

## **Cost-Volume Profit Analysis In Uncertainty Conditions Using Fuzzy Logic Method**

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### **Extensive Summary**

In order to be successful in business and to continue their commercial life in a global competitive systems, it depends on an efficient cost planning and control. When profit is the main objective, an accurate and reliable costing of goods and services produced is at most significant. Generally, a company can not have precise information on products' selling prices, sales demand, variable costs, and even fixed. Usually, sales managers assign the values of variables based on their experience, guesses and rules-of-thumb.

The classic Cost-Volume-Profit (C-V-P) analysis is a characteristic model in which four quarters of variables (i.e., sales volume, variable costs, fixed costs, and selling price) are supposed to be known. When market fluctuations can not be predicted with certainty, managers have to make decisions under conditions of uncertainty. Under these conditions, decisions to make or not are often based on managers' human intuitions, common sense and experience, rather than on the availability of clear, concise and accurate data. Fuzzy logic is used for reasoning about inherently vague concepts such as 'profit is good or not', where level of profit is open to interpretation. A firm's projection of profit is based on relatively precise forecasts of sales and cost behavior. Differences between planned versus actual profit are attributed to fluctuations in costs, selling prices, and volume. The identification of all these intricate interrelationships is very important for managers to be successful in planning and control. Once they identify these interrelationships, managers can concentrate on strategies or products that can yield maximum profits. Thus, a technique that can provide a reliable range of estimates of costs and revenues for planning purposes, thereby minimize the differences between the planned and actual results should be seriously considered. The purpose of this research is therefore to apply the fuzzy logic

to human reasoning where we specifically focus on the reasoning processes behind CPV analysis (Yuan, 2009:1155).

Fuzzy logic is a mathematical logic that aims to solve problems with an open, imprecise spectrum of data that makes it possible to obtain an array of accurate conclusions. Fuzzy logic is designed to solve problems by considering all available information and making the best possible decision given the input.

In this study, the activity-volume-profit analyses of the uncertainty conditions of the business which are predicted by the fuzzy logic method were compared with the actual values. The actual value has been converged with a low margin of error when compared to the post-implementation profit margin. Estimated profit amount calculated by fuzzy logic method is 1.422 TL and converged to the real profit amount of 1.522 TL with an error margin of 7%.