Stocking Policies for Fast Fashion Retailers: Preliminary Findings

CHOI Tsan-Ming (Jason)
CHOW Pui-Sze,
Business Division,
Institute of Textile and Clothing,
The Hong Kong Polytechnic University
Fast Fashion

- Short selling season, a lot of styles, fashionable, always changing, low inventory level, etc.
- Zara, H&M, Mango, etc.
- Zara’s story:
  - Zara can even achieve the 15 days’ magic in which the whole process cycle from conceptual design to a final ready-for-sale “well-produced and packaged” product in the retail store just takes about 15 days (Ghemawat & Nueno, 2003).
Stockout in Fast Fashion

- Stockout:
  - Traditional:
    - Negative: Loss of sales, loss of good-will, complaints.
  - Fast Fashion:
    - Negative?
    - Positive?
Consumers…

- Buying rice from a supermarket:
  - Stockout =>?
- Buying a blue shirt from Marks & Spencer:
  - Stockout =>?
- Buying a Polo shirt from Bossini:
  - Stockout =>?
- Buying a fashionable jacket from Zara:
  - Stockout =>?
Fast Fashion vs. Traditional Apparel

- **Traditional:**
  - Maximizing the revenue from each style.
  - Stockout is a loss (loss of goodwill, loss of sales).

- **Fast Fashion:**
  - Do not aim at maximizing the revenue from each particular style (or SKU basically).
    - It is especially true for companies such as Zara in which the production quantity for each SKU and hence the corresponding quantity available for sales are both relatively small.
  - Stockout does incur a loss of sales for that SKU BUT not the loss of goodwill.
Fast Fashion vs. Traditional Apparel

- Fast Fashion:
  - Retailers instill an idea into the consumers that stockout in the store is not a sin (loss of goodwill) and it actually means something positive.
  - The fast fashion supply chains will always create new designs and apparel products to satisfy the ever-changing taste of the market and hence when there is a stockout in the retail store, there are many other new products which can satisfy the consumers.
  - If a consumer goes to a fast fashion store and finds an interesting apparel product, the consumer should buy it at once as nobody can guarantee that this product will be available next time the consumer stops by.
Basic Model

- Newsvendor setting.
  - Profit setting: r, c, h, pie.
  - Penalty (extra) of stockout is:
    - (i) ZERO.
    - (ii) something “favourable”!

Objective function:
- A target threshold for profit D.
- Safety-first (SO)
  - \( SO = \frac{\text{Expected Profit} - D}{\text{SD of Profit}} \)
  - By Tchebycheff inequality,
    - \( \text{Max SO} = (\text{approximately}) \text{ Min the upper bound on Prob(Profit} \leq D) \).
- Mean-variance tradeoff (Choi et al. 2008a, b)
- Decision: quantity.
Basic Model

- Derive the expected profit and variance of profit functions.
- With two sets of real data (on demand patterns and cost-revenue parameters) of two product styles, we conduct analysis and report some preliminary findings.
Preliminary Findings

- With a “zero” penalty on stockout, SO is concave.
- With a positive effect from stockout, the function of SO is not concave and we need to compute several thresholds in order to identify the bound for computing the optimal quantity q.
Preliminary Findings

- When we consider the case in which stockout has a positive effect, a larger effect will imply:
  - 1. a smaller optimal stocking quantity, and
  - 2. a higher corresponding expected profit.

- Justify the widely-observed phenomenon that the stocking quantity in fast fashion retail stores is much lower than other traditional retail stores.
Preliminary Findings

- For the standard deviation of profit (SDP) and the coefficient of variation of profit (CVP) at the optimal stocking quantity, the functional forms look a bit complicated and they need not be monotonic with respect to the “stockout reward”.
  - We do observe, for both Styles A and B, that there is a value of the stockout “reward” with which the respective SDP is minimized. The same applies for CVP.
  - Implications: By establishing a certain amount of reward for stockout under fast fashion concept, the retailers not only can improve expected profit but they can also enjoy a smaller degree of uncertainty over profit (i.e., risk). It gives a dominating result.
Future Work

- A more general model.
- Impacts on supply chains.
- Multi-product scenario.
References