

MAPPING THE SYNTAX MODEL INPUT DATA

FROM DYNAMIC PROGRAMMING (dp) TO MIXED INTEGER AND LINEAR (milp)

- Assumptions
 - Object function: profit, not contribution margin
 - Number of models: two for dp and one for milp
 - While data did not exist for “wholesaler shipments to small geographical areas,” it is assumed they did for: i) product shipments to the wholesalers and ii) total product shipment volumes from the wholesalers to the channels but not channels’ zip codes. If they didn’t exist, use national average.
- Products: P1,...,P7
- Customers /channels: C1,...,C9
- Processes (5): pick/pack/ship, make product by category (M1,M4)
- Facilities (41): plant, 40 wholesale distributors
- Echelons (4): make, pick/pack/ship, wholesale distributors and customers

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- Independent variable
 - dp model: unit revenue
 - milp model: units = revenue/price
- Price
 - dp model
 - one price for each of 7 products which is average of 9 channels
 - one price for each of 9 channels which is average of 7 products
 - milp model: unique price by product and channel (63)
- Costs
 - sales person

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- Costs
 - dp model
 - Product: one cost for each of 7 products which is average of 9 channels or one cost for each of 9 channels which is average of 7 products
 - Distribution: same as for product
 - Milp model
 - Product: unique cost by product and channel (63)
 - Distribution
 - Pick/pack/ship: unique by product
 - Transportation: unique by product and number of wholesale ship to locations

NOTE #1: Assuming 40 such locations, there would be 280 link costs

NOTE #2: Thus, the Syntax milp model would have 2520 demand cells. This compares to the approximately 25,000 in the white goods model; e.g., brand, product, geo, and channel

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- Number of response curves
 - dp: 16; 7 for product model and 9 for channel model
 - milp: up to a max of 63. A middle ground could be nine channels and 4 product groups. Or, perhaps the channels group, also, into categories as the products do. Examining the similarity of the 16 Syntex curves would shed some light.

NOTE #3: The point is that the number of response curves is strictly a function of client's knowledge of the granularity at which the sales force drives demand.

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- Number of judgment data points per response curve
 - dp: 5
 - milp: 3

NOTE: As with a dp model, the milp model's response curves are piecewise linear. The number of "pieces" could be as few as two, obviously, all the way up to the number in the Syntax model, though at some point run time becomes a problem for milp models

SYNTEX milp Model DESIGN

