Web Appendix: Are Speculators Informed?

This web appendix contains additional results for “Are Speculators Informed?” that are not reported in the paper itself. These results are summarized as follows:

Tables 1 and 2 report robustness checks for equation (1) and Table II of the paper. Tables 3, 4, and 5 report robustness checks for equation (8) and Table IV of the paper. Table 6 reports robustness checks for equation (11) and Table V of the paper.

Table 1

Effect of Positioning on Contemporaneous Returns

MM Estimation

$$r_{t,t+1} = \beta_0 + \beta_1 q_{t+1} + \beta_2 (q_{t+1} - q_t) + \varepsilon_{t,t+1}$$

Panel A - Non-commercial

	Contract	DJIA	E-mini DJIA	Nasdaq	E-mini Nasdaq	Russell	E-mini Russell	S&P	E-mini S&P
(1)	q_{t+1}	0.44	0.11	0.32	**2.34**	0.62	**2.20**	-0.27	0.49
	Std Err	0.66	0.52	1.29	1.05	0.68	0.83	1.47	0.77
	R^2	0.00	0.00	0.00	0.01	0.00	0.02	0.00	0.00
(2)	$\Delta q_{t,t+1}$	**9.26**	**2.53**	**17.88**	**8.49**	4.17	**6.90**	**24.11**	**3.93**
	Std Err	1.86	1.22	2.75	1.84	2.22	2.05	4.52	1.19
	R^2	0.03	0.01	0.05	0.03	0.00	0.02	0.02	0.01
(3)	q_{t+1}	-0.25	**0.04**	**-1.58**	**0.74**	**0.41**	**1.87**	**-1.25**	-0.35
	Std Err	0.66	0.51	1.21	1.06	0.69	0.84	1.44	0.81
	$\Delta q_{t,t+1}$	**10.08**	**3.10**	**18.74**	7.99	**3.52**	**6.66**	24.83	**4.13**
	Std Err	2.01	1.31	2.75	1.95	2.26	2.14	4.65	1.30
	R^2	0.03	0.01	0.05	0.03	0.00	0.03	0.02	0.01

Panel B - Commercial

(1)	q_{t+1}	-0.06	**0.97**	1.58	-1.48	-0.31	**-1.98**	1.05	-0.53
	Std Err	0.41	0.46	0.95	0.82	0.58	0.58	0.77	0.60
	R^2	0.00	0.01	0.00	0.00	0.00	0.03	0.00	0.00
(2)	$\Delta q_{t,t+1}$	-1.04	1.66	-2.48	**-8.84**	**-3.50**	**-7.45**	**-14.87**	-2.19
	Std Err	1.47	0.94	2.34	1.46	1.61	1.18	3.41	1.14
	R^2	0.00	0.00	0.00	0.04	0.00	0.04	0.01	0.00
(3)	q_{t+1}	**-0.02**	**0.81**	**1.77**	-0.20	-0.08	**-1.71**	**1.53**	**-0.30**
	Std Err	0.41	0.47	0.95	0.81	0.58	0.56	0.76	0.62
	$\Delta q_{t,t+1}$	**-1.49**	**0.86**	**-3.75**	**-8.74**	-3.55	**-8.10**	**-16.16**	**-1.54**
	Std Err	1.53	1.00	2.38	1.55	1.66	1.46	3.53	1.23
	R^2	0.00	0.01	0.01	0.04	0.01	0.07	0.02	0.00

Panel C - Non-reporter

(1)	q_{t+1}	-0.36	**-2.51**	**-2.95**	0.13	-0.37	**3.59**	-2.12	0.24
	Std Err	0.77	0.73	1.28	1.07	1.07	1.15	1.10	0.59
	R^2	0.00	0.02	0.01	0.00	0.00	0.02	0.00	0.00
(2)	$\Delta q_{t,t+1}$	**-7.36**	**-6.47**	**-11.86**	5.75	2.12	**5.90**	1.40	-1.27
	Std Err	1.95	1.40	2.58	1.87	2.22	1.91	4.22	1.11
	R^2	0.02	0.03	0.03	0.01	0.00	0.02	0.00	0.00
(3)	q_{t+1}	**0.16**	**-1.87**	**-1.77**	-0.52	**-0.63**	**2.89**	**-2.28**	**0.50**
	Std Err	0.77	0.73	1.24	1.11	1.09	1.19	1.13	0.62
	$\Delta q_{t,t+1}$	**-7.37**	**-4.88**	**-10.48**	**5.81**	2.81	**4.55**	**2.90**	**-1.74**
	Std Err	2.07	1.50	2.67	2.06	2.26	2.04	4.43	1.19
	R^2	0.01	0.04	0.03	0.01	0.00	0.03	0.00	0.00
	n	629	420	625	574	826	405	926	629

Notes: This table shows results from time series regressions using MM estimation of returns onto position levels and position changes, where $r_{t,t+1}$ is the return from Tuesday t to Tuesday t+1 to capture the period for which positions are reported, and q_{t+1} is the level of positions on the collection date (Tuesday t+1), and $\Delta q_{t,t+1}$ is the change in positions since the previous collection date (Tuesday t). Bold denotes significance at the 5 percent level. White standard errors are used.

Table 2

Post 2003 Sample Period

$$r_{t,t+1} = \beta_0 + \beta_1 q_{t+1} + \beta_2 (q_{t+1} - q_t) + \varepsilon_{t,t+1}$$

Panel A - Non-commercial

	Contract	DJIA	E-mini DJIA	Nasdaq	E-mini Nasdaq	Russell	E-mini Russell	S&P	E-mini S&P
(1)	q_{t+1}	0.09	-0.17	1.11	**2.13**	0.95	**2.44**	-2.50	-0.61
	Std Err	1.03	0.47	0.95	1.05	1.44	0.79	3.56	1.69
	R^2	0.00	0.00	0.00	0.01	0.00	0.02	0.00	0.00
(2)	$\Delta q_{t,t+1}$	**8.30**	2.34	**14.70**	**8.89**	**13.43**	**7.21**	9.89	-2.18
	Std Err	2.94	1.38	2.32	2.24	4.70	2.23	10.02	3.44
	R^2	0.03	0.01	0.08	0.04	0.03	0.02	0.00	0.00
(3)	q_{t+1}	-0.53	-0.35	-0.43	1.01	0.17	**1.98**	-3.14	-0.43
	Std Err	1.06	0.47	0.97	1.08	1.45	0.81	3.44	1.78
	$\Delta q_{t,t+1}$	**8.57**	2.51	**14.92**	**8.37**	**13.33**	**6.26**	11.35	-1.97
	Std Err	3.08	1.41	2.43	2.30	4.87	2.34	9.65	3.65
	R^2	0.03	0.01	0.08	0.04	0.03	0.03	0.01	0.00

Panel B - Commercial

(1)	q_{t+1}	-0.40	**1.37**	0.32	**-1.61**	**1.39**	**-2.18**	-0.97	-1.12
	Std Err	0.45	0.44	0.74	0.71	1.36	0.52	2.43	0.71
	R^2	0.00	0.02	0.00	0.01	0.00	0.03	0.00	0.00
(2)	$\Delta q_{t,t+1}$	-0.59	1.46	0.64	**-10.67**	-2.50	-5.28	8.61	-4.23
	Std Err	2.14	1.05	2.49	2.14	4.10	1.88	8.63	2.56
	R^2	0.00	0.00	0.00	0.10	0.00	0.03	0.00	0.01
(3)	q_{t+1}	-0.38	1.29	0.28	-0.39	1.61	**-1.74**	-1.54	-0.75
	Std Err	0.46	0.44	0.78	0.72	1.43	0.54	2.46	0.73
	$\Delta q_{t,t+1}$	-0.42	0.86	0.50	-10.48	-3.30	**-4.43**	9.40	-3.87
	Std Err	2.15	1.07	2.58	2.13	4.23	1.98	8.72	2.65
	R^2	0.00	0.02	0.00	0.10	0.01	0.05	0.01	0.01

Panel C - Non-reporter

(1)	q_{t+1}	1.00	**-3.21**	-1.36	0.84	**-3.06**	**3.97**	2.69	1.46
	Std Err	0.95	0.65	1.01	1.03	1.29	1.01	2.83	0.93
	R^2	0.00	0.04	0.00	0.00	0.01	0.02	0.00	0.01
(2)	$\Delta q_{t,t+1}$	**-6.90**	**-6.61**	**-12.28**	**9.12**	**-8.76**	**7.08**	**-16.94**	**7.51**
	Std Err	2.74	1.78	2.96	2.83	3.88	2.21	8.21	2.79
	R^2	0.02	0.04	0.07	0.05	0.01	0.02	0.02	0.02
(3)	q_{t+1}	1.64	**-2.61**	-0.06	-0.13	-2.58	**3.13**	3.79	0.96
	Std Err	0.97	0.64	1.04	1.07	1.35	1.03	2.83	0.95
	$\Delta q_{t,t+1}$	**-7.80**	**-5.33**	**-12.24**	**9.18**	-7.32	**5.59**	**-18.96**	**7.04**
	Std Err	2.73	1.77	3.05	2.90	3.96	2.34	8.40	2.84
	R^2	0.03	0.06	0.07	0.05	0.02	0.03	0.02	0.03
	n	391	391	391	391	311	391	391	391

Notes: This table shows results from time series regressions of returns onto position levels and position changes, where $r_{t,t+1}$ is the return from Tuesday t to Tuesday t+1 to capture the period for which positions are reported, and q_{t+1} is the level of positions on the collection date (Tuesday t+1), and $\Delta q_{t,t+1}$ is the change in positions since the previous collection date (Tuesday t). The results are for the sample period from January 1, 2003 through the sample period end, July 7, 2010. Bold denotes significance at the 5 percent level.

Table 3

Announcement effect of positioning data release for 5-minute window

MM Estimation

$$r_{t,win} = \beta_0 + \beta_1 (q_t - E_{t-1} q_t) + \varepsilon_{t,win}$$

Contract	DJIA	E-mini DJIA	Nasdaq	E-mini Nasdaq	Russell	E-mini Russell	S&P	E-mini S&P
Coeff	-0.04	0.00	**0.47**	-0.01	**0.82**	**0.30**	-0.14	**0.18**
Std Err	0.12	0.03	0.23	0.09	0.38	0.15	0.26	0.07
R^2	0.0001	0.0000	0.0065	0.0000	0.0145	0.0086	0.0003	0.0079
T-stat	-0.33	-0.11	2.04	-0.14	2.13	2.07	-0.55	2.77
n	452	360	417	495	279	346	850	562

Notes: This table shows the results of a regression of returns over a five-minute window around the COT positioning data release onto the unexpected component of the positioning news. MM estimation is used. Positions are predicted using an AR(1) of positions augmented with returns. These results are shown for non-commercial positions. Bold denotes significance at the 5 percent level. White standard errors are used in all cases.

Table 4

Announcement effect of positioning data release

Post 2003 Sample Period

$$r_{t,win} = \beta_0 + \beta_1 (q_t - E_{t-1} q_t) + \varepsilon_{t,win}$$

Contract	DJIA	E-mini DJIA	Nasdaq	E-mini Nasdaq	Russell	E-mini Russell	S&P	E-mini S&P
Coeff	0.10	0.06	**1.41**	0.17	**0.66**	**0.74**	0.58	**0.51**
Std Err	0.29	0.12	0.70	0.12	0.31	0.29	1.03	0.16
R^2	0.000	0.001	0.080	0.005	0.008	0.024	0.002	0.015
n	264	360	238	366	130	346	346	368

Notes: This table shows the results of a regression of returns over a five-minute window around the COT positioning data release onto the unexpected component of the positioning news. Positions are predicted using an AR(1) of positions augmented with returns. These results are shown for non-commercial positions. The results are for the sample period from January 1, 2003 through the sample period end, July 7, 2010. Bold denotes significance at the 5 percent level. White standard errors are used in all cases.

Table 5

Announcement effect of positioning data release for window sizes from 5 minutes to 30 minutes

$$r_{t,win} = \beta_0 + \beta_1 (q_t - E_{t-1} q_t) + \varepsilon_{t,win}$$

Panel A
Positions predicted using AR(1) augmented with returns

$$q_t = \mu + \rho_{t-1} q_{t-1} + \gamma r_{t-1,t} + \varepsilon_t$$

Return window		E-mini	E-mini		E-mini		E-mini		E-mini
	Contract	DJIA	DJIA	Nasdaq	Nasdaq	Russell	Russell	S&P	S&P
5 min	Coeff	-0.04	0.06	**1.15**	-0.12	**0.86**	**0.74**	-0.17	**0.18**
	Std Err	0.20	0.12	0.46	0.14	0.30	0.29	0.48	0.09
	R^2	0.000	0.001	0.034	0.002	0.010	0.024	0.000	0.006
	T-stat	-0.20	0.47	2.52	-0.87	2.87	2.54	-0.36	2.07
	n	452	360	417	495	279	346	850	562
10 min	Coeff	-0.39	-0.07	0.80	-0.04	**1.07**	0.46	**-1.22**	0.10
	Std Err	**0.26**	0.06	0.37	0.20	0.35	0.26	0.44	0.11
	R^2	0.006	0.001	0.009	0.000	0.015	0.008	0.008	0.001
	T-stat	-1.49	-1.19	2.13	-0.20	3.10	1.79	-2.79	0.92
	n	452	360	417	495	279	346	850	562
15 min	Coeff	-0.26	-0.10	0.68	-0.12	0.73	**0.48**	**-1.00**	0.09
	Std Err	0.28	0.09	0.39	0.21	0.46	0.23	0.54	0.14
	R^2	0.002	0.002	0.005	0.001	0.005	0.007	0.004	0.001
	T-stat	-0.93	-1.10	1.77	-0.58	1.59	2.10	-1.83	0.65
	n	465	362	432	495	328	346	854	562
20 min	Coeff	-0.38	-0.21	0.40	-0.23	**0.98**	0.23	**-1.22**	0.04
	Std Err	0.27	0.11	0.51	0.23	0.45	0.30	0.59	0.16
	R^2	0.004	0.005	0.001	0.002	0.008	0.001	0.005	0.000
	T-stat	-1.37	-1.91	0.78	-0.97	2.17	0.77	-2.09	0.27
	n	468	362	438	495	340	346	854	562
25 min	Coeff	-0.39	**-0.24**	0.53	-0.23	**0.90**	0.30	**-1.56**	0.01
	Std Err	0.32	0.12	0.69	0.27	0.41	0.37	0.69	0.16
	R^2	0.003	0.005	0.002	0.002	0.008	0.001	0.006	0.000
	T-stat	-1.19	-2.07	0.76	-0.82	2.19	0.82	-2.26	0.04
	n	470	362	439	495	350	346	854	562
30 min	Coeff	-0.51	**-0.28**	1.00	-0.11	0.89	0.77	**-1.60**	0.07
	Std Err	0.39	0.13	0.66	0.29	0.51	0.50	0.80	0.18
	R^2	0.004	0.004	0.007	0.000	0.005	0.005	0.005	0.000
	T-stat	-1.29	-2.09	1.51	-0.36	1.74	1.54	-2.01	0.35
	n	470	362	440	495	353	346	854	562

Panel B

Positions predicted using AR(2) augmented with returns

$$q_t = \mu + \rho_{t-1} q_{t-1} + \rho_{t-2} q_{t-2} + \gamma r_{t-1,t} + \varepsilon_t$$

Return window	Contract	E-mini DJIA	E-mini DJIA	Nasdaq	E-mini Nasdaq	Russell	E-mini Russell	S&P	E-mini S&P
5 min	Coeff	0.00	0.07	**1.07**	-0.07	**0.74**	**0.69**	-0.12	**0.18**
	Std Err	0.21	0.13	0.45	0.13	0.30	0.27	0.53	0.09
	R^2	0.000	0.001	0.030	0.001	0.007	0.022	0.000	0.006
	T-stat	0.01	0.50	2.39	-0.50	2.46	2.55	-0.22	2.07
	n	451	359	416	494	278	345	849	561
10 min	Coeff	-0.33	-0.07	0.71	0.01	**0.98**	0.41	**-1.23**	0.10
	Std Err	**0.27**	0.06	0.37	0.20	0.34	0.24	0.45	0.11
	R^2	0.005	0.001	0.007	0.000	0.012	0.006	0.008	0.001
	T-stat	-1.25	-1.12	1.91	0.03	2.88	1.72	-2.70	0.95
	n	451	359	416	494	278	345	849	561
15 min	Coeff	-0.23	-0.10	0.60	-0.10	0.66	**0.43**	**-1.09**	0.10
	Std Err	0.28	0.09	0.37	0.21	0.45	0.22	0.55	0.14
	R^2	0.002	0.002	0.004	0.000	0.004	0.006	0.004	0.001
	T-stat	-0.81	-1.05	1.59	-0.48	1.44	2.00	-1.99	0.72
	n	464	361	431	494	327	345	853	561
20 min	Coeff	-0.34	-0.21	0.32	-0.28	**0.89**	0.22	**-1.31**	0.05
	Std Err	0.28	0.11	0.50	0.22	0.45	0.28	0.60	0.15
	R^2	0.003	0.005	0.001	0.003	0.007	0.001	0.005	0.000
	T-stat	-1.20	-1.88	0.64	-1.25	1.97	0.76	-2.18	0.32
	n	467	361	437	494	339	345	853	561
25 min	Coeff	-0.34	**-0.25**	0.46	-0.33	**0.83**	0.31	**-1.65**	0.01
	Std Err	0.34	0.12	0.69	0.26	0.40	0.34	0.73	0.16
	R^2	0.003	0.005	0.002	0.003	0.007	0.002	0.006	0.000
	T-stat	-1.02	-2.09	0.66	-1.29	2.05	0.89	-2.27	0.09
	n	469	361	438	494	349	345	853	561
30 min	Coeff	-0.47	**-0.29**	0.91	-0.21	0.82	0.70	**-1.73**	0.09
	Std Err	0.41	0.13	0.67	0.28	0.51	0.47	0.84	0.18
	R^2	0.004	0.004	0.005	0.001	0.004	0.004	0.005	0.000
	T-stat	-1.15	-2.12	1.35	-0.76	1.63	1.49	-2.07	0.49
	n	469	361	439	494	352	345	853	561

Panel C

Positions predicted using AR(2) augmented with returns and lagged returns

$$q_t = \mu + \rho_{t-1} q_{t-1} + \rho_{t-2} q_{t-2} + \gamma r_{t-1,t} + \gamma r_{t-2,t-1} + \varepsilon_t$$

Return window		E-mini	E-mini	E-mini	E-mini	E-mini	E-mini	E-mini	E-mini
	Contract	DJIA	DJIA	Nasdaq	Nasdaq	Russell	Russell	S&P	S&P
5 min	Coeff	-0.01	0.07	**1.02**	-0.12	**1.03**	**0.62**	-0.13	0.14
	Std Err	0.22	0.13	0.49	0.15	0.42	0.26	0.50	0.08
	R^2	0.000	0.001	0.028	0.002	0.014	0.020	0.000	0.004
	T-stat	-0.03	0.55	2.08	-0.80	2.43	2.42	-0.27	1.66
	n	451	359	416	494	278	345	849	561
10 min	Coeff	-0.38	-0.08	0.45	-0.08	**1.20**	0.37	**-1.16**	-0.02
	Std Err	**0.27**	0.06	0.42	0.22	0.40	0.23	0.45	0.12
	R^2	0.006	0.001	0.003	0.000	0.018	0.006	0.007	0.000
	T-stat	-1.42	-1.20	1.07	-0.39	2.98	1.59	-2.55	-0.16
	n	451	359	416	494	278	345	849	561
15 min	Coeff	-0.27	-0.09	0.38	-0.12	0.74	**0.36**	-0.98	-0.02
	Std Err	0.28	0.10	0.48	0.22	0.47	0.21	0.55	0.15
	R^2	0.002	0.002	0.002	0.001	0.005	0.005	0.004	0.000
	T-stat	-0.95	-0.96	0.80	-0.57	1.56	1.74	-1.79	-0.11
	n	464	361	431	494	327	345	853	561
20 min	Coeff	-0.39	-0.22	0.04	-0.39	**0.87**	0.23	**-1.09**	-0.08
	Std Err	0.28	0.12	0.57	0.23	0.47	0.27	0.60	0.16
	R^2	0.004	0.006	0.000	0.006	0.006	0.001	0.004	0.000
	T-stat	-1.39	-1.86	0.06	-1.72	1.84	0.82	-1.82	-0.51
	n	467	361	437	494	339	345	853	561
25 min	Coeff	-0.38	**-0.27**	0.08	-0.34	0.95	0.34	-1.33	-0.10
	Std Err	0.34	0.12	0.74	0.27	0.53	0.34	0.73	0.18
	R^2	0.003	0.006	0.000	0.004	0.007	0.002	0.004	0.001
	T-stat	-1.12	-2.18	0.11	-1.24	1.78	1.00	-1.82	-0.55
	n	469	361	438	494	349	345	853	561
30 min	Coeff	-0.56	**-0.33**	0.72	-0.14	1.19	0.74	-1.32	-0.06
	Std Err	0.41	0.14	0.69	0.30	0.70	0.46	0.84	0.19
	R^2	0.005	0.005	0.003	0.000	0.006	0.005	0.003	0.000
	T-stat	-1.38	-2.32	1.04	-0.47	1.70	1.61	-1.58	-0.29
	n	469	361	439	494	352	345	853	561

Notes: This table shows the results of a regression of returns over a short window around the COT positioning data release onto the unexpected component of the positioning news. Results for six different return window sizes are shown; from five minutes to thirty minutes. Panel A, B, and C use three different models to predict positions; an AR(1) of positions augmented with returns, an AR(2) of positions augmented with returns, and an AR(2) of positions augmented with returns and a lag of returns. These results are shown for non-commercial positions. Bold denotes significance at the 5 percent level. White standard errors are used in all cases.

Table 6

Effect of positioning on future returns (t to t+h)

$$r_{t,t+h} = \beta_0 + \beta_1 q_t + \beta_2 \Delta q_{t-1,t} + \beta_3 dy_t + \varepsilon_{t,t+h}$$

(h=4)

	Contract	DJIA	E-mini DJIA	Nasdaq	E-mini Nasdaq	Russell	E-mini Russell	S&P	E-mini S&P
(1)	q_t	-3.93	0.04	**-13.37**	3.05	-0.95	**6.85**	**-15.72**	-1.97
	Std Err	2.45	1.54	4.65	4.55	2.45	2.36	5.12	2.27
	R^2	0.012	0.000	0.036	0.003	0.001	0.033	0.028	0.003
(2)	q_t	-3.99	-0.44	**-13.50**	3.92	-0.71	**7.08**	**-15.53**	-2.52
	Std Err	2.45	1.53	4.92	4.82	2.53	2.37	5.19	2.54
	$\Delta q_{t,t-1}$	1.01	**5.63**	1.32	-5.52	-5.97	-2.87	**-2.66**	2.85
	SE	5.28	2.65	6.71	3.82	6.45	3.25	7.61	2.51
	R^2	0.013	0.010	0.036	0.006	0.002	0.034	0.029	0.004
(3)	q_t	-4.06	0.40	**-13.45**	4.13	-0.59	6.70	**-13.77**	-2.62
	Std Err	2.55	1.76	4.89	4.84	2.59	2.35	6.37	2.62
	$\Delta q_{t,t-1}$	1.02	**5.20**	1.26	-5.57	-6.05	**-2.63**	**-3.22**	2.88
	Std Err	5.41	2.57	6.71	3.86	6.42	3.51	7.80	2.52
	dy_t	0.06	-1.05	0.39	1.22	-0.78	-0.38	0.36	-0.22
	Std Err	1.26	1.42	1.33	1.40	0.90	1.98	0.50	1.19
	R^2	0.013	0.021	0.037	0.011	0.006	0.035	0.031	0.005
	n	625	416	621	570	822	401	922	625

Notes: This table shows results for time series regressions of weekly returns $(r_{t,t+h})$ onto the level (q_t) and change ($\Delta q_{t-1,t}$) in positions and the dividend yield (dy_t). Results are shown for non-commercial positions. Bold denotes significance at the 5 percent level. Newey-West standard errors with a lag truncation parameter of *h* are used to take account of the overlapping error structure.