# Skin in the game: personal stock holdings and investors' response to stock analysis on social media

J. Campbell et al, *Review of Accounting Studies*, 2019.

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# Introduction: Background

- A large body of research establishes that professional financial analysts play a valuable role in the capital markets by providing both new information and interpreting previously released information
- Regulators worry that stock positions of nonprofessional  analysts could create an additional bias
- Nonprofessional analysts are lack of researches.

# Introduction: Motivation

- A challenge to the use of nonprofessional analysis by investors is the lack of regulation: unlike professional analysts, NPAs face little regulatory oversight, leading to the potential for market manipulation.
- Nonprofessional analysts (hereafter NPAs) with personal stock positions have a vested interest in the stocks about which the write, which may enhance the quality, rigor, and timeliness of their analysis.

# Introduction: Research Questions

- Does an NPA's financial position convey information incremental to the content of their analysis?
  - Investors respond those article which present NPA's position more strongly
- Do investors find the tone in an NPA's analysis to be more credible when the author has a financial position?
  - Investors find the tone in an NPA's analysis and respond more strongly

# Introduction: Related Researches

- Research identifies two primary sources of conflicts of interest for professional analysts that may impair the credibility of their work.
- *firm-related conflicts*, such as trading commissions, trading gains/losses, etc. (e.g., Lin and McNichols 1998; Michaely and Womack 1999;Dechow et al., 2000)
- *personal conflicts*, such as their compensation structure, long-term reputation(Ke and Yu 2006; Bradshaw 2011).

# Introduction: Related Researches

- Elliott et al. (2018) suggest that experimental investors perceive social media participants with stock positions as less credible than those without.
- Chan et al. (2018) provide mixed evidence on whether professional analysts' personal holdings affect their credibility.

# Introduction: Contribution

- They find investors view a position disclosure as an information signal in its own right, presumably about the NPA's private information that is not included in the article.
- They find that NPA positions appear to magnify investor responses to tone

# Research Design: Data

- News content from **Seeking Alpha**
- **All** news published before 2015.07

| | |
|---|---|
| Seeking Alpha articles downloaded as of July 7, 2015 | 487,197 |
| Articles missing primary ticker designation | (280,219) |
| Articles missing position disclosure | (58,378) |
| Articles with ambiguous position disclosure | (246) |
| Articles with successfully coded disclosures | 148,354 |
| Articles not linked to CRSP | (21,124) |
| Articles missing other controls | (11,358) |
| Articles missing returns for any period | (10,920) |
| Total articles in sample | 104,952 |
| Unique Firm-day combinations | 86,741 |

# Research Design: Data

- Identify long positions by searching for the terms “long,” “hold,” or “own stock/shares.”
- Identify short positions by searching for the terms “short” .
- Using word lists from Loughran and McDonald (2011) divide article tone.

# Research Design: Hypothesis

- H1: Investors respond to the disclosure of stock positions by NPAs.

- H2: Investors respond more strongly to tone in SA articles authored by NPAs with stock positions than by those with no stock positions.

# Research Design: Model

- Regression:
  - Regress short-window abnormal returns on NPA position and a series of controls

$$AbRet_{i,[t,t+1]} = a_0 + a_1 Long_{i,t} + a_2 Short_{i,t} + a_3 NegPct_{i,t} + a_4 PosPct_{i,t} + a_5 CogProc_{i,t} + a_6 Numbers_{i,t} + a_7 lWordCount_{i,t} + a_8 ComNegPct_{i,[t,t+1]} + a_9 ComPosPct_{i,[t,t+1]} + a_{10} DJPosPct_{i,t} + a_{11} DJNegPct_{i,t} + a_{12} IDJ_{i,t} + a_{13} Upgrades_{i,t} + a_{14} Downgrades_{i,t} + a_{15} ReviseUps_{i,t} + a_{16} ReviseDowns_{i,t} + a_{17} PosES_{i,t} + a_{18} NegES_{i,t} + a_{19} Guidance_{i,t} + a_{20} PosGuidance_{i,t} + a_{21} NegGuidance_{i,t} + a_{22} Edgar8K_{i,t} + a_{23} Volatility_{i,t} + a_{24} AbRet_{i,[t-60,t-3]} + a_{25} AbRet_{i,t-2} + a_{26} AbRet_{i,t-1} + a_{27} Size + a_{28} BTM_{i,t} + a_{29} InstOwn_{i,t} + a_{30} AnalystFollowers_{i,t-2} + a_{31} SAFollowers_{i,t-1} + \Sigma\gamma Industry_i + \Sigma\delta Year{-}Month + e_{i,t}$$

# Research Design: Model

- Main variables:

| | |
|---|---|
| $AbRet_{i,t}$ | The firm's return measured on day $t$ or over days [$t$ to $t+k$] adjusted by a matching size, market-to-book, and momentum portfolio return over the same period. If the article was published after-hours, on a weekend, or holiday, day $t$ equals the first trading day following the article's release (winsorized). |
| *Position* | Takes value −1 if *Short* exceeds *Long* on a given day, 1 if *Long* exceeds *Short* on a given day, and 0 if *Long* and *Short* both equal 0. On days where *Long* = *Short* and both *Long* and *Short* are nonzero, *Position* is undefined. |
| *Short* | The percentage of articles about firm $i$ on day $t$ in which the nonprofessional analyst (NPA) discloses a short position. |
| *Long* | The percentage of articles about firm $i$ on day $t$ in which the NPA discloses a long position. |
| *NegPct* | The percentage of words for all Seeking Alpha articles on day $t$ that are classified as having negative sentiment using Loughran and McDonald's (2011) dictionary (winsorized). |
| *PosPct* | The percentage of nonnegated words for all Seeking Alpha articles on day $t$ that are classified as having positive sentiment using Loughran and McDonald's (2011) dictionary (winsorized). |

# Research Design: Model

- Part of control variables(Article part):

| | |
|---|---|
| *CogProc* | Count of cognitive processing words, such as "believe," "cause," and "consider" from LIWC, a commonly used psycholinguistic software package. |
| *Numbers* | The number of numbers, either as strings of digits and valid punctuation or written out in letters, divided by the total number of words appearing in SA articles about a firm on a given day (winsorized). |
| *lWordCount* | The natural log of the total number of words appearing in Seeking Alpha articles about a firm on a given day (winsorized). |
| $ComNegPct_{i,t}$ | The percentage of words appearing in comments posted between day $t$ and $t + k$ about the Seeking Alpha article classified as having negative sentiment using Loughran and McDonald's (2011) dictionary. |

# Research Design: Model

- Part of control variables(news part):

| | |
|---|---|
| *DJNegPct* | The percentage of words in all Dow Jones news content published on day *t*, or in the days between article publication and first trading day if different, classified as having negative sentiment using Loughran and McDonald's (2011) dictionary (winsorized). |
| *DJPosPct* | The percentage of nonnegated words in all Dow Jones news content published on day *t*, or in the days between article publication and first trading day if different, classified as having positive sentiment using Loughran and McDonald's (2011) dictionary (winsorized). |
| *IDJ* | An indicator equaling 1 if there is Dow Jones content about the firm published on day *t,* or in the days between article publication and first trading day if different. |

# Research Design: Model

- Part of control variables(firm part):

| | |
|---|---|
| *PosES* | Indicator equaling 1 if the firm announces earnings exceeding the most recent consensus estimate according to IBES between day *t-3* and the later of the article's publication date or first trading day following the article's publication date. |
| *NegES* | Indicator equaling 1 if the firm announces earnings below the most recent consensus estimate, according to IBES, between day *t-3* and the later of the article's publication date or first trading day following the article's publication date |
| *Guidance* | An indicator variable equaling 1 if the firm issues at least one piece of earnings guidance between day *t-3* and the later of the article's publication date or first trading day following the article's publication date. |
| *PosGuidance* | An indicator variable equaling 1 if the firm issues at least one piece of earnings guidance between day *t-3* and the later of the article's publication date or first trading day following the article's publication date that exceeds the prevailing analyst consensus on the forecast date. |

# Empirical Result: Test for H1

- Stock positions convey information about the NPA's overall opinion of the firm and that investors perceive NPAs to be credible.

**Panel A: Test of H1**

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| *Variable* | ALL | ALL | ALL | NO DOW-JONES |
| *Short* | −1.045*** | −1.154*** | −1.158*** | −1.552*** |
| | (−9.12) | (−9.73) | (−9.74) | (−9.55) |
| *Long* | 0.431*** | 0.373*** | 0.371*** | 0.505*** |
| | (11.92) | (11.25) | (11.27) | (9.77) |
| *NegPct* | −16.430*** | −14.452*** | −14.278*** | −15.509*** |
| | (−8.52) | (−7.77) | (−7.92) | (−5.75) |
| *PosPct* | 12.151*** | 11.197*** | 10.944*** | 12.890*** |
| | (6.27) | (5.49) | (5.38) | (4.86) |
| *CogProc* | −1.615*** | −1.575*** | −1.589*** | −1.327** |
| | (−4.07) | (−3.96) | (−4.00) | (−2.24) |
| *Numbers* | 0.542 | 0.398 | 0.377 | 1.121 |
| | (1.42) | (1.01) | (0.97) | (1.51) |

# Empirical Result: Test for H2

- Investors appear to perceive tone by NPAs holding positions to be more credible than those with no position

| | (1) | (2) | (3) | (4) | *Test of Difference* | | | |
|---|---|---|---|---|---|---|---|---|
| *Variable* | *Position = 0* | *\|Position\| = 1* | *Position = −1* | *Position = 1* | 1–2 | 1–3 | 1–4 | 3–4 |
| *NegPct* | −11.696*** | −31.925*** | −19.280* | −19.424*** | 0.00 | 0.24 | 0.04 | 0.99 |
| | (−5.88) | (−9.17) | (−1.77) | (−4.91) | | | | |
| *PosPct* | 8.862*** | 23.300*** | 37.616* | 12.341*** | 0.00 | 0.06 | 0.20 | 0.17 |
| | (4.52) | (5.52) | (1.97) | (3.10) | | | | |
| *CogProc* | −1.346*** | −2.642*** | −1.580 | −2.429*** | 0.16 | 0.91 | 0.19 | 0.78 |
| | (−3.18) | (−2.84) | (−0.49) | (−2.84) | | | | |
| *Numbers* | 0.854* | −0.443 | −4.301 | 0.430 | 0.17 | 0.13 | 0.65 | 0.16 |
| | (1.84) | (−0.57) | (−1.26) | (0.56) | | | | |
| *lWordCount* | 0.066** | 0.081** | −0.385** | 0.185*** | 0.76 | 0.00 | 0.01 | 0.00 |
| | (2.12) | (2.06) | (−2.50) | (4.74) | | | | |

# Robust Test: Contemporaneous events

- Redefine the day 0 return as (closing price – opening price) / opening price (all measured on day 0).

| *Variable* | (1)<br>ALL | (2)<br>ALL | (3)<br>ALL | (4)<br>NO DOW-JONES |
|---|---|---|---|---|
| *Short* | −1.312*** | −1.398*** | −1.403*** | −1.896*** |
| | (−6.86) | (−6.97) | (−6.99) | (−6.46) |
| *Long* | 0.371*** | 0.323*** | 0.321*** | 0.483*** |
| | (6.12) | (5.33) | (5.32) | (4.58) |
| *NegPct* | −7.247* | −6.655* | −6.692* | −15.825** |
| | (−1.87) | (−1.66) | (−1.67) | (−2.51) |
| *PosPct* | 8.585** | 9.181** | 9.147** | 15.420** |
| | (2.31) | (2.46) | (2.44) | (2.49) |
| *CogProc* | −1.721** | −1.472* | −1.471* | −0.005 |
| | (−2.29) | (−1.93) | (−1.93) | (−0.00) |
| *Numbers* | 1.275 | 1.259 | 1.250 | 1.314 |
| | (1.58) | (1.50) | (1.50) | (0.95) |

# Robust Test: First-time vs repeated disclosures

- There is no different between first time and repeated disclosures.

| *Variable* | (1) ALL | (2) NO DJ | (3) NO DJ OR EARN OR EARNINGS SURPRISE | (4) NO POST EVENT |
|---|---|---|---|---|
| *FirstDisc x Short* | −1.314*** | −1.668*** | −1.701*** | −1.445*** |
| | (−5.83) | (−4.50) | (−4.51) | (−4.96) |
| *FirstDisc x Long* | 0.205*** | 0.312*** | 0.296*** | 0.292*** |
| | (3.43) | (3.29) | (3.11) | (3.21) |
| *FirstDisc x NegPct* | −0.604 | −4.345 | −5.827 | 6.092 |
| | (−0.18) | (−0.83) | (−1.14) | (1.18) |
| *FirstDisc x PosPct* | −6.992* | −6.647 | −9.666* | −7.758 |
| | (−1.81) | (−1.17) | (−1.66) | (−1.63) |
| *FirstDisc x CogProc* | 2.925*** | 1.934 | 1.188 | 1.654 |
| | (3.54) | (1.63) | (0.91) | (1.55) |

# Robust Test: Long Run Return

| *Variable* | (1) ALL 60 Days | (4) NO DOW-JONES 60 Days | (6) ALL Day 3–5 | (7) ALL Day 3–10 | (8) ALL Day 3–20 |
|---|---|---|---|---|---|
| *Short* | −2.070*** | −1.942** | −0.001 | −0.001 | −0.005 |
| | (−3.51) | (−2.55) | (−1.37) | (−0.62) | (−1.51) |
| *Long* | −0.282 | −0.192 | 0.000 | 0.001 | 0.001 |
| | (−1.38) | (−0.67) | (0.30) | (1.03) | (0.88) |
| *NegPct* | −4.709 | −20.541 | 0.010 | −0.000 | −0.039 |
| | (−0.52) | (−1.54) | (0.60) | (−0.02) | (−0.95) |
| *PosPct* | 4.049 | 6.293 | 0.014 | 0.006 | −0.017 |
| | (0.43) | (0.44) | (0.78) | (0.20) | (−0.39) |
| *CogProc* | −3.638 | −6.216* | −0.004 | −0.010 | −0.016 |
| | (−1.54) | (−1.87) | (−0.83) | (−1.29) | (−1.23) |
| *Numbers* | 5.239** | 7.356** | 0.006 | 0.010 | 0.028** |
| | (2.19) | (2.10) | (1.64) | (1.28) | (2.39) |