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Optimism pattern of all-star analysts

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ABSTRACT

This paper studies what drives the change in optimism among all-star analysts. Using unique hand collected data for the entire career of all-star analysts, the paper discovers the optimism patterns in their forecasts and recommendations. One the one hand, while analysts tend to issue more optimistic estimate forecasts, they are less likely to issue optimistic recommendations after becoming all-stars. On the other hand, analysts appear to be less optimistic in terms of both estimates and recommendations after being eliminated from the all-star list. The results are significant controlling for forecast accuracy, firm coverage, and job separation effect. This is the first study to look at both the optimism pattern of all-star analysts, and the effect of demotion from all-star team on analyst optimism.

1. Introduction

A number of analyst behavioral studies seek to explain the biased earnings forecasts among analysts (Butler & Lang, 1991; Hilary & Hsu, 2013). Some papers have tied analyst earnings forecasts to their career concerns (Hong, Kubik, & Solomon, 2000; Hong & Kubik, 2003). While many papers find that analysts tend to be optimistic rather than pessimistic, to our knowledge, none of the previous findings have looked at the change of optimism throughout the entire career of an analyst. Provoked by this idea, the focus of the paper shall fall upon the effects of becoming an all-star analyst and being eliminated from all-star analyst list on the optimism changes in estimate forecasts and recommendations.

Institutional Investor has been selecting All-America Research Team annually since 1972. Institutional investors, or the "buy side," such as hedge funds and mutual funds across the US, Europe and Asia, answer a questionnaire created by *Institutional Investor* that covers 8 categories and 65 investment sectors each year. The votes awarded to each analyst are weighted according to the size of the participant's firm and the place it awards each analyst. The company ranking reflects the number of positions its analysts achieved. Although an analyst's compensation and reputation largely depend on the *All-Star* ranking, she needs to balance the interests of the "buy side" with those of the "sell side": institutional investors prefer accurate forecast information, whereas investment bankers care about trading commissions and favorable reports for initial public offerings (Hong & Kubik, 2003).

Previous literatures have mounted on analyst bias, such as issuing overly optimistic recommendations, and the relationship between their forecast accuracy and career concerns. For example, Hong et al. (2000) find that inexperienced analysts are more likely to be terminated for inaccurate earnings forecasts than are their more experienced counterparts; additionally, inexperienced analysts deviate less from consensus forecasts. These findings are broadly consistent with past career concerns that have motivated herding theories. However, these literatures divide analysts into experienced and inexperienced groups first, and then compare the differences between them. None of them study the behavioral change of a single analyst across their career. Scharfstein and Stein (1990), and Zwiebel (1995) suggest that herding among agents should vary with career concerns. And some multi-agent models can produce a link between career concerns and herd behavior, suggesting that an agent's propensity to herd might vary over different stages of their professional life. Hence, it is intuitively reasonable to question the degree of analyst optimism across time, particularly around the stage of all-star.

The hand-collected all-star analyst list contains individuals who were voted on the All-America Research Team between 1998 and 2010. After merging with the detailed data from I/B/E/S and screening with some criteria, the main all-star sample includes 333 distinct analysts. I/B/E/S offers detailed earnings forecast and recommendation histories of each analyst, to whom a specific code has been assigned in the database. Using this I/B/E/S analyst code, this paper is able to track and divide the data into three sub-periods, before becoming all-star analysts (Pre-All-Star), after becoming all-stars (All-Star), and after being eliminated from all-stars (Post-All-Star), respectively. This paper examines the changes in analyst optimism after these two major types of career changes of analysts. In addition, since there are career concerns related

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to analyst forecasts, this paper controls for analyst switching brokerage house and changing the number of firms that they cover after being promoted/demoted. Lastly, we study the impacts of regulations and macroeconomic conditions on analyst forecast optimism.

We find that analysts become more optimistic with respect to estimate forecasts after becoming all-star analysts. This finding is consistent with previous career concerns theory. Hong and Kubik (2003) find that controlling for accuracy, analysts who are optimistic relative to the consensus are more likely to experience favorable job separations (e.g., moving up to a high-status brokerage house). The fact that analysts are less optimistic during their beginning of careers also confirms the finding by Hong et al. (2000) that controlling for accuracy, inexperienced analysts are more likely to be terminated for bold forecasts that deviate from the consensus. In addition, Hilary and Hsu (2013) find that analysts consistently depress their forecasts and benefit from "low-balling"; particularly, they point out that those analysts are more likely to become all-stars, this supports our findings. Examining analysts' recommendations (as opposed to forecasts) suggests that they are less aggressive in terms of promoting stocks.

The demotion effect on estimate forecast is in line with our intuition. Given the reason that analysts would like to be ranked all-stars again in the future, they may have to lower their optimism in forecast in order to improve their accuracy, since forecast accuracy is one of the key factors to select all-star analysts. The paper shows that analysts indeed decrease their optimism in their forecast estimates in order to raise their accuracy. In addition, the paper shows that analysts are less likely to issue optimistic recommendations after being eliminated from all-stars. Clarke, Khorana, Patel, and Rau (2007) find that analysts do not deviate from their previous optimism level after exogenous shocks such as job separation. Hong and Kubik (2003) suggest that analysts are less aggressive in their recommendations once they have been moved up to a higher brokerage house. Overall, this paper controls for changes in firm coverage and job separation, and finds the results are strong both economically and statistically. The title of All-Star influences analyst optimism pointedly.

Although I/B/E/S database does offer analyst consensus of recommendations, we calculate the consensus that excludes an analyst's own estimate/recommendation to measure the optimism level. Therefore, this paper defines that an analyst casts an optimistic forecast/recommendation if her estimate/recommendation is above the consensus of other analysts. Regarding the three sub-periods, we use a three-year time horizon for all the stages. For instance, if an analyst became an all-star for the first time in 2005, then we proceed to study their earnings forecast and recommendations during 2002–2004 (pre) and 2006–2008 (during), respectively. Similarly, the post-all-star stage is three years after the elimination from all-stars. The estimates and recommendations given during the year she became an all-star analyst are excluded. In order to measure forecast accuracy, we adopt the measure that Clement (1999) used in his paper, namely proportional mean absolute forecast error (PMAFE).

With respect to the impacts of regulations on the optimism changes, we study the impact of Global Settlement Initiative and divides the sample into Pre-Global-Settlement-Initiative (Pre-GSI) and Post-Global-Settlement-Initiative (Post-GSI) subperiods, from January 1997 through April 2003, and from May 2003 through December 2011, respectively. As we expect analysts would be less bold to issue optimistic forecasts after the settlement.

As important as regulations, macro economy can influence earnings forecasts as well. Since the market was systemically optimistic during the late 90's, this paper proceeds to exclude tech-bubble period and re-runs the main tests. The refined results remain both qualitatively and quantitatively unchanged.

The main contributions of this paper are as follows. This is the first study that examines the change of an analyst optimism levels in their forecasts and recommendations across her career: instead of studying the qualitative question whether analysts are optimistic, the paper asks when they become optimistic; this paper is the pioneer in studying the effect of being eliminated from all-star analyst list. This approach is different from previous papers that have studied analyst behaviors by groups, and tried to explain forecast optimism by linking optimistic forecasts to banking affiliations, trading incentives, career concerns, and abilities. The fact that analysts are at various optimistic levels at different all-star status can be helpful in analyzing and interpreting earnings forecasts.

The rest of the paper will proceed as follows. Section 2 is a literature review. Section 3 introduces both the hypotheses that the paper will test. Section 4 describes the data and measurements. Section 5 provided the main results and explanations. Section 6 includes some robustness tests. Last but not least, Section 7 will conclude the findings and discuss the potential future research.

2. Related literatures

Inspired by O'Brien (1988)'s examination on analyst forecast accuracy, Butler and Lang (1991) find that analysts are persistently optimistic or pessimistic relative to consensus forecasts. During their four-year sample period (1983–1986), at least 69% of individual analysts' average annual forecast fell above average annual earnings, although there is little evidence of consistent forecast bias over long periods. Their finding supports this paper's result that analysts are not consistently optimistic during their career.

Hong et al. (2000) argue that analysts' herding of earnings forecasts is related to their career concerns. They find that inexperienced analysts deviate less from consensus forecasts, in that inexperienced analysts are more likely to be terminated for inaccurate and bold earnings forecasts than are their more experienced counterparts. Their finding is consistent with existing career concern motivating herding theories.

Scharfstein and Stein (1990) build a model linking herding behavior to reputation concerns. They argue that under certain circumstances, managers simply mimic the investment decisions of other managers, ignoring the substantive private information. Replacing managers with all-star analysts, their finding can contribute to explain why all-star security analysts tend to be systematically optimistic. Zwiebel (1995) also supports this point of view.

Hong and Kubik (2003) conduct research into analysts' career concerns and their biased earnings forecasts. By examining earnings forecasts and job separations, they find that relatively accurate forecasters are more likely to experience favorable career outcomes such as being hired by a high-status brokerage house. Furthermore, brokerage houses do not solely care about accuracy; relatively optimistic analysts are more likely to experience favorable job separations. They suggest that analysts are rewarded for promoting stocks generally and not just for stocks underwritten by brokerage houses. This paper is consistent with their point of view regarding how brokerage houses reward optimistic analysts.

Clement (1999) examines the factors that affect analyst accuracy. He finds that forecast accuracy is positively associated with analysts' experience and employer size, and negatively associated with the number of firms and industries followed by the analyst. We adopt his measure of forecast accuracy as a control variable. Our results are significant both economically and statistically after controlling for forecast accuracy. Also inspired by his finding, we control for number of firms an analyst follows.

Mola and Guidolin (2009) use mutual fund affiliation to explain analyst optimism. Their finding indicates that sell-side analysts are likely to assign frequent and favorable ratings to a stock after the analysts' affiliated mutual funds invest in that stock. And the greater the portfolio weight of a stock in the fund family, the more optimistic the stock ratings from affiliated analysts become. In order to alleviate the concern of analysts' affiliation, we compare test results under different regulation backgrounds. The results remain the same.

Table 1
Summary statistics.
This table contains descriptive statistics for the sample of all-star analysts regarding their estimate forecast and recommendation histories. The sample coverage starts from January 1997 through December 2011. The final sample is merged with both I/B/E/S detailed database and all-star analyst list hand-collected by Jay Ritter, Xiaogui Gao, and Lily Fang.

	Number of analysts (estimate forecast use)	Number of analysts (recommendatin use)
Original hand-collected list	727	727
Available on I/B/E/S and have at least 3-year data for both pre-all-star and post-all-star stages	−394	−394
Merge sample	333	333

Ertimur, Sunder, and Sunder (2007) test whether regulatory reforms commencing in the year 2002 have mitigated the influence of conflicts of interest as reflected in the relation between forecast accuracy and profitability. Mola and Guidolin (2009) also carry out this test and find that analyst optimism on stocks has declined since 2002. We use both regulations and economic conditions as robustness tests.

Hilary and Hsu (2013) show that consistently low-balling analysts are less likely to be demoted and more likely to be nominated all-stars. This paper supports their finding in a way that analysts are somewhat more optimistic in estimates once they are not concerned about getting the all-star title any more.

3. Hypotheses

This section states the two hypotheses that the paper will test in the next sections.

Hypothesis 1. *Relative optimism among analyst forecasts and recommendations will increase after analysts become all-stars.*

Previous literatures have studied the effect of career concerns on analyst forecasts. Specifically speaking, analysts are less likely to generate bold forecasts during the early stages of their career. Hong et al. (2000) find that controlling for forecast accuracy, inexperienced analysts are more likely to be terminated and less likely to be promoted when they make relatively bold forecasts than are their older counterparts. Taken together with past herding theories, which suggest that younger analysts face more career concerns, the paper expects analysts to be more optimistic as they enter the zenith of their career – becoming all-stars.

Secondly, the demotion shock ought to affect the optimistic behavior in issuing earnings forecasts and recommendations. Intuitively, analysts would like to reclaim their title on the all-star list. One of the vital measurements on the *Institutional Investor* questionnaire is forecast accuracy. Concerns about accuracy restrain the freedom of being optimistic. Therefore, our next hypothesis is:

Hypothesis 2. *Relative optimism among analyst forecast and recommendation will decrease after being eliminated from all-stars.*

Recognition as a member on All-American Research Team is likely to move analysts up to a higher-status brokerage house; contrarily, leaving the all-star team may be a signal to the market that a brokerage firm

Table 2
The effect of becoming all-star on forecast optimism
Security analysts with at least three-year data prior to and after becoming all-stars are included in this table that tests the effect of the exogenous shock of being named all-star analysts for the first time on their forecast optimism change. The dependent variable is optimism dummy $Optimism_{i,j,t}$ that is equal to one if the estimate (in Panel A) or recommendation (in Panel B) is above consensus for analyst *i* that follows firm *j* in year *t*, zero otherwise. *All-Star* is equal to one if the estimate (in Panel A) or recommendation (in Panel B) is given during the all-star stage of an analyst's career, zero otherwise. *PMAFE* is the forecast accuracy measure. *Job Separation* is a dummy variable that is equal to one if analysts experience brokerage house change after becoming all-stars, zero otherwise. *Coverage* is a dummy variable that is equal to one if analysts increase the number of the firms they follow after becoming all-stars, zero otherwise. Traditional variables (TV) include firm size, analyst tenure, market condition, firm return in the past 12 months. Panel A reports the estimate forecast test results. Panel B reports the recommendation test results. P-values are in brackets. (*** Significant at 1% level, ** Significant at 5% level, * Significant at 10% level.)

Dependent variable: *Optimism*

Panel A. Logistic result

	1	2	3	4	5
	Optimism	Optimism	Optimism	Optimism	Optimism
All-star	0.45***	0.45***	0.45***	0.44***	0.43***
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
PMAFE		0.00			0.00
		[0.83]			[0.83]
Job separation			2.92***		0.96**
			[0.00]		[0.02]
Coverage				2.94***	2.74***
				[0.00]	[0.00]
Control for traditional variables	Yes	Yes	Yes	Yes	Yes
Observations	62,444	60,752	61,272	62,444	59,630

Dependent variable: *Optimism*

Panel B. Logistic results

	1	2	3	4
	Optimism	Optimism	Optimism	Optimism
All-star	−0.27***	−0.27***	−0.21***	−0.22***
	[0.00]	[0.00]	[0.00]	[0.00]
Job separation		−0.02***		0.08
		[0.68]		[0.26]
Coverage			−0.26***	−0.24***
Control for traditional variables (TV)	Yes	Yes	Yes	Yes
Observations	22,763	21,621	22,763	21,621

Table 3
The effect of getting eliminated from all-star on forecast optimism.
Security analysts with at least three-year data prior to and after becoming all-stars are included in this table that tests the effect of the exogenous shock of getting eliminated from all-star analysts on their forecast optimism change. The dependent variable is optimism dummy $Optimism_{i,j,t}$ that is equal to one if the estimate (in Panel A) or recommendation (in Panel B) is above consensus for analyst *i* that follows firm *j* in year *t*, zero otherwise. *Demotion* is equal to one if the estimate (in Panel A) or recommendation (in Panel B) is given during the post-all-star stage of an analyst's career, zero otherwise. *Job Separation* is a dummy variable that is equal to one if analysts experience brokerage house change after becoming all-stars, zero otherwise. *Coverage* is a dummy variable that is equal to one if analysts increase the number of the firms they follow after becoming all-stars, zero otherwise. Traditional variables (TV) include firm size, analyst tenure, market condition, firm return in the past 12 months. Panel A reports the estimate forecast test results. Panel B reports the recommendation test results. P-values are in brackets. (*** Significant at 1% level, ** Significant at 5% level, * Significant at 10% level.)

Dependent variable: *Optimism*					
Panel A. Logistic results					
	1	2	3	4	5
	Optimism	Optimism	Optimism	Optimism	Optimism
Demotion	−0.31***	−0.31***	−.33***	−0.31***	−0.32***
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
PMAFE		0.00			0.00
		[0.67]			[0.67]
Job separation			2.92***		1.67***
			[0.00]		[0.00]
Coverage				2.94***	2.25***
Control for traditional variables	Yes	Yes	Yes	Yes	Yes
Observations	93,889	91,823	92,951	93,889	90,911

Dependent variable: *Optimism*				
Panel B. Logistic results				
	1	2	3	4
	Optimism	Optimism	Optimism	Optimism
Demotion	−0.21***	−0.17***	−0.16***	−0.15***
	[0.00]	[0.00]	[0.00]	[0.00]
Job separation		−0.23***		−0.09
		[0.00]		[0.15]
Coverage			−0.28***	−0.24***
Control for traditional variables	Yes	Yes	Yes	Yes
Observations	18,649	18,384	18,649	18,384

would be better-off by hiring someone else. Hong and Kubik (2003) argue that favorable job separations (move-up) will likely happen to analysts who are optimistic relative to the consensus, controlling for forecast accuracy. Therefore, we include the effect of job separation.

4. Data and measurements

The data involves two parts. The first part consists of analyst semi-annual detailed forecast histories, including estimates, recommendations, actual values, etc. The data is obtained from the Institutional Brokers Estimate System (I/B/E/S) database. Both the detailed estimates and recommendations start from January 1997, and end in December 2011. The second part is the unique hand collected all-star analyst list from 2000 to 2008 (The data is provided to us by Jay Ritter, Xiaohui Gao and Lily Fang). There are 333 analysts overall in the merged sample.

The all-star analyst list matches each year's all-star analysts' names to their I/B/E/S codes. Each individual has a distinct code in the I/B/E/S database. Using these codes, we were able to successfully track all-star analysts' forecast histories across their careers, and eliminate those analysts who have never been named all-stars during the sample period. The sample is divided into three periods, Pre-All-Star, All-Star, and Post-All-Star. Each period includes a three-year time horizon. The years of becoming and being eliminated from an all-star are excluded for two reasons. On the hand, by the date of announcing All-America Research Team members, analysts may have been working on their next forecast preparation for a while. Hence, they cannot alter their results simply because they become all-stars. On the other hand, the tests involve job separation effect on all-star forecasts. While brokerage houses can expect some analysts to become all-stars in a certain year, they may not hire them immediately after they get promoted. The year becoming all-stars can be noisy due to the lag in hiring process. The same reason applies to the year of being eliminated from all-stars. Both are possibly potential noise for the test results. Therefore, the years of being nominated for all-stars and getting eliminated from the all-star team are excluded.

The stages the paper analyzes are based on a three-year period average. In this way, the tests can avoid the noise caused by the variation in the number of firms an analyst covers each year (some analysts only cover a few stocks, while some cover almost 20 stocks in the same year). This means of division requires extra refinement on analyst selection. For example, some extremely talented security analysts make their way to the top by getting named all-stars within a relatively short of time period after entering their careers. The sample data remove the analysts with less than three-year pre-all-star career stage to ensure the

Table 4
The effect of becoming all-star on forecast optimism–excluding tech-bubble period (April 1997–March 2000).
Security analysts with at least three-year data prior to and after becoming all-stars are included in this table that tests the effect of the exogenous shock of being named all-star analysts for the first time on their forecast optimism change. The dependent variable is optimism dummy $Optimism_{i,j,t}$ that is equal to one if the estimate (in Panel A) or recommendation (in Panel B) is above consensus for analyst *i* that follows firm *j* in year *t*, zero otherwise. *All*-Star is equal to one if the estimate (in Panel A) or recommendation (in Panel B) is given during the all-star stage of an analyst's career, zero otherwise. *PMAFE* is the forecast accuracy measure. *Job Separation* is a dummy variable that is equal to one if analysts experience brokerage house change after becoming all-stars, zero otherwise. *Coverage* is a dummy variable that is equal to one if analysts increase the number of the firms they follow after becoming all-stars, zero otherwise. Traditional variables (TV) include firm size, analyst tenure, market condition, firm return in the past 12 months. Panel A reports the estimate forecast test results. Panel B reports the recommendation test results. P-values are in brackets. (*** Significant at 1% level, ** Significant at 5% level, * Significant at 10% level.)

Dependent variable: *Optimism*					
Panel A. Logistic results					
	1	2	3	4	5
	Optimism	Optimism	Optimism	Optimism	Optimism
All-star	0.60***	0.59***	0.60***	0.58***	0.56***
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
PMAFE		0.00			0.00
		[0.82]			[0.82]
Job separation			2.91***		0.96**
			[0.00]		[0.02]
Coverage				2.91***	2.73***
				[0.00]	[0.00]
Control for traditional variables	Yes	Yes	Yes	Yes	Yes
Observations	54,565	53,171	54,278	54,565	52,887

Dependent variable: *Optimism*				
Panel B. Logistic results				
	1	2	3	4
	Optimism	Optimism	Optimism	Optimism
All-star	−0.28***	−0.28***	−0.20***	−0.21***
	[0.00]	[0.00]	[0.00]	[0.00]
Job separation		−0.16**		−0.05
		[0.03]		[0.53]
Coverage			−0.27***	−0.26***
			[0.00]	[0.00]
Control for traditional variables	Yes	Yes	Yes	Yes
Observations	18,626	17,980	18,626	17,980

Table 5
The effect of getting eliminated from all-star on forecast optimism–excluding tech-bubble period (April 1997–March 2000).
Security analysts with at least three-year data prior to and after becoming all-stars are included in this table that tests the effect of the exogenous shock of getting eliminated from all-star analysts on their forecast optimism change. The dependent variable is optimism dummy $Optimism_{i,j,t}$ that is equal to one if the estimate (in Panel A) or recommendation (in Panel B) is above consensus for analyst *i* that follows firm *j* in year *t*, zero otherwise. *Demotion* is equal to one if the estimate (in Panel A) or recommendation (in Panel B) is given during the post-all-star stage of an analyst's career, zero otherwise. *Job Separation* is a dummy variable that is equal to one if analysts experience brokerage house change after becoming all-stars, zero otherwise. *Coverage* is a dummy variable that is equal to one if analysts increase the number of the firms they follow after becoming all-stars, zero otherwise. Traditional variables (TV) include firm size, analyst tenure, market condition, firm return in the past 12 months. Panel A reports the estimate forecast test results. Panel B reports the recommendation test results. *P*-values are in brackets. (*** Significant at 1% level, ** Significant at 5% level, * Significant at 10% level.)

Dependent variable: *Optimism*					
Panel A. Logistic results					
	1	2	3	4	5
	Optimism	Optimism	Optimism	Optimism	Optimism
Demotion	−0.31***	−0.30***	−0.31***	−0.31***	−0.30***
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
PMAFE		0.00			0.00
		[0.68]			[0.68]
Job separation			2.92***		1.65***
			[0.00]		[0.00]
Coverage				2.94***	2.26***
				[0.00]	[0.00]
Control for traditional variables	Yes	Yes	Yes	Yes	Yes
Observations	91,140	89,170	90,400	91,140	88,451
Dependent variable: *Optimism*					
Panel B. Logistic results					
	1	2	3	4	
	Optimism	Optimism	Optimism	Optimism	
Demotion	−0.22***	−0.18***	−0.16***	−0.15***	
	[0.00]	[0.00]	[0.00]	[0.00]	
Job separation		−0.22***		−0.07	
		[0.00]		[0.27]	
Coverage			−0.29***	−0.26***	
			[0.00]	[0.00]	
Control for traditional variables	Yes	Yes	Yes	Yes	
Observations	17,911	17,682	17,911	17,682	

fairness of the test results. There is one caveat we need to notice. An analyst simply disappearing from the all-star list does not necessarily mean that she was removed from the team. It may be due to retirement. Hence, in order to rule out this possibility, we only select analysts who have a three-year forecast record on I/B/E/S after getting eliminated from all-star team.

The data for robustness tests cover two major events. Global Settlement Initiative started in April 2003. Tech-Bubble period is defined from April 1997 through March 2000. I/B/E/S recommendations have two forms: numeric and texts. While 1 means strong buy, the numbers go all the way up to 5 that matches strong sell. Both I/B/E/S forecast and recommendation histories offer an issuing broker/institution code, Estimator and Estimator ID, respective. Additionally, the all-star analyst list conveniently offers this information as well. We were further able to confirm most of the employers of the analysts at a certain time.

The sample may suffer from the following issue. The all-star analyst list starts from 1998, which is 25 years after the first *Institutional Investor* launched its first All-America Research Team poll. Hence, those analysts who were on the 1998 list might have been named all-stars before as well. To lift this concern, the tests cut off the first and last two years of all-star analyst list. Therefore, the trimmed list starts from 2000 and ends in 2008.

4.1. Absolute forecast accuracy

The measure of forecast accuracy comes from Clement (1999). In his paper, the relative forecast accuracy of forecast *k* analyst *i* issues for firm *j* is:

$$PMAFE = -1 \times \frac{AFE_{i,j,k} - \overline{AFE}}{\overline{AFE}}$$

where *PMAFE* stands for the proportional mean absolute forecast error, $AFE_{i,j,k}$ is the absolute forecast error for earnings forecast *k* that analyst *i* issues for firm j. $\overline{AFE}$ is the mean absolute forecast error of forecasts that are issued for firm *j*. Clement (1999) explains that *PMAFE* controls for firm-year effects by subtracting the mean absolute forecast error from the analyst's absolute forecast error, and that deflating $AFE_{i,j,k} - \overline{AFE}$ by $\overline{AFE}$ reducing heteroskedasticity in forecast error distributions across firms. Taking the negative values ensures that higher values for *PMAFE* correspond to higher levels of accuracy.

Table 6
The effect of becoming all-star on forecast optimism–post-GSI period (May 2003–December 2011).
Security analysts with at least three-year data prior to and after becoming all-stars are included in this table that tests the effect of the exogenous shock of being named all-star analysts for the first time on their forecast optimism change. The dependent variable is optimism dummy $Optimism_{i,j,t}$ that is equal to one if the estimate (in Panel A) or recommendation (in Panel B) is above consensus for analyst *i* that follows firm *j* in year *t*, zero otherwise. *All*-Star is equal to one if the estimate (in Panel A) or recommendation (in Panel B) is given during the all-star stage of an analyst's career, zero otherwise. *PMAFE* is the forecast accuracy measure. *Job Separation* is a dummy variable that is equal to one if analysts experience brokerage house change after becoming all-stars, zero otherwise. *Coverage* is a dummy variable that is equal to one if analysts increase the number of the firms they follow after becoming all-stars, zero otherwise. Traditional variables (TV) include firm size, analyst tenure, market condition, firm return in the past 12 months. Panel A reports the estimate forecast test results. Panel B reports the recommendation test results. P-values are in brackets. (*** Significant at 1% level, ** Significant at 5% level, * Significant at 10% level.)

Dependent variable: *Optimism*					
Panel A. Logistic results					
	1	2	3	4	5
	Optimism	Optimism	Optimism	Optimism	Optimism
All-star	0.42***	0.42***	0.41***	0.34***	0.34***
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
PMAFE		0.00			0.00
		[0.71]			[0.73]
Job separation			4.17***		1.50***
			[0.00]		[0.01]
Coverage				3.50***	3.30***
				[0.00]	[0.00]
Control for traditional variables	Yes	Yes	Yes	Yes	Yes
Observations	35,648	34,774	35,519	35,648	34,645
Dependent variable: *Optimism*					
Panel B. Logistic results					
	1	2	3	4	
	Optimism	Optimism	Optimism	Optimism	
All-star	−0.34***	−0.34***	−0.22***	−0.22***	
	[0.00]	[0.00]	[0.00]	[0.00]	
Job separation		−0.18*		−0.09	
		[0.07]		[0.36]	
Coverage			−0.30***	−0.29***	
			[0.00]	[0.00]	
Control for traditional variables	Yes	Yes	Yes	Yes	
Observations	8950	8822	8950	8822	

4.2. Absolute measure of optimism

Although the I/B/E/S database does not have the direct information about optimism, it is fairly straightforward to construct the relative optimism measurement. The first intuitional idea that might come to our mind is that if an estimate forecast is above the actual value, it is optimistic. However, this is not precise because a pessimistic analyst can still give above-actual-value forecasts. Taken this into account, some previous literatures have agreed and defined that a forecast is considered optimistic if it is above the consensus value (e.g., Hong & Kubik, 2003). This consensus, nevertheless, ought to disregard the analyst's own forecast value, because if the total number of analysts following a certain firm is small, then a highly upward/downward biased estimate forecast can significantly lift/tank the average earning forecast. After calculating the consensus value, the paper generates an optimism dummy variable $Optimism_{i,j,t}$. The dummy is equal to one if the estimate is above consensus for analyst i that follows firm j in year t, zero otherwise.

The same methodology applies to recommendation optimism dummy. For instance, if the consensus for stock j is 2.00 (buy) on average without analyst i's recommendation, then analyst i will be defined optimistic if they issues a strong buy for stock j in year t.

Table 7
The effect of getting eliminated from all-star on forecast optimism–pos-GSI period (May 2003–December 2011).
Security analysts with at least three-year data prior to and after becoming all-stars are included in this table that tests the effect of the exogenous shock of getting eliminated from all-star analysts on their forecast optimism change. The dependent variable is optimism dummy $Optimism_{i,j,t}$ that is equal to one if the estimate (in Panel A) or recommendation (in Panel B) is above consensus for analyst i that follows firm j in year t, zero otherwise. *Demotion* is equal to one if the estimate (in Panel A) or recommendation (in Panel B) is given during the post-all-star stage of an analyst's career, zero otherwise. *Job Separation* is a dummy variable that is equal to one if analysts experience brokerage house change after becoming all-stars, zero otherwise. *Coverage* is a dummy variable that is equal to one if analysts increase the number of the firms they follow after becoming all-stars, zero otherwise. Traditional variables (TV) include firm size, analyst tenure, market condition, firm return in the past 12 months. Panel A reports the estimate forecast test results. Panel B reports the recommendation test results. P-values are in brackets. (*** Significant at 1% level, ** Significant at 5% level, * Significant at 10% level.)

Dependent variable: *Optimism*					
Panel A. Logistic results					
	1	2	3	4	5
	Optimism	Optimism	Optimism	Optimism	Optimism
Demotion	−0.46***	−0.45***	−0.46***	−0.46***	−0.46***
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
PMAFE		0.00			0.00
		[0.96]			[0.96]
Job separation			3.36***		1.91***
			[0.00]		[0.00]
Coverage				3.40***	2.69***
				[0.00]	[0.00]
Control for traditional variables	Yes	Yes	Yes	Yes	Yes
Observations	83,032	81,276	82,371	83,032	80,636

Dependent variable: *Optimism*				
Panel B. Logistic results				
	1	2	3	4
	Optimism	Optimism	Optimism	Optimism
Demotion	−0.22***	−0.17***	−0.15***	−0.14***
	[0.00]	[0.00]	[0.00]	[0.00]
Job separation		−0.24***		−0.10
		[0.00]		[0.14]
Coverage			−0.29***	−0.25***
			[0.00]	[0.00]
Control for traditional variables	Yes	Yes	Yes	Yes
Observations	15,579	15,361	15,579	15,361

5. Main results

Table 1 is the summary statistics of number of analysts for different tests. The original all-star list contains 727 analysts. Since the tests require a three-year horizon for both pre-all-star and post-all-star stages, and we require analyst records are available in both forecast and recommendation histories, 394 analysts from estimate forecast and recommendation samples were deleted from the original data. The final all-star list contains 333 analyst, all of which are available on I/B/E/S.

5.1. Becoming all-stars

Before we start to interpret the regression results, we need to understand the logic behind the empirical setup. Behavioral finance studies tend to focus on one exogenous shock and the consequence. While some argue that the optimism level change, if any, might be affected by traditional factors such as investment banking relation, analyst experience and skills, etc., we would like to study only the variables of interest. Therefore, the regression tables only demonstrate the main variables results (while controlling for the traditional variables).

We start with testing the first hypothesis whether the exogenous shock of becoming an all-star analyst has an impact on analyst optimism on average. The dummy variable *All-Star* is equal to one if the estimate is given during the all-star stage of an analyst's career, zero otherwise. Optimism dummy variable $Optimism_{i,j,t}$ is equal to one if the estimate (in Panel A) or recommendation (in Panel B) is above consensus for analyst i that follows firm j in year t, zero otherwise. Traditional control variables include firm size, analyst tenure, market condition, firm return in the past 12 months. We control for analyst fixed effect and year fixed effect.

$$Optimism_{i,j,t} = \beta_0 + \beta_1 All\text{-}Star + \beta_2 PMAFE + \beta_3 Job\ Separation + \beta_4 Coverage + \beta_4 TV + e_{it} \quad (1)$$

Panel A uses model (1) above to see the all-star effect on estimate optimism. Different from model (2) below, model (1) involves a forecast accuracy control variable *PMAFE* since the estimates are actual numbers, which are subject to errors; contrarily, recommendations (model (2)) excludes this concern. Regressions 1 is a univariate test that answers to our main question regarding becoming an all-star; regressions 2–5 include those major factors that affect analyst optimism from previous literatures. All regressions control for analyst effect. The coefficients of *All-Star* suggest that analysts are more likely to issue optimistic estimate forecasts after becoming all-star analysts, even after controlling for increased firm coverage and job separations. This finding is consistent with previous career concern theory (Hong et al., 2000). Analysts become relatively bold after they become all-stars. Additionally, the coefficient of *Job Separation* supports this point of view. Interestingly, the variable *Coverage* suggests that analysts tend to issue more optimistic forecasts if they become all-stars and increase their firm coverage. This is consistent with previous finding that analysts intentionally "low-ball" in order to become all-stars.

$$Optimism_{i,j,t} = \beta_0 + \beta_1 All\text{-}Star + \beta_2 Job\ Separation + \beta_3 Coverage + \beta_4 TV + e_{it} \quad (2)$$

Panel B uses model (2) to test the all-star effect on analyst recommendations. While analysts are more likely to issue optimistic forecasts after becoming all-stars, their recommendations are significantly less optimistic. Similarity, the coefficients of *Job Separation*, and *Coverage* are all significant and negative. These results imply that analysts are less aggressive with their recommendations after becoming all-stars.

5.2. After getting eliminated from all-stars

The total number of all-star analysts is limited each year. If there are new members joining the team, then there ought to be someone leaving as well. To keep the dynamic equilibrium, some all-star analysts have to be eliminated from the roster after being all-stars for a certain passage of time. The next table will focus on the impact of demotion on estimate forecast and recommendation optimism change.

$$Optimism_{i,j,t} = \beta_0 + \beta_1 Demotion + \beta_2 PMAFE + \beta_3 Job\ Separation + \beta_4 Coverage + \beta_4 TV + e_{it} \quad (3)$$

where *Demotion* is a dummy variable that is equal to one if the estimate is given during the post-all-star stage, zero otherwise. The coefficient on *Demotion* indicates that analysts appear to be less optimistic in their forecasts following a demotion. The coefficients of *Job Separation* and *Coverage* are similar to what we found before. Both switching brokerage house and increasing firm coverage increase analyst forecast optimism. These are consistent with stock promoting hypothesis.

$$Optimism_{i,j,t} = \beta_0 + \beta_1 Demotion + \beta_2 Job\ Separation + \beta_3 Coverage + \beta_4 TV + e_{it} \quad (4)$$

Panel B (recommendations) of Table 3 is the same format as that of Table 2. The demotion effect remains significant. Overall, we are able to draw a conclusion that getting eliminated from all-stars has an influential negative impact on analyst optimism as measured by forecasts or recommendations.

6. Robustness tests

Macroeconomic conditions and market regulations can be some important factors to influence analyst optimism. This section will carry out two tests regarding Tech-Bubble and Global Settlement Initiative, respectively. The Tech-Bubble period is defined from April 1997 to March 2000. Further, the paper divides the sample data into January 1997–April 2003 (Pre-GS) and May 2003–December 2011 (Post-GSI) for the Global Settlement Initiative test.

6.1. Tech-bubble

The Tech-Bubble, or so-called dot-com bubble, started from late 90′s. This paper excludes the period from April 1997 through March 2000, which is the peak of the bubble. The variables of interest remain significant after the exclusion. As a result investor optimism during the bubble period is not driving our results.

Overall, Tables 4 and 5 demonstrate that the main results remain the same both qualitatively and quantitatively after excluding dot-com bubble period. Namely, all-start analysts tend to issue more optimistic forecasts, and are less likely to issue optimistic recommendations. Following demotion former all-stars tend to issue less optimistic forecasts and recommendations.

6.2. Global settlement initiative

Global Settlement Initiative was an enforcement agreement reached on April 28, 2003. The investment firms involved in the settlement had all engaged in actions and practices that had allowed the inappropriate influence of their research analysts by their investment bankers seeking lucrative fees. As a result of the investigation, ten of the nation's top investment firms agreed to pay $1.4 billion. The main interest of the test is to see whether analyst hesitate to issue optimistic forecasts and recommendations under a stringent regulation. This paper expects that GSI weakens the overall optimism among analysts.

Tables 6 and 7 confirms the expected results for the Post-GSI period. As we can see in Tables 6 and 7 the estimated coefficients are lower in magnitude. In general the GSI regulation did seem to achieve its intended consequences.

7. Conclusion

This paper seeks to unveil the optimism trend throughout the entire career of an analyst. While previous studies did not conclude a general trend of analyst optimism given their all-star status, this paper finds that analysts become more likely to give optimistic estimate forecasts after becoming all-stars. This is the first study that tests both the effects of becoming and getting eliminated from all-stars on analyst optimism change.

Linking analyst behavior change to a specific career stage enables us to better interpret their earnings forecasts and recommendations in order to invest accordingly. Some potentially related areas such as why analysts become more optimistic after these events are left for future research.

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