

Correlation between Types, Precision and Accuracy of Management Earnings Forecasts

Shanshan Chen*

International Business School Suzhou, Xi'an Jiaotong-liverpool University, Jiangsu, China

*Corresponding author: Shanshan.CHEN19@student.xjtlu.edu.cn

Abstract. This paper examines the impacts of the types and precision of management earnings forecasts (hereafter as MEFs) on the accuracy of MEFs of listed companies in China. The empirical results show that compared with voluntary disclosure, mandatory disclosure has higher accuracy. In addition, the higher the precision of the company's MEFs, the more accurate the information contained in the MEFs, the higher the accuracy of the MEFs. The conclusion of this paper enriches the influencing factors of accuracy of company MEFs, which not only helps investors to make investment decisions, but also provides a theoretical basis for regulatory authorities to formulate regulatory policies.

Keywords: precision of MEFs; accuracy; MEFs; mandatory information disclosure.

1. Introduction

Management earnings forecasts (hereafter as MEFs) is an important part of information disclosure of listed companies and plays a crucial role in the capital market [1]. MEFs provide market participants with information about a company's future performance by disclosing earnings forecasts for the next year or quarter. It is conducive to decrease the information asymmetry between investors and management, release the performance risk in advance, and keep up the stability of the securities market effectively. And it is also beneficial to the protection of the interests of middle and small investors and other information vulnerable groups. As a kind of forward-looking financial information, the reference value of performance forecast largely depends on the accuracy of its forecast [2]. Performance forecast accuracy refers to the degree of deviation of earnings forecast value from actual value. The smaller the deviation, the higher the accuracy [3]. Therefore, the capital market how to predict the accuracy of performance forecast is particularly important.

The Securities and Exchange Commission of the United States established the performance announcement as a voluntary information disclosure system for listed companies in the late 1970s. China's securities and Exchange Commission began to implement performance preview as a mandatory disclosure system in the capital market since 1998 for purpose of enhancing the timeliness of information disclosure of listed enterprises and the transparency of market operation.

In February 2007, China Securities Regulatory Commission (CSRC) stipulated in the Administrative Measures on Information Disclosure of Listed Companies that "if a listed company expects to have a loss or significant change in its business performance, it shall make a performance announcement in time". This is also the first time that the word "performance announcement" appeared in the official documents of CSRC.

The types of performance forecast are not limited to early warning and pre-loss, but also include pre-increase, pre-decrease, continued profit, continued loss, first loss, turnaround and other forms. In this paper, the performance announcement types of "increase", "decrease", "turnaround", "turn loss" and "continued loss" are regarded as the mandatory disclosure of performance announcement, while the performance announcement types of "slightly increase", "slightly decrease" and "continued profit" are regarded as the voluntary disclosure of performance announcement [4]. In addition, the regulatory authorities on the main board of the company's performance forecast disclosure accuracy are not strict requirements.

In view of the influencing factors of performance forecast, the existing literature has studied the influencing factors of performance forecast from three angles. First, at the micro level, the influence

of enterprise's own characteristics on performance forecasting behavior includes management incentive [5], corporate strategy [6], etc. Second, from the perspective of macro environment, political environment uncertainty [7], media attention [8], market competition environment [9], etc. Third, based on the perspective of market supervision, the impact of market supervision intensity on the quality of performance prediction [10].

To sum up, domestic and foreign studies have deeply discussed the factors that affect the accuracy of performance prediction and achieved fruitful results. However, there are few researches on the impact of performance prediction type and performance prediction accuracy on performance prediction accuracy. Therefore, this paper intends to make an attempt in this aspect.

This paper may contain the following contributions: (1) This paper will enrich the related research on the factors affecting the accuracy of MEFs. This paper studies the influence of MEFs' type and precision on MEFs' accuracy, which can enrich the research framework of existing literature and provide empirical evidence for future related research. (2) This paper has certain practical significance for management and investors to judge the accuracy of performance forecast, and has certain reference significance for regulatory departments to make regulatory decisions.

The paper can be organized as follows. Hypothesis Development and Research Design belong to Sections 2 and 3, respectively. On top of that, section 4 is Empirical Results Analysis which is essential part in this paper. And lastly, section 5 is Conclusions.

2. Hypothesis Development

Within the scope of the different profit and loss, the management performance forecast interval exists the amplification effect of asymmetric, under the bad news is negative amplification effect or actual performance tend to forecast range limit, has positive amplification effect under the good news is the lower limit of the actual performance tend to forecast interval, and the difference of information environment will increase to a certain extent different profit and loss under the framework of the amplification effect [11]. Therefore, this paper concluded that the more accurate the performance prediction range, the smaller the impact of amplification effect, and the higher the accuracy of performance prediction.

On account of above analysis, this paper puts forward hypothesis 1:

H1: The higher the accuracy of MEFs, the higher the accuracy of MEFs.

The mandatory disclosure of information emphasizes the relevance of information and the starting point is to protect the interests of middle and small investors. To some extent, voluntary disclosure of performance forecast is a conscious behavior of the management, and more emphasis is on the reliability of information. Therefore, this paper preliminarily believes that voluntary disclosure of performance forecast information is more reliable.

On account of above analysis, this paper puts forward hypothesis 2:

H2: Compared with the performance prediction of mandatory disclosure, the performance prediction of voluntary disclosure is more accurate.

3. Research Design

3.1 Sample Selection and Data Sources

The companies listed in Shanghai and Shenzhen A-shares from 2016 to 2021 in the form of interval forecast made performance forecast are taken as the research sample in this article. The performance forecast sample is based on the company year, that is, each company only retains A forecast value every year, without considering the quarterly performance forecast data. First, considering the particularity of the financial industry and the unique risks of ST company, the listed financial companies and ST and *ST companies are eliminated; Second, for the sake of the rigor of the study, the companies with missing data in the data matching process were eliminated. Finally, 3447 valid samples were obtained in this study.

The performance forecast and annual report data of this article derived from CSMAR database, and the performance forecast disclosure regulations of listed companies come from Juchao Information Network. After obtaining relevant data, all continuous variables are winsorized at 1% and 99% levels.

3.2 Variable Definition

3.2.1 Dependent Variable

MEFs accuracy: Based on the research of Gopal [12], the deviation degree between the earnings forecast value and the actual value in the performance forecast is taken as the measurement index of the performance forecast Accuracy, which is represented by the symbol Accuracy. The lower the Accuracy value, the higher the Accuracy of performance prediction. The calculation formula is as follows:

$$\text{Accuracy} = \text{Abs} \frac{(\text{Forecast accuracy} - \text{Actual accuracy})}{\text{Actual accuracy}} * 100\%$$

3.2.2 Independent Variable

Performance forecast precision: Referring to the research of Wang Hao [13], Precision refers to the size of the closed interval disclosed by a company's performance forecast, which reflects the Precision of the form of performance forecast information and is represented by symbol Precision. The Precision value is inversely proportional to the Precision of performance prediction. The smaller the Precision value is, the higher the Precision of performance prediction is.

$$\text{Precision} = \frac{(\text{MEFs net profit ceiling} - \text{MEFs net profit lower limit})}{\text{abs}(\text{MEFs net profit ceiling} + \text{MEFs net profit lower limit})/2}$$

Voluntariness of MEFs: Considering the mandatory disclosure system of management performance preview, virtual variable force is introduced to measure the method of performance preview disclosure. When the company is forced to disclose performance preview, the variable value is 1, and vice versa is 0. According to relevant policies and regulations and referring to existing research Zhang Shuo et al. [4], if the performance forecast type is "greatly increased", "greatly decreased", "turnaround", "turnaround", "continued loss", the Force value is 1; If the performance forecast type is "slightly increase", "slightly decrease", or "continued profit", the value of Force is 0.

3.2.3 Control Variable

Yuan Zhenchao et al. [14] provides reference for this paper to takes the asset-liability ratio (LEV), return on assets (ROA) and performance announcement type (Positive) as control variables. The variables mentioned in the preceding part are summarized as illustrated in the table below.

Table 1. Variable Definitions

Types of variables	Variable name	Variable meaning	Variable declaration
Dependent variable	Accuracy	Accuracy of performance forecast	$\text{Abs} ((\text{Forecast accuracy} - \text{Actual accuracy})) / (\text{Actual accuracy}) * 100\%$
Independent variable	Precision	Precision of performance forecast	$((\text{MEFs net profit ceiling} - \text{MEFs net profit lower limit})) / (\text{abs}(\text{MEFs net profit ceiling} + \text{MEFs net profit ceiling}) / 2)$
	Force	Willingness to forecast performance	If the performance forecast type is "greatly increased", "greatly decreased", "turnaround", "turnaround", "continued loss", the Force value is 1; If the performance forecast type is "slightly increase", "slightly decrease", or "continued profit", the value of Force is 0.

Control variable	LEV	Asset-liability ratio	Total Liabilities / Total Assets
	ROA	Return on assets	Net Profit / Total Assets
	Positive	Performance announcement type	If the performance prediction type is "greatly increase", "slightly increase", "turnaround", "continued profit", the value of Positive is 1; If the performance announcement type is "major decline", "slight decline", "turn loss", or "continued loss", the value of Positive is 0

3.3 Model Building

For the sake of examining the two hypotheses in the preceding part, the following models is constructed for investigation by referring to the research of Wan Peng and Chen Xiangyu [15]:

Model 1:

$$\text{Accuracy} = \beta_0 + \beta_1 \times \text{Precision} + \beta_2 \times \text{LEV} + \beta_3 \times \text{ROA} + \beta_4 \times \text{Positive} + \varepsilon \quad (1)$$

Model 2:

$$\text{Accuracy} = \beta_0 + \beta_1 \times \text{Force} + \beta_2 \times \text{LEV} + \beta_3 \times \text{ROA} + \beta_4 \times \text{Positive} + \varepsilon \quad (2)$$

4. Empirical Results and Analysis

4.1 Descriptive Statistical Analysis

Table 2. Descriptive Statistics of Variables

Variable	Observations	Min	Max	Mean	Median	Std.Dev
Accuracy	12972	0	2.442	0.157	0.051	0.346
Precision	12972	0	0.300	0.056	0.045	0.049
Force	12972	0	1	0.58	1	0.493
LEV	12972	0.057	0.987	0.420	0.406	0.214
ROA	12972	-0.556	0.217	0.017	0.032	0.106
Positive	12972	0	1	0.64	1	0.480

According to the descriptive statistical analysis, the mean and the median of Accuracy are 15% and 5% respectively, which reflects that the deviation of the predicted net profit of most companies is below the mean value, and the actual information quality is also high. However, the prediction quality of a few companies is low, and the prediction deviation from the actual value is large. The mean value of Precision was 5%, and the median value was 4%, indicating that most companies chose a relatively small range width and a relatively high quality of formal information when forecasting performance. The mean value of the intention to forecast performance is 0.58, indicating that most of the sample enterprises are mandatory disclosure. It can be concluded that the capital composition of the sample companies does not deviate from the optimal form basically according to the mean of LEV of 0.420. The average value of ROA is 0.017, demonstrating that the sample companies are profitable. On the basis of the average value of performance forecast news type of 0.64, it can be inferred that most of the companies in the sample published good news.

4.2 Correlation Analysis

Table 3 lists Pearson/Spearman correlation coefficients for all variables. In light of Table 3, Precision is significantly positively correlated with Accuracy, which preliminarily verified hypothesis H1. On top of that, the correlation coefficients between the respective variables were all less than or much less than 0.6, demonstrating that the possibility of multicollinearity between the respective variables was low.

Table 3. Descriptive Statistics of Variables

		Accuracy	Precision	Force	LEV	ROA	Positive
Accuracy	Pearson correlation	1	0.307**	-0.023**	0.082**	-0.146**	-0.101**
	Sig.		0.000	0.009	0.000	0.000	0.000
Precision	Pearson correlation	0.307**	1	-0.023**	0.053**	-0.113**	-0.251**
	Sig.	0.000		0.009	0.000	0.000	0.000
Force	Pearson correlation	-0.023**	-0.023**	1	0.251**	-0.291**	-0.169**
	Sig.	0.009	0.009		0.000	0.000	0.000
LEV	Pearson correlation	0.082**	0.053**	0.251**	1	-0.373**	-0.143**
	Sig.	0.000	0.000	0.000		0.000	0.000
ROA	Pearson correlation	-0.146**	-0.113**	-0.291**	-0.373**	1	0.506**
	Sig.	0.000	0.000	0.000	0.000		0.000
Positive	Pearson correlation	-0.101**	-0.251**	-0.169**	-0.143**	0.506**	1
	Sig.	0.000	0.000	0.000	0.000	0.000	

**. At the 0.01 level (two-tailed), the association was significant.

4.3 Multivariate Regression Analysis

The regression results of the influence of MEFs precision on MEFs accuracy are shown in Table 4. The regression results indicated that the regression coefficient between MEFs precision and MEFs accuracy is 2.140, which is significant at 1% level. Therefore, it illustrates that there is a significant positive correlation between the MEFs precision and MEFs accuracy, namely the higher the precision of performance prediction, the higher the accuracy of released performance prediction, which verifies the hypothesis of this paper. This means that the closed interval width of the performance announcement becomes smaller, and the information contained in the performance announcement is more accurate, which can improve the accuracy of the performance announcement. Therefore, the regulatory department can formulate and modify the performance forecast supervision policy in order to establish a transparent and open investment environment.

In light of Table 5 show, the regression coefficient between voluntary performance forecasting and accuracy of performance forecasting is -0.056, which is significant at the 1% level. Therefore, the voluntary performance prediction is negatively correlated with the accuracy of performance prediction, which negates H2. This may due to the fact that the voluntary disclosure system of performance previews in China is not mature enough and the disclosure information is not standard, and Trueman [16] believes that the management may be keen to show their talents through voluntary information disclosure. Because the accounting performance of enterprises is often used by investors to judge the competitiveness of the company and the management ability of managers, managers have the incentive to voluntarily disclose good news. However, listed companies may decrease the quality of information disclosure for the purpose of coordinating with earnings management, which has achieved the purpose of improving accounting performance. Therefore, compared with the performance announcement of mandatory disclosure, the performance announcement of voluntary disclosure is less accurate.

Table 4 Regression Results (Precision)

VARIABLES	(1) Accuracy
Precision	2.140*** (35.220)
LEV	0.042*** (2.906)
ROA	-0.398*** (-11.892)
Positive	0.029*** (4.074)
Constant	0.009 (0.972)
Observations	12,972
R-squared	0.109
F	394.6

t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 5 Regression Results (Force)

VARIABLES	(1) Accuracy
Force	-0.056*** (-8.691)
LEV	0.077*** (5.000)
ROA	-0.424*** (-11.947)
Positive	-0.030*** (-4.147)
Constant	0.184*** (21.093)
Observations	12,972
R-squared	0.029
F	96.41

t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

5. Conclusions

Performance announcement system is a significant system to reduce the information asymmetry, enhance the quality of accounting information and maintain the stability of capital market. This paper conducts theoretical analysis and empirical test on the selected research samples, and investigates the correlation among voluntariness, precision and accuracy of the MEFs.

The results are as follows: (1) The higher the MEFs precision, the higher the accuracy of MEFs. That is, the more accurate the performance prediction interval selected by the manager, the higher the

quality of the performance prediction. (2) Compared with the performance prediction of voluntary disclosure, the performance prediction of mandatory disclosure is more accurate.

This paper has the following research significance: (1) Investors can judge the credibility of the MEFs issued by their companies according to the precision of the earnings forecast interval and whether the earnings forecast is mandatory. (2) To provide useful reference for regulatory departments to improve regulatory measures. For the sake of raising the quality and credibility of the market performance forecast and resolving the information asymmetry in the capital market, the relevant regulatory departments can increase the number of companies that need to conduct mandatory performance forecast appropriately.

References

- [1] Healy P. M., Palepu K. G. Information Asymmetry, Corporate Disclosure, and the Capital Markets: A Review of the Empirical Disclosure Literature[J]. *Journal of Accounting and Economics*, 2001,31(1-3):405-4403
- [2] Hirst D E, Koonce L, Venkataraman S. Management Earnings Forecasts: A Review and Framework[J]. *Accounting Horizons*, 2008 (22): 315-338.5
- [3] Chen Xiangyu. Does the Disclosure of Earnings Preannouncement Affect Analyst' s Forecasts. *Journal of Shanxi University of Finance and Economics* (03),102-114. doi:10.13781/j.cnki.1007-9556.2015.03.010.
- [4] Zhang shuo, Zhao shilei, Fu Shaozheng. (2021). Can the Type of Earnings Preannouncement Affect Its Accuracy? Based on Earnings Man-agement Motivation Perspective. *Scientific Decision-Making*, 2021, (07), 91-111.
- [5] Cheng, Q., Luo, T., Yue, H.. Managerial Incentives and Management Forecast Precision. *The Accounting Review*, 2013, 88(5) 1575-1602.
- [6] Wang Yutao, Duan Mengran. Does Business Strategy Impact a Firm's Management Earnings Forecasts? *Management Review*, 2019, (02),200-213. doi:10.14120/j.cnki.cn11-5057/f.2019.02.018.
- [7] Zhou Kaitang, Jiang Shushu, Ma Zhiming. Political Uncertainty and Voluntary Management Earnings Forecasts. *Accounting Research*, 2017, (10),65-70+97.
- [8] Huang Xiaobei, Zheng Jianming. Media Attention, Analysts Coverage, and Irregularities in Management Earnings Forecasts. *International Business*, 2015, (03),141-150. doi:10.13509/j.cnki.ib.2015.03.015.
- [9] Liu Huifen, Wang Hua. Competitive Environment, Uncertainty Policy and Voluntary Disclosure. *Economic Management Journal*, 2015, (11),145-155. doi:10.19616/j.cnki.bmj.2015.11.017.
- [10] Song Yunling, Luo Mei. The Quality of Mandatory Management Earnings Forecasts of Small and Medium Enterprises. *Accounting Research*, 2017, (06),24-30+96.
- [11] Ma Lisha. Does Management Magnify the Interval of Range Earning Forecast. *Chinese Review of Financial Studies*, 2016, (03),40-52+124.
- [12] Gopal V. Krishnan,Mikhail Pevzner & Partha Sengupta.(2012).How do auditors view managers' voluntary disclosure strategy? The effect of earnings guidance on audit fees. *Journal of Accounting and Public Policy*(5). doi:10.1016/j.jaccpubpol.2011.10.009.
- [13] Wang Hao. Does the Implementation of Equity Incentive Plan have effect on Corporate Earnings Forecast and Market Reaction? *Review of Investment Studies*, 2018, (02),87-101.
- [14] Yuan Zhenchao, Yue Heng, Tan Wenfeng. Agency Cost, Ownership Nature and Management Forecast Precision. *Nankai Business Review*, 2014, (03),49-61.
- [15] Wan peng, Chen Xiangyu. Comparability of financial information and Precision of management performance Prediction: Empirical evidence from Chinese A-share listed companies. *Journal of Finance and Economics*, 2018, (12),41-49. doi:10.19622/j.cnki.cn36-1005/f.2018.12.007.
- [16] Tureman, B.,1986, Why do managers voluntarily release earnings forecasts? *Journal of Accounting and Economics*, 8, 53-71.