**Guided Capstone Project Report**

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# **The model**

The model was developed using a Random Forest Regression on data from 276 ski resorts located in the US. The model assumes, unless stated otherwise, that Big Mountain will welcome 350,000 visitors per season and that each visitor will buy 5 tickets.

# **The place of Big Mountain Resort in the US ski resort market.**

Charging $81 per adult weekend ticket, Big Mountain Resort is the high-end ski resort in Montana and belongs to the upper national market share (Figure 1). It ranks among the best resorts in the nation in terms of artificial snow coverage, skiable terrain area, numbers of chairs, numbers of fastquads, numbers of runs and even owns one of the longest run. Only one feature, the vertical drop (2,353ft), is not ranked amongst the best (i.e. 3000+ft).

# **Modelled ticket price**

The predicted Adult Weekend Ticket price is $93.32 (+/- $10.32). A such positive difference with the current ticket price charged by Big Mountain is easily explained by the fact that the resort is already fairly high on some of the league charts of facilities offered whereas the ticket price is relatively low for the value of the resort as compared with others in the nation.

# **Modelling changes in equipment and features**

The possible changes in features proposed by leadership were passed through the model and the results indicate that:

* Permanently closing-down runs is not an option as it undermines the ticket price and hence decreases revenues (Figure 2). Closing one run down has no effect, however, closing two or more runs dramatically decreases the ticket price. Beyond 2 runs, a stepwise pattern emerges - closing 3 runs has the same effect than closing 4 or 5 runs. It goes the same for 6, 7 and 8 runs.
* Increasing the longest run by 0.2 mile does neither increase or decrease ticket price or revenues.
* Increasing the vertical drop by 150 feet, with the installation of a new chair lift and either with or without additional snow coverage, does not significantly contribute to either an increase in ticket pricing (+$0.09/ticket) or revenue (+$152,174/season), however, a significant change in vertical drop (at least +300 ft) has a strong impact on ticket pricing which is discussed in the next paragraph.
* Somehow the addition or the non-addition of snow to the additional runs does not affect the price of the ticket in our model though it would surely affect the skiing experience.

# **Modelling the addition of vertical drop**

Figure 3 illustrates the impact of increasing the vertical drop, adding necessary chairs (1 chair per 150 feet of vertical drop) and adding the necessary snow (2 acres per 150 feet of vertical drop):

* Increasing the vertical drop by 300 feet with the addition of 2 chairs and 2 runs improves the ticket price by $5.17 and the seasonal revenue by $9,054,348. The profit margin is then close to 6 million dollars.
* Increasing the vertical drop by 450 feet with installing 3 additional chairs and 3 runs improves the ticket price by $10.26 and the seasonal revenue by $17,956,522. The profit margin is around 13 million dollars.
* Increasing the vertical drop by 600 ft to be the closest to the top resort’s which is near 3000 feet and adding 4 chairs and 4 runs improves the ticket price by $13.20 and the seasonal revenue by $23,105,072. The profit margin is close to 17 million dollars.

Adding beyond 600 feet of vertical drop seems to have no benefit on income. The sweet spot lies around 400 and 600 feet of additional vertical drop.

Figure 4 places this change of feature in the context of a varying market. If each visitor would buy less than 5 tickets per season, the addition of vertical drop would remain sustainable if it is at least 400 feet longer than it currently is. The operational cost shown in Figure 3 and 4 includes only the cost of operating chairlifts ($1,540,000 per chair per season).

# **Conclusions, Considerations, Recommendations**

Big Mountain Resort may increase the ticket price by at least $10 to reflect its value within the US market. This increase could deepen the gap with other, less expensive, ski resorts in Montana. It would be likely beneticial to look into Montana’s market place. The model could be refined using additional data providing more details about the visitors (where are they from, how many tickets do they buy per season…) and about the resorts (why do they undercharge or overcharge?, what are their profit margins?).

Big Mountain may improve its profit margin by adding 400 to 600 feet of vertical drop, with the necessary chairlifts, runs and snow makers. The change would be sustainable provided Big Mountain receives at least 350,000 visitors per season and each visitor buys at least two tickets. This potential change in feature and associated profit should be investigated deeper using additional data pertaining to operation cost, installation cost, purchase of equipment, hiring new staff, cost of clsoing down/dismantling features…etc.. Some runs could be closed down to allow for the opening of new runs to lengthen the vertical drop at low cost.

Figure Big Mountain’s ranking (red line) among US ski resort.

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Figure Impact of closing runs on ticket price

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Figure Impact of adding vertical drop on ticket price, revenues, operational cost and profit assuming each visitor would buy 5 tickets per season.

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Figure Sustainability of adding vertical drop in a customer-driven market.

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