Analyst Forecast Consistency

Gilles HILARY
INSEAD

Charles HSU
HKUST

Motivation

- Researchers have long been interested in how analyst forecasts characteristics affect price formation and analysts' career development.
  - Prior research finds that more accurate analysts have greater ability to move prices (e.g., Park and Stice (2000); Jackson (2005))
  - More accurate analysts are rewarded with greater professional recognition (Stickel (1992)) and better career outcomes (e.g., Hong and Kubik (2003)).
  - The literature commonly uses forecast accuracy (the absolute distance between the forecast and the realized earnings) to assess analysts' performance.

Motivation

- Regulators have been concerned about biases that increase stated forecast error and confuse investors, particularly unsophisticated ones.
  - For example, Jackson (2005) explains the so-called Spitzer view: investors, especially small investors, are unable to de-bias analyst research, and as a result investors are systematically misled by biased forecasts.

Intuition

- Does stated forecast accuracy matter when forecast errors are consistent?
  - Analyst A's forecast errors are always +3 cents.
  - Analyst B's forecast errors are +2 cents half of the time and -2 cents the other half of the time.
  - As long as investors can unravel a systematic bias, they should prefer the forecasts of Analyst A because Analyst A's forecasts are a predictable transformation of realized earnings.

Intuition

- We argue that, if investors are Bayesian, forecast usefulness should be based on the extent to which an analyst delivers consistent forecast errors, as captured by the volatility of unexpected errors.

Predictions

1. Forecasts made by analysts who deliver consistent forecast errors should have a greater effect on prices than those made by analysts who deliver inconsistent forecast errors. (P1)

2. Greater consistency should improve analysts' welfare (Demotion and All-Star status) (P2)
   - If brokerage houses have a demand for analysts that issue informative forecasts, they should seek to retain consistent analysts.
   - If forecasts issued by more consistent analysts are more informative, then those analysts should gain more votes to be All-Star.

Predictions

3. Analysts may induce a downward bias in their forecasts (i.e., "lowball") to improve consistency. (P3)
   - Managers prefer beating analyst earnings forecasts (e.g., Brown and Caylor (2005)).
   - Analysts can curry favor with managers, leading to better access to managerial information (Lim (2001), Libby et al. (2008)).

4. The importance of consistency for the informativeness of a forecast should be increasing in the presence of sophisticated investors. (P4)
   - Sophisticated investors are more likely to identify a consistent forecast bias than naïve investors.

How do we measure consistency?

- Simple model for forecast errors:

$$FE_{i,j,q} = b_{0i,j} + \varepsilon_{i,j,q}$$

  - $FE_{i,j,q}$ is forecast error for firm i, analyst j, and quarter q
  - $b_{0i,j}$ is a systematic bias, assumed constant for each firm-analyst
  - $\varepsilon_{i,j,q}$ is a random error

- More complex model:

$$FE_{i,j,q} = b_{0i,j} + \rho\, FE_{i,j,q-1} + b_m\, Z^m_{i,j,q} + b_n\, Q^n + \varepsilon_{i,j,q}$$

  - $FE_{i,j,q}$ ($FE_{i,j,q-1}$) is the forecast error in the current (previous) quarter. Z^m represents a vector of control variables and Q^n represents indicator variables for the 1st, 2nd, and 3rd quarters of the year.
  - R^2 is largely explained by the firm-analyst fixed effects.

Informativeness tests (P1)

- Cross-sectional regression (one ob per firm-analyst):

$$Beta_{i,j} = \alpha_0 + \alpha_1 Cons_{i,j} + \alpha_2 Accu_{i,j} + \alpha_k X_{ki,j} + e_{i,j}$$

  - *Beta* is the coefficient obtained by regressing abnormal stock returns, *Bhr3d,* on forecast revisions, *Rev*, over all quarters for which analyst i covered firm j.
  - *Cons* is the ranking among analysts based on the standard deviation of forecast errors (or unexpected errors) for a firm.
  - *Accu* is are based on ranking of accuracy among analysts for a given firm.
  - To correct for skewness of *Beta*, we use *SqrBeta*.
  - We adjust standard errors for clustering by firm and analyst.

Informativeness tests

- Panel regression:

$$Bhr3d_{i,j,q} = \beta_0 + \beta_1 Treatment_{i,j,q} + \beta_2 Rev_{i,j,q} + \beta_3 Treatment*Rev_{i,j,q} + \beta_k Xk_{i,j,q} + e_{i,j,q}$$

  - Treatment variables are *Cons* and *Accu.*
  - *Cons* is measured over the previous eight quarters for which analyst i covered firm j.
  - An advantage of the panel specification is that we do not have to estimate *Beta*. One advantage of the pure cross-sectional approach is that it mitigates concerns regarding the effects of serial correlation.

Informativeness tests

- *Horizon:* recency of the forecast
- *Boldness:* distance from consensus
- *Brokersize:* number of analysts employed
- *Experience:* firm-specific experience
- *Breadth:* number of firms covered
- *Cover:* number of analysts covering the firm

Data and sample selection

- Period 1994 – 2006
- I/B/E/S – quarterly actual earnings and analyst forecasts
  - At least 5 analysts covering the firm
  - At least 8 prior quarters experience
  - the last forecast
- Compustat - accounting data
- CRSP daily files - stock price

Table II The Effect of Consistency on Informativeness

Variable	*Beta*	*SqrBeta*
Intercept	-19.69 (-5.33)	-1.58 (-3.95)
Cons	**8.71** **(11.16)**	**0.72** **(8.13)**
Accu	**1.97** **(2.89)**	**0.45** **(5.76)**
Horizon	20.11 (9.96)	2.56 (10.39)
Boldness	-6.27 (-3.28)	-0.54 (-2.29)
BrokerSize	0.70 (2.52)	0.15 (4.09)
Experience	-0.46 (-0.47)	0.15 (1.19)
Breadth	0.63 (0.67)	0.03 (0.28)
Cover	7.43 (6.27)	0.57 (4.65)
N	38,096	38,096
R^2	1.93	1.36

Do Cons and Accu capture the same effect?

- *Cons* and *Accu* are moderately correlated (approximately 0.30). To ensure that we are not measuring the same analyst forecast characteristic twice, we employ several tests.
  - remove forecasts that are both accurate and consistent (the correlation between *Cons* and *Accu* becomes -0.13).
  - orthogonalize *Cons* with respect to *Accu*.
  - partition our sample based on the size of the bias.
    - investors can undo systematic biases more easily when the magnitude of those biases is larger.

Career tests (P2)

For each analyst i and year t,

$$Demo_{i,t+1} = \gamma_0 + \gamma_1 Cons_{i,t} + \gamma_2 Accu_{i,t} + \gamma_k Xk_{i,t}$$

$$AllStar_{i,t+1} = \delta_0 + \delta_1 Cons_{i,t} + \delta_2 Accu_{i,t} + \delta k Xk_{i,t}$$

- *Demo* = 1 if analyst joins a smaller firm.
- *AllStar* = 1 if the analyst is on Institutional Investor magazine's All Star list.
- We include broker and year fixed effects, and adjust standard errors for clustering by broker and year.

Table III The Effect of Consistency and Stated Accuracy on Analyst Welfare

Variable	*Demo*	*AllStar*
Cons	**-0.30** **(-4.24)**	**0.60** **(4.89)**
Accu	**-0.03** **(-0.29)**	**0.54** **(4.03)**
Boldness	-0.13 (-0.48)	-0.35 (-0.95)
Breadth	-0.01 (-2.94)	0.02 (4.74)
Cover	0.14 (2.94)	0.15 (2.36)
Experience	-0.01 (-0.26)	0.42 (5.46)
N	15,561	11,985
Pseudo R^2	7.57	23.18

The Effect of lowballing on consistency (P3)

$$Cons_{i,j,q} = \alpha_0 + \alpha_1 Lowball_{i,t,q} + \alpha_k X^k_{i,j,q} + e_{i,j,q}$$

$$Accu_{i,j,q} = \alpha_0 + \alpha_1 Lowball_{i,t,q} + \alpha_k X^k_{i,j,q} + e_{i,j,q}$$

- *Lowball* is the difference between the number of lowballed and highballed forecasts divided by number of forecasts. We rank all the analysts following the same firm over the previous eight quarters.
- Similar results based on pure cross-sectional regression.

Table IV The Effect of Lowballing on Consistency

Variable	*Cons*	*Accu*
Intercept	0.56 (28.02)	0.77 (54.25)
Lowball	**0.20** **(24.84)**	**-0.11** **(-5.32)**
Horizon	-0.27 (-16.77)	-0.35 (-17.01)
Boldness	-0.25 (-22.61)	-0.30 (-19.90)
BrokerSize	0.03 (6.23)	0.03 (6.51)
Experience	0.04 (5.12)	0.06 (5.98)
Breadth	-0.02 (-2.69)	-0.04 (-5.00)
Cover	-0.01 (-2.66)	-0.01 (-1.72)
N	286,104	286,104
R^2	6.43	4.47

The effect of consistency on informativeness conditional on the level of investor sophistication (P4)

- Prior literature suggests that institutional investors are more sophisticated than retail investors, e.g. Hand (1990) and Boehmer and Kelley (2009).

- To the extent institutional investors are better at unraveling systematic biases, they should value consistency more than individual investors.

Table V The Effect of Consistency on Informativeness Conditional on the Level of Investor Sophistication

Variable	*SqrBeta* Low Inst	*SqrBeta* High Inst
Intercept	-2.23 (-4.38)	-0.80 (-1.43)
Cons	**0.40** **(3.08)**	**1.03** **(7.85)**
Accu	**0.53** **(4.91)**	**0.37** **(3.30)**
Horizon	2.16 (7.17)	3.18 (9.26)
Boldness	-0.44 (-1.42)	-0.62 (-1.87)
BrokerSize	0.15 (3.48)	0.12 (2.51)
Experience	0.13 (0.82)	0.39 (2.19)
Breadth	-0.02 (-0.15)	0.11 (0.66)
Cover	0.83 (5.40)	0.22 (1.21)
N	18,747	18,856
R^2	1.68	1.39

The effect of ownership on lowballing

- Our previous results suggest that:
  - Lowballing increases consistency but decreases stated accuracy (Table IV) → a trade off between *Cons* and *Accu*
  - Institutional investors are more likely to unravel biases and value consistency more (Table V).
- We thus expect that analysts covering firms with more institutional investors are more likely to lowball and are consistent.

Table VI The Effect of Ownership on Lowballing

Variable	*LB*	*StdErr*
Intercept	-0.53 (-7.34)	-2.28 (-12.68)
Inst	**0.39** **(9.87)**	**-0.68** **(-5.24)**
Horizon	-0.10 (-5.24)	0.13 (2.49)
Boldness	-0.10 (-6.21)	0.31 (9.15)
BrokerSize	0.03 (6.30)	-0.01 (-0.56)
Experience	0.02 (2.35)	-0.10 (-3.64)
Breadth	0.02 (2.09)	0.02 (0.48)
Cover	0.10 (4.89)	0.02 (0.36)
Size	0.01 (0.80)	-0.18 (-8.24)
Mkt-to-Book	0.01 (6.31)	-0.15 (-19.32)
Lev	-0.00 (-2.35)	0.10 (14.05)
StdRoa	-0.04 (-6.88)	0.48 (24.53)
N	268,489	268,311
R^2	6.27	38.31

Additional results

- The tendency to lowball and consistency have declined in the post-FD period.
  - Reg FD mandates that all publicly traded companies disclose material information to all investors at the same time.
  - Our results suggest Reg FD curtailed selective disclosure and in turn decreased analyst lowballing activity, which has resulted in less consistent forecasts.

Conclusions

- Consistency is important to investors and analysts
  - Consistency has a capacity to move prices.
  - More consistent analysts are less likely to be demoted and are more likely to be All-Star.
  - The effect of consistency is larger than that of accuracy.
- Analysts lowball to increase their consistency (at the expense of stated accuracy).
- The effect of consistency on informativeness is greater when the proportion of institutional investors is higher.

Contributions

- We provide a potentially more powerful measure of analyst performance for studies that examine forecast informativeness and labor market outcomes.
- Our study sheds light on the causes of downward-biased earnings forecasts, a question of interest to investors and regulators.
- We consider the role of investor sophistication in the trade-off between consistency and stated accuracy.
  - potentially valuable for regulators who wish to understand the trade-offs involved in biased forecasts.

Thank you!