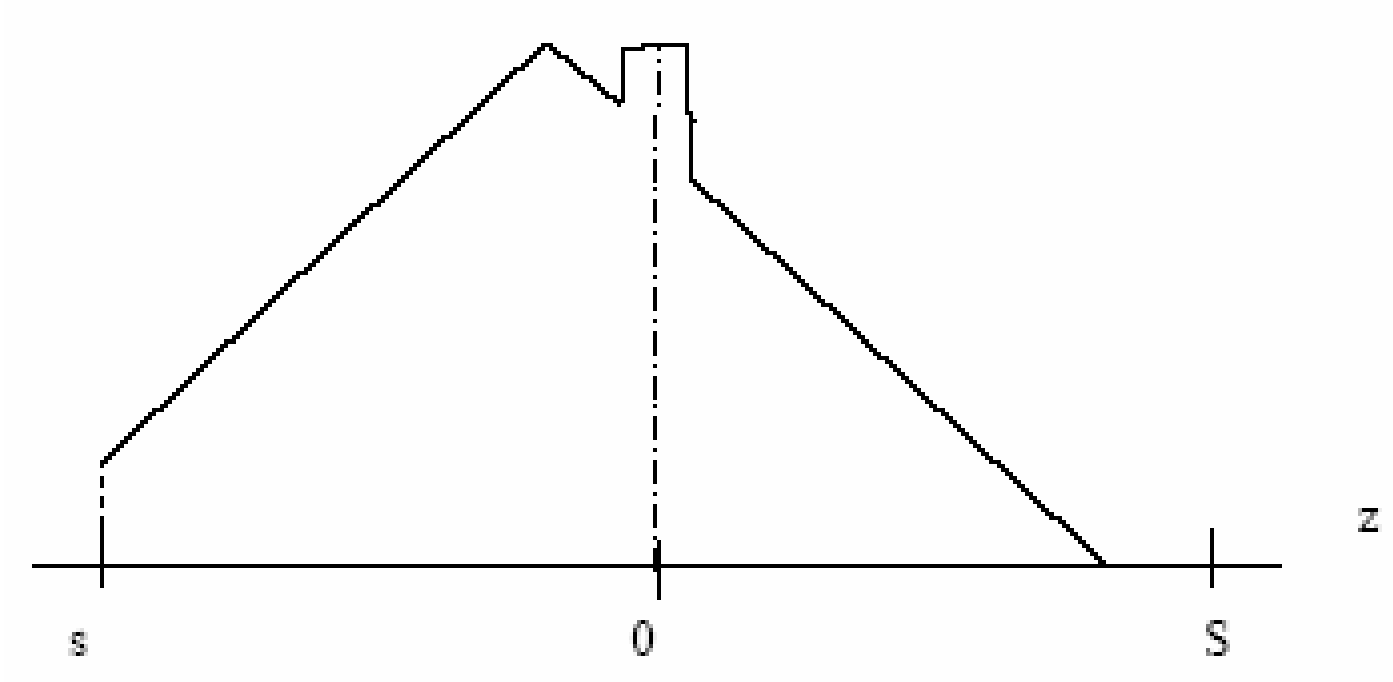
Relative Price Cross-Section Density: Aggregate Shock 1



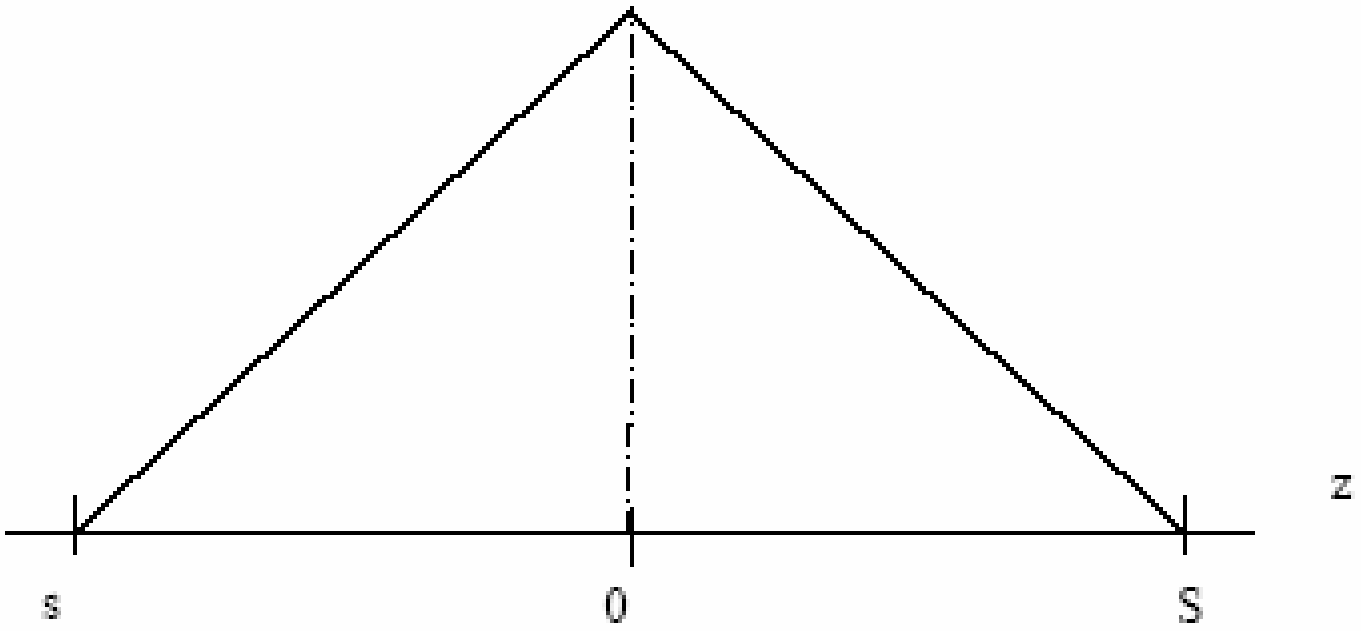
Relative Price Cross-Section Density: Aggregate Shock 2



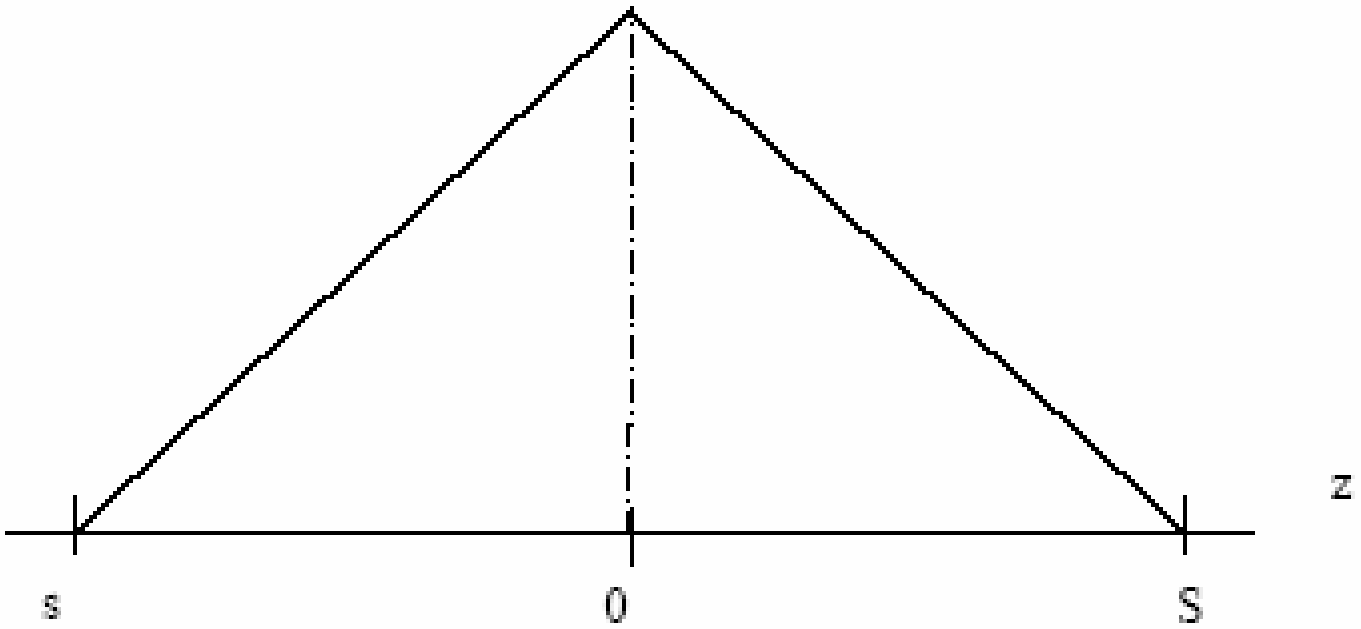
Relative Price Cross-Section Density: Aggregate Shock 3



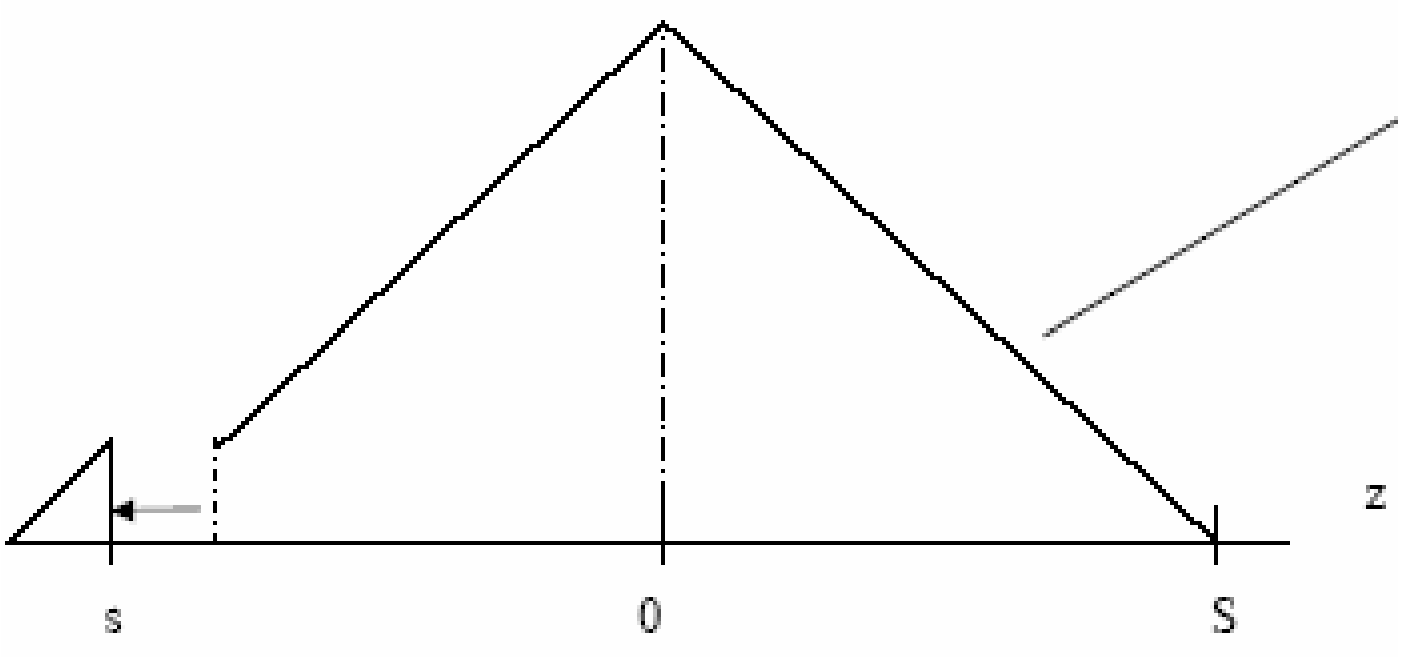
Relative Price Cross-Section Density: Aggregate Shock 4



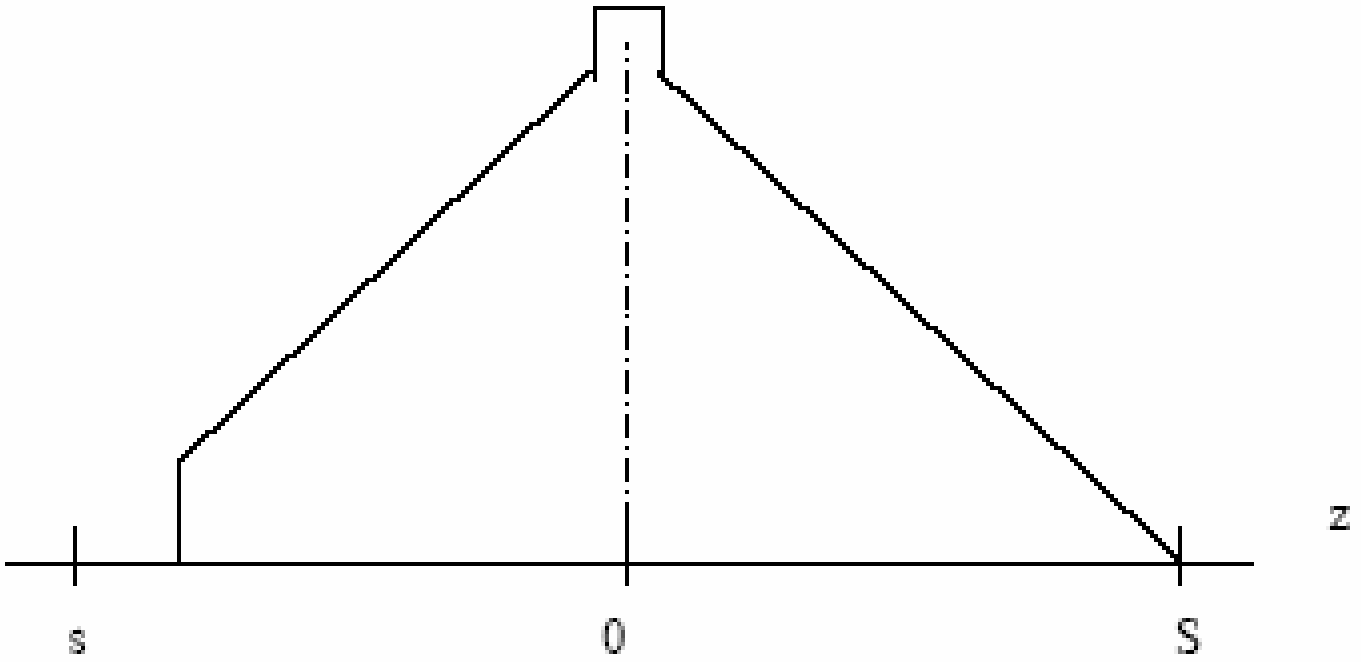
Relative Price Cross-Section Density: Idiosyncratic Shock 1



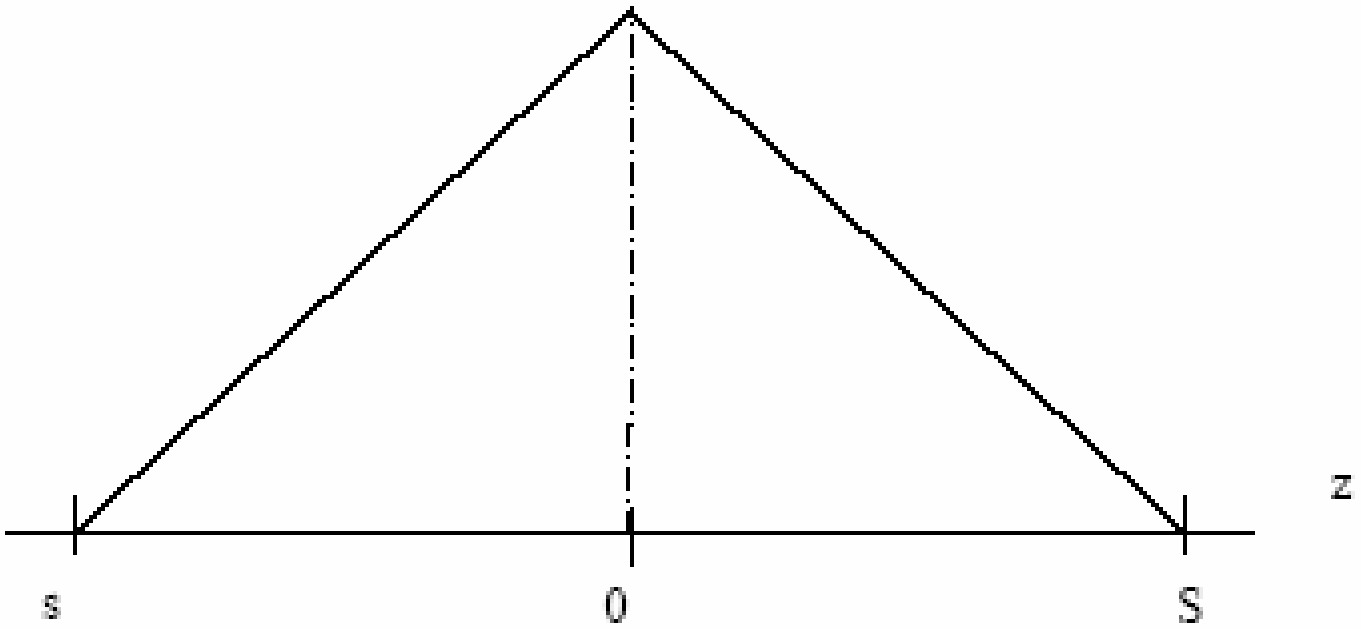
Relative Price Cross-Section Density: Idiosyncratic Shock 2



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 reduce 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.