

# How Inflation Affects the Management Earnings Forecasts

Jingyuan Zou

School of Management, Jinan University, Guangzhou, China

Email: jingyuan\_zou@126.com

**How to cite this paper:** Zou, J.Y. (2019) How Inflation Affects the Management Earnings Forecasts. *American Journal of Industrial and Business Management*, 9, 21-48.

<https://doi.org/10.4236/ajibm.2019.91003>

**Received:** December 10, 2018

**Accepted:** January 4, 2019

**Published:** January 7, 2019

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## Abstract

I use 2005-2017 Shenzhen and Shanghai's A-share listed company's quarterly earnings forecasts data as sample to perform multiple regression analysis. I find that when inflation rate rises, not only management's possibility of making earnings forecasts but also the precision and accuracy of management forecasts declines, *ceteris paribus*. Furthermore, I also find that when inflation rate rises, the state-owned nature of enterprises will aggravate the decline in the precision and accuracy of listed companies' earnings forecasts. In the unique context of semi-mandatory disclosure rules in China, if companies voluntarily disclose more performance-related information, it usually means that the managers are more capable, more confident. Therefore, this voluntary behavior can alleviate the decline in the precision and accuracy of the earnings forecast brought by inflation. Finally, I find that the precision and accuracy of the earnings forecasts will further decline for companies with higher debt ratios, indicating that liabilities may be one of the paths of inflation affecting voluntary information disclosure.

## Keywords

Management Earnings Forecast, Inflation, Voluntary Information Disclosure

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## 1. Introduction

The management earnings forecast is different from the financial report of the listed company. It is a kind of voluntary disclosure information, and it's also an important source of information in the capital market because it not only provides investors with information about the company's future prospects and changes investor expectations [1], but also ultimately influences the trading behavior of investors [2], which attracted great attention from market participants. At the same time, the disclosure of management forecasts does bring many ben-

efits to the enterprise. For example, the company discloses earnings forecast to reduce information asymmetry and cost of capital [3], reduce the risk of litigation [4], improve enterprise management and reputation [5] and affect other market players' decisions, which include leading analysts' forecast adjustments and market investors' expectations [6]. Finally, management forecasts, as a kind of publicly released information, can significantly influence the final market outcome, that is the price of stocks [7].

It is of great practical significance to study the management earnings forecast behavior of listed companies in China.

On the one hand, although the listed corporates disclose management earnings forecast lately in China, it is found that there is a discontinuity in earnings forecast among A-share listed companies by checking our sample data. This discontinuity exists both in different reporting periods for the same year and the same reporting period for different years. Vanke A (stock code: 000002.SZ) is taken as an example. In 2007, the company only released the first quarter's earnings forecast and annual forecast, and the semi-annual's and the first three quarters' forecasts were not released, while the company published management forecasts which have different types of precision in every reporting quarter of 2006. Taking the other situation of the first-quarter reporting period of three consecutive years in 2014-2016, the management forecast was only published in 2015.

On the other hand, China's early performance forecast disclosure requirements are imperfect and frequently changed until 2008. The China Securities Regulatory Commission (CSRC) determined to improve the disclosure of risk level and it authorized the semi-mandatory disclosure requirements. If the listed company meets the rules (which means the company gets loss for the reporting period, turns from loss to profit or its performance change exceeds 50%), the management earnings forecast must be made. And other companies can voluntarily disclose their management earnings forecasts. Even though the listed company must comply with the requirements to make a forecast, the CSRC doesn't stipulate how to disclose a forecast. So the managers have a great choice in the time, the content and the form of the disclosure of the management earnings forecasts. In conclusion, this difference in domestic and international institutional background further demonstrates the value of studying China's management earnings forecast behavior.

Existing researches concentrate more on the factors that influence motivation and performance prediction factors on the corporate level and at the industry level [1] [2] [3] [4] [7] [8]. However, there is little research on the impact of macroeconomic factors on management earnings forecasts from a macro or micro perspective. Among many macroeconomic indicators, inflation is one of the important indicators. Inflation is a significant feature of the modern economy [9], such as February 18, 2016 National Statistics' released data shows that China's 2016 CPI (consumer price index) rose 1.8%, while China's PPI (producer

price index) fell –5.3%, a consecutive 46-month decline, suggesting that industrial production being serious overcapacity.

How the economic impact of inflation is transmitted to the micro level, the theoretical explanation is from the “inflation illusion” hypothesis, first proposed by Modigliani and Cohn [10]. Modigliani and Cohn’s “inflation illusion” hypothesis states that investors do not correctly adjust the company’s growth rate when estimating the stock price. Even if the discount rate is accurately adjusted, the stock price is undervalued. Chordia and Shivakumar also find an important reason for post-earnings-announcement-drift (PEAD) phenomenon is that investors have “inflation illusion” and underestimate the extent to which inflation affects the company’s future earnings [11]. In addition, Basu *et al.* further discover that analysts don’t react correctly to the impact of inflation on the company’s earnings growth due to “inflation illusion” [12]. From an empirical testing view, inflation can predict the error between analyst forecasts and the company’s actual operating profits. Among market participants, existing studies have shown that investors and analysts cannot accurately judge the impact of inflation [10] [11] [12], but few people have an eye on another important market participant’s use of inflation information and their reactions to inflation from an information perspective.

Therefore, my research question in this paper is how the inflation will affect management earnings forecast behavior and whether managers can respond correctly to inflation.

So what effect will inflation put on management’s earnings forecast behavior? I believe that the “inflation illusion” also exists in the company’s managers so that the managers are not able to recognize the inflation impact on the company’s performance exactly, which means they “can’t see clearly” of inflation. The specific reason for “can’t see clearly” is as follows: First, the increase in inflation rate leads to an increase in macroeconomic uncertainty to some extent [13] [14]. Second, the impact of inflation on micro-enterprises is “invisible”, which means this impact is not recognized by market investors. Konchitchki adjusts the accounting statements of US listed companies with inflation rate directly, and then obtains the inflation-affected unrealized profit (IGL) included in the net profit of each company per year [15]. He finds that IGL and the cash flow of future 1 - 4 operating period is positively correlated, but investors in the capital market have not handled this information correctly. Third, the impact of inflation on micro-enterprises’ operational decisions are also “invisible”, which will result in managers “invisibility” about the final company’s operating results. On the one hand, inflation has caused the price of raw materials for commodities to rise [16], which in turn led to an increase in the overall cost of the company. At the same time, the adjustment of product prices in the course of business operation lags behind, that is to say, the revenue growth is relatively slow and the company faces the risk of earnings falling. The extent of the decline cannot be accurately measured. On the other hand, rising inflation has led to an increase in debt [17].

Hence, rising debt and rising nominal interest rates brought by inflation have led to an increase in corporate interest expenses. As a result, rising costs have further affected accounting profits but the direction and the degree of this impact is also unreasonably accurately identified. Finally, due to voluntary information disclosure requiring costs [7], if management's voluntary information disclosure is inaccurate or quite different from actual operating results, the company may face severe penalties from the market. To sum up, when managers "can't tell exactly" the extent of influence of the inflation, they may choose not to publish the performance forecast due to cost factors, that is, the possibility of releasing the performance forecast is reduced (H1). Even if the earnings forecast is issued under the mandatory or voluntary disclosure rules, the precision and accuracy of management earnings forecasts will also decrease (H2 and H3).

This paper investigates the quarterly earnings forecast data of China's Shanghai and Shenzhen A-share listed companies from 2005 to 2017 as a sample to study how the inflation rate will affect the management earnings forecast behavior. The empirical test found that under the same conditions, when the inflation ratio increased, the possibility of the company issuing management earnings forecast decreases, as well as the precision of the management earnings forecast, that is, the hypotheses H1, H2 and H3 are supported. Further research finds that under the background of special ownership in China, state-owned enterprises are even more reluctant to issue earnings forecasts. At the same time, when the inflation rises, the state-owned nature of enterprises will aggravate the decline in the precision and accuracy of listed companies' earnings forecasts. Under the semi-mandatory disclosure rules, if a company voluntarily discloses more performance-related information, it usually means that the management of the managers are more capable, more confident, or have other purposes to achieve. Therefore, this voluntary behavior can alleviate the precision and the accuracy of the earnings forecast brought by inflation. Finally, I divide my sample data into two subsample according to the asset-liability ratio, the precision and accuracy of the earnings forecast will be further reduced when the debt ratio is higher, indicating that the liability may be one of the important path of inflation affecting the voluntary information disclosure behavior.

The main contribution of this paper is: 1) enrich research about management earnings forecast. From the existing literature, few people have studied the impact of macroeconomic factors on management's forecast behavior, and this paper attempts to give an explanation on the management earnings forecast issuing, management earnings forecast characteristics and strategies from this perspective. 2) Enrich inflation-related research. The existing literatures mainly focus on the impact of inflation on the management of enterprise assets, investment and financing, and some believe inflation has predicting function on analysts forecasting error. However, few people have studied how inflation affects corporate management's earnings forecasts, so this essay attempts to expand in this area. 3) Reduce costs of investors and guide investment decisions. It helps

reduce the cost of collecting and understanding information, which helps investors interpret earnings forecasts better and encourages investors to make more rational investment decisions. 4) Improve investors' understanding on how inflation affects at the micro level. Inflation's influence is "invisible". Even if we use price index CPI and PPI to represent inflation at the macro level, the extent of the impact of inflation on corporate performance is still difficult to measure. Through this paper, investors can identify to some extent.

The rest of the paper is arranged as follows: Section 2 is the literature review and research hypothesis; Section 3 is the research design and sample data; Section 4 is the empirical test result and analysis; Section 5 is the further test and the robustness test and the final is the conclusion.

## 2. Literature Review and Research Hypothesis

### 2.1. Research on Management Earnings Forecast

The motivation for management to disclose earnings forecasts mainly includes adjusting expectations [1], avoiding higher litigation costs [4] [8], establishing personal reputation [7], and avoiding individual wealth decline, etc. [18]. Ajinkya and Gift believe that if the managers publish a earnings forecast to adjust market expectations, then the stock price response to good news and bad news should be similar. In fact, the test results support the "adjustment expectations" hypothesis, that is, managers have the motivation to publish forecasting information to reduce information asymmetry. However, voluntary disclosure is costly. Because of the cost of litigation, the companies prefer voluntarily disclose bad news before the earnings announcement so that the amount of compensation can be greatly reduced [4] [8]. From the perspective of management's personal self-interest, managers can build a good reputation by voluntarily disclosing earnings forecasts [7]. Under the equity incentive conditions, managers have a strong motive to guide the stock price to avoid personal wealth shrinking [19]. A feasible way is to publish a more precise good news forecast or fuzzy bad news forecast before selling the stock and issue a precise bad news or vague good news before buying stocks [18].

There are many factors that affect management's earnings forecast. Dempsey believes that when listed companies are large-scaled [20], they will attract more investors or securities institutions, and the potential benefits from releasing information will be less. So they are not willing to make performance disclosures proactively. Ajinkya and Bhojraj *et al.* find that institutional investors will require the company to disclose more performance-related information in order to grasp the company's operating conditions better [21]. Feng and Koch find that the historical accuracy of management forecasts will further influence the management's decision to release earnings forecasts in the current period [22]. The worse the accuracy of previous forecast is, the less the company's willing of issuing a forecast, the frequency and the accuracy of an earnings forecast. In addition, managers' personal characteristics can also affect the company's voluntary

disclosure behavior. Gilles and Hsu find that if the CEO continuously predicts accurately [23], he will gradually overestimate his ability and ignore the influence of other factors and hence cause the prediction accuracy to decline. Hribar and Yang [24] also stand by this view.

## 2.2. Research on Inflation and Inflation Illusion

In capital market, Modigliani and Cohn first proposed the “inflation illusion” hypothesis [10]. They find that the stock value in the capital market is undervalued in the period of high inflation, while the stock value is high in the period of low inflation. The fundamental reason is that investors adjust real interest rates but do not adjust the company’s earnings growth. Ritter and Warr provide a theoretical explanation for “inflation illusion” hypothesis, that is, the rising inflation will lead to rise in nominal interest rates and lead to capital outflow of capital markets [25], which means the relationship change between funds supply and demand finally results in a decline in stock market returns. Chordia and Shivakumar find that an important reason for the post-earnings-announcement-drift (PEAD) phenomenon is that investors underestimate the impact of inflation on the company’s future earnings [11]. And Basu *et al.* further find that analysts fail to react to the company’s earnings growth caused by inflation correctly [12], therefore the expected inflation rate can predict the analyst’s forecast error, and the analyst’s system prediction error is related to the company’s future returns. All of these illustrate the “invisible nature” of inflation.

At the micro level, inflation has a characteristic of “invisibility”. First, Konchitchki recalculates the performances in accounting statements of US listed companies and obtains unrealized profits (IGL) which contain inflation [15]. He finds that IGL is positively related to the operating cash flow of the next 1 - 4 period, while the capital market investors do not handle this information correctly. Second, researchers have found that debt is an important path for inflation to affect micro-enterprises. Li Qingyuan *et al.* find that the expected inflation rate lowers the real interest rate while increasing the bank debt level [26]. Meanwhile state-owned enterprises are more likely to obtain loans than non-state-owned enterprises when the expected inflation rate rises. The rise in inflation not only affects the capital structure of enterprises, but also encourages micro-enterprises to increase the size of current capital expenditures and reduce investment efficiency. For banks are more willing to lend to enterprises when inflation is expected to rise, so high-growth enterprises will be more likely to obtain loans and increase investment [27]. Luo Yonggen and Rao Pingui find that “inflation illusion” hypothesis is able to be applied to explain the phenomenon of undervaluing the stock value from the perspective of debt financing [17]. That is to say, higher inflation will lead to rising debt, and this debt increases will lead to increased business risk, even reduce stock value in the long run. Finally, inflation also affects management’s operational decisions from the perspective of inventory holdings and cash holdings [16] [28].

Summarizing the literature above, we can find that scholars pay less attention to macro factors in the research of management earnings forecast on the one hand, on the other hand, although the “inflation illusion” hypothesis explains to some extent the reasons for the stock price being miscalculated, market anomalies, and the impact of micro-enterprise investment decisions, but macro factors such as how inflation affects management earnings forecasts are not clear enough.

### 2.3. Hypothesis Development

First, the rise in inflation, to some extent, lead to an increase in macroeconomic uncertainty [13] [14]. Lin argues that higher inflation rates will lead to non-efficient macroeconomic operations [13], rising unemployment rate and the decline in industrial investment so that will reduce economic growth.

Second, the impact of inflation on micro-enterprises is “invisible”, and this “invisibility” has not been recognized by market investors. Konchitchki adjusts the performances in accounting statements of listed companies in the United States with inflation rate directly [15], and then obtained the inflation-affected unrealized profit (IGL) which is included in the net profit of each company per year. He finds IGL and the operating cash flow of future 1 - 4 reporting period is positively correlated. However, investors in the capital market did not correctly process this information.

Third, the impact of inflation on micro-enterprise operational decisions is also “invisible”, which will result in managers “invisibly” recognizing the final company’s operating results. On the one hand, inflation causes the price of raw materials for commodities to rise [16]. The overall cost of enterprises rises. However, managers’ adjustment of product prices lag behind, consequently, not only revenue growth is relatively slower than the rise of cost but the matching degree of income to cost also declines. As a result, the company will be confronted with a risk of a decline in earnings. Because of the “invisibility” of inflation, the extent of this decline cannot be accurately measured, that is, the managers can’t clearly discern the possibility and extent of this decline in business performance. On the other hand, debt is an important path for inflation to affect business performance. Rao Pingui and Luo Yonggen find that rising inflation will lead to an increase in corporate debt [17]. And then, rising debt and rising nominal interest rate will further increase the interest expenses which has a strong impact on accounting profits [29]. The direction and extent of this impact is also unclearly accurately identified, that is, managers “can’t see clearly” the influences of the increase in liabilities and the rise in interest rates to business performance.

Finally, the voluntary disclosure of information required cost [7]. Managers could face severe penalties from the market if a voluntary disclosure offers inaccurate information or has a great difference with the actual performance of operations, and therefore the will of the managers releasing a management earnings forecast may be reduced. Based on the analysis above, the hypothesis H1 is

proposed.

H1: As inflation rate rise, managers are less likely to announce earnings forecasts, *ceteris paribus*.

Further, when the manager makes a more precise earnings forecast (often means that the forecast has a narrower width), the probability that the actual profit of the enterprise will eventually fall outside the interval is greater. A study by Kim and Verrecchia and Subramanyam find that the market participants respond to management earnings forecasts [30] [31], and the more precise the predictions are, the stronger the response is [4]. The market will impose penalties on companies when the actual EPS fall outside the predicted range (the market investors believe that a narrower prediction is more precise and always more informative while the possibility of actual EPS falling outside the predicted range raises), especially when the company miss their predictions. When inflation rate rises, managers feel inflation “invisible” and are not able to discern the impact of inflation both on the macro level and micro level. Hence, managers have a strong motivation to prevent precise earnings forecasts in case of a strong market negative reaction. Therefore, the precision of the earnings forecast issued by the managers may be degraded. Based on the above analysis, the hypothesis H2 is proposed.

H2: As the inflation rate rises, the precision of management forecast is declining, *ceteris paribus*.

Finally, Chordia and Shivakumar find that investors underestimate the quarterly unanticipated earnings because they could not understand the impact of inflation on stock prices [11], so an important reason for the post-earnings-announcement-drift (PEAD) is inflation. From the empirical research perspective, they rank the company’s standardized unexpected earnings (SUE) in ascending order and divide the sample into 10 groups, and find the SUE’s inflation rate sensitivity of each group monotonously increase. At the same time, they find that using lagged inflation rate can predict future earnings growth, abnormal returns, and earnings announcement returns of SUE-sorted stocks. Basu *et al.* find that “invisible” inflation has effect on analysts, too [12]. They prove that the expected inflation rate can be used to predict the analyst’s forecast error, and the analyst’s system forecast error is related to the company’s future return because analysts fail to respond correctly to inflation. Now that the managers can’t see the impact of inflation on business performance clearly and fail to respond accurately, the accuracy of the management earnings forecasts will also decline. In general, the accuracy of management earnings forecast is proxied by the absolute value of the error between the earnings forecast and the actual earnings in financial reports. Therefore, the error can also be predicted by lagged inflation. If grouping is performed using the absolute value of the error, the sensitivity of each group of errors to inflation may also increase monotonously. Based on the above analysis, the hypothesis H3 is proposed.

H3: As the inflation rate rises, the accuracy of management forecast will decrease, that is, the absolute value of the forecast error increases, *ceteris paribus*.



### 3. Research Design and Sample Data

#### 3.1. Variable Definition

##### 1) The Dependent Variables

a) Management earnings forecast possibility (Issue): define herein that listed companies release results notice published at least once before the date of the periodic reports take 1, and 0 otherwise.

##### b) Precision of management earnings forecast (Precision)

Because the precision of earnings forecast can be divided into 4 categories: only a qualitative forecast (gain or loss) is announced without particular numbers, only the minimum or maximum profit is announced, the profit range is announced, and the point value is announced. The precision of these four types of earnings forecasts is gradually increasing. Therefore, this article defines that if the earnings forecast issued by a listed company has only a qualitative judgment of profit or loss, it will take 0, and the other 3 categories will take 1.

##### c) Earnings forecast accuracy

This article defines the accuracy of earnings forecasts in two ways. Drawing on the definition of Cheng Qiang *et al.* [18], this paper first uses the absolute value of the earnings forecast error as the proxy variable for the accuracy of the earnings forecast. The calculation is as follows:

$$\text{Accuracy} = \left| \frac{(\text{the lower forecast EPS} + \text{the upper forecast EPS}) \times 0.5 - \text{actual EPS}}{\text{stock price of 2 days before forecast date}} \right|$$

Particularly,

$$\text{The Lower (Upper) Forecast EPS} = \frac{\text{the lower (upper) forecast EPS}}{\text{total shares outstanding}};$$

$$\text{Actual EPS} = \frac{\text{net profit attributed to parent company}}{\text{total shares outstanding}}$$

Secondly, according to the information disclosure rule: when the earnings forecasts bias exceeds 10% of actual EPS, it can be defined there is a large bias of management earnings forecasts. So under this context, I define Bigbias as another proxy for forecast accuracy. Then earnings forecasts bias is calculated as follows:

$$\text{Bias} = \left| \frac{(\text{the lower forecast EPS} + \text{the upper forecast EPS}) \times 0.5 - \text{actual EPS}}{\text{actual EPS}} \right|$$

Thus, when Bias is bigger than 10%, Bigbias takes 1, and 0 otherwise.

##### 2) The Independent Variable (Inf)

This article draws on Rao Pingui and Luo Yonggen [17] to obtain the monthly CPI ring data of the province from the website of the National Bureau of Statistics, and obtain the quarterly CPI by means of monthly multiplication, and then calculate it by  $\text{Inf} = (\text{CPI}_q - \text{CPI}_{q-1}) / \text{CPI}_{q-1}$ . The quarterly inflation data (Inf) is taken as a lag.

In addition, in order to more accurately reflect the impact of inflation on management earnings forecast behavior, I add a series of control variables. The

company's own operating factors such as: total asset size (Size), listing period (Age), asset-liability ratio (Lev); profitability variable: total return on assets (Roa), whether the operating net cash flow is negative (Loss), book-to-market-value ratio (BTM); Corporate governance factors: property rights (Soe), shareholding ratio of the top five shareholders (Her5), current issue (Offer); external governance variables: institutional shareholding ratio (Inst), analyst tracking number (Lna-analyst); macro level factor: nominal GDP growth rate (Gdp\_g).

Furthermore, I also control the interval between the release date of the management forecast and the actual earnings announcement (Horizon) in the robustness test and whether it is a good news forecast (News) in additional research. I define the forecast type "pre-increasing, turning losses, slightly and continued earnings growth" as a good news, so the variable takes 1, defines "continued losses, the first loss, pre-cut and slightly reduced uncertainty" for the bad news, take the 0 variable.

### 3.2. Empirical Model

This paper draws on the research methods of Hribar and Yang [24] to establish a regression model.

$$\text{logit/reg}(\text{Dependent Variable}_q) = \alpha_q + \beta \times \text{Inf}_{q-1} + \sum \gamma_i \times \text{Control Variable}_{q-1} + \sum \text{Year} + \sum \text{Quarter} + \sum \text{Industry} + \varepsilon_q \quad (1)$$

Among them,  $\text{Inf}_{q-1}$  is the explanatory variable inflation rate, the inflation rate is lagging one period, Control Variable are the control variables and both are lagging one period, and Year, Quarter, and Industry respectively control the year, quarter and industry effect, using clustering robust standard errors to test. In order to test hypothesis H1, the dependent variable is Issue with logit regression used and  $\beta < 0$  is expected; to test hypothesis H2, the explained variable is Precision, and  $\beta < 0$  is expected; as for H3, the dependent variables are Accuracy and Bigbias, both OLS and logit regression were used, respectively, with  $\beta > 0$  expected.

### 3.3. Sample Data

The research object of this paper is the A-share listed companies of China Shanghai and Shenzhen Stock Exchanges from 2005 to 2017. All data are taken from the consolidated statements. Among them, the management forecast data and GDP growth rate data are from the WIND database, monthly provincial CPI data are from the website of the National Bureau of Statistics, and the financial data from the CSMAR database. Except that manufacturing enterprises keep two codes, the other industries keep one code according to the industry standard of the CSRC in 2012. In order to ensure the reliability of the research data, this paper has made a certain screening of the sample data: 1) due to the different motivation between the revision of forecasts and the first forecast, I only keep the first forecasts; 2) exclude financial and insurance companies because their busi-

ness mode and financial status are quite different from those of other industries; 3) exclude the sample observations with missing total assets; 4) exclude observations with asset-liability ratio greater than 1; 5) exclude other data incomplete sample observations. After screening, the sample observations of 93,591 unbalanced panels are finally obtained. In order to avoid the influence of extreme values on the stability of regression test results, the sample data of all continuous variables are bilaterally winsorized at the 1% level.

## 4. Empirical Test Results and Analysis

### 4.1. Descriptive Statistics

**Table 1** presents descriptive statistics for each variable.

In terms of the dependent variables, the mean value of Issue is 0.508, and the standard deviation of the ladder is 0.500, indicating that the proportion of willingness to issue performance forecasts is just over 50% in the context of China's current semi-mandatory disclosure rules. And at the same time, the proportion

**Table 1.** Descriptive statistics of management forecasts.

Variable	N	Mean	Sd	Min	P50	Max
Issue	93,591	0.508	0.500	0	1	1
Precision	47,562	0.890	0.313	0	1	1
Precision1	47,562	2.787	0.739	1	3	4
Accuracy	35,540	0.0024	0.0063	0.0000	0.0006	0.0521
Bigbias	38,902	0.345	0.475	0	0	1
Horizon	47,557	4.017	0.899	1.609	4.190	5.215
News	47,562	0.620	0.485	0	1	1
Voluntary	47,562	0.356	0.479	0	0	1
Inf_q	93,591	0.0067	0.0134	-0.0335	0.0069	0.0690
Size	93,591	21.774	1.271	18.932	21.612	26.542
Age	93,591	2.059	0.791	0	2.303	3.219
Lev	93,591	0.452	0.213	0.0509	0.459	1.000
Roa	93,591	0.026	0.040	-0.132	0.019	0.172
Loss	93,591	0.377	0.485	0	0	1
BTM	93,591	0.933	0.894	0.084	0.648	6.033
Offer	93,591	0.0295	0.169	0	0	1
Soe	93,591	0.492	0.500	0	0	1
Her5	93,591	0.536	0.156	0.189	0.542	0.891
Inst	93,591	0.042	0.049	0	0.025	0.231
Lnanalyst	93,591	1.408	1.139	0	1.386	3.664
Gdp_g	93,591	0.103	0.029	-0.081	0.100	0.251

of observations that are willing to release management earnings forecasts has improved with the gradual improvement of China's disclosure rules in an untabulate table (2007 total observations of 4803), of which 1834 observations are issued, accounting for 38.18%, while the number of observations is 10,454 in 2017 and the number of observations for the management forecasts is 6537, accounting for 62.53%. The Precision mean is 0.890, and the standard deviation is 0.313, which indicates that in the sub-samples that issued the management earnings forecast, the proportion of observations that issued quantitative forecasts reached 89%, which is in line with previous studies, that is, quantitative prediction has higher information and, management is more likely to issue quantitative forecasts to convey information to the market in the process of gradual improvement of disclosure system. The minimum Accuracy is 0 and the maximum is 0.0521, while the average is 0.0024 and the standard deviation is 0.0063. Besides, the average value of Bigbias is 0.345, the standard deviation is 0.475, indicating that the proportion of errors in the sub-samples that issued the performance forecast exceeds 10% is about 34.5%.

In terms of explanatory variable, the inflation rate (Inf) is calculated by the provincial CPI. The minimum value is  $-0.0335$ , the maximum value is 0.069, the average value is 0.0067, and the standard deviation is 0.0134, indicating that the difference of provinces in the sample interval years is not obvious.

In terms of the explanatory variables, inflation (Inf) uses a chain provincial CPI calculated minimum value is  $-0.0335$  and the maximum is 0.069, an average of 67,000, standard deviation of 0.0134, indicating that in the sample interval of each year The difference in inflation rates in the provinces is not obvious.

As for control variables, Horizon is the natural logarithm of the number of days between the management forecast date and the actual performance announcement date. The minimum value is 1.609 which means the corresponding number of days is 4.96 days and the maximum value is 5.215, that is 183.91 days. The average is 4.017 and the corresponding number of days is approximately 55 days. In addition, taking China's special semi-mandatory disclosure rules into account, this paper further discards whether it is voluntary disclosure in the sub-samples of the disclosed earnings forecast. If it meets the requirements for mandatory information disclosure, it will take 0, and the rest will take 1. From the descriptive statistics, the average value of Voluntary is 0.356, that is, voluntary disclosure of earnings forecast accounts for 35.6% of the issuing sample. This indicates that managers of listed companies in China are still driven by mandatory disclosure requirements and their willingness to disclose voluntarily needs to be promoted. Descriptive statistics of other control variables such as Size, Age, Lev, Roa, Loss, BTM, Offer, Soe, Her5 are basically consistent with existing literature [26] [32] [33].

Furthermore, **Table 2** is a distribution summary of management forecasts precision which includes 4-type: qualitative, open range, closed range and point. Panel A is a distribution that summarizes the annual precision of management

**Table 2.** Distribution of management forecast precision. (a) Panel A summary of annual management forecast precision type; (b) Panel B summary of quarterly management forecast precision.

(a)					
Year	1 = Qualitative	2 = Open range	3 = Closed range	4 = Point	Total
2005	557	479	144	105	1285
2006	489	450	269	193	1401
2007	403	633	547	251	1834
2008	316	523	822	322	1983
2009	382	321	1185	418	2306
2010	364	302	1458	377	2501
2011	300	244	2207	329	3080
2012	308	159	3679	322	4468
2013	376	86	4566	282	5310
2014	382	63	4699	301	5445
2015	445	61	4836	280	5622
2016	458	47	5001	284	5790
2017	459	44	5746	288	6537
Total	5239	3412	35159	3752	47,562

  

(b)					
Quarter	1 = Qualitative	2 = Open range	3 = Closed range	4 = Point	Total
First Quarter	182	395	5658	693	6928
Semi-annual	1508	992	9216	1011	12,727
Third Quarter	1573	734	9311	818	12,436
Annual	1976	1291	10974	1230	15,471
Total	5239	3412	35159	3752	47,562

earnings forecasts. Compare in vertical perspective, there are only 1285 observations in 2005, and the number increases 4.08 times to 6537 by 2017. Thanks to the improvement of China's information disclosure system. On the one hand, in the early days, only the semi-annual and the annual report were required for the announcement of the periodic results. Therefore, in the early stage of the lack of the first- and third-quarter results announcements, the number of earnings forecasts was even less. On the other hand, the CSRC increased the semi-mandatory disclosure rules management earnings forecast in order to fully remind investment risk, which led to a significant increase in the number of observations. In 2005, the number of observations for the release of less accurate earnings forecasts (including qualitative and open range predictions) was 1036, accounting for 80% of the total. In 2017, the number of observations for the release of less accurate performance forecasts (qualitative notices and open interval forecasts) was only 503, which was less than half of the number of fuzzy forecast observa-

tions in 2005. At the same time, the number of more precise management forecasts (including closed range and point forecasts) was 6.034, accounting for 92.3% of the total number in 2017. This trend of change is consistent with the study of predictive motives in the aforementioned literature. Panel B is a distribution of management forecast precision based on quarterly summary. Similar to Panel A, the closed range forecast still accounts for the highest (the number is 35,159 and 73.65%) of the total 47,562 observations. In addition, the number of management forecasts in the first quarter is significantly less than the other three quarters, and the distribution of observations in other quarters is basically consistent with the existing research literature.

## 4.2. Empirical Results

**Table 3** shows the regression test results of the inflation rate on the possibility of issuing management earnings forecasts. In column (3), the regression coefficient

**Table 3.** Inflation reduces the possibility of management forecasts.

Variable	Issue		
	(1)	(2)	(3)
Inf	0.115 (0.17)	-0.156 (-0.21)	-1.379* (-1.87)
Size		-0.416*** (-14.25)	-0.292*** (-13.42)
Age		-0.691*** (-17.16)	-0.573*** (-18.57)
Lev		0.288** (2.21)	0.018 (0.18)
Roa		-10.679*** (-19.73)	-10.178*** (-22.60)
Loss		0.043 (1.48)	0.053** (2.02)
BTM		0.161*** (4.96)	0.140*** (5.78)
Offer		0.286*** (6.35)	0.069 (1.38)
Soe		-0.501*** (-9.12)	-0.360*** (-8.91)
Her5		0.242 (1.48)	0.157 (1.29)
Inst		-0.899** (-2.29)	-0.724** (-2.25)

## Continued

Lnanalyst		0.194***	0.146***
		(8.67)	(7.94)
Gdp_g		-1.588*	-0.733
		(-1.80)	(-1.01)
Issue			2.033***
			(60.66)
_Cons	-1.692***	7.958***	4.908***
	(-9.77)	(13.42)	(10.96)
Year Quarter Industry Effect	Yes	Yes	Yes
N	93591	93591	90659
pseudo R-sq	0.114	0.211	0.324

t-value in parentheses, \*, \*\*, \*\*\* indicate the level of significance of 10%, 5% and 1%, respectively.

of inflation rate is  $-1.379$ , and is significantly negative at the 5% significance level (t-value is  $-1.87$ ). The margin effect is  $-0.207$  and its z-value is  $-1.87$ . This indicates that the higher the inflation rate rises, the lower the probability of the managers announcing the earnings forecast is, *ceteris paribus*. Therefore, the assumption of H1 is verified.

In terms of control variables, the coefficient of lagged explained variable (Lissue) is significantly positive at the 1% significance level, indicating that if managers disclosed the earnings forecast in previous quarter, they will continue to publish earnings forecast in current quarter. That is to say, this issuing behavior of the management earnings forecast has certain stickiness, and managers tend to be consistent with the previous behavior. The coefficient of total asset (Size) in column (2) and (3) are  $-0.416$  and  $-0.292$ , both are significant at 1% level, consist with the result of Dempsey [20]. The coefficient of state-owned-enterprises (Soe) in column (2) and (3) are  $-0.501$  and  $-0.360$  at the 1% significant level, indicating that if the listed company is state-owned, the issuing possibility of the management forecasts will decrease. This result is consistent with the findings of Zhang Xinyi *et al.* [34]. Analysts tracking number (Lnanalyst) in column (2) and (3) are  $0.194$  and  $0.146$  significant at the 1% level. It shows that the more attention the listed company receives, that is, the external governance improvement, the company managers are more willing to release earnings forecasts to reduce information asymmetry. The regression coefficient results of other control variables are basically consistent with previous studies.

**Table 4** is the regression test results of the effect of inflation rate on the precision of management earnings forecast. In column (3), the regression coefficient of inflation rate is  $-4.929$  and margin effect is  $-0.219$ , and is significantly negative at the 10% level (t-value is  $-1.71$ ), which indicates that the precision of the performance forecast issued by the management when inflation rises. So the hypothesis of H2 is verified.

**Table 4.** Inflation lowers the precision of management forecast.

Variable	Precision		
	(1)	(2)	(3)
Inf	-0.339 (-0.24)	-0.961 (-0.67)	-4.929* (-1.71)
Size		-0.144*** (-2.60)	-0.146*** (-2.97)
Age		-0.410*** (-5.49)	-0.174*** (-2.77)
Lev		-0.336 (-1.48)	-0.028 (-0.15)
Roa		11.544*** (15.72)	7.886*** (9.77)
Loss		-0.175*** (-3.57)	-0.156*** (-2.62)
BTM		-0.016 (-0.29)	0.008 (0.16)
Offer		-0.007 (-0.06)	0.128 (0.91)
Soe		-0.297*** (-3.42)	-0.169** (-2.04)
Her5		-0.362 (-1.30)	-0.154 (-0.62)
Inst		1.010 (1.39)	1.120 (1.51)
Lnanalyst		0.243*** (5.85)	0.113*** (2.88)
Gdp_g		0.723 (0.44)	0.832 (0.47)
Lprecision			3.777*** (51.19)
_Cons	1.522*** (6.18)	5.867*** (5.40)	3.138*** (3.14)
Year Quarter Industry Effect	Yes	Yes	Yes
N	47,562	47,562	33,987
pseudo R-sq	0.100	0.194	0.447

t-value in parentheses, \*, \*\*, \*\*\* indicate the level of significance of 10%, 5% and 1%, respectively.

In terms of control variables, the coefficient of lagged explained variable (Lprecision) is 3.777, significant at the 1% significance level. That is, the higher



the precision of the earnings forecast issued in the previous reporting period, the higher the precision of forecasts is in the current period. The total asset size (Size) coefficient is significantly negative at the 1% significance level in both columns (2) and (3). The regression coefficient of property rights (Soe) is negative in columns (2) and (3), and the coefficient in (2) is significantly negative at the 1% level, indicating that if the listed company is a state-owned enterprise, the precision of its management earnings forecasts will drop. The regression coefficient of the analyst tracking number (Lnanalyst) is positive in both (2) and (3) and both significant at the 1% level, which means that the more attention the listed company receives, that is the external governance is improved, the company managers are more willing to release high-precision earnings forecasts to reduce information asymmetry.

**Table 5** shows the regression results of the impact of inflation rate on management earnings forecast accuracy. When the dependent variable is Accuracy,

**Table 5.** Inflation decreases the accuracy of management forecasts.

Variable	Accuracy			Bigbias		
	(1)	(2)	(3)	(1)	(2)	(3)
Inf	0.009** (2.57)	0.013*** (3.34)	0.017*** (3.68)	3.709*** (3.34)	3.115*** (2.75)	3.731*** (2.61)
Size		0.001*** (6.66)	0.001*** (5.31)		0.152*** (4.94)	0.134*** (3.98)
Age		0.000 (0.29)	-0.000 (-0.57)		-0.172*** (-5.36)	-0.266*** (-6.44)
Lev		0.001** (2.46)	0.001 (1.63)		0.390*** (3.25)	0.385*** (3.03)
Roa		-0.005*** (-2.60)	-0.001 (-0.27)		-4.528*** (-9.91)	-3.347*** (-6.68)
Loss		0.000 (1.14)	0.000 (1.02)		0.095*** (3.12)	0.119*** (3.46)
BTM		0.001*** (2.97)	0.001*** (2.69)		-0.061* (-1.77)	-0.055 (-1.37)
Offer		-0.000 (-1.59)	-0.000 (-1.29)		-0.152** (-2.45)	-0.172** (-2.54)
Soe		-0.000** (-2.46)	0.000 (0.10)		-0.195*** (-3.77)	-0.092 (-1.59)
Her5		0.001*** (2.90)	0.001 (1.49)		0.041 (0.29)	-0.157 (-1.05)
Inst		-0.002* (-1.86)	-0.002* (-1.81)		-1.561*** (-3.87)	-1.263*** (-2.83)

## Continued

Lnanalyst	-0.000	-0.000	-0.140***	-0.120***		
	(-1.26)	(-1.25)	(-6.66)	(-5.31)		
Gdp_g	-0.000	0.002	0.889	1.973*		
	(-0.03)	(0.57)	(0.92)	(1.78)		
Ldependent		0.196***		0.717***		
		(7.84)		(21.17)		
_Cons	0.008***	-0.011***	-0.013***	0.205	-2.816***	-2.810***
	(6.59)	(-4.08)	(-5.00)	(1.14)	(-4.56)	(-3.96)
Year Quarter Industry Effect	Yes	Yes	Yes	Yes	Yes	Yes
N	35,540	35,540	22,154	38,902	38,902	26,568
adj. R-sq/pseudo R-sq	0.071	0.111	0.138	0.021	0.036	0.060

t-value in parentheses, \*, \*\*, \*\*\* indicate the level of significance of 10%, 5% and 1%, respectively.

the regression coefficients of the inflation rates in columns (1) - (3) are 0.009, 0.013, and 0.017, which are significantly lower at the significance levels of 5%, 1%, and 1%, respectively (t-values are 2.56, 3.31, and 3.57, respectively). When the explanatory variable is Bigbias, the regression coefficients of the inflation rates in columns (4) - (6) are 3.709, 3.115, and 3.731, both of which are significant at the 1% significance level (t-values are 3.34, 2.75, and 2.61, respectively). In colum (3), the margin effect is 0.797 (z-value is 2.61). This shows that under the same conditions, the higher the inflation, the lower the accuracy of the earnings forecast issued by the managers, that is, the assumption of H3 is verified.

In terms of control variables, the lagged explained variables (Accuracy and Bigbias) are 0.196 and 0.717, respectively, both of which are significant at the 1% significance level. The total asset size (Size) are positive significant at 1% in both sets of regressions. Among them, the regression coefficient for Accuracy is 0.001, and the regression coefficient for Bigbias is 0.152 and 0.134. This shows that the managers may not accurately identify the actual and specific earnings results limited by the size of the company, thus when the company's scale rises, the accuracy of the management's earnings forecast is reduced. The asset-liability ratio (Lev) is significantly positive in both sets of regressions, 0.001 significant at 5% level for Accuracy set with a significant 5% level and 0.39 and 0.385 both significant at 1% for Bigbias set. This just consists with the research of Rao Pingui and Luo Yonggen [17]. The management has not been able to identify the impact of rising interest rates due to the "inflation illusion", so it is impossible to make an accurate judgment on the performance of the company and the accuracy of forecasts will decline. The analysts' number of followers (Lnanalyst) and the institutional shareholding ratio (Inst) have negative regression coefficients in both sets of regressions, indicating that the more attention the listed company receives, that is the external governance is improved, the company's managers are more willing to release more accurate management forecasts to reduce informa-

tion asymmetry.

What's more, I draw on the methods of Chordia and Shivakumar [11] and Basu *et al.* [12] to investigate the influence of inflation rate on the forecast error. I rank and sort the variable Accuracy into three groups and put them into the model for regression test. If the hypothesis is established, the regression coefficient of inflation rate should be larger in the group with higher forecast error while the coefficient of inflation rate should be smaller in lower forecast error group. There should be a significant difference between the higher group and the lower group theoretically. Therefore, Table 6 lists the regression results after dividing the sample and test results for coefficient differences. As can be seen from Table 6, as the forecast error increases, the regression coefficient of the inflation rate gradually increases. In the higher error group, the regression coefficient of the inflation rate is 0.035 and is significantly positive at the 1% level (t-value is 2.97). Through the coefficient test, it is found that the coefficient difference between the higher group and the lower group is significant at the 1% level ( $\text{Chi}(2) = 8.17, P > \text{Chi}(2) = 0.0043$ ). Therefore, Hypothesis 3 is further supported.

**Table 6.** Test coefficient differences by accuracy.

Variable	Accuracy		
	(1) = lower	(2) = median	(3) = higher
Inf	-0.000 (-0.99)	0.000 (0.90)	0.035*** (2.97)
Accuracy	0.000 (0.76)	0.002*** (2.72)	0.232*** (6.71)
Size	0.000*** (2.89)	0.000*** (4.54)	0.001*** (4.25)
Age	-0.000*** (-5.35)	-0.000*** (-2.60)	0.001*** (2.96)
Lev	0.000* (1.89)	0.000 (1.01)	0.001 (0.58)
Roa	0.000** (2.00)	0.000*** (4.43)	-0.010** (-2.17)
Loss	-0.000* (-1.96)	-0.000 (-0.81)	0.000 (0.99)
BTM	-0.000 (-0.09)	-0.000** (-2.20)	0.001** (1.99)
Offer	-0.000 (-1.10)	0.000 (0.43)	-0.000 (-0.10)
Soe	-0.000*** (-3.51)	-0.000 (-0.64)	0.000 (1.31)

## Continued

Her5	0.000 (0.31)	-0.000 (-1.38)	0.002 (1.33)
Inst	-0.000** (-2.19)	-0.000 (-1.22)	-0.005* (-1.68)
Lnanalyst	0.000 (1.40)	-0.000** (-2.02)	-0.000** (-2.40)
Gdp_g	0.000 (0.53)	0.000* (1.65)	0.005 (0.61)
_Cons	0.000 (0.76)	0.000 (0.08)	-0.026*** (-4.47)
Year Quarter Industry Effect	Yes	Yes	Yes
Test Inf(1) = Inf(3)	chi2(1) = 9.12***		Prob > chi2 = 0.0025
N	7088	7369	7697
adj. R-sq	0.054	0.045	0.155

## 5. Further Research and Robustness Test

### 5.1. Further Research

In order to further study the possible path of the impact of inflation on management earnings forecast behavior, this paper conducted a series of mechanisms test.

First of all, this paper believes that under the background of China's unique ownership system, whether a listed company belongs to a state-owned enterprise will have a certain impact on the possibility, precision and accuracy of the management earnings forecasts. Studies have shown that state-owned companies have a weaker willingness to publish voluntary information, and they are more motivated to self-protect, so it is more likely to publish less precise forecasts and the accuracy of earnings forecasts will be lower. Therefore, this state-owned enterprise characteristic may further aggravate the precision and accuracy of management earnings forecasts when inflation rises. Hence, I suppose the interaction coefficient of the nature of property rights (Soe) and inflation rate (Inf) to be negative. **Table 7** shows the results of the regression test. Due to space limitations, the regression results of the control variables are omitted from the table. And in order to maintain consistency, lagged explained variables are included as control variables in the regression model and I still control the industry, year and quarter effect. The regression results in **Table 7** show that the listed company's state-owned nature will aggravate the decline of precision and accuracy of earnings forecasts when inflation rises.

Secondly, due to semi-mandatory disclosure rules in China's earnings forecast disclosure, such mandatory and voluntary information disclosure behavior may have certain differences in motivation. Researches have shown that managers

**Table 7.** Mechanism test for the nature of property rights (Soe).

	Precision	Accuracy
Inf	2.381 (0.61)	0.0129*** (3.22)
Soe	-0.098 (-1.07)	-0.000 (-0.37)
Soe*Inf	-10.063** (-2.19)	0.012* (1.68)
Ldependent	3.779*** (51.10)	0.197*** (7.84)
_Cons	3.114*** (3.11)	-0.013*** (-4.98)
Control Variables	Yes	Yes
Year Quarter Industry Effect	Yes	Yes
N	33987	22154
pse. R-sq/adj. R-sq	0.448	0.140

disclose more precise and accurate earnings forecasts voluntarily in order to establish a better disclosure reputation [7], show better operating and management capabilities [35], personal wealth preservation and appreciation [18]. In this paper, I focus on the observations that have already issued the earnings forecast and further divide the observation into two sub-samples that meet the mandatory disclosure requirements and the voluntary disclosure rules. If the company still voluntarily issues earnings forecasts in addition to the rules of the stock exchange, it indicates that the managers of the company may be more capable, more confident or have a stronger willingness to provide more precise and accurate information for its management purposes. Considering the effect of inflation rate, if the company still voluntarily issues earnings forecasts, this voluntary behavior can alleviate the decline in the accuracy and accuracy of the management earnings forecast when inflation rate rises. I suppose the interaction coefficient between the Voluntary and the inflation rate (Inf) to be positive in the test of precision and negative for accuracy test. **Table 8** lists the results of the regression test. The interaction coefficients of the three columns of Precision, Accuracy and Bigbias are 24.325, -0.005 and -4.771, respectively, which are significant at the 1% and 5% levels, respectively. That is, the suppose is confirmed.

Finally, it is pointed out that debt is an important path for inflation to affect the performance of micro-enterprises in the theoretical analysis [16] [17] [26]. Therefore, when the inflation rate rises, the higher the asset-liability ratio of the enterprise, the fuzzier the managers may consider about the effect of inflation on the business performance. At this time, if the management releases the performance

**Table 8.** Mechanism test for voluntary disclosure (Voluntary).

	Precision	Accuracy	Bigbias
Inf	-8.840*** (-2.63)	0.019*** (3.25)	5.588*** (3.49)
Voluntary	-0.873*** (-8.500)	-0.000* (-1.842)	0.024 (0.604)
Voluntary*Inf	24.325*** (5.50)	-0.005 (-1.05)	-4.771** (-2.42)
Ldependent	3.809*** (51.10)	0.196*** (7.81)	0.717*** (21.16)
_Cons	3.730*** (3.62)	-0.013*** (-4.97)	-2.800*** (-3.94)
Control Variables	Yes	Yes	Yes
Year Quarter Industry Effect	Yes	Yes	Yes
N	33987	22154	26568
pse. R-sq/adj. R-sq	0.454	0.140	0.060

forecast, its precision and accuracy may be further reduced which means high debt ratio will increase the management's "invisible" situation. From an empirical perspective, I rank the asset-liability ratio of the sample observations and divide into high and low two groups according to the median leverage rate. I suppose the interaction coefficient between the high asset-liability ratio (D\_lev) and the inflation rate (Inf) to be negative in the precision's regression and to be positive in accuracy's test. **Table 9** lists the test results. In the test of the precision of the management earnings forecast, the coefficient of the interaction is -10.034, which is significant at the 5% level (t-value is -2.15). In the test of the accuracy of the management earnings forecast, the coefficient is 0.020, significant at the level of 1% (t-value is 3.21).

## 5.2. Robustness Test

In order to ensure the robustness of the test results, the following methods are used to repeat the test. **Tables 10-13** are the results of empirical tests. Due to space limitations, only the inflation rate and the regression coefficients of the lagged dependent variable are listed in the table.

First of all, due to the financial crisis in 2008, the managers have been greatly affected by the business situation of the company and the situation of the investors. Therefore, the managers may deviate from the normal situation both in terms of performance identification and motivation of earnings forecast. On the other hand, because China's semi-mandatory information disclosure rules were first promulgated in 2008, the pre-2008 forecast may differ from the situation after 2008. Therefore, this paper drops the observations before 2010 and re-regresses. The results still support assumption.

**Table 9.** Mechanism test for path of leverage (D\_lev).

	Precision	Accuracy
Inf	2.894 (0.68)	0.009** (2.32)
D_lev	0.094 (1.11)	-0.000 (-0.45)
D_lev*Inf	-10.034** (-2.15)	0.020*** (3.21)
Ldependent	3.779*** (51.18)	0.197*** (7.84)
_Cons	3.177*** (3.15)	-0.014*** (-5.19)
Control Variables	Yes	Yes
Year Quarter Industry Effect	Yes	Yes
N	33987	22154
pse. R-sq/adj. R-sq	0.448	0.140

**Table 10.** Exclude the observations before 2010.

	Issue	Preci	Accuracy	Bigbias
Inf	-0.157 (-0.16)	-0.119 (-0.03)	0.010** (2.06)	3.559** (2.34)
Ldependent	2.415*** (58.83)	4.271*** (45.73)	0.217*** (7.86)	0.736*** (20.97)
_Cons	5.906*** (11.34)	4.709*** (3.66)	-0.013*** (-4.96)	-3.450*** (-4.94)
Control Variables	Yes	Yes	Yes	Yes
Year Quarter Industry Effect	Yes	Yes	Yes	Yes
N	67,654	29,301	20,939	25,318
pse. R-sq/adj. R-sq	0.382	0.434	0.147	0.062

**Table 11.** Replace the proxy for precision and accuracy of management forecasts.

	Precision1	Accuracy1	Bias1	Bias2
Inf	-0.466 (-0.25)	0.444* (1.77)	5.632** (2.16)	2.813 (0.81)
Ldependent	2.299*** (42.39)	0.127*** (9.53)	0.897*** (11.36)	0.885*** (6.93)
_Cons	8.113*** 12.79	-0.132 (-1.22)	-6.795*** (-5.40)	-5.154*** (-3.53)
Control Variables	Yes	Yes	Yes	Yes

**Continued**

Year Quarter Industry Effect	Yes	Yes	Yes	Yes
N	33987	26568	26478	26406
pse. R-sq/ajd. R-sq	0.286	0.051	0.066	0.062

**Table 12.** Test coefficient differences by adding groups of accuracy.

	(1)	(2)	(3)	(4)	(5)
Inf	0.000 (1.23)	0.000 (1.05)	-0.000 (-0.54)	-0.001* (-1.68)	0.037* (1.91)
Laccuracy	0.000 (0.30)	0.000 (1.44)	0.000 (0.32)	0.003** (2.34)	0.257*** (6.74)
_Cons	0.000** (2.44)	0.000*** (6.63)	0.000*** (3.79)	0.001*** (4.68)	-0.030*** (-3.82)
Control Variable	Yes	Yes	Yes	Yes	Yes
Year Quarter Industry Effect	Yes	Yes	Yes	Yes	Yes
Test Inf(1) = Inf(5)	Chi(2) = 4.29**		Prob > Chi(2) = 0.0384		
N	4271	4276	4391	4666	4550
adj. R-sq	0.031	0.008	0.019	0.013	0.172
Devised in 8 groups Test Inf(1) = Inf(8)	Chi(2) = 4.35**		Prob > Chi(2) = 0.0369		

**Table 13.** Add another control variable horizon.

	Precision	Precision1	Accuracy	Bigbias
Inf	-3.888 (-1.19)	-0.438 (-0.23)	0.016*** (3.53)	3.861** (2.57)
Ldependent	3.791*** (48.66)	2.244*** (41.49)	0.189*** (7.59)	0.487*** (14.53)
Horizon	-1.743*** (-20.56)	-0.721*** (-20.17)	0.001*** (11.48)	1.032*** (28.91)
_Cons	7.876*** (6.73)	6.589*** (10.07)	-0.015*** (-5.53)	-4.795*** (-6.63)
Other Control Variables	Yes	Yes	Yes	Yes
Year Quarter Industry Effect	Yes	Yes	Yes	Yes
N	33,982	33,982	22,153	26,567
pse. R-sq/adj. R-sq	0.500	0.303	0.147	0.108

Second, I replace the proxy variable of precision and accuracy of the earnings forecast, which are measured as follows:

Precision 1: 1 is only a qualitative forecast of gain or loss, 2 is the open-range forecast with only the maximum or minimum forecast earnings, 3 is the



closed-range forecast of a profit interval, and 4 is point forecast.

$$\text{Accuracy 1} = \left| \frac{(\text{the lower forecast EPS} + \text{the higher forecast EPS}) \times 0.5 - \text{actual EPS}}{\text{actual EPS}} \right|$$

Bias = 1 if Accuracy > Mean Accuracy + Std(Accuracy), otherwise is 0

Reinput into the model and I find that the results still support the hypothesis.

Thirdly, when the Accuracy is grouped, the samples are further divided into 5 groups and 8 groups, and the coefficient difference between the highest error group and the lowest group is tested respectively. From the test results of **Table 12**, it is found that when divided into 5 groups,  $\text{Chi}(2) = 4.29^{**}$  ( $p > \text{chi}2 = 0.0384$ ), when divided into 8 groups,  $\text{Chi}(2) = 4.35^{**}$  ( $p > \text{chi}2 = 0.0369$ ). Therefore, the empirical results still support the conclusion.

Finally, studies have shown that the number of days between the earnings forecast date and the date of the performance announcement, as well as the advance notice is good news or bad news also has an impact on the precision and accuracy of the earnings forecast. For example, when the number of days is smaller, more information can be used for earnings forecasting so that managers will identify the results of the performance more clearly. That is to say, the smaller the number of interval days is, the more precise and accurate the earnings forecast will be. Therefore, the Horizon is added to the regression model, and the empirical test finds that the results still support the hypothesis.

## 6. Research Conclusion

This paper uses the data of Shanghai and Shenzhen A-share listed companies in 2005-2017 to study the relationship between inflation rate and management earnings forecast behavior. The empirical results show that when the inflation rate rises, the possibility of managers' announcement of earnings forecasts declines, the precision of the management earnings forecasts decreases, and the accuracy of earnings forecasts also declines. The results of this study indicate that management has an "inflation illusion". On the one hand, the rise in inflation can lead to an increase in macroeconomic uncertainty. On the other hand, because of the "invisibility" of inflation, managers cannot understand and react to inflation correctly and exactly about the extent of the impact on micro-business performance results. In further research, this paper finds that the state-owned nature of listed companies will exacerbate the "invisible" situation of management, and the precision and accuracy of management earnings forecasts will be further reduced. If the company is still voluntarily disclosure of earnings forecasts above the mandatory disclosure rules, it means that the managers will actively communicate signals to the market, and the precision and accuracy of earnings forecasts issued by managers are strengthened. Finally, liability is an important path for inflation to affect micro-enterprise business performance. When inflation rises, the higher the debt, the more "invisible" the management is. Therefore, the precision and accuracy of the management earnings

forecast will further decline. Future research in this topic could also investigate whether investors or analysts are able to recognize this managerial “invisibility” and take it into consideration when determining a firm’s stock price based on its forecasts.

### Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

### References

- [1] Ajinkya, B. and Gift, M. (1984) Corporate Managers’ Earnings Forecasts and Symmetrical Adjustments of Market Expectations. *Journal of Accounting Research*, **22**, 425-444. <https://doi.org/10.2307/2490657>
- [2] Schoenfeld, J. (2017) The Effect of Voluntary Disclosure On Stock Liquidity: New Evidence from Index Funds. *Journal of Accounting and Economics*, **63**, 51-74. <https://doi.org/10.1016/j.jacceco.2016.10.007>
- [3] Kim, O. and Verrecchia, R.E. (2001) The Relation among Disclosure, Returns, and Trading Volume Information. *The Accounting Review*, **76**, 633-654. <https://doi.org/10.2308/accr.2001.76.4.633>
- [4] Skinner, D. (1994) Why Do Firms Voluntarily Disclose Bad News? *Journal of Accounting Research*, **32**, 38-60. <https://doi.org/10.2307/2491386>
- [5] Hutton, A. and Stocken, P. (2009) Prior Forecasting Accuracy and Investor Reaction to Management Earnings Forecasts. Working Paper, Boston College and Dartmouth University.
- [6] Cotter, J., Tuna, I. and Wysocki, P.D. (2006) Expectations Management and Beatable Targets: How Do Analysts React to Public Earnings Guidance? *Contemporary Accounting Research*, **23**, 593-624. <https://doi.org/10.1506/FJ4D-04UN-68T7-R8CA>
- [7] Hirst, D., Koonce, L. and Venkataraman, S. (2008) Management Earnings Forecasts: A Review and Framework. *Accounting Horizons*, **22**, 315-338. <https://doi.org/10.2308/acch.2008.22.3.315>
- [8] Skinner, D. (1997) Earnings Disclosures and Stockholder Lawsuits. *Journal of Accounting and Economics*, **23**, 249-292. [https://doi.org/10.1016/S0165-4101\(97\)00010-4](https://doi.org/10.1016/S0165-4101(97)00010-4)
- [9] Doepke, M. and Schneider, M. (2006) Inflation and the Redistribution of Nominal Wealth. *Journal of Political Economy*, **114**, 1069-1097. <https://doi.org/10.1086/508379>
- [10] Modigliani, F. and Cohn, R.A. (1979) Inflation, Rational Valuation and the Market. *Financial Analysts Journal*, **35**, 24-44. <https://doi.org/10.2469/faj.v35.n2.24>
- [11] Chordia, T. and Shivakumar, L. (2005) Inflation Illusion and Post Earnings Announcement Drift. *Journal of Accounting Research*, **43**, 521-556. <https://doi.org/10.1111/j.1475-679X.2005.00181.x>
- [12] Basu, S., Markov, S. and Shivakumar, L. (2010) Inflation, Earnings Forecasts, and Post-Earnings Announcement Drift. *Review of Accounting Studies*, **15**, 403-440. <https://doi.org/10.1007/s11142-009-9112-9>
- [13] Lin, S. (2009) Inflation and Real Stock Returns Revisited. *Economic Inquiry*, **47**, 783-795. <https://doi.org/10.1111/j.1465-7295.2008.00193.x>

- [14] Bekaert, G. and Wang, X. (2010) Inflation Risk and the Inflation Risk Premium. *Economic Policy*, **25**, 755-806. <https://doi.org/10.1111/j.1468-0327.2010.00253.x>
- [15] Konchitchki, Y. (2011) Inflation and Nominal Financial Reporting: Implications for Performance and Stock Prices. *The Accounting Review*, **86**, 1045-1085. <https://doi.org/10.2308/accr.00000044>
- [16] Rao, P., Yue, H. and Jiang, G. (2016) Inflation Expectations and Corporate Inventory Adjustment Behavior. *The Economics (Quarterly)*, **1**, 499-526.
- [17] Rao, P. and Luo, Y. (2016) How Inflation Affects Stock Returns—Based on the Perspective of Debt Financing. *Journal of Financial Research*, **7**, 160-175.
- [18] Qiang, C., Ting, L. and Heng, Y. (2013) Managerial Incentives and Management Forecast Precision. *The Accounting Review*, **88**, 1575-1602. <https://doi.org/10.2308/accr-50506>
- [19] Nagar, V., Nanda, D. and Wysocki, P. (2003) Discretionary Disclosure and Stock-Based Incentives. *Journal of Accounting and Economics*, **34**, 283-309. [https://doi.org/10.1016/S0165-4101\(02\)00075-7](https://doi.org/10.1016/S0165-4101(02)00075-7)
- [20] Dempsey, S.J. (1989) Predisclosure Information Search Incentives, Analyst Following, and Earnings Announcement Price Response. *Accounting Review*, **64**, 748-757.
- [21] Ajinkya, B., Bhojraj, S. and Sengupta, P. (2005) The Association between Outside Directors, Institutional Investors and the Properties of Management Earnings Forecasts. *Journal of Accounting Research*, **43**, 343-374. <https://doi.org/10.1111/j.1475-679x.2005.00174.x>
- [22] Mei, F. and Adam, S.K. (2010) Once Bitten, Twice Shy: The Relation between Outcomes of Earnings Guidance and Management Guidance Strategy. *The Accounting Review*, **85**, 1951-1984. <https://doi.org/10.2308/accr.2010.85.6.1951>
- [23] Hilary, G. and Hsu, C. (2011) Endogenous Overconfidence in Managerial Forecasts. *Journal of Accounting and Economics*, **51**, 300-313. <https://doi.org/10.1016/j.jacceco.2011.01.002>
- [24] Hribar, P. and Yang, H. (2016) CEO Overconfidence and Management Forecasting. *Contemporary Accounting Research*, **33**, 204-227. <https://doi.org/10.1111/1911-3846.12144>
- [25] Ritter, J. and Warra, R.S. (2002) The Decline of Inflation and the Bull Market of 1982-1999. *Journal of Financial and Quantitative Analysis*, **37**, 29-61. <https://doi.org/10.2307/3594994>
- [26] Li, Q., Wu, S. and Wang, H. (2015) Inflation Expectation and Corporate Bank Debt Financing. *Journal of Financial Research*, **11**, 124-141.
- [27] Li, W. and Zheng, M. (2016) Inflation Expectations, Corporate Growth and Corporate Investment. *Statistical Research*, **5**, 34-42.
- [28] Rao, P. and Zhang, H. (2015) Inflation Expectations and Corporate Cash Holdings. *Journal of Financial Research*, **1**, 101-116.
- [29] Luo, Y., Rao, P. and Yue, H. (2018) The Microscopic Interpretation of “Inflation Illusion”: The Perspective of Earnings Quality. *The Journal of World Economy*, **4**, 124-149.
- [30] Oliver, K. and Verrecchia, R.E. (1991) Trading Volume and Price Reactions to Public Announcements. *Journal of Accounting Research*, **29**, 302-321. <https://doi.org/10.2307/2491051>
- [31] Subramanyam, K.R. (1996) Uncertain Precision and Price Reactions to Information. *The Accounting Review*, **71**, 207-220.
- [32] Lu, Z. and Zhang, H. (2009) Accounting Standards Reform and the Decision Use-

fulness of Subsidiary Earnings Information—Empirical Evidence from Chinese Capital Market. *Accounting Research*, **5**, 20-28.

- [33] Huang, Q., Cheng, M., Li, W. and Wei, M. (2014) Listing Approach, Political Favours and Earnings Quality—Evidence from Chinese Family Firms. *Accounting Research*, **7**, 43-49.
- [34] Zhang, X., Zhang, H. and Xia, D. (2012) Executives Holding Shares, Timing Disclosure and Market Reaction. *Accounting Research*, **6**, 54-60.
- [35] Baik, B., Farber, D.B. and Lee, S. (2011) CEO Ability and Management Earnings Forecasts. *Contemporary Accounting Research*, **28**, 1645-1668.  
<https://doi.org/10.1111/j.1911-3846.2011.01091.x>