Revenue and Facilities Recommendations for Big Mountain Resort

Recently, Director of Operations, Jimmy Blackburn came to us with a request to build a more data-driven pricing model for Big Mountain’s ski tickets. Big Mountain needs to ensure it is successfully capitalizing on its unique combination of facilities and amenities and could benefit from comparing its ticket prices with resorts in a more detailed fashion than using market averages as a benchmark. We were hoping a more detailed pricing model would support a 10% increase in ticket prices for this season.

Big Mountain is also considering making some adjustments to its facilities that might improve revenue or reduce costs. We applied our pricing model to a few of the current proposals in order to recommend a course of action.

To arrive at our model, we sourced data from Alesha Eisen, Database Manager, who was very supportive. She provided us with current market research including many resort features, such as summit height, vertical drop, numbers and types of chairlifts, number of runs, skiable acreage, snowmaking coverage, night skiing, and, crucially, ticket prices for 277 resorts in our market. We supplemented this information with some state-by-state information such as population and area, to answer questions such as “are ticket prices affected by the number of resorts per unit of population in a state?”

Exploring the state-summary data yielded few obvious patterns. A state might be in the top 5 for a feature such as resorts per state but not in the top 5 for total skiable area per state. State average ticket prices seemed to have very little pattern with respect to the two main features derived by Principle Components Analysis (PCA). After exploring the state data, we decided to focus our model on resort features without considering state information.

Here’s the good news: as we tested various combinations of resort features to see which were most strongly correlated with ticket prices, we discovered that Big Mountain is quite high within the broad market on the features that seem to be most important to pricing: total chairlifts, fast quads, total runs, snowmaking acres, and vertical drop.

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\* Charts will also be on the accompanying PowerPoint in a more visible fashion.

Our ticket price is currently $81.00, medium-high for the market, but with our position in features, our model suggests there is indeed room for an increase. Our final model indicated a price of $95.87, with a mean absolute error of $10.39. Even if we take the entire error to the down side, we could still easily be charging $85.00 for a ticket, and our hoped-for 10% increase would be $89.10 which is still well below the model result.

Additionally, we modeled a number of proposed changes to facilities to see how each would affect ticket prices.

* Scenario 1: close up to 10 of the least-used runs
* Scenario 2: add a low run to increase our vertical drop by 150 feet. Includes adding a chairlift to return skiers to the base.
* Scenario 3: same low run and chairlift, additionally supported by 2 acres of snowmaking.
* Scenario 4: increase longest run by 0.2 miles, adding 4 acres of snowmaking support.

Our models predict effects as follows:

* Scenario 1: closing more than 1 run is not recommended unless cost savings will more than replace the lost revenue. We did not consider operating costs in our modeling. We also did not model the possible closure of lifts serving the closed runs, but the importance of lift numbers to the model in general suggests that reducing lifts would also drive prices down.Chart, line chart

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* Scenario 2 and 3: Increasing our runs, vertical drop, and chairlift total predicts a price increase of $1.99 per ticket and is recommended unless cost information would contravene. Assuming 350,000 visitors per season buying an average of 5 days’ tickets, a $1.99 price increase would increase revenue by $3,474,638. Assuming the new chairlift operating costs are similar to our most recently installed new lift, at $1,540,000, increased revenue would easily cover this cost. Increasing snowmaking coverage by only 2 acres did not measurably affect the price and would not be recommended.
* Scenario 4: Increases to longest run and snowmaking in this scenario are minimal and have zero predicted effect on price. Not recommended.

Areas for further research:

* The only price data in our dataset were ticket prices. Have we considered equipment rentals, lesson fees, or other directly ski-related prices?
* Cost information would be highly useful in order to compare gains/losses in revenue against costs added or reduced as we make facility changes.

Conclusion: Big Mountain does appear to have room to increase ticket prices with our current facilities by 10%, and adding a low run and supporting chairlift could add a further $1.99 to the ticket price.