

Design the Fuzzy Variable to Determine the Relation Between Price and Assessment

SEYED MAHMOOD HASHEMI
KAR High Education Institute, QAZVIN branch
Qzvin, Alvand, IRAN

Abstract: - Accounting produces information that is used for decision-making, so helpful standards of accounting are required. One of the challenging aspects of accounting is trade assessment. This subject is important in the buying process (and also in the fund management). In the buying process, customers are looking for trades with high profit, but determining the exact value for the profit is hard. Profit is categorized into Cash and Obligation. In this paper, the spread of cash operation is considered as a cash component, and the difference in the receive accounts, the difference in the inventory, and the difference in the payment accounts are considered as obligations. To examine, the financial information of 10 trades in the TEHRAN EXCHANGE STOCK are used. In this paper to determine the relation between the assets and the real price, a fuzzy approach is used. Fuzzy systems include some components and diversity in each of them may influence the final result. Therefore the influence of each fuzzy component needs to be examined, but the goal of this paper is to use the fuzzy system. Hence we use a simpler shape of fuzzifier, defuzzifier, and inference engine.

Key-Words:- Accounting, Assessment, Obligation, Cash, Profit, Fuzzy System

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1 Introduction

The major goal of financial reporting is to help the investor in decision-making, so the profit assessments of trades have a critical role in this play. The profit accounted is based on the obligation, so there is a difference between the accounted profit and the report of the cash steam. The decomposition of profit into the obligation and cash reduces the error forecasting. These parts of information are considered as the parameters for trade profit. Indeed there is a need for a variable that explains and forecasts the price of stocks. There are some weaknesses in the previous research: firstly there is no special structure to combine exercises; secondly, most research is based on linear regression, so they are limited to the cross-sectional variations.

2 Related Works

Moorthy et al. focus on the green accounting in their work [1]. Green accounting is related to environmental information. An important function of green accounting is to bring environmental costs to the attention of corporate stakeholders. They number seven measures, but four of them are more important. Pollution prevention costs, environmental

protection costs, costs of resource recycling, and environmental restoration costs.

Du et al. consider the account management in China [2]. Management accounting itself is to provide information and solutions for business operations and decisions. There are some crucial factors for small and medium-sized enterprises such as human factors.

The main goal of Liu et al. work is to analyze the situation of the development of small and medium-sized accounting firms in Jing Zhou City (China) [3]. They found the internal risk governance mechanism is directly related to the quality management and risk control of the entire firm. They believe one of the most important human resources for small and medium-sized firms is their personnel quality.

Zhang researches about the relationship between state-owned enterprises and the government reduces the utility of accounting information [4]. He studies in soundness accounting information and finds there is a need to deal with, this because if there is no robustness requirement in the accounting recognition measurement principles, profits, and cash flows will converge over the long term, and accruals will tend to be reversed so that the cumulative accruals will be

zero. He proposed three formulas for accrual accounting. In the next step, he proposed an optimization model to test.

Moron et al. study the usage of the artificial intelligence in the accounting [5].

In [6, 7], authors investigate various techniques in the accrual accounting.

Grandis et al. answer the question that which variables are needed for accrual accounting [8]. They analyze the data of the none-business-oriented companies.

Bhasin investigates fraud on a large scale [9]. In that work, the author describes the scenario of SATYAM company in INDIA and the reason of require to the creative accounting (CA).

Liu introduces cashlet accounting defined as a basic accounting concept with a value of negative one [10]. Accounting is an approach to finding the nature of companies and some tools such as GRAPH can help to understand.

Yan studies the evaluation of the fund production process in CHINA within 20 years [11]. He uses three methods (CAPM model, FFC four-factor model, and CPZ seven-factor model) to find the situation of China's open-end fund markets.

Upadhyaya et al. analyze the stock trades to assess whether they are taking advantage of diversification [12]. The main subject is the evaluation of 8 mutual funds.

Chang et al. investigate the maximization of the companies' profit [13]. They test the fund strategies of TAIWAN companies.

5 Problem Expression

Let there be a firm with a special amount (A) of assets. The assets of the firm are divided into the cash (C) and obligation (O). Therefore when the stocks of this firm are released, both parts of the assets are considered. Indeed the other variable (V) has been considered to recognize the relation between the amount of assets (C+O) and the real price. In other words, there is a need for an extra accounting component (more than the formal accounting components) to find the accrual benefit of the stocks.

The common approach to compute "V" is the aggregation. In that method, every asset (such as cash and obligation) has its coefficient, so the total value of "V" is equal to the summation of cash and obligation multiple to their coefficients. The problem of this way is having the correct value of coefficients.

The other way, that is used in this work, is using of FUZZY SYSTEM. In this proposed approach, firstly we create a fuzzy set for each part of the assets and then we compute the total value for "V" as the result of the fuzzy system.

3 Proposed Approach

There is a need to find a variable that shows the relationship between assets (cash and obligation) and the real price. In this work, we proposed the fuzzy system. The first step in the fuzzy is set define. In the fuzzy system, for each input variable (in this problem cash and obligation) a fuzzy set is defined, which is shown in the FIG. 1.

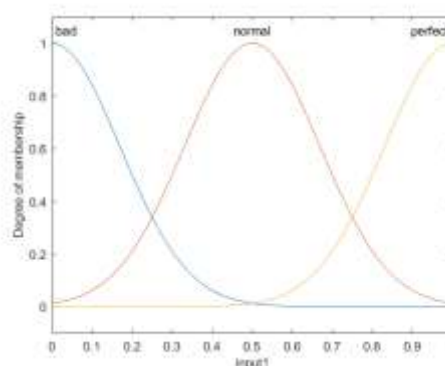


FIG. 1. Membershpm sets of the inputs

We can name each set as 'bad', 'normal', and 'perfect'. All input variables are determined based on the MEMBERSHIP in these sets.

We design two fuzzy sets for output (FIG. 2).

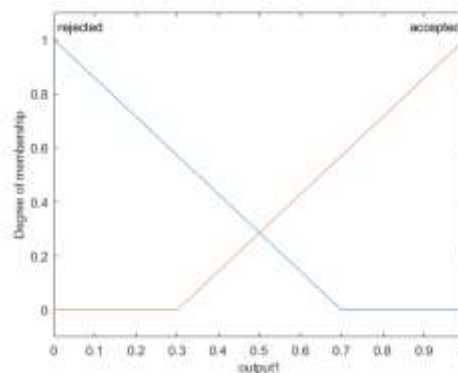


FIG. 2. Membership sets of the outputs

In the second step, there is a need for an INFERENCE ENGINE. The function that is called the inference engine has a role as the heart of the system and determines the main computation of the fuzzy system.

$$\hat{y} = \frac{\sum_{i=1}^{nR} y_0^{(i)} \cdot \prod_{k=1}^r \mu_{A_{ik}}(x_k)}{\sum_{i=1}^{nR} \prod_{k=1}^r \mu_{A_{ik}}(x_k)} \tag{1}$$

The third step is the definition of a set of rules. Rules declare the relation between inputs and outputs.

1. If (input1 is bad) and (input2 is bad) then (output1 is rejected) (1) '
- '2. If (input1 is bad) and (input2 is normal) then (output1 is rejected) (1) '
- '3. If (input1 is bad) and (input2 is perfect) then (output1 is rejected) (1) '
- '4. If (input1 is normal) and (input2 is normal) then (output1 is accepted) (1) '
- '5. If (input1 is normal) and (input2 is perfect) then (output1 is accepted) (1) '
- '6. If (input1 is perfect) and (input2 is bad) then (output1 is rejected) (1) '
- '7. If (input1 is perfect) and (input2 is normal) then (output1 is accepted) (1) '
- '8. If (input1 is perfect) and (input2 is perfect) then (output1 is accepted) (1)'

FIG. 3. Rules

According to the defined rules and based on the trade information, the following information is produced:

Table 1. Results

Cash	Obligation	Price
0.498572	0.257569691	0.205026
0.142947	0.895070841	0.413985
0.506214	0.705629404	0.566864
0.587545	0.38177241	0.401781
0.53515	0.888695867	0.634908
0.105293	0.796781748	0.55901
0.479564	0.088248344	0.068649
0.169665	0.349417634	0.43453
0.555427	0.900380128	0.689795
0.85691	0.240038143	0.163025

The results are after the normalization process, they are between 0 and 1.

6 Conclusion

In this paper, an approach based on the fuzzy system is proposed to help decision-making about assets. Components of the fuzzy system can be in different modes that may influence the final results, so the examination of other components is good.

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Contribution of Individual Authors to the Creation of a Scientific Article (Ghostwriting Policy)

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Conflict of Interest

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