An Alternative Explanation for the "Fed Information Effect"

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The "Fed Information Effect"

$$BCrev_t = \alpha + \theta\, mps_t + \varepsilon_t$$

- t indexes FOMC announcements
- $BCrev_t$ is one-month change in Blue Chip forecast around FOMC announcement
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- but empirical work sometimes estimates $\theta > 0$

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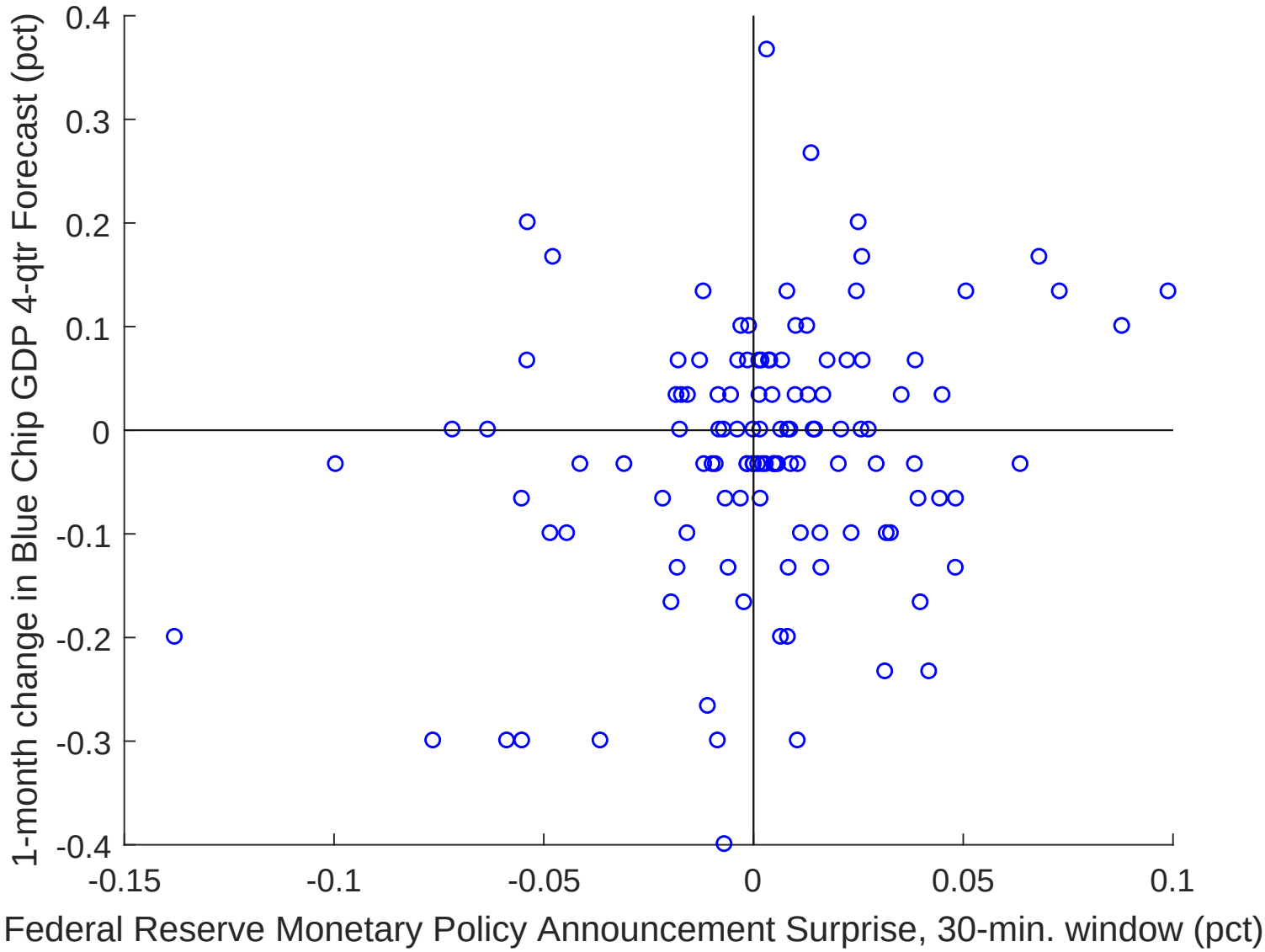

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- the Fed is a better economic forecaster than the private sector
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See:

- Romer and Romer (2000 AER)
- Campbell, Evans, Fisher, Justiniano (2012 BPEA)
- Nakamura-Steinsson (2018 QJE)

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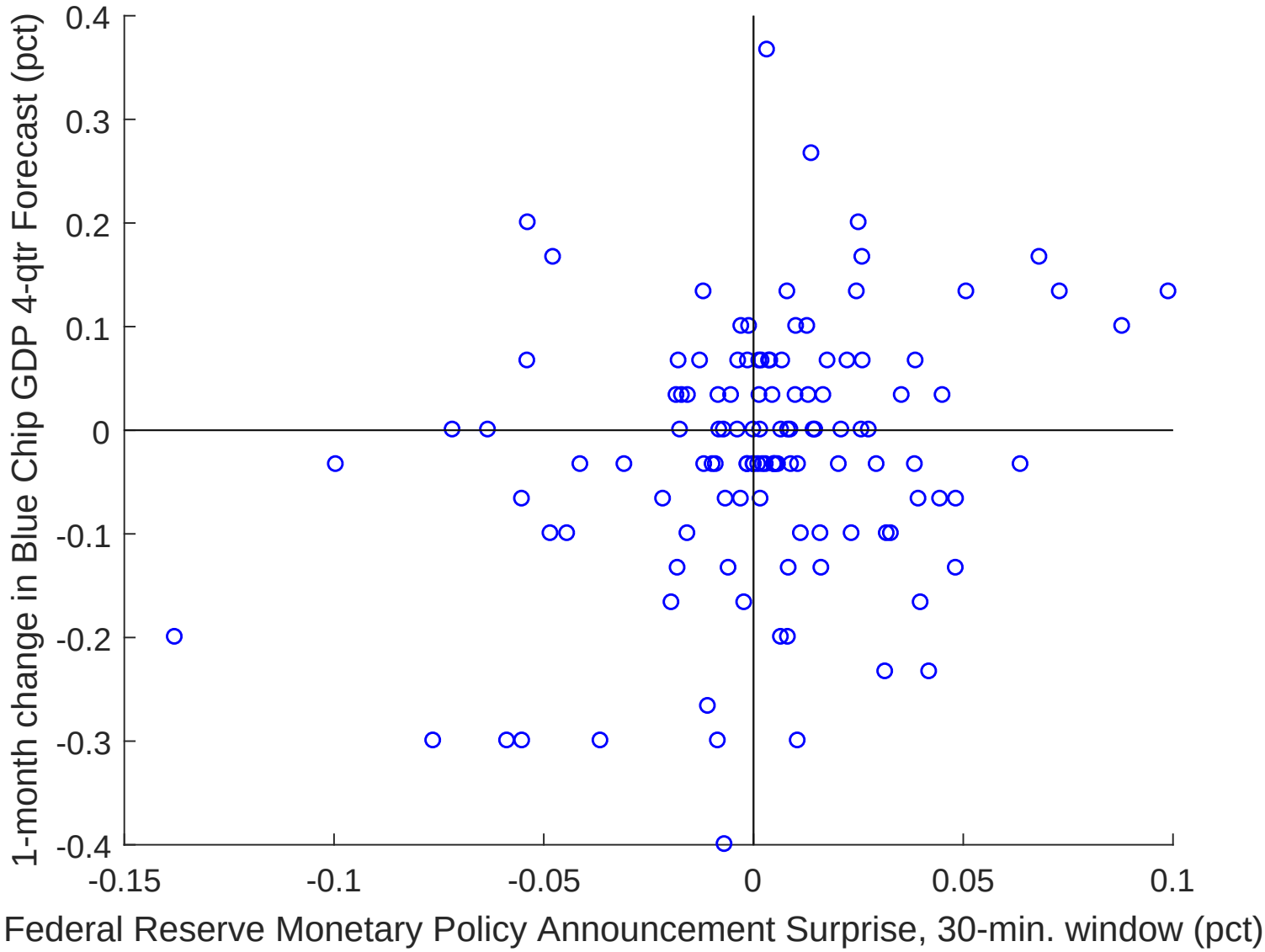

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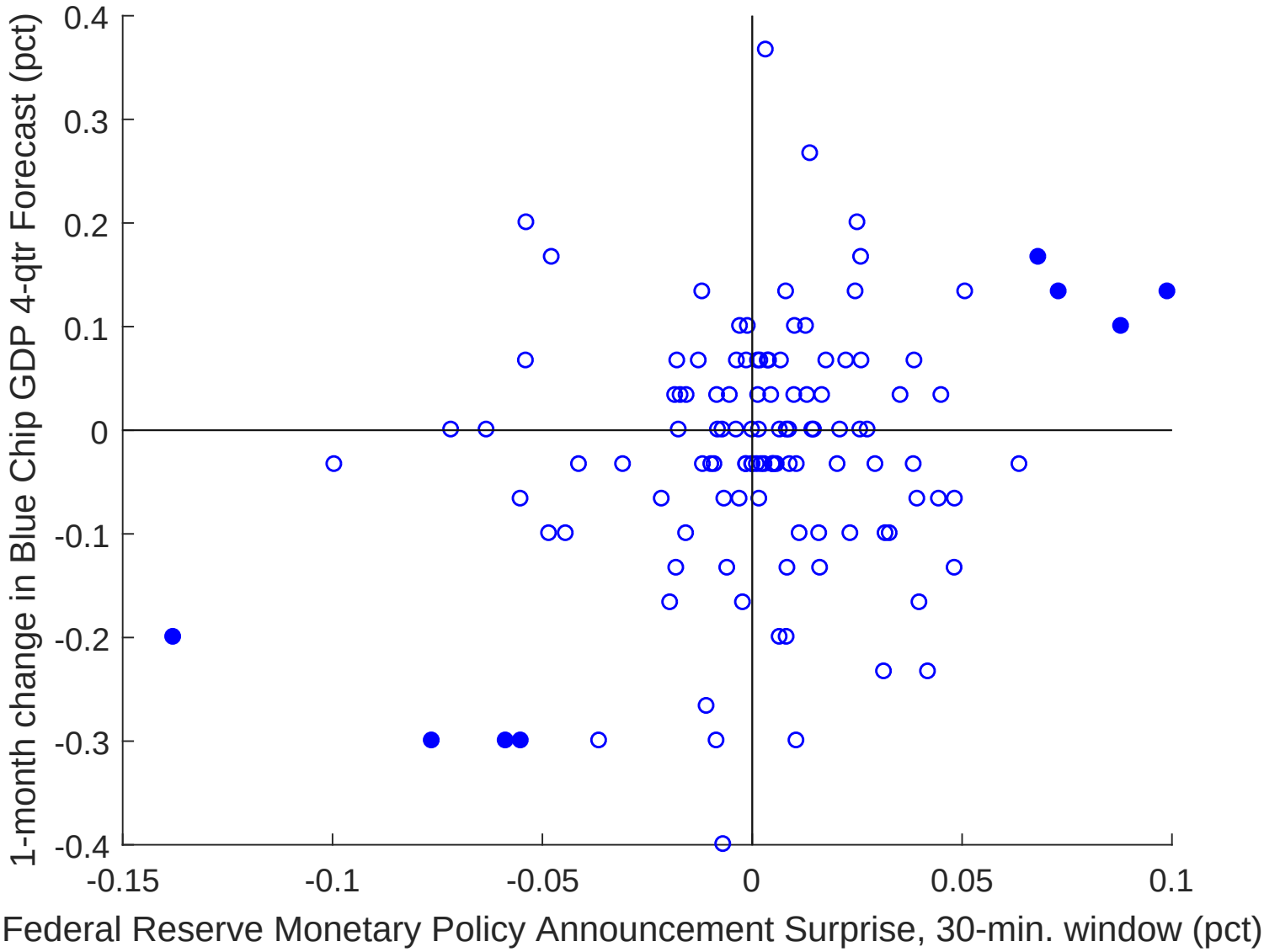

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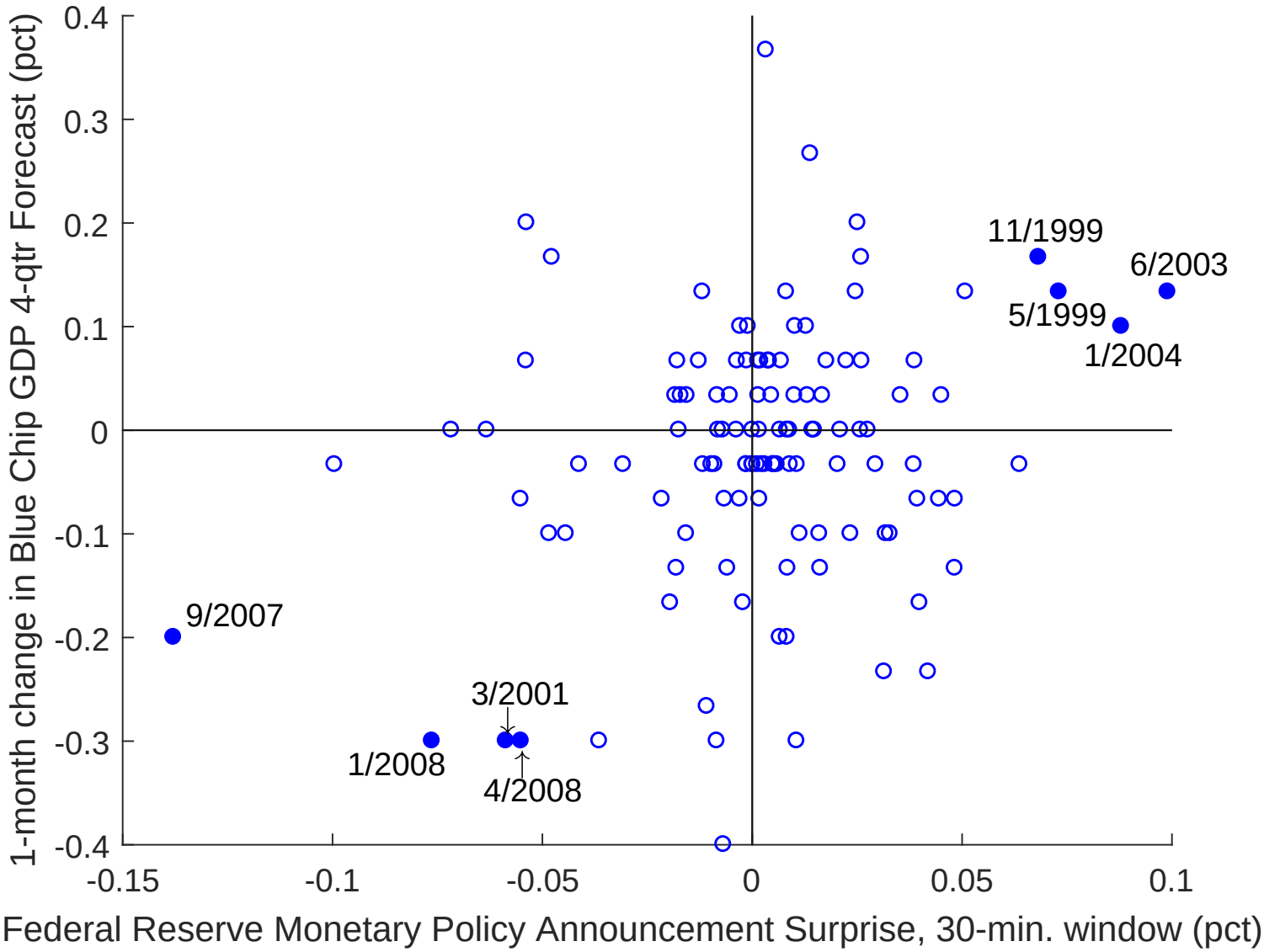

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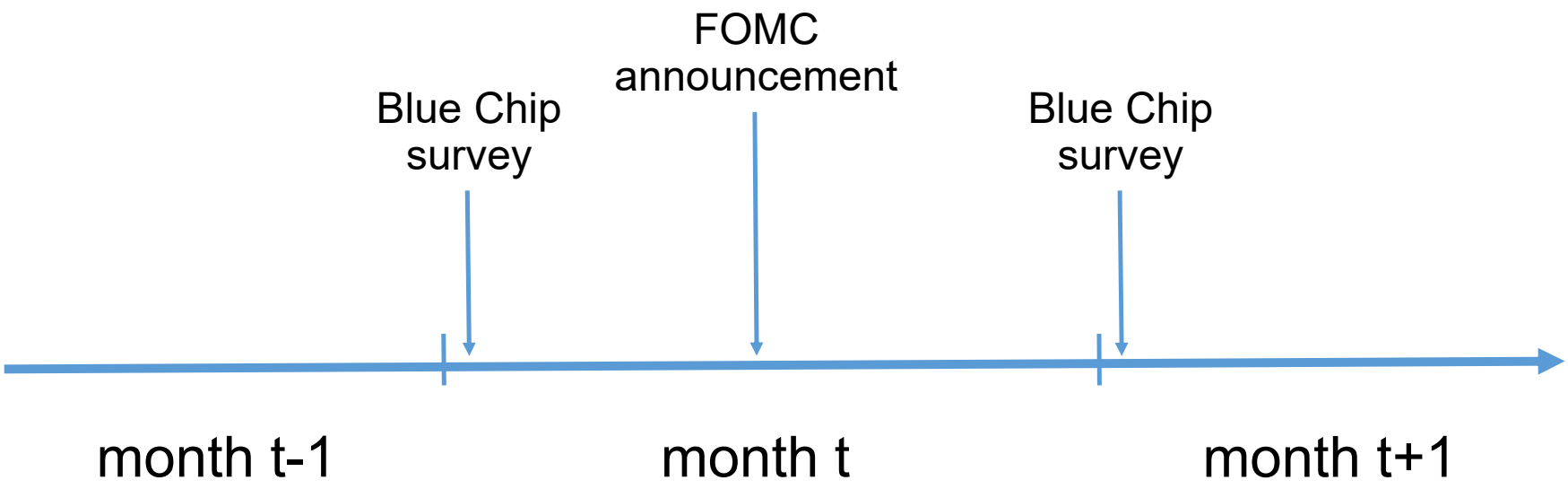

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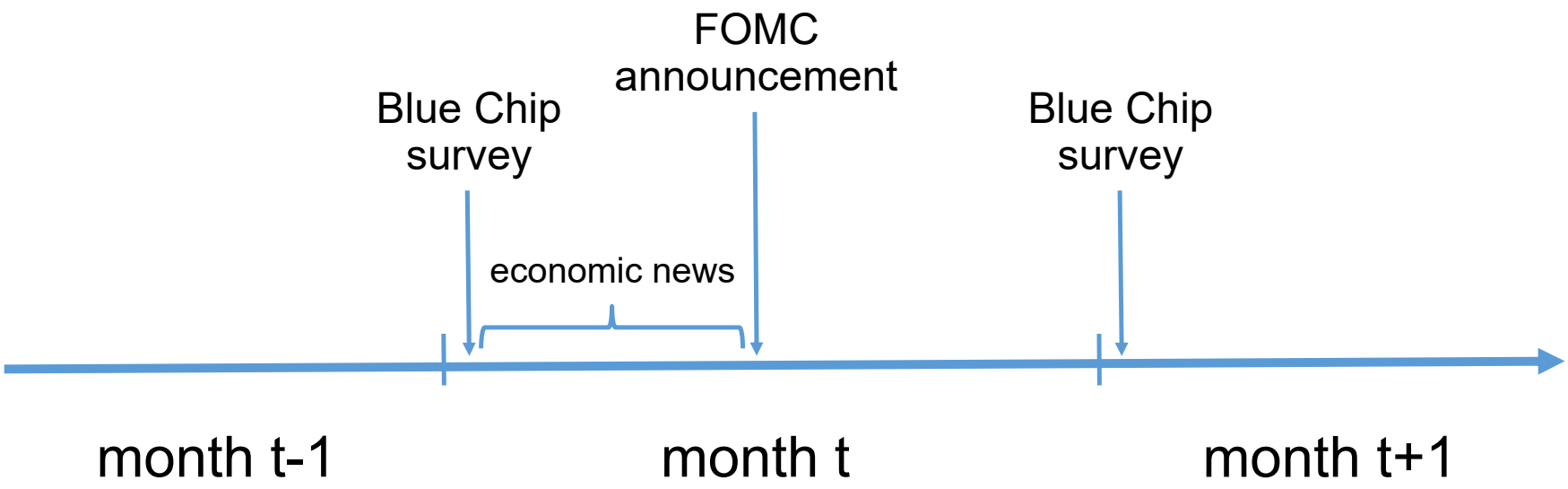

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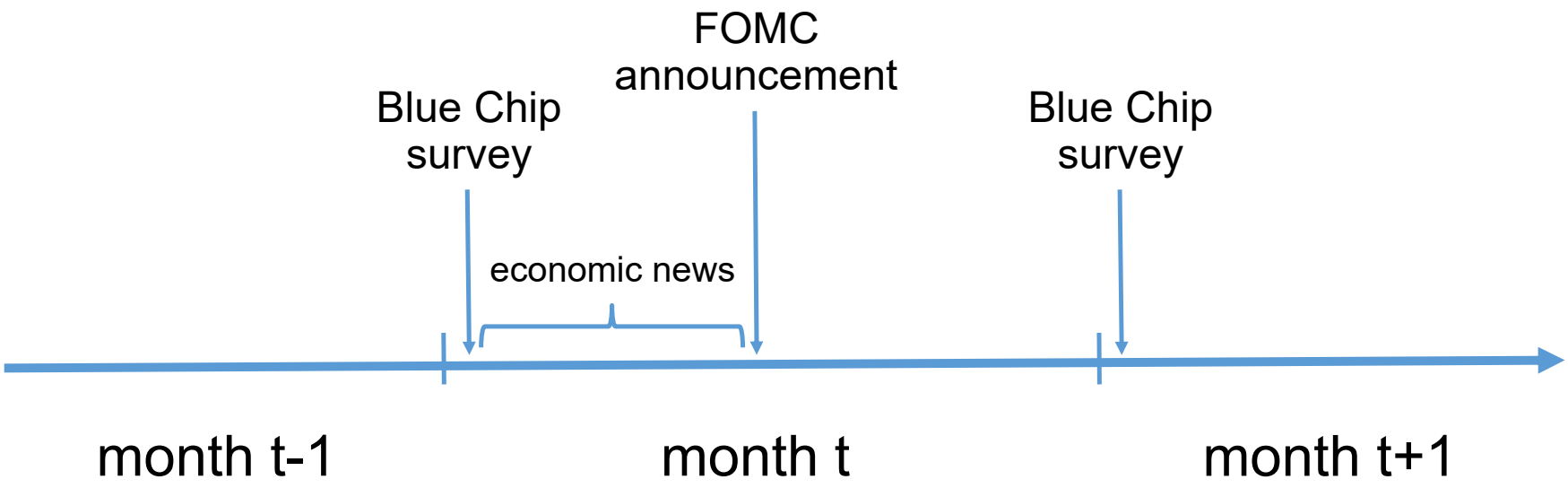

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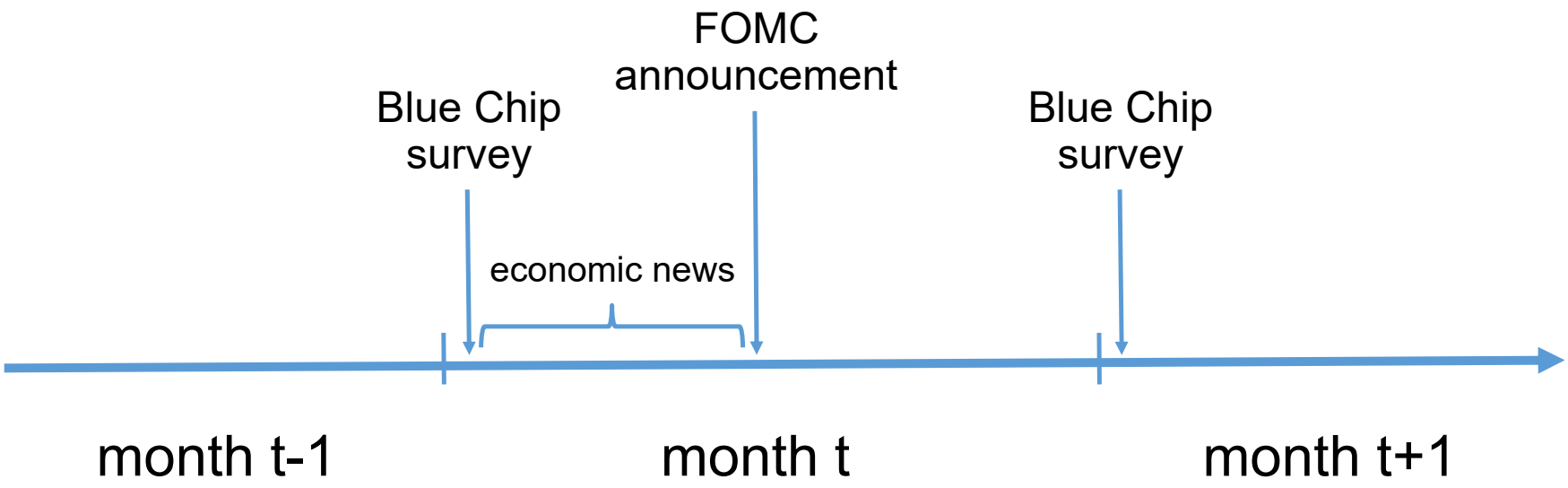

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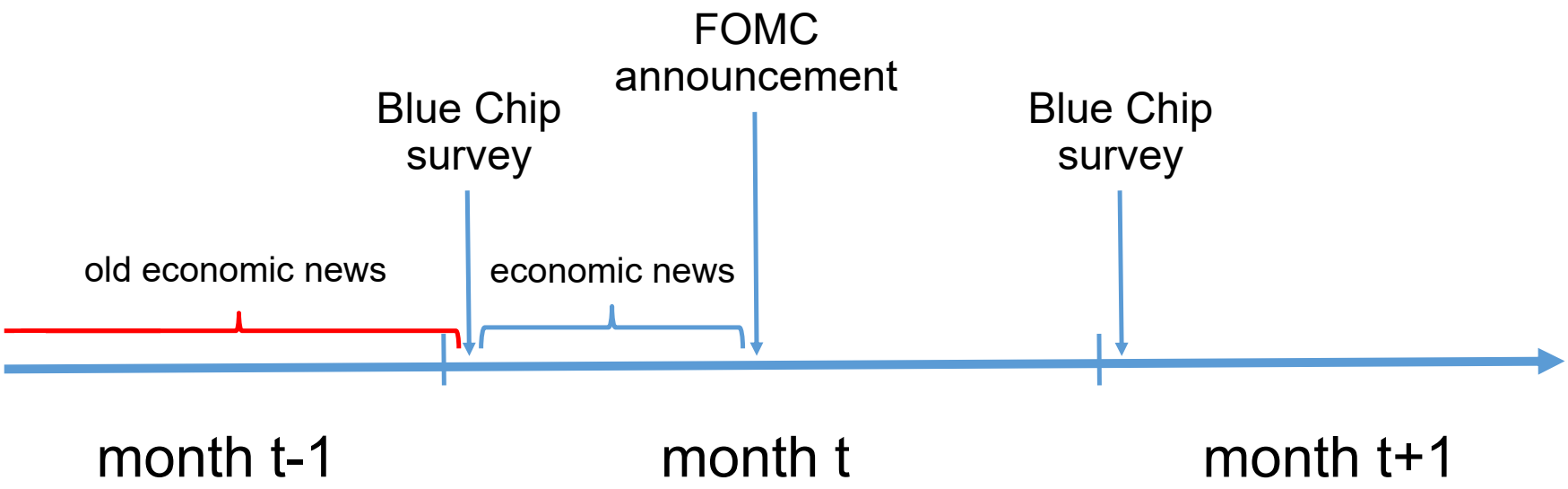

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  Estimates of θ are biased if economic news is correlated with mps_t
- Old economic news can also matter if Blue Chip forecasters revise forecasts a little slugglishly (Coibion-Gorodnichenko, 2015 AER)

Outline of Presentation

1. Replicate “Information Effect” regressions, check robustness
2. Repeat analysis with omitted variables included
3. Results from our own survey of Blue Chip forecasters
4. High-frequency stock market evidence
5. Forecast comparison: Fed vs. Blue Chip
6. Simple model of “Fed Response to News” channel

Information Effect Regressions

Campbell et al. (2012):

$$BCrev_t = \alpha + \beta\, target_t + \gamma\, path_t + \varepsilon_t$$

Nakamura-Steinsson (2018):

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- $target_t$ and $path_t$ are the Gürkaynak-Sack-Swanson (2005) measures of target funds rate surprise and forward guidance surprise in 30-min window around announcement
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Information Effect Regression Results

	Blue Chip forecast revision:					
	Unemployment rate		Real GDP growth		CPI inflation	
	(1)	(2)	(3)	(4)	(5)	(6)
(A) Campbell et al. replication sample: 1/1990–6/2007 ($N = 129$)						
target	−0.114		0.097		0.146	
	(0.102)		(0.187)		(0.115)	
path	−0.226		0.273		0.102	
	(0.139)		(0.264)		(0.154)	
R^2	0.04		0.02		0.02	
(B) Nakamura-Steinsson replication sample: 1/1995–3/2014, excluding unscheduled FOMC announcements and 7/2008–6/2009 ($N = 120$)						
NS surprise		−0.165		0.920**		0.062
		(0.294)		(0.373)		(0.249)
R^2		0.00		0.06		0.00

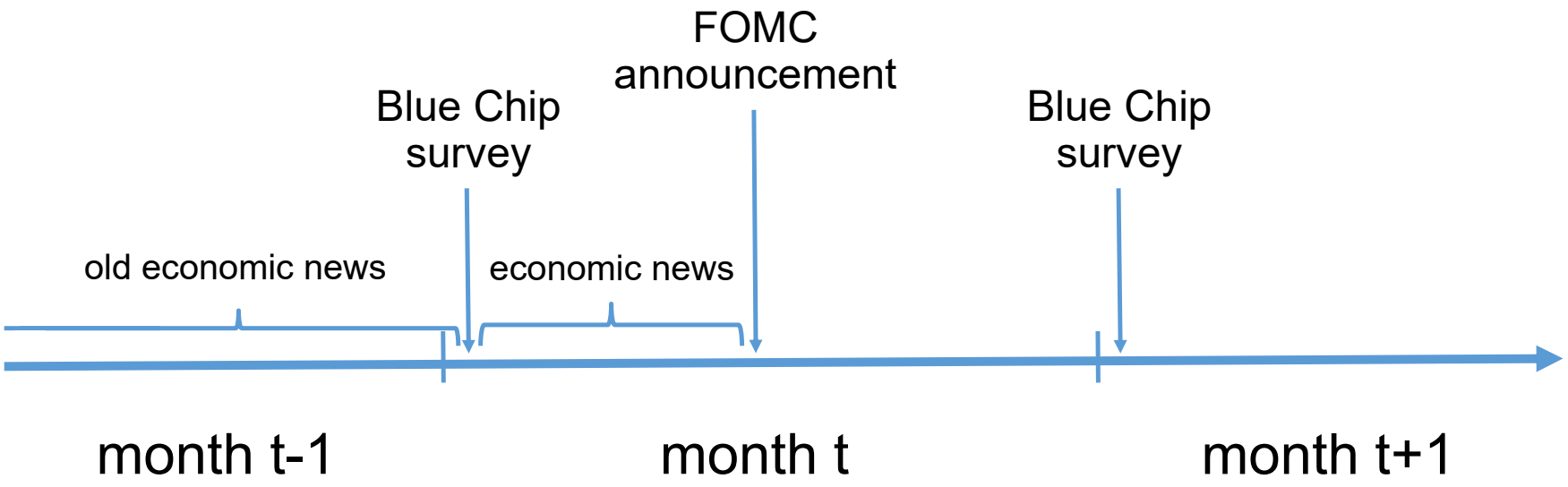
Information Effect Regression Results (cont.)

	Blue Chip forecast revision:					
	Unemployment rate		Real GDP growth		CPI inflation	
	(1)	(2)	(3)	(4)	(5)	(6)
(C) Full sample: 1/1990–6/2019 ($N = 217$)						
target	−0.161		0.162		0.163*	
	(0.112)		(0.171)		(0.096)	
path	−0.237		0.139		0.084	
	(0.146)		(0.229)		(0.123)	
NS surprise		−0.391**		0.325		0.288*
		(0.194)		(0.298)		(0.167)
R^2	0.03	0.02	0.01	0.01	0.02	0.02

Information Effect Regressions Summary

- Replicated basic "Fed Information Effect" findings:
  - coefficients have puzzling signs
- Statistical significance not very robust, depends on:
  - sample period
  - variable being forecast (unemployment, GDP, inflation)
- "Fed Information Effect" story has changed over time:
  - Romer-Romer (2000): inflation
  - Campbell et al. (2012): unemployment
  - Nakamura-Steinsson (2018): GDP
- But: coefficient signs are robust across samples, specifications

Economic News Is an Omitted Variable



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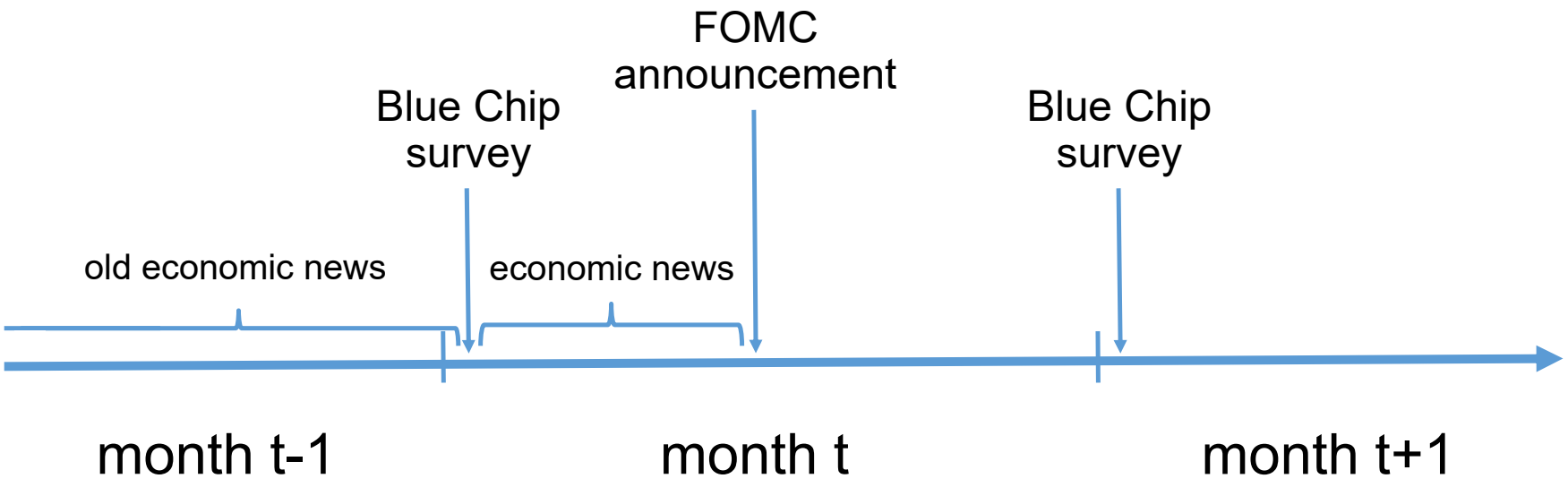

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Economic News Predicts Blue Chip Forecast Revisions

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- t indexes FOMC announcements
- $news_t$ is a vector of economic news released before FOMC announcement:
  - macroeconomic data release surprises
  - financial market changes
  - some old economic news

Economic News Predicts Blue Chip Forecast Revisions

	Blue Chip forecast revision:		
	Unemployment	Real GDP	inflation
	(1)	(2)	(3)
Macroeconomic news			
unemployment surprise	0.308***	−0.010	0.027
	(0.037)	(0.073)	(0.045)
payrolls surprise	−0.121**	−0.100	−0.127*
	(0.056)	(0.110)	(0.067)
GDP surprise	−0.020**	0.064***	0.010
	(0.008)	(0.016)	(0.009)
BBK index	−0.047***	0.031	0.008
	(0.013)	(0.026)	(0.016)
core CPI surprise	0.097	−0.187	0.209**
	(0.071)	(0.139)	(0.084)
change in core CPI inflation from 6 mos. previous	−0.025***	−0.016	0.032***
	(0.009)	(0.019)	(0.011)

(cont.)

Economic News Predicts Blue Chip Forecast Revisions

	Blue Chip forecast revision:		
	Unemployment	Real GDP	inflation
	(1)	(2)	(3)
Financial news			
Δ log S&P500	-0.212^{**}	0.620^{***}	0.009
	(0.086)	(0.168)	(0.101)
Δ yield curve slope	-0.023^{**}	-0.012	0.013
	(0.011)	(0.022)	(0.014)
Δ log pcommodity	-0.111	0.145	0.429^{***}
	(0.103)	(0.206)	(0.125)
R^2	0.64	0.40	0.31

Economic News Predicts Monetary Policy Surprises

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- under standard FIRE assumption, mps_t should be unpredictable: $\alpha, \beta = 0$ (even if Fed Information Effect is true)
- but if markets don't know Fed's monetary policy rule, then mps_t can be correlated with economy *ex post*, resulting in $\alpha, \beta \neq 0$
  (see also Cieslak, 2018 RFS; Schmeling et al., 2020)

Economic News Predicts Monetary Policy Surprises

	Monetary policy surprise measure: target (1)	path (2)	NS surprise (3)
Macroeconomic news			
unemployment surprise	−0.010	−0.020	−0.013
	(0.044)	(0.030)	(0.024)
payrolls surprise	0.125*	0.018	0.070*
	(0.066)	(0.046)	(0.036)
GDP surprise	0.003	0.015**	0.008*
	(0.009)	(0.006)	(0.005)
BBK index	0.003	0.000	0.002
	(0.016)	(0.011)	(0.009)
core CPI surprise	0.042	0.079	0.054
	(0.080)	(0.055)	(0.043)
change in core CPI inflation from 6 mos. previous	0.004	0.009	0.006
	(0.011)	(0.008)	(0.006)

(cont.)

Economic News Predicts Monetary Policy Surprises

	Monetary policy surprise measure:		
	target	path	NS surprise
	(1)	(2)	(3)
Financial news			
Δ log S&P500	0.155^{*}	0.150^{**}	0.141^{***}
	(0.094)	(0.064)	(0.052)
Δ yield curve slope	-0.022^{*}	-0.011	-0.016^{**}
	(0.013)	(0.009)	(0.007)
Δ log pcommodity	0.076	0.171^{**}	0.110^{*}
	(0.108)	(0.073)	(0.058)
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- news_t is correlated with mps_t, will cause omitted variable bias in "Fed Information Effect" regressions

Economic News Drives Out "Fed Information Effect"

Repeat "Fed Information Effect" regressions with omitted variable included:

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	Blue Chip forecast revision:					
	Unemployment rate		Real GDP growth		CPI inflation	
	(1)	(2)	(3)	(4)	(5)	(6)
Reminder: results excluding controls for economic news (full sample):						
target	−0.161		0.162		0.163*	
	(0.112)		(0.171)		(0.096)	
path	−0.237		0.139		0.084	
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NS surprise		0.328^{***}		-0.588^{**}		-0.035
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- essentially all coefficients now have standard sign
- standard errors are smaller, statistical significance is larger
- coefficients are quantitatively similar to DSGE models, VARs

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NS surprise		0.328^{***}		-0.588^{**}		-0.035
		(0.135)		(0.258)		(0.160)
R^2	0.65	0.65	0.42	0.42	0.32	0.31

- R^2 are much larger
- essentially all coefficients now have standard sign
- standard errors are smaller, statistical significance is larger
- coefficients are quantitatively similar to DSGE models, VARs
- results are very similar for other samples (see paper)

Omitted Variables Summary

- Economic news is an omitted variable in “Fed Information Effect” regressions
  - economic news predicts Blue Chip forecast revisions
  - economic news predicts monetary policy surprises
  - coefficients in standard “Fed Information Effect” regressions are biased
  - including economic news drives out the “Fed Information Effect”

Our Survey of Blue Chip Forecasters

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- emailed them a survey asking how they revised their GDP, unemployment, and inflation forecasts in response to FOMC announcements, in particular:
  - federal funds rate decision
  - FOMC statement
  - interest rate “dot plot”
  - Summary of Economic Projections (SEP) forecasts for GDP, unemployment, and inflation

Results from Our Survey

36 responses out of 52 possible:

	Response to hawkish surprise in:		
	fed funds rate	FOMC statement	"dot plot"
Do not revise GDP forecast	13	16	14
Revise GDP forecast downward	18	15	18
Revise GDP forecast, but direction depends on other factors	5	5	4
Revise GDP forecast upward	0	0	0

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- The last row contradicts Nakamura-Steinsson (2018), Campbell et al. (2012)

Results from Our Survey

	Response to FOMC's Summary of Economic Projections (SEP)
Do not revise GDP forecast	24
Revise GDP forecast towards SEP forecast, if substantially different	4
Use SEP to help forecast fed funds rate, effect on GDP standard	3
Use SEP to help forecast fed funds rate, effect on GDP depends on other factors	1
Revise GDP, but revision depends on multiple factors	2

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Revise GDP, but revision depends on multiple factors	2

- If there was a Fed information effect, we ought to see it here

Typical Quotes from Our Survey

24 out of 34 survey respondents do not find SEP forecasts useful:

"I trust my outlook more than the Fed's. . . Their forecasting ability is pretty poor."

"My view is that the Fed does not have superior information. . . The FOMC forecast tends to be off by a lot."

"We tend to find that the Fed has no better information advantage over economists like myself. . . In fact, what we have found many times is Fed forecasts (per the SEP) tend to be somewhat stale."

"I would be responding to the change in the policy outlook, not to the possibility that the Fed 'knew' something that I did not."

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Typical Quotes from Our Survey (cont.)

"I have not been surprised by an FOMC announcement since well before 2008 (including January 2008 [a 75bp intermeeting rate cut])."

"In the end, we are likely to get more information from speeches and press conferences than we are from the statement, the decision, or the dots. So by the time we get those things, it tends to be relatively 'old news', if you will."

"I make my forecasts based on the data, not Fed assumptions. I haven't been surprised by them in a very long time."

"If we think the Fed is about to make a decision that is inconsistent with our expected outlook, we often think that will lead to a change in financial conditions that will in turn push the Fed back to where we think is appropriate for the economy."

"I could never find an effect of interest rates on any component of investment except residential [which was too small to have a significant effect on the GDP forecast]."

Results from Our Survey: Summary

- Large majority of survey respondents do not find FOMC's SEP forecasts useful
- Overwhelming majority do *not* revise GDP forecasts in "information effect" direction:
  - 13–14 do not revise macro forecasts at all in response to FOMC
  - 18 revise macro forecasts in traditional direction
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  - 0 revise macro forecasts in "information effect" direction
- But:
  - 5 forecasters did say "it depends"

Stock Market Response to FOMC Announcements

Consider high-frequency stock market response regressions:

$$\Delta \log \text{S\&P500}_t = \alpha + \beta\, \textit{target}_t + \gamma\, \textit{path}_t + \varepsilon_t$$

$$\Delta \log \text{S\&P500}_t = \phi + \theta\, \textit{mps}_t + \eta_t$$

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  - in any case, β, γ, θ should be less negative if information effect is substantial

Top 10 Influential Announcements from NS Regression

Date	Effect on t-statistic	MP surprise mps_t	$BCrev_t$, GDP	Δ log S&P500$_t$	bus. cycle indicator
9/2007	0.554	−0.138	−0.2	1.33	−0.29
1/2008	0.351	−0.076	−0.3	0.76	−0.81
6/2003	0.312	0.099	0.133	−0.27	−0.38
3/2001	0.291	−0.059	−0.3	−0.68	−1.45
4/2008	0.278	−0.055	−0.3	0.31	−1.52
11/1999	0.240	0.068	0.167	−0.42	0.86
1/2004	0.224	0.088	0.1	−0.97	0.38
5/1999	0.224	0.073	0.133	−1.44	0.19
12/1995	0.207	−0.036	−0.3	0.26	−0.08
3/1997	0.155	0.051	0.133	−0.67	0.80

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	Ten strongest information effect observations (1)	Sample excluding 10 strongest observations (2)
NS surprise	-8.04^{***}	-7.14^{***}
	(1.91)	(1.84)
R^2	0.64	0.14
N	10	110

Stock Market Regressions Summary

- Stock market responses do not support "Fed Information Effect"
  - $\beta, \gamma, \theta < 0$ on average
  - $\beta, \gamma, \theta < 0$ for influential "Information Effect" observations
  - β, γ, θ are just as negative for influential "Information Effect" observations
- Results are highly statistically significant and very robust

Fed vs. Blue Chip Forecasts

Horizon (quarters)	RMSEs GB	BC	H_0: $GB = BC$
(A) Unemployment rate			
0	0.18	0.17	.412
1	0.34	0.34	.831
2	0.54	0.53	.842
3	0.73	0.73	.952
0-3 avg.	0.42	0.42	.923

Fed vs. Blue Chip Forecasts

Horizon (quarters)	RMSEs GB	RMSEs BC	H_0: $GB = BC$
(B) Real GDP growth			
0	1.96	1.97	.741
1	2.44	2.32	.030
2	2.46	2.49	.739
3	2.55	2.52	.710
0-3 avg.	1.64	1.60	.447

Fed vs. Blue Chip Forecasts

Horizon (quarters)	RMSEs GB	BC	H_0: $GB = BC$
(C) CPI inflation			
0	0.89	1.15	.012
1	2.01	2.07	.554
2	1.92	1.80	.092
3	1.96	1.87	.191
0-3 avg.	1.13	1.05	.242

A Simple Model

Let x_t denote state of the economy (e.g., GDP):

$$x_t = \rho_x x_{t-1} + \eta_t$$

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$\eta_t, \varepsilon_t \perp \mathcal{H}_{t-1}$

A Simple Model

Private sector ex ante expected interest rate at time t is:

$$\begin{aligned} E\left[i_t \,|x_t, \mathcal{H}_{t-1}\right] &= E\left[ax_t + \varepsilon_t \,|\, x_t, \mathcal{H}_{t-1}\right] \\ &= E\left[ax_t \,|\, x_t, \mathcal{H}_{t-1}\right] \\ &= \hat{a}_t x_t \end{aligned}$$

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When central bank announces i_t, private sector is surprised by:

$$\begin{aligned} mps_t &\equiv i_t - E\left[i_t \,|x_t, \mathcal{H}_{t-1}\right] \\ &= (a - \hat{a}_t)x_t \; + \; \varepsilon_t \end{aligned}$$

A Simple Model

Kalman filtering/optimal Bayesian updating of a implies:

$$E\left[a|\mathcal{H}_t\right] = \hat{a}_t + \omega_t \frac{1}{x_t} mps_t$$

where $\omega_t \equiv \frac{x_t^2 \sigma_{a_t}^2}{x_t^2 \sigma_{a_t}^2 + \sigma_\varepsilon^2}$

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Private sector revises forecasts of interest rate path by:

$$\begin{aligned} E\left[i_{t+j}|\mathcal{H}_t\right] - E\left[i_{t+j}|x_t, \mathcal{H}_{t-1}\right] &= E\left[ax_{t+j}|\mathcal{H}_t\right] - E\left[ax_{t+j}|x_t, \mathcal{H}_{t-1}\right] \\ &= \left(E\left[a|\mathcal{H}_t\right] - \hat{a}_t\right) \rho_x^j x_t \\ &= \rho_x^j \omega_t mps_t \end{aligned}$$

Implications of the Simple Model

Key equations:

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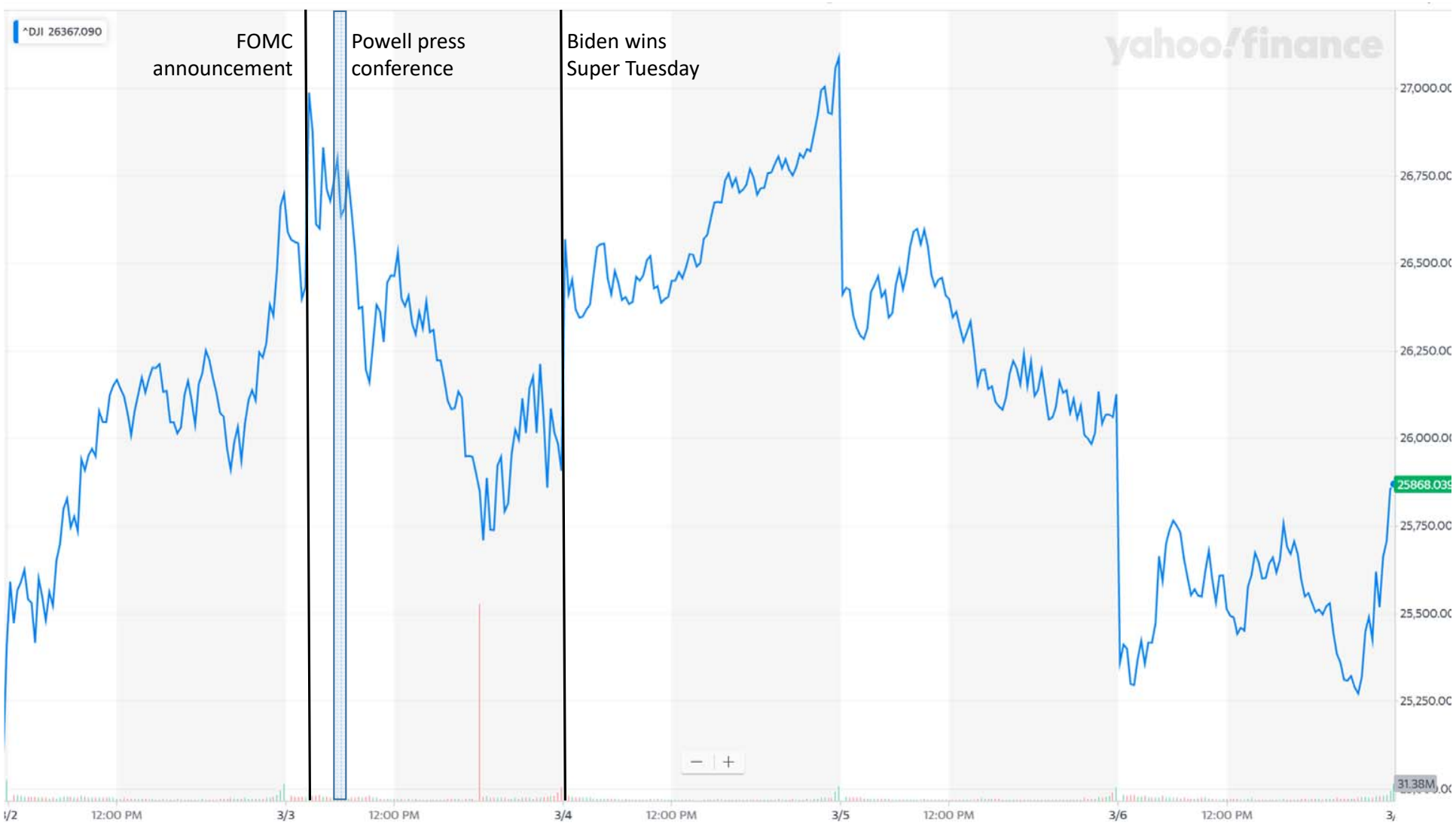
- However, for high-frequency identification of a VAR, mps_t is correlated with x_t, must be orthogonalized to be used as external instrument (e.g., Miranda-Agrippino and Ricco, 2021).

Conclusions

1. Economic news is an omitted variable in "Information Effect" regs.
   - "Fed Information Effect" regressions suffer from omitted variable bias
   - including the omitted variable drives out "Fed Information Effect"
2. Our survey of Blue Chip forecasters contradicts "Fed Information Effect"
3. Stock market responses to FOMC announcements do not support "Fed Information Effect"
4. Fed forecasts and Blue Chip forecasts are very similar
5. We propose alternative "Fed Response to News" channel that is consistent with all of our empirical findings
6. High-frequency monetary policy surprises can be used:
   - in high-frequency regressions to estimate effects of monetary policy
   - to help identify VARs (but some adjustment here can be necessary)

The Stock Market, March 2–6, 2020



Jarocinski and Karadi (2020)

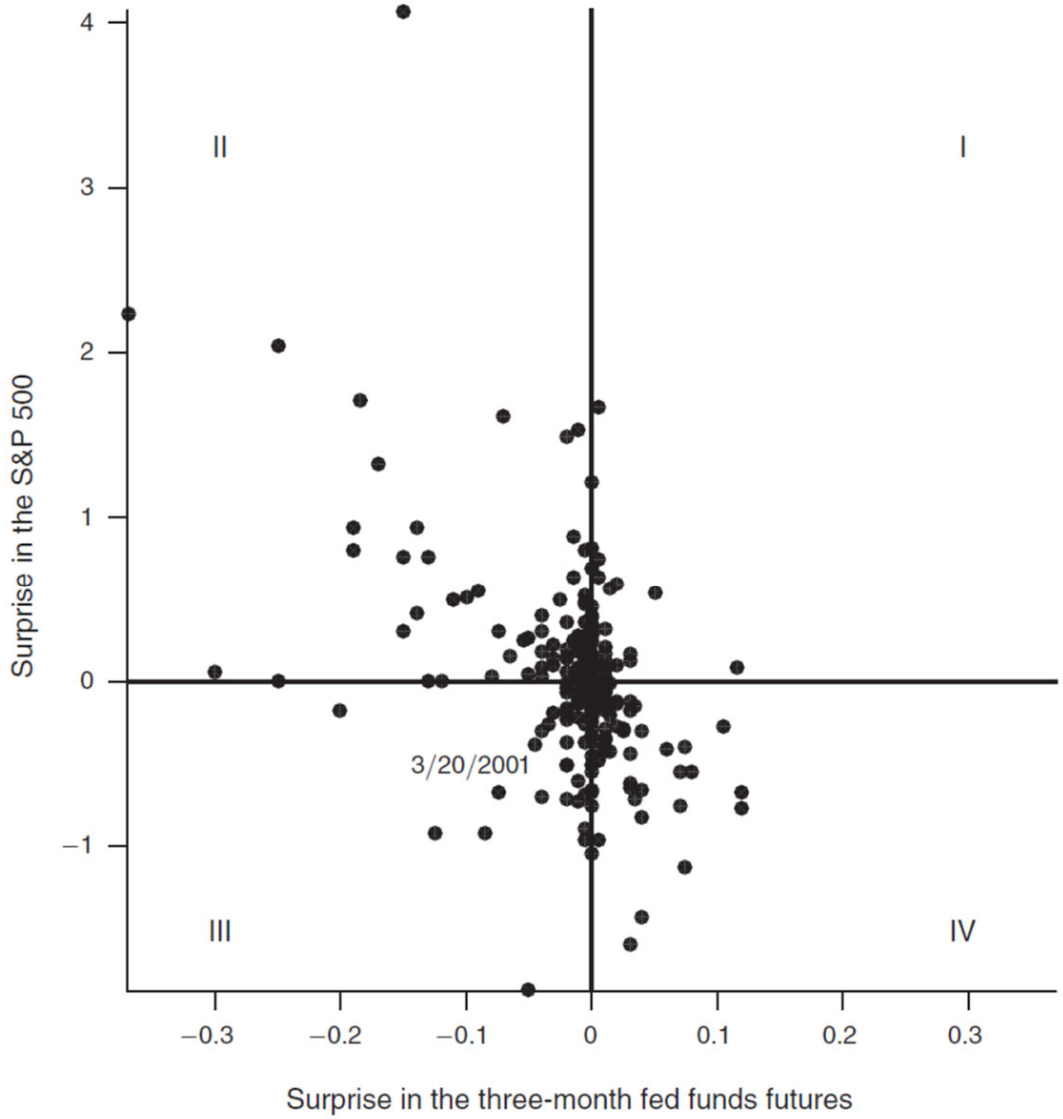


FIGURE 1. SCATTERPLOT OF INTEREST RATE AND STOCK PRICE SURPRISES

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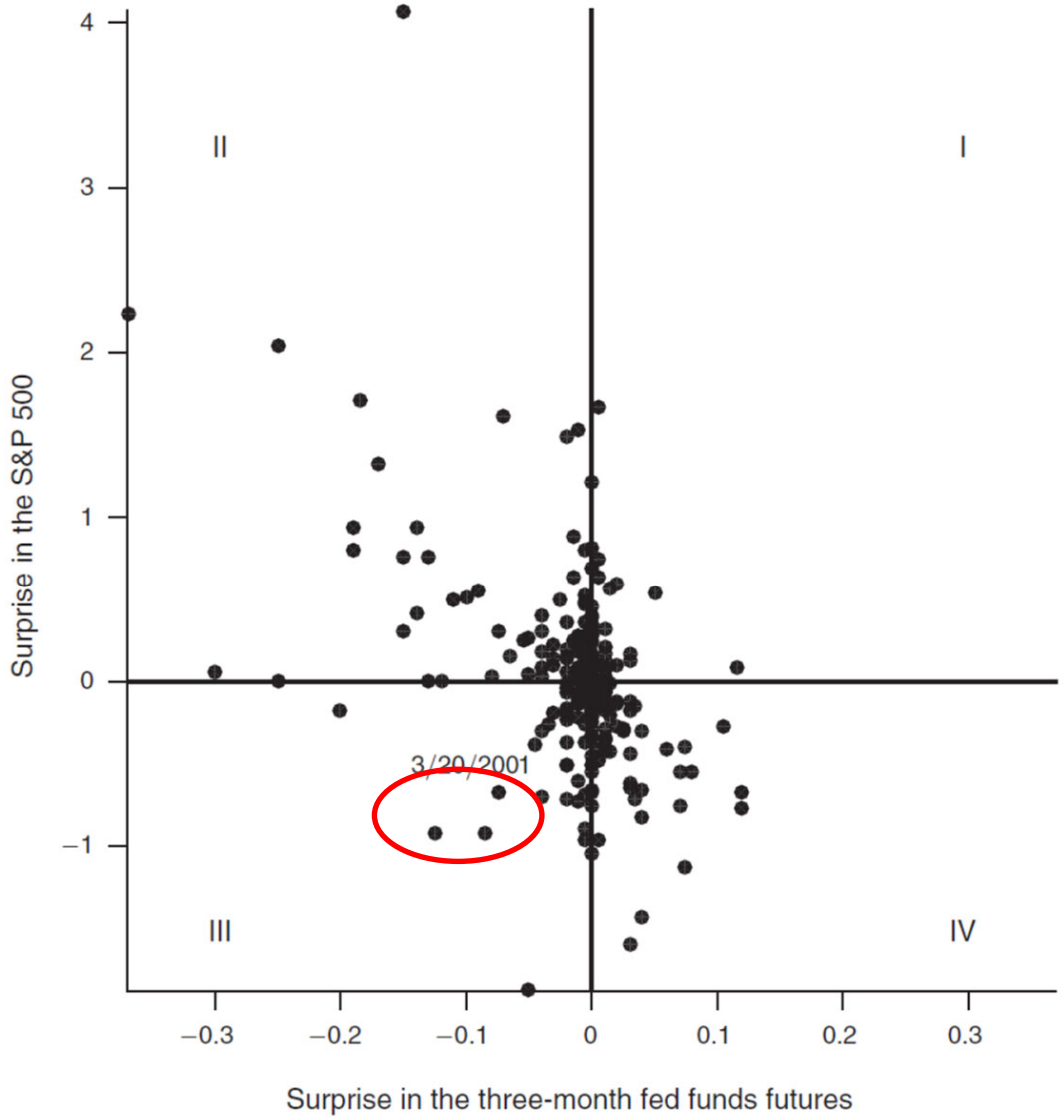

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Jarocinski and Karadi (2020): 3/20/2001

STOCKS & BONDS

Shares Fall Hard as Fed Rate Cut Disappoints Inves...

By MICHAEL BRICK

After weeks of anticipation, investors were disappointed yesterday after the Federal Reserve cut interest rates less than they had wanted.

Stocks fell sharply, with technology issues suffering big losses. The afternoon selloff partly reflected the misplaced bets of investors who had hoped the Fed would reduce short-term interest rates by three-quarters of a percentage point. Instead, the central bank cut its target for the federal funds rate by a widely anticipated half a point, to 5 percent.

The Nasdaq composite index fell 93.74 points, or 4.8 percent, to 1,857.44. The Nasdaq is down 24.8 percent so far this year. The Dow Jones industrial average fell 238.35 points, or 2.4 percent, to 9,720.76. It fell below 10,000 last week as investors' fears spread beyond the technology sector, and it has now declined 9.9 percent this year.

The Standard & Poor's 500-stock index fell 28.19 points, or 2.4 percent, to 1,142.62. It has declined 13.5 percent this year.

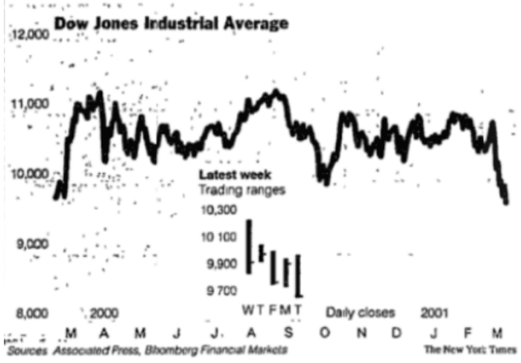
The Fed made its announcement around 2:15 p.m. Eastern time. Until then, the stock market was sluggish, showing modest gains. Immediately afterward, the Nasdaq dropped about seven-tenths of a percent, then jumped back up about 2 percent.

"The indecision is rampant," said Jeffrey D. Saut, chief investment strategist for Raymond James & Associates. "It's up, it's down, it's down, it's up."

After that, though, stocks began a rapid and steady descent. The losses carved deeply into technology stocks, which some investors had hoped would surge, at least temporarily, after the move by the Fed.

"Investors just don't know how they want to be positioned," said Brett Gallagher, a vice president of Julius Baer Investment Management, who manages $400 million in equity holdings for foundations and wealthy individuals. After some hasty adjustments, they seemed struck by a realization that "the next scheduled releases we're going to see are going to be first-quarter earnings and we don't expect those to be brilliant."

Intel fell $2.44, to $24.63; Cisco fell $1.75, to $19.06, and JDS Uniphase fell $3.13, to $21.50



Hot & Cold

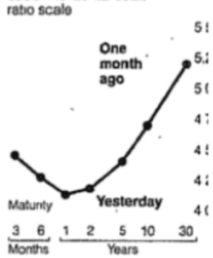
A look at stocks with large price percentage gains and losses

STOCK EX, SYMBOL	YESTERDAY CLOSE	CHANGE	YEAR TO DATE	COMMENT
Plantronics N PLT	$16.97	−$6.03 −26.2%	−63.9%	Maker of cellular-phone headsets says earnings will be 16 cents to 19 cents a share in its fourth quarter, analysts had expected 36 cents
Three-Five Systems N TFS	$12.39	−$3.26 −20.8%	−31.2%	Maker of liquid-crystal displays expects to break even in the first quarter, analysts had forecast a profit of 8 cents a share
Flextronics International NNM FLEX	$19.00	−$4.38 −18.7%	−33.3%	Several analysts lower their earnings estimates for the electronics manufacturing service provider
Solectron N SLR	$19.09	−$2.40 −11.2%	−43.7%	The contract manufacturer of electronics is cutting 8,200 jobs, or 10 percent of its workers, and will miss profit forecasts for the current quarter because demand is falling
Exfo Electro-Optical Engineering NNM EXFO	$25.25	+$2.00 +8.60%	−3.4%	Maker of gear for testing fiber optic equipment reports fiscal second-quarter profit, excluding costs, that tops analysts' estimates. The company cites higher-than-expected demand
Oracle NNM ORCL	$14.38	−$1.06 −6.88%	−50.5%	Software maker is cutting its work force by up to 2 percent, or 900 jobs, in an attempt to bolster its sagging profits

Compiled from staff reports, The Associated Press, Bloomberg News, Bridge News, Dow Jones, Reuters

Treasury Yield Cu...

Yields of selected Tre... securities. Short-term ... ities are shown on a bond equivalent basis. Horizontal scale ... ratio scale.



Key Rates

Percent	Yesterday	Day Ago	Ye... Ag...
Prime rate	8.00	8.50	8...
Discount rate	4.50	5.00	5...
Federal funds	5.13	5.38	5...
3-month T-bills	4.34	4.37	5...
6-month T-bills	4.16	4.22	5...
10-yr T-infl	3.30	3.29	4...
10-yr T-note	4.75	4.81	6...
30-yr T-bond	5.26	5.29	5...
Telephone bd	7.67	7.70	8...
Municipal bds	5.27	5.27	6...

Sources Salomon Smith Barney, Telerate, The Bond Buyer

their purchases in the energy se... and in the stocks of intrinsically ... clical companies, said Jon Bror... director of equities for North... Trust, the money management ... of the Northern Trust Company.

Alcoa rose 35 cents, to $36.28, International Paper gained $1.10 ... $37.36.

Treasury Prices Rise

By Bloomberg News

Treasury bond prices rose yes... day after the Federal Reserve l... ered interest rates to 5 percent ... signaled another rate cut could co... as early as next month — before ...

Reckonings

PAUL KRUGMAN

Half a Loaf

It could have been the one-two punch that turned the world economy around. On Monday the Bank of Japan met to set monetary policy in the world's second-largest economy, amid hopes that last year's disastrous decision to raise interest rates would be decisively reversed. Yesterday the Federal Reserve's Open Market Committee met to set interest rates for the world's biggest economy, amid hopes that it would act decisively to stop the slide in America's economic growth.

Alas, both central banks pulled their punches. Not that they refused to act: the Fed cut interest rates half a percentage point, and the Bank of Japan announced what amounted to a humiliating reversal of policy. But in each case the measures taken were half-hearted — moves in the right direction, but almost certainly too weak to do the job. And since both central banks faced problems in which market psychology is key, in both cases half a loaf may be as bad as no loaf at all. For if the measures taken in the last two days fail — which they almost certainly will — the fact that each central bank tried to turn the economy around but failed will damage its credibility, and make it all the harder to engineer a recovery in the future.

Start with Japan. Last year the Bank of Japan somehow managed to convince itself that the right cure for an economy suffering persistent deflation was to raise interest rates. Now it has grudgingly conceded that deflationary monetary policy is, you

that much harder for any later effort to break the vicious cycle of deflationary psychology.

The situation in the United States is not nearly so grim. We don't have a long history of deflation in consumer prices. But we do have rapidly deflating stock prices, and equally rapidly deflating consumer and business confidence. The Bank of Japan needs to break a vicious circle of self-fulfilling expectations of defla-

Central banks do it partway.

tion; the Fed needs to break a vicious circle of self-fulfilling deflation of expectations. This isn't just word play; there is a real similarity in the problems facing the two institutions.

The big difference is that the Fed has a powerful conventional tool at its disposal; since U.S. interest rates remain well above zero, there is still room for substantial cuts.

But yesterday the Fed applied that tool half-heartedly, with a rate cut that almost nobody thinks is large enough to do the trick. The official statement that went with the cut contained the code words "the Federal Reserve will need to monitor developments closely." I take this to mean that the Fed itself suspects strongly that another emergency

The New York Times

Fed Disappoints Wall Street With Half-Point Cut in Rates

By Richard W. Stevenson

March 20, 2001

WASHINGTON, March 20 - The Federal Reserve cut interest rates today by half a percentage point, continuing its aggressive effort to resuscitate the faltering economy but disappointing investors who had hoped for more.

Stock prices fell sharply after the Fed's announcement. The Dow Jones industrial average and the broader Standard & Poor's 500-stock index both dropped more than 2 percent, while technology-heavy Nasdaq composite index lost more than 4 percent.