Inventory Managment System for Retailers

Literature Survey:

"Demand uncertainty and inventory turnover performance: An empirical analysis of the US retail industry"

The purpose of this study is to investigate the impact of demand uncertainty on inventory turnover performance through empirical modeling. In particular we use the inaccuracy of quarterly sales forecasts as a proxy for demand uncertainty and study its impact on firm level inventory turnover ratios. Design/methodology/approach We use regression analysis to study the effect of various measures on inventory performance. We us a sample financial data for 304 publicly listed U.S. retail firms for the 25-year period from 1985 to 2009. Findings Controlling for the effects of retail segments and year, it is found that inventory turnover is negatively correlated with mean absolute percentage error of quarterly sales forecasts and gross margin and positively correlated with capital intensity and sales surprise. These four variables explain 73.7% of the variation across firms and over time and 93.4% of the within-firm variation in our data. Practical implications In addition to conducting an empirical investigation for the sources of variation in a major operational metric, the results in this study can also be used to benchmark a retailer's inventory performance against its competitors. Originality/value We develop a new proxy to measure the demand uncertainty that a firm faces and show that this measure may help to explain the variation in inventory performance.

"The analysis of the impact of business process outsourcing on the profitability of commercial airline in the conditions of a global pandemic"

This article provides an economic assessment of the impact of the global pandemic COVID-19 on the economic efficiency of commercial airlines. The dominant role of airlines in the formation of flexible service supply chain and service travel chain has been identified, which increases their customer orientation and competitiveness in the air transportation market, as well as allows them to adapt more quickly to the changing logistics environment. It has been proven that the use of the outsourcing mechanism in combination with the diversification of services provided, allows, on the one hand, to create added consumer value for customers, and on the other - necessitates building complex integration relationships with business partners in service supply chains. Analysis of statistics and experience of leading airlines with different business models in the air transportation market has shown that outsourcing business processes in a global pandemic has allowed carriers to optimize costs according to the volume of work, respond flexibly to changes in consumer demand and better overcome negative impacts external logistics environment.

“Making Better Fulfillment Decisions on the Fly in an Online Retail Environment”

Relative to brick-and-mortar retailers, online retailers have the potential to offer more options to their customers, with respect to both inventory as well as delivery times. To do this entails the management of a distribution network with more decision options than a traditional retailer. The online retailer, not the customer, decides from where items will ship, by what shipping method, and how or whether multiple-item orders will be broken up into multiple shipments. What is the best way to fulfill each customer's order to minimize average outbound shipping cost? We partner with an online retailer to examine this question. We develop a heuristic that makes fulfillment decisions by minimizing the immediate outbound shipping cost plus an estimate of future expected outbound shipping costs. These estimates are derived from the dual values of a transportation linear program (LP). In our experiments on industry data, we capture 36% of the opportunity gap assuming clairvoyance, leading to reductions in outbound shipping costs on the order of 1%. These cost savings are achieved without any deterioration in customer service levels or any increase in holding costs. The transportation LP also serves as the basis for a metric that provides information on the quality of the inventory position. Based on initial successful piloting, our industrial partner has implemented the metric as well as a version of the heuristic that it is applying to every fulfillment decision for each of its stock keeping units in North America.

“Inventory management for retail companies: A literature review and current trends”

In recent years, the correct management of inventories has become a fundamental pillar for achieving success in enterprises. Unfortunately, studies suggesting the investment and adoption of advanced inventory management and control systems are not easy to find. In this context, this article aims to analyze and present an e xtensive literature concerning inventory management, containing multiple definitions and fundamental concepts for the retail sector. A systematic literature review was carried out to de termine the main trends and indicators of inventory management in Small and Medium-sized Enterprises (SMEs). This research covers five years, between 2015 and 2019, focusing specifically on the retail sector. The primary outcomes of this study are the leading inventory management systems and models, the Key Performance Indicators (KPIs) for their correct management, and the benefits and challenges for choosing or adopting an efficient inventory control and management system. Findings indicate that SMEs do not invest resources in sophisticated systems; instead, a simple Enterprise Resource Planning (ERP) system or even programs such as Excel or manual inventories are mainly used.

“Integrated Location- Inventory Modelling under Forward and Reverse Product Flows in the Used Merchandise Retail Sector: A Multi-Echelon Formulation”

This study presents a joint three-echelon location inventory model for a donation-demand driven industry in which the main warehouse (MW), distribution centers (DC), retail stores (RS) and donation-only centers (ADCs) exist. This unique inventory-location problem involves demand and supply uncertainties, coverage radius limitations, service level requirements, and multiple products consideration. Each retailer has two classes of products flowing from the assigned DC due to demands minus donations occurring in that retailer. The proposed model simultaneously determines the number of DCs to open, DC locations, and assignments of retailers to the open DCs for particular product types. The objective is to minimize the total annual cost including: facility location costs, transportation costs, inventory costs, and the lost sale costs. Due to the complexity of the problem, the proposed model structure allows for relaxing complicating constraints through recourse to Lagrangian relaxation. The use of robust branch-cut and price heuristics solves the mixed integer nonlinear problem to obtain a lower bound and a distance-based heuristic to get an upper bound. We formulate essential features of this novel problem, solve several numerical example problems and evaluate solution performance. We believe this is a novel problem environment, and that this initial study extends integrated location-inventory modeling to a new context.

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