

Analysis of the Investment Features of Stocks of Valuation System with Chinese Characteristics Based on Hierarchical Cluster Method

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Abstract. The ultimate goal of stock investment is to achieve profitability, and risk avoidance is the most important foundation for achieving profitability. Accurately evaluating the value of stocks in the market is one of the key factors for successful investment. Under the background of proposing the Valuation System with Chinese Characteristics, a reasonable analysis of the investment features of stocks of Valuation System with Chinese Characteristics can bring opportunities to investors. To this end, first construct the characteristic indices of stocks of Valuation System with Chinese Characteristics — Price Earnings Ratio (PE), Price-to-Book Ratio (PB), and Dividend Yield Ratio. Then, based on the characteristic indices, use the hierarchical cluster method to perform clustering analysis on the stocks of Valuation System with Chinese Characteristics. Afterwards, by optimizing the clustering results, all stocks of Valuation System with Chinese Characteristics were classified into four categories. According to the classification analysis of the investment features of the stocks, it can be concluded that the issuing company of the first category of stocks has recently been operating poorly, so it is not recommended to invest; The value of stocks in the second category is overestimated and it is not recommended to invest; The third category of stocks are high growth stocks, and it is recommended to invest with caution; The stocks in the fourth category have the characteristics of undervaluation and high dividends, and it is recommended to invest.

Keywords: Stocks of Valuation System with Chinese Characteristics, Stock Classification, Investment Features, Hierarchical Cluster Method.

1. Introduction

The core issue of securities investment is how to obtain returns and avoid risks. Therefore, effectively evaluating the value of securities in market transactions is a fundamental issue in securities investment. However, due to institutional differences, for investors in the Chinese stock market, when using commonly used valuation models, it is necessary to combine them with the market background, comprehensively analyze stocks, objectively and accurately evaluate the investment characteristics of stocks, and form effective investment strategies. In the past, many scholars have analyzed the A-shares.

Wang Wenxuan (2023) improved deep forests and developed the sub-layer connection deep forests (SCDF) classification algorithm, which not only effectively improves the convergence speed and correct classification rate of the algorithm, but also compensates for the sampling imbalance of the multi-granularity scan of deep forest. The market performance of the multi factor stock selection model constructed based on this algorithm is excellent [1]. Liu Yuxuan (2022) introduces the Chinese Financial Conditions Index (FCI) synthesized by the GARCH model into the multi-factor stock selection model and constructs a multi-factor stock selection model of industry rotation based on the financial cycle based on the PCA algorithm. The model can better capture the changes in the financial market than the stock selection model with the introduction of the economic cycle index, to get a higher excess return [2]. Wang Xiaoyan (2023) introduces Knockoff method based on logistic regression for factor screening and constructing a multi factor stock selection model, effectively controlling the false discovery rate (FDR), improving the accuracy of factor selection, and the model has good market performance [3]. Chen Jiahe (2023) incorporate ESG factors that measure non-financial performance of enterprises in environmental, social, governance and other aspects into

traditional multi factor stock selection models. Back testing showed that S sub-rating factors can significantly improve the model's profitability and slightly enhance its risk control ability [4]. Liu Honghao (2023) uses the GBDT algorithm to construct a multi factor stock selection model, four effective factors for stock selection were first selected, namely PE, PB, Turnover Rate, and Net Assets per Share. Then, the GBDT algorithm and effective factors were used for stock selection, proposing an effective stock investment strategy [5]. Yu Jingxuan (2023) analyzed the stock selection efficiency of the Fama-French three factor model in the Chinese A-share market and found that the return on stocks is positively correlated with the market's risk premium factor and book to market ratio factor, and negatively correlated with the market value factor [6]. Chen Shi (2023) takes the chemical industry of A-share stock markets as the research object, and uses PE and PB as the stock selection indicators, finally concluded that the stocks of companies with low PE and low PB have better gains in the future and can achieve higher excess returns [7].

In November 2022, the Chairman of the China Securities Regulatory Commission, Yi Huiman, first proposed the concept of the Valuation System with Chinese Characteristics, which sparked heated discussions in the market. However, at present, there is relatively little research in the academic community on the Valuation System with Chinese Characteristics, especially its impact on the stock market. Therefore, based on the concept of the Valuation System with Chinese Characteristics, we will classify Stocks of Valuation System with Chinese Characteristics and analyze the investment features of each category of the stocks, providing feasible investment suggestions for investors.

2. Introduction to stocks of Valuation System with Chinese Characteristics and characteristic indices

2.1. Features and list of stocks of Valuation System with Chinese Characteristics

For a long time in the past, due to various reasons, the valuation level of stocks in Chinese state-owned enterprises was generally low. This unreasonable valuation level hindered the implementation of strategic transformation and optimization of layout, and brought certain negative impacts on the growth and development of enterprises. Therefore, the establishment of Valuation System with Chinese Characteristics helps to change the current situation of low valuation levels in Chinese state-owned enterprises, improve the adaptability of the valuation system to the Chinese capital market, and enable valuation to more accurately reflect the true value of listed companies, thereby promoting the healthy development of enterprises.

According to the background and connotation of the Valuation System with Chinese Characteristics, stocks of Valuation System with Chinese Characteristics are mainly issued by Chinese state-owned enterprises, involving industries and fields supported by the state. Moreover, stocks of Valuation System with Chinese Characteristics generally have the characteristics of low valuation level, high dividend payout, and stable growth, while the issuing enterprises have strong profitability. Therefore, based on the characteristics of the stocks of Valuation System with Chinese Characteristics, we take Price Earnings Ratio Trailing Twelve Months (PE-TTM), Price-to-Book Ratio (PB), and Dividend Yield Ratio as the characteristic indices of stocks of Valuation System with Chinese Characteristics, and classify and analyze them according to the characteristic indices.

Due to the needy of research, we have obtained a list of stocks of Valuation System with Chinese Characteristics in the A-share market based on the index (8841681.WI) released by Wind (www.wind.com.cn) on March 21, 2023. There are a total of 79 stocks of Valuation System with Chinese Characteristics in the A-share, as shown in Table 1.

Table 1. Stocks of Valuation System with Chinese Characteristics in the A-share

Number	Stock Code	Number	Stock Code	Number	Stock Code
1	601398.SH	28	000898.SZ	55	600941.SH
2	601939.SH	29	000999.SZ	56	600970.SH
3	601988.SH	30	001872.SZ	57	601006.SH
4	601288.SH	31	001965.SZ	58	601088.SH
5	601818.SH	32	002128.SZ	59	601117.SH
6	601328.SH	33	002368.SZ	60	601179.SH
7	601658.SH	34	002415.SZ	61	601186.SH
8	601998.SH	35	002916.SZ	62	601598.SH
9	601390.SH	36	003816.SZ	63	601600.SH
10	688425.SH	37	600011.SH	64	601611.SH
11	688396.SH	38	600019.SH	65	601618.SH
12	688009.SH	39	600025.SH	66	601668.SH
13	603019.SH	40	600028.SH	67	601669.SH
14	601989.SH	41	600050.SH	68	601728.SH
15	601985.SH	42	600131.SH	69	601766.SH
16	601919.SH	43	600150.SH	70	601800.SH
17	601898.SH	44	600271.SH	71	002230.SZ
18	601868.SH	45	600339.SH	72	600118.SH
19	601866.SH	46	600406.SH	73	600685.SH
20	601857.SH	47	600489.SH	74	000032.SZ
21	601881.SH	48	600498.SH	75	000066.SZ
22	601319.SH	49	600511.SH	76	000877.SZ
23	000028.SZ	50	600528.SH	77	600845.SH
24	000059.SZ	51	600582.SH	78	601698.SH
25	000617.SZ	52	600688.SH	79	601816.SH
26	000761.SZ	53	600886.SH	/	/
27	000778.SZ	54	600938.SH	/	/

2.2. Characteristic indices of stocks of Valuation System with Chinese Characteristics

After establishing the characteristic features of PE-TTM, PB, and Dividend Yield Ratio for stocks of Valuation System with Chinese Characteristics, we also obtained a list of 79 stocks of Valuation System with Chinese Characteristics in the A-share. In order to provide feasible investment suggestions to investors based on the connotation of the Valuation System with Chinese Characteristics, we first need to classify the stocks of Valuation System with Chinese Characteristics. Before classification, briefly introduce the basic meanings and roles of each characteristic feature.

Price Earnings Ratio (PE) generally refers to the ratio of market price per common share to earnings per share (EPS) [8]. PE is one of the most commonly used indicators to evaluate whether the stock price level is reasonable, which can measure the investment value of stocks and is an important stock market indicator with reference value. Generally speaking, for a stock, if its PE is negative, it means that the company's profit is negative; If the PE is high, then the stock valuation level of the enterprise is high, and the investment risk is high.

Price-to-Book Ratio (PB) refers to the ratio of a company's stock price per share to its net assets per share, and is also one of the tools used to analyze whether stocks have investment value. Usually, the lower the Price-to-Book Ratio of a company, the greater its investment value, while the higher the Price-to-Book Ratio, the smaller its investment value [9]. Unlike PE, PB generally cannot reflect a company's profitability, so PB and PE need to be analyzed together.

Dividend Yield Ratio is the ratio of dividends to stock prices, which is a simplified form of investment return. In investment practice, dividend yield is one of the important benchmarks for measuring whether a company has investment value. Generally speaking, a higher dividend yield

means a higher dividend yield, indicating that investors can achieve higher returns. Meanwhile, if the dividend yield of a stock remains stable at a high level, the risk of stock price collapse will be significantly reduced [10].

However, in order to support the development of enterprises, the government will provide subsidy funds to some enterprises. At the same time, companies may also have some income that is not directly related to their business operations. These subsidies and income will change the profits of enterprises, thereby affecting their PE. In order to make the analysis results more accurate, we need to deduct the Non-recurring Profit and Loss of the enterprise when conducting the analysis. So, we will use PE-TTM Excl. Extraordinary for analysis. PE-TTM Excl. Extraordinary can provide a more realistic reflection of a company's financial condition and profitability, thereby helping us to make more reasonable investment recommendations. For convenience, we will use PE-TTM Excl.E to refer to PE-TTM Excl. External.

3. Classification of stocks of Valuation System with Chinese Characteristics

3.1. Data preprocessing

We have collected PE-TTM Excl. E, PB, and Dividend Yield Ratio data (www.lixinger.com) for 79 stocks of Valuation System with Chinese Characteristics in the A-share in the first half of 2023. Some of the data are shown in Table 2.

Table 2. Data of the characteristic indices of 79 stocks in the first half of 2023

Number	Stock Code	PE-TTM Excl.E	PB	Dividend Yield Ratio
1	601398.SH	4.8013	0.5323	0.063
2	601939.SH	4.8335	0.5589	0.0621
3	601988.SH	5.0666	0.5469	0.0593
...	...	...	...	...
77	600845.SH	57.0402	13.7332	0.0131
78	601698.SH	174.3107	5.5872	0.0022
79	601816.SH	184.5477	1.3866	0.0022

In order to classify 79 stocks of Valuation System with Chinese Characteristics, we plan to conduct cluster analysis. However, clustering algorithms are sensitive to noise and outliers, and outliers can seriously affect the accuracy of clustering results. Therefore, before conducting cluster analysis, it is necessary to clean the data and remove abnormal data.

After in-depth analysis of the data, we found that among the stocks of Valuation System with Chinese Characteristics, 002230.SZ, 600118.SH, 600685.SH, 000032.SZ, 000066.SZ, 000877.SZ, 600845.SH, 601698.SH, and 601816.SH had abnormal PE-TTM Excl. E and PB in the first half of 2023. For instance, 002230.SZ had PE-TTM Excl. E of -2378.2, 600685.SH had PE-TTM Excl. E of -539.5, 000877.SZ had PE-TTM Excl. E of 187.9, 600845.SH had PB of 13.73, etc. The list of stocks of Valuation System with Chinese Characteristics with abnormal indicator data is shown in Table 3.

Table 3. The list of stocks with abnormal indicator data in the first half of 2023

Number	Stock Code	PE-TTM Excl. E	PB	Dividend Yield Ratio
71	002230.SZ	-2378.21	10.3488	0.0015
72	600118.SH	169.4988	5.3623	0.0027
73	600685.SH	-539.537	2.7546	0.0003
74	000032.SZ	-179.826	6.2325	0.0024
75	000066.SZ	-173.031	3.3421	0.0005
76	000877.SZ	187.88	1.3588	0.0332
77	600845.SH	57.0402	13.7332	0.0131
78	601698.SH	174.3107	5.5872	0.0022
79	601816.SH	184.5477	1.3866	0.0022

Therefore, before conducting cluster analysis, we first remove 9 stocks with abnormal data in Table 3, and then perform cluster analysis on the remaining 70 stocks. After the clustering analysis is completed, we will combine the excluded stocks with the clustering results for analysis, and finally obtain the classification results of the stocks of Valuation System with Chinese Characteristics.

Moreover, after cleaning the data, we also found that the absolute value of PE-TTM Excl. E for each stock is generally large, which can affect the clustering effect. Therefore, before conducting cluster analysis, we standardized the data of all three indicators using SPSS.

3.2. Principle of hierarchical cluster method and Elbow Method

At present, there are three most commonly used clustering algorithms: K-means clustering algorithm, hierarchical cluster method, and DBSCAN algorithm.

The K-means clustering algorithm has a simple and fast processing process, with high efficiency when dealing with large datasets, but it requires a predetermined number of clusters K . Meanwhile, the K-means clustering algorithm adopts an iterative method, so the clustering results may converge to local optima and cannot obtain global optimal solutions.

The DBSCAN algorithm is a density-based clustering algorithm that is widely used, without the need for a predetermined number of clusters K , and can discover clusters of any shape. However, the principle of DBSCAN algorithm is relatively complex and it is difficult to determine input parameters. At the same time, the DBSCAN algorithm requires a higher distribution of the dataset, otherwise it will result in poor clustering performance.

In summary, both K-means clustering algorithm and DBSCAN algorithm find it difficult to obtain the optimal clustering effect for the characteristic indicator data of stocks of Valuation System with Chinese Characteristics. Therefore, we will use hierarchical cluster method for clustering analysis.

Hierarchical cluster method first treats each sample as a class, uses Euclidean distance for clustering, and finally combines all samples into one category and generates a clustering spectrum. The algorithm flowchart of the hierarchical cluster method is shown in Figure 1.

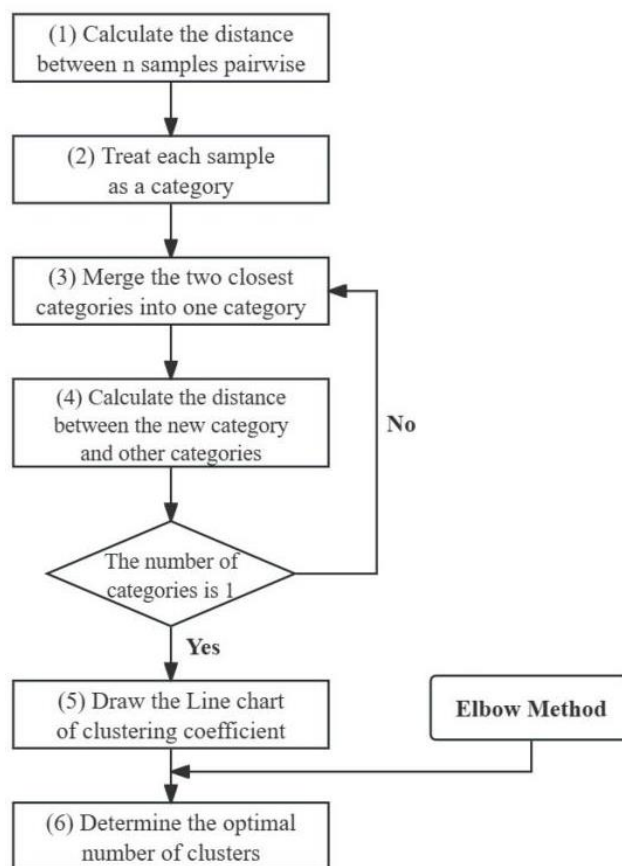


Figure 1. The algorithm flowchart of the hierarchical cluster method

The hierarchical cluster method will ultimately combine all samples into one category. In order to obtain the optimal number of clusters for remaining 70 stocks of Valuation System with Chinese Characteristics, we will use the Elbow Method and the line chart of clustering coefficient to determine the optimal number of clusters.

Firstly, the degree of distortion for each category is defined as the sum of squared distances between the centroid of the category and its internal sample points. Therefore, the total degree of distortion for all categories is the sum of the degrees of distortion for each category. The total degree of distortion of all categories is also known as the clustering coefficient. As the number of clusters continues to increase, the accuracy of sample partitioning will become higher, and therefore the degree of aggregation for each category will also continue to improve, leading to a gradual decrease in the clustering coefficient. When the number of clusters is less than the optimal number, an increase in the number of clusters will significantly increase the degree of aggregation for each category, leading to a significant decrease in the clustering coefficient; When the number of clusters is greater than the optimal number of clusters, the increase in the number of clusters cannot significantly improve the degree of aggregation of each category, so the decrease in clustering coefficient will tend to be gradual. Therefore, the core idea of the Elbow Method is to identify the number of categories in the line graph of clustering coefficient that significantly reduce the decrease in aggregation coefficient, and use this as the optimal number of clusters.

3.3. Clustering process of hierarchical cluster method

We first applied hierarchical cluster method to the remaining 70 stocks of Valuation System with Chinese Characteristics. The line chart of clustering coefficient is shown in Figure 2.

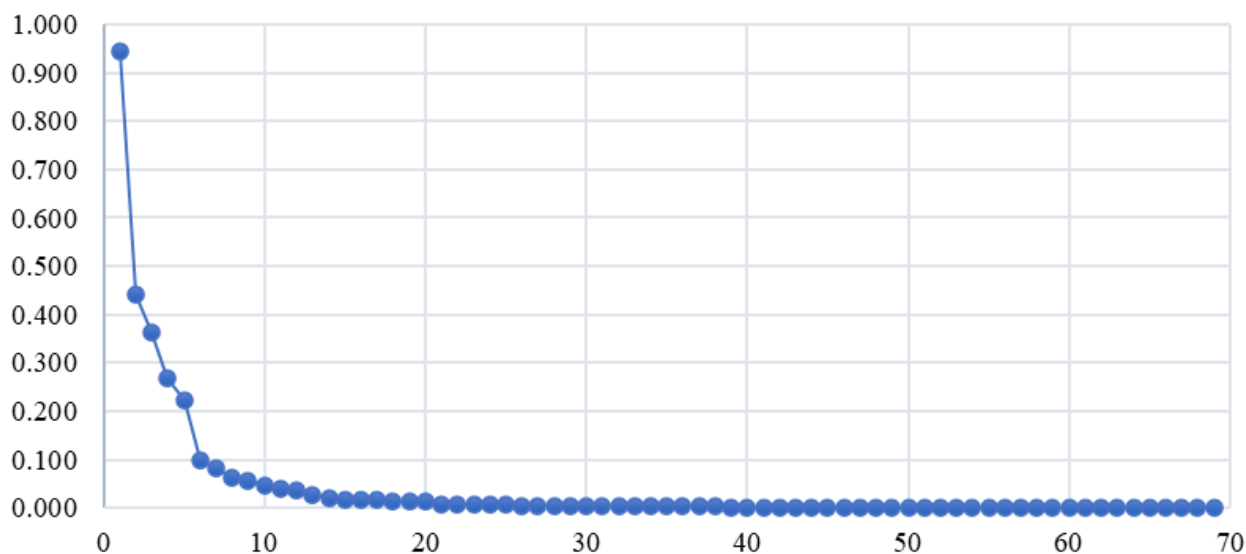


Figure 2. Line chart of clustering coefficient

In Figure 2, the horizontal axis refers to the number of clusters, and the vertical axis refers to the clustering coefficient. According to Figure 2, when the number of clusters is 6, the downward trend of the line chart of clustering coefficient tends to be gentle. Therefore, according to the Elbow Method, the optimal number of clusters is 6.

Based on the optimal number of clusters, the clustering results of 70 stocks of Valuation System with Chinese Characteristics can be obtained by combining the cluster dendrogram. The clustering dendrogram is shown in Figure 3. Besides, the red line in the dendrogram represents the optimal number of clusters determined by the Elbow Method, which can be used to obtain the clustering results.

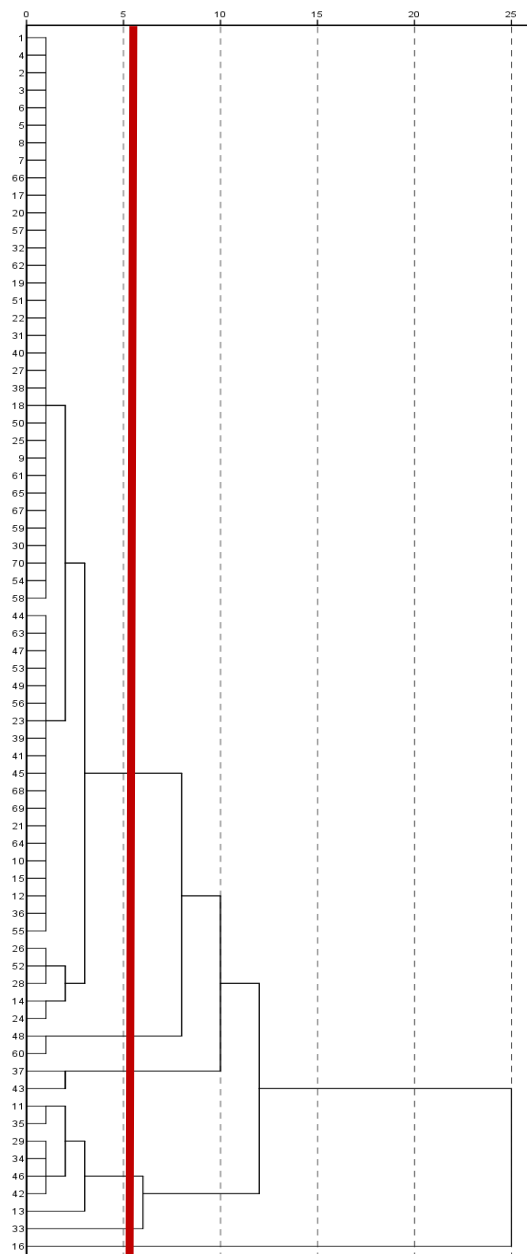


Figure 3. Cluster dendrogram

3.4. Classification process of stocks of Valuation System with Chinese Characteristics

We have conducted cluster analysis on the remaining 70 stocks of Valuation System with Chinese Characteristics after data preprocessing using the hierarchical cluster method. In order to obtain the classification results of all stocks, we also need to improve and optimize the clustering results. We know that when using the hierarchical cluster method to perform clustering analysis on the remaining 70 stocks, the optimal number of clusters obtained according to the Elbow Method is 6. However, according to the clustering results, it can be seen that among the six categories obtained, there are two categories with only one stock, namely 002368.SZ forms its own category, and 601919.SH forms its own category; There are two categories with only two stocks, namely 600011.SH and 600150.SH belong to the same category, and 600498.SH and 601179.SH belong to the same category. In addition, seven stocks were classified into one category, while the remaining 57 stocks were all classified into one category. Although this optimal number of categories result is derived from the Elbow Method, such a large number of categories not only increases the difficulty of analyzing each category of stocks, but may also reduce the representativeness and rationality of the analysis results. Moreover, we excluded 9 stocks during data preprocessing, which did not participate in clustering analysis.

Therefore, when classifying, we need to analyze these 9 stocks. So, the classification of the stocks of Valuation System with Chinese Characteristics will be carried out according to the following steps:

First of all, analyze the categories with fewer stocks. The PE-TTM Excl.E and PB of 002368.SZ in the first half of 2023 were 74.77 and 6.24, both of which were relatively high; 601919.SH's PE-TTM Excl.E in the first half of 2023 was only 1.71 and PB was only 0.85, both of which were very low, but Dividend Yield Ratio was as high as 36%. In addition, both 600498.SH and 601179.SH had PE-TTM Excl.E exceeding 60 in the first half of 2023, with Dividend Yield Ratio of less than 1%; Both 600011.SH and 600150.SH had negative PE-TTM Excl.E in the first half of 2023, with Dividend Yield Ratio close to 0.

Then, analyze the 9 excluded stocks. 000032.SZ, 000026.SZ, 002230.SZ, and 600685.SH all had negative PE-TTM Excl.E in the first half of 2023, and their Dividend Yield Ratio were all below 0.3%; 000877.SZ, 600118.SH, 601698.SH, and 601816.SH had PE-TTM Excl.E almost all exceeding 170 in the first half of 2023, while 600845.SH had a PB of 13.73 in the first half of 2023. Overall, these 9 stocks are in two extreme situations. One extreme situation is that the issuing company is currently in a loss-making state with poor operating performance. The other extreme situation is that the stock value is severely overvalued, resulting in low investment value and high investment risk.

Besides, an analysis was conducted on certain stocks out of the 70 stocks that were not excluded. 601989.SH, 000761.SZ, and 600688.SZ all had negative PE-TTM Excl.E in the first half of 2023, and their Dividend Yield Ratio were all 0. After consulting relevant reports, it was found that all three companies experienced losses in the first half of 2023.

Finally, based on the analysis results, the clustering results of the system are improved and optimized to obtain the classification results of the stocks of Valuation System with Chinese Characteristics. In order to improve the rationality and interpretability of the classification, we divided the 79 stocks into four categories based on the systematic clustering results. The summary of the classification results of stocks of Valuation System with Chinese Characteristics is shown in Table 4.

Table 4. Summary of the classification results of the 79 stocks

Category	Number	Proportion(%)
Category 1	9	11.39
Category 2	8	10.13
Category 3	7	8.86
Category 4	55	69.62
Total	79	100.00

The list of various stocks is shown in Tables 5-8. Among them, the number refers to the number of the stock in Table 1.

Table 5. List of the stocks in the Category 1

Number	Stock Code	Number	Stock Code	Number	Stock Code
14	601989.SH	43	600150.SH	73	600685.SH
26	000761.SZ	52	600688.SH	74	000032.SZ
37	600011.SH	71	002230.SZ	75	000066.SZ

Table 6. List of the stocks in the Category 2

Number	Stock Code	Number	Stock Code
33	002368.SZ	76	000877.SZ
48	600498.SH	77	600845.SH
60	601179.SH	78	601698.SH
72	600118.SH	79	601816.SH

Table 7. List of the stocks in the Category 3

Number	Stock Code	Number	Stock Code
11	688396.SH	35	002916.SZ
13	603019.SH	42	600131.SH
29	000999.SZ	46	600406.SH
34	002415.SZ	/	/

Table 8. List of the stocks in the Category 4

Number	Stock Code	Number	Stock Code	Number	Stock Code
1	601398.SH	23	000028.SZ	53	600886.SH
2	601939.SH	24	000059.SZ	54	600938.SH
3	601988.SH	25	000617.SZ	55	600941.SH
4	601288.SH	27	000778.SZ	56	600970.SH
5	601818.SH	28	000898.SZ	57	601006.SH
6	601328.SH	30	001872.SZ	58	601088.SH
7	601658.SH	31	001965.SZ	59	601117.SH
8	601998.SH	32	002128.SZ	61	601186.SH
9	601390.SH	36	003816.SZ	62	601598.SH
10	688425.SH	38	600019.SH	63	601600.SH
12	688009.SH	39	600025.SH	64	601611.SH
15	601985.SH	40	600028.SH	65	601618.SH
16	601919.SH	41	600050.SH	66	601668.SH
17	601898.SH	44	600271.SH	67	601669.SH
18	601868.SH	45	600339.SH	68	601728.SH
19	601866.SH	47	600489.SH	69	601766.SH
20	601857.SH	49	600511.SH	70	601800.SH
21	601881.SH	50	600528.SH	/	/
22	601319.SH	51	600582.SH	/	/

4. Investment features of various stocks of Valuation System with Chinese Characteristics

According to Table 5, the PE-TTM Excl.E of the first category of stocks in the first half of 2023 were all negative, and the Dividend Yield Ratio was very close to 0. Therefore, we believe that companies issuing the first type of stocks experienced poor performance or even operational difficulties in the first half of 2023. If investors invest in their stocks, the investment returns they receive will be small and may even incur losses. So, the investment risk of the first category of stocks is high, and the investment value is low. It is not recommended to invest in the first category of stocks of Valuation System with Chinese Characteristics.

According to Table 6, the PE-TTM Excl.E of the second category of stocks was very high in the first half of 2023, with an average of 125.02, and their average Dividend Yield Ratio in the first half of 2023 was only 0.8%. Meanwhile, some stocks also have high PB. Therefore, we believe that the value of the stocks in the second category has been overestimated, and there is a serious premium phenomenon. So, the investment risk of the second category of stocks is high, and the investment value is low. It is not recommended to invest in the stocks of Valuation System with Chinese Characteristics in the second category.

According to Table 7, the average PE-TTM Excl.E and average PB of the third category of stocks in the first half of 2023 were 34 and 4.25. Although the third class of stocks did not experience extreme situations similar to those of the first- or second-class stocks, their PE-TTM Excl. E and PB

were also relatively high. We know that, unlike extreme situations, a relatively high PE often means that the market is optimistic about the company's development prospects. The market believes that the company has high growth potential in the future, so it is willing to use a certain degree of premium to maintain the current stock price. This is high growth stocks. High growth stocks are generally dominated by stocks issued by high-tech enterprises, and the classification results of stocks in the third category can also better confirm this. For example, the issuing company of 688396.SH is China Resources Microelectronics Limited, a high-tech enterprise or investment, development, and management of microelectronics business. In summary, the issuing companies of stocks in the third category are all high-tech enterprises or enterprises in key areas supported by China, and these enterprises often have high development potential and good development prospects. Therefore, the market generally believes that the stocks they issue are high growth stocks. However, high growth often carries high volatility, which implies certain investment risks. Therefore, we believe that the third category of stocks are high growth stocks, which have high development potential but also imply certain investment risks. So, the investment risk in the third category of stocks is relatively high, and it is recommended to invest cautiously in the third category of stocks of Valuation System with Chinese Characteristics.

Finally, the fourth category has the highest number of stocks, and their average PE-TTM Excl.E in the first half of 2023 was 11.41, with an average PB of 1.11 and an average Dividend Yield Ratio of up to 4%. Therefore, we believe that the stocks in the fourth category belong to undervalued stocks, with lower valuation levels and higher Dividend Yield Ratio. Therefore, the investment risk of the stocks in the fourth category is relatively low and they have higher investment value. It is recommended to invest in the stocks of Valuation System with Chinese Characteristics in the fourth category.

In summary, based on the characteristic indicator data of stocks of Valuation System with Chinese Characteristics in the first half of 2023, we divided 79 stocks of Valuation System with Chinese Characteristics into four categories. Among them, the issuing companies of the first category of stocks generally face poor performance or operational difficulties, and investment risks are high. Therefore, it is not recommended to invest in the first category of stocks of Valuation System with Chinese Characteristics; The value of the stocks in the second category is overestimated, so the investment risk is high. Therefore, it is not recommended to invest in the stocks in the second category; The third type of stocks are high growth stocks, which have high development potential but also contain investment risks. Therefore, it is recommended to invest cautiously in the third category of stocks; The fourth type of stocks have the characteristics of undervaluation and high dividends, with low investment risk and high investment value. So, it is recommended to invest.

5. Conclusions

Stocks of Valuation System with Chinese Characteristics have the characteristics of low valuation level, high dividend payout, and stable growth, while the issuing enterprises have strong profitability. Therefore, PE-TTM, PB, and Dividend Yield Ratio can be used as characteristic indicators for stocks of Valuation System with Chinese Characteristics. Using these indicators, we utilized hierarchical cluster method and optimized and improved the clustering results. Finally, we divided 79 stocks of Valuation System with Chinese Characteristics into four categories and analyzed their investment characteristics.

There are 9 stocks in the first category, accounting for 11.39%. At the same time, companies that issued the first type of stocks experienced poor performance or even operational difficulties in the first half of 2023. Therefore, the investment risk and value of the first category of stocks are high, and it is not recommended to invest in the first category of stocks of Valuation System with Chinese Characteristics.

There are 8 stocks in the second category, accounting for 10.13%. Meanwhile, in the first half of 2023, the PE-TTM Excl.E of the second type of stocks was very high, but the Dividend Yield Ratio

was low. Therefore, the value of the stocks in the second category is overestimated, there is a big investment foam, and the investment risk is high. It is not recommended to invest in the stocks in the second category.

There are 7 special appraisal stocks in the third category, accounting for 8.86%. After analysis, the third type of stocks belong to high growth stocks with high development potential, but also have significant investment risks. Therefore, it is recommended to invest cautiously in the third category of stocks.

There are 55 special appraisal stocks in the fourth category, accounting for a high proportion of 69.62%. Research has shown that the stocks in the fourth category are undervalued, with lower valuation levels and higher Dividend Yield Ratio. Therefore, the investment risk of the fourth category of stocks is relatively low and has high investment value. It is recommended to invest in the fourth category of stocks of Valuation System with Chinese Characteristics.

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