

Abstract

It is very important to understand the value of stock prices as it will be beneficial for both investors as well as the company. By understanding those determinants that can affect the stock price, the investor will be in a position to make various profitable investment decisions. Whereas, from the company's point of view it helps to know about the intrinsic value of the company's stocks. The purpose of this study is to identify the factors that affect the stock price of a company listed on the Mongolian Stock Exchange. This information is taken from the official website of the Mongolian Stock Exchange in 2021 financial information of 50 stable companies. The stock price has 4 control variables. Principal Component Analysis is a statistical technique that reduces a large number of inputs of data to a few factors. Once the factors are established, they are displayed in a correspondence analysis map. The correspondence analysis map provides a clear picture of the winning stocks that should be selected for trading.

Introduction

Investment in the stock market is regarded as high gains and so attracts a large number of investors. However, information regarding a stock is normally complex and has a lot of uncertainty, making it a challenge to select winning stocks. Although the selection of winning stocks is a challenge, principle component analysis and correspondence analysis mapping can guide an investor in identifying winning stocks from losing ones.

There are many methods by which investors use economic data to select their stocks, other use technical data with the help of charts to determine whether a stock is good or not, and others rely on fundamental data such as financial ratios to determine winning stocks, and others use a combination of technical and fundamental information. While there are many ways in which one can select stocks, what counts, is the method that is simple to understand and use and at the same time proves accurate in returning good money. Everyone wants to make money using stocks, but, many do not have the technical skills or knowledge to make good decisions and merely select stocks on pure gut feel.

The purpose of this article is to test whether the application of principal component analysis to a large number of input variables, can sensibly reduce this large number of input variables to just few factors. In this sense, principal component analysis will simply the investor's time and costs as only a few input variables will now need to be captured, cleaned and maintained by the investor.

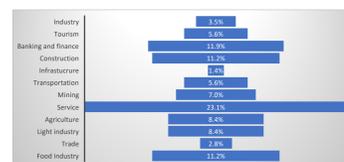


Figure 1. Percentage of total companies traded.

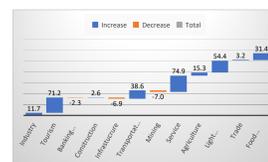


Figure 2 Average price of stocks.

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Methods and Materials

With a large number of variables, there are many pair-wise correlations between the variables. To interpret the data in a more meaningful way, we used the dimension reduction technique, principal component analysis, in order to reduce a large number of variables into a few number of factors. The resulting factors are an interpretable linear combination of the input variables.

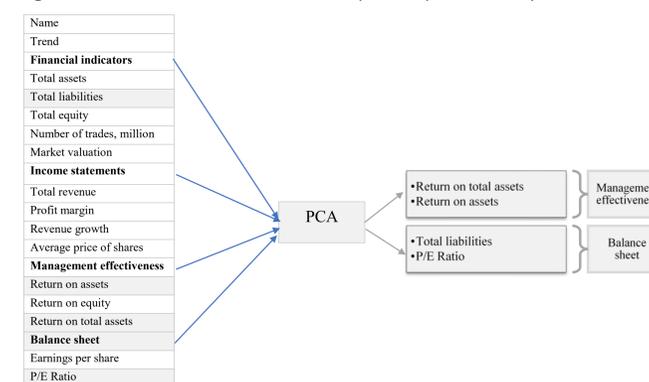
The Cronbach's alpha coefficient helps to measure the internal consistency of the data. Correspondence analysis is a graphical representation of the interactions between objects (or categories) of two or more categorical variables. Perceptual mapping is a set of techniques that attempt to identify the perceived relative image of a set of objects.

Results

The IBM SPSS Statistics 25 software was used to perform Principle Component analysis. Initially all the 15 variables were used for the varimax rotation. According to Figure 3, the factor 1 had Return on total assets and Return on assets highly which we termed, "Management effectiveness" and factor 2 had the variables Total liabilities and price to earnings ratio loaded highly which we termed "Balance sheet". As we can be seen from the above results, with the help of principle component analysis, we were able to identify that Return on Assets, Return on Total assets, Total Liabilities, price to earnings ratio are the important variables that contribute towards the upward trend movement of the stocks. Also we were able to name the factors 1 and 2 as management effectiveness and balance sheet respectively. This is pictorially depicted in the below Figure 3.

To perform correspondence analysis, convert numeric variables to categorical variables using the simple numerical grouping method. The aim is to present a four-dimensional graph of qualitative indicators of four factors.

Figure 3. Variables and factors from Principle Component Analysis.



Discussion

The Cronbach's Alpha coefficient value for the factor Management effectiveness was 0.741 which is good and confirms the reliability of management effectiveness as a factor. The Cronbach's Alpha coefficient value for the balance sheet was 0.657 which is good and confirms the reliability of Balance sheet as a factor.

We are interested in stocks that are high Management effectiveness and also Balance sheet. We denote winning stocks as the ones that are high in Management effectiveness and also have high Balance sheet when compared with the Mongolian stocks. From the above correspondence analysis map, as seen in figure 4, the stocks such as Invescor, Mandal insurance, Atar-Urguu, Berkh-Uul and Ard insurance are considered as winning stocks. 50 companies are coded, not by name in Figure 4.

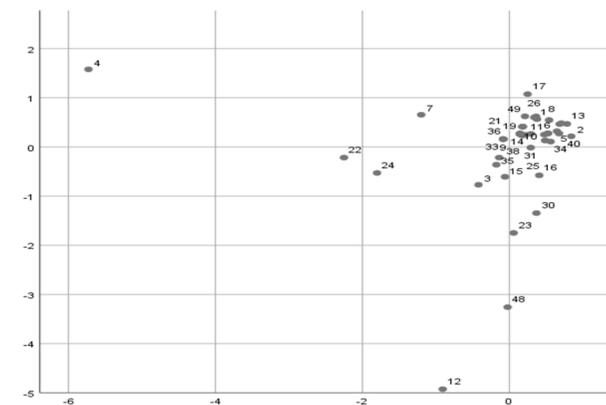


Figure 4. Correspondence analysis map using factors from PCA.

Conclusions

Our research demonstrated that we can reduce fifteen stock market fundamental variable indicators to four important variables. These four variables are sufficient in accurately identifying stock with an upward trend movement.

Further, we learnt from the principle component analysis that the above four variables loaded as two key important factors. We named the factors 1 and 2 as management effectiveness and balance sheet respectively.

With the results from the principle component analysis and the perceptual map, we could clearly identify the stocks that were high on two factors, Invescor, Mandal insurance, Atar-Urguu, Berkh-Uul were considered as winning stocks.

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