Demand Forecasting Methods: A Case Study in the Italian Processed Meat Industry

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Abstract

Demand forecasting is acquiring more and more importance in the fast-changing business world, where market instability and economic shocks such as Covid-19 pandemic require firms to be both efficient and flexible. This work is based on a research project aiming at the development of a demand forecasting model for a company that operates in the Italian processed meat segment. The purpose is to obtain a forecast as accurate as possible and then use it at a later stage to carry out an optimal production scheduling (see, e.g., [1], [2]). Especially in the food sector, a proper integration of forecast and production management is essential, because the perishable nature of the items does not allow for over production. In this work, we compared different Machine Learning forecasting algorithms, including Linear Regressor, Random Forest Regressor, Support Vector Regressor and Multi-layer Perceptron Regressor. We compared these methods with the ones used in the literature to define a baseline, like random walk and seasonal mean. Extensive computational tests on a two-year real-world data series prove the effectiveness of the algorithms, especially the Support Vector Regressor, in providing an accurate forecast. The resulting model is now used by the company on a daily basis.

References:
[1] W. Wong, Z. Guo, A hybrid intelligent model for medium-term sales forecasting in fashion retail supply chains using extreme learning machine and harmony search algorithm, *International Journal of Production Economis* **128(2)** (2010) 614–624.
[2] G. Tsoumakas, A survey of machine learning techniques for food sales prediction, *Artificial Intelligence Review*, **52(1)**, (2019) 441-447.