Online Appendix to

The Structure of Information Release and the Factor Structure of Returns

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In this online appendix, we present supplementary material on our analysis of the link between the structure of information release and the factor structure of returns. First, we present additional details on the earnings announcement patterns by size and book-to-market. Second, we present evidence of an increase in volatility of second-period announcers following market shocks. Third, we show that our results on alpha concentration are robust to the use of conditional betas and censoring. And fourth, we show that inter-industry differences in earnings announcement patterns do not drive our results.

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OA. Additional details on earnings announcement patterns

OA.1. Statistical tests

The paper's Figure 1 shows that big firms announce their quarterly earnings before small firms and value firms tend to announce before growth firms. This visual pattern is confirmed by statistical tests: we use the Rao-Scott Chi-square test (Rao and Scott, 1981, 1984, 1987) to assess the significance of the differences in announcement frequencies across quintiles *as well as* between the 1st and 5th quintiles. This test analyzes the difference between the observed and the expected frequencies in our two-way table setup where the null hypothesis is that there is no association between the row and column variables (p-values untabulated).

The first (and weaker) test analyzes whether there is a difference in announcement frequency across, for instance, all size quintiles for the 1st book-to-market quintile, i.e., whether the lines in Figure 1 are flat. All ten test statistics are significant at the 1% level (10 tests because 10 lines). The second (and stronger) test analyzes whether there is a difference in announcement frequency between the 1st and 5th quintiles, i.e., whether the endpoints of the lines in Figure 1 are equal. Nine test statistics are significant at the 1% level, and the test across book-to-market quintiles for the 2nd size quintile is significant at the 10% level (10 tests because 10 pairs of end points).

OA.2. Results within quarter

In Table OA1, we tabulate the within-quarter fraction of firms in each Fama-French portfolio that announce in a given month of that quarter (one panel per quarter) – the percentages within a cell hence sum to 100% across the three months in each quarter. Looking across Panels A through D, we see broadly the same patterns for each quarter: big firms announce earlier than small firms and value firms tend to announce earlier than growth firms.

Quarters 2 through 4 have very similar announcement patterns. Quarter 1 differs somewhat, with a shift in announcements into months 2 and 3 for all firms, consistent with the February data point in Panel A of Appendix Figure B1. More precisely, between 22 and 32% of firms in the smallest quintile announce in the first month of the first quarter and these percentages increase to 39 and 51% in the second, third and fourth quarters. And similarly, between 55 and 63% of firms in the biggest quintile release their earnings in the first month of the first quarter and these percentages rise to 73 and 80% in the second, third and fourth quarters.

We run the identical statistical tests at the individual quarter level as we do when aggregating across all quarters (differences across quintiles and differences between 1st and 5th quintiles): two sets of 20 tests (5 quintiles for 4 quarters). All forty tests across size quintiles are significant at the 1% level. Thirty-three test statistics across book-to-market quintiles are significant at the 1% level, two are significant at the 5% level, and two are significant at the 10% level. Consistent with the tests aggregated across quarters, the three insignificant tests are in the 2nd size quintile (quarters 1, 2, and 4). It is therefore difficult to argue that these patterns of differential announcement timing are simply random.

OA.3. Other results

In untabulated results, we find that the pattern of big stocks announcing earlier than small stocks persists when we sort on size only to form five rather than 25 portfolios. However, when we sort only on book-to-market ratio to form five portfolios, we no longer observe the earlier announcement of value stocks. This earlier announcement of value stocks is masked by the later announcement of small stocks, because value stocks tend to be smaller than growth stocks. Thus, to see the earlier announcement of value stocks, it is important to sort along both the size and book-to-market ratio dimensions. The SMB and HML factors are similarly based on double-sorting by size and book-to-market.

The magnitude of this difference in the monthly timing of earnings announcements is especially apparent when we consider the interaction of the size and book-to-market reporting

Table OA1

Fraction of reporting firms by quarter-month sorted by size and B/M.

This table shows the fraction of firms (across all years) within each of the Fama-French 25 size and book-to-market sorted portfolios that have their first earnings announcement of the quarter in month 1, month 2 or month 3 of the quarter from 1973 to 2013. Panels A through D present results for each quarter separately. Observations are firm-years. To be included a firm-year must have at least four earning reports in that year. In the text, we present the results of Rao-Scott chi-square tests of the differences in announcement frequencies across quintiles as well as between the 1st and 5th quintiles.

Panel A: Percentage of firms reporting within first quarter

	January					February					March				
	G	2	3	4	V	G	2	3	4	V	G	2	3	4	V
S	22.	28.	31.	32.	25.	42.	41.	40.	40.	40.	32.	28.	26.	25.	30.
2	32.	33.	38.	40.	35.	47.	47.	46.	44.	46.	20.	19.	16.	15.	18.
3	39.	45.	50.	47.	42.	45.	43.	38.	44.	47.	16.	14.	12.	10.	11.
4	45.	47.	50.	52.	43.	42.	42.	40.	42.	51.	14.	11.	9.	7.	7.
B	55.	57.	63.	63.	59.	37.	35.	32.	33.	37.	9.	7.	6.	4.	4.

Panel B: Percentage of firms reporting within second quarter

	April					May					June				
	G	2	3	4	V	G	2	3	4	V	G	2	3	4	V
S	41.	47.	51.	51.	46.	53.	44.	41.	41.	47.	10.	11.	11.	10.	11.
2	56.	57.	61.	63.	61.	36.	33.	31.	30.	33.	9.	10.	8.	8.	7.
3	62.	64.	71.	69.	68.	29.	27.	23.	26.	28.	9.	9.	8.	5.	5.
4	67.	72.	76.	75.	69.	25.	21.	19.	22.	28.	9.	6.	5.	3.	3.
B	75.	78.	79.	77.	77.	20.	18.	18.	21.	23.	6.	5.	3.	2.	1.

Panel C: Percentage of firms reporting within third quarter

	July					August					September				
	G	2	3	4	V	G	2	3	4	V	G	2	3	4	V
S	39.	45.	49.	50.	42.	50.	44.	40.	39.	46.	10.	11.	10.	10.	12.
2	56.	57.	60.	63.	59.	35.	32.	31.	29.	34.	8.	10.	8.	8.	7.
3	62.	64.	70.	67.	67.	29.	27.	23.	28.	28.	8.	8.	7.	5.	4.
4	66.	71.	74.	74.	70.	27.	23.	21.	23.	27.	8.	7.	5.	3.	2.
B	74.	77.	80.	78.	76.	20.	18.	16.	20.	23.	7.	5.	4.	2.	0.

Panel D: Percentage of firms reporting within fourth quarter

	October					November					December				
	G	2	3	4	V	G	2	3	4	V	G	2	3	4	V
S	41.	47.	50.	50.	42.	51.	43.	39.	40.	47.	10.	11.	11.	10.	12.
2	58.	59.	62.	62.	60.	34.	31.	29.	29.	32.	9.	10.	9.	9.	7.
3	65.	66.	69.	67.	68.	26.	25.	23.	27.	27.	9.	8.	7.	5.	4.
4	67.	72.	76.	76.	72.	24.	20.	18.	21.	25.	7.	7.	7.	3.	3.
B	73.	78.	80.	80.	78.	20.	17.	16.	18.	21.	6.	5.	4.	2.	1.

patterns. We see this by looking at the ratio of the percent of firms reporting in group biggest-value (BV) and the percent of firms reporting in group smallest-growth (SG). In the aggregate results across quarters (Figure 1), the ratio falls from about 2.0 (73% versus 36%) in the first month, to 0.5 (26% versus 49%) in the second month, and 0.13 (2% versus 16%) in the third month. The monotonic decrease in this BV:SG ratio is present in every quarter as well (see Table OA1).

OB. Conditional risk

In the model, the conditional expected returns vary with the conditional risk, which within the model is well proxied by volatility. In the data, volatility is obviously an imperfect proxy. Nevertheless, Table OB1 shows that the standard deviation of the returns of small stocks in months 2 and 3 is high (low) following high (low) market returns in month 1. The ratio between the high and low standard deviations in months 2 and 3 is about two and highly statistically significant. The results in terms of conditional risk for growth stocks are insignificant in general, but they are significant after we condition on size (untabulated). In particular, they are strongest in the smallest three size quintiles. This is consistent with the earnings announcement patterns across book-to-market being weaker than the patterns across size and becoming apparent only after conditioning on size.

Table OB1

Conditional announcement risk.

This table shows the standard deviation of the monthly returns in months 2 and 3 of the quarter (in percentage points), of small stocks, of growth stocks, or of all stocks predicted to announce in month 2 or month 3, conditional on the return of the market excess return in month 1 of the quarter. Small (growth) stocks is defined as the Fama-French portfolio of the lowest decile of stocks (single sort) defined by market capitalization (book-to-market), and the sample period for these is 1926-2013. Predicted announcement months are defined as the previous year's announcement month plus 12 months, and the sample period for these is 1974-2013. All portfolios are value-weighted. The p-values of the F-tests of equality of variance are in square brackets. *, ** and *** indicate significance at the 10%, 5% and 1% levels, respectively.

	Return volatility in months 2 and 3 of		
	Small stocks	Growth stocks	Month 2 or 3 announcers
Conditional on market return above median in month 1	12.35	4.97	4.81
Unconditional	10.35	5.45	5.07
Conditional on market return below median in month 1	7.47	5.86	5.29
Above median / below median	1.65*** [0.00]	0.85*** [1.00]	0.85* [0.98]

OC. Robustness tests of the concentration in alpha reduction

In the paper's equation (8), betas are constant across all months. Given the monthly variation in the FF3M's improvement over the CAPM, we check whether SMB and HML simply proxy for monthly variation in conditional market exposure. We do so by allowing the CAPM beta to vary conditional on each calendar month:

$$r^e_{i,t} = \alpha^{CAPM}_{i,jan} + \ldots + \alpha^{CAPM}_{i,dec} + \beta_{rmrf,i,jan}\, r^e_{rmrf,t,jan} + \ldots + \beta_{rmrf,i,dec}\, r^e_{rmrf,t,dec} + \epsilon_{i,t} \quad \text{(OC.1)}$$

where $r^e_{rmrf,t,m}$ is the market excess return at t multiplied by indicator variable that has value 1 in month m and 0 otherwise. This alternative specification is run on the same 55 test assets (30 Fama-French value-weighted industry portfolios and 25 size and book-to-market sorted portfolios) over the same sample period (1926 to 2013) as in Table 4. Note that we focus exclusively on the 55 test assets.

We compare the monthly alphas from this specification to those from the unconditional CAPM. Panel A of Table OC1 shows that allowing the betas to vary by month does not result in alpha reductions of the same magnitude as with the FF3M: the total reduction in alpha is 0.13 compared to 1.52 in Table 4. Thus the reduction in alpha for the FF3M is not simply due to SMB and HML providing additional flexibility to match seasonal variation in market betas. This is consistent with our model where the conditional CAPM cannot fix the mispricings due to the non-uniform information release structure. This result is also consistent with the finding of Lewellen and Nagel (2006) that a conditional CAPM cannot explain observed alphas.

We also test whether our results are driven by a few outliers. In Panel B of Table OC1, we show that the particularly bad fit of the CAPM in months like October and the FF3M's ability to reduce these pricing errors is not simply due to a random occurrence of extreme

Table OC1

Robustness of the improvement in alphas.

Panel A shows the mean absolute alphas by month for the CAPM and the conditional CAPM, where betas are allowed to differ for each calendar month (for each portfolio a conditional beta is estimated each month by interacting a monthly dummy with the market return), as well as the difference in the monthly mean absolute alpha across the two models. Panel B shows the mean absolute alphas (in percentage points) by month for the CAPM and Fama-French three-factor model as well as the difference in the monthly mean absolute alpha across the two models, after having censored the worst 20 days in terms of market return. Monthly alphas are calculated using calendar month dummy variables in time-series regressions (1926 to 2013). There are 55 test assets in both panels: the value-weighted Fama-French 30 industry portfolios and the value-weighted Fama-French 25 size and book-to-market sorted portfolios. We also present the total mean absolute alpha reduction across the two models within four sets of earnings-focused months. To assess the statistical significance of these monthly concentrations of alpha reductions, we perform a test against the null that the concentration in improvement is due to randomness. Further details of this null and the bootstrapping procedure used are in Appendix C. *, ** and *** indicate significance at the 10%, 5% and 1% levels, respectively.

Panel A: Conditional CAPM

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
CAPM	1.18	0.47	0.35	0.42	0.35	0.35	0.43	0.32	0.39	0.67	0.45	0.48
CondCAPM	1.15	0.48	0.34	0.36	0.33	0.34	0.37	0.31	0.40	0.67	0.44	0.52
Change	-0.02	0.02	0.00	-0.07	-0.01	-0.01	-0.06	-0.02	0.01	0.00	-0.01	0.04

	Change	% of total
Jan+Apr+Jul+Oct	-0.15	114.0
Jan+Feb+Apr+Jul+Oct	-0.14	102.0
Apr+Jul+Oct	-0.13	95.3
Feb+Apr+Jul+Oct	-0.11	83.8
All months	-0.13	100.0

Panel B: Censoring of the worst 20 days in terms of market return

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
CAPM	1.16	0.45	0.37	0.44	0.35	0.37	0.42	0.32	0.40	0.70	0.49	0.48
FF3M	0.47	0.33	0.36	0.43	0.33	0.34	0.28	0.30	0.27	0.44	0.39	0.43
Change	-0.69	-0.13	-0.01	-0.02	-0.02	-0.03	-0.14	-0.02	-0.12	-0.26	-0.10	-0.05

	Change	% of total
Jan+Apr+Jul+Oct	-1.11***	69.8
Jan+Feb+Apr+Jul+Oct	-1.24***	77.7
Apr+Jul+Oct	-0.42**	26.2
Feb+Apr+Jul+Oct	-0.55**	34.2
All months	-1.60	100.0

returns in those months, such as the stock market crashes of 1929 and 1987. To control for these effects we omit the months with the 20 worst market returns (using the same test assets over the same sample period). We see that censoring the data leaves our results in Panel C of Table 4 virtually unchanged. This insensitivity is robust to various censoring levels (e.g., 10 or 30 worst months).

In untabulated results, we find that our results are robust to using the equal-weighted test assets. We also find that the results are robust across subperiods: 1973-2013 (matching the Compustat earnings announcement sample), as well as 1926-1962 and 1963-2013. Interestingly, the results are strongest in the post-1963 sample, consistent with the notion that the FF3M fits particularly well in that period (Ang and Chen, 2007). Lastly, looking at the effect of SMB and HML separately, we find that SMB is the more important driver of our findings, in particular in January, July, and October.

OD. Robustness to industry effects

The paper's analysis is at the market level. In this section, we investigate the robustness to variation in inter-industry earnings announcement patterns.

Table OD1 shows the timing of earnings announcements by month of the quarter (equal-weighted and value-weighted) for each of the 30 Fama-French industries. This table is the analog of the aggregate results shown in Appendix Figure B1, collapsed across quarters. While there are differences in the slope of the pattern across industries, only Retail announces in a qualitatively different way from the aggregate on both a value-weighted and an equal-weighted basis. On a value-weighted basis, it is the only industry where more firms announce in month 2 rather than month 1.[1] On an equal-weighted basis, 10 industries have an announcement pattern that differs from the aggregate (Food, Games, Clths, Hlth, Oil, Telcm, Whlsl, Rtail, Meals, Other) and only Oil, Telecom and Retail have more than 10% differences between month-2 announcers and month-1 announcers.[2]

Despite finding qualitatively similar announcement patterns across the majority of industries, we nevertheless investigate whether that variation we document could lead to an inter-industry factor manifesting as our seasonal information release factor. We do so by checking whether our results on alpha concentrations, differential beta exposures, and our information structure factor are robust to the use of an intra-industry HML factor. Specifically, we replace HML with the HML* factor of Novy-Marx (2013).[3] We focus on this alternative factor since several papers show that the majority of the explanatory power of HML is driven by its intra-industry component that this factor captures (Cohen and Polk, 1998; Asness, Porter, and Stevens, 2000; Novy-Marx, 2011).

We obtain virtually identical results using HML* as we did for HML.[4] Table OD2 shows

[1]This is driven by the fact that most Retail firms have January fiscal year ends.

[2]Penman (1987) writes on page 214 that "reporting lags differ by industry classification" but provides no further breakdowns.

[3]The HML* factor is constructed by demeaning book-to-market within each industry prior to sorting the firms into the 2x3 portfolios. The data are available on Robert Novy-Marx's website, covering the July 1963 to December 2012 period: `http://rnm.simon.rochester.edu/data_lib/OSoV/index.html`.

[4]Novy-Marx provides an alternative to HML*, namely HMLN, and our results are robust to the use of

that we obtain the same model-predicted variation in SMB and HML* betas as the announcement timing of firms varies, holding the size and (industry adjusted) book-to-market characteristics constant, as in Table 5. In fact, the variation along the HML* dimension is somewhat stronger.

Panel A of Table OD3 shows that, under a modified Fama-French three-factor model (FF3M*) which uses the market, SMB and HML*, the alpha reductions are concentrated in the key earnings announcement months, just as in Panel C of Table 4 and Panel A of Table 6. Furthermore, Panels B and C of Table OD3 show that this seasonal concentration is driven entirely by our information structure factor, with no statistically significant seasonal concentration in the model using SMB and HML* orthogonalized to the information structure factor, just as in Panels B and C of Table 6.

In summary, while there are differences in earnings announcement patterns across industries, there are few qualitative differences between the aggregate announcement patterns and any one industry. Furthermore, we find nearly identical results when replicating our main findings using an HML factor purged of inter-industry differences in book-to-market ratios. We therefore conclude that our results are not driven by differences across industries.

HMLN as well.

Table OD1

Earnings announcements by industry by month of the quarter.

Panel A shows the by-industry within-quarter percentage of firms with a quarterly announcement in each month of the quarter. Panel B shows the by-industry within-quarter percentage of market capitalization (measured on December 31 of the prior year) with a quarterly announcement in each month of the quarter. We sort firms by industry according to the 30 Fama-French industry classification. Month 1 is January, April, July and October. Month 2 is February, May, August and November. Month 3 is March, June, September and December. Data are from Compustat and cover the time period 1973 to 2013. To be included in the sample a firm must have at least four earnings announcements within that year.

Panel A: Equal-weighted

Industry	Month 1	Month 2	Month 3
Food	39.7	40.3	20.1
Beer	43.7	43.2	13.2
Smoke	66.5	28.7	4.8
Games	40.2	45.5	14.3
Books	52.5	31.5	16.1
Hshld	51.4	35.4	13.2
Clths	36.1	39.1	24.9
Hlth	40.7	47.1	12.2
Chems	61.5	29.5	9.0
Txtls	52.2	35.1	12.7
Cnstr	47.3	38.1	14.6
Steel	61.8	27.2	11.0
FabPr	49.3	37.2	13.5
ElcEq	45.2	40.7	14.1
Autos	50.6	33.8	15.6
Carry	55.0	34.7	10.3
Mines	46.7	44.5	8.8
Coal	57.6	35.1	7.4
Oil	37.9	51.4	10.8
Util	57.1	39.6	3.4
Telcm	39.7	50.2	10.1
Servs	44.4	42.8	12.9
BusEq	51.9	35.7	12.4
Paper	60.7	26.7	12.6
Trans	56.7	34.9	8.4
Whlsl	40.9	41.7	17.5
Rtail	26.5	48.4	25.2
Meals	39.3	42.2	18.6
Fin	67.9	26.7	5.41
Other	40.5	48.0	11.5
All	49.4	38.3	12.3

Panel B: Value-weighted

Industry	Month 1	Month 2	Month 3
Food	50.7	30.0	19.4
Beer	76.0	22.1	1.9
Smoke	92.5	7.5	0.7
Games	62.2	32.9	5.0
Books	71.4	21.6	6.9
Hshld	76.5	21.8	1.6
Clths	46.7	25.2	28.2
Hlth	84.5	13.9	1.6
Chems	86.5	11.9	1.6
Txtls	66.8	25.0	8.2
Cnstr	68.7	25.4	5.9
Steel	84.7	11.2	4.2
FabPr	62.1	30.9	7.0
ElcEq	62.4	34.9	2.8
Autos	71.5	23.1	5.4
Carry	82.8	15.9	1.3
Mines	67.1	29.0	3.9
Coal	81.0	17.6	3.2
Oil	84.4	14.8	0.8
Util	72.3	26.5	1.3
Telcm	60.8	17.6	21.6
Servs	63.5	24.1	12.4
BusEq	73.4	22.9	3.7
Paper	87.7	9.3	3.0
Trans	75.5	15.5	9.1
Whlsl	55.7	30.8	13.5
Rtail	18.6	65.3	16.1
Meals	69.9	20.1	10.0
Fin	78.4	18.7	3.0
Other	60.5	37.7	4.3
All	72.3	21.6	6.1

Table OD2

Variation in SMB and HML* exposure with timing of earnings announcement.

This table shows the exposures (betas) to SMB and HML* of subportfolios of the 25 Fama-French size and book-to-market sorted portfolios. Each (value-weighted) Fama-French portfolio is subdivided into three groups based on which month of the quarter (first, second or third) each firm first reports earnings in a given a quarter (using predicted announcement month gives similar results). These triple sorts are repeated for each of the four quarters, and the subportfolios are rebalanced in July. Panel A shows SMB exposures and Panel B shows HML* exposures. The last row of each panel reports the average results for an equal-weighted portfolio of the 25 value-weighted Fama-French portfolios. The sample period is from 1973 to 2012. We report the statistical significance of the beta differences across month 1 and month 3 in the direction predicted by the model (positive difference) using cutoffs from a two-sided t-test, with *, ** and *** indicating significance at the 10%, 5% and 1% levels. $^{(*)}$ indicates statistical significance at the 10% level using one-sided cutoffs.

Panel A: SMB exposure

	Month 1	Month 2	Month 3	M3-M1
SL	1.42	1.44	1.43	0.01
S2	1.29	1.40	0.99	-0.30
S3	0.87	1.20	1.03	0.17***
S4	0.91	0.95	1.04	0.13**
SH	0.92	0.90	1.19	0.27***
2L	0.95	1.15	0.99	0.04
22	0.80	0.99	0.89	0.08
23	0.66	0.73	0.83	0.17**
24	0.70	0.55	0.80	0.11$^{(*)}$
2H	0.71	0.74	0.78	0.07
3L	0.94	0.63	0.72	-0.22
32	0.47	0.54	0.63	0.16**
33	0.31	0.44	0.47	0.16**
34	0.27	0.28	0.40	0.12
3H	0.38	0.32	0.62	0.24
4L	0.51	0.61	0.36	-0.15
42	0.17	0.33	0.23	0.06
43	0.12	0.09	0.44	0.31***
44	0.05	0.02	0.76	0.71***
4H	0.01	0.07	0.27	0.26*
BL	-0.26	-0.07	0.24	0.51***
B2	-0.30	-0.14	-0.21	0.09
B3	-0.30	-0.15	-0.28	0.01
B4	-0.28	-0.18	-0.02	0.26*
BH	-0.24	-0.09	-0.27	-0.02
Avg.	0.44	0.51	0.63	0.19***

Panel B: HML* exposure

	Month 1	Month 2	Month 3	M1-M3
SL	-0.63	-0.51	-0.55	-0.08
S2	0.10	-0.05	0.21	-0.11
S3	0.55	0.41	0.51	0.03
S4	0.75	0.82	0.40	0.34***
SH	1.24	1.20	1.14	0.11
2L	-0.90	-1.00	-0.63	-0.27
22	0.19	0.09	-0.05	0.24$^{(*)}$
23	0.54	0.60	0.36	0.17
24	0.83	0.84	0.55	0.28*
2H	1.19	1.41	1.39	-0.20
3L	-0.59	-0.83	-0.60	0.01
32	0.24	0.09	0.22	0.01
33	0.63	0.70	0.51	0.13
34	0.94	0.79	0.77	0.17
3H	1.19	1.15	0.80	0.39
4L	-0.64	-0.69	-0.79	0.14
42	0.38	0.27	-0.11	0.49***
43	0.83	0.44	0.25	0.58**
44	0.89	0.65	0.83	0.06
4H	1.51	1.31	1.46	0.05
BL	-0.46	-0.65	-0.91	0.45***
B2	0.17	-0.01	0.09	0.08
B3	0.54	0.55	0.47	0.07
B4	1.06	0.78	0.85	0.21
BH	1.23	0.93	0.56	0.67*
Avg.	0.47	0.37	0.25	0.22***

Table OD3
Alpha concentration and information structure factor with intra-industry HML*.
Each panel of this table shows the mean absolute alphas (in percentage points) by month for the CAPM and another factor model as well as the difference in the monthly mean absolute alpha across the two models. Monthly alphas are calculated using calendar month dummy variables in time-series regressions. We also present the total mean absolute alpha reduction across the two models within four sets of earnings-focused months. Panel A presents the CAPM and a modified Fama-French three-factor model (FF3M*) where HML is replaced by the intra-industry HML* factor of Novy-Marx (2013). Panel B presents the CAPM and a two-factor model consisting of the market and a factor based on the timing of earnings announcements (M+M3M1). This factor (LMF = last-minus-first) is constructed as the difference between the return of an equal-weighted portfolio of all predicted month-3 announcers and the return of an equal-weighted portfolio of all predicted month-1 announcers. Predicted announcement months are calculated as last year's announcement month plus 12 months. Panel C presents the CAPM and the modified Fama-French three-factor model where SMB and HML* have been orthogonalized to the LMF factor used in Panel B (FF3MO*). In all three panels, there are 55 test assets: the value-weighted Fama-French 30 industry portfolios and the value-weighted Fama-French 25 size and book-to-market sorted portfolios. The sample period is from 1974 to 2012. To assess the statistical significance of these monthly concentrations of alpha reductions, we perform a test against the null that the concentration in improvement is due to randomness. Further details of this null and the bootstrapping procedure used are in Appendix C. *, ** and *** indicate significance at the 10%, 5% and 1% levels, respectively.

Panel A: CAPM v modified Fama-French three-factor model with HML* (1974 to 2012)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
CAPM	0.91	0.70	0.70	0.64	0.50	0.53	0.47	0.45	0.51	0.99	0.42	0.65
FF3M*	0.68	0.38	0.43	0.47	0.46	0.56	0.42	0.47	0.51	0.54	0.42	0.47
Change	-0.24	-0.32	-0.27	-0.17	-0.04	0.03	-0.06	0.02	0.00	-0.45	0.00	-0.18

	Change	% of total
Jan+Apr+Jul+Oct	-0.91**	54.6
Jan+Feb+Apr+Jul+Oct	-1.23***	73.6
Apr+Jul+Oct	-0.68**	40.5
Feb+Apr+Jul+Oct	-1.00**	59.5
All months	-1.68	100.0

Panel B: CAPM v model with market (M) and last-minus-first (LMF) factors (1974 to 2012)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
CAPM	0.91	0.70	0.70	0.64	0.50	0.53	0.47	0.45	0.51	0.99	0.42	0.65
M+LMF	0.64	0.60	0.67	0.70	0.47	0.52	0.43	0.44	0.53	0.84	0.45	0.68
Change	-0.27	-0.10	-0.02	0.06	-0.03	-0.01	-0.05	-0.01	0.01	-0.15	0.03	0.03

	Change	% of total
Jan+Apr+Jul+Oct	-0.41***	80.3
Jan+Feb+Apr+Jul+Oct	-0.50***	99.7
Apr+Jul+Oct	-0.13	26.6
Feb+Apr+Jul+Oct	-0.23*	46.0
All months	-0.50	100.0

Panel C: CAPM v Fama-French three-factor model with SMB and HML* orthogonalized to the LMF information structure factor (1974 to 2012)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
CAPM	0.91	0.70	0.70	0.64	0.50	0.53	0.47	0.45	0.51	0.99	0.42	0.65
FF3MO*	0.89	0.57	0.50	0.58	0.48	0.58	0.52	0.47	0.55	0.68	0.43	0.47
Change	-0.02	-0.12	-0.20	-0.07	-0.02	0.05	0.05	0.03	0.04	-0.30	0.01	-0.18

	Change	% of total
Jan+Apr+Jul+Oct	-0.35	46.4
Jan+Feb+Apr+Jul+Oct	-0.47	63.1
Apr+Jul+Oct	-0.32	43.1
Feb+Apr+Jul+Oct	-0.44	59.8
All months	-0.74	100.0