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Do Exchange Traded Funds Affect the Processing of Earnings Information?

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Motivation and Research Questions

- Exchange Traded Funds (ETFs) have garnered a great deal of attention and AUM in recent years

- ETFs trade like ordinary stocks – buying, selling, shorting, margin etc.

- As ETFs are easy to trade, have low fees and are diversified, they have become very popular

- ETFs account for over 30% of all trading volume

- ETFs constitute almost $ 3 Trillion in AUM (end 2016)

- ETFs were the 12 most actively traded securities in 2016
    - AAPL in 13th place

Motivation and Research Questions

- However, they are controversial with critics faulting them for causing market disruptions and supporters arguing they are beneficial

- We contribute evidence to address this debate by examining three questions

- Do ETFs facilitate the efficient transfer of information across firms?
    - Do other constituents of ETFs react when firms' release earnings information?
    - Is this reaction rational?

- How does ETF ownership affect long-term market-efficiency?
    - Does ETF ownership mitigate or exacerbate the post-earnings announcement drift?

- Do the effects vary by the type of ETF

Summary of Results

- ETFs assist in information transfer across firms
  - When a "leader" releases earnings, the "follower" firm also reacts

- All ETFs are not the same
  - Reaction to fundamental news is stronger for sector ETFs, consistent with ETFs assisting in impounding factor/industry information
  - Weaker intra industry reversal subsequent to introduction of sector ETFs

- ETF ownership plays a role in mitigating drift
  - But only for sector ETF ownership

Summary of Results

- Increased co-movement consistent with prior work

- However, implications of co-movement varies by ETF type
  - Sector ETF co-movement is the result of more factor information being impounded
  - Non-sector ETF co-movement is potentially detrimental

- Overall sector ETFs have enhanced market efficiency around earnings announcements while non-sector ETFs have had no discernible effect

What are ETFs?

- ETFs are open-ended funds
- Own the underlying assets and divide ownership of those assets into shares.
- Unlike open-ended mutual funds, ETFs can be traded on stock exchanges and are priced throughout the day
- An ETF is created by a sponsor who chooses the investment objective and benchmark for the ETF
- Sponsor manages the process of creating and redeeming ETFs through intra-day intermediary financial institutions called authorized participants
- Most ETFs are passive in that they track an index
- Active ETFs are a recent phenomena but are still a small part of the ETF AUM
- They are more liquid and tax efficient than mutual funds

How can ETFs improve efficiency

- ETFs allow for trading a large number of stocks in a cost efficient manner.

- More timely incorporation of information, especially for firms in weak information environments (Glosten et al 2017)

- Allows factor investors to better express their information (Cong and Xu 2016)

- In a recent working paper Huang et al., 2018 argue and find evidence that sector ETFs can help market efficiency by making it easier to hedge again industry specific risk

How can ETFs hinder efficiency

- ETFs have fixed and pre-determined rules
  - The relevance of information may depart from these rules

- Not all components of information may be relevant for ETF constituents

- ETF activity
  - Increases return co-movement, future reversals (Da and Shive 2016)
  - Increases stock price volatility (Ben David et al 2017)

- If everyone cares about the ETF, will underlying firms get ignored?
  - Lower earnings response coefficients, analyst following (Israeli et al 2017)

ETFs and the processing of earnings information

- Information in earnings is comprised, in varying degrees, of

  – idiosyncratic components

  – industry level information

  – economy or market level information

- When an ETF constituent releases earnings, if traders express their sentiment through ETF trading, other firms in the ETF will also move in conjunction.

- Whether ETFs help or hinder processing of earnings information depends on how relevant each component is for other ETF constituents and the type of ETF

All ETFs are not the same

- Fundamentally two kinds of ETFs – broad market ETFs following large indices vs. sector ETFs

- Sector ETF firms are more likely to be closely related to each other
  - Better propagation of industry information
  - "Idiosyncratic Information" more likely to be relevant
  - About 40% of the ETFs are sector ETFs

- Market ETFs
  - Tend to be market cap weighted similar to the underlying indices they track
  - Contain a wide swath of the market and therefore firms that are quite dissimilar
  - Potentially better for propagation of market macro data

Primary Research Design – ETF Level

- Analysis at the ETF level

- Focus on the top five holdings of each ETF

- Firm releasing earnings first is "leader", paired with upto 4 other followers.

- Reaction to earnings news in two windows

  - Leader's earnings announcement

  - In between leader's and followers' earnings annoucement

Market reaction to Earnings Announcements

- When the "leader" announces earnings news. Do the "followers' respond?

- Does this response vary between sector and non-sector ETFs?

- Is this response rational (leader information relevant for follower) or purely mechanical because of membership in same ETF?

Table 3

Panel A: Investors' reaction to follower firms on leader firm's earnings announcement during ETF period
Model: $FRET_{ANNC1} = \alpha + \beta_1*LRET + \varepsilon$ (for columns 1 to 3)
Model: $FRET_{ANNC1} = \alpha + \beta_1*LRET + \beta_2*SEC + \beta_3*FRET_{ANNC1}*SEC + \varepsilon$ (for column 4)

ETF period	1 All ETFs	2 Sector ETFs	3 Non-Sector ETFs	4 All ETFs with interaction
Intercept	-0.001***	0.000	-0.001***	-0.001***
	(3.25)	(0.48)	(4.34)	(4.34)
LRET	0.049***	0.085***	0.023***	0.026***
	(8.51)	(7.95)	(3.69)	(3.69)
SEC				0.001**
				(2.40)
LRET*SEC				0.062***
				(5.12)
# of obs	31,992	16,281	15,711	31,992
Adj R square	0.93%	2.22%	0.25%	1.33%

Table 3

Panel B: Investors' reaction to follower firms on leader firm's earnings announcement during pre-ETF period

Model: $FRET_{ANNC1} = \alpha + \beta_1 * LRET + \varepsilon$ *(for columns 1 to 3)*
Model: $FRET_{ANNC1} = \alpha + \beta_1 * LRET + \beta_2 * SEC + \beta_3 * FRET_{ANNC1} * SEC + \varepsilon$ *(for column 4)*

PRE-ETF period	1 All ETFs	2 Sector ETFs	3 Non-Sector ETFs	4 All ETFs with interaction
Intercept	0.000**	0.000	-0.001***	-0.001***
	(2.04)	(0.71)	(-2.71)	(-2.71)
LRET	0.019***	0.056***	-0.004	-0.004
	(4.19)	(6.28)	(-0.83)	(-0.83)
SEC				0.000
				(0.93)
LRET*SEC				0.060***
				(5.94)
# of obs	68,752	29,888	38,864	68,752
Adj R square	0.08%	0.53%	0.00%	0.25%

Table 3

Table 3

Panel C: Investors' reaction to ETF follower firms on ETF leader firm's earnings announcement partitioned by ETF Volumes

Model $FRET_{ANNC1} = \alpha + \beta_1*LRET + \beta_2*SEC + \beta_3*LRET*SEC + \varepsilon$ (for columns 1 to 3)

Model $FRET_{ANNC1} = \alpha + \beta_1*LRET + \beta_2*SEC + \beta_3*LRET*SEC + \beta_4*HIGH + \beta_5* LRET*HIGH + \beta_6*HIGH*SEC + + \beta_7*LRET*HIGH*SEC + \varepsilon$ (for column 4)

	1 All pairs	2 High Volume pairs	3 Low Volume pairs	4 All pairs with interaction
Intercept	-0.001***	-0.002***	-0.001***	-0.001***
	(-4.34)	(-3.26)	(-3.05)	(-3.05)
LRET	0.023***	0.019**	0.026***	0.026***
	(3.69)	(2.22)	(2.94)	(2.94)
SEC	0.001**	0.001*	0.001	0.001
	(2.40)	(1.82)	(1.64)	(1.64)
LRET*SEC	0.062***	0.103***	0.017	0.017
	(5.12)	(5.46)	(1.21)	(1.21)
HIGH				0.000
				(0.52)
SEC*HIGH				0.000
				(0.32)
LRET*HIGH				-0.007
				(-0.54)
LRET*SEC*HIGH				0.086***
				(3.68)
# of obs	31,992	16,301	15,691	31,992
Adj R square	1.33%	2.53%	0.50%	1.59%

Table 4

Panel A: Adjustment by Investors between leader's and followers' earnings announcement during ETF period

Model $FRET_{BETW} = \alpha + \beta_1*FRET_{ANNC1} + \varepsilon$ (for columns 1 to 3)
Model $FRET_{BETW} = \alpha + \beta_1*FRET_{ANNC1} + \beta_2*SEC + \beta_3*FRET_{ANNC1}*SEC + \varepsilon$ (for column 4)

	1 All ETFs	2 sector ETFs	3 Non-Sector ETFs	4 All ETFs with interaction
Intercept	0.000	0.000	0.000	0.000
	(0.37)	(0.43)	(0.18)	(0.18)
$FRET_{ANNC1}$	-0.071***	-0.037***	-0.109***	-0.109***
	(-3.89)	(-1.89)	(-3.54)	(-3.54)
SEC				0.000
				(0.18)
$FRET_{ANNC1}*SEC$				0.071**
				(1.99)
# of obs	31,992	16,281	16,771	31,992
Adj R square	0.32%	0.08%	0.55%	1.34%

Table 4

Panel B: Adjustment by Investors between leader's and followers' earnings announcement during pre-ETF period

Model $FRET_{BETW} = \alpha + \beta_1 * FRET_{ANNC1} + \varepsilon$ *(for columns 1 to 3)*
Model $FRET_{BETW} = \alpha + \beta_1 * FRET_{ANNC1} + \beta_2 * SEC + \beta_3 * FRET_{ANNC1} * SEC + \varepsilon$ *(for column 4)*

	1 All ETFs	2 sector ETFs	3 Non-Sector ETFs	4 All ETFs with interaction
Intercept	0.001***	0.001***	0.001**	0.001**
	(4.30)	(3.80)	(2.40)	(2.40)
$FRET_{ANNC1}$	-0.085***	-0.100***	-0.072***	-0.072***
	(-8.53)	(-7.21)	(-5.26)	(-5.26)
SEC				0.001
				(1.57)
$FRET_{ANNC1} * SEC$				-0.027
				(-1.42)
# of obs	68,752	29,888	38,864	68,752
Adj R square	0.30%	0.46%	0.20%	0.31%

Table 4

Panel C: Adjustment by Investors between leader's and followers' earnings announcement partitioned by ETF Volumes

Model: $FRET_{BETW} = \alpha + \beta_1*FRET_{ANNC1} + \beta_2*SEC + \beta_3*FRET_{ANNC1}*SEC + \varepsilon$ (for columns 1 to 3)

Model: $FRET_{BETW} = \alpha + \beta_1*FRET_{ANNC1} + \beta_2*SEC + \beta_3*FRET_{ANNC1}*SEC + \beta_4*HIGH + \beta_5* FRET_{ANNC1}*HIG.$ $+ \beta_6*HIGH*SEC+ + \beta_7*FRET_{ANNC1}*HIGH*SEC+ \varepsilon$ (for column 4)

	1 All pairs	2 High Volume pairs	3 Low Volume pairs	4 All pairs with interaction
Intercept	0.000	0.000	0.000	0.000
	(0.18)	(0.52)	(0.22)	(0.22)
$FRET_{ANNC1}$	-0.109***	-0.147***	-0.073**	-0.073**
	(-3.54)	(-2.86)	(-2.34)	(-2.34)
SEC	0.000	0.000	0.000	0.000
	(0.18)	(0.19)	(0.03)	(0.03)
$FRET_{ANNC1}*SEC$	0.071**	0.104*	0.045	0.045
	(1.99)	(1.83)	(0.99)	(0.99)
HIGH				-0.000
				(-0.54)
SEC*HIGH				-0.000
				(-0.16)
$FRET_{ANNC1}*HIGH$				-0.074
				(-1.25)
$FRET_{ANNC1}*SEC*HIGH$				0.059
				(0.81)
# of obs	31,992	16,301	15,691	31,992
Adj R square	0.32%	0.55%	0.15%	0.35%

Alternate Research Design – Leaders and Followers

- Analysis at the firm level

- Replicate design in Thomas and Zhang (2008)

- For each target (follower) firm identify all firms that released earnings before it (leader firms)

- Determine market reaction of target firm to the earnings announcement of each leader firm

- Regress market return of target firm to its earnings announcement on the average response to the leader firms

- Focus on sector ETFs:
  - Firms that some point get included in a sector ETF and examine period prior to and subsequent to ETF inclusion

Table 5

Model ARET= $\alpha + \beta_1*RESP + \varepsilon$ (for columns to 1 to 2)

Model ARET= $\alpha + \beta_1*RESP + \beta_2*POST + \beta_3*RESP*POST + \varepsilon$ (for column 3)

	1 PRE-ETF Period	2 ETF Period	2 ALL periods
Intercept	0.004***	0.001***	0.004***
	(15.54)	(5.28)	(15.54)
RESP	-0.094***	-0.007	-0.094***
	(-7.34)	(-0.44)	(-7.34)
POST			-0.003***
			(-7.25)
RESP*POST			0.087***
			(4.38)
# of obs	66,079	97,043	163,122
Adj R square	0.15%	0.00%	0.17%

Summary of Leader-Follower Results

- Followers react to leader's earnings information
  - Follower returns correlated to both leader's earnings news as well as leader's returns
  - Relationship is stronger for sector ETF pairs

- There is a reversal of returns for followers in the period between leader and follower earnings release
  - Reversal is stronger in the subset of non-sector ETFs

- Followers earnings news is related to leaders earnings news
  - Relationship stronger for sector ETFs

- Sector ETFs seem to enhance efficiency

Path Analysis

- To better understand the return correlation, we carry out a path analysis

  - To what extent is the relationship between leaders and followers happening because of their inherent correlation vs. the ETF channel?

  - Does this vary between sector and non-sector ETFs?

TABLE 7
Path Analysis

	All ETFs	Sector ETFs	Non-Sector ETFs
Total effect			
$\rho[LRET, FRET_{annc1}]$	0.118***	0.200***	0.044***
	(21.75)	(26.74)	(5.74)
Direct path			
$\rho\,[LRET, FRET_{annc1}]$	0.078***	0.105***	0.038***
	(14.49)	(14.20)	(4.93)
Percentage	66%	52%	86%
Mediated path			
$\rho\,[LRET, ETFRET]$	0.174***	0.268***	0.081***
	(32.83)	(37.15)	(10.61)
$\rho\,[ETF, FRET_{annc1}]$	0.228***	0.353***	0.076***
	(43.43)	(50.73)	(9.81)
mediated effect	0.040***	0.095***	0.006***
	(25.99)	(29.54)	(7.19)
Percentage	34%	48%	14%

ETF Ownership and Post-Earnings Announcement Drift (PEAD)

- Evidence thus far suggests that
  - Firms impound information correlated to their own earnings news into price prior to earnings release
  - This varies between Sector and Non-Sector ETFs
  - This suggests that ETF ownership may mitigate PEAD (especially sector ETF ownership)
  - Direct test of whether ETFs help or hinder market efficiency

- We next analyze the impact of ETF ownership on PEAD

Research Design – Impact on Drift

- Analysis at the firm-level

- ETF ownership across all ETFs summed up at firm level.

- PEAD analyzed as the relationship between earnings surprise (SUE) and returns over 60 says after earnings announcement (POST60)

- Impact of ETF ownership on PEAD examined

  - ETF ownership also partitioned into sector and non-sector

TABLE 8
Impact of ETF Ownership on Post-Earnings Announcement Drift: Portfolio Analysis

Panel C: Post-Earnings-Drift by SUE Deciles

SUE decile	All Firms Post60	ETF% < median Post60	ETF% >= median Post60	Sector ETF% < median Post60	Sector ETF% >= median Post60
1	-1.96%	-2.14%	-1.67%	-2.34%	-1.50%
2	-1.44%	-1.64%	-1.23%	-1.60%	-1.28%
3	-1.24%	-1.36%	-1.12%	-1.43%	-1.05%
4	-1.00%	-1.40%	-0.66%	-1.21%	-0.80%
5	-0.08%	-0.46%	0.22%	-0.35%	0.16%
6	0.90%	0.84%	0.95%	0.74%	1.06%
7	1.17%	1.00%	1.31%	1.12%	1.21%
8	2.03%	2.05%	2.02%	1.98%	2.09%
9	2.88%	3.06%	2.68%	3.31%	2.44%
10	4.22%	4.41%	4.07%	4.77%	3.72%
(10)-(1)	6.17%[***] (22.78)	6.56%[***] (18.00)	5.74%[***] (13.95)	7.10%[***] (18.69)	5.22%[***] (13.23)
		Impact of ETF ownership	-0.82% (-1.49)	Impact of sector ETF ownership	-1.88%[***] (-3.43)

TABLE 9

Impact of ETF Ownership on Post-Earnings Announcement Drift: Multivariate Analysis

$POST60 = \alpha + \beta_1{*}RSUE + \beta_2{*}ETF\% + \beta_3{*}SIZE + \beta_4{*}BETA + \beta_5{*}MTB + \beta_6{*}PRERET + \beta_7{*}RSUE{*}ETF\% + \beta_8{*}RSUE{*}SIZE + \beta_9{*}RSUE{*}BETA + \beta_{10}{*}RSUE{*}MTB + \beta_{11}{*}RSUE{*}PRERET + \varepsilon.$

	Pooled	*Fama-Macbeth*	*Pooled*	*Fama-Macbeth*
Intercept	-0.033***	-0.031***	-0.031***	-0.029***
	(-6.84)	(-3.21)	(-6.44)	(-3.13)
RSUE	0.109***	0.111***	0.106***	0.108***
	(13.09)	(11.26)	(12.59)	(11.88)
ETF%	0.096***	0.119		
	(3.81)	(1.62)		
SECT%			0.333***	0.819**
			(5.14)	(1.99)
REST%			0.001	-0.075
			(0.04)	(-0.72)
SIZE	0.001*	0.001	0.001	0.001
	(1.73)	(1.04)	(1.57)	(0.94)
BETA	-0.005	-0.018	-0.006	-0.018
	(-0.80)	(-0.97)	(-0.83)	(-0.97)
MTB	-0.001*	-0.001	-0.001**	-0.001
	(-1.84)	(-1.29)	(-1.97)	(-1.41)
PRERET	-0.015*	-0.011	-0.015*	-0.011
	(-1.71)	(-0.79)	(-1.71)	(-0.82)
*RSUE*ETF%*	-0.102**	-0.164**		
	(-2.22)	(-1.99)		
*RSUE*SECT%*			-0.587***	-0.974**
			(-4.79)	(-2.05)
*RSUE*REST%*			0.079	0.086
			(1.20)	(0.59)
*RSUE*SIZE*	-0.007***	-0.007***	-0.007***	-0.007***
	(-6.56)	(-5.70)	(-6.35)	(-5.77)
*RSUE*BETA*	0.020*	0.028**	0.021*	0.028**
	(1.80)	(2.57)	(1.81)	(2.56)
*RSUE*PRERET*	0.025*	0.020*	0.025*	0.020
	(1.78)	(1.65)	(1.75)	(1.55)
*RSUE*MTB*	0.001	0.001	0.001	0.001
	(1.21)	(1.18)	(1.39)	(1.37)
Adj. R^2	1.29%	2.00%	1.31%	1.93%
N	136,500	136,500	136,500	136,500

Summary of Results

- ETFs play a significant role in transmitting information across firms

    - In some cases, this transmission is likely rational as the information is relevant (sector ETFs)

    - In other cases, this transmission may be mechanical (non-sector ETFs)

- ETFs can help help markets become more informationally efficient

    - Lower PEAD for sector ETFs

Contributions

- Bridges inconsistent findings from prior literature regarding impact of ETFs
  - Crucial to separate ETFs into sector and non-sector ETFs
  - Sector ETFs, designed to impound systematic information, can improve market efficiency of underlying securities
  - Corroborates theory work in composite security design and pricing (Subrahmanyam 1991, Cong and Xu 2017).

- Contributes to literature on intra-industry information transfer.
  - Sector ETFs reduce the intra-industry over reaction (Thomas and Zhang 2008).

Implications

- The answer to the question "Is the emergence of ETFs good or bad" is contextual

  – Sector ETFs – our paper indicates they have improved efficiency

  – Non-sector ETFs – some evidence of overreaction

- With ETFs, information events occur more frequently (whenever an ETF constituent releases earnings)

  – Changes the interpretation of results in prior research - lower ERCs not necessarily bad

Table 1

TABLE 1

Sample Selection and Distribution

Panel A: Sample Selection (ETF Level)

Sample Selection Criterion	*Observations*
Initial universe of ETF funds from CRSP as of 2015	2,091
Less: ETFs that are invested in stocks with no matches with Thomson-Reuters Mutual Fund Holding (S12) database	(1,604)
Number of distinct Equity ETFs with constituent holding information	487
Number of Sector ETFs	214
Number of non-Sector ETFs	273

Sector	Number of ETFs	% of Sector ETFs
Aerospace	2	0.93%
Agriculture	1	0.47%
Banks	5	2.34%
Basic Materials	9	4.21%
Biotech	5	2.34%
Chemical	1	0.47%
Construction	3	1.40%
Consumer products	21	9.81%
Energy	10	4.67%
Environmental	2	0.93%
Financial Services	15	7.01%
Healthcare	29	13.55%
Industrials	9	4.21%
Infrastructure	2	0.93%
Internet	7	3.27%
Media	1	0.47%
Medical Devices	1	0.47%
Natural resources	2	0.93%
Nuclear	1	0.47%
Oil & Gas	8	3.74%
Pharmaceutical	4	1.87%
Precious Metals	2	0.93%
Real Estate	20	9.35%
Renewable Energy	4	1.87%
Retail	3	1.40%
Semiconductors	5	2.34%
Steel	1	0.47%
Technology	18	8.41%
Telecommunications	7	3.27%
Timber	1	0.47%
Transportation	1	0.47%
Utilities	10	4.67%
Water	4	1.87%
Total	214	100%

Panel B: Distribution across Time

Year	# distinct ETFs
2002	106
2003	109
2004	138
2005	154
2006	177
2007	413
2008	473
2009	426
2010	453
2011	446
2012	434
2013	423
2014	407
2015	409

TABLE 2

Summary Statistics and Correlations for Leader-Follower Pairs Analyses

The table below presents sample selection and summary statistics for the variables used in the leader-follower analysis. There are 31,992 distinct leader-follower pairs within ETFs in the 2002-2015 period. See Appendix for variable definitions. In Panel B and C, figures above/below diagonal represent Pearson/Spearman rank-order correlations. [***], [**], [*] represent statistical significance at 0.01, 0.05 and 0.1 levels, respectively, based on two-tailed tests.

Panel A: Sample Selection (leader-follower pairs)

Sample Selection Criterion	Observations
Total Number of ETF-quarters from 2002 to 2015	16,707
Less: Observations deleted for firms with fiscal quarter ending not aligned with calendar quarter ending and missing underlying ETF trading volume	
Total useable number of ETF-quarters from 2002 to 2015	15,116
Times 4 followers equals theoretical maximum number of pairs	60,464
Less: Observations deleted for missing earnings announcement dates or earnings announcement within 2 days of leader's earnings announcement	(9.072)
Leader-follower pairs with appropriately spaced earnings announcements	51,392
Less: duplicates within sector type by underlying ETF trading volume	(18,872)
Less: duplicates from non-sector ETFs	(528)
Final Leader-follower sample	31,992

Panel A: Summary Statistics

Variables	P25	Median	Mean	P75	Std
LRET	-3.19%	-0.18%	0.07%	3.25%	6,78%
$FRET_{ANNC1}$	-1.55%	-0.07%	-0.08%	1.41%	3.47%
$FRET_{BETW}$	-1.75%	-0.04%	-0.01%	1.69%	4.8%
SEC	0	0	0.509	1	0.5

Panel B: Correlation Table for Subsample of Firm-quarters from Sector ETFs and Non-Sector ETFs

	Pearson Correlation			Spearman Correlation		
	LRET	$FRET_{ANNC1}$	$FRET_{BETW}$	LRET	$FRET_{ANNC1}$	$FRET_{BETW}$
LRET	1.000	0.149***	-0.002	1.000	0.167***	-0.008
$FRET_{ANNC1}$	0.149***	1.000	-0.028***	0.167***	1.0000	-0.031***
$FRET_{BETW}$	-0.002	-0.028***	1.000	-0.008	-0.031***	

Panel C: Correlation Table for Subsample of Firm-quarters from Sector ETFs and Non-Sector ETFs

	Pearson Correlation			Spearman Correlation		
	LRET	$FRET_{ANNC1}$	$FRET_{BETW}$	LRET	$FRET_{ANNC1}$	$FRET_{BETW}$
LRET	1.000	0.050***	-0.011**	1.000	0.034***	-0.005**
$FRET_{ANNC1}$	0.050***	1.0000	-0.074***	0.034***	1.0000	-0.049***
$FRET_{BETW}$	-0.011*	-0.074***	1.000	-0.054*	-0.049***	

Panel A: Sample Selection (leader-follower pairs)

Sample Selection Criterion	Observations
Total Number of ETF-quarters from 2002 to 2015	16,707
Less: Observations deleted for firms with fiscal quarter ending not aligned with calendar quarter ending and missing underlying ETF trading volume	
Total useable number of ETF-quarters from 2002 to 2015	15,116
Times 4 followers equals theoretical maximum number of pairs	60,464
Less: Observations deleted for missing earnings announcement dates or earnings announcement within 2 days of leader's earnings announcement	(9.072)
Leader-follower pairs with appropriately spaced earnings announcements	51,392
Less: duplicates within sector type by underlying ETF trading volume	(18,872)
Less: duplicates from non-sector ETFs	(528)
Final Leader-follower sample	31,992

Panel B: Summary Statistics

Variables	P25	Median	Mean	P75	Std
LRET	-3.19%	-0.18%	0.07%	3.25%	6.78%
$FRET_{ANNC1}$	-1.55%	-0.07%	-0.08%	1.41%	3.47%
$FRET_{BETW}$	-1.75%	-0.04%	-0.01%	1.69%	4.80%
SEC	0	0	0.509	1.000	0.500