Chapter 14
Trimming Safety Stock: Empirically, Realizing Working Capital Gains

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ABSTRACT
Today’s retail environment has become extremely competitive with retailers offering low prices almost on daily basis through various promotional techniques. Majority of their products placed on their shelves are promoted to boost sales, compete efficiently and gain market share. Retailers have a natural tendency to keep a very close watch on various costs in whichever way they can be curtailed or controlled. Costs like Labor, Transportation, Vendor Deals and Inventory reduction are some of the key areas that are tracked and renegotiated very frequently by retailers worldwide. Safety Stock holding is one critical area where a lot of work can be done “empirically” by retailers and distributors to create stock efficiencies across their established supply chain networks. Application of appropriate statistical techniques on the right set of products can help us getting a trimmed down safety stock numbers which are still capable in addressing the demand and supply variability while holding much lesser stock and still achieve greater customer service levels.

INTRODUCTION
The theory of Bull Whip Effect explains the problem of amplification of demand variability signal as we move up in the supply chain (Lee, 1997 and Balakrishnan, 2004). This amplified or inaccurate information traversing up the supply chain leads to multiple inefficiencies in the entire system leading to stock excesses, inventory shortages, loss in customer sales and revenues, inappropriate capacity planning and production schedule and finally falling customer satisfaction at global retail outlets.

To avert this, the retail organizations have to maintain high level of safety stocks at various levels of their global supply chains. In this chapter we will emphasize largely on the reduction in safety stock build ups by focusing on the key contributing factors like demand variability, supply variability, customer service levels and
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competition and how by applying appropriately chosen statistical distribution models and other home-built empirical techniques we can arrive at intelligent and optimized safety stock figures for different stock keeping units (SKUs = item at a location) present at different echelons of the supply chain network.

Robert N. Boute (2007) has strongly emphasized on the coordination problem in supply chain, more specifically the issue of coordinating the retailer’s safety stock requirements and manufacturer’s lead time decisions which are quite closely related as longer and more variable lead times lead to higher level of safety stocks. Having just the right safety stock at the right place is a significant challenge in itself as it requires a inputs from multiple directions of organization’s ecosystem where it is operating from like planners, customers, vendors, competitors, transporters, economy and shareholders etc.

Disney (2006) who analyzed P&G’s home care & family care product categories, the presence of weekly promotions actually might lead to deceleration of customer demand before and after the promotion period due to customer stock piling during promotions. Similarly we refer to Raju (1992) who has related the promotional activity in a product category to its variability in sales.

Oeser (2011) emphasized enough on the concept of risk pooling at a higher echelon in supply chain network like a distribution center to address the problem of demand variability wherein the variability for individual products is consolidated in order to reduce the product portfolio’s total variability.

Quite naturally, in this chapter, we will also focus on the various prevailing constraints which retail organizations of today’s world operate under like lead time and capacity constraints, varying customer expectations, promotions, profitability, alignment of supply chain information systems with varying customer needs. We will discuss how addressing variability of different kinds will lead to significant cost savings not only in working capital investments but also in other areas of the retailer’s business and consequently in what all areas these monies saved can be spent to enhance profitability component of the balance sheet, adding multiple new revenue generation streams and aligned customer satisfaction levels. Killingsworth (2011 p6) states “The dynamics of supply chains and large supply networks are still not well understood and major inefficiencies are the costly result. As supply chains have become more global and increasingly complex, supply chain dynamics and the associated risks and costs plague companies around the world.”

Evolution of Forecasting

Let’s talk briefly about the evolution of forecasting. Referring to the sequence of events given in the below picture which has been adapted from ToolsGroup Inc. website, we can easily see how forecasting has evolved over a period of time. From reacting to forecasting to sensing and planning, how it has crossed multiple evolution stages and reached and attained these levels of process and technological maturity (see Figure 1).

Larry Lapide (2009) in his journal “History to Demand Driven Forecasting Vol 28 Issue 2” has mentioned the development of understanding of uncertainty and probabilistic events by organizations. How understanding of trend variations, seasonalities has helped the forecasting process to be more fine-tuned and slowly but surely closer to reality of what is expected to happen in future. He also mentioned that the rise in consumerism made the business forecaster’s job much more difficult. Demand forecasting methods and systems have had to become larger in scale to accommodate the dramatic growth in the entities that needed to be forecast in multinational organizations. Business planning has become more complex in terms of having to deal with the myriad products being sold, many with short lifecycles (e.g., known as