Big Mountain Resort

Project Report

Context

Big Mountain Resort's current ticket pricing strategy has been to charge a bit above the average price of other ski resorts in their shared market. This method, however, does not take into account different resort features (e.g. skiable area, number of runs, types of chairlifts), and their varying levels of influence in determining a resort's market value. Lacking this information, Big Mountain may not be charging as much as they could for admission.

By analyzing data from other ski resorts in the country, we created a model that 1) identified the most influential features, 2) predicted a better value for ticket price, and 3) modeled a few different scenarios involving changes Big Mountain could make to increase ticket price and/or decrease operating costs.

Our pre-processing analysis identified eight influential features in determining ticket price: vertical drop, snow making equipment, total chairs, fast quads, runs, longest run, trams, and skiable terrain.

Recommendations

I. Increasing Ticket Price

Currently, Big Mountain charges $81 for a weekend ticket. According to our model, the predicted price was a much higher $95.87. Even with a mean average error of $10.39, a higher ticket price is well within reason. However, it is important to note that a majority of the resorts in our dataset come from more populous states where a higher ticket price is to be expected.

To explore this issue, we compared Big Mountain to resorts in all states as well as resorts only in Montana. Compared to all states, Big Mountain's ticket price is only somewhat above average, but when compared only to resorts within Montana, it already has the highest ticket price (Figure 1). At the same time, the resort is also amongst the highest in snow making area, total number of chairs, fast quads, longest run, and skiable terrain area when compared across resorts of all states.

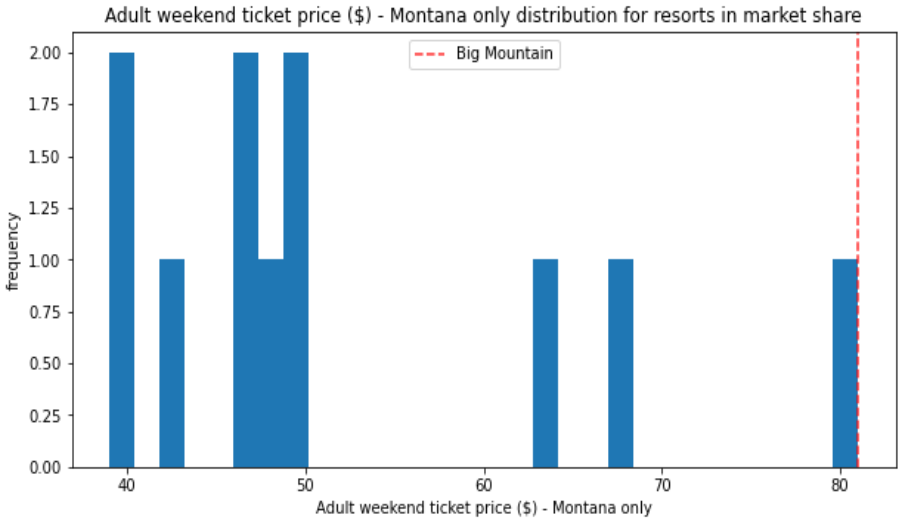
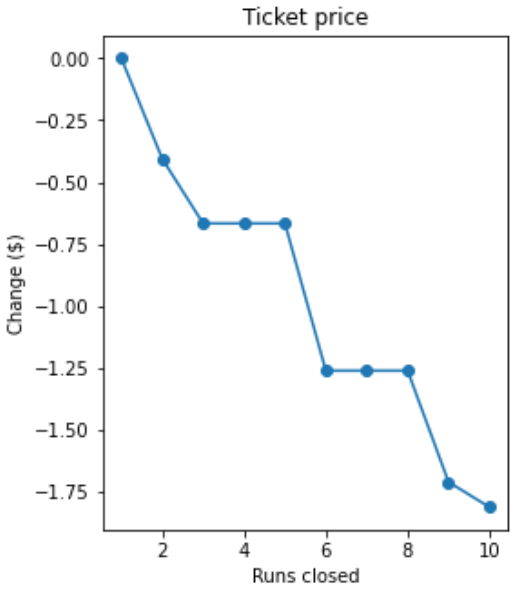


Figure 1: Histogram of weekend ticket prices for Montana resorts with Big Mountain labelled for comparison.

II. Closing Less Popular Runs



based on number of runs closed.

Compared to other resorts in the shared market, Big Mountain Resort is on the higher end of total number of runs. To reduce operating costs, up to ten of the least popular runs were considered for closure. We modeled the expected loss in ticket price and revenue for each closed run. Our calculation for revenue was based on an expected visitor count of 350,000 and 5 tickets purchased per visitor.

As seen in Figure 2, closing one run does not lead to any expected change in ticket price. Closing two to three runs leads to a $0.41 and $0.67 reduction in ticket price respectively. After this point, however, change in ticket price briefly stabilizes; there's no expected reduction in ticket price between closing three runs and five runs. Therefore, if Big Mountain chooses to close three runs, they may as well close five.

Figure 2: Predicted change in ticket price

III. Adding a Run to Increase Vertical Drop

Although Big Mountain Resort already has a fairly large vertical drop, there are still quite a few resorts with a larger value (Figure 3). As vertical drop was identified as one of the top four influential features of our final model, a small increase could potentially lead to a significant change in predicted ticket price and revenue.

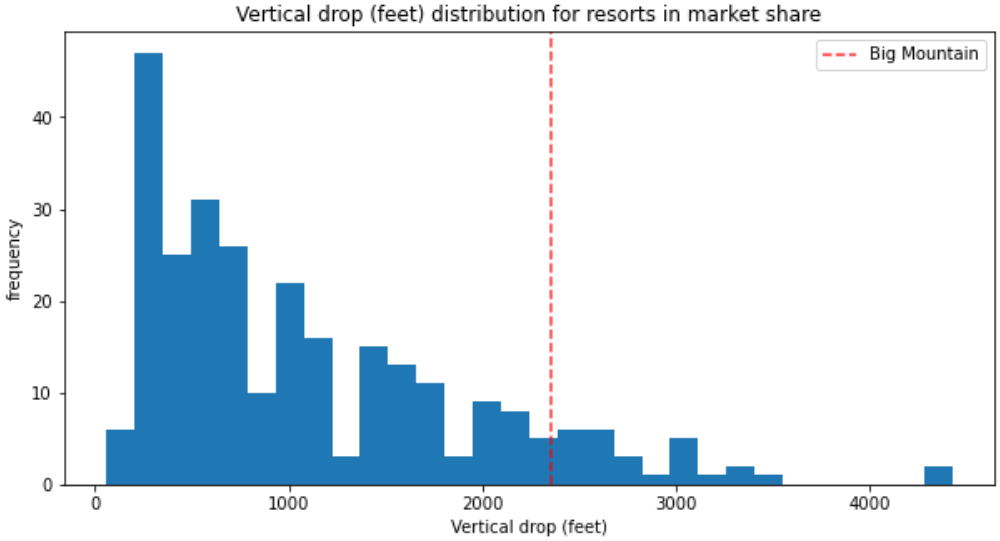


Figure 3: Histogram of vertical drop (in feet) for all resorts with Big Mountain labelled for comparison.

Two scenarios were modeled. In the first, vertical drop was increased by adding a run 150 feet lower, requiring the installation of an additional chairlift. In the second, all of the above would still be done, but with the addition of an added two acres of snowmaking coverage. For both Scenarios 2 and 3, our model predicted an increase of $1.99 in ticket price and $3,474,638 in revenue. It seems that the additional snowmaking coverage in Scenario 3 has no impact on ticket price or revenue, and is therefore unnecessary.

Conclusion

In summary, Big Mountain has room to increase its ticket price to fully capitalize on its resort features. In addition, changes could be made to either increase revenue or reduce operating costs. Adding an additional run to increase vertical drop could lead to a fairly large increase in revenue, offsetting the cost of installing an additional chairlift. Closing a few of the least used runs could also reduce operating cost with minimal change in ticket prices.

It is worth taking note of several limitations in our dataset, however. As our model was largely based on resorts from other states, particularly those from more populated states, it's likely that this data led to a predicted price for Big Mountain that is much higher than the current price. Additional data, such as visitor count, would have also been useful. Larger resorts with more visitors may charge less per visitor. Similarly, the only price data in our dataset was ticket price, and therefore we did not have access to other potential sources of revenue, such as lodging, parking, rental equipment, etc. When modeling the four scenarios suggested by Big Mountain, it would have been useful to have information on the operating costs of each run so that we could factor in the reduced operating cost relative to the reduced ticket price when calculating revenue.