The Influence of Annual Reports' Disclosure Delay on the Analysts' Forecast Behavior: An Empirical Study in China

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Abstract

This paper carries out an empirical study on how annual reports' disclosure delay affects analyst forecast accuracy and optimism, based on 6,523 firm-year observations of 2,287 A-share listed firms in the Chinese stock market between 2016 and 2019. Results show that there is a significant negative correlation between analyst forecast accuracy and annual reports' disclosure delay, which indicates that, affected by the low quality of accounting information in untimely disclosed annual reports, analysts tend to be less accurate in forecasting the performance of companies; moreover, there is a significant positive correlation between analysts' optimism and annual reports disclosure delay, indicating that in order to turn things around, the management of firms that have delayed disclosing their annual reports in the current year will carry out more positive earnings management in the next year, which leads to analysts' optimism about their profitability in the next year. After eliminating the problem of heteroscedasticity and endogeneity, our conclusions remain valid. Our research suggests that investors need to be more cautious about analysts' forecasts on firms with annual reports' delayed disclosure and that analysts should verify the accounting information in belated annual reports through multiple channels and make more conservative estimates.

1. Introduction

Statement No. 4 issued by the Accounting Principles Board (an authoritative body of the American Institute of Certified Public Accountants) in 1970 points out that timeliness is one of the goals of accounting. According to Paragraph 45 of the Conceptual Framework for Financial Reporting by the International Accounting Standards Board, accounting information that is not timely disclosed will lose its relevance. Based on the actual situation in China, the research group studying Qualitative Characteristics of Accounting Information in China in 2006 proposes the

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qualitative characteristics system of accounting information, which likewise emphasizes that timeliness is an important characteristic of accounting information and untimeliness erodes the relevance of accounting information.

With regard to regular financial reports related to accounting information, as the annual report is compiled in a more systematic manner and provides more comprehensive information, it has become the most important source of information for stakeholders and analysts (Chen & Zhou, 2008; Khatun, Naima, Karim, & Alam, 2016). In light of previous research, this paper examines the relationship between annual reports' disclosure delay and analysts' forecast behavior, in hopes of providing direct assistance to investors, analysts, and regulators.

Previous research suggests that annual reports' disclosure delay is often related to poor business performance and out of the necessity to buy time for the management to formulate an appropriate plan to cope with bad news and to manipulate accounting data so as to minimize the negative impacts of bad news (Begley & Fischer, 1998). Hence, annual reports disclosed untimely are often of lower quality (Liu & Zhu, 2008). Moreover, in China, analysts have higher requirements for the quality of accounting information to facilitate forecast

accuracy (Hu, Rao, Chen, & Li, 2003). As discovered by previous research, accounting information of lower quality results in less accurate forecasts (Xiao, Zheng, Li, & Zhu, 2012; Xie, Shi, & Hui, 2018). Therefore, first we speculate that there is a negative correlation between analysts' forecast accuracy and annual reports' disclosure delay (Hypothesis 1).

Besides, Wang, Chen, and Gu (2008) note that firms that have delayed disclosing the annual report of the current year will focus more on positive earnings management in the next year, seeking to turn things around. Hence, analysts are likely to be optimistic about their profitability in the next year. For this reason, we speculate that there is a positive correlation between analysts' optimism and annual reports' disclosure delay (Hypothesis 2).

An empirical study was performed to test the hypotheses, based on the 6,523 firm-year observations of 2,287 A-share listed firms in the Chinese stock market between 2016 and 2019. The results show there is a significant negative correlation between analysts' forecast accuracy and annual reports' disclosure delay, indicating that accounting information in untimely disclosed annual reports is of poorer quality, leading to the lower accuracy of analysts' forecasts, while there is a significant positive correlation between analysts' optimism and annual reports' disclosure delay, indicating that in order to turn things around, the management of firms that have delayed disclosing their annual reports in the current year will carry out more positive earnings management in the next year, which increases analysts' optimism about their level of profitability in the next year.

Analysts' forecast provides an important basis for investment decision-making (Fan & Wang, 2010). Our research shows that analysts are less accurate in forecasting the performance of companies with delayed annual report disclosure and are significantly optimistic, which warns investors to be more cautious about analysts' forecasts on firms with delayed annual report disclosure. Moreover, our research shows that analysts should verify the accounting information in belated annual reports through multiple channels and make more conservative estimates.

The remainder of this paper is organized as follows: the second section provides information on prior research and formulates hypotheses, the third section introduces the model and samples, the fourth section presents empirical results, and the fifth section summarizes, concludes, and highlights the study's contributions.

2. Literature Review and Hypothesis Development

2.1. Annual Reports' Disclosure Delay and Accounting Information Quality

The phenomenon of "good news comes early and bad news arrives late" was first noticed by foreign scholars

(Basu, 1997; Beaver, 1968; Kothari, Shu, & Wysocki, 2009; Kross, 1981). Then, studies on the Chinese stock market have reached the same conclusion: companies with positive performance tend to release their annual reports earlier while those with negative performance tend to delay the disclosure (Chen & Deng, 2004; Haw, Park, Qi, & Wu, 2003; Wu, Huang, & Wu, 2004; Wu, Wang, & Qiao, 2006).

Trueman (1990) notes that, after weighing the quality of earnings, the management of listed firms can influence market reaction by choosing a specific time point for disclosure. In general, in order to release good news to investors, high achievers not only truthfully report the high return rate, but also choose to disclose their annual reports in advance, in the hope of gaining more attention from media and investors as well as producing excess returns (Wang et al., 2008; Wu et al., 2006). On the contrary, when it comes to bad news, the management is inclined to delay its disclosure, so that it can gradually seep into share prices, avoiding the severe blow to corporate shares caused by the sudden disclosure of bad news (Wu et al., 2006; Zhang, 2013). Specifically, over time, as bad news in the industry is disclosed, the market can predict the existence of bad news in firms that have not disclosed their annual reports and react in advance, which helps cushion the blow to corporate share prices caused by the sudden disclosure of annual reports (Wang & Shen, 2014; Wang et al., 2008; Wu et al., 2006).

In particular, through disclosure delay, managers gain time to manipulate accounting information and generate false financial statements (Wang et al., 2008; Xie & Tao, 2017; Zhu & Yang, 2006). Begley and Fischer (1998) suggest that the delayed disclosure of bad news helps the management formulate a plan to cope with bad news and to manipulate accounting data so as to minimize the negative impacts of bad news. Therefore, firms who delay disclosing their annual reports are more likely to perform earnings management and to disclose accounting information of lower quality (Trueman, 1990). Studies on the Chinese stock market also support the conclusion. Liu and Zhu (2008) discover that untimely disclosed annual reports provide accounting information of lower quality. Wang et al. (2008) suggest that for a long time period in the future, the timeliness of annual reports' disclosure can be an indicator of the transparency of accounting information.

2.2. Quality of Accounting Information and Analysts' Forecast

Some empirical studies conducted by foreign researchers reveal that the quality of disclosed accounting information can affect the accuracy of analysts' forecast (Das, Levine, & Sivaramakrishnan, 1998; Eames & Glover, 2003). According to the study of Hu et al. (2003), unlike their foreign counterparts, Chinese analysts use accounting information significantly more often than management

information. That way, the quality of accounting information inevitably has a stronger influence on the forecast accuracy of Chinese analysts.

Fan and Wang (2010) hold that the higher the degree of earnings manipulation, the more difficult it is for analysts to infer the future earnings from the disclosed accounting information. Xiao et al. (2012) note the more accounting information diverges from the actual conditions of firms, the less accurate analysts' forecasts are. Xie et al. (2018) also discover that the lower the quality of disclosed accounting information, the more difficult it is for analysts to make accurate estimates of corporate business performance and financial conditions, which causes greater errors in earnings forecasts.

2.3. Hypothesis Development

According to previous research, untimely disclosed annual reports tend to present accounting information of lower quality and transparency, while analysts' forecast is to a large extent affected by the quality of accounting information disclosed. Therefore, we propose the first hypothesis as following:

H1: The accuracy of analysts' forecasts is negatively correlated with annual reports' disclosure delay.

As noted by previous research, annual reports' disclosure delay is often caused by poor business performance, while in order to turn things around, firms that delay annual reports' disclosure tend to carry out more positive earnings management in the next year (Wang et al., 2008), which may lead to analysts' optimism about their profitability in the next year. Thus, we propose the following hypothesis:

H2: The forecast optimism of analysts is positively correlated with annual reports' disclosure delay.

3. Model and Samples

3.1. The Measurement of Analysts' Forecast Accuracy and Optimism

Inspired by the studies of Ayres, Huang, and Myring (2017); Hong, Zhang, and Su (2013); Li (2020), this paper adopted Formula (1) and Formula (2) to measure the analysts' forecast accuracy (ACC) and optimism (OPT):

$$ACC_{i,t} = (-1) \times \frac{|FORECAST_{i,t} - EPS_{i,t}|}{PRICE_{i,t}} \quad (1)$$

$$OPT_{i,t} = \frac{FORECAST_{i,t} - EPS_{i,t}}{PRICE_{i,t}} \quad (2)$$

In the formula, $FORECAST_{i,t}$ represents the mean of the analysts' estimates of Firm i's earnings per share (Year t), after the annual report (Year$_{t-1}$) of Firm i is disclosed, $EPS_{i,t}$ represents the earnings per share of Firm i in Year t, and $PRICE_{i,t}$ represents the closing price of Firm i in Year t.

3.2. Measurement of Annual Reports' Disclosure Delay

In light of previous research, this paper adopted the method of measuring annual reports (Year$_{t-1}$) delay with the natural logarithm of the number of calendar days between the actual date of disclosure and the last day (December 31) of the t–1 year (Chambers & Penman, 1984; Li & Song, 2010; Zhang & Liu, 2006; Zhu & Yang, 2006).

3.3. Regression Model

The following regression model is constructed to test the hypotheses:

$$\begin{aligned} ACC_{i,t} = {} & \alpha_0 + \alpha_1 DELAY_{i,t-1} + \alpha_2 AdjROE_{i,t} + \alpha_3 LEV_{i,t} \\ & + \alpha_4 LnAGE_{i,t} + \alpha_5 FOLLOW_{i,t} + \alpha_6 LnSIZE_{i,t} \\ & + \alpha_7 LOSS_{i,t} + \alpha_8 MB_{i,t} + \alpha_9 StdROA_{i,t} \\ & + \text{Industry Dummies} + \text{Year Dummies} + \varepsilon_{i,t} \end{aligned}$$

$$\begin{aligned} OPT_{i,t} = {} & \beta_0 + \beta_1 DELAY_{i,t-1} + \beta_2 AdjROE_{i,t} + \beta_3 LEV_{i,t} \\ & + \beta_4 LnAGE_{i,t} + \beta_5 FOLLOW_{i,t} + \beta_6 LnSIZE_{i,t} \\ & + \beta_7 LOSS_{i,t} + \beta_8 MB_{i,t} + \beta_9 StdROA_{i,t} \\ & + \text{Industry Dummies} + \text{Year Dummies} + \varepsilon_{i,t} \end{aligned}$$

Table 1 illustrates the definitions for variables of the model.

According to previous research, AdjROE, LEV, LnAGE, FOLLOW, LnSIZE, LOSS, MB and StdROA can affect the forecast accuracy and optimism of analysts (Ayres et al., 2017; Gu & Wu, 2003; Hong et al., 2013; Li, 2020; Muslu, Mutlu, Radhakrishnan, & Tsang, 2019; Nam, 2019; Oh & Ki, 2020).

3.4. Samples

All data used in this paper come from the CSMAR database. As the Chinese stock market experienced several shocks before 2016, in order to minimize the impacts of abnormal market fluctuations, we studied A-share listed companies in China between 2016 and 2019. After deleting samples with missing values and those of financial enterprises, we finally obtained 6,523 firm-year observations.

4. Empirical Results

4.1. Descriptive Statistics

Table 2 lists the descriptive statistical results of main variables. The mean value of the dependent variable ACC is –0.021, and that of OPT is 0.018. The minimum, maximum, and mean values of the independent variable DELAY are 2.772 (around 16 days), 4.795 (around 121 days), and 4.554 (around 97 days). As required by China Securities Regulatory Commission (CSRC), publicly-listed firms shall release their financial statements before May (within 121 days). However, the mean of DELAY is 4.554, indicating that Chinese listed firms generally release their financial reports at later points of time.

4.2. Univariate Analysis

Table 3 presents the results of univariate correlation analysis between main variables, which reveal a significant

Table 1: Variable Definitions

Variables	Definition
ACC	Analyst forecast accuracy
OPT	Analyst optimism
DELAY	Annual reports disclosure delay
AdjROE	It is measured as the firm's ROE minus the median return on equity over the same period of all firms with the same industry code
LEV	Total liabilities divided by total assets
LnAGE	The natural logarithm of firm age
FOLLOW	It is measured using the natural logarithm of the number of analysts who issue a forecast for firm i for the period ending at t
LnSIZE	The natural log of total assets
LOSS	A dummy variable that takes the value of 1 if a company experienced losses
MB	It is computed as the ratio of the market value of assets divided by the book value of assets
StdROA	Earnings volatility, computed as the standard deviation of previous five years' ROA
Industry Dummies	Industry dummy variables
Year Dummies	Year dummy variables
ε	Error term

Table 2: Descriptive Statistics

Variables	N	Mean	Std	Min	Median	Max
ACC	6,523	–0.021	0.064	–1.878	–0.007	0
OPT	6,523	0.018	0.065	–0.131	0.005	1.878
DELAY	6,523	4.554	0.223	2.772	4.605	4.795
AdjROE	6,523	–0.020	1.238	–66.614	–0.004	43.547
LEV	6,523	0.448	0.199	0.017	0.442	2.578
LnAGE	6,523	2.960	0.278	2.079	2.995	3.970
FOLLOW	6,523	1.766	1.101	0	1.791	4.234
LnSIZE	6,523	22.896	1.282	17.778	22.705	28.636
LOSS	6,523	0.068	0.252	0	0	1
MB	6,523	3.084	6.419	–91.821	2.271	324.118
StdROA	6,523	0.045	0.851	0.000	0.017	48.686

Table 3: Univariate Correlations Among Key Variables

	ACC	OPT	DELAY	AdjROE	LEV	LnAGE	FOLLOW	LnSIZE	LOSS	MB	StdROA
ACC	1.000										
OPT	−0.721 (0.000)	1.000									
DELAY	−0.050 (0.000)	0.062 (0.000)	1.000								
AdjROE	0.299 (0.000)	−0.401 (0.000)	−0.092 (0.000)	1.000							
LEV	−0.202 (0.000)	0.111 (0.000)	0.039 (0.001)	−0.044 (0.000)	1.000						
LnAGE	−0.049 (0.000)	−0.021 (0.081)	−0.036 (0.003)	0.038 (0.001)	0.179 (0.000)	1.000					
FOLLOW	0.175 (0.000)	−0.115 (0.000)	−0.117 (0.000)	0.437 (0.000)	−0.007 (0.528)	−0.071 (0.000)	1.000				
LnSIZE	−0.103 (0.000)	−0.000 (0.950)	0.022 (0.073)	0.115 (0.000)	0.562 (0.000)	0.203 (0.000)	0.287 (0.000)	1.000			
LOSS	−0.349 (0.000)	0.356 (0.000)	0.067 (0.000)	−0.419 (0.000)	0.105 (0.000)	−0.014 (0.235)	−0.181 (0.000)	−0.073 (0.000)	1.000		
MB	0.314 (0.000)	−0.166 (0.000)	−0.029 (0.016)	0.210 (0.000)	−0.270 (0.000)	−0.212 (0.000)	0.126 (0.000)	−0.552 (0.000)	0.021 (0.079)	1.000	
StdROA	−0.220 (0.000)	0.142 (0.000)	0.045 (0.000)	−0.016 (0.180)	−0.147 (0.000)	−0.046 (0.000)	−0.069 (0.000)	−0.209 (0.000)	0.285 (0.000)	0.229 (0.000)	1.000

negative correlation between ACC and DELAY, and a significant positive correlation between OPT and DELAY. The results provide initial support for our hypotheses. Since univariate correlation analysis alone is not sufficient, we will verify the hypotheses with multivariate regression analysis.

4.3. Multivariate Regression Analysis

Table 4 presents the multivariate OLS regression results of Hypothesis 1. The Column 1 of Table 4 reveals a significant negative correlation between ACC and DELAY. The Column 2 of Table 4 shows that after eliminating the problem of heteroscedasticity, the negative correlation between ACC and DELAY remains valid, which indicates that affected by the lower quality of accounting information in untimely disclosed annual reports, analysts are less accurate in forecasting the performance of companies with annual reports' delayed disclosure.

Table 5 lists the multivariate OLS regression results of Hypothesis 2. The Column 1 of Table 5 reveals a significant positive correlation between OPT and DELAY. The Column 2 of Table 5 shows that after eliminating the problem of heteroscedasticity, the positive correlation between OPT and

DELAY remains valid, which indicates that to turn things around, firms that delay in annual reports disclosure tend to carry out more positive earnings management in the next year, leading to the optimism of analysts in their profitability in the next year.

4.4. Endogeneity

The influence of endogeneity on the results is controlled through the use of IndDELAY as the instrumental variable for 2SLS regression. IndDELAY is measured using the natural logarithm of the median of the delay days in annual reports disclosure of other companies in the industry of firm i. The method of using the industry median as an instrumental variable is widely employed in financial and accounting research (Harjoto & Jo, 2015; Larcker & Rusticus, 2010). Previous research suggests that managers are inclined to choose the time point for annual reports disclosure with that of their peers as a reference (Trueman, 1990). Therefore, we speculate there is a positive correlation between DELAY and IndDELAY, while obviously IndDELAY does not influence ACC and OPT directly.

Table 6 displays the results of 2SLS regression. The Column 1 of Table 6 shows that there is a significant

Table 4: Analysts' Forecast Accuracy and Annual Reports' Disclosure Delay

Variables	ACC		ACC	
	Coeff.	*t*-statistics	Coeff.	*t*-statistics
DELAY	−0.006**	−2.290	−0.006***	−2.851
AdjROE	0.002***	4.435	0.002	0.963
LEV	−0.057***	−13.249	−0.057***	−2.997
LnAGE	0.003	1.274	0.003	1.175
FOLLOW	0.002***	3.535	0.002***	3.277
LnSIZE	0.002***	3.869	0.002*	1.869
LOSS	−0.121***	−44.504	−0.121***	−14.830
MB	0.000***	6.483	0.000***	2.650
StdROA	−0.001	−1.636	−0.001	−1.119
Constant	−0.027	−1.249	−0.027	−0.964
Year dummies	YES		YES	
Industry dummies	YES		YES	
Clustered by firm	NO		YES	
R-squared	0.3202		0.3202	
F-test	109.25***		14.60***	
N	6,523		6,523	
VIF	1.02–2.14		1.02–2.14	

Note: ***, **, *Indicate respectively significance at the 1%, 5%, and 10% levels or better.

Table 5: Analysts' Optimism and Annual Reports' Disclosure Delay

Variables	OPT		OPT	
	Coeff.	*t*-statistics	Coeff.	*t*-statistics
DELAY	0.008***	2.831	0.008***	3.480
AdjROE	−0.003***	−4.803	−0.003	−1.047
LEV	0.056***	12.666	0.056***	2.904
LnAGE	−0.005**	−2.020	−0.005*	−1.868
FOLLOW	−0.001*	−1.854	−0.001*	−1.716
LnSIZE	−0.003***	−5.220	−0.003**	−2.555
LOSS	0.125***	45.195	0.125***	15.280
MB	−0.000***	−6.706	−0.000***	−2.671
StdROA	0.001	1.602	0.001	1.189
Constant	0.042*	1.881	0.042	1.453
Year dummies	YES		YES	
Industry dummies	YES		YES	
Clustered by firm	NO		YES	
R-squared	0.3208		0.3208	
F-test	109.54***		12.71***	
N	6,523		6,523	
VIF	1.02–2.14		1.02–2.14	

Note: ***, **, *Indicate respectively significance at the 1%, 5%, and 10% levels or better.

Table 6: Endogeneity—2SLS Regression

Variables	DELAY		ACC		OPT	
	Coeff.	*t*-statistics	Coeff.	*t*-statistics	Coeff.	*t*-statistics
IndDELAY	0.482***	4.879				
Pre-DELAY			−0.109**	−2.042	0.129**	2.309
AdjROE	−0.003	−1.403	0.002***	3.312	−0.002***	−3.468
LEV	0.030*	1.770	−0.047***	−10.020	0.045***	9.137
LnAGE	−0.039***	−3.886	0.000	0.142	−0.002	−0.557
FOLLOW	−0.018***	−6.659	0.000	0.367	0.001	0.896
LnSIZE	0.010***	3.484	0.003***	4.171	−0.005***	−5.483
LOSS	0.014	1.278	−0.121***	−39.011	0.124***	38.579
MB	−0.000	−1.492	0.000***	5.127	−0.000***	−5.119
StdROA	0.000	0.188	−0.001	−1.308	0.001	1.252
Constant	2.248***	4.902	0.423*	1.761	−0.481*	−1.921
Year dummies	YES		YES		YES	
R-squared	0.0244		0.1927		0.1521	
F-test/Wald χ^2	13.56***		2542.63***		2416.68***	
N	6,523		6,523		6,523	
Hausman-test			$\chi^2 = -30.57$ (*P*-value < 0.05)		$\chi^2 = -1070.58$ (*P*-value < 0.05)	

Note: ***, **, *Indicate respectively significance at the 1%, 5%, and 10% levels or better.

correlation between DELAY and IndDELAY. Besides, the statistical value of F in the first stage is 13.56 (>10), demonstrating that IndDELAY is not a weak instrumental variable. In particular, although it is shown by the Hausman test that the multivariate OLS regression results are influenced by endogeneity. Nonetheless, the Column 2 and Column 3 of Table 6 still reveal a significant negative correlation between ACC and pre-DELAY, and significant positive correlation between OPT and pre-DELAY. Therefore, after eliminating the problem of endogeneity, the empirical results still support our hypotheses.

5. Conclusion

Timeliness is an important qualitative characteristic of accounting information, and untimeliness erodes the relevance of accounting information. This paper explores how the delay in the disclosure of annual reports (as the most important accounting information resources for forecasting) influences the forecast accuracy and optimism of analysts.

The 6,523 firm-year observations of 2,287 A-share listed firms in the Chinese stock market between 2016 and 2019 were employed for an empirical study, which obtained results listed below.

First, the forecast accuracy of analysts shows a significant negative correlation with annual reports disclosure delay, which indicates that accounting information in untimely disclosed annual reports is of poorer quality, leading to the lower accuracy of analysts' forecasts.

Second, the optimism of analysts shows a significant positive correlation with annual reports disclosure delay, which indicates that in order to turn things around, firms that delay in annual reports' disclosure tend to carry out more positive earnings management in the next year, which leads to analyst optimism about their profitability in the next year.

Our paper has made several contributions:

First, during the information disclosure of publicly-listed firms, analysts play the significant role of passing on messages to investors and bridging the gap between investors and companies (Fan, 2020; Xie & Tao, 2017). While making investment decisions, investors tend to adopt analysts' forecasts as a reliable reference for the future profitability of their target companies (Fan & Wang, 2010). Hence, inaccurate forecasts will cause investment decisions to deviate significantly from the actual conditions of firms (Fan, 2020). Our research has found that analysts are less accurate yet significantly more optimistic in forecasting the performance of companies with annual reports' delayed disclosure, which warns investors to be more cautious about analyst forecasts on firms with annual reports disclosure delay.

Second, the value of analysts' forecasts to the capital market is determined by the forecast accuracy (Shi, Su, &

Qi, 2007). Our research suggests that analysts should expend more efforts on verifying the authenticity of accounting information and make more conservative estimates.

Third, by studying the influence of annual reports' disclosure delay on the forecast behaviors of analysts, our paper further confirms that firms with annual reports' disclosure delay are more likely to manipulate accounting information, which indicates that regulators should be more strict with the supervising and investigating of those enterprises.

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