Klover Research Journal of Business and Management
Volume 10 Issue 3, July-September 2022
ISSN: 2995-4525
Impact Factor: 7.09
http://kloverjournals.org/journals/index.php/bm

A GENDER-INCLUSIVE FINANCIAL FUTURE: FORECASTING THE ROLE OF WOMEN IN SHAPING THE NEXT ERA OF FINANCIAL MARKETS

Ming Chen Wang, Ph.D. and Li Hui Zhang, M.A.
Business School, East China University of Political Science and Law, Shanghai, China

ABSTRACT
This study investigates the impact of gender on the accuracy of analysts' earnings predictions in the context of China's dynamic capital market. Analysts play a crucial role in reducing information asymmetry, guiding investor behavior, and influencing market trends. However, the quality of research reports can vary significantly. To address this issue, we explore the behavioral patterns and predictive accuracy of female analysts. Gender has been shown to influence cognitive processes and decision-making, but its impact in the financial sector, particularly among analysts, remains underexplored. Our research aims to shed light on whether gender influences the precision of earnings forecasts and to uncover potential gender-related differences in predictive behavior within the male-dominated financial industry.

Keywords: Analysts, Earnings predictions, Gender diversity, financial markets, Information asymmetry

Introduction

As an information intermediary in the capital market, analysts collect and analyze information on listed companies, form corresponding predictive data, and provide suggestions to investors through the public release of research reports, reducing the degree of information asymmetry in the capital market. They are an important bridge connecting investors and listed companies. Analysts' predictions have a certain guiding effect on investor behavior and capital market trends, and their accuracy in prediction has a crucial impact on the performance of analysts' functions. With the development of the analyst industry in recent years, the number of market research reports has surged, but the quality of research reports is uneven, and even multiple negative scandals have frequently emerged. Therefore, with the rapid development of China's capital market and the imperfect information environment, investors need to scientifically screen the pros and cons of analysts and their published research reports, while analysts need to strive to improve the accuracy of their earnings forecasts. Studying the factors that affect the accuracy of analyst predictions and the behavioral patterns of analysts has important theoretical value and practical significance.

Cognitive psychology believes that gender is an important factor that affects people's work results. The difference between men and women in their thinking habits and behavior patterns will have an

important impact on their work performance and the economic consequences of the enterprise. In recent years, with the improvement of women's social status, women have increasingly participated in various fields of work. This has also attracted widespread attention from many scholars. The role of women in corporate governance and daily operations has been extensively validated. A large number of studies have shown that women typically exhibit characteristics of prudence and risk aversion, which can have a positive impact on reducing operational risks, reducing overinvestment, and increasing corporate performance in listed companies. However, in the male dominated financial industry, research on female analysts' predictive behavior and predictive characteristics is still relatively rare.

This article selects the prediction data of securities analysts in the Chinese securities market from 2019 to 2020 as the research sample. Empirical testing shows that: (1) the accuracy of analyst earnings prediction is significantly correlated with the analyst's own gender; (2) The increase in the number of female analysts' predictions will weaken the impact of gender differences on the accuracy of earnings forecasts; (3) When considering market trends, gender differences have a more significant impact on the accuracy of analysts' earnings forecasts in bear markets; (4) There is a strong gender difference in the accuracy of earnings forecasts for analysts working in small securities firms, while there is no significant relationship between the accuracy of earnings forecasts for analysts working in large securities firms and their gender.

The innovation and possible contributions of this paper are as follows: (1) This paper conducts analysis when the accuracy of analysts' relative earnings forecasts is higher than the market average. Most of the existing literature is located in the historical background where analysts' forecasts are highly biased. Therefore, the conclusions and findings of this paper are quite different from the existing literature, which helps to supplement the Empirical evidence of analysts' gender differences, At the same time, it helps female analysts, as a minority group, to have a clearer understanding of the gender differences in securities analysts' ability to predict information and behavioral patterns, thus enabling them to take targeted measures; (2) Previous literature in this article has mostly explored the relationship between analyst gender and earnings prediction accuracy from social relationships, corrective ability, and learning mechanisms. In terms of learning mechanisms, attention has been paid to the analyst's educational background and years of experience, while ignoring the heterogeneous effect of the accumulation of research reports written by analysts on the accuracy of earnings prediction for male and female analysts. This opens up new ideas for understanding and optimizing the accuracy of analyst earnings prediction.

The structure of this article is arranged as follows: The second part proposes research hypotheses based on relevant literature and theories; The third part designs research hypotheses, selects variables, and sets models; The fourth part is the analysis of empirical results; The fifth part is the research conclusion and relevant policy recommendations.

1. Theoretical analysis and research hypotheses

1.1. Gender Differences and the Accuracy of Analyst Earnings Prediction

In recent years, literature research has shown that analysts' personal characteristics have a significant impact on their information intermediary role. Existing literature has explored various aspects such as

analyst education, experience, and conflicts of interest. Among all personal traits, gender factors are an important area of empirical research, and their significant impact on analyst behavior should also be of concern to scholars. Previous literature has shown that compared to male analysts, female analysts perform more conservatively and robustly, with significant advantages in providing company trait information, reducing stock price synchronicity[1], and reducing the risk of stock price collapse. Female analysts have higher accuracy in earnings forecasting[2].Female analysts' earnings forecasts were more accurate on the whole[3], while male analysts' forecasts were more accurate in a longer period of time. In addition, analysts' social relationships can improve their ability to obtain private information, but male analysts are more likely to benefit from social relationships, while female analysts have a disadvantage in this regard[4].

In summary, the predictive style of female analysts is relatively different from that of male analysts. On the one hand, female analysts are psychologically averse to risks, and their research reports and forecast data are more conservative and cautious, closer to the market average; On the other hand, due to the disadvantage of female analysts in terms of social capital, they rely more on public information in the market for forecasting, and have less access to insider and private information. Therefore, their accuracy in earnings forecasting is closer to the market average. In situations where the accuracy of earnings forecasting is generally high in the market, male analysts obtain more private information, coupled with their advantages in financial mathematics, resulting in higher accuracy of earnings forecasting than females. Therefore, the first set of assumptions is proposed:

H1a: The accuracy of earnings forecasts by female analysts is closer to the market average.

H1b: When the accuracy of market average earnings prediction is high, male analysts have higher accuracy in earnings prediction.

1.2. The moderating effect of predicted quantity

Analysts who have been in the industry for a long time have accumulated more experience and mastered more basic skills, resulting in higher accuracy in earnings forecasting[5].A significant positive correlation between analyst prediction experience and the accuracy of earnings prediction[6]. The longer Chinese analysts follow up with companies, the more experienced they become, and thus their predictions will be more accurate[7]. Male analysts are more inclined to spend time collecting and organizing private information, and their improved prediction accuracy mainly comes from corporate experience; Female analysts are more inclined to mine and analyze public information, and the improvement in prediction accuracy comes from general experience[8].

In summary, the growth of employment time can accumulate relevant experience, thereby improving the analyst's ability to obtain and process information. This article believes that the essence of professional experience is the accumulation of analysts' research reports, analysis, and predictions. Therefore, predicting the number of companies and the number of predictions is the fundamental factor that affects the accuracy of analysts' earnings forecasts. Due to the fact that female analysts are more meticulous and rigorous in their work, and rely more on general experience, they are more able to summarize and reflect on past work experience, guiding current research and prediction work, thereby improving the accuracy of analysts' earnings forecasts. Therefore, a second hypothesis is proposed:

H2: Female analysts are more able to improve their own earnings prediction accuracy by predicting the number of companies and the accumulation of predicted numbers.

1.3. Scenario Impact of Market Situation

The market development trend, as an important environmental factor, can also have an impact on analysts' predictive behavior. Analysts' optimistic tendency to overestimate profits is more evident in bear markets[9].Due to the influence of investor sentiment in a bull market environment and the motivation to seek the maximum benefit for the securities firms they work for, analysts will exhibit a higher degree of optimism in a bull market environment [10].

In summary, this article believes that market trends have a moderating effect on the relationship between gender bias and the accuracy of analyst earnings forecasts. Considering the differences in individual characteristics of analysts, when the market is in a prosperous state, listed companies are generally willing to disclose information, with a lower degree of information asymmetry, lower cost of information collection and processing difficulty, thus weakening the impact of female analysts on the accuracy of earnings forecasting; When the market is in a depressed state, the degree of information asymmetry is high, and female analysts are more dependent on public information in the market, making them more unfavorable in a bear market. Therefore, a third hypothesis is proposed:

H3: Restricting other conditions, gender differences have a more significant impact on analyst prediction bias in bear markets.

1.4. The environmental impact of the scale of securities firms

Securities firms are often regarded as important information resource channels for analysts, not only providing relevant information for analysts, but also providing support for their information processing work. There is significant controversy in the existing literature regarding how the characteristics of securities firms affect the accuracy of analyst predictions. On the one hand, larger and more reputable securities firms can provide analysts with richer information resources and more comprehensive supporting mechanisms, thereby improving the accuracy of analyst earnings forecasts [5]. On the other hand, large securities firms may also be influenced by factors such as the economic benefits of underwriting stocks and maintaining good customer relationships, and their hired analysts often have optimistic biases when making predictions, reducing the accuracy of earnings forecasts [11]. In addition, the research conclusions indicate that there is no significant relationship between the accuracy of analyst predictions and the size of securities firms [12].

In summary, large securities firms can provide analysts with various resources, thereby reducing the difficulty of processing information and weakening the impact of gender differences on analyst behavior patterns; On the other hand, the interests behind large securities firms can drive analysts to make predictions that deviate from reality, and also reduce the impact of gender differences on analysts' predictions. Therefore, large securities firms have a significant impact on analyst predictions, and analyst predictions tend to converge; However, small securities firms have a smaller impact on analysts' predictions, and the results of analysts' predictions more reflect their personal characteristics. This article speculates that gender has little impact on the accuracy of analysts employed by large securities

firms compared to analysts employed by small securities firms. Therefore, a fourth set of assumptions is proposed:

H4a: An analyst working at a large securities firm, with no significant correlation between the accuracy of analyst predictions and gender.

2. Data source and model establishment

2.1. Data source

This article extracts profit forecasts from research reports released by analysts from 2019 to 2020 as the research object, eliminates samples with missing data, and applies a 1% winsorize treatment to the dependent variable. The analyst recommendation rating data, personal characteristics of analysts, basic characteristics of securities companies to which analysts belong, and basic information of listed companies used in this paper are all from CSMAR database, and the size data of securities companies to which analysts belong are from East Money Information Choice database.

This article ultimately includes a total of 32,035 analyst prediction data samples shown in Table 1, of which 8,552 are female analyst prediction data, with female analyst prediction data accounting for 26.70%. Although the number of female analysts has increased over the past two years, it still lags far behind that of men, with significant differences in quantity that need to be taken seriously. Table 1 Gender differences in analyst forecasts from 2019 to 2020

Year	Total number of analysts	Predicted Quantity from Female Analyst	Proportion of predicted quantity (%)
2019	15,974	5,742	35.95
2020	16,061	6,200	38.60
Total	32,035	11,942	37.28

2.2. Variable Definition

2.2.1. Dependent variable

To measure the accuracy of an analyst's profit forecast relative to other analysts, this article draws inspiration from Clement's method [5]. The absolute value of an analyst's prediction error for a certain stock is subtracted from the average absolute value of all other analysts' errors, and the difference between the two is divided by the average absolute value of all other analysts' errors (based on the 60 days before the report is published). The specific calculation formula is as follows:

$$Accuracy_{ijt} = \frac{AFE_{jt} - AFE_{ijt}}{AFE_{jt}}$$

$$AFE_{ijt} = FE_{ijt} - AE_{ijt}$$

Among them, FE_{ijt} is the earnings forecast of company j promoted by analyst i in year t, AE_{ijt} is the actual earnings of company j promoted by analyst i in year t, AFE_{ijt} is the absolute value of the deviation(AFE_{ijt}) of all analyst earnings forecasts of company j in year t. $Accuracy_{ijt}$ is an evaluation AFE_{jt} is the average of the absolute difference between earnings forecast and actual earnings, and AFE_{jt} to reduce the Homoscedasticity standard for the relative accuracy of prediction bias, divided by and heteroscedasticity of estimation. The value range of $Accuracy_{ijt}$ is $(-1,\infty)$. If $Accuracy_{ijt}$ is positive, it indicates that the analyst's forecast deviation for a certain company is higher than the average level of

the market forecast for that year; If it is negative, it indicates that the analyst's prediction deviation is lower than the market average. The smaller the value, the lower the deviation, and the better the prediction effect; If it is 0, it indicates that the average level of prediction deviation is the market average level; Specifically, when $Accuracy_{ijt}$ =-1, the analyst's prediction bias is zero.

2.2.2. Explanatory variable

The main explanatory variable of this article is Gender, which is the analyst's gender variable. Considering that there are many situations where analysts predict in the form of teams, this article sets the gender variable as: if it is an individual prediction by female analysts or a team prediction with female analysts participating (hereinafter collectively referred to as female analyst prediction), take 1; otherwise, take 0.

2.2.3. Controlling or regulating variables

Analyst bias is used as the dependent variable. According to existing literature, this article takes other main influencing factors of analyst prediction bias as control variables. The corresponding control or moderating variables reflect the personal characteristics of the analyst, the characteristics of the securities company to which the analyst belongs, the characteristics of the analyzed company, and external factors. The specific definition of explanatory variables is shown in Table 2.

Table 2 Definition of Control or Regulating Variables

Category	Name	Meaning
Characteristics of Analysts	Degree	Analyst degree, 0 for associate's degree, 1 for undergraduate degree, 2 for master's degree, and 3 for doctoral degree. The analyst team is based on the highest education level among its members.
	Experience	Analyst degree, 0 for associate's degree, 1 for undergraduate degree, 2 for master's degree, and 3 for doctoral degree. The analyst team is based on the highest education level among its members.
	CoNumber	Relative number of predicted companies: The average of the number of companies predicted by an analyst minus the number of companies predicted by all analysts of the same company. (60 days prior to the publication of the report shall prevail)
	Number	Relative Forecast Quantity: The average of a certain analyst's forecast minus all analyst forecasts for the same company as their forecast (based on the 60 days prior to the publication of the report)
Characteristics of listed companies	Opacity	The transparency of listed companies is subject to disclosure on the Shenzhen and Shanghai stock exchanges, with 4 being excellent, 3 being good, 2 being passed, 1 being failed, and 0 not included.
	CompanySize	The size of a listed company, i.e. the total assets of the listed company at the beginning of the year.

	AnaAttention	Analyst attention refers to how many analysts (teams) have conducted tracking analysis on the company in the past year, with a team size of 1, and the number of members is not separately listed.
	RepAttention	How many research reports have been tracked and analyzed by the company within the past year.
Characteristics of securities companies	ZqSize	The size of the securities company where the analyst works, based on the data at the end of last year.
External environment	Rm	Market return rate, based on the average daily return rate of the Shanghai Composite Index in the five trading days prior to the release of the research report.

2.3. Model establishment

To test the research hypotheses proposed in this article, three econometric regression models were involved to test hypotheses H1-H2 respectively, and grouped based on market trends and the size of the securities firms to test hypotheses H3-H4.

Accuracy□□$_0$ □□$_1$□Gender□□$_2$□Degree□□$_3$□Experience□□$_4$□CoNumber
□□$_5$□Number □□$_6$□Opacity□□$_7$ □CompanySize□□$_7$ □AnaAttention
□□$_8$□RepAttention□□$_9$□ZqSize □□ (1)

Accuracy□□$_0$ □□$_1$□Gender□□$_2$□Degree□□$_3$□Experience□□$_4$□CoNumber
□□$_5$□Number □□$_6$□Opacity□□$_7$ □CompanySize□□$_7$ □AnaAttention
□□$_8$□RepAttention□□$_9$□ZqSize □□$_{10}$□Gender□CoNumber □□ (2)

Accuracy□□$_0$ □□$_1$□Gender□□$_2$□Degree□□$_3$□Experience□□$_4$□CoNumber
□□$_5$□Number □□$_6$□Opacity□□$_7$ □CompanySize□□$_7$ □AnaAttention
□□$_8$□RepAttention□□$_9$□ZqSize □□$_{10}$□Gender□Number □□ (3)

In the above model, the dependent variable Accuracy represents the accuracy of analyst predictions, while Gender is the main explanatory variable. The measurement and meaning of other control variables have been elaborated in detail in the previous section.

3. Empirical analysis

3.1. Descriptive Statistics

Table 3 shows the descriptive statistical results of the main variables in this article. The total number of samples in this article is 32,035. Among them, the average accuracy is -0.0619, with a standard deviation of 0.870, indicating that the overall prediction deviation of Chinese analysts is relatively small, but there are significant differences and differences among analysts. The statistical results of analysts' personal characteristics such as educational level show that the average educational level is above 2, indicating that the average educational level of analysts in China is above a master's degree. It is expected that a master's degree will become an inevitable requirement for analysts to establish themselves in the securities analyst industry in the future. From the characteristics of listed companies, the average transparency is above 2, indicating that analysts in China prefer listed companies with good or higher levels of information disclosure. On average, 25 analysts or their teams issue 62 research reports on each listed company that is being followed in a year, and there is a significant difference in

attention among listed companies, indicating a significant degree of repeatability in the listed companies that analysts focus on. The standard deviation of the size of securities companies is 0.2578, indicating that this study covers listed companies of different sizes, which is beneficial for adding persuasiveness to the conclusions of this article.

This paper also further tested the correlation between various variables. The unlisted results show that the correlation between most variables is low, and the variance expansion coefficient (VIF) is far below 10, so it is ruled out that there is a possibility of serious Multicollinearity. Table 3 Descriptive Statistics

Variable	Obs	Mean	Std.Dev.	Min	Max
Accuracy	32,035	-0.0619	0.870	-5.250	1
Degree	32,035	2.123	0.407	0	3
Experience	32,035	0.0656	9.800	-35.16	57.10
CoNumber	32,035	-0.695	25.52	-179	312.9
Number	32,035	-0.751	108.6	-459	837.2
Opacity	32,035	2.437	0.556	0	3
CompanySize	32,035	0.0612	0.288	0.000374	3.939
AnaAttention	32,035	25.57	14.52	1	65
RepAttention	32,035	62.42	43.54	1	212
ZqSize	32,035	0.262	0.2578	0.001342	1.052962
Rm	32,035	0.0161	0.457	-1.545	1.972

3.2. Empirical testing

3.2.1. H1 test results - analyst gender and prediction bias

Without controlling for any variables and fixed effects, the gender differences in the mean values of each variable are shown in Table 4. The preliminary comparison results show that both male and female analysts' predictions are better than the market average, but there are indeed differences between male and female analysts' predictions. Male analysts have a smaller prediction bias, while female analysts have a prediction bias closer to the market average. From the perspective of personal characteristics, female analysts have lower educational qualifications, predicted numbers, and work experience than men, which may be due to the fact that female professionals start and develop later than men. From the selection of listed companies, female analysts tend to analyze listed companies with high levels of information disclosure, large company size, and high peer attention. From the perspective of affiliated securities companies, female analysts are more likely to work in large securities companies.

Table 4 Gender based mean differences

Variables	Male	Mean(M)	Female	Mean(F)	MeanDiff
Accuracy	20093	-0.0770	11942	-0.0370	-0.040***
Degree	20093	2.139	11942	2.096	0.043***
Experience	20093	0.466	11942	-0.608	1.074***
CoNumber	20093	0.600	11942	-2.874	3.474***
Number	20093	1.870	11942	-5.159	7.029***
Opacity	20093	2.426	11942	2.456	-0.030***
CompanySize	20093	0.0550	11942	0.0720	-0.017***
AnaAttention	20093	24.98	11942	26.57	-1.593***

RepAttention	20093	60.60	11942	65.49	-4.887***
ZqSize	20093	0.259	11942	0.267	-0.007**

Perform stepwise regression on model (1), and the test results are shown in Table 5. From the results in the table, it can be seen that both univariate regression and control variable regression have significantly positive coefficients for the gender variable Gender, indicating that in an environment where personal prediction bias is lower than the market, female analysts have a greater prediction error than males. From the results of model 3, with Ceteris paribus, the relative prediction deviation of female analysts is 3.19 basis points higher than that of male analysts.

Table 5 Regression test results of H1

	(1)	(2)	(3)
Gender	0.0403***		0.0319***
	(0.0101)		(0.0101)
Degree		-0.0228*	-0.0207*
		(0.0120)	(0.0120)
Experience		-0.0008	-0.0007
		(0.0007)	(0.0007)
CoNumber		-0.0010***	-0.0010***
		(0.0003)	(0.0003)
Number		0.0002***	0.0002***
		(0.0001)	(0.0001)
Opacity		-0.0126	-0.0129
		(0.0092)	(0.0092)
CompanySize		0.0004	-0.0005
		(0.0172)	(0.0172)
AnaAttention		0.0050***	0.0050***
		(0.0009)	(0.0009)
RepAttention		-0.0005	-0.0005
		(0.0003)	(0.0003)
ZqSize		-320.7714*	-328.5460*
		(188.3437)	(188.3334)
_cons	-0.0769***	-0.0739**	-0.0883**
	(0.0061)	(0.0343)	(0.0346)
N	32035	32035	32035
R2	0.0005	0.0043	0.0046
F	16.1024	15.3529	14.8201
p	0.0001	0.0000	0.0000

From the perspective of controlling variables for analysts' personal characteristics, the degree of an analyst is significantly negatively correlated with prediction bias, indicating that an improvement in education does help enhance the analyst's research ability and judgment. The number of analysts' predictions is significantly negatively correlated with prediction bias, but the number of predicted companies (CoNumber) is significantly negatively correlated with prediction bias, indicating that analysts can gain experience from extensive analysis of multiple listed companies to guide the next

listed company and improve the accuracy of analysis and prediction. Simply writing more research reports can only lead to a decrease in prediction accuracy. In terms of controlling variables for listed companies, receiving more attention from analysts can help improve the accuracy of analysts' predictions for the company. In terms of the variables controlled by the securities company to which the analyst belongs, the coefficient of the size of the securities company is significantly negative. Due to the good reputation and abundant resources of large-scale securities companies, the accuracy of predictions is higher than that of large-scale securities companies.

3.2.2. H2 test results - moderating effect of predicted quantity

The empirical results of hypothesis H2 are shown in Table 6. From Table 6, it can be seen that both the interaction term between gender and the number of companies predicted by analysts, as well as the interaction term between gender and the number of analysts predicted, have significantly negative coefficients, indicating that female analysts can exercise their research abilities, make up for their shortcomings, and improve the accuracy of future predictions by increasing the number of predictions. It is worth noting that in column 2, the coefficient of the predicted quantity control variable is significantly positive, but its interaction with gender is significantly negative, indicating that an increase in the predicted quantity alone will reduce the accuracy of analyst earnings prediction, but it will improve the accuracy of earnings prediction for female analysts. This may be due to female analysts being more able to think and summarize experiences and methods from the amount of research report writing to improve their prediction accuracy, rather than mechanical office work.

Table 6 Regression test results for H2

	(1)	(2)
Gender	0.0299***	0.0311***
	(0.0101)	(0.0101)
Gender_CoNumber	-0.0012***	
	(0.0004)	
Gender_Number		-0.0003***
		(0.0001)
ZqSize	-329.1357*	-330.8902*
	(188.3108)	(188.3144)
Degree	-0.0199*	-0.0205*
	(0.0120)	(0.0120)
Experience	-0.0007	-0.0007
	(0.0007)	(0.0007)
CoNumber	-0.0006*	-0.0011***
	(0.0003)	(0.0003)
Number	0.0003***	0.0004***
	(0.0001)	(0.0001)
Opacity	-0.0126	-0.0124
	(0.0092)	(0.0092)
CompanySize	-0.0013	-0.0023
	(0.0172)	(0.0172)

AnaAttention	0.0050***	0.0050***
	(0.0009)	(0.0009)
RepAttention	-0.0005	-0.0005
	(0.0003)	(0.0003)
_cons	-0.0908***	-0.0901***
	(0.0346)	(0.0346)
N	32035	32035
R2	0.0049	0.0049
F	14.2675	14.2084
p	0.0000	0.0000

3.2.3. H3-H4 Test Results - Heterogeneity Analysis of Market Situation and Securities Firm Size

This article divides the average market returns of the five trading days prior to the publication of the research report into positive and negative categories, aiming to verify the impact of market trends on the relationship between analyst gender and prediction bias. The empirical results are shown in columns 1 and 2 of Table 7. The coefficient of gender variables is significantly positive in both market trends, and the coefficient of gender variables is greater in bear markets. The hypothesis H3 of this article is confirmed, that is, when considering market situation scenarios, the impact of gender differences on analyst prediction bias is more pronounced in bear markets. Compared to when market sentiment is high, the phenomenon of information asymmetry in bear markets is more widespread, and female analysts are more affected by pessimistic sentiment, resulting in more severe prediction biases. Considering the concentration of top securities firms, this article divides the securities firms in the sample into large securities firms (in the top 20% of the total) and general securities firms (in the bottom 80% of the total), aiming to verify the impact of securities firm size on the relationship between analyst gender and prediction bias. The empirical results are shown in columns 3 and 4 of Table 7. Gender variables are negatively correlated but not significantly correlated with prediction bias in large securities firms, while they are significantly positively correlated in general securities firms. The hypothesis H4 in this article confirms that the impact of gender differences on analyst prediction bias is more significant when the size of securities firms is small, and larger securities firms have richer information resources and more complete company supporting mechanisms, which to some extent weakens the prediction differences caused by analyst gender.

Table 7 Regression test results for H3

	(1)	(2)	(3)	(4)
	Market1	Market0	ZqBig1	ZqBig0
Gender	0.0299**	0.0336**	-0.0145	0.0437***
	(0.0144)	(0.0141)	(0.0231)	(0.0112)
Degree	-0.0032	-0.0411**	-0.0065	-0.0243*
	(0.0166)	(0.0173)	(0.0272)	(0.0134)
Experience	-0.0008	-0.0007	0.0018	-0.0013*
	(0.0010)	(0.0010)	(0.0017)	(0.0008)

CoNumber	-0.0011**	-0.0008*	-0.0010	-0.0009***
	(0.0005)	(0.0005)	(0.0008)	(0.0004)
Number	0.0002**	0.0002	0.0002	0.0002**
	(0.0001)	(0.0001)	(0.0002)	(0.0001)
Opacity	-0.0106	-0.0151	-0.0125	-0.0127
	(0.0130)	(0.0130)	(0.0208)	(0.0102)
CompanySize	-0.0242	0.0149	0.0273	-0.0083
	(0.0271)	(0.0222)	(0.0360)	(0.0196)
AnaAttention	0.0050***	0.0050***	0.0023	0.0057***
	(0.0013)	(0.0013)	(0.0022)	(0.0010)
RepAttention	-0.0003	-0.0006	0.0002	-0.0006*
	(0.0004)	(0.0005)	(0.0007)	(0.0003)
ZqSize	-392.8616	-268.9334	325.9472	-689.4664*
	(271.7274)	(260.8375)	(647.1649)	(417.8123)
_cons	-0.1508***	-0.0185	-0.1201	-0.0857**
	(0.0487)	(0.0492)	(0.0908)	(0.0386)
N	16370	15665	6407	25628
R2	0.0052	0.0042	0.0028	0.0056
F	8.6271	6.6805	1.7664	14.5297
p	0.0000	0.0000	0.0611	0.0000

3.3. Robustness testing

3.3.1. Replace the dependent variable

This article tests the robustness of the model by replacing the dependent variable, replacing the relative prediction bias of analysts with absolute prediction bias, and testing for systematic errors caused by other analyst prediction biases. In order to avoid the Plus–minus sign effect of the difference between the predicted value and the actual value, this paper takes the absolute value of the deviation, making this variable a one-way variable. The smaller the value, the more accurate the analyst's prediction. The specific calculation formula for $|$ absolute deviation is as follows: $AFEijt = |FEijt - AEijt|$ Among them, FE_{ijt} is the earnings forecast of company j promoted by analyst i in year t, and AE_{ijt} is the actual earnings of company j promoted by analyst i in year t.The stepwise regression results are shown in columns 1-3 of Table 8, indicating that there is no significant change in the results of each variable, indicating the robustness of the above research conclusions in the article.

3.3.2. Subsample regression

Due to the fact that the sample data in existing literature shows a characteristic of analyst relative prediction deviation greater than 0, that is, the analyst prediction deviation is greater than the market average. Therefore, this article intercepts sub samples with analyst relative prediction deviation greater than 0 for re regression. The regression results are shown in Table 8, Column 4, and it can be seen that the gender variable is still significantly negative. The conclusion of this article is still robust and valid.

Table 8 Robustness Test Regression Results

	(1)	(2)	(3)	(4)

Gender	0.0515***		0.0444***	0.0086*
	(0.0112)		(0.0111)	(0.0046)
Degree		-0.0197	-0.0167	-0.0150***
		(0.0131)	(0.0131)	(0.0056)
Experience		0.0001	0.0003	0.0002
		(0.0008)	(0.0008)	(0.0003)
CoNumber		0.0009**	0.0010***	-0.0002
		(0.0004)	(0.0004)	(0.0002)
Number		-0.0002*	-0.0002**	0.0000
		(0.0001)	(0.0001)	(0.0000)
Opacity		-0.2249***	-0.2253***	-0.0162***
		(0.0100)	(0.0100)	(0.0042)
CompanySize		-0.1301***	-0.1314***	-0.0008
		(0.0189)	(0.0189)	(0.0082)
AnaAttention		-0.0090***	-0.0090***	-0.0012***
		(0.0010)	(0.0010)	(0.0004)
RepAttention		0.0066***	0.0066***	0.0004**
		(0.0003)	(0.0003)	(0.0001)
ZqSize		42.0637	31.2597	40.0762
		(206.2928)	(206.2619)	(86.3272)
_cons	0.4898***	0.9232***	0.9032***	0.4598***
	(0.0068)	(0.0376)	(0.0379)	(0.0160)
N	32035	32035	32035	17768
R2	0.0007	0.0383	0.0388	0.0022
F	21.1312	141.6385	129.1426	3.9964
p	0.0000	0.0000	0.0000	0.0000

4. Research Conclusion and Countermeasure Suggestions

4.1. Research Conclusion

The research reports and earnings forecasts of securities analysts provide incremental information for the market, which helps to enhance the effectiveness of the capital market. This paper takes the gender of analysts as the starting point, and uses the group of securities analysts from 2019 to 2020 as the research object to test whether the accuracy of earnings forecast of securities analysts is different due to the quotation of analysts' gender. The main conclusions of this paper are as follows.

Firstly, the overall accuracy of analyst earnings forecasts is significantly correlated with gender. Under the overall good accuracy and small deviation of earnings prediction by sample analysts, the accuracy of earnings prediction by female analysts is closer to the market average, while the accuracy of earnings prediction by male analysts is higher than that of women.

Secondly, the increase in the number of female analysts predicting and predicting companies will weaken the impact of gender differences on the accuracy of earnings forecasts. This indicates that compared to men, female analysts are more able to summarize experience and improve themselves

from the accumulation of past prediction quantities, in order to improve the accuracy of their earnings prediction and reduce the negative impact of gender differences on the accuracy of earnings prediction. Thirdly, considering market trends, the impact of gender differences on the accuracy of analyst earnings forecasts is more pronounced in bear markets. This indicates that compared to when market sentiment is high, the phenomenon of information asymmetry in bear markets is more widespread, and female analysts are more severely affected by pessimistic sentiment, leading to prediction bias.

Fourthly, there is a strong gender difference in the accuracy of earnings forecasts for analysts working in small securities firms, while there is no significant relationship between the accuracy of earnings forecasts for analysts working in large securities firms and their gender. This indicates that larger securities firms have richer information resources and more complete company supporting mechanisms, which to some extent weakens the prediction differences caused by analyst gender.

4.2. Policy recommendations

The research conclusion of this article has important guiding significance for analysts to improve the accuracy of their earnings forecasts and for investors to rationally refer to research reports, which helps investors to more accurately identify and select analysts and their reports, It also helps female analysts, as a minority group, to have a clearer understanding of the gender differences in securities analysts' ability to predict information and behavioral patterns, thus enabling them to take targeted measures.

Firstly, investors should rationally refer to analyst predictions. With the development of the analyst industry, the overall deviation between research reports and earnings forecasts issued by analysts is relatively small, which has certain reference value for investors. However, there are significant differences in the accuracy of earnings forecasts among analysts, and investors should rationally refer to the results of analyst forecasts. Investors themselves should also have some basic knowledge and analytical skills in securities investment decision-making. While referring to analyst research reports and predictive data, they must still combine their own calm and dialectical thinking to distinguish the credibility of analyst reports, screen useful and logically clear parts for themselves, and make decisions based on analyst suggestions and their own judgment.

Secondly, analysts should comprehensively improve their analytical skills. Analysts predict that there will still be mixed trends in the report. Based on investors' trust in analysts, analysts should continuously improve their professional level and personal qualities. For example, male analysts should pay more attention to the guiding significance of past prediction experience for the future, while female analysts should continuously strengthen their ability to obtain information sources, try to obtain the necessary information from more channels and fields, and add evidence for their own analysis and judgment.

References

Yi Zhihong, Li Ying, Jiang Xuanyu. Female Analyst Attention and Stock Price Synchronization, Financial Research, (2015)11, 175-189.

Li Ying, Yi Zhihong. Can female analysts better predict the risk of stock price collapse, Economic and Management Research, (2017)38, 6, 124-136.

Lv Zhaode, Zeng Xuehan. Securities analysts' gender, earnings forecast deviation and correction ability, Journal of Beijing Technology and Business University, Social Science Edition, (2016) 31, 5, 77-86.

Fang L. H, and S. Huang. Gender and Connections among Wall Street Analysts, Review of Financial Studies, (2017)30, 9, 3305-3335.

Clement M B. Analyst Forecast Accuracy: Do Ability, Resources, and Portfolio Complexity Matter. Journal of Accounting and Economics, (1999), 27, 3, 285-303.

Fan Zheng, Song Le. Analyst Characteristics, Scale of Securities Firms, and Profit Forecast, Chinese Certified Public Accountant, (2010)7, 45-50.

Wang Yaowen. Empirical Analysis on the Relationship between the Characteristics and Prediction Accuracy of Securities Analysts in China, Financial Theory and Practice, (2013)7, 91-95.

Shi Xianwang, Li Zhigang, Liu Zheng. Differences in individual characteristics of analysts and prediction accuracy, Friends of Accounting, (2015)512, 8, 53-58.

Li Liqing. Is the Best Analyst selected by New Wealth trustworthy—— Empirical evidence Based on Accuracy of Earnings Forecast and Forecast Correction of Market Reaction, Investment Research, (2012)31, 7, 54-64.

Xu Nianxing, Jiang Xuanyu, Yi Zhihong, Xu Xinzhong. Analyst Conflict of Interest, Optimistic Bias, and the Risk of Stock Price Collapse, Economic Research, (2012)47, 7, 127-140.

John C. Easterwood, Stacey R. Nutt Inefficacy in Analysts' Earnings Forecasts: Systematic Misinterpretation or Systematic Optimism? The Journal of Finance, (1999), 54, 5.

Li Yue, Wang Chao. Factors Influencing the Accuracy of Earnings Forecast of Chinese Securities Analysts -- Evidence from China's Stock Market. Journal of Shanxi University of Finance and Economics, (2011), 33, 11, 19-25.