Supply Contracts at SkiRetail (Answers)

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Q. 1

- Optimal production quantity = 15,000
- Expected profit for "the company" = $1,122,813

Q. 2

- What is your estimate of the quantity for ski jackets that Bergard (SkiRetail) shall place an order for?
  - Optimal order quantity = 10,000
- Expected profit for SkiRetail based on your estimate of order quantity.
  - Using empirical method = $452,500
- Expected profit for Skiekz based on estimate of order quantity.
  - Using empirical method = $530,000
- Total supply chain profit
  - Using empirical method = $982,500
- How does this profit compare to the vertically integrated case (Q 1).
  - As expected, the profit is lower by $1,122,813 -$982,500 = 140,313. This is a decrease of 12.5% compared to the vertically integrated case.

Q 3

- Analyze the impact of different buy-back prices on the optimal order quantity, retailer's expected profit, supplier's expected profit, as well as the total supply chain profit? Show your results using some plots.

buy back price	Ser.Level	*Optimal Qty.*	Retailer's Expe	Manuf.'s Profi	Total Profi
$ -	20.00%	9000	$450,000	$470,000	$920,000
$ 50.00	25.00%	9000	$450,000	$470,000	$920,000
$ 50.01	25.001%	10000	$450,003	$517,498	$967,501
$ 72.22	28.125%	10000	$455,555	$511,945	$967,500
$ 72.23	28.126%	11000	$455,560	$551,628	$1,007,188
$ 116.66	37.498%	11000	$479,163	$528,024	$1,007,187
$ 116.67	37.501%	12000	$479,170	$544,268	$1,023,438
$ 143.33	46.874%	12000	$503,330	$520,107	$1,023,437
$ 143.34	46.878%	13000	$503,343	$512,908	$1,016,251
$ 150.00	50.000%	13000	$512,500	$503,750	$1,016,250
$ 150.01	50.005%	14000	$512,519	$488,731	$1,001,250
$ 150.88	53.124%	14000	$523,525	$477,725	$1,001,250
$ 150.89	53.129%	15000	$523,548	$454,890	$978,438

- What is the "optimal" range of buy-back price that you would propose to the firms?

  The optimal, range implies the "profit maximizing" buy-back price, which is $116.67 to $ 143.33. The total profit is $1,023, 438.

- Determine the expected profit for the "retailer" under the proposed buy-back contract.

  The expected profit of the retailer ranges from $479,170 to $503,330.

- Determine the expected profit for the "supplier" under the proposed buy-back contract.

  The expected profit of the supplier (or manufacturer) ranges from $544,268 to $520,107.

Q 4

- What is the optimal purchase /wholesale price that Skiekz should propose?

  The range of optimal purchase /wholesale price that Skiekz is [122,131]. The maximum profit is $1,122,813.

- Determine the expected profit for the "retailer" under the proposed revenue-sharing contract.

Refer to the table below:

- Determine the expected profit for the "supplier" under the proposed revenue-sharing contract.

Refer to the table below:

Wholesale price	Service Level	*Optimal Qty.*	Retailer's Expected Profit	Manuf.'s Profit	Total Profit
$ 122.00	59.34%	15000	$ 990,547	$ 132,266	$ 1,122,813
$ 131.00	53.44%	15000	$ 855,547	$ 267,266	$ 1,122,813

Q 5 Revenue Sharing is out of scope of this course. Please ignore this question.

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