ELIMINATING THE BULLWHIP EFFECT IN COMPETITIVE MARKET SUPPLY CHAINS

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ABSTRACT

Changes in consumer demand that cause inventory levels to fluctuate more in the supply chain. The bullwhip effect in the supply chain has already been widely studied. Observations of business operations, simulated experiments and macroeconomic data reveal the enormous additional supply chain costs caused by this problem. Well-coordinated and implemented supply chain management decisions can directly benefit organizations by reducing shipping, purchasing, out-of-stock, storage and disposal costs. The whiplash effect has never been studied in complex supply chains. If there is only one retailer, market competition between the two retailers is not taken into account. The greater the level of competition in the market, the greater the bullwhip effect.

***Keywords**: Bullwhip, Market competition, Supply chain management, TCO*

Introduction

Multinationals are increasingly competitive in global markets as demand for improved products and services increases. Organizations value their entire supply chain, profits and well-being more than ever. Inventory fluctuations or inefficient asset allocation due to changes in demand are at the top of the supply chain. Fluctuations in supply chain orders get worse as you move up the supply chain. This phenomenon is known as the "whiplash" effect. (Also known as the "whiplash" or "whiplash" effect.) In the supply chain, the whiplash effect has already been widely studied. Business activity monitoring, simulation experiments and macroeconomic data indicate significant additional costs to the supply chain as a result of this problem.

A limited number of researchers have identified the determinants that lead to the whiplash effect in a competitive market. Extensive literature studies believe that these key market factors actually influence the bullwhip effect. However, a review of the literature may not be sufficient to reach these conclusions. This can be seen as a limitation of the study. the purpose of the research

Objectives of Study

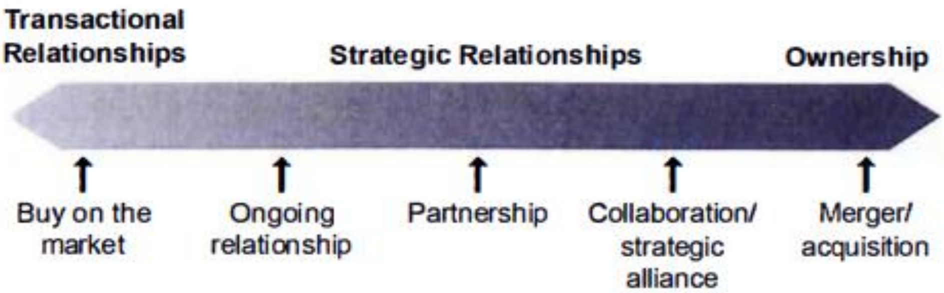
1. Explore the key determinants of bullwhip effect.
2. Identify key determinants of whiplash reduction.
3. Identify the determinants affecting the effectiveness of the whiplash supply chain in competitive markets book review

Literature Review

Lee et al (1997) noted that the whiplash effect leads to more inefficiencies in the supply chain. These include poor customer service, overinvestment in inventory, lost sales revenue, inefficient transportation, inadequate energy planning, and missed production schedules. Hassanzadeh, Jafarian, and Amiri (2014) identified five main causes of the whiplash effect: demand signal processing, lead times, price fluctuations, order selection, and supply shortages. According to the APICS Dictionary of Supply Chain Management, total cost of ownership (TCO) is the sum of all costs associated with each activity in the supply chain. The most important insight that TCO provides supply chain managers is to understand that the cost of acquisition is often a very small fraction of the total cost of ownership.

The purpose of TCO is to encourage supply chain decision makers to view supply chain activities as an investment in functionality, not as a cost that can be minimized. The supply chain is an expensive and complex system. TCO takes into account tangible and intangible costs. Dividing costs into logistics costs, process change costs, and operating costs helps you decide which costs to include in your analysis and which to exclude because they are unrelated or complex to your analysis. TCO analysis may require advanced tools analysis, such as scenarios or network models for simulation or decision support systems. The APICS dictionary defines CPFR (Collaborative Planning, Forecasting and Replenishment) as a collaborative process that enables trading partners to jointly plan key supply chain activities, from the production and delivery of raw materials to the production and delivery of finished products to end customers. Cooperation includes business planning, sales forecasting and all necessary work for replenishment of raw materials and finished products. Process philosophy to facilitate collaborative communication

Strategic relationships are in the middle of the spectrum of buyer-supplier relationships. At one end of the spectrum are traditional trade-buy or "market buy" relationships. On the other hand, it turns the relationship with the external supplier into a purely internal process.



Optimistic effect in a competitive market

There are several conditions involved in creating competition in the market.

1. Profit Motive: Market competition occurs when the opportunity to make a profit motivates a firm to enter the market. 2. The discount principle: The stock of a good decreases because more products are purchased. Eventually the supply will reach zero and the price will rise. High prices are an incentive to increase production. 3. Principles of Competition: Market competition occurs only when consumers and businesses compete to provide superior goods or services. 4. Exclusion: Exclusion from consumer benefits is important for market competition. Parasites can develop if not removed

The whiplash effect has never been studied in complex supply chains. If only one retailer is considered, market competition between the two retailers is not taken into account. Retailers compete in the same market. Demand from one seller may decrease as demand from another seller increases and vice versa. The demand for Retailer 1 is negatively correlated with the demand for Retailer 2. The correlation coefficient is equal to the degree of competition in the market. That is, the greater the degree of competition in the market, the greater the negative correlation of demand among retailers. At the inventory level, the lead time forecast, forecast standard error, and demand forecast range function. The optimal order inventory is determined by the inventory cost and the shortage cost. The more competitive the market, the greater the volatility of demand among retailers. This means that the market is increasingly competitive, making it increasingly difficult to predict demand and delivery times. Optimal inventory levels can be compromised because forecasts are not accurate. In a competitive market, the bullwhip effect is a function of the volatility of retail demand, retail lead times, forecast coverage, and the stability of market competition. The impact of the selected determinants on the whiplash effect is retailer lead time, expected spreads, demand volatility between the two retailers and market competition.

One. The longer the cooking time, the greater the whipping effect. To reduce the whiplash effect, managers can benefit from reduced training time. However, shorter operating times do not always mean less impact. To overcome these challenges, more historical demand data can be used to more accurately predict optimal delivery times. 2. The whip effect is reduced to the intended range. The smaller the demand forecast deviation, the smaller the bullwhip effect. This means that managers can reduce the bullwhip effect by increasing their forecast range. 3. Demand volatility between two retailers is driven by demand processes and is difficult for managers to control. The whiplash effect affects demand volatility between two retailers in different ways. This is because the demand volatility between the two retailers may have different values. 4. The whiplash effect is a monotonous feature of market competition. Therefore, from a management point of view, market competition is simply a factor influencing the whiplash effect. Although it can be concluded that market competition is an important factor in causing the bullwhip effect, it is difficult for managers to regulate it to reduce the bullwhip effect. An efficient and even flow of value can be seen as the opposite of the whiplash effect. They examined operational characteristics, organizational characteristics, and dynamic behavior within the organization to assess the extent of fluid flow of materials. Markets create uncertainty that leads to explosion, and optimizing behavior through market competition leads to optimism.

Competitive markets can lead to a whiplash effect

Market competition is when a company tries to be more successful than its competitors in providing identical or similar goods/services or similar substitutes. In a competitive market, competitors strive to gain a competitive advantage to increase sales, profits, and market share. Several factors have been identified that significantly influence the bullwhip effect in a competitive market. These factors are market structures, behavioral optimization, substitutes, pricing strategies and innovations.

• Competitive markets can vary with different levels of competition. This is important to understand because the level of competition in the market affects the whiplash effect.

• All parties involved in the supply chain have their own goals and strive to achieve them.

Conclusion and Discussion

Market competition is also identified as a factor leading to the bullwhip effect, as well as the five traditional causes. The higher the degree of market competition, the more significant the bullwhip effect will be in the chain. However, some studies suggest that market competition does not directly contribute to the bullwhip effect.

Due to market forces, causes of the bullwhip effect may emerge. Thus, there are two opposing ideas regarding the way in which market competition affects the bullwhip effect. If market competition does lead directly to bullwhips, then the bullwhip effect should be present in almost every market. However, this is not the case. Therefore, the underlying factors in the competitive market were investigated to determine whether they are more decisive than the competitive market in causing the bullwhip effect.

Many factors in a competitive market can either directly or indirectly lead to bullwhip effect. This happens because market forces in a competitive market have led to various inefficiencies that are detrimental to the entire supply chain. The factors of market structure, substitution behavior and pricing strategies lead directly to the bullwhip effect in the supply chain.

Optimizing behavior and innovation can be classified as indirect factors leading to the causes of the bullwhip effect.

To overcome all the negative consequences originating from the bullwhip several strategies to reduce the bullwhip. Multiple studies concluded that inaccurate demand forecasts, long lead times, price fluctuations, order batching and supply shortage lead the bullwhip effect. However, this paper suggest that market competition is also a factor leading to the bullwhip effect.

Future research can establish a model in which several degrees of market competition are included. Perhaps in a market structure with a lower degree of competition the bullwhip effect exhibits different properties and magnitudes.

References

1. All references to the APICS Dictionary are from the 14th edition.
2. Hassanzadeh, A., Jafarian, A., & Amiri, M. (2014). Modeling and analysis of the causes of bullwhip effect in centralized and decentralized supply chain using response surface method. Applied Mathematical Modelling, 38(9), 2353-2365.
3. Lee, H. L., Padmanabhan, V., & Whang, S. (1997). Information distortion in a supply chain: The bullwhip effect. Management science, 43(4), 546-558.
4. Wang, X., & Disney, S. M. (2016). The bullwhip effect: Progress, trends and directions. European Journal of Operational Research, 250(3), 691-701.