Additions, Corrections, and Updates to

Operations Strategy: Principles and Practice by J.A. Van Mieghem, Publisher: Dynamic Ideas, 2008

Last updated on Feb 2, 2010 by JVM

Chapter 2

- P. 40: equation (2.1) should have the square root of *N*-1 instead of *N*.

Chapter 3

- P. 73 (L-3): typo: delete "capacity".
- P. 85 (last sentence first paragraph): replace "maximum" by "minimum"

Chapter 6

- P.231: additions to Mini-Case 6 questions to keep things specific.
  For all questions: focus on the TLC to supply North America only. Furthermore:
  For question 1: Contrast the TLC assuming *all* products are produced in Mexico or *all* in China. For China, assume % of shipments by sea = 100%, 50%, and 0%. (In other words: calculate four TLC numbers.)
  For question 2: Now implement the proposed tailored global operations strategy and assume first that "high volume" means "monthly sales exceed 30,000 units." (Thus, the four top SKUs are dual sourced: China serves the base demand of the top 4 SKUs while Mexico serves their surge demand. The remaining SKUs are single sourced from Mexico.) *How does TLC depend on the choice of what "high volume" means? How do you suggest implementing a tailored global strategy?*

Chapter 8

- P. 293: add footnote to first sentence of paragraph 6: "As a solution, the resort can overbook…":
  "It is typically assumed in revenue management that there is excess demand at the lower price point that would take these extra 10 reservations. However, to stay consistent with our deterministic demand functions, the hotel could slightly reduce its prices (and re-run the capacity constrained price optimization on p 283 with capacity 130 instead of 120). Clearly, this will reduce the value of overbooking."
- P. 302: Example 8.6: The displacement cost is \$5, the extra cost spent for express supply (\$11 - \$6). The regular shortage probability becomes 80% so we should protect norminv(.2,50000,30000)=24,751 units and accept 100000-24751 = 75,248 advance orders. The expected regular orders to be filled by the backup supplier is 30,000*L(0.95) = 28,598 at an extra

cost of ($11-$6)*28,598. The expected profit is 75,248*($10-$6) + 50,000*($16.72-$6) - ($11-$6)*28,598 = $694,005. This compares to an expected profit of $676,158 when allocating to the mean. The value of optimization thus is $17,847 or 2.6%.

Chapter 13: Peapod case

- P. 428: add to first second to last paragraph: "…, including benefits and tax, but excluding tips."

Appendix A

- P. 433: notice that Q here represents the maximal inventory (or build-up-to) level and *not* the production quantity. The correct derivation of the square root result goes as follows (recall we have total demand rate R of N different products with equal demands and costs):

Let T be the total cycle time during which we produce exactly on lot of each product. Given that we assume all demands have equal demand rate, each product is produced during a cycle time $t = T/N$. We seek to determine the optimal cycle time t.

To satisfy each product's demand R/N we must produce at rate R during its cycle. Meanwhile, we sell at rate R/N so that its inventory accumulates at rate $R-(R/N)= (N-1)R/N$. In contrast, it depletes at rate R/N when the product is not being produced. [Indeed, in Fig A.2 with 3 products, the build-up rate 2R/3, double the depletion rate of R/3.] Consequently, the maximal inventory level of each product is

$$Q = \text{build-up rate} \times t = (N\text{-}1)R/N \times t.$$

The corresponding annual holding cost for each product is $HQ/2$ and the total holding cost is

$$\text{Total annual holding cost} = N \times HQ/2 = (N\text{-}1)HRt / 2.$$

The number of cycles (and thus changeovers) per year = 1/ t so that

$$\text{Total annual changeover cost} = S/t.$$

Notice that the total cost is the same as the simple EOQ cost (p. 431) provided we make the following substitutions in parameters:

$$Q_{EOQ} = t \qquad S_{EOQ} = S/R \qquad H_{EOQ} = (N\text{-}1)HR$$

Using the simple EOQ solutions (p. 431) thus yields the optimal t and corresponding cost:

$$t^* = \text{sqrt}(2RS/H)_{EOQ} = \text{sqrt}(2R(S/R)/ (N\text{-}1)HR) = \text{sqrt}(2S/(N\text{-}1)HR)$$

$$TC(t^*) = \text{sqrt}(2RSH)_{EOQ} = \text{sqrt}(2R(S/R)(N\text{-}1)HR) = \text{sqrt}(2(N\text{-}1)SHR)$$

- P. 436: the expression for the expected operating profit becomes:

$$\Pi(K) = p^*E(\text{sales units}) - cK - c_p\, E(\text{shortfall}) = p^*[\mu - E(\text{shortfall})] - cK - c_p\, E(\text{shortfall})$$