

MEASUREMENT OF THE IMPACT OF THE NEWS ON STOCK PRICES

ABSTRACT

This paper presents a quantitative method to measure the impact of news on the price of the stock. It combines the Analytic Hierarchical Process (AHP) and Artificial Neural Network (ANN). AHP is used with the purpose of weighting the news and converting them from a qualitative variable into a quantitative. This information is used as input to the Artificial Neural Network (ANN) models, to see the impact of the news in predicting price. It is concluded that when the news are included as an additional variable in the ANN models, the performance measurements increase.

Keywords: stock price, news, AHP, artificial neural network

1. Introduction

For any investor who wants to make a profit in the financial markets it is vitally important to be acquainted with all national and world events, because there are news that can influence in some way the price of some security traded in the stock exchange. This paper proposes the use of Analytic Hierarchy Process (AHP) and Artificial Neural Network (ANN) to measure the impact of news on the price of the stock.

2. Literature Review

Birz and Lott (2011) indicate that in the last three decades, few studies have sought to find a relationship between the news and the stock market. Figueroa et al. (2006) measured the effect of disseminating news on the price of the sovereign debt of emerging markets. The combination of AHP and ANN has been used in other areas, such as price estimation (Dey et al., 2014).

3. Objectives

This paper aims at developing a quantitative method to measure the impact of news on the price of the stock for support the decision making of buying and selling stock.

4. Research Methodology

The method was developed using the Analytical Hierarchical Process (AHP) with the purpose of weighting the news and converting them from a qualitative variable into a quantitative. This was modelled using a classification of the news by block and the experiments were made comparing Artificial Neural Network (ANN) models to measure such an effect, considering base models with quantitative variables at the network's input against models having the same characteristics that also include a variable related to news

at the network's input. The method was implemented in measure the impact of the news on the price of the stock of the Enersis Corporation.

5. The Proposed Method

Once the news have been classified according to type of news and the effect that the publication can cause, the AHP model is applied with the purpose of finding a numerical or weighting value for each news block and consequently for each news within the news block classification. In Figure 1 show, hierarchical tree for weighting blocks and news. The complexity that exists in terms of number of paired comparisons and possible inconsistencies in them, a relaxation of the situation designed above is proposed; it consists in using only the first level. The result of normalized priorities of news blocks using the AHP is show in Figure 2.

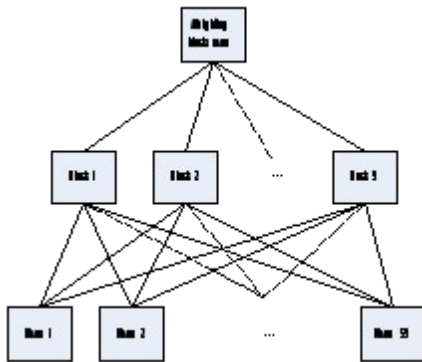


Figure 1

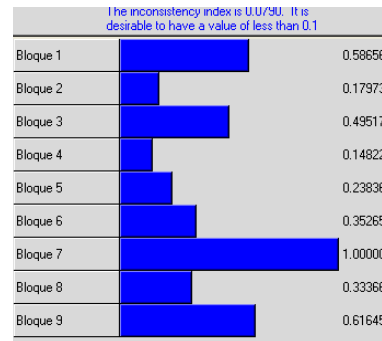


Figure 2

To measure the impact of the news on the price of Enersis stock, an ANN model was designed and implemented, based on the backpropagation algorithm. Once the news have been quantified, six ANN-based experiments were set up, in each of which an ANN with a particular architecture was compared with an ANN of the same characteristics, but with a variable associated with the additional input news.

6. Limitations

The main limitation of the method is that exists in terms of number of paired comparisons and possible inconsistencies for elevate number of comparisons, by which method was relaxed in terms of evaluating only the first part of the hierarchy tree.

7. Conclusions

The relaxed AHP it is possible to transform the news into a quantitative variable, expressed in their hierarchization, and can be concluded that the news associated with the Enersis company affect the price of its stock. This situation is proven statistically using the analysis of variance for comparison of means. In the future, we propose to look into the effect of the news on the stock price of other companies, using a longer period of

study. We also propose to extend the model used in this research for the application of forecasts incorporating the news as an additional prediction variable.

8. Key References

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