# Efficacy of Seasonal Factor-Adjusted Naïve Forecasting in Operations Management: Insights from a Simulation Study

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**Abstract.** *Purpose*: This study explores the effectiveness of a novel forecasting method, the Seasonal Factor-Adjusted Naïve (SFAN) forecasting, within operations management business education. It aims to assess the method's ability to improve forecasting accuracy and pedagogical effectiveness compared to traditional forecasting techniques. *Design/Methodology/ Approach:* Employing a quasi-experimental design, the research compares students' performance across three operations management classes using different forecasting methods: SFAN, a traditional method, and a control group with no specific method. The primary performance metric used is the Mean Absolute Percentage Error (MAPE), supported by ANCOVA controls for a comprehensive analysis. *Findings*: The results indicate that the SFAN method significantly outperforms traditional methods. Students using SFAN demonstrated lower MAPE scores, indicating higher forecasting accuracy. The effectiveness of SFAN in scenarios with pronounced seasonal trends was particularly notable. *Originality*: This study is the first to empirically test the SFAN method in an operations management educational setting, offering novel insights into integrating advanced forecasting techniques in business education. *Research Limitations/Implications:* While the study provides valuable insights, it is limited by its focus on a specific educational setting. Future research could explore the SFAN method's applicability across various disciplines and cultural contexts. *Practical Implications*: The findings suggest that incorporating SFAN into operations management business education curricula could significantly enhance students' forecasting skills, preparing them better for real-world challenges. *Social Implications:* By improving forecasting accuracy and pedagogical methods in business education, this research contributes to developing more skilled and competent business professionals, potentially impacting decision-making and strategic planning in various industries.

**Keywords:** forecasting, simulation, seasonal factor, adjusted naïve method, forecasting simulation, ANCOVA, MAPE.

## 1. Introduction

Forecasting is essential in operations management business education and vital for decision-making and strategic planning across various industries. The accuracy and reliability of forecasting methods directly influence the quality of these decisions, making forecasting techniques a crucial aspect of business

analytics education (Saha *et al.* 2023; Kapoor & Wilde 2023). Traditionally, operations management business education has emphasized imparting theoretical knowledge, often overlooking the importance of practical application. However, the dynamic nature of the business environment demands a more application-oriented approach, especially in disciplines like forecasting, where real-world applicability is paramount (Kapoor & Wilde 2021). The rapidly changing business landscape, characterized by volatile markets and fluctuating consumer patterns, also requires forecasting methods to adapt to and accurately predict these changes. As a result, traditional forecasting methods often fail to capture seasonal variations effectively, leading to significant inaccuracies (Wang *et al.* 2022). Introducing the Seasonal factor adjusted Naïve method in an academic setting addresses this gap and provides a platform for testing its efficacy in a controlled learning environment.

The authors believe that the Seasonal factor adjusted Naïve method, a novel approach to predicting developed by combining seasonal factor and naïve forecasts sequentially, promises to integrate the complexities of seasonal variations more accurately than conventional methods. This study delves into the efficacy of a relatively new forecasting method, the Seasonal factor adjusted Naïve method, within a business education context. The research aims to evaluate the method's effectiveness compared to traditional forecasting techniques and a control group using no specific process, focusing on enhancing pedagogical approaches in business education. This study is one of the first to empirically test this method in an educational setting, seeking to bridge the gap between theoretical forecasting models and their practical implementation.

The primary objective of this study is to assess the effectiveness of the Seasonal factor adjusted Naïve forecasting method in improving forecasting accuracy among business students. The research compares the performance of students who used this method with those who employed traditional forecasting methods and a control group that relied on intuitive guesswork. The study aims to answer the following two key questions specifically:

(1) How does the Seasonal factor adjusted Naïve method compare to traditional forecasting methods regarding student performance measured by MAPE scores?

(2) What are the pedagogical implications of incorporating this method into business education curricula?

A comparative analysis across three classes in a business school setting is performed to address these research questions and objectives. Each class used a different forecasting approach for this study: the Seasonal factor adjusted Naïve method, a traditional forecasting method, and no specific method (control group). The primary metric for evaluating performance was the Mean Absolute Percentage Error (MAPE), a standard measure in forecasting