A Variance Screen for Collusion

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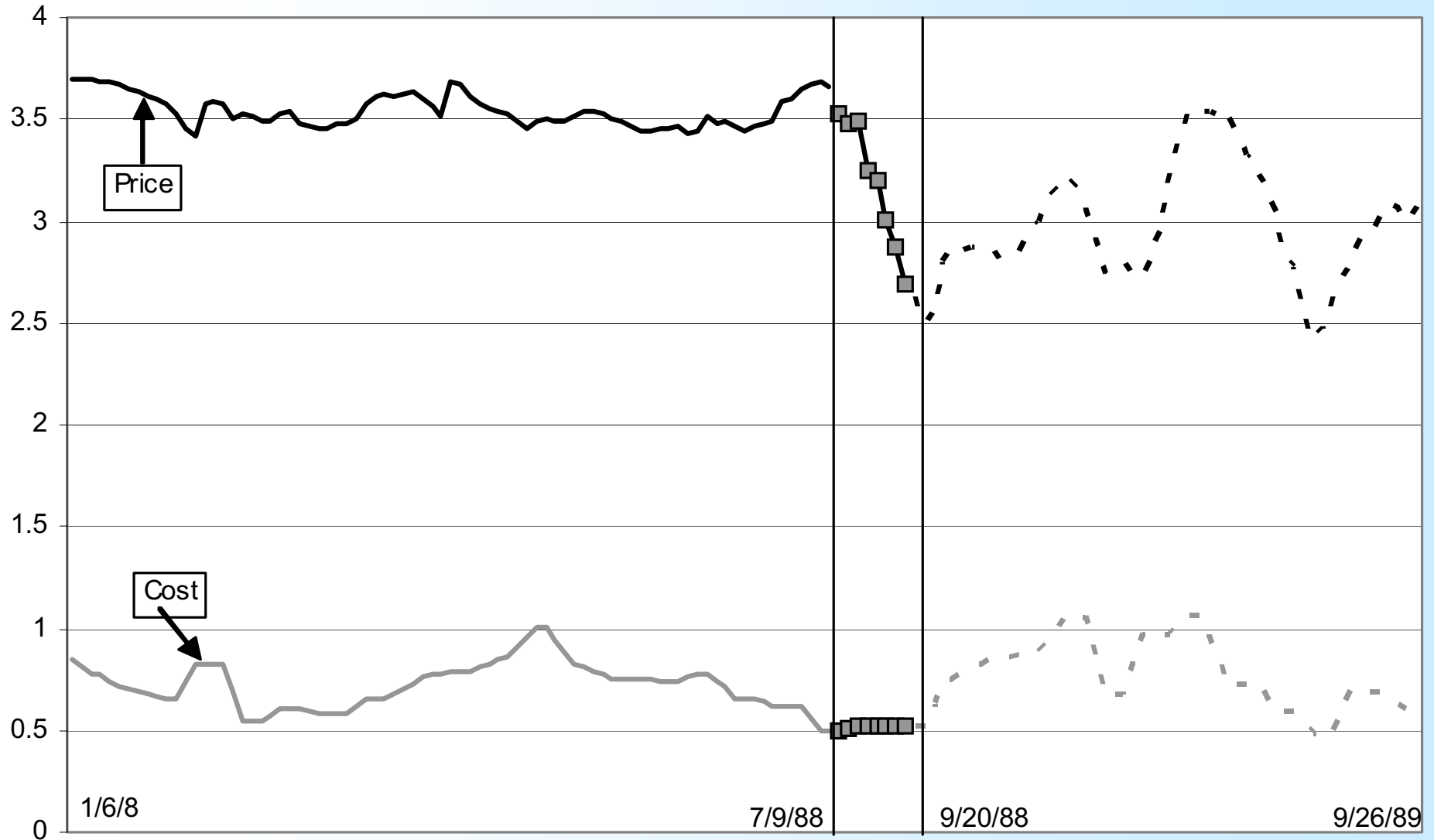
Collusion Screens

- Desirable features of a screen
  - Low false positives
  - Low false negative
  - Practicable (easy to implement)
  - Costly to avoid, even if screen known
- Existing Screens
  - High prices (compared to what?)
    - But costs hard to observe (FTC's Gasoline price screen)
  - Identical, complementary, or exchangeable bids

Conspiracy Collapse

Price

Cost

1/6/8		7/9/88	9/20/88	9/26/89

Differences Across Regimes: Collusion vs. Competition

	Collusion	Competition	Difference Across Regimes
Std. Dev. Ratio Std.Dev(P)/Std.Dev (C)	0.68	1.66	Collusion = Competition/2.45
Smoothness Coefficient(π/2) Price relative to Cost	-1.97	0.28	Collusion = Competition - 2.21

Salient Features of Conspiracy

- Price decreased by 23%
- Standard deviation increased by 145%
- Which should we use as a screen?
- Theory: Collusion and Variance
  - Cost of coordinating price changes
  - Agency Costs (Athey, Bagwell, Sanchiro)

Smoothness

- <u>Definition</u>: long run (low-frequency) variation relative to short run (high-frequency) variance
- <u>Theory</u>: a cost to coordinating changes means that conspiracies respond only to low-frequency changes ➔ smoothness in price
- But smoothness increased
  - Induced by smoothness in cost series

Gasoline Price Data

- Wholesale and retail
- Only 140 out of 400 retail stations
  - Missing stations
- Few price series continuous

Gas Station Retail Price Variance

Louisville, KY Gas Stations - Retail Variances

Wholesale Price Variance

Louisville, KY Gas Stations - Wholesale Variances

Screen Results

- No pockets of low retail price variation indicative in Cincinnati
- Not much variation in wholesale variance.
  - Explained by station ownership