

Uncertainty, Expectation Dispersion, and the Reaction to News

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Financial Markets Closely Watch Indicator Releases

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Stock Market Drops After U.S. Adds Just 20,000 Jobs -- Smallest Increase in 17 Months

Weak economic data stoked fears of sputtering economic growth.

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Stocks Fall, Weighed Down by Tech Losses and Jobless Claims

Major indexes drop as technology shares continue to decline and jobless claims remain above pre-pandemic peak

Financial Markets Closely Watch Indicator Releases

- **Release of macro information move asset prices (Fleming/Remolona, 1999; Andersen et al., 2007; Beechey/Wright, 2009)**
- **Link between macro news and asset prices varies:**
 - Boom vs. recession (McQueen/Roley, 1993; Boyd et al., 2005)
 - Information content (Ehrmann/Sondermann, 2012; Gilbert et al., 2017)
 - Expectations about monetary policy responses (Law et al., 2020)

What Makes a Signal Important/Useful?

- **We offer fresh look at two specific dimensions in this context:**
 - Uncertainty about macro fundamentals
 - Dispersion of forecasts of macro indicators
- **Theoretical model with information frictions in which**
 - ... at times where little is known about fundamentals (high uncertainty) signals become important
 - ... signals that are closely linked to fundamentals (low forecast dispersion) are important
- **Empirical results confirm opposed effects of uncertainty and dispersion, respectively, on strength of news effect on stock market**

Model

- **Fundamental factor follows random walk:**

- $x_t = x_{t-1} + \varepsilon_t$ ←
- Long-run profits → stock prices

- **Changes of this factor not observable:**

- Macro indicators: $i_t = \varepsilon_t + v_t(i), v_t(i) \sim N(\mu_{v,t}, \sigma_{v,t}^2)$ ←
- Noisy component with unknown time-varying mean and variance

- **Agents get private noisy signals about relation between indicator and fundamental change:**

- $s_t(j)$ drawn from distribution of $v_t(i)$
- High $\sigma_{v,t}^2$ → large dispersion of forecasts

Model

Step 1: nowcasts of i_t



Step 2: survey publication



Step 3: indicator release

- $E_t^j[i_t] = v_t(j)$
- **No trading** ($E[x_t] = x_{t-1}$)
- **Noise distribution revealed** $\rightarrow E_t[i_t] = \bar{v}_t, \sigma_{v,t}^2$ **known**
- **No trading** ($E[x_t] = x_{t-1}$)
- **Update of** $E[x_t] = x_{t-1} + \rho_{i,t}(i_t - \bar{v}_t)$
- **Depends on variances of fundamental shock and link between indicator and fundamental shock:**

$$\rho_{i,t} = \frac{\sigma_{\varepsilon,t}^2}{\sigma_{\varepsilon,t}^2 + \sigma_{v,t}^2}$$
- **Trading**

Survey on Forecasts of Macro Indicator Releases

- **Bloomberg survey:**

- Various indicators covered
- Individual forecasts available
- Very short forecast horizon

- **Indicators**

- Law et al. (2020) + GDP + CPI inflation

- **Sample:**

- Aug. 1997 to Mar. 2015 (few obs. before 1999)
- Avg. number of forecasters is 51.4
- Number of indicator releases covered is 1,671

- **Computation of i) dispersion and ii) news**



Survey on Forecasts of Macro Indicator Releases

Indicator	Acronym	Freq.	First obs.	# obs	Avg. # forecasters
Chg. in non-farm payrolls	CNP	m	01/08/1997	197	70.5
Initial jobless claims	IJC	w	11/02/1999	824	36.9
ISM manufacturing index	ISM	m	01/06/1998	195	64.6
Conf. Board cons. confidence	CCI	m	23/02/1999	193	59.4
GDP growth	GDP	q	30/04/1998	66	68.3
CPI inflation	CPI	m	16/06/1998	196	66.5

Notes: Observed frequencies in our sample are weekly (w), monthly (m), and quarterly (q). The last observations in our sample are from March 2015.

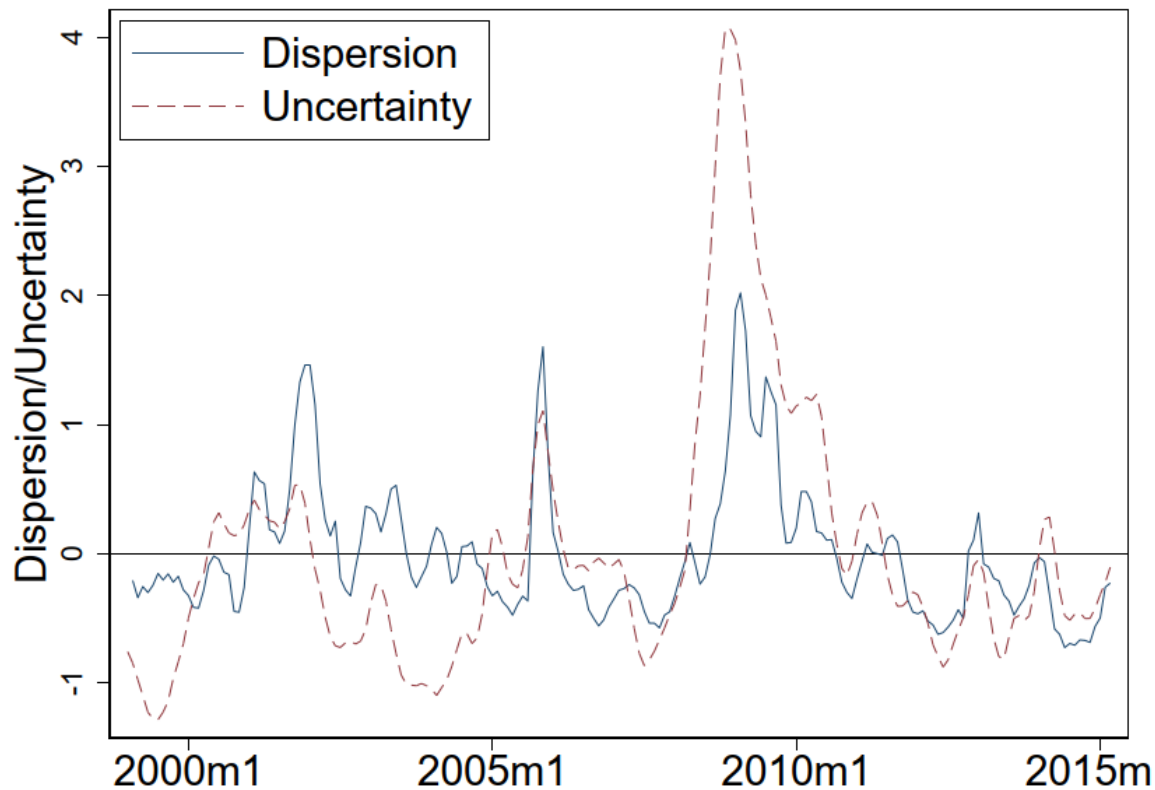
Stock Market Data

- **Tick-by-tick data for S&P500 futures:**
 - Some releases not during trading hours of stock exchange
 - Data provider: TickData
- **Track return over window around data release:**
 - Our baseline +/- 5 minutes
 - Results robust when we switch to longer windows (- 15 minutes to + 30 minutes)

Fundamental Uncertainty

- **Baseline proxy:**
 - Real uncertainty (Ludvigson et al., 2021)
- **Alternative proxies:**
 - Economic policy uncertainty (Baker et al., 2016)
 - VIX
 - Monetary policy uncertainty (Husted et al., 2020)
 - Macro uncertainty (Ludvigson et al., 2021)
 - Financial uncertainty (Ludvigson et al., 2021)

Uncertainty vs. Dispersion



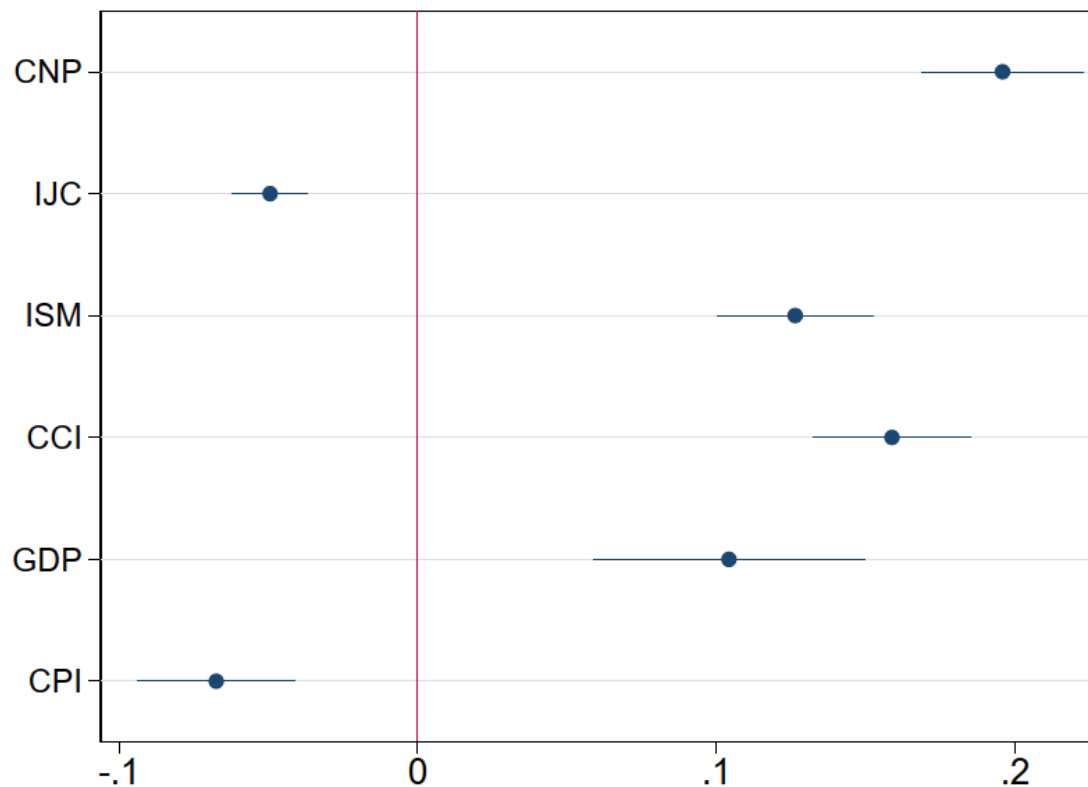
Empirical Model

- **Interested in interaction of effects on returns of**
 - news and dispersion
 - news and uncertainty
- **Event study framework (one indicator release = one observation)**

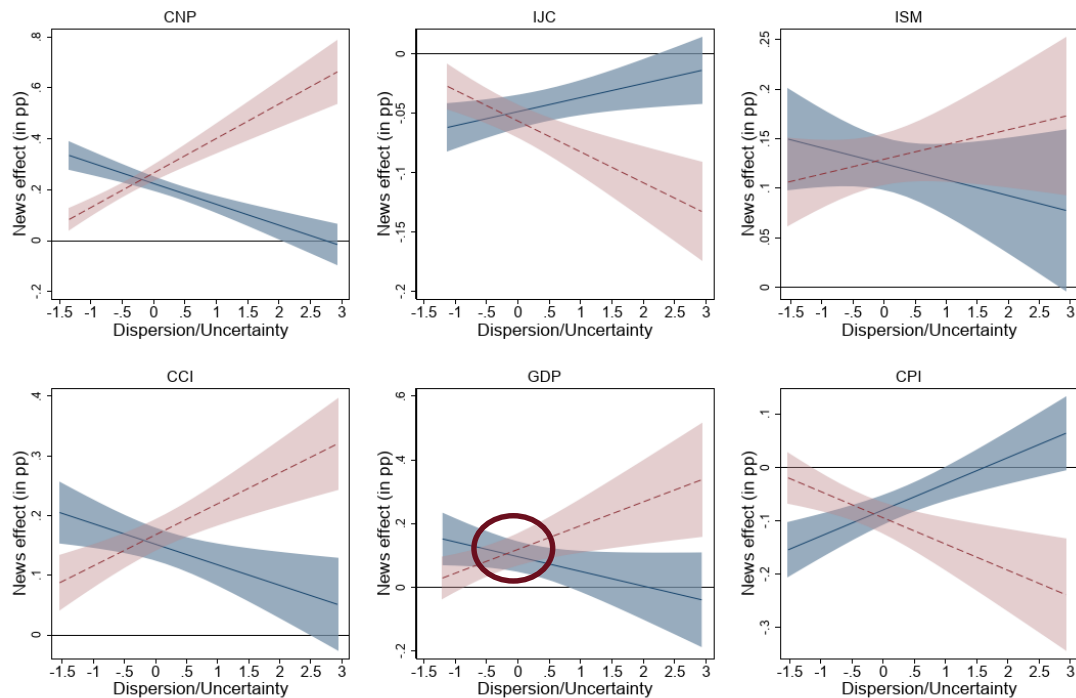
$$R_t^{\overline{F5}} = \alpha + \sum_{i=1}^I (\beta_1^i News_t^i + \beta_2^i Disp_t^i + \beta_3^i News_t^i \times Disp_t^i) \\ + \beta_4 Unc_t + \sum_{i=1}^I (\beta_5^i News_t^i \times Unc_t) + \gamma' X_t + \varepsilon_t$$

- **We will plot the effect of news on returns for different levels of dispersion and uncertainty (all variables standardized)**

Results: No Interactions/Plain News Effect



Results: State-dependent News Effects



[Further results](#)

Conclusion

- **Study addresses important question:**
 - “How do market prices react to news?”
- **Look at the role of uncertainty and forecast dispersion:**
 - (Until recently) literature treated both as very similar animals
 - Our model: fundamentally different effects on link between macro news and stock price movements
- **Empirical results confirm model predictions**
- **Implications:**
 - Don't mix expectation dispersion and uncertainty
 - Indicator releases should be evaluated in light of additional information

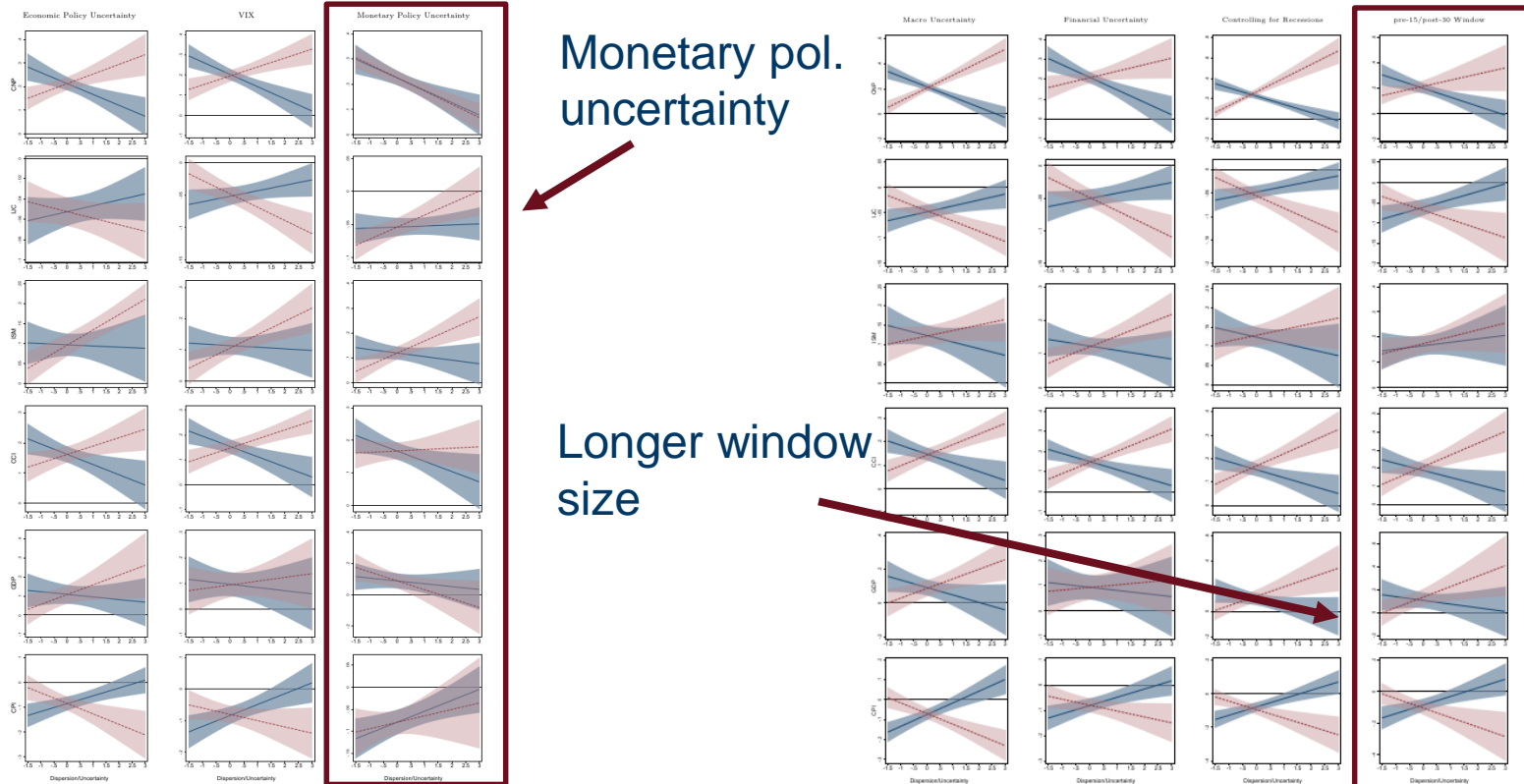
Thank you for your attention!

Results: Significance of Slope Differences

	CNP	IJC	ISM	CCI	GDP	CPI
	<i>Baseline</i>					
Real uncertainty	44.06 (0.00)	10.38 (0.00)	1.85 (0.17)	14.43 (0.00)	4.68 (0.03)	9.93 (0.00)
	<i>Robustness</i>					
Economic policy uncertainty	19.44 (0.00)	5.44 (0.02)	18.64 (0.00)	7.40 (0.01)	2.35 (0.13)	8.93 (0.00)
Implied volatility – VIX	19.10 (0.00)	10.16 (0.00)	8.92 (0.00)	16.64 (0.00)	0.43 (0.51)	6.04 (0.01)
Monetary policy uncertainty	0.03 (0.85)	3.03 (0.08)	7.89 (0.00)	1.70 (0.19)	1.17 (0.28)	0.25 (0.62)

Notes: Test of difference in slopes for the interaction effects between news and dispersion and news and uncertainty. Test statistic with p-value in parentheses. Economic policy uncertainty: daily newspaper-based proxy (Baker et al., 2016); monetary policy uncertainty: monthly newspaper-based proxy (Husted et al., 2020).

Results: Robustness Checks



Monetary pol.
 uncertainty

Longer window
 size