The Fed's Response to Economic News Explains the "Fed Information Effect"

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NBER Summer Institute
Impulse and Propagation Mechanisms (online)
July 9, 2020

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
- mps_t is measure of FOMC announcement surprise in 30-min window around announcement

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- standard macro models, VARs predict $\theta < 0$ (for GDP, inflation)
- but empirical work sometimes estimates $\theta > 0$

The "Fed Information Effect"

The "Fed Information Effect" story:

- the Fed is (perhaps) a better economic forecaster than the private sector
- when the Fed lowers interest rates, private sector infers that economy must be worse than they thought
- so private sector *lowers* rather than raises GDP forecast

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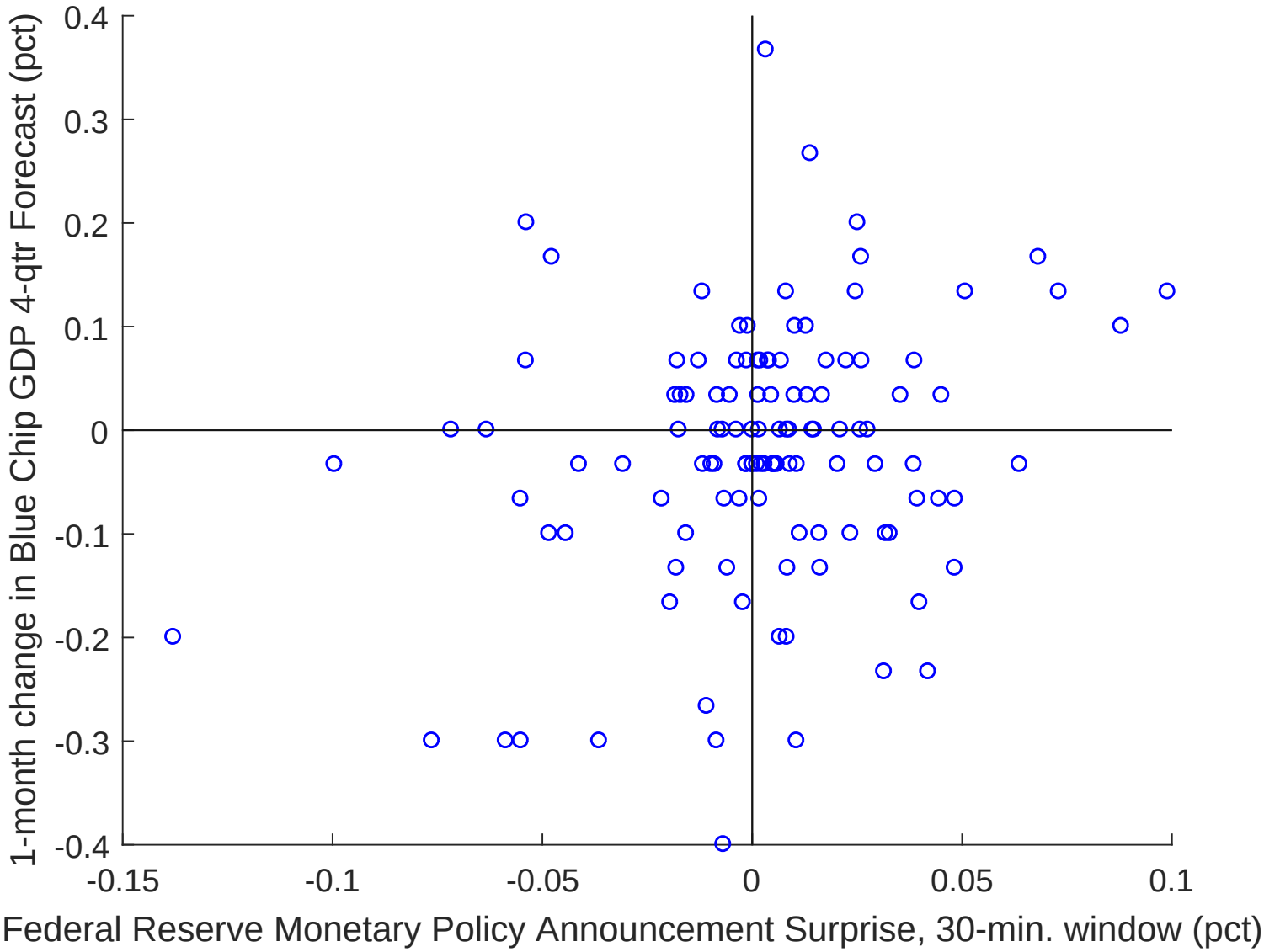

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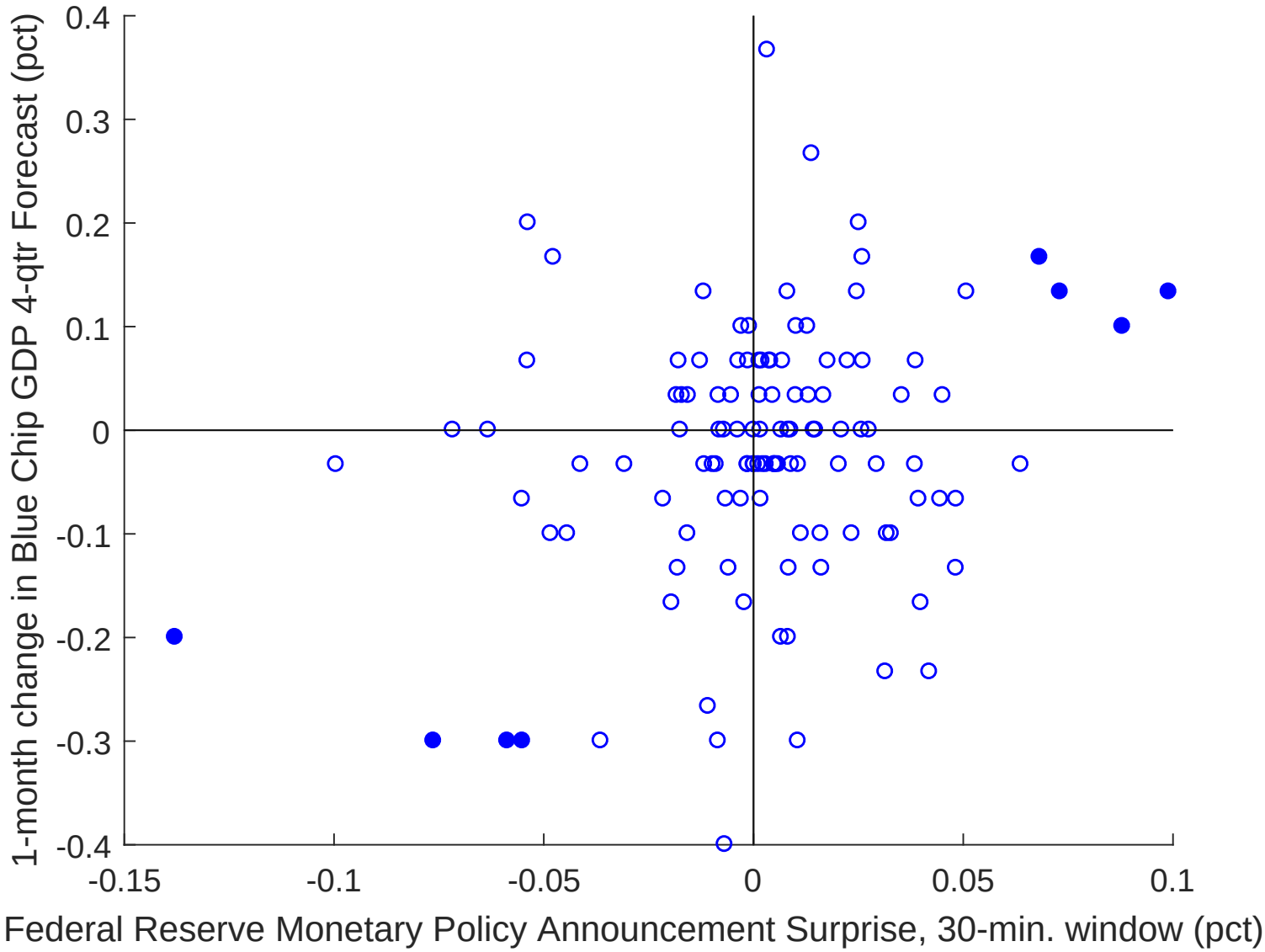

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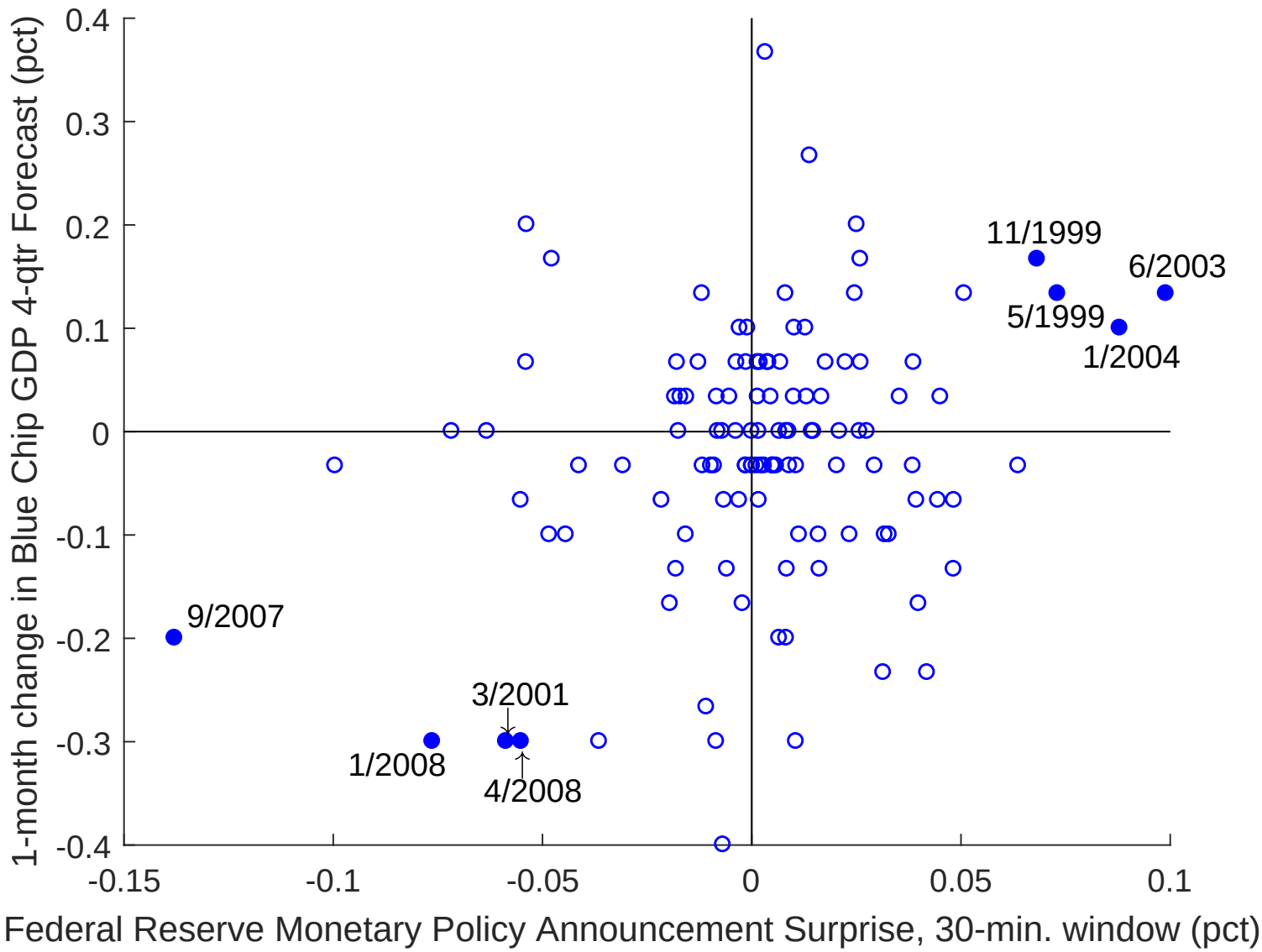

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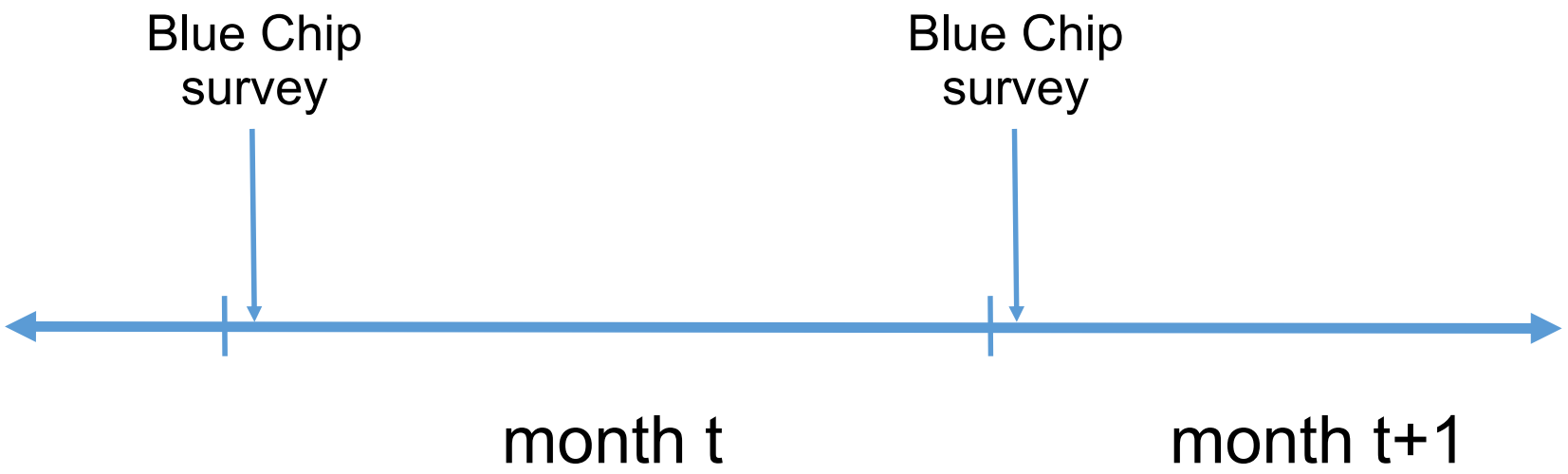

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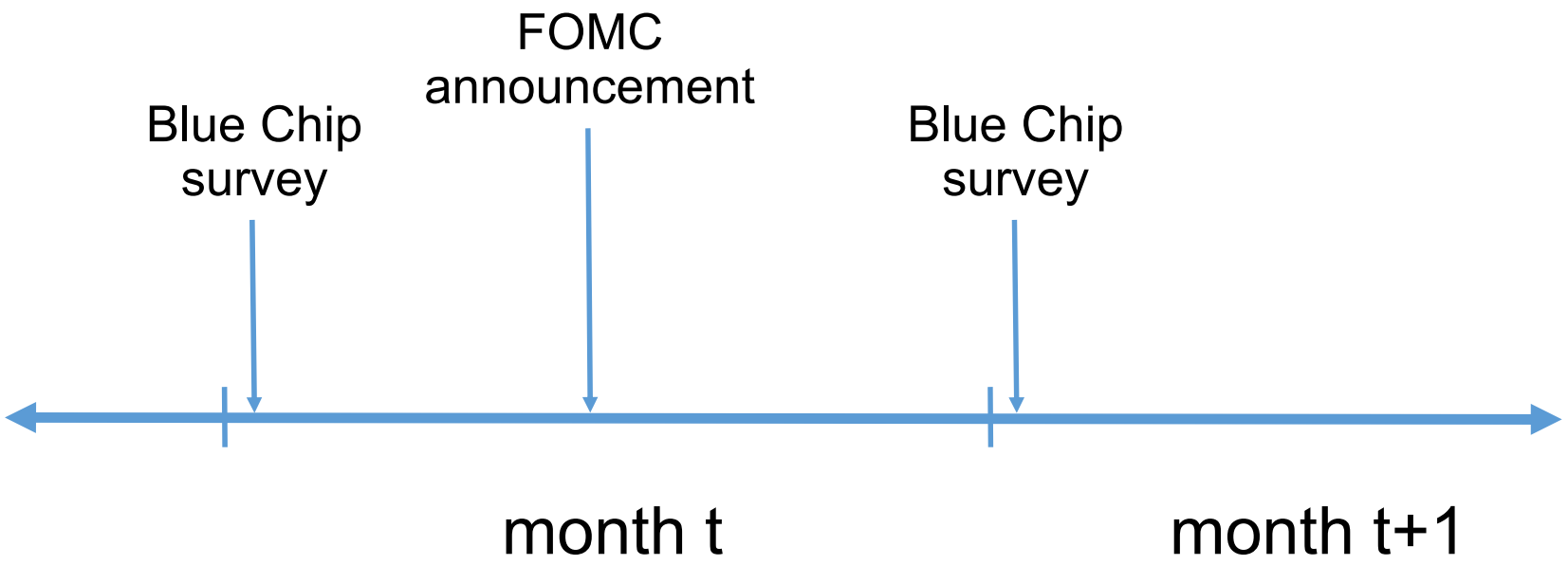

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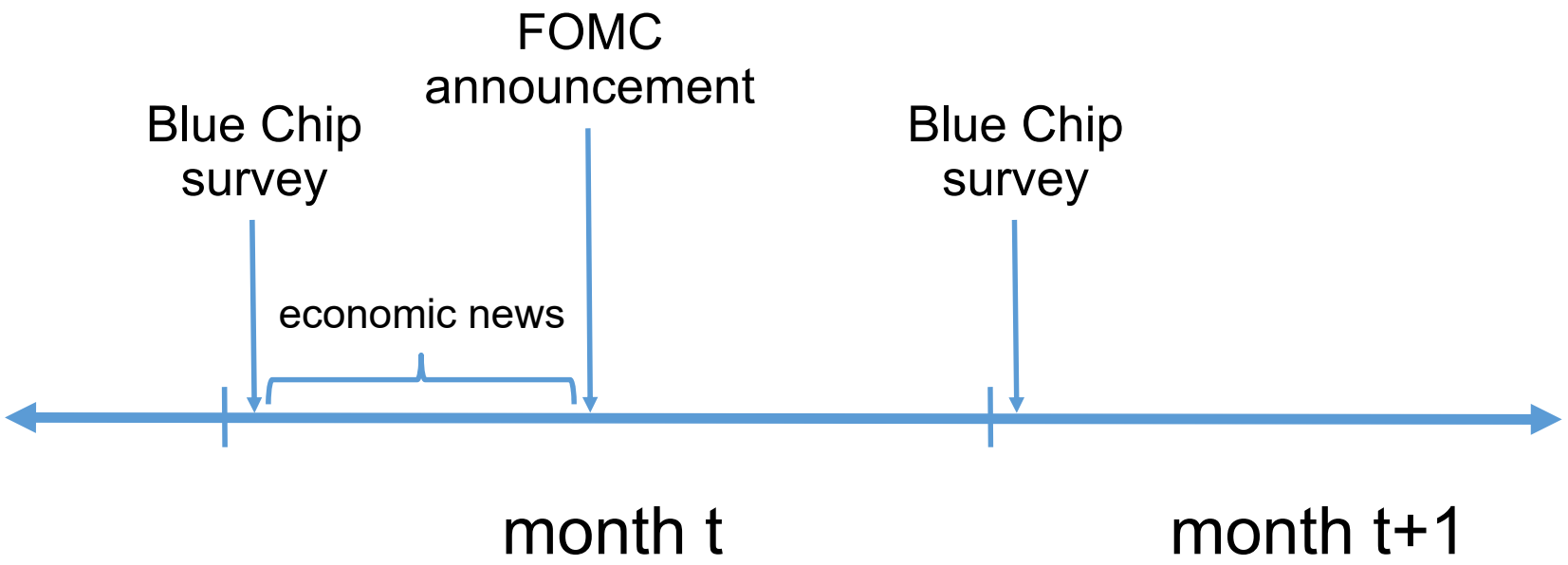

Information Effect Regressions

Campbell et al. (2012):

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

Nakamura-Steinsson (2018):

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

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Information Effect Regression Results

	(1) Campbell et al.		(2) Nakamura-Steinsson
Blue Chip forecast	fed funds rate "target factor"	fwd. guidance "path factor"	first princip. comp. "MP surprise"
(A) Replication sample: 1/1990–6/2007 for Campbell et al., 1/1995–3/2014 for NS			
Unemployment rate	−0.11	−0.23*	−0.17
	(.100)	(.136)	(.292)
Real GDP growth	0.10	0.27	0.92**
	(.181)	(.273)	(.376)
CPI inflation	0.15	0.10	0.06
	(.112)	(.152)	(.246)

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(B) Full sample: 1/1990–6/2019, including unscheduled announcements			
Unemployment rate	−0.16	−0.24*	−0.39**
	(.109)	(.142)	(.188)
Real GDP growth	0.16	0.14	0.33
	(.171)	(.223)	(.296)
CPI inflation	0.16*	0.08	0.29*
	(.094)	(.123)	(.163)

Information Effect Regression Results (cont.)

	(1) Campbell et al.		(2) Nakamura-Steinsson
Blue Chip forecast	fed funds rate "target factor"	fwd. guidance "path factor"	first princip. comp. "MP surprise"
(C) Full sample: 1/1990–6/2019, excluding unscheduled announcements			
Unemployment rate	0.07	−0.32**	−0.30
	(.179)	(.151)	(.246)
Real GDP growth	0.13	0.37*	0.54*
	(.242)	(.203)	(.328)
CPI inflation	0.12	0.13	0.27
	(.150)	(.126)	(.204)
(D) Full sample: 1/1990–6/2019, excl. unsched. announcemts. and 7/2008–6/2009			
Unemployment rate	−0.02	−0.20	−0.25
	(.151)	(.129)	(.208)
Real GDP growth	0.29	0.32*	0.64**
	(.209)	(.176)	(.287)
CPI inflation	0.15	0.06	0.20
	(.142)	(.119)	(.190)

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

Stock Market Response to FOMC Announcements

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

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  - higher discount rate lowers stock prices
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- standard macro theory predicts $\beta, \gamma, \theta < 0$:
  - higher discount rate lowers stock prices
  - lower future profits lowers stock prices
- information effect prediction is ambiguous for β, γ, θ:
  - higher discount rate lowers stock prices
  - higher future profits *raises* stock prices
  - Jarocinski-Karadi (2019), Cieslak-Schrimpf (2019) argue net effect is positive

Stock Market Regression Results

Campbell et al. factors			Nakamura-Steinsson factor	
fed funds rate "target factor"	fwd. guidance "path factor"	*N*	first princip. comp. "MP surprise"	*N*
(A) Replication sample: 1/1990–6/2007 for CEFJ, 1/1995–3/2014 for NS				
-4.24^{***}	-2.05^{***}	158	-5.95^{***}	146
(0.46)	(0.65)		(1.03)	
(B) Full sample: 1/1990–6/2019, including unscheduled announcements				
-4.37^{***}	-2.52^{***}	259	-7.82^{***}	259
(0.45)	(0.54)		(0.72)	
(C) Full sample: 1/1990–6/2019, excluding unscheduled announcements				
-3.11^{***}	-3.14^{***}	236	-6.53^{***}	236
(0.64)	(0.51)		(0.82)	
(D) Full sample: 1/1990–6/2019, excl. unsched. announcemts. and 7/2008–6/2009				
-2.81^{***}	-3.02^{***}	228	-6.03^{***}	228
(0.64)	(0.51)		(0.78)	

Top 10 Influential Announcements from NS Regression

Date	Effect on t-statistic	MP surprise mps_t	$BCrev_t$, GDP	$\Delta \log$ 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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Stock Market Response to 10 Most "Informative" Obs.

$$\Delta \log \text{S\&P500}_t = \phi + \theta\, mps_t + \varepsilon_t$$

θ	R^2	N
(A) Ten most "informative" observations in NS sample:		
-8.04^{***}	0.64	10
(2.13)		
(B) NS sample, excluding ten most "informative" observations:		
-4.96^{***}	0.11	136
(1.24)		

Stock Market Regressions Summary

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

High-Frequency Private Sector Forecasts

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- We analyze two new sources of high-frequency macroeconomic forecast data:
  - Macroeconomic Advisers daily GDP Tracking estimates
  - Results from our own survey of Blue Chip forecasters

Macroeconomic Advisers GDP Tracking

MACROECONOMIC ADVISERS

Current-Quarter GDP Tracking — **First Quarter 2011**

April 28, 2011 | www.macroadvisers.com | 314-721-4747

			GDP		Final Sales of Domestic Product											CIPI	
		Reference			Total	Final Sales to Domestic Purchasers						Net Exports					
Release Title	Date	Month	Chng	% ch		Total	PCE	Struct.	E&S	Res	Gov. C&GI	Level	Chng	Exports	Imports	Level	Chng
MA Base Forecast	1-Apr-11		68	2.1	1.1	0.6	1.6	-18.6	9.7	4.8	-3.8	-382	16	14.4	8.4	47	31
Man. Ship, Inv, Orders	31-Mar-11	Feb	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Construction	1-Apr-11	Feb	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Unit Vehicle Sales	1-Apr-11	Mar	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Chain Store Sales	7-Apr-11	Mar	71	2.1	1.1	0.7	1.8	-18.6	9.7	4.8	-3.8	-382	16	14.4	8.4	47	31
Wholesale Trade	8-Apr-11	Feb	71	2.1	1.1	0.7	1.8	-18.6	9.7	4.8	-3.8	-382	16	14.4	8.4	47	31
International Trade	12-Apr-11	Feb	50	1.5	0.3	0.6	1.8	-18.6	8.4	4.8	-3.8	-408	-10	5.7	6.7	55	39
Retail Sales	13-Apr-11	Mar	59	1.8	0.6	1.0	2.3	-18.6	8.4	4.8	-3.8	-408	-10	5.7	6.7	52	35
Business Inventories	13-Apr-11	Feb	49	1.5	0.6	1.0	2.3	-18.6	8.4	4.8	-3.8	-408	-10	5.7	6.7	43	26
Consumer Price Index	15-Apr-11	Mar	46	1.4	0.6	0.9	2.2	-18.6	8.4	4.8	-3.8	-408	-10	5.7	6.7	43	26
Industrial Production	15-Apr-11	Mar	47	1.4	0.5	0.9	2.2	-18.6	8.3	4.8	-3.8	-408	-10	5.7	6.7	44	28
Boeing Deliveries & Ords	15-Apr-11	Mar	46	1.4	0.5	0.9	2.2	-18.6	8.1	4.8	-3.8	-409	-11	5.5	6.7	44	28
Housing Starts	19-Apr-11	Mar	46	1.4	0.5	0.9	2.2	-18.6	8.1	5.2	-3.8	-409	-11	5.5	6.7	44	28
Existing Home Sales	20-Apr-11	Mar	47	1.4	0.5	0.9	2.2	-18.6	8.1	5.8	-3.8	-409	-11	5.5	6.7	44	28
New Home Sales	25-Apr-11	Mar	47	1.4	0.5	0.9	2.2	-18.6	8.1	6.2	-3.8	-409	-11	5.5	6.7	44	28
Durable Goods Orders	27-Apr-11	Mar	52	1.6	0.5	0.9	2.2	-18.6	8.1	6.2	-3.8	-409	-11	5.9	7.0	49	32
CQ Forecast as of	27-Apr-11		52	1.6	0.5	0.9	2.2	-18.6	8.1	6.2	-3.8	-409	-11	5.9	7.0	49	32
BEA's Advance Est.	28-Apr-11		58	1.8	0.8	0.9	2.7	-21.7	11.6	-4.1	-5.2	-400	-2	4.9	4.4	44	28

Release Notes:

Man Ship, Inv, and Ords: These data were available prior to completion of the base forecast and, hence, incorporated therein.
Construction: These data were available prior to completion of the base forecast and, hence, incorporated therein.
Unit Vehicle Sales: These data were available prior to completion of the base forecast and, hence, incorporated therein.
Chain Store Sales: ICSC chain-store sales rose sharply in March, suggesting more growth of PCE in March than we previously expected.
Wholesale Trade: Nonautomotive wholesale inventories rose in line with expectations in February and were little revised for January.
International Trade: Net exports were well below expectations through February.
Retail Sales: While core sales rose less than expected in March, large upward revisions in previous months imply more growth of core sales in the first quarter than we previously expected.
Business Inventories: Nonautomotive retail inventories rose much less than expected in February.
Consumer Price Index: The components of the CPI that we use to deflate retail sales came in higher than expected. This implies less real retail sales and PCE in Q1 than we expected.
Industrial Production: Vehicle assemblies were above expectations in March, suggesting more inventory investment in Q1 than previously estimated.
Boeing Deliveries and Ords: Boeing delivered 43 civilian aircraft in March, 2 fewer than expected, and at lower average value that assumed.
Housing Starts: Starts and permits were above expectations in March and revised higher in previous months. This suggests more residential investment in Q1 than previously thought.
Existing Home Sales: Existing home sales rose more than expected in March, suggesting more brokers' commissions in Q1 than previously assumed.
New Home Sales: New home sales through March were above expectations, suggesting slightly higher brokers' commissions in Q1 than previously assumed.

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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
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- The last row contradicts "Fed information effect"

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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- 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."

"We would not be updating our forecasts because we think the SEP forecasts are good. But if we think they signal something about future policy and portend a market shock then we might change some forecasts in anticipation of that."

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- 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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- But:
  - 5 forecasters did say "it depends"

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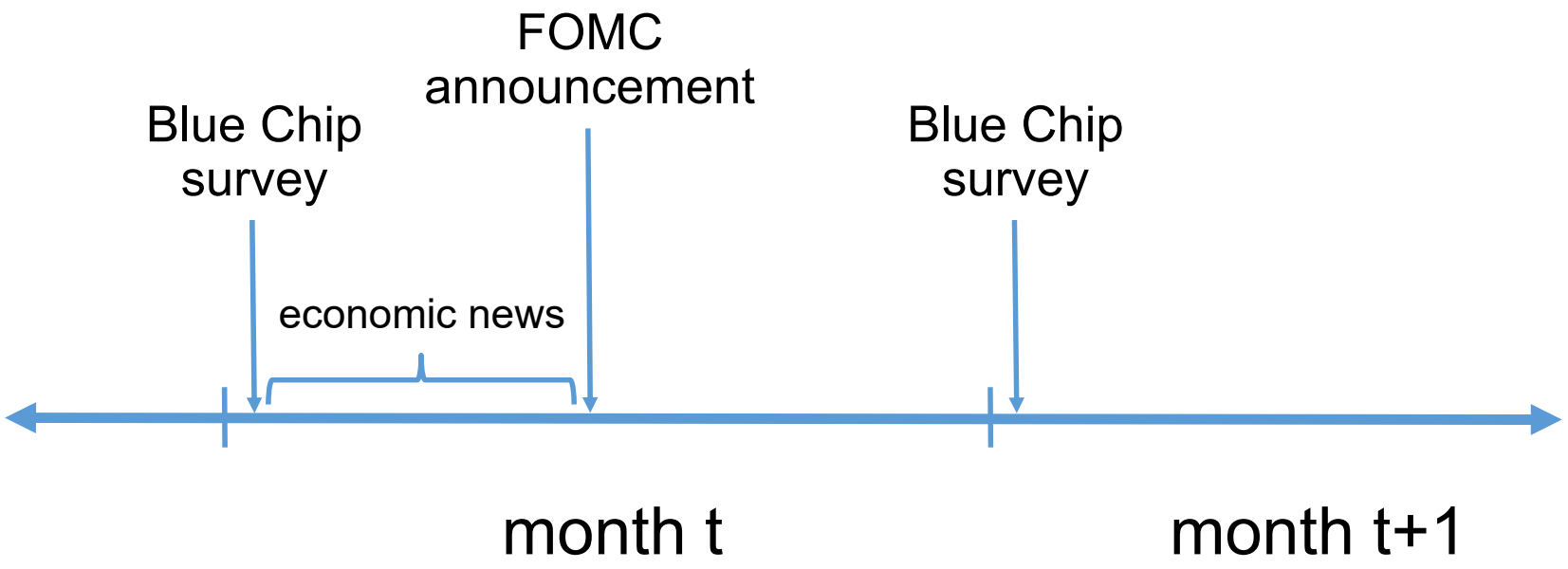

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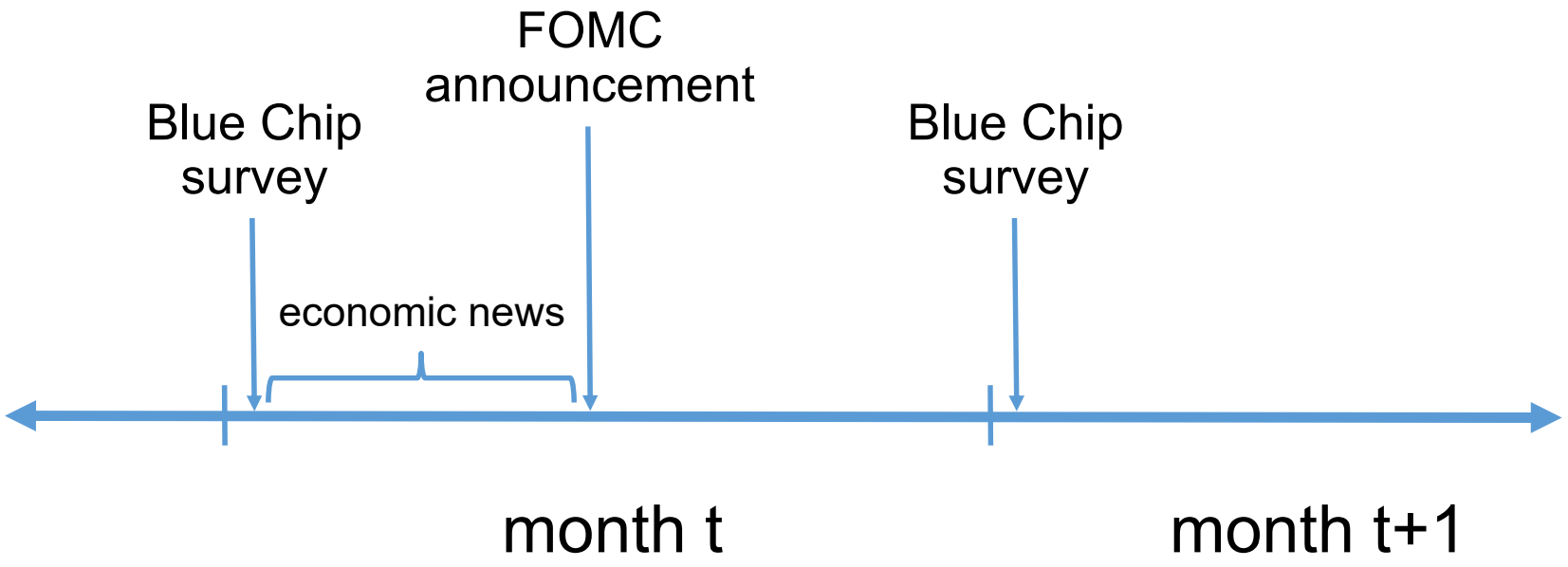

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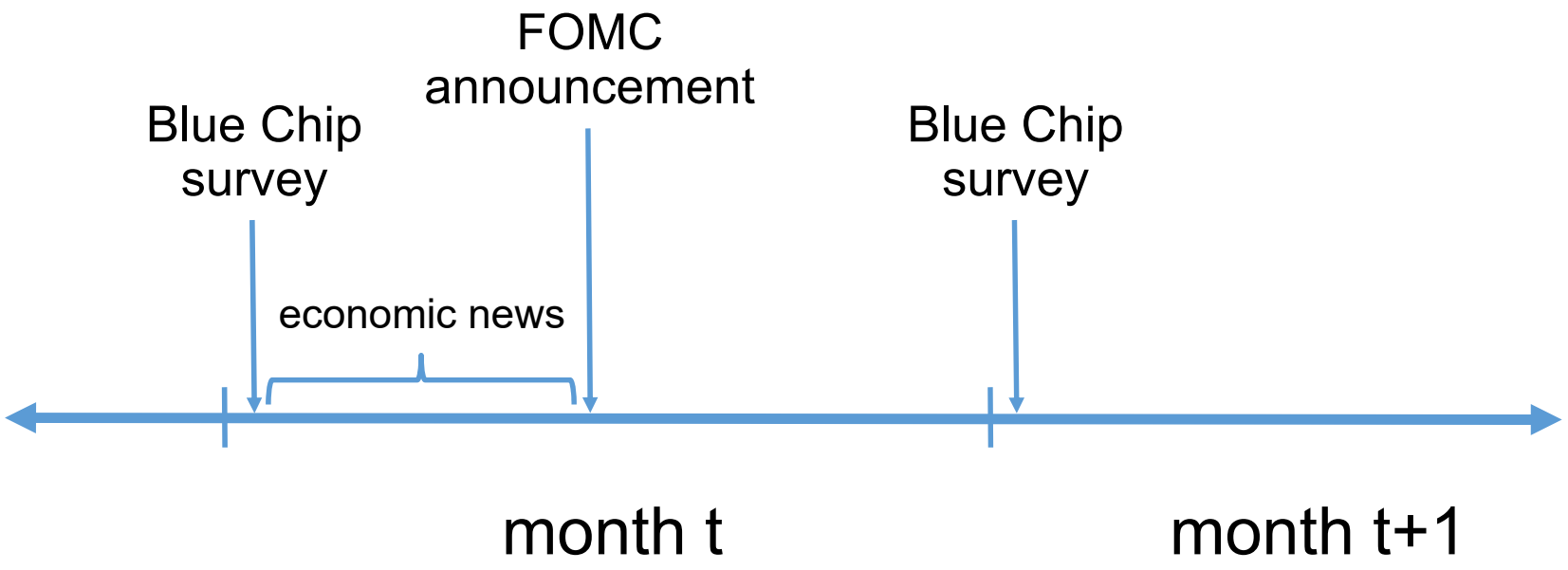

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Estimates of θ are biased if economic news is correlated with mps_t

Economic News Predicts Blue Chip Forecast Revisions

Start by checking:

$$BCrev_t = \alpha + \beta\, news_t + \eta_t$$

- t indexes FOMC announcements
- $news_t$ is a measure of economic news released before FOMC announcement:
  - nonfarm payrolls
  - Brave, Butters, Kelley (2019) "big data" index of macro data releases
  - $\Delta \log$ S&P500

Economic News Predicts Blue Chip Forecast Revisions

Blue Chip Forecast	Economic news measure: (1) Nonfarm payrolls	(2) Brave et al. index	(3) $\Delta \log$ S&P500
(A1) Campbell et al. replication sample: 1/1990–6/2007			
Unemployment rate	$-.211^{***}$	-0.60^{***}	-0.37^{***}
	(.047)	(.009)	(.116)
Real GDP growth	.016	$.047^{***}$	0.95^{***}
	(.093)	(.019)	(.193)

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(A2) Nakamura-Steinsson replication sample: 1/1995–3/2014, excl. 7/2008–6/2009			
Unemployment rate	$-.162^{***}$	$-.061^{***}$	-0.60^{***}
	(.062)	(.016)	(.133)
Real GDP growth	.028	$.092^{***}$	1.01^{***}
	(.084)	(.020)	(.158)
(B) Full sample: 1/1990–6/2019, including unscheduled announcements			
Unemployment rate	$-.298^{***}$	$-.078^{***}$	-0.69^{***}
	(.042)	(.007)	(.102)
Real GDP growth	$.127^{*}$	$.069^{***}$	1.09^{***}
	(.071)	(.013)	(.150)

Economic News Predicts Blue Chip Forecast Revisions

Blue Chip Forecast	Economic news measure: (1) Nonfarm payrolls	(2) Brave et al. index	(3) $\Delta \log$ S&P500
(C) Full sample: 1/1990–6/2019, excluding unscheduled announcements			
Unemployment rate	$-.292^{***}$	$-.081^{***}$	-0.74^{***}
	(.043)	(.007)	(.106)
Real GDP growth	$.128^{**}$	$.071^{***}$	1.14^{***}
	(.064)	(.011)	(.135)
(D) Full sample: 1/1990–6/2019, excl. unsched. announcemts. and 7/2008–6/2009			
Unemployment rate	$-.182^{***}$	$-.067^{***}$	-0.54^{***}
	(.046)	(.010)	(.109)
Real GDP growth	.051	$.065^{***}$	1.05^{***}
	(.065)	(.015)	(.135)

Economic News Predicts Monetary Policy Surprises

Regress

$$mps_t = \alpha + \beta\, news_t + \varepsilon_t$$

- mps_t is 30-min measure of monetary policy surprise (target, path, or NS measure)

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- under standard RE assumption, mps_t should be unpredictable: $\alpha, \beta = 0$ (even if Fed Information Effect is true)

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Note:

- under standard RE 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 $\alpha, \beta \neq 0$

Economic News Predicts Monetary Policy Surprises

MP Surprise measure	Economic news measure: (1) Nonfarm payrolls	(2) Brave et al. index	(3) $\Delta \log$ S&P500
(A) Replication sample: 1/1990–6/2007 for Campbell et al., 1/1995–3/2014 for NS			
fed funds rate	.158***	.033***	.179
	(.050)	(.011)	(.128)
fwd guidance path	.032	.017**	.235***
	(.038)	(.0085)	(.088)
NS MP surprise	.041*	.013**	.096*
	(.022)	(.0059)	(.051)

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fwd guidance path	.032	.017**	.235***
	(.038)	(.0085)	(.088)
NS MP surprise	.041*	.013**	.096*
	(.022)	(.0059)	(.051)
(B) Full sample: 1/1990–6/2019, including unscheduled announcements			
fed funds rate	.095***	.017**	.217***
	(.035)	(.0067)	(.084)
fwd guidance path	.024	.013***	.187***
	(.024)	(.0046)	(.058)
NS MP surprise	.058***	.014***	.188***
	(.020)	(.0039)	(.048)

Economic News Predicts Monetary Policy Surprises

MP Surprise measure	Economic news measure: (1) Nonfarm payrolls	(2) Brave et al. index	(3) $\Delta \log$ S&P500
(C) Full sample: 1/1990–6/2019, excluding unscheduled announcements			
fed funds rate	.045**	.007*	.065
	(.020)	(.0039)	(.051)
fwd guidance path	.027	.017***	.254***
	(.024)	(.0045)	(.057)
NS MP surprise	.035**	.011***	.148***
	(.015)	(.0029)	(.037)
(D) Full sample: 1/1990–6/2019, excl. unsched. announcemts. and 7/2008–6/2009			
fed funds rate	.048**	.012**	.018
	(.024)	(.0058)	(.059)
fwd guidance path	.008	.023***	.187***
	(.028)	(.0067)	(.068)
NS MP surprise	.028	.017***	.098**
	(.018)	(.0044)	(.044)

Economic News Drives Out "Fed Information Effect"

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

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

$$BCrev_t = \phi + \theta\, mps_t + \lambda\, news_t + \eta_t.$$

Economic News Drives Out "Fed Information Effect"

	(1) Campbell et al.		(2) Nakamura-Steinsson
Blue Chip forecast	fed funds rate "target factor"	fwd. guidance "path factor"	first princip. comp. "MP surprise"
(A) Replication sample: 1/1990–6/2007 for Campbell et al., 1/1995–3/2014 for NS			
Unemployment rate	.088	−.036	.191
	(.093)	(.127)	(.266)
Real GDP growth	−.045	−.083	.502
	(.181)	(.267)	(.307)

Economic News Drives Out "Fed Information Effect"

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Blue Chip forecast	fed funds rate "target factor"	fwd. guidance "path factor"	first princip. comp. "MP surprise"
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	(.093)	(.127)	(.266)
Real GDP growth	−.045	−.083	.502
	(.181)	(.267)	(.307)
(B) Full sample: 1/1990–6/2019, including unscheduled announcements			
Unemployment rate	.104	.091	.210
	(.089)	(.116)	(.157)
Real GDP growth	−.110	−.328*	−.375
	(.148)	(.195)	(.261)

Economic News Drives Out "Fed Information Effect"

	(1) Campbell et al.		(2) Nakamura-Steinsson
Blue Chip forecast	fed funds rate "target factor"	fwd. guidance "path factor"	first princip. comp. "MP surprise"
(C) Full sample: 1/1990–6/2019, excluding unscheduled announcements			
Unemployment rate	.335**	.157	.502**
	(.137)	(.124)	(.195)
Real GDP growth	−.082	−.280	−.385
	(.193)	(.176)	(.278)
(D) Full sample: 1/1990–6/2019, excl. unsched. announcemts. and 7/2008–6/2009			
Unemployment rate	.129	.054	.179
	(.132)	(.117)	(.183)
Real GDP growth	.204	−.059	.119
	(.175)	(.153)	(.245)

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”

Conclusions

1. "Fed Information Effect" regression evidence is not very robust
   - varies with sample period, variable being forecast
2. Stock market responses to FOMC announcements do not support "Fed Information Effect"
3. Our Blue Chip panel survey contradicts "Fed Information Effect"
4. Economic news is an omitted variable in "Information Effect" regs.
   - omitted variable bias
   - including the omitted variable drives out "Fed Information Effect"
5. Blue Chip forecasts and Fed Greenbook forecasts very similar
6. "Fed Response to News" channel consistent with all this evidence
7. 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)

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