

GMAN 505: Forecasting and Operations Management

Class 10: Supply Chain Management

Video Vault

- ◆ Availability of tapes is important to customers.
 - Demand starts high and decreases rapidly.
- ◆ With a standard wholesale price contract a retailer cannot earn a profit and satisfy demand in the initial weeks:
 - Retailer's cost per tape = \$60, revenue per tape = \$4
 - Required incremental number of rentals to justify purchasing an additional tape = $60 / 4 = 15$
 - A tape is unlikely to rent 15 times in the first week or two.
- ◆ Lack of inventory is not due to poor forecasting or bad inventory management, it is due to the economics imposed on the retailer.
- ◆ Even if each firm in the supply chain acts optimally, overall supply chain performance may not be optimal.

Availability solutions

- ◆ Cut the wholesale price:
 - The retailer does buy more tapes...
 - ... but this is not attractive to the supplier.
- ◆ We want an arrangement that ...
 - (1) maximizes supply chain profits and
 - (2) allows the firms to divide the "supply chain's pie" so that they are both better off.
- ◆ Revenue sharing:
 - Supplier sells each tape at a reduced price, but takes a share of the retailer's revenue.
 - e.g., wholesale price = \$8, retailer's share = 50%
 - Now the retailer only needs $8 / (50\% \times 4) = 4$ incremental rentals to justify ordering a tape.

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Revenue sharing issues

- ◆ Monitoring costs:
 - Supplier must incur the cost of monitoring the retailer
- ◆ Supplier's profit becomes more variable and payment is received later.
- ◆ Foolish/irrational retailer: The supplier risks working with a retailer that orders too few tapes.
- ◆ Diversion – retailers buying tapes for \$8 and selling them to other retailers.
- ◆ Retailer's incentive to exert effort to increase sales is reduced
 - Why increase sales if you only keep $\frac{1}{2}$ of the revenue?
- ◆ Revenue sharing makes supplier advertising more attractive because demand can be concentrated around the release date.

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Summary

◆ Coordination failure:

- Supply chain performance may be less than optimal with decentralized operations (i.e., multiple firms making decisions) even if firms choose individually optimal actions.

◆ Reason for coordination failure:

- The terms of trade do not give firms the proper incentive to choose supply chain optimal actions.

◆ Why fix coordination failure:

- If total supply chain profit increase, the “pie” increases and everyone can be given a bigger piece.

◆ How to fix coordination failure:

- Design terms of trade to restore a firm’s incentive to choose optimal actions.
- e.g., with revenue sharing a retailer can justify holding more tapes.

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A Thought Experiment

- ◆ You are a retailer. You buy certain computer components for the wholesale price of \$30 from a supplier and retail it for \$40. It costs your supplier \$20 to make the part. Unsold parts are marked down and sold for \$15. Demand is uncertain and is normally distributed with mean 20 and standard deviation 5. How many parts should you stock?
- ◆ Now suppose that there is a revenue sharing agreement where the wholesaler charges you \$20 per part plus 50% of the revenue. How many parts should you stock now?
- ◆ What is the optimal revenue sharing arrangement?

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