Guided Capstone Project Report

Motivation

We recently opened up a new run, and we know what it's costing to maintain, but we are not sure we are getting the right revenue for this investment. This holds true for any further investments as well. We would like to have some indicators of what factors can dictate a higher ticket price.

We also believe that the number and kind of facilities that we can offer to our customers has some bearing on the price that we can charge.

This is the data that we'll look at today. It's the effect of facilities on the amount we can charge. That is just one of several aspects of the overall rationale for pricing our product.

What data are we working with?

We are using data from ski resorts across the US. The data contains ticket pricing, along with several attributes, such as runs, chair lifts, snow making, and terrain information such as skiable area, elevation and vertical drop. We can see what attributes a resort has, and what they are charging, and extrapolate our pricing against all or some of these attributes.

What are we trying to predict?

What resorts across the US are charging for tickets, and what facilities they offer. We are using that data to extrapolate the ways facilities could inform pricing.

What are we NOT trying to predict?

This model does not address profit, or how operational costs will affect profit. For example, we can see that other resorts with fewer runs are still able to charge a good price, but it does not predict how dropping some runs will affect operational costs and profitability.

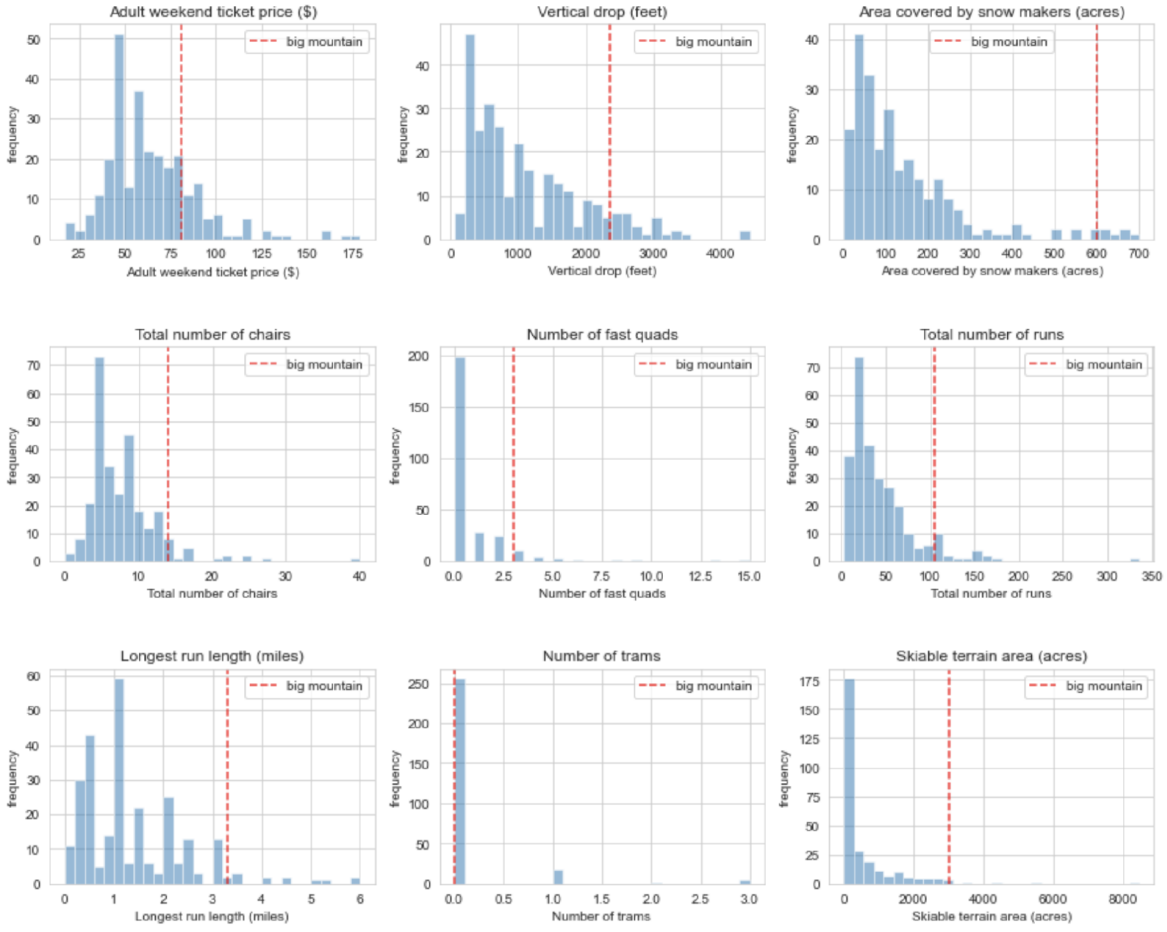
How does the Big Mountain facility stack up?

Overall

Big Mountain currently charges $81.00 dollars for a weekend ticket which is a **high** price compared to many resorts — it's somewhere in the 90th percentile for all resorts in the US.

Big Mountain has extensive facilities when compared to all resorts across the US.

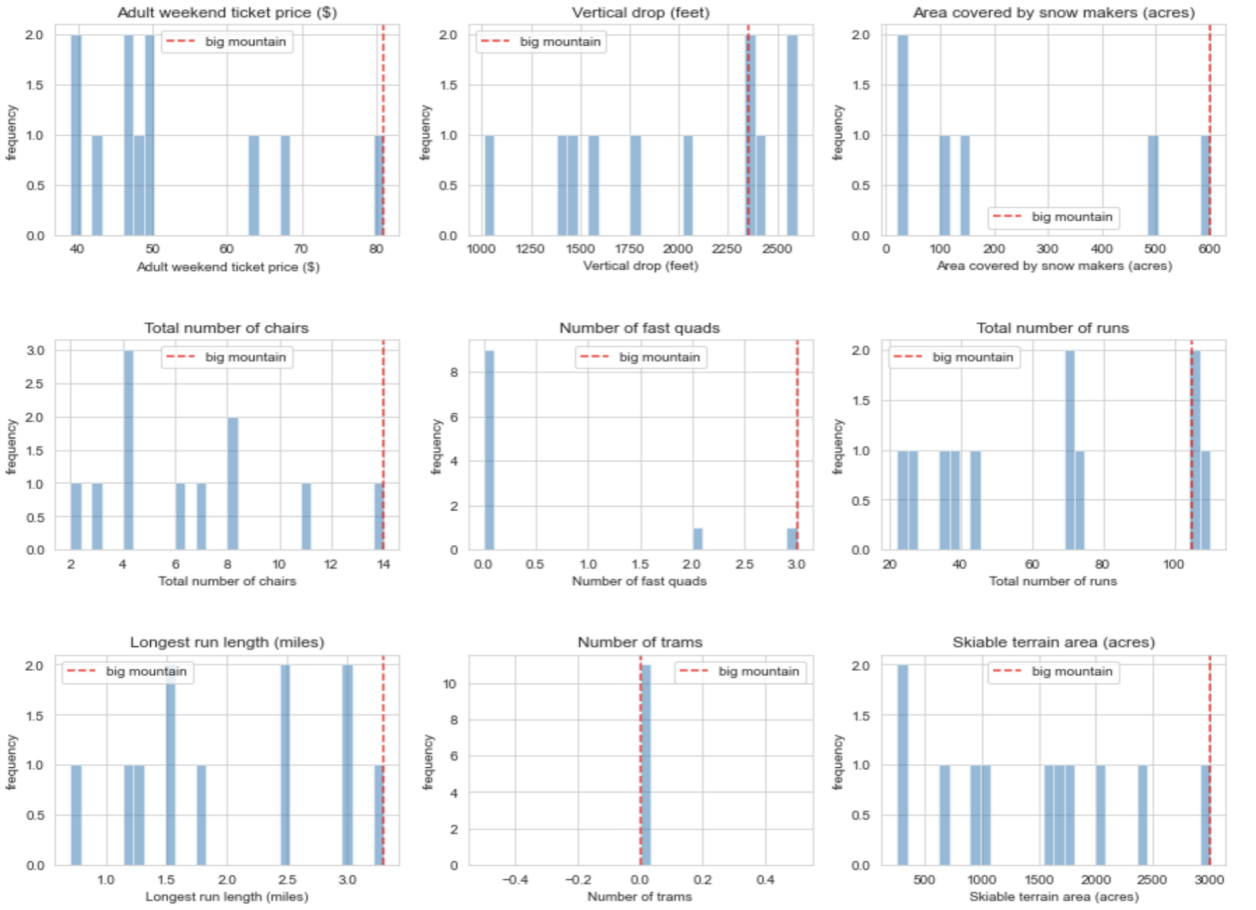
- high vertical drops
- amount of snowmaking equipment
- number of chairs
- fast quads
  .. and more



In Montana only

Big Mountain commands one of the highest prices in Montana, but is also one of the largest facilities in Montana

- greatest snowmaker distribution
- greatest number of chairs
- greatest fast Quads
- longest run in Montana
- most skiable area
- one of the highest priced
- has one of the higher vertical drops - but not the
- one of the higher number of runs



either way, that amounts to an increase somewhere between $93.00 and $97.00 dollars for a ticket.

In the worst case this amounts to an increase of > 8 million dollars per year.

Our current pricing

Without any change in facilities at all, the model suggests that a higher ticket price might be worth investigating. But this particular model is based on a single data set - and is focused purely on facilities, and not some of the other factors that might influence ticket price - so it is only an interesting indicator at this point.

Big Mountain currently charges $81.00 dollars for a weekend ticket, which is a **high** price compared to many resorts — it's somewhere in the 90th percentile for all resorts in the US. In terms of Montana alone, BM has one of the highest prices in Montana

But the model suggests that on the basis of its **current facilities** an average $95.87 dollar weekend ticket price might be supportable. That amounts to an increase between approximately 94.00 and 96.00 dollars.

In the worst case this amounts to an increase of > 8 million dollars per year.

But there are limitations to the precision of this prediction that we'll outline later in the **Scope of this mode**l section.

The new chair lift

The model predicts that adding an additional chair lift could support a $0.29 increase in ticket price, resulting in a yearly increase of $507,246, but we know that the operations cost of that new chair is triple that amount at $1.5 million.

However, the model does not say one way or the other whether that additional chair could result in more customers, or increase customer satisfaction.

Increasing the vertical drop of that new run by 150 feet theoretically supports a 1.99 dollar increase, amounting to a 3.5 million yearly increase.

Future facility investments

Taking our single dataset at face value, it might be worth further considering dropping some of our less-used runs, and adding a new run or extending an existing run to increase vertical drop, and raise pricing, but that is only based on facilities, and not other market considerations.

The model suggests that a higher vertical drop equates to higher ticket prices, and while that may or may not be enough to suggest that we should immediately install a higher run and raise prices, higher vertical drop does seem to correlate with higher ticket prices. It may be that there are other factors, such as snow quality, or factors that correlate with vertical drop, and more directly explain the correlation.

For example, it's possible that baseline elevation and vertical drop really correspond to snow quality, or more skiable days, which are more obvious market factors, but these factors are not included in our current dataset.

Scope of this model

Without any change in facilities at all, the model suggests that a higher ticket price might be worth investigating. But this particular model is based on a single data set - and is focused purely on facilities, and not some of the other factors that might influence ticket price - so it is only an interesting indicator at this point.

In terms of making other predictions, our mean absolute error of $10.39 per ticket may not be precise enough. With 350,000 customers per year, each staying five days, the $10.39 mean error adds up to 18 million dollars per year.

So, while the model can still indicate general directions, when we are trying to understand how changing our facilities will support new pricing, the pricing predictions we are seeing are smaller than the mean error. For example, adding a run with 150 feet more vertical drop theoretically supports a 1.99 dollar increase, amounting to only a 3.5 million per year boost in revenue (350K customers * 5 days per visit * $10.39 > 18M per year), but that increase is dwarfed by the $18 million dollar margin of error.

What our current data covers:

- **Facilities** -> what facilities command higher value?

What this dataset does not cover:

- **Volume vs price** - Increasing the number of visitors is also a viable way of increasing profits, but this dataset does not help us one way or the other in that area.
- **Quality of snow over time** – how 'good' are the snow conditions in winter or spring? Is this what we are really measuring when we talk about vertical drop, or is there another customer driver?
- **Skill types** - how many beginner, intermediate, advanced, and expert runs do US resorts get? What about Montana resorts? Is this additional data worth acquiring? How many of each type of customer do we get, and could we have a different profile (e.g. heavier on advanced and expert) and make or accelerate a new market?
- **Competition** - local customer vs travelers - how much revenue is from local customers? How much local competition do we have for local customers? How much travel time to other competing resorts, and how close are they to higher income populations?
- **Marketing** - do we believe that we can successfully market a new advanced or expert run at a higher rate? Can a resort in Montana command a higher price, even if it's the best resort in the country?
- **Market segmentation** The only market segments we are looking at are (1) All US and (2) just Montana? Is there another way to segment? e.g. midwest region, or by some other non-geo criteria?
- **Root causes** - It's (arguably) highly unlikely that a customer decides on where to go and how much to pay based on vertical drop, but this is a key indicator in our data. It may be necessary to expand our existing dataset to get to root causes.

- **Brand** → Aspen, Telluride, have a big reputation as a premier destination - people travel to spend X days there.
- **The overall market** – is it shrinking or growing or flat? How have ticket prices fluctuated over the past years?
- **Economics** - The economic outlook - how free will money be over the next X year? Will it allow growth from new skiers, or ski families, or die-hards? Think Racquetball.
- **Travel and entertainment** → If our average stay per customer is 5 days then we probably have a good set of customers who travel from other locations. For travelers, what kinds of lodging is available? Is it chic or functional? Is there nearby entertainment? What flights service our area?

Call to action

What we can do right now, is to ask any questions about how other facilities are configured in terms of facilities and their respective ticket prices: we can ask questions such as: 'what ticket prices do other resorts with 10 runs or 20 runs and a higher vertical drop charge. We can ask against a broad variety of facilities and terrains, such as:

- vertical drops
- snowmaking equipment
- number of chairs
- fast quads
- skiable area

  And more ..

This is limited to just the dimension of **facilities vs price**. It is not comprehensive. Additionally our model has a high mean error, which should be improved.

Should we have access to deeper analytics to understand our pricing options? Yes - we think so, and there are a number of avenues we can take to improve these analytics. Will it help to spend some more effort to achieve more comprehensive predictions? If so, we suggest forming a more expanded set of questions together with operations and with marketing - to take this project to the next level.