Echelon position and inventory behavior: Revisiting the Bullwhip evidence

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Abstract

Bullwhip effect (BWE) has been among the most prominent topics of supply chain research using different methodologies. One set of research has investigated the application of theoretical perspectives in real life data. In an interesting paper of this type, Dooley et al. (2010) used economic data to interpret the bullwhip caused because of the recession in 2007-2008. They demonstrated the bullwhip based on the data of industry as an aggregate and for the automobile industry. Based on the three years of data Dooley et.al. (2010) have suggested that all the agents at the same levels have similar response in terms of their inventory and ordering behavior.

We have three specific objectives in extending the work of Dooley et.al. (2010). First, we believe that the short time span of three years does not allow us enough data to judge the behavior of the echelons. We seek to remedy this by working with 5 years of data – from 2010 to 2014. Second, we are not sure if the results can be held valid to every individual industry cluster. We seek to advance theory for testing the behavior in multiple industry clusters. We can only generalize the results if the validity can be proved across industry clusters. While the values of the change of inventory and sales could change across clusters, the direction of the change must be consistent to prove validity. Lastly, we will examine the bullwhip in in the individual years for the aggregate and industry data to check for consistency.

We will use inventory and sales data for manufacturing industry from the US Bureau of Economic Affairs. The data provides echelon wise information for various industry segments. Based on the monthly data, the change in inventory and sales would be calculated. These values of changes will be tested for consistency. The process will be repeated to aggregate and the industry wise data.

In spite of the tremendous research, bullwhip is still a major cause for concern in the industry. The research will lead to very important insights into the echelon specific behavior that leads to bullwhip. Based on the results of our research, policies can be designed for specific echelons and mitigate the bullwhip impact. This research will also spawn further academic studies on the role of position in the supply network causing a certain bullwhip specific behavior.

Reference

Dooley, K. J., Yan, T., Mohan, S., & Gopalakrishnan, M. (2010). Inventory management and the bullwhip effect during the 2007-2009 recession: evidence from the manufacturing sector. *Journal of Supply Chain Management*, *46*(1), 12-19

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