

Homework #3

The data file contains **daily** demands for one year in four different regional distribution center for three different products.

Consider a periodic review policy with review interval 6 days and lead time 5 days. The cycle service level is 95%. The unit holding cost is \$0.15 per unit per **day**.

For the regional distribution centers, the inbound transportation cost is \$0.09 per unit and the outbound transportation cost is \$0.10 per unit.

For product 1, calculate the following for each region:

- 1) OUL
- 2) Average order quantity
- 3) Average Cycle stock
- 4) Average Safety Stock
- 5) Average Inventory
- 6) Daily Average Inventory holding cost
- 7) Daily Average transportation cost (sum of inbound and outbound)
- 8) The sum of Daily Average Inventory holding cost and Daily Average transportation cost

For product 1, suppose that instead of four regional distribution centers, we will have one National distribution center. In the national distributional center case, the inbound transportation cost becomes \$0.05 per unit and the outbound transportation cost becomes \$0.24 per unit. Everything else remains the same. In the national distributional center case, calculate the following:

- 1) OUL
- 2) Average order quantity
- 3) Average Cycle stock
- 4) Average Safety Stock
- 5) Average Inventory
- 6) Daily Average Inventory holding cost
- 7) Daily Average transportation cost (sum of inbound and outbound)
- 8) The sum of Daily Average Inventory holding cost and Daily Average transportation cost

Compare the total daily cost for the regional distribution center and the national distribution center. Do you recommend National distribution center?

Repeat the same exercise for products 2 and 3. Do you see any difference for the last comparison question? Why do you think that in some cases, the national distribution center is better, but in other cases, the regional distribution center is better?