

**AN AUTOMATIC TEXTILE SALES FORECAST USING FUZZY TREATMENT OF EXPLANATORY VARIABLES**

Sébastien Thomassey***, Michel Happiette* and Jean Marie Castelain*

* GEMTEX – ENSAIT of Roubaix (France)

** IFTH of Villeneuve d'Ascq (France)

ABSTRACT

To reduce their stocks and to limit ruptures, textile companies must improve their supply chain management. This organization requires sales forecasting systems adapted to the uncertain environment of the textile field. The uncertainty is characterized by noisy data, short historic and numerous explanatory variables that influence the sales behavior. This paper deals with new forecasting models based on "soft computing" and more particularly, last evolutions of hybrid fuzzy model (HFCCX) developed in previous works. HFCCX model uses fuzzy logic abilities to map the non-linear influences of explanatory variables to perform mean-term forecasting. The drawback of this model is the require of an expert judgment for the learning process. The last improvements of our model called AHFCCX allow an automatic learning of the explanatory variables influence. To evaluate performances, a comparative test between AHFCCX, HFCCX and classical models has been applied to real data of textile items selected from an important French ready-to-wear distributor.

KEYWORDS : Textile-apparel industry, Sales forecasting, Fuzzy inference system, Automatic learning, Explanatory variables.

1. Introduction

To set up all logistic steps require to produce and deal a product, textile managers must rely on efficient and accurate forecasting systems. A suitable sales forecast, allowing to predict in due time the sufficient quantity to produce, is one of the most important factors for the success of a lean production (Kincade, 1993). Forecasting is an essential planning tool for decision making

process (Geriner, 1991) (Lee, 1995). All the Supply Chain Management optimization depends on the forecast quality of the finished products sales (Sboui, 2001) (Graves, 1998).

That supposes to take into account as much information adapted to the forecast context as possible. To summarize, a such a textile sales forecasting system require :

- to quickly react to a significant variation of trend and seasonality,