Does the Clarity of Monetary Policy Reports Reduce Volatility in Financial Markets? Appendix[a]

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Abstract

This not-for-publication appendix reports additional details.

1. estimation results using shorter or longer event windows.
2. our coding of the tone of the reports.
3. results for models in first differences.
4. results for EGARCH models.
5. results for fixed-effect panel models.
6. results adding a measure of market surprise.

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1 Results using different length for event windows

This section shows OLS results using either five-day event windows (Tables A1 - A4) or fifteen-day event windows (Tables A5 - A8) for the dependent variables. The conclusions regarding the (absence of) an effect of clarity are generally unchanged from those reported in the main text.

Table A1. Five-day event windows (1)

Panel A: Czech Republic

	(1) Overnight	(2) 3 month	(3) 1 year	(4) 2 year	(5) 3 year	(6) 5 year	(7) Stock returns
FK level (reports)	0.3	0.1	0.1	0.0	0.1	-0.0	-0.2
	(0.3)	(0.1)	(0.1)	(0.2)	(0.1)	(0.1)	(0.1)
FK*Crisis	-0.0	0.3	0.3	0.3	0.2	-0.1	-0.2
	(0.4)	(0.3)	(0.2)	(0.2)	(0.2)	(0.4)	(0.2)
Tone	0.3	0.0	0.1	0.1	-0.0	-0.0	-0.1
	(0.5)	(0.2)	(0.2)	(0.3)	(0.2)	(0.2)	(0.2)
Policy rate change	16.7	-22.1	-12.7	-5.0	-3.5	-8.4	-8.0
	(22.6)	(14.9)	(10.5)	(10.3)	(9.8)	(13.0)	(11.0)
Pre-event volatility	0.7*	0.0	0.4*	0.4*	0.4**	0.5**	0.5***
	(0.3)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.1)
Observations	41	41	41	41	41	41	53
Adjusted R^2	0.34	0.10	0.29	0.10	0.23	0.29	0.40
F-statistic	0.5	1.9	3.7	3.6	1.7	0.0	4.0

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A2. Five-day event windows (1)

Panel B: euro area	(1) Overnight	(2) 3 month	(3) 1 year	(4) 2 year	(5) 3 year	(6) 5 year	(7) Stock returns
FK level (reports)	-0.1	0.2	0.1	0.1	0.1	0.2	0.1
	(0.3)	(0.2)	(0.2)	(0.2)	(0.1)	(0.1)	(0.1)
FK*Crisis	0.1	-0.4*	-0.2	0.0	-0.0	-0.0	-0.3
	(0.4)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)
Tone	0.1	-0.1	0.0	-0.0	0.0	-0.1	-0.0
	(0.2)	(0.2)	(0.2)	(0.1)	(0.1)	(0.1)	(0.1)
Policy rate change	-14.8	-6.7	-11.9	-10.2	-9.1	-10.4	2.4
	(11.8)	(9.9)	(9.1)	(9.9)	(9.7)	(8.2)	(6.2)
Pre-event volatility	0.1	0.5***	0.3**	0.3***	0.3***	0.3**	0.3***
	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)
Observations	145	106	106	106	106	106	175
Adjusted R^2	0.46	0.60	0.44	0.36	0.29	0.22	0.36
F-statistic	0.0	2.8	0.2	0.9	0.5	0.9	2.0

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A3. Five-day event windows (cont)

Panel C: Sweden	(1) Overnight	(2) 3 month	(3) 1 year	(4) 2 year	(5) 5 year	(6) Stock returns
FK level (reports)	-0.8	-0.1	-0.0	0.0	0.1	0.1
	(2.2)	(0.2)	(0.2)	(0.2)	(0.1)	(0.1)
FK*Crisis	0.8	-0.2	0.0	-0.1	-0.1	-0.4*
	(2.5)	(0.5)	(0.2)	(0.3)	(0.3)	(0.2)
Tone	-2.1	0.3	0.2	0.1	0.1	0.3
	(1.8)	(0.3)	(0.1)	(0.2)	(0.1)	(0.2)
o.Policy rate change	0.0	13.6	26.3**	11.0	13.8	-8.6
	(.)	(19.7)	(11.7)	(14.9)	(11.3)	(14.8)
Policy rate change						
Pre-event volatility	0.1	0.5**	0.3*	0.0	0.1	0.3*
	(0.5)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)
Observations	20	47	39	50	50	50
Adjusted R^2	-0.33	0.25	0.40	-0.07	0.15	0.30
F-statistic	0.0	0.6	0.0	0.1	0.0	4.0

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A4. Five-day event windows (cont)

Panel D: United Kingdom	(1) Overnight	(2) 3 month	(3) 1 year	(4) 2 year	(5) 3 year	(6) 5 year	(7) Stock returns
FK level (reports)	0.2	-0.1	-0.1	-0.1	-0.1	-0.0	-0.2
	(0.6)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.2)
FK*Crisis	-1.1	-0.7*	-0.2	-0.1	-0.1	-0.1	0.5**
	(0.8)	(0.4)	(0.3)	(0.2)	(0.2)	(0.2)	(0.3)
Tone	0.3	-0.0	0.2	0.1	0.1	0.1	0.1
	(0.6)	(0.2)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)
Policy rate change	-49.8	-1.4	-11.2	-4.2	-3.8	-6.7	8.6
	(43.3)	(9.4)	(7.6)	(8.6)	(8.4)	(6.8)	(7.3)
Pre-event volatility	0.1	0.1	0.3**	0.2	0.2	0.1	0.5***
	(0.2)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)
Observations	45	63	66	66	66	66	66
Adjusted R^2	0.82	0.54	0.50	0.35	0.22	0.18	0.44
F-statistic	1.3	5.3	1.3	2.8	4.0	1.0	2.2

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A5. Fifteen-day event windows (1)

Panel A: Czech Republic

	(1) Overnight	(2) 3 month	(3) 1 year	(4) 2 year	(5) 3 year	(6) 5 year	(7) Stock returns
FK level (reports)	-0.2	0.0	0.0	-0.0	-0.0	-0.0	0.1
	(0.4)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)
FK*Crisis	0.3	-0.0	0.0	0.3	0.3	0.5	-0.2
	(0.6)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.1)
Tone	0.1	0.0	0.3	0.4	0.2	0.2	0.2
	(0.5)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.1)
Policy rate change	-13.3	-18.1	-9.2	-0.1	-4.9	0.1	-10.8
	(27.1)	(14.0)	(13.0)	(13.9)	(13.8)	(11.2)	(9.0)
Pre-event volatility	0.1	0.3	0.2	0.5	0.4	0.4*	0.7***
	(0.2)	(0.2)	(0.3)	(0.3)	(0.2)	(0.2)	(0.2)
Observations	51	41	41	41	41	41	53
Adjusted R^2	0.32	0.15	0.25	0.28	0.18	0.25	0.42
F-statistic	0.1	0.0	0.0	0.5	0.5	1.9	0.6

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A6. Fifteen-day event windows (1)

Panel B: euro area

	(1) Overnight	(2) 3 month	(3) 1 year	(4) 2 year	(5) 3 year	(6) 5 year	(7) Stock returns
FK level (reports)	-0.2	0.1	0.1	0.1	0.1	0.1	0.0
	(0.1)	(0.2)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)
FK*Crisis	0.6**	0.1	-0.1	-0.1	-0.1	-0.1	-0.0
	(0.3)	(0.3)	(0.2)	(0.1)	(0.1)	(0.1)	(0.1)
Tone	0.2	0.1	0.1	0.0	0.0	-0.0	-0.0
	(0.2)	(0.2)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)
Policy rate change	-10.5	-10.7	-11.9**	-7.7	-7.5	-5.6	0.2
	(7.5)	(7.7)	(5.9)	(5.6)	(5.4)	(4.9)	(4.6)
Pre-event volatility	-0.0	0.3***	0.2	0.3**	0.3***	0.3***	0.5***
	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)
Observations	174	106	106	106	106	106	174
Adjusted R^2	0.61	0.57	0.60	0.50	0.42	0.40	0.51
F-statistic	2.7	0.6	0.1	0.0	0.2	0.2	0.0

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A7. Fifteen-day event windows (cont)

Panel C: Sweden	(1) Overnight	(2) 3 month	(3) 1 year	(4) 2 year	(5) 5 year	(6) Stock returns
FK level (reports)	-0.3	-0.2	0.0	-0.1	0.0	0.0
	(1.1)	(0.2)	(0.1)	(0.2)	(0.1)	(0.1)
FK*Crisis	0.5	0.3	-0.5***	-0.1	-0.2	-0.2
	(1.5)	(0.4)	(0.2)	(0.2)	(0.1)	(0.2)
Tone	-1.1	0.2	0.1	-0.1	0.0	-0.0
	(0.9)	(0.2)	(0.1)	(0.1)	(0.1)	(0.1)
Policy rate change	-38.6	-3.3	10.2	0.8	2.7	-2.3
	(241.0)	(14.0)	(14.7)	(9.0)	(6.5)	(9.8)
Pre-event volatility	0.0	0.3	-0.1	0.2	0.4**	0.3*
	(0.5)	(0.2)	(0.2)	(0.2)	(0.1)	(0.1)
Observations	23	50	39	50	50	50
Adjusted R^2	-0.22	0.42	0.31	0.05	0.42	0.52
F-statistic	0.1	0.1	22.4	1.6	3.3	1.0

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A8. Fifteen-day event windows (cont)

Panel D: United Kingdom	(1) Overnight	(2) 3 month	(3) 1 year	(4) 2 year	(5) 3 year	(6) 5 year	(7) Stock returns
FK level (reports)	-0.2	-0.0	-0.1	-0.1	-0.1	-0.1	-0.1
	(0.4)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)
FK*Crisis	-0.4	-0.6	-0.3*	-0.2	-0.1	-0.0	0.4**
	(0.5)	(0.5)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)
Tone	0.2	-0.0	0.1	0.1	0.1	0.1	-0.1
	(0.3)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)
Policy rate change	-53.3**	-3.2	-9.2*	-7.2	-8.2	-9.5*	-7.4
	(24.7)	(8.6)	(4.8)	(5.7)	(5.7)	(5.5)	(5.2)
Pre-event volatility	0.4**	0.2	0.2	0.3	0.3	0.3*	0.5***
	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.1)
Observations	49	63	66	66	66	66	66
Adjusted R^2	0.94	0.53	0.61	0.39	0.30	0.22	0.50
F-statistic	1.3	1.9	6.9	3.6	1.8	0.5	4.4

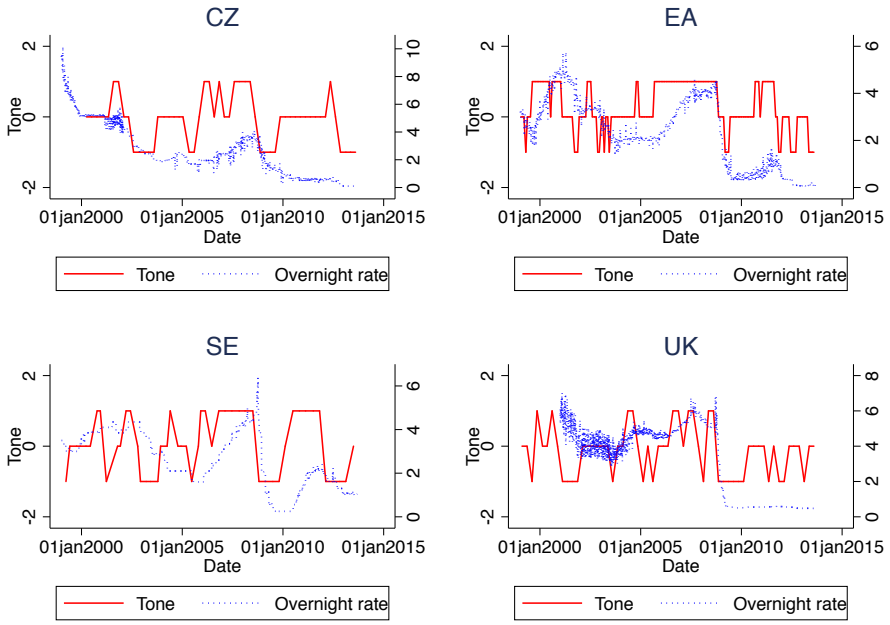
Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

2 Coding for tone of reports

We code each individual report on a ternary scale that captures the tone of the communication. The value -1 is given for reports that are predominantly dovish in tone, e.g. when it states that there are substantial downward risks to inflation. The value 0 is used for reports that are neutral in tone, e.g. when it states that risks to the inflation outlook are balanced. The value 1 is given when the report is hawkish in tone, e.g. when it is signalled that medium-term inflation is very likely to overshoot the target.

Figure A1 plots the tone coding for the four central banks in our sample and compares these against the overnight interest rate. Naturally, there is a close connection by changes in tone and changes in the interest rate. However, changes in tone can be used more frequently, e.g. by already turning the communication tone to signal an upcoming rate change.

Figure A1. Coding for tone of monetary policy reports



Notes: Tone (red line, left axis) is coded as dovish (-1), neutral (0), or hawkish (+1). The blue line (scaled on the right axis) denotes the level of the overnight interest rate. Abbreviations: CZ = Czech National Bank, EA = European Central Bank, SE = Sveriges Riksbank, UK = Bank of England.

3 Regressions in first differences

Table A9 reports parameters estimates for the FK grade level variable for a set of regressions that is specified in first differences. Though occasionally the estimates are significant, there is no strong evidence of a robust correlation between clarity and volatility.

Table A9. Parameter estimates for models in first differences

CZECH REPUBLIC						
	(1)	(2)	(3)	(4)	(5)	(6)
	Overnight	3 month	1 year	2 year	5 year	Stock returns
FK level (reports)	-0.42	0.16	0.07	0.12	0.11	-0.17
	(0.26)	(0.14)	(0.14)	(0.15)	(0.13)	(0.10)
EURO AREA						
	(1)	(2)	(3)	(4)	(5)	(6)
	Overnight	3 month	1 year	2 year	5 year	Stock returns
FK level (reports)	-0.06	0.01	0.14	0.10	0.03	-0.01
	(0.14)	(0.13)	(0.11)	(0.10)	(0.08)	(0.07)
SWEDEN						
	(1)	(2)	(3)	(4)	(5)	(6)
	Overnight	3 month	1 year	2 year	5 year	Stock returns
FK level (reports)	3.70***	-0.17	0.09	-0.23	0.04	0.10
	(0.18)	(0.20)	(0.18)	(0.24)	(0.13)	(0.12)
UNITED KINGDOM						
	(1)	(2)	(3)	(4)	(5)	(6)
	Overnight	3 month	1 year	2 year	5 year	Stock returns
FK level (reports)	-0.29	-0.16	-0.10	-0.18	-0.16	-0.35***
	(0.43)	(0.14)	(0.12)	(0.13)	(0.14)	(0.12)

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

4 EGARCH estimates

Table A10 reports selected parameters estimates for various EGARCH models.[1] All these models use a t-distribution and 2 lagged dependent variables. We also include measure for the *TONE* and *Flesch-Kincaid* grade level in both the mean and variance equations. The mean equations of these models are specified as:

$$\Delta i_t = \alpha + \beta_1 i_{t-1} + \beta_2 i_{t-2} + \beta_3 Tone_t + \beta_4 FK_t + \epsilon_t \tag{1}$$

where

$$\epsilon \sim (0, h_t) \tag{2}$$

and the variance equations take the form:

$$h_t = \delta_0 + \delta_1 h_{t-1} + \delta_2 \left| \frac{\epsilon_{t-1}}{h_{t-1}} \right| + \delta_3 \frac{\epsilon_{t-1}}{h_{t-1}} + \delta_4 Tone_t + \delta_5 FK_t \tag{3}$$

A number of results stand out:
- In the mean equation, there is occasional evidence of a positive correlation between our *TONE* variable and changes in interest rates, most notably so for Sweden and somewhat for the euro area. Regarding stock returns, there is no evidence of a negative correlation.
- Turning to the variance equation, there is no broad-based evidence of a positive coefficient for the FK measure.
- In fact, there is occasional evidence that less clarity coincided with lower levels of volatility.

[1] We report results for fewer instruments than in the main paper, as not all models converged.

Table A10. Parameter estimates based on EGARCH models

CZECH REPUBLIC	(1) 3 month	(2) 1 year	(3) 5 year	(4) Stock returns
main				
FK level (reports)	0.00	0.00	-0.00*	0.01
	(0.00)	(0.00)	(0.00)	(0.01)
Tone	0.01	0.01	0.00	0.02
	(0.01)	(0.01)	(0.01)	(0.17)
HET				
FK level (reports)	-0.02	0.00	-0.02	-0.02*
	(0.01)	(0.01)	(0.01)	(0.01)
Tone	0.35	0.12	0.16	0.04
	(0.22)	(0.12)	(0.21)	(0.17)
EURO AREA	(1)	(2)	(3)	(4)
main				
FK level (reports)	-0.00	-0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.01)
Tone	0.00***	0.00	0.01*	0.00
	(0.00)	(0.00)	(0.01)	(0.12)
HET				
FK level (reports)	-0.02	-0.02**	-0.00	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)
Tone	-0.31**	0.11	0.01	-0.03
	(0.14)	(0.10)	(0.06)	(0.06)
SWEDEN	(1)	(2)	(3)	(4)
main				
FK level (reports)	-0.00	-0.00***	-0.00**	-0.00
	(0.00)	(0.00)	(0.00)	(0.01)
Tone	0.03***	0.04***	0.02***	-0.20
	(0.00)	(0.00)	(0.01)	(0.19)
HET				
FK level (reports)	0.11***	-0.01	0.00	0.00
	(0.02)	(0.01)	(0.01)	(0.01)
Tone	-0.25	-0.10	-0.01	-0.07
	(0.24)	(0.14)	(0.08)	(0.10)
UNITED KINGDOM	(1) 3 month	(2) 1 year	(3) 2 year	(4) Stock returns
main				
FK level (reports)	-0.00***	-0.00**	-0.00	-0.01
	(0.00)	(0.00)	(0.00)	(0.01)
Tone	-0.00	-0.00	0.00	0.07
	(0.00)	(0.00)	(0.01)	(0.14)
HET				
FK level (reports)	-0.02	0.01	0.01	-0.00
	(0.01)	(0.01)	(0.01)	(0.01)
Tone	0.04	0.11	0.00	0.04
	(0.13)	(0.09)	(0.08)	(0.09)

Notes: We report coefficients β_3,β_4, δ_3, and δ_4 from the mean (main) and variance (HET) equations for selected EGARCH-models. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

5 Panel regressions

Table A11 reports results for fixed-effect panel regressions. In general, the coefficient for the Flesch-Kincaid grade level remains insignificant. There is some evidence that communication that is more hawkish in tone coincides with higher levels of volatility.

Table A11. Results for fixed-effect panel regressions

	(1) Overnight	(2) 3 month	(3) 1 year	(4) 2 year	(5) 3 year	(6) 5 year	(7) Stock returns
FK level (reports)	-0.3***	-0.0	-0.0	-0.0	0.0	0.0	-0.0
	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
FK*Crisis	0.1	0.1	0.1**	0.1	0.0	0.0	0.0
	(0.2)	(0.1)	(0.0)	(0.0)	(0.1)	(0.0)	(0.0)
Tone	0.1	-0.0	0.1***	0.1*	0.1**	0.1*	0.0
	(0.2)	(0.1)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Policy rate change	9.6	2.7	-2.4	-2.2	-3.8	-1.9	0.2
	(11.7)	(5.5)	(2.6)	(3.0)	(2.5)	(2.0)	(1.7)
Pre-event volatility	0.4	0.4***	0.4**	0.4***	0.4***	0.4***	0.6***
	(0.2)	(0.1)	(0.1)	(0.0)	(0.0)	(0.0)	(0.1)
Observations	284	259	252	263	213	263	344
Adjusted R^2	0.54	0.53	0.44	0.34	0.31	0.30	0.49
F-statistic	0.6	0.2	1.1	0.2	0.1	1.3	0.5

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

6 Adding market surprise

As suggested during the review process, we add a measure of market surprise regarding policy rates based on surveys from Consensus Forecast. This surprise is defined as the difference between the short-term (3 month) interest rate and the rate that was expected previous to the meeting.

Selected parameter estimates from this exercise are presented in the Tables A12 - A14. Generally, the conclusions regarding clarity remain unchanged, while there is no robust significance for the surprise variable.

Table A12. Adding market surprise (1)

Panel A: euro area

	(1) Overnight	(2) 3 month	(3) 1 year	(4) 2 year	(5) 3 year	(6) 5 year	(7) Stock returns
FK level (reports)	0.1	0.1	0.2**	0.2*	0.2*	0.2*	0.0
	(0.3)	(0.2)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)
Market surprise	-0.1	0.1	0.0	-0.0	-0.0	0.1	-0.3***
	(0.3)	(0.1)	(0.2)	(0.2)	(0.1)	(0.1)	(0.1)
Observations	101	106	106	106	106	106	107
Adjusted R^2	0.40	0.66	0.59	0.47	0.39	0.37	0.50

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A13. Adding market surprise (cont)

Panel B: Sweden

	(1) Overnight	(2) 3 month	(3) 1 year	(4) 2 year	(5) 5 year	(6) Stock returns
FK level (reports)	-0.3	-0.0	-0.0	-0.2	-0.0	0.0
	(1.6)	(0.2)	(0.1)	(0.2)	(0.1)	(0.1)
Market surprise	-0.6	-0.5***	-0.0	-0.1	-0.1	-0.2***
	(0.5)	(0.1)	(0.5)	(0.1)	(0.1)	(0.1)
Observations	21	48	38	49	49	49
Adjusted R^2	-0.42	0.44	0.38	0.17	0.44	0.65

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A14. Adding market surprise (cont)

Panel C: United Kingdom

	(1) Overnight	(2) 3 month	(3) 1 year	(4) 2 year	(5) 3 year	(6) 5 year	(7) Stock returns
FK level (reports)	-0.1	-0.1	-0.0	-0.0	-0.0	-0.0	-0.3*
	(0.5)	(0.2)	(0.1)	(0.2)	(0.2)	(0.1)	(0.2)
Market surprise	-1.0	-0.4	-0.2	-0.3	-0.2	-0.0	0.3
	(1.0)	(0.4)	(0.2)	(0.3)	(0.3)	(0.3)	(0.3)
Observations	44	55	55	55	55	55	55
Adjusted R^2	0.87	0.62	0.62	0.39	0.23	0.08	0.51

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.