

# Short Term Investment Rating Forecast

-- Based on Outlook Attribute Factors

**Qin Guo**

School of Economics and Management, Chongqing University of Posts and Telecommunications, Chongqing, 400065, China

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**Abstract:** The stock market has been in unpredictable, in view of the stock market dynamic forecast and investment prospect value quantitative problem, this paper plans to forward segment regression method, with one year for experimental period, quarter as the time window, dynamically select the window period investment prospect attribute factor, forecast the investment prospect of the next quarter, and through the entropy right Topsis method sorting quantitative investment prospect value, rating the stock. The rating is divided into 5 grades and 13 levels, and then the investment portfolio is constructed according to the rating level and the asset quality indicators are selected to test. The results show that the dynamic investment rating method based on the prospect attribute factor has a certain investment rating prediction role in the short term, and plays a certain reference role for investors' decision-making.

**Keywords:** Investment prospects, Forward segment regression, Entropy right Topsis, Investment rating forecast.

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## 1. Introduction

Since the 21st century, China's capital market has been in the process of continuous development and improvement. According to relevant statistics, by the end of June 2020, the circulating market value of Shanghai and Shenzhen stock markets is 52.1 trillion yuan, and the number of investor accounts is 480 million [1], It can be seen that China's investment market and investment group scale are very large. Investors are mainly divided into two categories, one is institutional investors, the other is retail investors, the old number of institutional investors is low, and most of the retail investors, retail relative to institutional investors, financial knowledge and investment experience, also lack of scientific and rational decisions, most retail investors do not have the ability of stock data analysis, in the overall information disadvantage[2]. At the same time of a large number of investors, analysis institutions also emerged. Their stock earnings forecasts and investment rating reports for individual stocks are important ways for investors, especially retail investors, to obtain information. Such data provide investors with investment decisions such as buying and selling stocks. Investors can get more useful information by reading the earnings forecasts and investment ratings in the analysts' reports, and by observing the analysts' tracking behavior[3].

Stock investment rating is also known as analyst rating, which generally refers to the prediction of institutions or independent analysts on the future investment surplus of the analysis subject, through quantitative factor model, calculate scores and issue research reports to provide decision-making suggestions for investors. At present, Wind comprehensive rating is one of the more mature ratings in China. The release of its rating data is in the form of signing contracts with investment analysis institutions, which is expensive, and there is no clear information about the whole process of rating [4] And most companies are not rated. Therefore, the purpose of this paper is to quantify the investment prospect value and forecast the investment rating through the comprehensive public market information and objective market data, so as to provide scientific and effective investment decision analysis

for investors, especially retail investors. Second, because the stock market has always been volatile, it is difficult to predict it accurately. This paper provides a dynamically adjusted quantitative investment foreground value method, which dynamically finds the factors related to the investment rating by the forward segment regression method, and calculates the investment foreground value as the foreground attribute factor. Taking the quarter as the time window, the investment prospect attribute factor of the previous quarter is used to dynamically predict the investment prospect value of the next quarter, rather than using fixed factor. factor selection has certain universality and elasticity, which is more in line with the multiple changing characteristics of the stock market.

## 2. Foreground Attribute Factor Screening

This paper uses the forward segmentation regression method to fit the factors of the independent variables of the next quarter and the W ind of the next quarter and the factors of the next quarter to fit the factors in the experimental period, and then obtains the prospect attribute factor of the next year.

### 2.1. Sample Selection

In this chapter, it takes manufacturing companies as a sample, selects the quarterly financial data of A-share listed companies in 2017-2019, excluding ST's ST and \* ST enterprises, as well as enterprises with missing financial data and Wind comprehensive rating data, and obtains a total of 352 enterprises, data sources and Wind database.

#### 2.1.1. Factor Set Construction

Reviewing the historical literature, there are two main measures of investment rating. One is to verify the investment rating through stock yield, and the other is through the factors of business operation. In 1981, Rolf and Banz found through empirical research that the portfolio yield with the largest stock market value was lower than the portfolio yield with the smallest stock market value, confirming for the first time the scale effect of the U. S. stock market[5], Domestic scholars Chen Can and Zhao Mengxue also found that there is scale effect in Chinese stock market through demonstration[6-7].

For value factors and financial factors and stock returns, both at home and abroad scholars have different conclusions, Fama and French in 1993 put forward the famous three-factor asset pricing model, explain the phenomenon of risk return excess return, they are looking for the factor affecting stock yields found that the reciprocal of price-to-book ratio, p-earnings ratio can explain the difference in most stock returns [8]. The business operation status of enterprises will also have an impact on stock returns. Edirisinghe found through research that the investment value of enterprises is also reflected in

four aspects: development ability, profitability, operation ability and solvency [9]. Pan Heping established a comprehensive financial evaluation system of the company's internal value from five aspects: solvency, operation ability, development ability, profitability and investment return ability, so as to study the investment value of the enterprise [10]. In this chapter, a total of 25 factors are selected to construct independent variable factor candidates. The specific factor indicators are shown in the table below. The dependent variable is the comprehensive rating in the Wind database.

**Table 1.** The candidate set of independent variable factors

Independent variable factor type		Independent variable factor name			
Scale factor	Total market value	Circulation market value			
Value factor	pe ratio	Price-to-book ratio	City rate	City sales rate	
Growth factor	Year-on-year growth rate of operating revenue	Earnings per share growth rate	Year-on-year growth rate of operating profit	Year-on-year growth rate of cash flow generated from operating activities	Net profit year-on-year growth rate
Momentum factor	Price momentum for the last 10 days	Price momentum for the last 20 days	Price momentum for the last 60 days	Price momentum for the last 120 days	
Market predictors	Consistent forecast of net profit	Consistently forecast earnings per share			
Profit factor	Return on equity	rate of return on total assets	earnings per share	net profit rate	
Operation class factor	inventory turnover ratio	turnover of total capital			
Debt repayment factor	quick ratio	asset-liability ratio			

## 2.2. Foreground Attribute Factor Filter

### 2.2.1. Data Preprocessing

In order to eliminate some extreme value interference, the data needs to be depolarized, and the MAD method is selected for extreme value processing in this chapter. At the same time, because the selected factors have different magnitude, the factor data need to be standardized in order to compare the data of different magnitude.

### 2.2.2. Factor Screening

1. Introduction to the forward piecewise regression methods

The forward stepwise regression algorithm is a method to calculate the best regression coefficient after multiple iterations. In each iteration, a certain weight is added or reduced, observe the error rate changes, and choose the direction with little influence on the error. This method is suitable for processing high-dimensional data and can avoid multiple collinearity between factors [11] However, in this method, we need to go through multiple passes and update the factor coefficients to find the factors related to the response variable. The specific steps are as follows

(1) Build the independent variable matrix and the response variable matrix  $XY$

$$X = [x_1 x_2 \dots x_m] = \begin{bmatrix} x_{11} & \dots & x_{1m} \\ \vdots & \ddots & \vdots \\ x_{n1} & \dots & x_{nm} \end{bmatrix}, Y = \begin{bmatrix} y_1 \\ y_2 \\ \vdots \\ y_n \end{bmatrix} \quad (1)$$

(2) Data standardization

The independent variable matrix was normalized, and the dependent variable matrix was centralized

(3) Key parameters of the initialization model

$a_1, a_2, \dots, a_m = 0a_i$  Initializes the coefficients of all feature variables in the model to zero, i. e., where (i =1,2,..., m) is the coefficient of the i-th variable. The model residual, e is initialized as follows:

$$e = y - \bar{y} \quad (2)$$

$$\bar{y} = \frac{\sum_{i=1}^n y_i}{n} \quad (3)$$

(4) Look for the characteristic variables most related to the current residuals.

$x_j \in R^n$  First, solve each input feature variable (j=1,2,..., m)

Correlation coefficient with the current residual  $e$ , with the following formula:

$$\text{corr}(x_j, e) = \frac{\text{cov}(x_j, e)}{\sqrt{\text{var}[x_j] \text{var}[e]}} \quad (j=1, 2, \dots, m) \quad (4)$$

By traversing the correlation coefficient with the residue of each feature variable, find the variable most associated with the current residue, when the correlation coefficient between the factor and the residue  $e$  is, and has = max.

$$\{ \text{corr}(x_1, e), \text{corr}(x_2, e), \dots, \text{corr}(x_m, e) \}$$

(5) Update the coefficients and residues of the feature variables.

$x_i a_i = a_i + \delta_i \delta_i \varepsilon \cdot \text{sign}(\text{corr}(x_i, e)) \varepsilon$  The updated coefficients, where  $\delta_i$  are arbitrarily small step sizes, for

example  $= 0.01$ , update residue  $= \varepsilon e - \delta_i \cdot x_i$

(6) Repeat steps 4 and 5 until any feature variables are associated or minimal to the current residue.

## 2. Foreground Attribute Factor Screening

This chapter depolarity and standardizes the resulting 25 independent variable factor matrix  $X$ . The Wind composite rating with the next quarter is the dependent variable matrix  $Y_{t+1}$ . Enter the forward segment regression model for factor screening, select  $= 0.001$  as the iteration step in the algorithm, predict the 2019 forward value as an example, fit the independent variable factor of the fourth quarter of 2018 and the first quarter of 2019 Wind for four times, and select the factor with repetition rate of more than 75% is selected as the foreground attribute factor in this time window. The resulting prospect attribute factor and forward segment regressor coefficient are shown in Table 2 below.

**Table 2.** Foreground attribute factors and factor coefficients

	pe ratio	Price-to-book ratio	increase rate of business revenue	Growth rate of net cash flow in operating activities	Price momentum for the last 120 days	Consistently forecast earnings per share	Return on equity
1812	0.192	0.229	-0.037		-0.003	-0.002	-0.309
1903	0.751	1.446	-0.109	-5.005	-0.005	-0.053	-0.085
1906	0.571		-0.47	-0.601		-0.042	-0.249
1909	1.2105	0.3945	-0.083	-2.621	-0.013	-0.03	-0.5705
Select the rate	100%	75%	100%	75%	75%	100%	100%

As can be seen from the above table, from the fourth quarter of 2018 to the third quarter of 2019, the consistent forecast of earnings per share, return on equity, operating income growth rate, and p/E ratio probability were all 100%, indicating that these three factors showed a high correlation with Wind rating during this period. The price/E ratio and price/book ratio, the higher the price/E ratio and price/book ratio, the higher the score, the lower the rating; the operating revenue growth rate, cash flow growth rate of operating activities, price momentum, consistent forecast earnings per share and return on equity preference, and the larger these factors, the lower the rating score, the higher the rating grade, the factors selected in the above table are defined as the prospect attribute factors in this period.

## 3. Investment Outlook Value Calculation and Investment Rating Forecast

Since there is no definite function relationship between the prospect attribute factor and the investment rating, it is necessary to quantify the investment prospect according to reflect the investment rating of the prospect attribute factor to provide investors with more intuitive decision-making suggestions. Entropy right Topsis first calculates the index weight according to the entropy weight method, and then calculates the score through Topsis. This method makes full use of the original data information, and the results can accurately reflect the gap between the evaluation schemes, and there is no strict limit on the data distribution and sample content.

### 3.1. Calculation of the Foreground Attribute Factor Weight

Entropy weight method is an objective empowerment method, which can avoid the interference of subjectivity to the experimental results. Its main idea is to make objective weight empowerment according to the variability of each index. Generally speaking, the smaller the information entropy of a certain index, the greater the degree of variation of the index, the greater the influence it can play in the comprehensive evaluation, and the greater the corresponding weight. The entropy weight method is calculated as follows

(1) The entropy value of each indicator is calculated, as shown in the formula (5)

$$e_j = -k \sum_{i=1}^n p_{ij} \ln p_{ij}, \quad (j = 1, 2, \dots, m) \quad (5)$$

$p_{ij} = \frac{x_{ij}}{\sum_{i=1}^n x_{ij}}, k = \frac{1}{\ln n}, x_{ij}$  represents the  $j$  index value of each  $i$  enterprise,  $m$  represents the number of index value, and  $n$  represents the number of enterprises.

(2) The entropy weight of each index factor is calculated, and the formula is shown in (6)  $w_j$

$$w_j = \frac{1 - e_j}{m - \sum_{j=1}^m e_j} \quad (6)$$

Through the above steps, the weight set of each index can be obtained, which can reflect the objective weight size of each index. The entropy right method has been applied to many fields. Chen Xiaoxin uses the entropy right Topsis method to select indicators for comprehensive evaluation of

white liquor listed companies. The evaluation results show that the objective weight is more effective for the performance level of rating enterprises [12]. Zhang Mei et al. applied the entropy right method to the science and technology rating system reflected in the scientific outlook on development, and established a comprehensive evaluation model of science and technology [13]. Based on the relevant literature, the entropy right Top sis multi-attribute decision analysis method is

selected to calculate the comprehensive score of each enterprise and take this as the prospect value of the enterprise to quantify the investment prospect.

Taking the predicted 2019 foreground value as an example, the weights of each foreground attribute factor calculated by the selected foreground attribute factors according to the above steps are shown in Table 3.

**Table 3.** Four quarter quarter quarter property for four factors

	pe ratio	Price-to-book ratio	increase rate of business revenue	Growth rate of net cash flow in operating activities	Price momentum for the last 120 days	Consistently forecast earnings per share	Return on equity
1812	0.089531	0.051943	0.155783	0.079334	0.463861	0.100514	0.059033
1903	0.134334	0.054837	0.200067	0.031274	0.267414	0.071451	0.240623
1906	0.022731	0.047549	0.1931	0.075389	0.370872	0.055013	0.235346
1909	0.060543	0.041456	0.24107	0.049277	0.285182	0.065667	0.256804

Next, a descriptive statistical analysis of the prospect attribute factor weights from Q18 to Q19 is shown in Table 4

**Table 4.** Descriptive statistical analysis of foreground attribute factor weights

	pe ratio	Price-to-book ratio	increase rate of business revenue	Growth rate of net cash flow in operating activities	Price momentum for the last 120 days	Consistently forecast earnings per share	Return on equity
mean	0.076785	0.048946	0.197505	0.058819	0.346832	0.073161	0.197951
variance	0.047117	0.005823	0.03495	0.022695	0.090151	0.019465	0.093061
least value	0.022731	0.041456	0.155783	0.031274	0.267414	0.055013	0.059033
median	0.075037	0.049746	0.196584	0.062333	0.328027	0.068559	0.237984
crest value	0.134334	0.054837	0.24107	0.079334	0.463861	0.100514	0.256804
Observations	4	4	4	4	4	4	4

As can be seen from the above table, the weights of the seven foreground attribute factors are relatively stable. Combining the weight information of the four quarters, the

final weight of the most median foreground attribute factor is finally selected to get the following table

**Table 5.** Foreground Attribute Factor Weight

	pe ratio	Price-to-book ratio	increase rate of business revenue	Growth rate of net cash flow in operating activities	Price momentum for the last 120 days	Consistently forecast earnings per share	Return on equity
weight	0.076785	0.048946	0.197505	0.058819	0.346832	0.073161	0.197951

### 3.2. Investment Outlook Value Is Calculated By Rating and Forecast

The Topsis method was developed in 1981 by Wang C.L. And the Yoon K.S. For the first time, it is a sort method to approximate the ideal solution [14]. The method needs to determine the positive and negative ideal solution, positive ideal solution for the optimal solution of each factor, negative ideal solution for the worst solution of each factor, and then calculate the distance between the positive ideal point and the negative ideal point, finally calculate the evaluation object to the relative proximity of the positive ideal point of the comprehensive score, the specific steps are shown in the figure below.

The initial decision matrix is constructed for the set of evaluation objects and rating indicators as follows  $A = \{a_i\}, i = 1, 2, \dots, n$   $C = \{c_j\}, j = 1, 2, \dots, m$

$$X = \begin{bmatrix} x_{11} & \cdots & x_{1m} \\ \vdots & \ddots & \vdots \\ x_{n1} & \cdots & x_{nm} \end{bmatrix}$$

$x_{ij}$  represents the  $j$  index value of each  $i$  enterprise,  $m$  represents the number of index value, and  $n$  represents the number of enterprises.

Decision matrix normalization.

Since there are indicators of different dimensions in the decision matrix, in order to eliminate the influence of different dimensions on the calculation results, the matrix should first be normalized, and the normalized matrix  $B = \{B_{ij}\} n \times m$  is obtained after processing by formula (7)

$$b_{ij} = \frac{x_{ij} - \min_j x_{ij}}{\max_j x_{ij} - \min_j x_{ij}} \quad i = 1, 2, \dots, n, j = 1, 2, \dots, m \quad (7)$$

Determine the positive and negative ideal solutions.  $Q^+ Q^-$   
 $Q^+ = (b_1^+, b_2^+, \dots)$

$$= \left\{ \left( \max_i b_{ij} \mid j \in J^+ \right), \left( \min_i b_{ij} \mid j \in J^- \right) \mid i = 1, 2, \dots, n \right\}$$

$$Q^- = (b_1^-, b_2^-, \dots) \\ = \left\{ \left( \max_i b_{ij} \mid j \in J^- \right), \left( \min_i b_{ij} \mid j \in J^+ \right) \mid i = 1, 2, \dots, n \right\}$$

$J^+J^-$  Among them is the income index, is the cost index. The bigger the income index, the better, and the smaller the cost index, the better.

The weight of each index is calculated according to the entropy weight method  $w_j$

The Eucandean weighted distance between the positive and negative ideal solutions is calculated for each evaluation object

$$D^+ = \sqrt{\sum_{j=1}^m w_j (b_{ij} - b_j^+)^2} \quad i = 1, 2, \dots, n \quad (8)$$

$$D^- = \sqrt{\sum_{j=1}^m w_j (b_{ij} - b_j^-)^2} \quad i = 1, 2, \dots, n \quad (9)$$

Calculate the relative closeness of the rating object to the ideal solution  $C_i$

$$C_i = \frac{D^-}{D^- + D^+} \quad (10)$$

$C_i$  Order each rating object according to the size, the larger the value, the higher the evaluation object score.  $C_i$

According to the weights of each factor in Table 3.3, according to the above steps, each factor is divided into cost indicators and benefit indicators. According to Table 2, the price / E ratio and book ratio preference direction are cost indicators; operating income growth rate, cash flow growth rate in operating activities, price momentum in the past 120 days, consistent forecast earnings per share and return on equity preference direction are benefit indicators. Then, the set of positive and negative ideal solutions is constructed and the distance from 352 enterprises to positive ideal and negative ideal solutions is calculated respectively. Finally, the proximity of each enterprise to the positive ideal solution from the fourth quarter of 2018 to the third quarter of 2019, that is, the comprehensive evaluation score of the fourth quarter of 18 is taken as the prospect value of the first quarter of 19, and so on, the cumulative distribution of the comprehensive evaluation score of four quarters, namely the investment prospect value, is as follows.

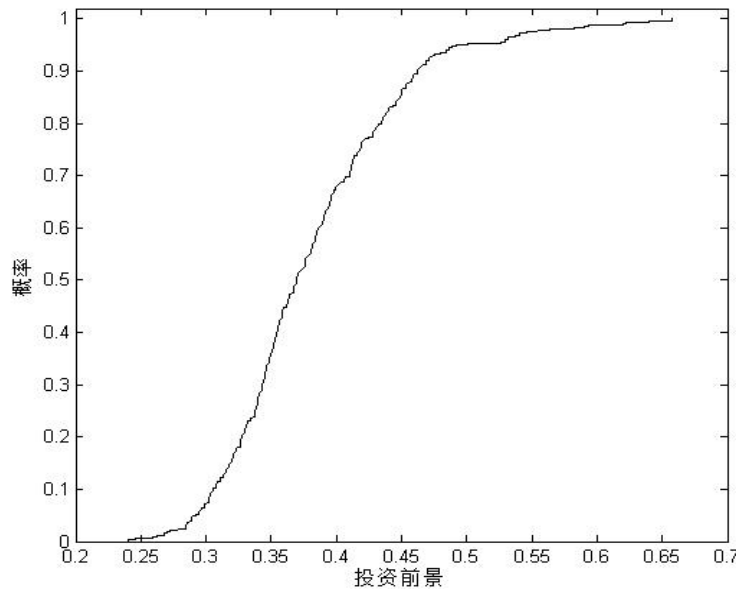


Figure 1. Cumulative probability distribution chart of investment prospect

Observation can be seen from figure 1 investment prospect value is mainly distributed between 0 and 0, and the distribution is uniform, prospect value above 0 and below 0 companies accounted for about 10%, thus the enterprise actual prospect distribution between span, according to establish investment level is not only focused on optimistic rating, it is also more in line with the actual situation of the stock market, such as previously found that analysts release investment rating will be affected by institutional shareholding, the higher the shareholding the more inclined

to issue optimistic rating[15], Xu Xinyi, Leung Shangkun and others have also proved that underwriting relations, analysts' reputation and insider control will all stimulate analysts to issue optimistic ratings[16-17]It shows that the investment rating report issued by the analyst lacks a certain objectivity, and the prospect value calculated according to the method of this paper suggests that the investment rating is more objective from the probability distribution.

Descriptive statistical analysis of the four quarters gives the following table 6

Table 6. Descriptive statistical analysis factor weighting of investment prospect value

	1806	1903	1906	1909
mean	0.376836	0.442334	0.361647	0.371782
variance	0.059358	0.043844	0.078234	0.061349
least value	0.240059	0.337684	0.234784	0.260864
median	0.368174	0.435122	0.33871	0.357693
crest value	0.563666	0.586032	0.657812	0.749097
Observations	352	352	352	352

As can be seen in the above table, the overall level of the investment outlook value of each enterprise in the first quarter of 2019 is higher than that of other quarters, while the overall level of the other three quarters is not much different, and the distribution of the outlook value of each quarter is around the average, with little fluctuation.

## 4. Forecast Test of Investment Rating

This chapter according to the previous chapter of four quarters of investment prospect value, each quarter according to the outlook value from high to low, due to the W ind comprehensive rating stock rating is divided into five categories, 13 levels, so the investment prospect value is divided into 13 groups to build portfolio, and select the portfolio asset quality inspection index for inspection.

### 4.1. Selection of Predictive Test Indicators

Reviewing the relevant literature, this paper selects performance indicators: interval return; performance evaluation indicators: annualized volatility, A lpha, B eta, Sharp ratio, Jensen index to test the portfolio constructed by 13 investment levels.

Range reporting rate: for the investment income obtained by investors in the investment range segment, the higher the general range return, the higher the return brought by the portfolio;

Annualized volatility: The larger the annualized volatility value, the return is far from the past average, and the return is unstable, the higher the risk, the smaller the general annualized volatility, the combined return is stable and the less the risk.

Alpha value: it represents non-systemic risk, namely excess return, which has nothing to do with market fluctuations, not by systemic rise. The higher the A lpha, the higher the excess return obtained by the investment strategy.

Beta value: represents systemic risk, that is, the sensitivity of investment strategy performance to the changes of the market. The higher the B eta, the more volatile the stocks are relative to the market index.

Sharp ratio: indicates how much excess return per unit of risk. If it is positive, the fund return rate is higher than the volatility risk; if negative, the operational risk is too return. The higher the proportion, the better the portfolio.

Jensen index: For each excess return from one unit of systemic risk, the greater the Jensen index, the better the portfolio strategy performance.

### 4.2. Investment Rating Inspection

Also, for example, in forecasting 2019, Taking the comprehensive evaluation score obtained in the fourth quarter of 2018 by the entropy weight Topsis method as the

foreground value for the first quarter of 2019, And according to the investment outlook value from high to low is divided into 13 groups, Corresponding to the 13 investment levels, respectively, In order, buy, buy-, increase +, increase, increase-, neutral +, neutral, neutral-, reduction +, reduction, reduction-, sell +, sell, Build 13 investment portfolios; Also construct the portfolio with the composite evaluation score for the first quarter of 2019 as the outlook value for the second quarter of 2019, and so on. Each investment level corresponds to a strategy portfolio, the portfolio holding period is a quarter, the last trading day of each quarter adjusts the portfolio of the next quarter, a total of 4 times, and then the value of each test index of each portfolio in 2019 is calculated, and the results are shown in the following figure below.

As can be seen in the figure above analysis, the abscissa represents the investment level, decreasing in order from left to right; the ordinate represents the value of the test index of each portfolio. From the overall trend, During the projected 2019 period, For the range rate of return, The return rate of high investment level is higher than the low investment level; A lpha values indicate that the portfolio is not rewarded by market volatility, Portfolio with high investment level have higher A lpha values than those with low investment level; The S harpe ratio is an indicator that combines both earnings and risk, As can be seen from the figure above, most level high portfolio Sharpe ratio values are greater than 1, It indicates that the combined return rate is high over the fluctuation risk; The overall trend of the Jensen index has also decreased with the decrease of the investment level, It indicates that the portfolio with high investment level obtains higher excess return from a unit of system risk than the portfolio with low investment level. Similarly, on the overall trend, for annualized volatility and Beta values, from high-rated buy combinations to low-rated sell combinations, indicating that high-grade portfolio returns are more stable, less risky than low combinations and smoother volatility than the broader index. On the whole, the portfolio with high investment rating is better than that with low investment rating, indicating that it is feasible to select the prospect attribute factor according to the forward segment regression method, and then calculate the investment prospect value according to the entropy right Topsis method to predict the investment rating method, which can provide investment decision suggestions for investors.

According to the same method steps screening the investment prospect attribute factor, calculate investment prospect value and build portfolio to forecast in 2017 and 2018 investment rating, get the rating of each index although there are local fluctuations, but the overall trend and forecast 2019 investment prospects have similar investment rating, high investment rating portfolio indicators better than low investment level portfolio.

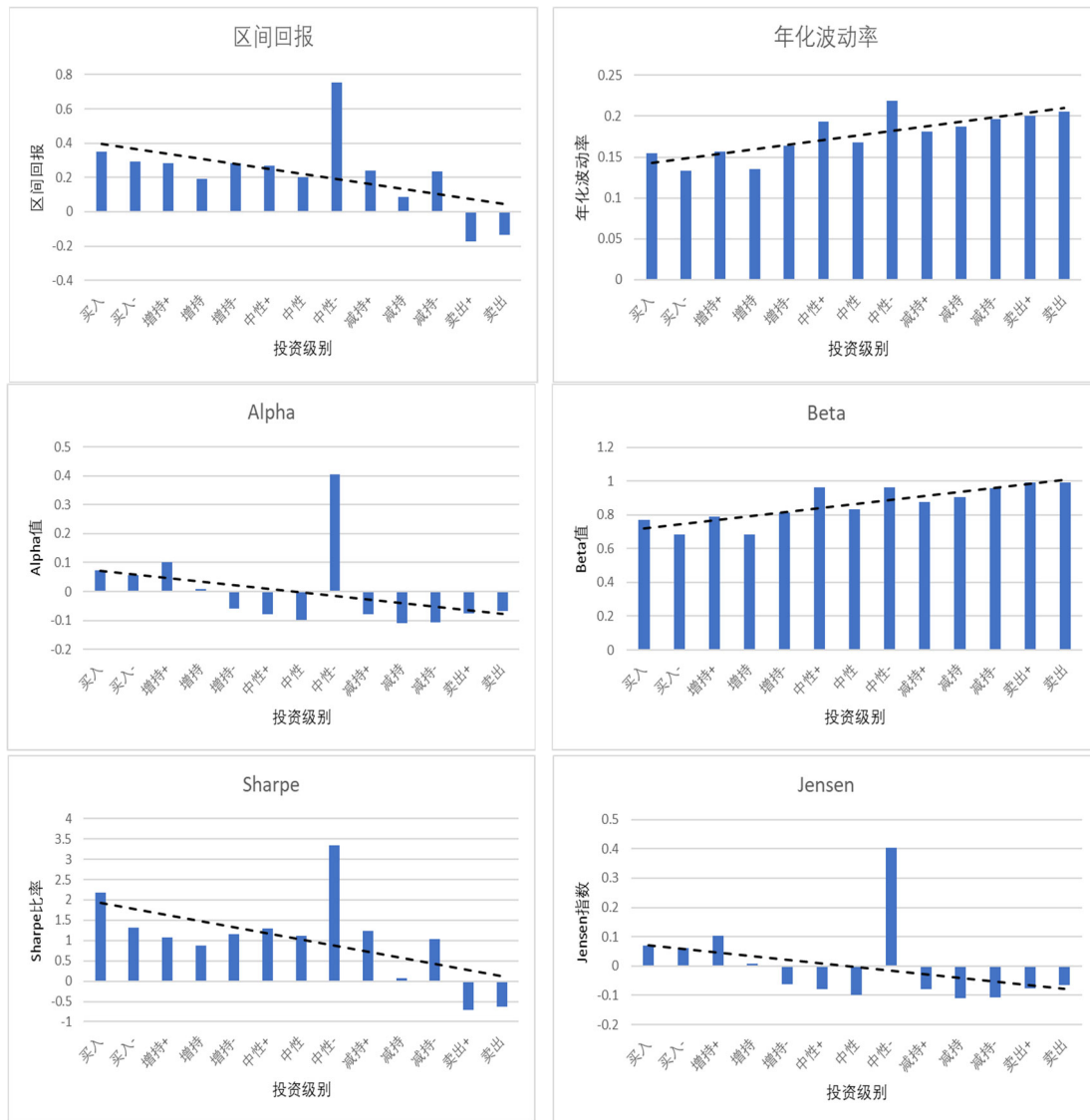


Figure 2. Inspection diagram of each index of investment rating

## 5. Conclusions

The stock market has been a complex system difficult to predict and has been changing. Based on our research at home and abroad, Through a forward-direction segmented regression approach, Using four quarters as the study time window, Fitting the factors related to the investment ratings for the current quarter and the Wind composite rating for the next quarter, Ftotal fit 4 times, Dynamic filtering out of the foreground attribute factor in this time window, Then the entropy right Top sis method is used to calculate the comprehensive rating score of each quarter as the investment prospect value of the next quarter, Then build the portfolio at 13 levels from high to low, Finally, interval returns, annualized volatility, Alpha, Beta, Sharpe ratio and Jen sen index are selected to test the asset quality of portfolportfolio constructed by different investment levels.

The experimental results show that from the overall trend, the portfolio strategy with high investment rating is better than the portfolio strategy with low investment rating, which can provide the investment decision suggestions such as buying and selling. Moreover, the factor is not fixed, but changes dynamically with different business conditions in the time window, and the forecast results are not fixed and consistent with the characteristics of the stock market change.

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